

Für jede Anwendung der passende Motor



Motors

Answers for industry.



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 Siemens AG
 Industrielle Elektronik

	Niederspannungsmotoren					Getriebemotoren				EX-Motoren		Gleichstrommotoren	Hochspannungsmotoren																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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	Niederspannungsmotoren für Netz- und Umrichterbetrieb					Asynchronservomotoren für Umrichterbetrieb		Permanent erregte Synchronservomotoren		Permanent erregter Direktantrieb für Rundachsen		Permanent erregter Direktantrieb für Linearachsen		Getriebemotor für Netz- und Umrichterbetrieb		Industriegetriebe/Schneckengetriebe		Servogetriebemotoren mit Stirn- und Winkelgetriebe		Servogetriebemotoren mit koaxialem Planetengetriebe		Explosionsgeschützte und schlagwettergeschützte Motoren für Netz- und Umrichterbetrieb (Ex-Zone 1 bzw. Division 1)		Permanent erregte Synchronservomotoren		Gleichstrommotoren für drehzahlgeregelten Betrieb		Hochspannungs-Asynchronmotoren für Netz- und Umrichterbetrieb		Hochspannungs-Synchronmotoren für Netz- und Umrichterbetrieb																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			

The right motor for every application



Motors

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	Low-voltage motors					Geared motors				EX motors		DC motors	High-voltage motors					
	Asynchronous		Synchronous			Asynchronous		Synchronous		Asynchronous	Synchronous		Asynchronous	Synchronous				
	Low dynamic performance	Medium dynamic performance	High dynamic performance	Medium dynamic performance	Very high dynamic performance	Low dynamic performance	Low dynamic performance	High dynamic performance	High dynamic performance	Low dynamic performance	High dynamic performance	Medium dynamic performance	Dynamic performance levels	Dynamic performance levels				
	Low-voltage motors for line and inverter operation		Induction servomotors for inverter operation	Permanent-magnet synchronous servomotors	Permanent-magnet direct drive for rotary axes	Permanent-magnet direct drive for linear axes	Geared motors for line and inverter operation	Industrial gears/worm gears	Geared servomotors with helical and angled gear units	Geared servomotors with coaxial/planetary gear	Explosion-protected and fire-damp-protected motors for line and inverter operation (Ex Zone 1 and Division 1)	Permanent-magnet synchronous servomotors	DC motors for variable-speed operation	High-voltage induction motors for line and inverter operation	High-voltage synchronous motors for line and inverter operation			
Core features	With aluminum frame: Light, reliable, compact, with efficiency classes EFF1, EFF2 (IEC); EPA, Ultra NEMA Premium (NEMA)		With grey cast iron frame: Reliable, rugged, compact, with efficiency classes EFF1, EFF2 (IEC); EPA, Ultra NEMA Premium (NEMA)			Compact, high power density, either with solid or hollow shaft	Compact, high power density	Compact, high torque at low speed	Compact, high rate of acceleration at high velocity	High degree of flexibility regarding gearbox types (helical gear, bevel, offset, helical worm, worm gears)	Especially reliable and rugged gearbox with high overload capability, low noise, compact, flexible	Can be mounted, high precision, high efficiency (helical/offset/bevel/worm gears)	Highest precision, extremely high efficiency, compact	Especially reliable and rugged motors with: Increased safety "e", flameproof enclosure "d", pressurized enclosure "p"	Compact, high power density, explosion-protected for use in Ex Zone 1 and Division 1	Low shaft height with a high torque, reliable, low noise	Compact, flexible, high degree of availability	Compact, flexible, high degree of availability
Rated voltage	IEC: 230 ... 690 V NEMA: 220 ... 575 V		IEC: 230 ... 690 V NEMA: 220 ... 575 V			400 ... 480 V, 690 V	230 V, 400 ... 480 V	400 ... 480 V, 690 V	400 ... 480 V	230 ... 690 V	230 ... 690 V	400 ... 480 V	400 ... 480 V	IEC: 230 V ... 13.2 kV NEMA: 230 ... 460	400 ... 480 V	Up to 810 V DC	2 ... 13.2 kV	6 kV ... 13.2 kV
Rated speed, velocity at rated force	IEC: Line operation at 50 Hz: 750 ... 3000 rpm NEMA: Line operation at 60 Hz: 900 ... 3600 rpm		IEC: Line operation at 50 Hz: 750 ... 3000 rpm NEMA: Line operation at 60 Hz: 900 ... 3600 rpm			400 ... 2900/4000 rpm	Up to 6000 rpm	38 ... 800 rpm	105 ... 836 m/min	0.05 ... 1088 rpm	0.08 ... 580 rpm	43 ... 780 rpm	120 ... 1500 rpm	IEC: Line operation 750 ... 3600 rpm NEMA 900 ... 3600 rpm	1500 ... 6000 rpm	Up to 3600 rpm	Line operation up to 3600 rpm	Line operation up to 3600 rpm
Maximum speed	Inverter operation: Up to 6000 rpm		Inverter operation: Up to 6000 rpm			Up to 18,000 rpm	Up to 12,000 rpm	Up to 1700 rpm	Up to 836 m/min	Up to 1088 rpm	Up to 580 rpm	Up to 780 rpm	Up to 1500 rpm	Inverter operation Ex de: Up to 12,000 rpm	Up to 7000 rpm		Inverter operation up to 4800 rpm	Inverter operation up to 6300 rpm
Rated power	IEC: 0.06 ... 45 kW (0.08 ... 61.2 HP) NEMA: 1 ... 20 HP		0.75 ... 4000 kW (1.02 ... 5440 HP) NEMA: 1 ... 400 HP			3.7 ... 630 kW (5.03 ... 856.8 HP)	0.05 ... 118 kW (0.07 ... 160.48 HP)	3.1 ... 2150 kW (4.22 ... 2924 HP)	0.09 ... 200 kW (0.12 ... 272 HP)	0.12 ... 200 kW (0.16 ... 272 HP)	0.3 ... 7.9 kW (0.41 ... 10.74 HP)	0.3 ... 57 kW (0.41 ... 77.52 HP)	0.3 ... 57 kW (0.41 ... 77.52 HP)	IEC: 0.12 ... 70,000 kW (0.16 ... 95,200 HP) NEMA: 1 ... 400 HP	1.2 ... 12.4 kW (1.63 ... 16.86 HP)	Up to 1610 kW (2189.6 HP)	200 ... 30,000 kW (272 ... 40,800 HP)	5,000 ... 100,000 kW (6,800 ... 136,000 HP)
Rated torque, rated force	IEC: 0.3 ... 292 Nm NEMA: 1.5 ... 60 lb-ft		IEC: 9.9 ... 38,000 Nm NEMA: 1.5 ... 1772 lb-ft			22 ... 3600 Nm	0.08 ... 690 Nm	100 ... 42,000 Nm	150 ... 10,375 N	40 ... 20,000 Nm	100 ... 360,000 Nm	3.6 – 1730 Nm	2 ... 3400 Nm	IEC: 0.61 ... 450,000 Nm NEMA: 3.0 ... 1772 lb-ft	1.9 ... 68 Nm	Up to 44,500 Nm	Up to 200,000 Nm	Up to 600,000 Nm
Ratios I	-		-			-	-	-	-	1.36 ... 449.21	5.17 ... 75	3 ... 70	4 ... 50	-	-	-	-	-
Ratio with initial gearbox	-		-			-	-	-	-	181 ... 71388	22.5 ... 10,958	-	-	-	-	-	-	-
Shaft height	IEC: 56 ... 225 NEMA FS: 140 ... 280		IEC: 100 ... 630 NEMA FS: 140 ... 440			100 ... 280	20 ... 160	150 ... 500		Dependent on the motor and gearbox	63 ... 630	Dependent on the motor and gear	28 ... 132	IEC: 63 ... 1250 NEMA: 140 ... 440	71 ... 132	100 ... 630	315 ... 1250	710 ... 1250
Degree of protection	IEC: IP55, IP56 (non-heavy sea), IP65, NEMA: IP54		IEC: IP55, IP56 (non-heavy sea), IP65, NEMA: IP55			IP23, IP55, IP65	IP64, IP65, IP67, IP68	IP23, IP54, IP55	IP65	IP55, IP56, IP65	IP55	IP65	IP65	IEC: IP20, IP55, IP56 (non-heavy sea), IP65, IP67, IP68 NEMA: IP54	IP64, IP65	IP23, IP54	IP23, IP55	IP55
Explosion-protection (also refer to column explosion-proof motors)	Optional: IEC: Ex nAII T3 (Zone 2) or dust-ex (Zone 21, 22)		Optional: IEC: Ex nAII T3 (Zone 2) or dust-ex (Zone 21, 22)			Optional: Zone 2, 22 IEC: (E) Exn (Zone 2) or dust-ex (Zone 22)	Optional: Zone 2, 22	-	-	Optional: Zone 1, 2, 21, 22	Yes	-	-	IEC: Ex e II, Ex de IIC, Ex d IIC, Ex de I, Ex d I, Ex p II and double protection Ex d plus Ex e NEMA: Class I, Group D, Class II, Groups F&G, Division 1, Class I, Groups C&D, Division 1	Ex de IIC T3 (Zone 1)	No	Ex n AII (Zone 2) or dust-ex	Ex n AII (Zone 2) or dust-ex
Cooling type	IEC: Self-ventilated NEMA: TEFC (totally enclosed fan cooled)		IEC: Self-ventilated, force-ventilated, water-jacket-cooled NEMA: TEFC (totally enclosed fan cooled), ODP (open drip proof)			Force-ventilated, water-cooled, open-circuit air-cooled (dependent on the type)	Self-ventilated, force-ventilated, water-cooled (dependent on the type)	Force-ventilated, water-cooled (dependent on the type)	Water-cooled	Self-ventilated, force-ventilated	Self-ventilated, force-ventilated	Non-ventilated	Self-ventilated, force-ventilated, water-cooled	IEC: Self-ventilated, force-ventilated, water-cooled, pipe-cooled, air/air cooler, air/water cooler NEMA: TEFC (totally enclosed fan cooled)	Self-ventilated	Self-ventilated, force-ventilated, open-circuit air-cooled, air/air cooler, air/water cooler, non-ventilated	Self-ventilated, force-ventilated, air/air cooler, air/water cooler, open-circuit air-cooled	Air/air cooler Air/water cooler
Sensorless operation	Yes		Yes			Yes, dependent on the type	-	Yes	External encoder required	Yes	Yes	-	-	-	Yes	Yes	Yes	Yes
Encoder	Pulse encoder HTL, pulse encoder TTL		Pulse encoder HTL, pulse encoder TTL			Resolver (dependent on the type), incremental encoder (sin/cos, 1Vpp), absolute encoder EnDat (dependent on the type), pulse encoder HTL (dependent on the type)	Resolver, incremental encoder (sin/cos, 1Vpp), absolute encoder EnDat	Resolver (dependent on the type), incremental encoder (sin/cos, 1Vpp) (dependent on the type), absolute encoder EnDat (dependent on the type)	-	Inkrementalgeber TTL Inkrementalgeber HTL Resolver Absolutwertgeber EnDat Absolutwertgeber SSI	Inkrementalgeber TTL Inkrementalgeber HTL Resolver Absolutwertgeber EnDat Absolutwertgeber SSI	Resolver, incremental (sin/cos, 1Vpp), absolute (EnDat)	Resolver, incremental (sin/cos 1Vpp), absolute (EnDat)	Pulse encoder HTL/TTL (dependent on the type)	Incremental encoder (sin/cos, 1Vpp), absolute encoder EnDat	Resolver (please enquire), incremental encoder (sin/cos, 1Vpp), absolute encoder EnDat (please enquire), pulse encoder HTL, pulse encoder TTL	Resolver, incremental encoder (sin/cos, 1Vpp), absolute encoder EnDat, pulse encoder HTL, pulse encoder TTL	Resolver, incremental encoder (sin/cos, 1Vpp), absolute encoder EnDat, pulse encoder HTL, pulse encoder TTL
Options	Brake	Yes	Yes	Yes	Yes	Yes	-	-	-	Yes	Yes	Yes	Please enquire	-	Yes	-	-	-
Drive-CLIQ interface	-	-	-	Yes	Yes	Yes, dependent on the type	Yes	Yes, dependent on the type	Yes	-	-	Yes	-	-	-	-	-	-
Separately-driven fan	Yes	Yes	Yes	Yes, dependent on the type	Yes, dependent on the type	Yes, dependent on the type	-	Yes	Yes	Yes	-	Yes	Yes, dependent on the type	-	Yes	Yes	Yes	Yes
ECOFAST	Yes	Yes	-	-	-	-	-	-	Yes	Yes	-	-	-	-	Yes	-	-	-
2 nd shaft end	Yes	Yes, dependent on the type	Yes, dependent on the type	-	Yes, dependent on the type	-	Yes	Yes, dependent on the type	Yes	Yes	-	Yes	Yes	-	Yes	Yes	Yes	Yes
Frequency Converter and Motorstarter	SINAMICS G110, G120, S120 MICROMASTER, MASTERDRIVES, SIMATIC ET 200S FC, SIMATIC ET 200pro FC, SIRIUS 3RW30, 3RW40 and 3RW44 soft starters, SIRIUS compact starters 3RA6, AS-Interface compact starters, SIMATIC ET 200pro motor starters, ECOFAST motor starters		SINAMICS G110, G120, G130, G150, S120, S150, MICROMASTER, MASTERDRIVES, DYNAVERT, SIMATIC ET 200S FC, SIRIUS 3RW30, 3RW40 and 3RW44 soft starters, SIRIUS compact starters 3RA6, AS-Interface compact starters, SIMATIC ET 200S motor starters, ECOFAST motor starters			SINAMICS G120, G130, G150, S120, S150, MASTERDRIVES, SIMODRIVE 611	SINAMICS S120, MASTERDRIVES, SIMODRIVE 611	SINAMICS S120, G130, G150, S150, MASTERDRIVES, SIMODRIVE 611	SINAMICS S120, MASTERDRIVES, SIMODRIVE 611	SINAMICS G110, G120, S120, MICROMASTER, MASTERDRIVES, SIMATIC ET 200S FC, SIMATIC ET 200pro FC, SIRIUS 3RW30, 3RW40 and 3RW44 soft starters, SIRIUS compact starters 3RA6, AS-Interface compact starters SIMATIC ET 200S motor starters, SIMATIC ET 200pro motor starters, ECOFAST motor starters	SINAMICS G110, G120, S120, MICROMASTER, MASTERDRIVES, SIMATIC ET 200S FC, SIMATIC ET 200pro FC, SIRIUS 3RW30, 3RW40 and 3RW44 soft starters, SIRIUS compact starters 3RA6, AS-Interface compact starters SIMATIC ET 200S motor starters, SIMATIC ET 200pro motor starters, ECOFAST motor starters	SINAMICS S120, SIMODRIVE 611, MASTERDRIVES MC	SINAMICS S120, SIMODRIVE 611, MASTERDRIVES MC	SINAMICS G110, G120, G130, G150, S120, S150, GM150, SM150, MICROMASTER, MASTERDRIVES, SIMATIC ET 200S FC, Dynavert T, ROBICON Perfect Harmony, SIRIUS 3RW30, 3RW40 and 3RW44 soft starters	SINAMICS S120, MASTERDRIVES, SIMODRIVE 611	SIMOREG DC-MASTER	ROBICON Perfect Harmony, SINAMICS GM150, SM150, SIMOVERT D, SINAMICS GL150	ROBICON Perfect Harmony, SINAMICS GM150, SM150, SIMOVERT D, SINAMICS GL150
Motormanagement	Motormanagement system SIMOCODE pro		Motormanagement system SIMOCODE pro							Motormanagement system SIMOCODE pro	Motormanagement system SIMOCODE pro		Motormanagement system SIMOCODE pro (Ex die)	Motormanagement system SIMOCODE pro (Ex die)				
Typical applications	Pumps, fans, compressors, conveyor systems with special requirements regarding low weight and highest efficiency		Pumps, fans, compressors, conveyor systems, marine applications, offshore, mixers, crushers, extruders, rolls with special requirements regarding the ruggedness – especially in the chemical and petrochemical industries			High-power rating applications with requirements for a high dynamic performance and compact design, e.g. printing machines, extruders, main spindle drives in machine tools	Applications with high up to the highest dynamic performance, e.g. robots and handling systems, woodworking, glass, ceramic and stone processing, packaging, plastic and textile machines and in the machine tool sector	Extruders, swiveling axes, rotary and rotary cyclic tables, tool magazines, turret indexing, cylinder indexing, rotary spindles, roll drives and in the machine tool area	High requirements on the dynamic performance and precision for linear motions, e.g. machining centers, turning, grinding, laser machining, handling and in the machine tool area	Pumps, conveyor systems, cooling tower drives, agitators and mixers, crane systems, washing lines, food & beverage industry	Solar systems, elevators, escalators, theater drives, presses, heavy duty applications, e.g. in the area of steel plants and power stations	Basic positioning tasks and continuously running auxiliary drives with servo quality (production machines, high-bay racking units, filling systems, conveyor belts)	Positioning tasks in machine tools, production machines, robots and handling systems, auxiliary axes	For general industrial applications with special requirements on explosion protection, e.g. in the process industry	For general industrial applications with specific requirements on explosion protection, e.g. flexo printing and photogravure printing machines, filling systems	Motors for standard drive applications in all industrial areas and in the infrastructure	Medium- and high-voltage drive applications – especially pumps, compressors, blowers, extruders, mixers, crushers, conveyor belt systems, ship's propulsion systems	Medium- and high-voltage drive applications – including compressors, blast furnace blowers, refiners, pumps, extruders
Catalog	IEC: DB1.1 NEMA: DB1.2		IEC: DB1.1 NEMA: DB1.2			PM21, NC 60, NC61	PM21, NC 60, NC61	PM21, NC 60, NC61, DB6.2	NC 60, NC61	DB7.1 MOTOX Konfigurator	K88 MOTOX Konfigurator	PM21	PM21, NC60, NC61	IEC: DB1.1, NEMA: DB1.2 Loher: IM01	PM21	DA12	-	-

Industry sector-specific motors, e.g.
 - spindle/spindle drives for machine tools (turning, milling, grinding)
 - special drives for the textile industry
 - special motors for oil & gas, chemical/petrochemical, marine engineering, mining, steel industry

Application-specific motors, e.g.
 - high-speed motors with up to 21,000 rpm
 - motors for high- and low-temperature applications
 - distributed drives with integrated drive inverters
 - smoke extraction motors, stepping motors

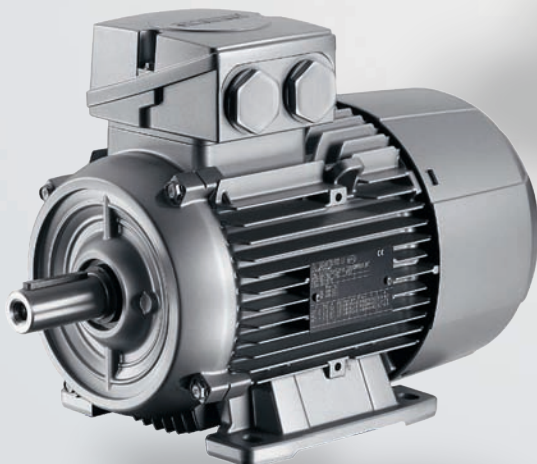
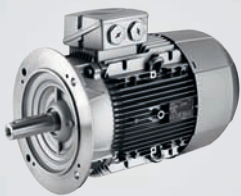
Customer-specific motors and drive solutions:
 Across the complete range shown here we also design – in close cooperation with customers – individual motors up to integrated mechatronic drive solutions

IEC Squirrel-Cage Motors

Frame sizes 56 to 450

Power range 0.06 to 1250 kW

Catalog D 81.1 · 2008



Motors

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Related catalogs

<p>MOTEX Geared motors D 87.1</p> <p>E86060-K5287-A111-A2-7600</p>		<p>Industry Automation and Motion Control</p> <p>Information and ordering platform on the Internet at: www.siemens.com/automation/mall</p>	
<p>FLENDER Standard Couplings MD 10.1</p> <p>E86060-K5710-A111-A2-7600</p>		<p>Additional documentation</p> <p>You will find all information material, such as brochures, catalogs, manuals and operating instructions for standard drive systems up-to-date on the Internet at the address http://www.siemens.com/motors/printmaterial</p> <p>You can order the listed documentation or download it in common file formats (PDF, ZIP).</p>	
<p>SINAMICS G110/SINAMICS G120 D 11.1 Inverter Chassis Units SINAMICS G120D Distributed Frequency Converters</p> <p>E86060-K5511-A111-A5-7600</p>		<p>Catalog CA 01 – Selection tool SD configurator</p> <p>The selection tool SD configurator is available in combination with the electronic catalog CA 01 on DVD.</p>	
<p>SINAMICS G130 D 11 Drive Converter Chassis Units SINAMICS G150 Drive Converter Cabinet Units</p> <p>E86060-K5511-A101-A4-7600</p>			
<p>MICROMASTER DA 51.2 MICROMASTER 420/430/440 Inverters 0.12 kW to 250 kW</p> <p>E86060-K5151-A121-A6-7600</p>		<p>Furthermore, the SD configurator can now be used on the Internet without installation. The SD configurator can be found in the Siemens Mall under the following address: http://www.siemens.com/sd-configurator</p>	
<p>MICROMASTER/COMBIMASTER DA 51.3 MICROMASTER 411 Inverter COMBIMASTER 411 Distributed Drive Solutions</p> <p>E86060-K5251-A131-A2-7600</p>		<p>In the main menu of the CA 01 under the tab “selection tool”, you will find the SD configurators for low-voltage motors, MICROMASTER 4 inverters, SINAMICS G110 and SINAMICS G120 inverter chassis units as well as SINAMICS G120D distributed frequency converters and SIMATIC ET 200S FC and SIMATIC ET 200pro FC frequency converters for distributed I/O, complete with:</p>	
<p>Industrial Communication IK PI Part 5: ET 200 Distributed I/O ET 200S FC Frequency converter</p> <p>E86060-K6710-A101-B6-7600</p>		<ul style="list-style-type: none"> • Dimension drawing generator for motors • Data sheet generator for motors and inverters • Starting calculation • 3D models in .stp format • Extensive documentation 	
<p>AC NEMA & IEC Motors D 81.2 Further details available on the Internet at: http://www.sea.siemens.com/motors</p> <p>Only PDF</p>		<p>Hardware and software requirements</p> <ul style="list-style-type: none"> • PC with 1.5 GHz CPU or faster • Operating systems <ul style="list-style-type: none"> – Windows 98/ME – Windows 2000 – Windows XP – Windows NT (Service Pack 6 or higher) – Windows Vista • 1024 MB work memory (minimum) • Screen resolution 1024 x 768, graphic with more than 256 colors • Small fonts • CD-ROM drive • Windows-compatible sound card • Windows-compatible mouse 	
<p>Industry Automation and Motion Control CA 01 The Offline-Mall (DVD)</p> <p>E86060-D4001-A510-C7-7600</p>		<p>Installation</p> <p>You can install this catalog directly from the DVD as a partial version or full version on your hard disk or in the network.</p>	

Motors

IEC Squirrel-Cage Motors

Frame sizes 56 to 450

Power range 0.06 to 1250 kW

Catalog D 81.1 · 2008



The products and systems described in this catalog are manufactured/distributed under application of a certified quality management system in accordance with DIN EN ISO 9001 (Certified Registration No. DE-000357 QM). The certificate is recognized by all IQNet countries.

Supersedes:

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Catalog News D 81.1 N · October 2007

The products contained in this catalog can also be found in the e-Catalog CA 01.

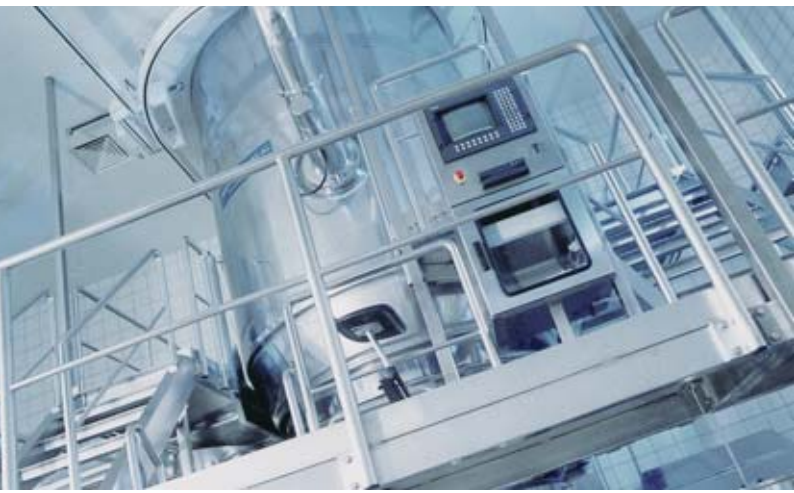
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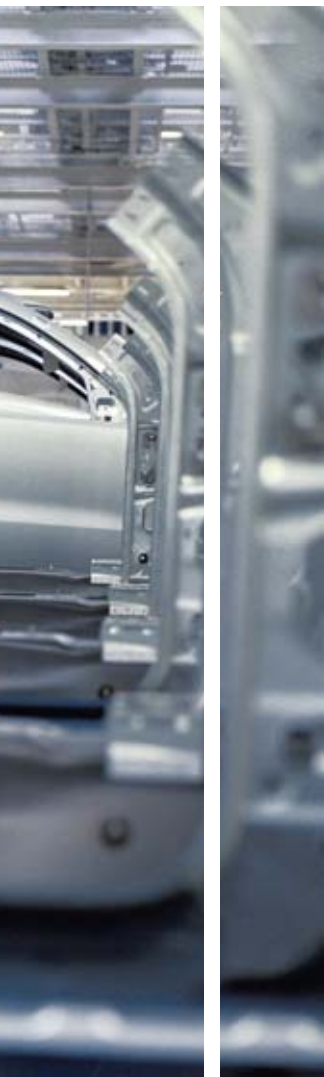
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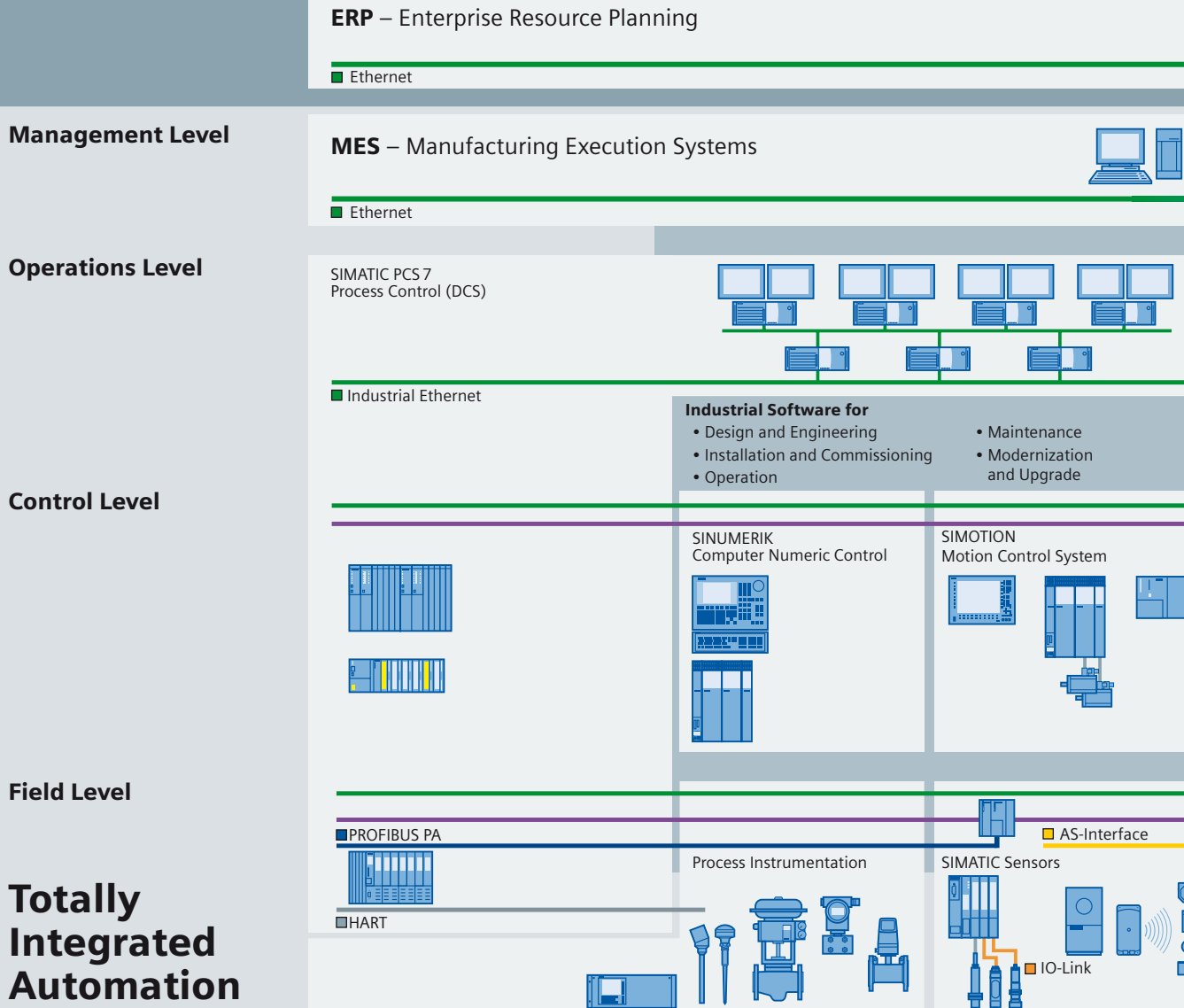
Answers for Industry.

Siemens Industry answers the challenges in the manufacturing and the process industry as well as in the building automation business. Our drive and automation solutions based on Totally Integrated Automation (TIA) and Totally Integrated Power (TIP) are employed in all kinds of industry. In the manufacturing and the process industry. In industrial as well as in functional buildings.

Siemens offers automation, drive, and low-voltage switching technology as well as industrial software from standard products up to entire industry solutions. The industry software enables our industry customers to optimize the entire value chain – from product design and development through manufacture and sales up to after-sales service. Our electrical and mechanical components offer integrated technologies for the entire drive train – from couplings to gear units, from motors to control and drive solutions for all engineering industries. Our technology platform TIP offers robust solutions for power distribution.

The high quality of our products sets industry-wide benchmarks. High environmental aims are part of our eco-management, and we implement these aims consistently. Right from product design, possible effects on the environment are examined. Hence many of our products and systems are RoHS compliant (Restriction of Hazardous Substances). As a matter of course, our production sites are certified according to DIN EN ISO 14001, but to us, environmental protection also means most efficient utilization of valuable resources. The best example are our energy-efficient drives with energy savings up to 60 %.

Check out the opportunities our automation and drive solutions provide. And discover how you can sustainably enhance your competitive edge with us.

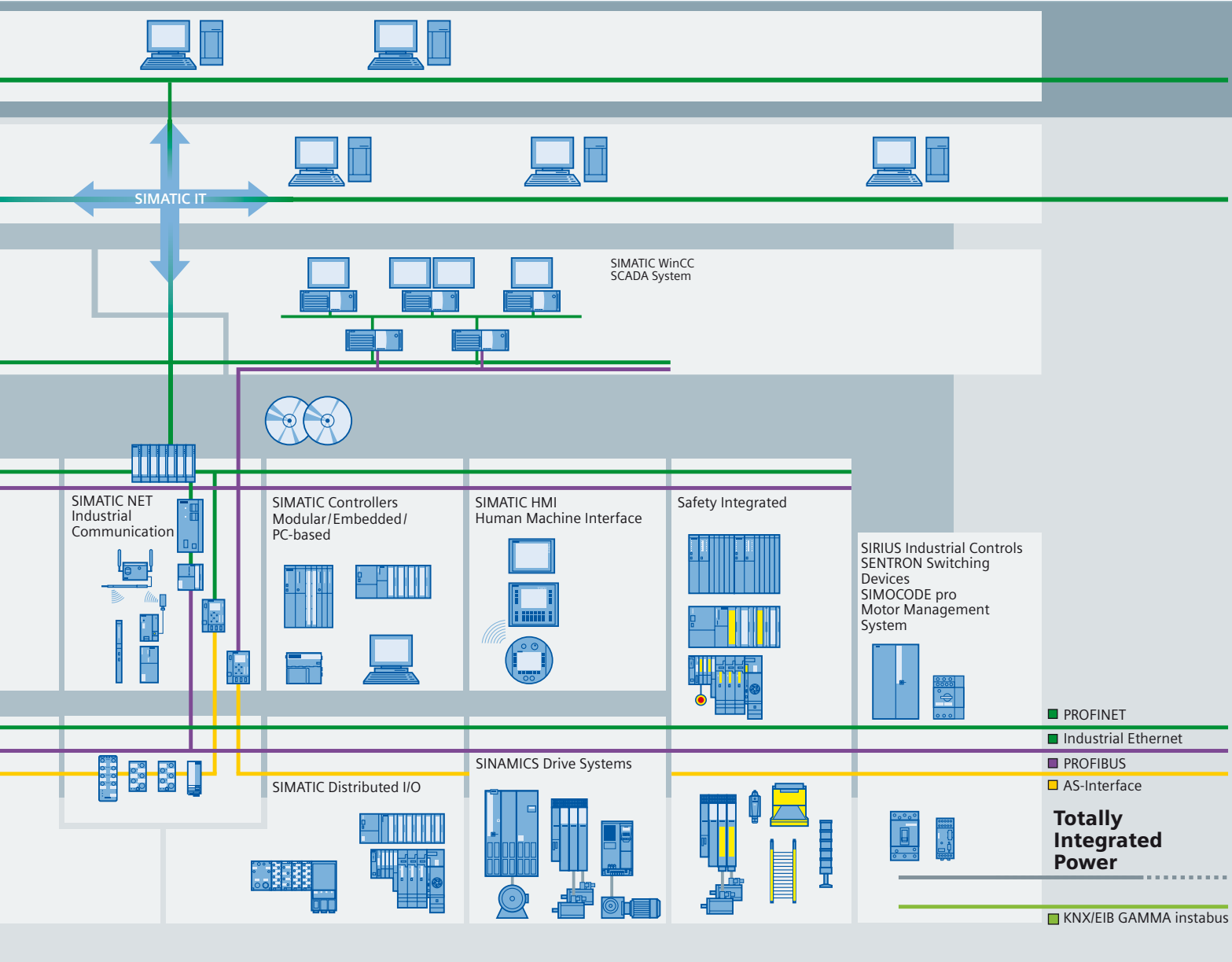


Setting standards in productivity and competitiveness.

Totally Integrated Automation.

Thanks to Totally Integrated Automation, Siemens is the only provider of an integrated basis for implementation of customized automation solutions – in all industries from inbound to outbound.

30.04.2008



TIA is characterized by its unique continuity.

It provides maximum transparency at all levels with reduced interfacing requirements – covering the field level, production control level, up to the corporate management level. With TIA you also profit throughout the complete life cycle of your plant – starting with the initial planning steps through operation up to modernization, where we offer a high measure of investment security resulting from continuity in the further development of our products and from reducing the number of interfaces to a minimum.

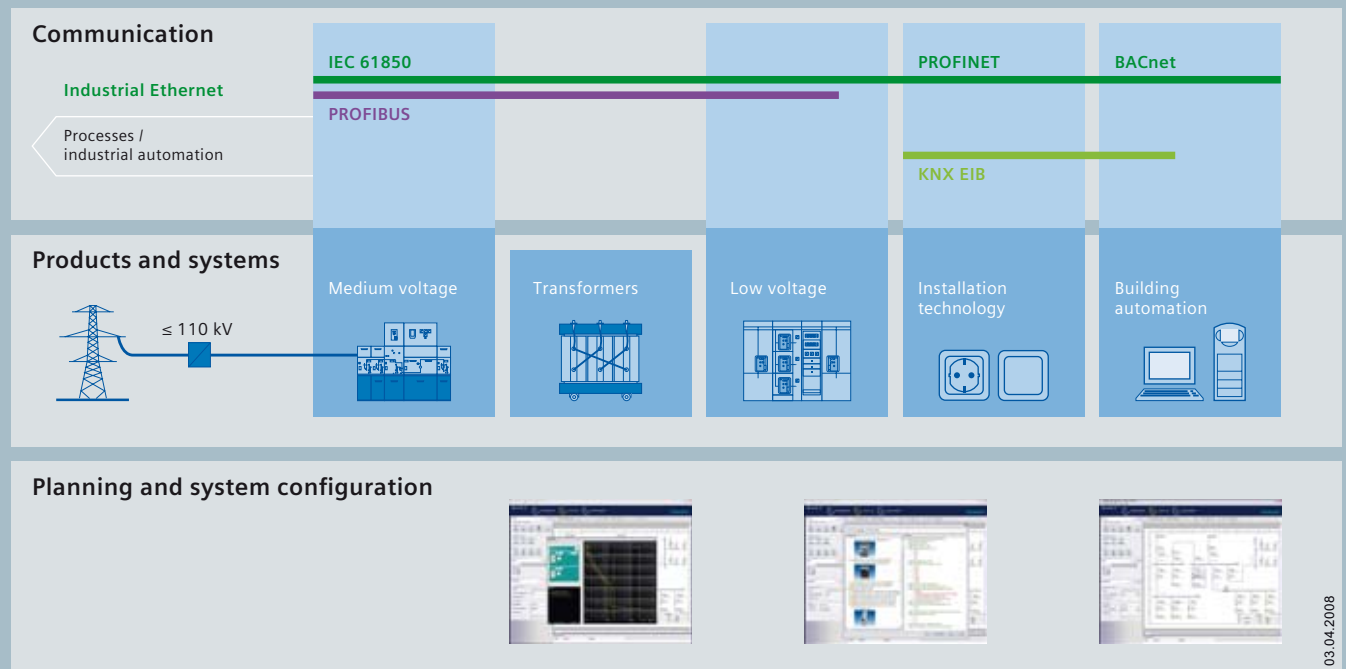
The unique continuity is already a defined characteristic at the development stage of our products and systems.

The result: maximum interoperability – covering the controller, HMI, drives, up to the process control system. This reduces the complexity of the automation solution in your plant. You will experience this, for example, in the engineering phase of the automation solution in the form of reduced time requirements and cost, or during operation using the continuous diagnostics facilities of Totally Integrated Automation for increasing the availability of your plant.



Integrated power distribution from one source.

Totally Integrated Power.



03.04.2008

Electrical power distribution in buildings requires integrated solutions. Our response: Totally Integrated Power. This means innovative and integrated, interface-optimized products and systems which have been optimally coordinated and complemented with communication and software modules that link power distribution to building automation or industrial automation. Totally Integrated Power accompanies power distribution projects from one end to the other. From A to Z. From the planning to the building's use: Totally Integrated Power offers significant advantages in every project stage and to everyone involved in the project – the investors, electrical planning engineers, electricians, users and building facility managers.

Our portfolio comprises everything from engineering tools to the matching hardware: from switchgear and distribution systems for medium voltage to transformers, from switching and circuit-protection devices to low-voltage switchgear and busbar trunking systems, as far as to the small distribution board and the wall outlet. It goes without saying that both the medium-voltage switchgear, which requires no maintenance, and the low-voltage switchgear are type-tested, and their busbar connections, too. Comprehensive protection systems ensure the safety of man and machine at any time.

Introduction



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- 0/108 • Windings and insulation
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Overview

These “recommendations for drive selection” guide you step-by-step through this catalog to the required motor.

Step 1	Technical requirements for the motor		
Determine the required product profile, the following are required:	Rated frequency and rated voltage	3 AC 50/60 Hz, 400, 500 or 690 V	
	Duty	Standard duty (continuous duty S1 according to DIN EN 60034-1)	
	Degree of protection or type of explosion protection required	IP..	
	Rated speed (No. of poles)	$n = \dots\dots\dots$ rpm	
	Rated output	$P = \dots\dots\dots$ kW	
	Rated torque	$M = P \cdot 9550/n = \dots\dots\dots$ Nm	
	Type of construction	IM..	
Step 2	Environmental requirements for the motor		
Determine the installation conditions	Ambient temperature	≤ 40 °C	>40 °C
	Site altitude	≤ 1000 m	>1000 m
	Factors for derating	None	Determine the factor for derating (for derating factor, see “Technical information” – “Coolant temperature and site altitude”)
Step 3	For preliminary selection of the motor, \Rightarrow see subsequent pages and the corresponding “Preliminary selection of the motor” tables in the different catalog parts		
Determine the range of possible motors	Select the frame size and therefore the possible motors on the basis of the following parameters: cooling method, degree of protection, rated output, rated speed and rated torque range. Note: The standard temperature range of the motors is from -20 to $+40$ °C.		
Step 4	Detailed selection of the motor		
Determine the basic Order No. of the motor	Determine the motor Order No. according to the following parameters: rated output, rated speed, rated torque and rated current from the “Selection and ordering data” for the motors that have already been identified as possibilities.		
Step 5	Selection of the special versions (see under “Special versions”)		
Complete the motor Order No.	Determine special versions and the associated order codes (e. g. special voltages and types of construction, motor protection and degrees of protection, windings and insulation, colors and paint finish, mountings and technology, etc.) .		
Step 6			
Select the frequency converter, if required	For Order No. of the converter as well as its selection, see Catalogs D 11, D 11.1 , DA 51.2 and DA 51.3.		

Note on using this catalog

Due to the wide range of possible versions of low-voltage motors, the special features of the various motor series are not explained in detail in each case in this catalog part. The availability of individual technical designs can be established from catalog parts 1 to 10.

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Determine the motor type according to cooling method, degree of protection and frame design
(for further selection according to speed or number of poles, rated output, rated torque, rated speed and rated current, see the relevant "Preselection of the motor" tables in catalog parts 1 to 10)

Applications for surface-cooled motor types	Cooling method	Standard designation for degree of protection to DIN EN 60034 Part 5	Frame design	Motor type (Positions 1 to 3 of the Order No.) + type series (Position 4 of the Order No.) Rated output at 50 Hz		Motor frame sizes (shaft heights)															
				1LE1	1PC1	56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
New generation motors 1LE1/1PC1 Catalog Part 1																					
General Line motors with shorter delivery time	Self-ventilated	IP55	Aluminum	1LE1	1.5 ... 18.5 kW																
Energy-saving motors with improved efficiency (Improved Efficiency EFF2)	Self-ventilated	IP55	Aluminum	1LE1	0.75 ... 18.5 kW																
Energy-saving motors with high efficiency (High Efficiency EFF1)	Self-ventilated	IP55	Aluminum	1LE1	0.75 ... 18.5 kW																
Motors with increased output and improved efficiency	Self-ventilated	IP55	Aluminum	1LE1	2.2 ... 22 kW																
Motors with increased output and high efficiency	Self-ventilated	IP55	Aluminum	1LE1	2.2 ... 22 kW																
Motors without external fan and fan cover with improved efficiency	Forced-air-cooled	IP55	Aluminum	1LE1	0.75 ... 18.5 kW																
Motors without external fan and fan cover with high efficiency	Forced-air-cooled	IP55	Aluminum	1LE1	0.75 ... 18.5 kW																
Motors without external fan and fan cover with improved efficiency	Self-cooled	IP55	Aluminum	1PC1	0.3 ... 7.4 kW																
Motors without external fan and fan cover with high efficiency	Self-cooled	IP55	Aluminum	1PC1	0.37 ... 9 kW																
Standard motors (up to frame size 315 L) Catalog Part 2																					
Energy-saving motors with improved efficiency (Improved Efficiency EFF 2)	Self-ventilated	IP55	Aluminum	1LA7	0.06 ... 18.5 kW	1LE1/1PC1	1LA5	11 ... 45 kW													
		IP55	Cast iron	1LA6	0.75 ... 18.5 kW	1LG4	11 ... 200 kW														
Pole-changing motors with improved efficiency	Self-ventilated	IP55	Aluminum	1LA7	0.15 ... 17 kW		1LA5	18 ... 31 kW													
Energy-saving motors with high efficiency (High Efficiency EFF1)	Self-ventilated	IP55	Aluminum	1LA9	0.06 ... 37 kW																
		IP55	Cast iron	1LG6	11 ... 200 kW																
Motors with increased output	Self-ventilated	IP55	Aluminum	1LA9	0.14 ... 53 kW																
		IP55	Cast iron	1LG4	15 ... 110 kW																
Motors without external fans	Self-cooled	IP55	Aluminum	1LP7	0.045 ... 7 kW	1LE1/1PC1	1LP5	5.5 ... 16.5 kW													
		IP55	Cast iron	1LP4	3.7 ... 67 kW																
Non-standard motors (frame size 315 and above) Catalog Part 3																					
Motors for mains-fed operation	Self-ventilated	IP55	Cast iron				1LA8	160 ... 1000 kW													
Motors for converter-fed operation	Self-ventilated	IP55	Cast iron				1LA8	145 ... 1000 kW													
Motors with mounted separately driven fan for converter-fed operation	Forced-air-cooled	IP55	Cast iron				1PQ8	145 ... 1000 kW													
Motors with through-ventilation for mains-fed operation	Self-ventilated	IP23	Cast iron				1LL8	200 ... 1250 kW													
Motors with through-ventilation for converter-fed operation	Self-ventilated	IP23	Cast iron				1LL8	200 ... 1250 kW													

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Determining the motor type according to cooling method, degree of protection and frame design (continued)

Applications for surface-cooled motor types	Cooling method	Standard designation for degree of protection to DIN EN 60034 Part 5	Frame design	Motor type (Positions 1 to 3 of the Order No.) + type series (Position 4 of the Order No.) Rated output at 50 Hz	Motor frame sizes (shaft heights)															
					56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
Explosion-proof motors					Catalog Part 4															
Motors in Zone 1 with type of protection "e" (Zone 1 Exe II T3)	Self-ventilated	IP55	Aluminum	1MA7 0.12 ... 16 kW																
			Cast iron																	
Motors in Zone 1 with type of protection "de" (Zone 1 Exde IIC T4)	Self-ventilated	IP55	Cast iron	1MJ6 0.25 ... 37 kW																
Motors in Zone 2 with type of protection "n"	Self-ventilated	IP55	Aluminum	1LA7 0.09 ... 18.5 kW																
			Aluminum	1LA9 0.06 ... 37 kW																
			Cast iron																	
Motors in Zone 21 with explosion protection	Self-ventilated	IP65	Aluminum	1LA7 0.09 ... 18.5 kW																
			Aluminum	1LA9 0.06 ... 37 kW																
			Cast iron																	
Motors in Zone 22 with explosion protection	Self-ventilated	IP55	Aluminum	1LA7 0.09 ... 18.5 kW																
			Aluminum	1LA9 0.06 ... 37 kW																
			Cast iron																	
Motors operating with frequency converters					Catalog Part 5															
Surface-cooled motors with standard insulation for voltages ≤500 V																				
For standard motors, non-standard motors, explosion-proof motors and fan motors, see catalog part 5.																				
Motors with special insulation for voltages up to 690 V (standard motors)	Self-ventilated	IP55	Aluminum	1LA7 1.5 ... 18.5 kW																
			Cast iron																	
Motors with special insulation for voltages up to 690 V (non-standard motors)	Self-ventilated	IP55	Cast iron																	
Motors with mounted separately driven fan with special insulation for voltages up to 690 V	Forced-air cooled	IP55	Cast iron																	

IEC Squirrel-Cage Motors

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Guide to selecting and ordering the motors

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Determining the motor type according to cooling method, degree of protection and frame design (continued)

Applications for surface-cooled motor types	Cooling method	Standard designation for degree of protection to DIN EN 60034 Part 5	Frame design	Motor type (Positions 1 to 3 of the Order No.) + type series (Position 4 of the Order No.) Rated output at 50 Hz		Motor frame sizes (shaft heights)																											
				56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450												
Pump motors																						Catalog Part 6											
Energy-saving motors with improved efficiency (Improved Efficiency EFF2)	Self-ventilated	IP55	Aluminum	1LA7 0.06 ... 18.5 kW		1LE1/1PC1		1LA5 11 ... 45 kW																									
		IP55	Cast iron			1LA6 0.75 ... 18.5 kW		1LG4 11 ... 200 kW																									
Motors with increased output	Self-ventilated	IP55	Aluminum	1LA9 0.14 ... 53 kW																													
		IP55	Cast iron					1LG4 15 ... 110 kW																									
Fan motors																						Catalog Part 7											
Motors in pole-changing version	Self-ventilated	IP55	Aluminum	1LA7 0.15 ... 17 kW		1LA5 18 ... 31 kW																											
		IP55	Cast iron			1LG4 4.5 ... 175 kW																											
Motors without external fan and without fan cover	Forced-air cooled	IP55	Aluminum	1PP7 0.09 ... 18.5 kW		1LE1/1PC1		1PP5 11 ... 37 kW																									
		IP55	Cast iron					1PP4 11 ... 200 kW																									
Compressor motors																						Catalog Part 8											
Energy-saving motors with high efficiency	Self-ventilated	IP55	Aluminum	1LA9 0.06 ... 37 kW																													
		IP55	Cast iron					1LG6 11 ... 200 kW																									
Motors with increased output	Self-ventilated	IP55	Aluminum	1LA9 0.14 ... 53 kW																													
		IP55	Cast iron					1LG4 15 ... 110 kW																									
Non-standard motor for mains-fed and converter-fed operation	Self-ventilated	IP55	Cast iron																	1LA8 160 ... 1000 kW													
Smoke extraction motors																						Catalog Part 9											
Temperature/time class F200, F300	Self-ventilated	IP55	Aluminum	1LA7 0.37 ... 18.5 kW (0.09 ... 3.85 kW pole-changing)		1LA5 15 ... 45 kW (4.05 ... 8.6 kW pole-changing)																											
		IP55	Cast iron					1LG6 37 ... 200 kW																									
	Forced-air cooled	IP55	Aluminum	1PP7 0.37 ... 18.5 kW (0.09 ... 3.85 kW pole-changing)		1PP5 15 ... 45 kW (4.05 ... 8.6 kW pole-changing)																											
		IP55	Cast iron					1PP6 37 ... 200 kW																									
Temperature/time class F400	Self-ventilated	IP55	Cast iron	1LA6 1.5 ... 18.5 kW (0.3 ... 3.45 kW pole-changing)		1LG6 15 ... 200 kW																											
	Forced-air cooled	IP55	Cast iron	1PP6 1.5 ... 200 kW (0.3 ... 3.45 kW pole-changing)																													
Marine motors (motors for drives on ships below deck)																						Catalog Part 10											
Type approved standard motors up to frame size 315 L – Energy-saving motors with improved efficiency (Improved Efficiency EFF2)	Self-ventilated	IP55	Aluminum	1LA7 0.06 ... 18.5 kW		1LA5 11 ... 45 kW																											
		IP55	Cast iron			1LA6 0.75 ... 18.5 kW		1LG4 11 ... 200 kW																									
Type approved standard motors up to frame size 315 L – Energy-saving motors with high efficiency (High Efficiency EFF1)	Self-ventilated	IP55	Aluminum	1LA9 0.06 ... 37 kW																													
		IP55	Cast iron					1LG6 11 ... 200 kW																									
Type approved, explosion-proof motors up to frame size 315 L – Motors in Zone 1 with type of protection “e” (Zone 1 Exe II T3)	Self-ventilated	IP55	Aluminum	1MA7 0.12 ... 16 kW																													
		IP55	Cast iron					1MA6 1.3 ... 165																									

IEC Squirrel-Cage Motors

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Guide to selecting and ordering the motors

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Determining the motor type according to cooling method, degree of protection and frame design (continued)

Applications for surface-cooled motor types	Cooling method	Standard designation for degree of protection to DIN EN 60034 Part 5	Frame design	Motor type (Positions 1 to 3 of the Order No.) + type series (Position 4 of the Order No.) Rated output at 50 Hz																		
				Motor frame sizes (shaft heights)	Catalog Part 10																	
				56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450	
Marine motors (motors for drives on ships below deck) (continue)																						
Type approved, explosion-proof motors up to frame size 315 L – Motors in Zone 1 with type of protection “de” (Zone 1 Exde IIC T4)	Self-ventilated	IP55	Cast iron	1MJ6 0.25 ... 37 kW										1MJ7 18.5 ... 132 kW								
Type approved, explosion-proof motors up to frame size 315 L – Motors in Zone 2 with type of protection “n”	Self-ventilated	IP55	Aluminum	1LA7 0.09 -18.5 kW																		
		IP55	Aluminum	1LA9 0.06 ... 37 kW																		
		IP55	Cast iron	1LA6 0.75 ... 18.5 kW					1LG4/1LG6 11 ... 200 kW													
Explosion-proof motors up to frame size 315 L – Motors in Zone 21 with protection against dust explosions	Self-ventilated	IP55	Aluminum	1LA7 0.09 ... 18.5 kW										1LA5 11 ... 45 kW								
		IP55	Aluminum	1LA9 0.06 ... 37 kW																		
		IP55	Cast iron						1LG4/1LG6 11 ... 200 kW													
Explosion-proof motors up to frame size 315 L – Motors in Zone 22 with protection against dust explosions	Self-ventilated	IP55	Aluminum	1LA7 0.09 ... 18.5 kW										1LA5 11 ... 45 kW								
		IP55	Aluminum	1LA9 0.06 ... 37 kW																		
		IP55	Cast iron	1LA6 0.75 ... 18.5 kW					1LG4/1LG6 11 ... 200 kW													
Type approved fan motors – Motors in pole-changing version	Self-ventilated	IP55	Aluminum	1LA7 0.15 ... 17 kW										1LA5 18 ... 31 kW								
		IP55	Cast iron						1LG4 4.5 ... 83 kW													
Type approved fan motors – Motors without external fan and without fan cover	Forced-air cooled	IP55	Aluminum	1PP7 0.09 ... 18.5 kW										1PP5 15 ... 37 kW								
		IP55	Cast iron						1PP4 11 ... 200 kW													
Standard motors up to frame size 315 L	Self-cooled	IP55	Aluminum	1LP7 0.045 ... 7 kW										1LP5 5.5 ... 16.5 kW								
		IP55	Cast iron						1LP4 3.7 ... 67 kW													
Smoke-extraction motors Temperature/time classes F200 and F300	Self-ventilated	IP55	Aluminum	1LA7 0.09 ... 18.5 kW										1LA5 4.05 ... 45 kW								
		IP55	Cast iron						1LG6 37 ... 200 kW													
	Forced-air cooled	IP55	Aluminum	1PP7 0.09 ... 18.5 kW										1PP5 4.05 ... 45 kW								
		IP55	Cast iron											1PP6 37 ... 200 kW								
Smoke-extraction motors Temperature/time class F400	Self-ventilated	IP55	Cast iron	1LA6 0.3 ... 22 kW					1LG6 15 ... 200 kW													
	Forced-air cooled	IP55	Cast iron	1PP6 0.3...200 kW																		
Non-standard motor frame size 315 and above – Motors for mains-fed and converter-fed operation	Self-ventilated	IP55	Cast iron	1LA8 145 ... 1000 kW																		
Non-standard motors frame size 315 and above – Forced-air cooled motors with mounted separately driven fan for converter-fed operation	Forced-air cooled	IP55	Cast iron	1PQ8 145 ... 1000 kW																		
Non-standard motors frame size 315 and above – Self-ventilated motors with through-ventilation for mains-fed and converter-fed operation	Self-ventilated	IP23	Cast iron	1LL8 180 ... 1250 kW																		
Non-standard motors frame size 315 and above – Water-cooled motors for mains-fed and converter-fed operation	Forced-air cooled	IP55	Steel	1) 1)																		
Explosion-proof motors frame size 315 and above – Self-ventilated motors in Zones 2, 22 with type of protection “n” or protection against dust explosions	Self-ventilated	IP55	Cast iron	1LA8 160 ... 1000 kW																		

1) 1LH8 motor frame size 450, rated output 485 ... 1150 kW

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

Order No. code

0

Overview

The Order No. comprises a combination of letters and numbers and for clarity it is subdivided into two blocks which are connected by hyphens,

e. g.

1LA5223-4AA19-Z

M1F + A11 + G17

The first block (positions 1 to 7) identifies the motor type; further characteristics of the version are coded in the second block (positions 8 to 12).

For deviations in the second block from the catalog codes, either **-Z** or **9** should be used as appropriate.

Ordering data:

- Complete Order No. and order code(s) or plain text.
- If a quotation has been requested, please specify the quotation number in addition to the Order No.
- When ordering a complete motor as a spare part, please specify the works serial No. for the previously supplied motor as well as the Order No.

Structure of the Order No.:		Position:	1	2	3	4	5	6	7	-	8	9	10	11	12	
IEC squirrel-cage motors, surface-cooled																
Positions 1 to 3: Digit, letter, letter	<ul style="list-style-type: none"> • Self-ventilated by fan mounted on and driven by rotor, aluminum or cast-iron housing • Self-ventilated by fan mounted on and driven by rotor, cast-iron housing • Self-ventilated by fan mounted on and driven by rotor, increased safety, type of protection Ex e II • Self-ventilated by fan mounted on and driven by rotor, explosion-proof enclosure, type of protection Ex de IIC • Self-ventilated with through-ventilation, cast-iron housing • Self-cooled without external fan, aluminum and cast-iron housing • Forced-air cooled by air flow from the fan to be driven, aluminum or cast-iron housing • Forced-air cooled by separately driven fan, cast-iron housing 	1	L	A												
Position 4: Digit	Type series 4 Type series 5 Type series 6 Type series 7 Type series 8 Type series 9					4 5 6 7 8 9										
Positions 5 to 7: 3 digits	Motor frame size (frame size comprising shaft height and construction length, codes from 050 to 457)															
Position 8: Digit	Number of poles															
Positions 9 to 10: Letter	Version															
Position 11: Digit	Voltage, circuit and frequency															
Position 12: Digit	Type of construction															
	Special order versions: Coded – Order code also required Not coded – Plain text also required															- Z

Ordering example

Selection criteria	Requirement	Structure of the Order No.
Motor type	Standard motor with improved efficiency, IP55 degree of protection, aluminum housing	1LA5□□□□-□□□□□□
Motor frame size/No. of poles/speed	4-pole/1500 rpm	1LA5223-4AA□□
Rated output	45 kW	1LA5223-4AA1□
Voltage and frequency	230 VΔ/400 VY, 50 Hz	1LA5223-4AA19
Type of construction	IM V5 with protective cover	M1F
Special versions	3 PTC thermistors	1LA5223-4AA19-Z M1F A11
	Mounted separately driven fan	1LA5223-4AA19-Z M1F A11 G17

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

Special versions

0

Overview

The order codes and availability are assigned to the individual motor series in the "Selection and ordering data" in the individual catalog parts 2 to 10.

For voltages, see "Voltages, currents and frequencies" in the "Introduction" as well as in catalog parts 2 to 10.

For types of construction, see "Types of construction" in the "Introduction" as well as in catalog parts 2 to 10.

All available options are listed according to topics in the following table. An alphanumerical listing according to order codes can be found in the appendix under "Overview of order codes".

Order code	Special versions	For further information, see Page
Motor protection		
A10	With PTC thermistors for alarm for converter-fed operation in Zones 2, 21, 22	0/33, 4/82
A11	Motor protection through PTC thermistor with 3 embedded temperature sensors for tripping	0/34, 0/38
A12	Motor protection through PTC thermistor with 6 embedded temperature sensors for tripping and alarm	0/35
A15	Motor protection with PTC thermistors for converter-fed operation with 3 or 4 embedded temperature sensors for tripping	0/35, 4/3, 4/82
A16	Motor protection with PTC thermistors for converter-fed operation with 6 or 8 embedded temperature sensors for alarm and tripping	0/33, 4/3, 4/82
A23	Motor temperature detection with embedded temperature sensor KTY 84-130	0/35
A25	Motor temperature detection with embedded temperature sensors 2 x KTY 84-130	0/35
A31	Temperature detectors for tripping	0/34
A60	Installation of 3 PT 100 resistance thermometers in stator winding	0/36
A61	Installation of 6 PT 100 resistance thermometers in stator winding	0/36
A72	Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings	0/36
A78	Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings	0/36
A80	Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings	0/36
Motor connection and connection box		
G55	ECOFAST motor plug Han-Drive 10e for 230 VΔ/400 VY	0/51
G56	ECOFAST motor plug EMC Han-Drive 10e for 230 VΔ/400 VY	0/51
K06	Two-part plate on connection box	0/39
K09	Connection box on RHS	0/38
K10	Connection box on LHS	0/38
K11	Connection box on top, feet screwed on	0/38
K15	Connection box in cast-iron version	0/38, 0/47 ...
K53	Explosion-proof connection box, Ex d IIC type of protection	0/38, 0/48 ...
K54	One cable gland, metal	0/39
K55	Cable gland, maximum configuration	0/39
K57	Cable gland DIN 89280, maximum configuration	0/39
K83	Rotation of the connection box through 90°, entry from DE	0/39
K84	Rotation of the connection box through 90°, entry from NDE	0/39
K85	Rotation of connection box through 180°	0/39
L00	Next larger connection box	0/38
L01	Undrilled entry plate	0/40
L13	External earthing	0/38
L44	3 cables protruding, 0.5 m long	0/40
L45	3 cables protruding, 1.5 m long	0/40
L47	6 cables protruding, 0.5 m long	0/40
L48	6 cables protruding, 1.5 m long	0/40
L49	6 cables protruding, 3 m long	0/40
L51	Protruding cable ends – right side	0/40
L52	Protruding cable ends – left side	0/40
L97	Auxiliary connection box 1XB3 020	0/50
M46	Stud terminal for cable connection, accessories pack (3 items)	0/49
M47	Saddle terminal for connection without cable lug, accessories pack	0/49
M50	Auxiliary connection box 1XB9 016	0/50
M58	Next larger connection box 1XB1 621	0/38
M64	Connection box on NDE	0/38
M69	Terminal strip for main and auxiliary terminals	0/49
M88	Auxiliary connection box 1XB9 014 (aluminum)	0/50
Windings and insulation		
C11	Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	0/32
C12	Temperature class 155 (F), used acc. to 155 (F), with increased power rating	0/32
C13	Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	0/33
C18	Temperature class 180 (H) at rated output and max. CT 60 °C	0/33
C19	Increased air humidity/temperature with 30 to 60 g water per m ³ of air	0/33

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

Special versions

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Overview (continued)

Order code	Special versions	For further information, see Page
Windings and insulation (continued)		
C22	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	0/33
C23	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	0/33
C24	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	0/33
C25	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	0/33
C26	Increased air humidity/temperature with 60 to 100 g water per m ³ of air	0/33
Y50	<i>New!</i> Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	0/33
Y52	Temperature class 155 (F), used acc. to 155 (F), other requirements	0/33
Colors and paint finish		
K23	Unpainted (only cast-iron parts primed)	0/17
K24	Unpainted, only primed	0/17
K26	Special finish in RAL 7030 stone gray	0/18
M91	<i>New!</i> Offshore special finish	0/17
M94	<i>New!</i> Sea air resistant special finish	0/17
Y51	Special finish in special RAL colors	0/17, 0/19
Y53	Standard finish in other standard RAL colors	0/17, 0/18
Y54	Special finish in other standard RAL colors	0/17, 0/18
Modular technology – Basic versions		
G17	Mounting of separately driven fan	0/76
G26	Mounting of brake	0/77 ...
H57	Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	0/75
H58	Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	0/75
Modular technology – Combinations of basic versions		
H61	Mounting of separately driven fan and 1XP8 001-1 rotary pulse encoder	0/84
H62	Mounting of brake and 1XP8 001-1 rotary pulse encoder	0/84
H63	Mounting of brake and separately driven fan	0/84
H64	Mounting of brake, separately driven fan and 1XP8 001-1 rotary pulse encoder	0/84
H97	Mounting of separately driven fan and 1XP8 001-2 rotary pulse encoder	0/84
H98	Mounting of brake and 1XP8 001-2 rotary pulse encoder	0/84
H99	Mounting of brake, separately driven fan and 1XP8 001-2 rotary pulse encoder	0/84
Modular technology – Additional versions		
C00	Brake supply voltage 24 V DC	0/83
C01	Brake supply voltage 400 V AC	0/83
C02	Brake supply voltage 180 V DC, for operation on MM411-ECOFAST	0/83
K82	Manual brake release with lever	0/83
Special technology		
H15	Prepared for mounting MMI	0/15, 0/85
H47	Mounting of brake NFA (Stomag)	0/85
H70	Mounting of LL 861 900 220 rotary pulse encoder	0/85
H72	Mounting of HOG 9 D 1024 I rotary pulse encoder	0/86
H73	Mounting of HOG 10 D 1024 I rotary pulse encoder	0/87
H78	Prepared for mounting LL 861 900 220	0/85
H79	Prepared for mounting HOG 9 D 1024 I	0/86
H80	Prepared for mounting HOG 10 D 1024 I	0/87
H86	<i>New!</i> Mounting of explosion-proof rotary pulse encoder for use in Zones 2, 21, 22	4/5, 4/6
H87	<i>New!</i> Mounting of explosion-proof rotary pulse encoder for use on Ex d/de motors in Zone 1	4/5, 4/6
J15	<i>New!</i> Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against moisture	0/87
J16	<i>New!</i> Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against dust	0/88
M95	<i>New!</i> Mounting of explosion-proof separately driven fan Ex nA for use in Zone 2	4/5, 4/8
M96	<i>New!</i> Mounting of explosion-proof separately driven fan II 2D for use in Zone 21	4/5, 4/8
M97	<i>New!</i> Mounting of explosion-proof separately driven fan II 3D for use in Zone 22	4/5, 4/8
M98	<i>New!</i> Mounting of explosion-proof separately driven fan Ex de for use in Zone 1	4/5, 4/8
Y70	Mounting a special type of rotary pulse encoder	0/85
Y74	<i>New!</i> Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against moisture	0/88
Y76	<i>New!</i> Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against dust	0/89
Y79	<i>New!</i> Mounting of rotary pulse encoder HOG 10 DN 1024 I + E SL 93, (speed rpm), connection box protection against moisture	0/89

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

Special versions

Overview (continued)

Order code	Special versions	For further information, see Page
Mechanical design and degrees of protection		
K17	Drive-end seal for flange-mounting motors with oil resistance to 0.1 bar	0/54
K32	With two additional eyebolts for IM V1/IM V3	0/54
K37	Low-noise version for 2-pole motors with clockwise direction of rotation	0/55
K38	Low-noise version for 2-pole motors with counter-clockwise direction of rotation	0/55
K50	IP65 degree of protection	0/54
K52	IP56 degree of protection (non-heavy-sea)	0/54
L03	Vibration-proof version	0/55
L12	Condensation drainage holes	0/54
M27	Non-rusting screws (externally)	0/55
M44	Earth brushes for converter-fed operation	0/55
M68	Mechanical protection for encoder	0/55
Coolant temperature and site altitude		
D02	Coolant temperature -50 to +40 °C	0/32
D03	Coolant temperature -40 to +40 °C	0/32
D04	Coolant temperature -30 to +40 °C	0/32
D11	Coolant temperature 45 °C, derating 4 %	0/32
D12	Coolant temperature 50 °C, derating 8 %	0/32
D13	Coolant temperature 55 °C, derating 13 %	0/32
D14	Coolant temperature 60 °C, derating 18 %	0/32
D19 <i>New!</i>	Coolant temperature -40 °C to + 40 °C for EX motor	4/5
Designs in accordance with standards and specifications		
D01	CCC China Compulsory Certification	0/16
D30	Electrical according to NEMA MG1-12	0/15
D31	Design according to UL with "Recognition Mark"	0/15
D32	Ex certification for China	4/83
D33 <i>New!</i>	Certified for Korea according to KS C4202	0/16
D40	Canadian regulations (CSA)	0/15, 0/16
D46 <i>New!</i>	PSE Mark Japan	0/16
Design for Zones 1, 2, 21 and 22 according to ATEX		
C27	Stamping of Ex nA II on VIK rating plate	4/83
C30	Outputs T1/T2 on rating plate	4/81
K30	VIK design (comprises Zone 2 for mains-fed operation, without Ex nA II marking on rating plate)	4/83
M34	Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for mains-fed operation	4/4, 4/81
M35	Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	4/4, 4/81
M38	Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating	4/4, 4/83
M39	Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating	4/4, 4/83
M72	Design for Zone 2 for mains-fed operation Ex nA II T3 to IEC/EN 60079-15	4/4, 4/81 ...
M73	Design for Zone 2 for converter-fed operation, derating Ex nA II T3 to IEC/EN 60079-15	4/4, 4/83
M74 <i>New!</i>	Design for Zones 2 and 22, for non-conducting dust (IP55), for mains-fed operation	4/81
M75 <i>New!</i>	Design for Zones 2 and 22, for non-conducting dust (IP55), for converter-fed operation, derating	4/83
M76 <i>New!</i>	Design for Zones 1 and 21, as well as for Zone 22 for conducting dust (IP65), for mains-fed operation	4/81
M77 <i>New!</i>	Design for Zones 1 and 21, as well as for Zone 22 for conducting dust (IP65), for converter-fed operation, derating	4/82
Y68	Alternative converter (SIMOVERT MASTERDRIVES, SINAMICS G110, SINAMICS S120 or ET 200 S FC)	4/82
Marine version – Basic marine version		
E00	Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class 155 (F), used according to 155 (F)	10/4 ...
E11	With/without type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	10/4 ...
E21	With/without type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	10/4 ...
E31	With/without type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	10/4 ...
E51	With/without type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	10/4 ...
E61	With/without type test certificate according to ABS (American Bureau of Shipping), USA, CT 50 °C, temperature class 155 (F), used according to 155 (F)	10/4 ...
E71	With/without type test certificate according to CCS (Chinese Classification Society), China, CT 45 °C, temperature class 155 (F), used according to 155 (F)	10/4 ...
E80	Motor for use in shipping, higher ambient temperature and/or used as 155 (F) according to 130 (B)	10/10 ...

IEC Squirrel-Cage Motors

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Special versions

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Overview (continued)

Order code	Special versions	For further information, see Page
Marine version – Acceptance/certification		
E09	Individual acceptance by marine classification society with supervision of construction and acceptance test certificate 3.2 according to EN 10204	10/4 ...
E10	Individual acceptance by marine classification society	10/4 ...
F83	Type test with heat run for horizontal motors, with acceptance	10/6 ...
F93	Type test with heat run for vertical motors, with acceptance	10/23 ...
Standardline (only for motor series 1LA8)		
B20	Standardline version	3/13
Bearings and lubrication		
G50	Measuring nipple for SPM shock pulse measurement for bearing inspection	0/58
K20	Bearing design for increased cantilever forces	0/58, 0/62 ...
K36	Special bearing for DE and NDE, bearing size 63	0/58, 0/63 ...
K40	Regreasing device	0/58
K94	Located bearing DE	0/58
L04	Located bearing NDE	0/58
L27	Insulated bearing cartridge	0/58
Balance and vibration quantity		
K02	Vibration quantity level B	0/56
L68	Full key balancing	0/56
M37	<i>New!</i> Balancing without key	0/56
Shaft and rotor		
K04	Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors	0/57
K16	Second standard shaft extension	0/56
K42	Shaft extension with standard dimensions, without featherkey way	0/57
L39	Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	0/57
M65	Standard shaft made of non-rusting steel	0/57
Y55	Non-standard cylindrical shaft extension	0/57
Heating and ventilation		
H17	Fan cover for textile industry	0/37
K34	Cast-iron fan cover	0/37
K35	Metal external fan	0/37
K45	Anti-condensation heaters for 230 V	0/36
K46	Anti-condensation heaters for 115 V	0/36
L36	Sheet metal fan cover	0/37
M14	<i>New!</i> Anti-condensation heater, Ex. 115 V	0/36
M15	<i>New!</i> Anti-condensation heater, Ex. 230 V	0/36
Y81	Separately driven fan with non-standard voltage and/or frequency	0/37
Rating plate and extra rating plates		
B06	<i>New!</i> Second lubricating plate, supplied loose	0/30
K31	Second rating plate, loose	0/30
Y80	Extra rating plate or rating plate with deviating rating plate data	0/30
Y82	Extra rating plate with identification code	0/30
Y84	Additional information on rating plate and on package label (maximum of 20 characters)	0/30
Packaging, safety notes, documentation and test certificates		
B00	Without safety and commissioning note. Customer's declaration of renouncement required.	0/21
B01	Complete with one set of safety and commissioning notes per wire-lattice pallet	0/21
B02	Acceptance test certificate 3.1 according to EN 10204	0/21
B23	Operating instructions German/English enclosed in print	0/21
B31	Document – Electrical data sheet	0/21, 3/52 ...
B32	Document – Order dimension drawing	0/21, 3/52 ...
B37	Document – Load characteristics	0/21, 3/52 ...
F01	Standard test (routine test) with acceptance	0/21, 3/52 ...
F03	Visual acceptance and report handover with acceptance	0/21, 3/52 ...
F04	Temperature-rise test, without acceptance	0/21, 3/53 ...
F05	Temperature-rise test, with acceptance	0/21, 3/53 ...
F28	Noise measurement during idling, no noise analysis, no acceptance	0/21, 3/53 ...
F29	Noise measurement during idling, no noise analysis, with acceptance	0/21, 3/53 ...

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

Special versions

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Overview (continued)

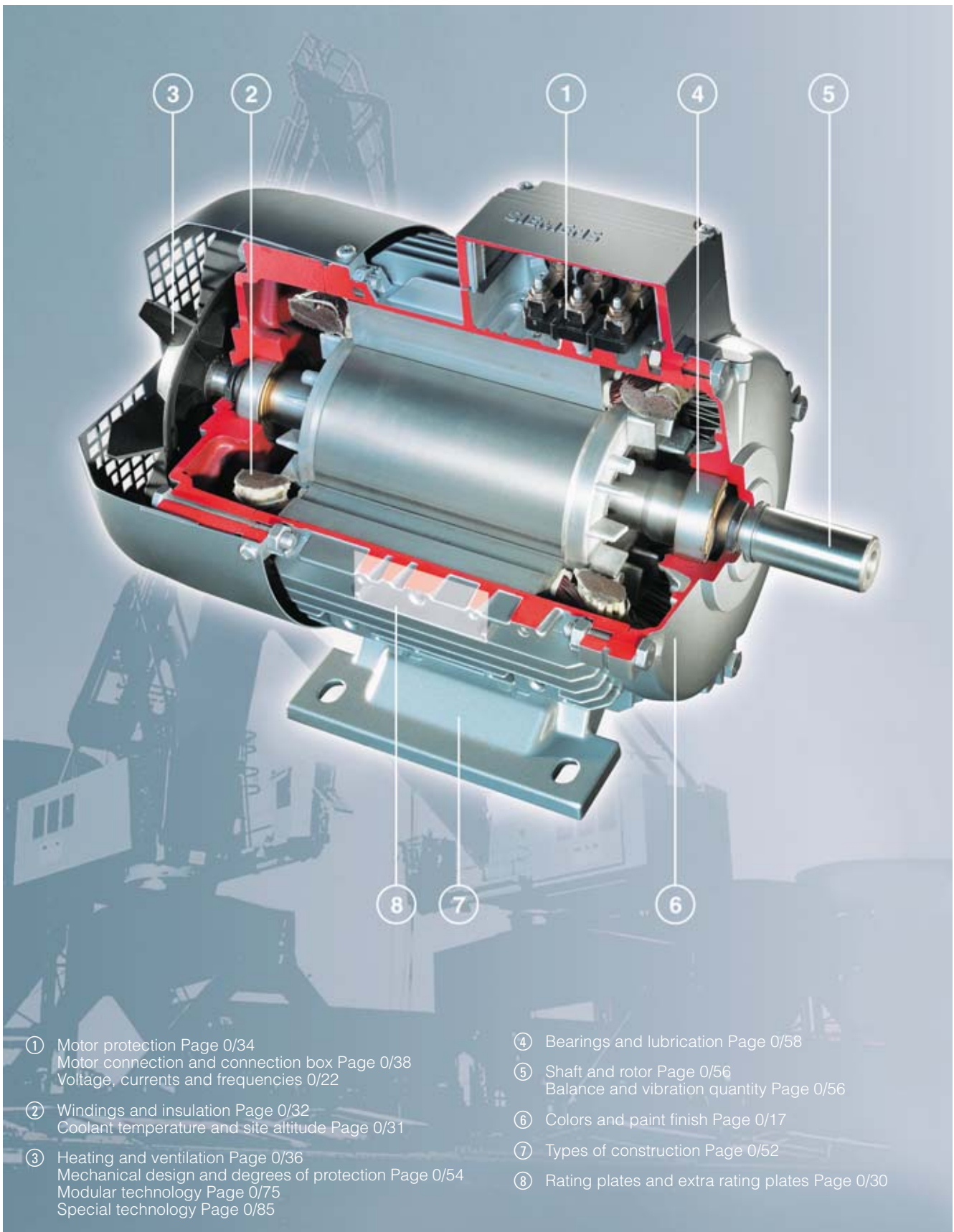
Order code	Special versions	For further information, see Page
Packaging, safety notes, documentation and test certificates (continued)		
F34	Recording of current and torque curves with torque metering shaft during starting, without acceptance	0/21, 3/53 ...
F35	Recording of current and torque curves with torque metering shaft during starting, with acceptance	0/21, 3/53 ...
F52	Measurement of the locked-rotor torque and locked-rotor current, without acceptance	0/21, 3/53 ...
F53	Measurement of the locked-rotor torque and locked-rotor current, with acceptance	0/21, 3/53 ...
F62	Noise analysis, without acceptance	0/21, 3/53 ...
F63	Noise analysis, with acceptance	0/21, 3/53 ...
F82	Type test with heat run for horizontal motors, without acceptance	0/21, 3/53 ...
F83	Type test with heat run for horizontal motors, with acceptance	0/21, 3/53 ... 10/6, 10/10 ...
F92	Type test with heat run for vertical motors, without acceptance	0/21, 3/53 ...
F93	Type test with heat run for vertical motors, with acceptance	0/21, 3/53 ...
L99	Wire-lattice pallet	0/20
M32	Connected in star for dispatch	0/20
M33	Connected in delta for dispatch	0/20

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

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Overview*Cut-away diagram of a low-voltage motor*

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Motor connection and connection box Page 0/38
Voltage, currents and frequencies 0/22
- ② Windings and insulation Page 0/32
Coolant temperature and site altitude Page 0/31
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Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Designs in accordance with standards and specifications

Applicable standards and specifications

The motors comply with the appropriate standards and regulations, especially those listed in the table below.

Title	IEC/EN	DIN EN
General specifications for rotating electrical machines	IEC 60034-1, IEC 60085	DIN EN 60034-1
Specification of the losses and efficiency of rotating electrical machines	IEC 60034-2	DIN EN 60034-2
Asynchronous AC motors for general use with standardized dimensions and outputs	IEC 60072 fixing only	DIN EN 50347
Restart characteristics for rotating electrical machines	IEC 60034-12	DIN EN 60034-12
Terminal designations and direction of rotation for electrical machines	IEC 60034-8	DIN EN 60034-8
Designation for type of construction, installation and terminal box position	IEC 60034-7	DIN EN 60034-7
Entry to terminal box	–	DIN 42925
Built-in thermal protection	IEC 60034-11	DIN EN 60034-11
Noise limit values for rotating electrical machines	IEC 60034-9	DIN EN 60034-9
IEC standard voltages	IEC 60038	DIN IEC 60038
Cooling methods for rotating electrical machines	IEC 60034-6	DIN EN 60034-6
Vibration severity of rotating electrical machines	IEC 60034-14	DIN EN 60034-14
Vibration limits	–	DIN ISO 10816
Degrees of protection of rotating electrical machines	IEC 60034-5	DIN EN 60034-5
In addition, the following applies to Ex motors:		
General regulations	IEC/EN 60079-0	DIN EN 60079-0
Explosion-proof enclosure "d"	IEC/EN 60079-1	DIN EN 60079-1
Increased safety "e"	IEC/EN 60079-7	DIN EN 60079-7
Type of protection "n" (non sparking)	IEC/EN 60079-15	DIN EN 60079-15
Areas containing flammable dust	IEC/EN 61241	DIN EN 61241

National standards

The motors comply with the IEC or European standards listed above. The European standards replace the national standards in the following European countries:

Germany (VDE), France (NF C), Belgium (NBNC), Great Britain (BS), Italy (CEI), Netherlands (NEN), Sweden (SS), Switzerland (SEV) etc.

The motors also comply with various national standards. The following standards (with the exception of non-standard motors) have been harmonized with IEC publication 60034-1 or replaced with DIN EN 60034-1 so that the motors can be operated at standard rated output.

AS 1359	Australia (higher output assignment than stated in DIN EN 50347 for frame size 250 M and above)
CSA C22.2, No. 100	Canada
IS 325 IS 4722	India
NEK – IEC 60034-1	Norway

Explosion-proof motors:

Since the requirements of explosion-proof motors comply with the European standards EN 60079-0, EN 60079-1, EN 60079-7 and Directive 94/9/EG (ATEX 95), certificates issued by authorized testing agencies (PTB, DMT, etc.) are accepted by all member states of the EU. The remaining members of CENELEC, Switzerland in particular, also accept the certificates.

The EU is currently changing the standard series from EN 50014ff to IEC / EN 60079-xx and IEC / EN 61241-xx. The transition period is approximately 2 years. After changing the standards, the first E of the marking of the type of protection will be omitted. For example: Old: EEx de – New: Ex de. The first E represented Euronorm.

Tolerances for electrical data

According to DIN EN 60034, the following tolerances are permitted: Motors which comply with DIN EN 60034-1 must have a voltage tolerance of $\pm 5\%$ / frequency tolerance of $\pm 2\%$ (Design A), if utilized, the permitted limit temperature of the temperature class may be exceeded by 10 K.

A tolerance of $\pm 5\%$ also applies to the rated voltage range in accordance with DIN EN 60034-1. Rated voltage and rated voltage range see Page 0/23.

Efficiency η for

$$P_{\text{rated}} \leq 150 \text{ kW: } -0.15 \cdot (1 - \eta)$$

$$P_{\text{rated}} > 150 \text{ kW: } -0.1 \cdot (1 - \eta)$$

with η being a decimal number.

$$\text{Power factor} - \frac{1 - \cos \varphi}{6}$$

- Minimum absolute value: 0.02
- Maximum absolute value: 0.07

Slip $\pm 20\%$ (for motors $< 1 \text{ kW}$ $\pm 30\%$ is admissible)

Locked-rotor current $+20\%$

Locked-rotor torque -15% to $+25\%$

Breakdown torque -10%

Moment of inertia $\pm 10\%$

 1MA motors:

Add 10 % to the certified values for the locked-rotor current.

Energy-saving motors with European efficiency classification in accordance with EU/CEMEP (European Committee of Manufacturers of Electrical Machines and Power Electronics)

Low-voltage motors in the output range of 1.1 to 90 kW, 2-pole and 4-pole are marked in accordance with the EU/CEMEP agreement with the efficiency class EFF2 (Improved Efficiency) or EFF (High Efficiency).

So that the requirements of efficiency classes EFF and EFF2 are fulfilled, the active parts of the motor have been optimized. The procedure for calculating the efficiency is based on the loss-summation method according to IEC 60034-2.

Motors for the North American market

For motors which comply with North American regulations (NEMA, CSA, UL, etc.), it must always be checked whether the motors will be used in the US or Canada and whether they are subject to state laws.

Minimum efficiencies required by law

In 1997, an act was passed in the US to define minimum efficiencies for low-voltage three-phase motors (EPACT = Energy Policy Act). An act is in force in Canada that is largely identical, although it is based on different verification methods. The efficiency is verified for these motors for the USA using IEEE 112, Test Method B and for Canada using CSA-C390. Apart from a few exceptions, all low-voltage three-phase motors exported to the USA or Canada must comply with the legal requirements on efficiency.

The law requires minimum efficiencies for 2, 4 and 6-pole motors with a voltage of 230 and 460 V/60 Hz, in the output range of 1 to 200 HP (0.75 to 150 kW). Explosion-proof motors must also be included. 1LA9 and 1LG6 are also available in the design for Zones 2, 21 and 22.

According to EPACT, the following are excluded from the efficiency requirements, for example.

- Motors whose frame size output classification does not correspond with the standard series according to NEMA MG1-12.
- Flange-mounting motors without feet
- Brake motors
- Converter-fed motors
- Motors with design letter C and higher

For more information on EPACT:

<http://www.eren.doe.gov/>

Special requirements for the USA: Energy Policy Act

The act lays down that the nominal efficiency at full load and a "CC" number (Compliance Certification) must be included on the rating plate. The "CC" number is issued by the US Department of Energy (DOE). The following information is stamped on the rating plate of EPACT motors which must be marked by law: Nominal efficiency (service factor SF 1.15), design letter, code letter, CONT, CC-Nr. CC 032A (Siemens) and NEMA MG1-12.

Special requirements for Canada: CSA – Energy Efficiency Verification

These motors fulfill the minimum efficiency requirements laid down by the CSA standard C390. These motors are available as 1LA9 or 1LG6 and can be ordered with order code **D40** and are also marked with the CSA-E verification on the rating plate.



NEMA – Order code D30

The motors with increased efficiency according to EPACT are designed to meet the NEMA MG1-12 electrical standard and are marked accordingly. The mechanical design of all motors is compliant only to IEC, not to NEMA dimensions.

All motors in the **D30** version correspond to NEMA Design A (i. e. standard torque characteristic in accordance with NEMA and no starting current limitation).

For Design B, C and D, a special version is required (on request). According to NEC-ANSI-C1, Division 2, Class I, Group A, B, D, all 1LA/1LG motors that comply with Zone 2 can be used.

All other 1LA/1LG motors must be ordered with order code **D30**. Data on the rating plate: Rated voltage (voltage tolerance of $\pm 10\%$), nominal efficiency, design letter, code letter, CONT and NEMA MG1-12.

UL approval – Order code D31

The motors based on the 1LA/1LG basic series are listed for up to 600 V by Underwriters Laboratories Inc. ("Recognition Mark" = R/C).

For Zones 2, 21, 22 and Ex e motors or Ex de motors as well as marine motors, there is no listing.

This is not possible in combination with the option "temperature class 180 (H) at rated output and maximal coolant temperature of 60 °C", order code **C18**.

The motors must be ordered with order code **D31**, voltage code "9" and the order code for voltage and frequency.

According to UL, motor voltages are only certified up to 600 V, i. e. voltage codes 1, 3, 4 or 5. For this reason, voltage code "6" for example is omitted (400 V Δ /690 VY/ 50 Hz or 460 V Δ /60 Hz). Voltages 400 V Δ and 460 V Δ , for example, should be ordered as follows:

Voltage	Voltage code
400 V Δ /50 Hz or 460 V Δ /60 Hz (50 Hz output)	9 with L1U ¹⁾
460 V Δ /60 Hz (50 Hz output)	9 with L2T
460 V Δ /60 Hz (60 Hz output)	9 with L2F

The "UL Recognition Mark" is included on the rating plate of the motor.



In addition, the motor is designed to meet the NEMA MG1-12 electrical standard (with the exception of non-standard motors) and includes the following data on the rating plate: Rated voltage (voltage tolerance of $\pm 10\%$), nominal efficiency, design letter, code letter, CONT and NEMA MG1-12.

Externally or internally mounted components such as

- Motor protection
- Heating element
- Separately driven fan
- Brake
- Encoder
- Power connection
- Plug connector

are UL-R/C, CSA or C-US listed or used by manufacturers in accordance with regulations. It may have to be decided whether the motor is suitable for the application.

The motors can be operated with a frequency converter – separate converter or built-on (**1UA7**/order code **H15**) – with 50/60 Hz.

Deviating frequency settings must be tested at final acceptance.

The external fans for 1LA8 and 1LL8 motors must be made of metal.

The following versions are possible:

- 2-pole²⁾ motors, only in combination with K37 or K38
- 4, 6 and 8-pole motors, only in combination with K35

¹⁾ Only applicable to non-standard motors.

²⁾ Frame size 450 in 2-pole version, on request.

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General technical data

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For 1PQ8 motors, UL listed motors with separately driven fan (400 V Δ 50 Hz/460 V Δ 60 Hz) are used. Other voltages up to 600 V and/or other frequencies must be ordered using the order code Y81 and plain text. For 1LA8 and 1PQ8 motors of frame size 315, when option **D31** is ordered, connection box gt 640 will be automatically replaced without additional charge with connection box 1XB1 621. The connection boxes are designed with an undrilled cable entry. UL-R/C cable glands must be used for cable entry.

CSA approval – Order code D40

Motors based on the 1LA/1LG basic series are approved for up to 690 V in accordance with the Canadian regulations of the “Canadian Standard Association” (CSA). Externally or internally mounted components which are used are listed by CSA or are used by manufacturers in accordance with regulations. It may have to be decided whether the motor is suitable for the application. For Zones 2, 21, 22 and Ex e motors or Ex de motors as well as marine motors, there is no approval.

This is not possible in combination with the option “temperature class 180 (H) at rated output and maximal coolant temperature of 60 °C”, order code C18, for 1LA5, 1LG4, 1PP4 and 1PP5 motor series.

The motors must be ordered with the order code **D40**, voltage code “**9**” and order code for voltage and frequency. The CSA mark and the rated voltage (voltage tolerance of ±10 %) are included on the rating plate.



When energy-saving motors (1LA9, 1LG6) are ordered, they also include the CSA-E mark on the rating plate.



Other versions:

For versions and certification of explosion-proof motors in compliance with directive 94/9/EU (ATEX) as well as VIK versions, see catalog part 4 “Explosion-proof motors”.

For versions for use in shipping, see Section 10 “Marine motors”.

Export of low-voltage motors to China

CCC – China Compulsory Certification – Order code D01

“Small power motors” which are exported to China must be certified up to a rated output of:

2-pole: ≤2.2 kW

4-pole: ≤1.1 kW

6-pole: ≤0.75 kW

8-pole: ≤0.55 kW

The **1LA7, 1LA9, 1MA7 and 1MJ6** motors which must be certified have been certified by the CQC (China Quality Cert. Center). When ordered with the D01 order code, the “CCC” logo and “Factory Code” are included on the rating plate and packaging.



A005216

Factory Code:

A005216 = Works Bad Neustadt

A010607 = Works Mohelnice

Note:

Chinese customs checks the need for certification of imported products by means of commodity code.

The following do not need to be certified:

- Motors imported to China which have already been installed in a machine
- Repair parts

Export of low-voltage motors to Japan

PSE Mark Japan – Order Code D46

PSE marking is a mandatory certification in Japan in accordance with the electrical devices and safety of materials act. “Small power motors” with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking. Marking is only applicable to motor series 1LA7, 1LP7, 1PP7 in catalog parts 2 “Standard motors up to frame size 315 L” and 7 “Motors with fans”.

The motors concerned are marked on the rating plate with the following “PSE” logo.



Export of low-voltage motors to Korea

Korea certification – Order Code D33

Certification confirms that the efficiency and power factor are in compliance with KSC 4202 (KEMCO). The certification is applicable to EFF1 motors of the 1LA9 and 1LG6 series in 2, 4 and 6 pole versions from 0.75 kW to 200 kW 400 V 50 Hz.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

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Colors and paint finish

To protect the drives against corrosion and external influences, high-quality coatings based on 2-K epoxy resin are offered in various different colors.

Version	Suitability of paint finish for climate group in accordance with DIN IEC 60721, Part 2-1	
Standard finish	Moderate (extended) for indoors and outdoors under a roof not directly subjected to weather conditions	Briefly: up to 120 °C Contin.: up to 100 °C
Special finish	Worldwide (global) for outdoor use in direct sunlight and/or weather conditions. Suitable for use in the tropics for <60 % relative humidity at 40 °C	Briefly: up to 140 °C Contin.: up to 120 °C Also: for aggressive atmospheres up to 1 % acid and alkali concentration or permanent dampness in sheltered rooms

“Sea air resistant” special finish system – Order code **M94**

Field of application	Resistance
<ul style="list-style-type: none"> Recommended for indoor installations or outdoor installations exposed to direct weather conditions Industrial climate with moderate SO₂ exposure, inshore maritime climate, but not offshore maritime climate, e.g. for crane drives and also in the paper industry Complies with the test requirements of DIN EN ISO 12944-2 Corrosion Category C4 	<ul style="list-style-type: none"> Chemical exposure to 5 % acid and caustic solution concentration Suitable for use in the tropics up to 75 % relative humidity at 50 °C Thermal stability from –40 to 140 °C

“Offshore” special finish system – Order code **M91**

Field of application	Resistance
<ul style="list-style-type: none"> Recommended for outdoor installations exposed to direct weather conditions Industrial climate with moderate SO₂ exposure and offshore maritime climate, e.g. for crane drives Complies with the test requirements of DIN EN ISO 12944-2 Corrosion Category C5 	<ul style="list-style-type: none"> Chemical exposure to 5 % acid and caustic solution concentration Suitable for use in the tropics up to 75 % relative humidity at 60 °C Thermal stability from –40 to 140 °C

All motors are painted with RAL 7030 (stone gray) if the color is not specified.

Other colors can be ordered with standard finish using order code **Y53** and the RAL number in plain text for an additional charge (for an overview of the available RAL No./RAL colors see the following table for order code **Y53**).

Other colors in special finish must be ordered with the order code **Y51** or **Y54** and the RAL number in plain text (for an overview of the available RAL No./RAL colors, see the following tables for order codes **Y51** and **Y54**).

Direct sunlight can change the color. If color stability is required, it is recommended to use a polyurethane-based paint (only on request).

All paint finishes can be painted over with commercially available paints. Special paint with increased layer thickness available on request.

If required, the motors can be supplied only coated in primer, order code **K24**, or unpainted (unworked cast-iron surfaces in primer) using order code **K23**.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

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Standard finish in other standard RAL colors – Order code **Y53**
(RAL number is required in plain text)

RAL No.	Color name	RAL No.	Color name
1002	Sand yellow	6011	Reseda green
1013	Pearl white	6019	Pastel green
1015	Light ivory	6021	Pale green
1019	Gray beige	7000	Squirrel gray
2003	Pastel orange	7001	Silver gray
2004	Pure orange	7004	Signal gray
3000	Flame red	7011	Iron gray
3007	Black red	7016	Anthracite gray
5007	Brilliant blue	7022	Umber gray
5009	Azure blue	7031	Blue gray
5010	Gentian blue	7032	Pebble gray
5012	Light blue	7033	Cement gray
5015	Sky blue	7035	Light gray
5017	Traffic blue	9001	Cream
5018	Teal blue	9002	Gray white
5019	Capri blue	9005	Jet black

Special finish in standard RAL color with defined order codes
(special finish in other standard RAL colors can be ordered
indicating the RAL number in plain text with order code **Y54**)

For 1LA5, 1LA6, 1LA7, 1LA9, 1MA7, 1MA6, 1MJ6, 1PP5, 1LP5,
1PP7 and 1LP7 motors up to frame size 200 L, the special finish
is in RAL 7030 stone gray (order code **K26**) standard version.

RAL No.	Color name	Order code
7030	Stone gray	K26

Special finish in other standard RAL colors – Order code **Y54**
(RAL number is required in plain text)

RAL No.	Color name	RAL No.	Color name
1002	Sand yellow	6011	Reseda green
1013	Pearl white	6019	Pastel green
1015	Light ivory	6021	Pale green
1019	Gray beige	7000	Squirrel gray
2003	Pastel orange	7001	Silver gray
2004	Pure orange	7004	Signal gray
3000	Flame red	7011	Iron gray
3007	Black red	7016	Anthracite gray
5007	Brilliant blue	7022	Umber gray
5009	Azure blue	7031	Blue gray
5010	Gentian blue	7032	Pebble gray
5012	Light blue	7033	Cement gray
5015	Sky blue	7035	Light gray
5017	Traffic blue	9001	Cream
5018	Teal blue	9002	Gray white
5019	Capri blue	9005	Set black

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Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Special finish in special RAL colors – Order code **Y51** (RAL number is required in plain text)

RAL No.	Color name	RAL No.	Color name	RAL No.	Color name	RAL No.	Color name
1000	Green beige	3014	Antique pink	6003	Olive green	7036	Platinum gray
1001	Beige	3015	Light pink	6004	Blue green	7037	Dusty gray
1003	Signal yellow	3016	Coral red	6005	Moss green	7038	Agate gray
1004	Golden yellow	3017	Rose	6006	Gray olive	7039	Quartz gray
1005	Honey yellow	3018	Strawberry red	6007	Bottle green	7040	Window gray
1006	Maize yellow	3020	Traffic red	6008	Brown green	7042	Traffic gray A
1007	Daffodil yellow	3022	Salmon pink	6009	Fir green	7043	Traffic gray B
1011	Brown beige	3027	Raspberry red	6010	Grass green	7044	Silk gray
1012	Lemon yellow	3031	Orient red	6012	Black green	7045	Tele gray 1
1014	Dark ivory	3032	Pearl ruby red	6013	Reed green	7046	Tele gray 2
1016	Sulfur yellow	3033	Pearl pink	6014	Yellow olive	7047	Tele gray 4
1017	Saffron yellow	4001	Red lilac	6015	Black olive	7048	Pearl mouse gray
1018	Zinc yellow	4002	Red violet	6016	Turquoise green	8000	Green brown
1020	Olive yellow	4003	Heather violet	6017	May green	8001	Ocher brown
1021	Rape yellow	4004	Claret violet	6018	Yellow green	8002	Signal brown
1023	Traffic yellow	4005	Blue lilac	6020	Chrome green	8003	Clay brown
1024	Ochre yellow	4006	Traffic purple	6022	Olive drab	8004	Copper brown
1027	Curry	4007	Purple violet	6024	Traffic green	8007	Fawn brown
1028	Melon yellow	4008	Signal violet	6025	Fern green	8008	Olive brown
1032	Broom yellow	4009	Pastel violet	6026	Opal green	8011	Nut brown
1033	Dahlia yellow	4010	Tele magenta	6027	Light green	8012	Red brown
1034	Pastel yellow	4011	Pearl violet	6028	Pine green	8014	Sepia brown
1035	Pearl beige	4012	Pearl blackberry	6029	Mint green	8015	Chestnut
1036	Pearl gold	5000	Violet blue	6032	Signal green	8016	Mahogany
1037	Sun yellow	5001	Green blue	6033	Mint turquoise	8017	Chocolate
2000	Yellow orange	5002	Ultramarine	6034	Pastel turquoise	8019	Gray brown
2001	Red orange	5003	Sapphire blue	6035	Pearl green	8022	Black brown
2002	Vermilion	5004	Black blue	6036	Pearl opal green	8023	Orange brown
2008	Bright red orange	5005	Signal blue	7002	Olive gray	8024	Beige brown
2009	Traffic orange	5008	Gray blue	7003	Moss gray	8025	Pale brown
2010	Signal orange	5011	Steel blue	7005	Mouse gray	8028	Terra brown
2011	Deep orange	5013	Cobalt blue	7006	Beige gray	8029	Pearl copper
2012	Salmon orange	5014	Pigeon blue	7008	Khaki gray	9003	Signal white
2013	Pearl orange	5020	Ocean blue	7009	Green gray	9004	Signal black
3001	Signal red	5021	Water blue	7010	Tarpaulin gray	9006	White aluminum
3002	Carmine red	5022	Night blue	7012	Basalt gray	9007	Gray aluminum
3003	Ruby red	5023	Distant blue	7013	Brown gray	9010	Pure white
3004	Purple red	5024	Pastel blue	7015	Slate gray	9011	Graphite black
3005	Wine red	5025	Pearl gentian	7021	Black gray	9016	Traffic white
3009	Oxide red	5026	Pearl night blue	7023	Concrete gray	9017	Traffic black
3011	Brown red	6000	Patina green	7024	Graphite gray	9018	Papyrus white
3012	Beige red	6001	Emerald green	7026	Granite gray	9022	Pearl light gray
3013	Tomato red	6002	Leaf green	7034	Yellow gray	9023	Pearl dark gray

Coating structure and colors not specified in the catalog are available on request.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

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Packaging, safety notes, documentation and test certificates

Connected in star for dispatch – Order code **M32**

The terminal board of the motor is connected in star for dispatch.

Connected in delta for dispatch – Order code **M33**

The terminal board of the motor is connected in delta for dispatch.

Packing weights and packing dimensions

Packing weights		For land transport					
For motors		Type of construction IM B3			Types of construction IM B5, IM V1		
Frame size	Type	In box Tare	On batters Tare	In crate Tare	In box Tare	On batters Tare	In crate Tare
	1LA5 .../1LA7 ..., 1LA6 ..., 1LA9 ..., 1LG4 ..., 1LG6 ..., 1LP4 ..., 1LP5 .../1LP7 ..., 1MA6 ..., 1MA7 ..., 1MJ6 ..., 1MJ7 ..., 1PP4 ..., 1PP5 .../1PP7 ...	kg	kg	kg	kg	kg	kg
56 M	... 050/053	0.65	–	–	0.65	–	–
63 M	... 060/063	0.65	–	–	0.65	–	–
71 M	... 070	0.65	–	–	0.65	–	–
	... 073	0.65	–	–	0.65	–	–
80 M	... 080	0.65	–	–	0.65	–	–
	... 083	0.65	–	–	0.65	–	–
90 S	... 090	0.65	–	–	0.65	–	–
90 L	... 096/097	0.65	–	–	0.65	–	–
100 L	... 106/107	1.3	–	–	1.3	–	–
112 M	... 113	1.5	–	–	1.5	–	–
132 S	... 130/131	4.7	–	–	5.2	–	–
132 M	... 133/134	4.7	–	–	5.2	–	–
160 M	... 163/164	4.8	–	–	5.7	–	–
160 L	... 166	4.8	–	–	5.7	–	–
180 M	... 183	13.0	–	–	13.4	–	–
180 L	... 186	13.0	–	–	13.4	–	–
200 L	... 206/207	13.5	–	–	13.5	–	–
225 S	... 220	13.7	7	20	13.7	10	20
225 M	... 223	13.7	7	20	13.7	10	20
250 M	... 253	–	20	36	–	20	40
280 S	... 280	–	20	36	–	20	40
280 M	... 283	–	20	36	–	20	40
315 S	... 310	–	20	38	–	20	45
315 M	... 313	–	20	38	–	20	45
315 L	... 316/317/318	–	22	40	–	22	45

Values for 1PP6 motors on request.

Data apply for individual packaging. For frame sizes 56 to 180 L, wire-lattice pallets can be used, order code **L99**.

Packing weights and packing dimensions for 1LA8, 1PQ8 and 1LL8 motors

For motors	Type	Packing weights			
		Land transport on batters		Sea transport in wooden cases	
Frame size	1LA8 ..., 1PQ8 ..., 1LL8 ...	Type of construction IM B3 Tare	Type of construction IM V1 Tare	Type of construction IM B3 Tare	Type of construction IM V1 Tare
		kg	kg	kg	kg
315	... 315/317	30	55	270	310
355	... 353/355/357	40	65	320	365
400	... 403/405/407	45	75	390	445
450	... 453/455/457	50	85	450	510
Maximum motor dimensions		Allowances for maximum motor dimensions (packing dimensions = motor dimensions + allowance)			
		Land transport on batters		Sea transport in wooden cases	
		Type of construction IM B3	Type of construction IM V1	Type of construction IM B3	Type of construction IM V1
		approx.	approx.	approx.	approx.
		mm	mm	mm	mm
Length		+250	+250	+250	+250
Width		+200	+300	+200	+200
Height		+200	+250	+500	+500

Safety notes

The motors are supplied without safety and commissioning notes for most motor types and frame sizes. A customer's declaration of renouncement is required.

Without safety and commissioning note – Order code **B00**

The motors are supplied with only one set of safety and commissioning notes per wire-lattice pallet for most motor types and frame sizes.

Complete with one set of safety and commissioning notes per wire-lattice pallet – Order code **B01**Documentation

The documentation for non-standard motors frame size 315 and above (catalog part 3) contains as standard:

- Safety and commissioning notes (paper)
- Operating instructions (on CD)
- EU manufacturer's declaration (on CD)
- Acceptance test certificate 3.1 according to EN 10204 (by e-mail)
- Routine test certificate (by e-mail)

For non-standard motors from frame size 315 and above (catalog part 3) the following documents are optionally available:

- Document – Electrical data sheet – Order code **B31**
- Document – Order dimension drawing – Order code **B32**
- Document – Load characteristics – Order code **B37** (on request, only available for motors for mains-fed operation)

Optionally available documents for other motors:

- Operating instructions German/English enclosed in print – Order code **B23**
- "SD Manual Collection": all manuals for low-voltage motors, geared motors and low-voltage converters on DVD in 5 languages, see catalog part 11 "Appendix".

Test certificates**Acceptance test certificate 3.1 according to EN 10204** – Order code **B02**

An acceptance test certificate 3.1 according to EN 10204 can be supplied for most motors.

The tests listed below are mainly intended for non-standard motors (catalog part 3). The assignment of order codes to motor types can be found in the "Special versions" section of the relevant catalog parts.

Standard test (routine test) with acceptance – Order code **F01**

Standard routine testing of the motor, but with acceptance by an external representative (e.g. customer). The routine test is required to check the correct functioning of a motor where the characteristic data are known and were determined on a machine of the same type in a detailed type test. For a routine test, characteristic variables are determined, which after being converted to the basic data, are compared with the reference values for this machine type.

Visual acceptance and report handover with acceptance – Order code **F03**

Visual acceptance of the motor by external representative (e.g. customer) and handover of the routine test report to external representative (e.g. customer).

Temperature-rise test without acceptance – Order code **F04**

For the temperature-rise test, the temperature rise of a motor is measured in continuous duty. To do this, the motor is connected to a load (dynamometer), and operated with the rated power.

Temperature-rise test with acceptance – Order code **F05**

As for order code F04, but with acceptance by an external representative (e.g. customer).

Noise measurement during idling, no noise analysis, no acceptance – Order code **F28**

The A-rated sound pressure level L_{pA} is measured during idling at rated voltage. The number of measuring points and their locations are specified in the test certificate.

Noise measurement during idling, no noise analysis, with acceptance – Order code **F29**

As for order code F28, but with acceptance by an external representative (e.g. customer).

Recording of current and torque curves with torque metering shaft during starting, without acceptance – Order code **F34**

The measurement is used to determine the starting response of a motor. By comparison with the load torque characteristic, the acceleration torque can be calculated. This can be used to check that a complete machine set has started correctly. This measurement is only meaningful for motors that are directly mains-fed and is not offered for motors that are designed for converter-fed operation.

Recording of current and torque curves with torque metering shaft during starting, with acceptance – Order code **F35**

As for order code F34, but with acceptance by an external representative (e.g. customer).

Measurement of the locked-rotor torque and locked-rotor current without acceptance – Order code **F52**

The torque and current are determined when the rotor is locked. This measurement is only meaningful for motors that are directly mains-fed and is not offered for motors that are designed for converter-fed operation.

Measurement of the locked-rotor torque and locked-rotor current with acceptance – Order code **F53**

As for order code F52, but with acceptance by an external representative (e.g. customer).

Noise measurement during idling, with noise analysis, without acceptance – Order code **F62**

As for F28, but a noise analysis is also performed. The signal is divided up into frequency bands and the level is determined in each band.

Noise measurement during idling, with noise analysis, with acceptance – Order code **F63**

As for order code F62, but with acceptance by an external representative (e.g. customer).

Type test with heat run for horizontal motors, without acceptance – Order code **F82**

During the type test, a temperature-rise test is performed; no-load, short-circuit and load characteristics are recorded; the iron losses and friction losses are determined and the efficiency is calculated from the summed losses. This option is only applicable to motors with a horizontal type of construction.

Type test with heat run for horizontal motors, with acceptance – Order code **F83**

As for order code F82, but with acceptance by an external representative (e.g. customer, classification society).

Type test with heat run for vertical motors, without acceptance – Order code **F92**

As for order code F82, but only for motors with a vertical type of construction.

Type test with heat run for vertical motors, with acceptance – Order code **F93**

As for order code F92, but with acceptance by an external representative (e.g. customer, classification society).

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

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Voltages, currents and frequencies

Standard voltages

EN 60034-1 differentiates between Category A (combination of voltage deviation $\pm 5\%$ and frequency deviation $\pm 2\%$) and Category B (combination of voltage deviation $\pm 10\%$ and frequency deviation $+3/-5\%$) for voltage and frequency fluctuations. The motors can supply their rated torque in both Category A and Category B. In Category A, the temperature rise is approx. 10 K higher than during normal operation.

Standard	Category	Category
EN 60034 - 1	A	B
Voltage deviation	$\pm 5\%$	$\pm 10\%$
Frequency deviation	$\pm 2\%$	$+3\%/-5\%$
Rating plate data stamped with rated voltage (e.g. 230 V)	a $\pm 5\%$ (e.g. 230 V $\pm 5\%$)	a $\pm 10\%$ (e.g. 230 $\pm 10\%$)
Rating plate data stamped with rated voltage ranges b to c (e.g. 220 to 240 V)	b -5% to c $+5\%$ (e.g. 220 -5% to 240 $+5\%$)	b -10% to c $+10\%$ (e.g. 220 -10% to 240 $+10\%$)

According to the standard, longer operation is not recommended for Category B, therefore this is not permitted for explosion-proof motors. See Page 0/31 for details of the rating plate inscriptions and examples. The selection and ordering data state the rated current at 400 V and where applicable 690 V. The DIN IEC 60038 standard specifies a tolerance of $\pm 10\%$ for mains voltages of 230 V, 400 V and 690 V. The rating plates of motors with voltage code 0, 1 or 6 also include a rated voltage range in addition to the rated voltage (see table).

The rated currents at 420 V and for 1LA8 motors 660 V or 725 V are listed in the table on Pages 0/26, 0/27 and on the rating plate.

The tolerance laid down by DIN EN 60034-1 applies to all converter-fed 1LA8 motors as well as to 1LA5, 1LA7, 1LG6, 1PQ8 and 1LL8 motors with special 690 V insulation, i.e. no rated voltage range is specified on the rating plate.

For 1LA and 1LG motors, type of protection "n" (Zone 2), a rated voltage range is not specified.

Mains voltages	Rated voltage range	Voltage code
1LA, 1LG, 1MJ, 1PQ8 and 1LL8 motors		
230 V Δ /400 VY, 50 Hz	220 ... 240 V Δ /380 ... 420 VY 50 Hz	1 ¹⁾
400 V Δ /690 VY, 50 Hz	380 ... 420 V Δ /660 ... 725 VY, 50 Hz	6
500 VY, 50 Hz	-	3
500 V Δ , 50 Hz	-	5
1LA and 1LG motors		
Second rating plate with 50 and 60 Hz data, frame sizes 56 to 315 M for 1LA9 and 1LG6 with output at 60 Hz additionally in HP		
460 V, 60 Hz	440 ... 480V, 60 Hz	1, 6
1MA motors		
230 V Δ /400 VY, 50 Hz	218 ... 242 V Δ /380 ... 420 VY, 50 Hz	1
400 V Δ /690 VY, 50 Hz	380 ... 420 V Δ /655 ... 725 VY, 50 Hz	6

1MA motors:

For non-standard frequencies, the t_E times and, where applicable, the rated output, may differ from those specified in the selection tables; in this case, a new or supplementary certificate is needed. For Δ connection, overload protection with phase-failure protection must be provided.

Non-standard voltages and/or frequencies

The tolerance laid down by DIN EN 60034-1 applies to all non-standard voltages.

Order codes have been allocated for a number of non-standard voltages at 50 or 60 Hz. They are ordered by specifying the code digit 9 for voltage in the 11th position of the Order No. and the appropriate order code.

L8Y Standard winding

Winding in accordance with voltage codes 0, 4, 5, 6, 7 or 8; rating plate is stamped with order details.

The rated voltage is permitted to deviate up to $\pm 5\%$ from the medium voltage of the defined voltage codes (0, 4, 5, 6, 7 or 8). The order code **L8Y** is only possible for non-standard motors of the motor series 1LA8, 1PQ8 and 1LL8. Order code **L8Y** does not apply to explosion-proof motors, converter-fed motors and motors for the North American market (in connection with order codes D30, D31 or D40).

L1Y Non-standard winding for voltages between 200 V (380 V for 1LA8, 1PQ8 and 1LL8 motor series) and 690 V and rated outputs.

For voltages and rated outputs outside these ranges, please inquire.

Motor series	Frame size	Rated voltages for L1Y that can be supplied	
		Lowest / highest voltage in V for	
1LA7, 1LA9, 1LP7, 1MA7, 1MJ6, 1PP7	56 ... 90	Delta	Star
		200/500 ²⁾	250/690 ³⁾
1LA6, 1LA7, 1LA9, 1LP7, 1MA6, 1MA7, 1MJ6, 1PP6, 1PP7	100 ... 160	200/690	250/690
1LA5, 1LA9, 1LP5, 1MA6, 1MJ6, 1PP5, 1PP6	180 ... 200	200/690	250/690
1LA5, 1LP5, 1PP5	225	200/690	250/690

L3Y Non-standard winding Y/ Δ starting at low speed (only possible for 1LA7 and 1LA5 pole-changing motors).

When ordering **L8Y**, **L1Y** and **L3Y**, state in plain text: Voltage, frequency and connection.

Order codes for other rated voltages in the relevant catalog parts

For converter-fed motors and smoke extraction motors, only order code **L1Y** is possible. For non-standard motors, order code **L8Y** is also possible for converter-fed operation. The order codes listed below are possible for other motors; see the relevant catalog parts.

¹⁾ Not applicable to non-standard motors.

²⁾ Highest voltage in delta circuit for 1MA7 060-2 and 1MA7 063-4 290 V as well as for 1MA7 060-4 230 V.

³⁾ Highest voltage in star circuit for 1MA7 060-2 and 1MA7 063-4 500 V as well as for 1MA7 060-4 400 V.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Further voltages for standard motors

Voltage at 50 Hz	Required output at 50 Hz	Order code for 50 Hz constant-speed motors (not pole-changing) ¹⁾	Frame sizes for motor					
			1LA5, 1LA7	1LA6	1LA9	1LG4, 1LG6	1LP5, 1LP7	1LP4
220 VΔ/380 VY ²⁾ (210 ... 230 VΔ/ 360 ... 400 VY)	50 Hz output	L1R	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
230 VΔ (220 ... 240 VΔ)	50 Hz output	L1E	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 M
380 VΔ/660 VY ³⁾ (360 ... 400 VΔ/ 625 ... 695 VY)	50 Hz output	L1L	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
415 VY (395 ... 435 VY)	50 Hz output	L1C	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
415 VΔ (395 ... 435 VΔ)	50 Hz output	L1D	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
400 VY (380 ... 420 VY)	50 Hz output	L1A	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
400 VΔ (380 ... 420 VΔ)	50 Hz output	L1B	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ)	50 Hz output	L1U	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L

Voltage at 60 Hz	Required output at 60 Hz	Order code for 60 Hz constant-speed motors (not pole-changing)	Frame sizes for motors					
			1LA5, 1LA7	1LA6	1LA9	1LG4, 1LG6	1LP5, 1LP7	1LP4
220 VΔ/380 VY	50 Hz output	L2A	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
220 VΔ/380 VY	60 Hz output	L2B	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
380 VΔ/660 VY	50 Hz output	L2C	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
380 VΔ/660 VY	60 Hz output	L2D	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
440 VY	50 Hz output	L2Q	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
440 VY	60 Hz output	L2W	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
440 VΔ	50 Hz output	L2R	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
440 VΔ	60 Hz output	L2X	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
460 VY	50 Hz output	L2S	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
460 VY	60 Hz output	L2E	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
460 VΔ	50 Hz output	L2T	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
460 VΔ	60 Hz output	L2F	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
575 VY	50 Hz output	L2U	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
575 VY	60 Hz output	L2L	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
575 VΔ	50 Hz output	L2V	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
575 VΔ	60 Hz output	L2M	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L

Voltage at 60 Hz	Required output at 60 Hz	Order code for 60 Hz motors multi-voltage	Frame sizes for motors					
			1LA5, 1LA7	1LA6	1LA9	1LG4, 1LG6	1LP5, 1LP7	1LP4
230 VYY/460 VY 60 Hz	50 Hz output	L3E	56 ... 200	–	56 ... 200	–	63 ... 200	–
230 VYY/460 VY 60 Hz	60 Hz output	L3F	56 ... 200	–	56 ... 200	–	63 ... 200	–
230 VΔΔ/460 VΔ 60 Hz	50 Hz output	L3G	100 ... 200	–	100 ... 200	–	100 ... 200	–
230 VΔΔ/460 VΔ 60 Hz	60 Hz output	L3H	100 ... 200	–	100 ... 200	–	100 ... 200	–

Voltage at 60 Hz	Required output at 60 Hz	Order code for 60 Hz motors pole-changing	Frame sizes for motors					
			1LA5, 1LA7	1LA6	1LA9	1LG4, 1LG6	1LP5, 1LP7	1LP4
220 V	50 Hz output	L4A	63 ... 200	–	–	–	–	–
220 V	60 Hz output	L4B	63 ... 200	–	–	–	–	–
380 V	50 Hz output	L4C	63 ... 200	–	–	–	–	–
380 V	60 Hz output	L4D	63 ... 200	–	–	–	–	–
440 V	50 Hz output	L4G	63 ... 200	–	–	–	–	–
440 V	60 Hz output	L4E	63 ... 200	–	–	–	–	–
460 V	50 Hz output	L4J	63 ... 200	–	–	–	–	–
460 V	60 Hz output	L4H	63 ... 200	–	–	–	–	–
575 V	50 Hz output	L4N	63 ... 200	–	–	–	–	–
575 V	60 Hz output	L4M	63 ... 200	–	–	–	–	–

¹⁾ For order codes **L1A, L1B, L1C, L1D, L1E, L1L, L1R** and **L1U**, a rated voltage range is also included on the rating plate.

²⁾ For the order code **L1R** a voltage of 440 VY 60 Hz is also possible for 1LA5, 1LA7, 1LA9, 1LP5 and 1LP7 motor series.

³⁾ For the order code **L1L** a voltage of 440 VΔ 60 Hz is also possible for 1LA5, 1LA7, 1LA9, 1LP5 and 1LP7 motor series.

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Further voltages for non-standard motors

Voltage at 60 Hz	Required output at 60 Hz	Order code for 60 Hz constant-speed motors (not pole-changing)	Frame sizes for motors		
			1LA8	1PQ8	1LL8
220 VΔ/380 VY	50 Hz output	L2A	–	–	–
220 VΔ/380 VY	60 Hz output	L2B	–	–	–
380 VΔ/660 VY	50 Hz output	L2C	315 ... 450	315 ... 450	315 ... 450
380 VΔ/660 VY	60 Hz output	L2D	315 ... 450	315 ... 450	315 ... 450
440 VY	50 Hz output	L2Q	–	–	–
440 VY	60 Hz output	L2W	–	–	–
440 VΔ	50 Hz output	L2R	315 ... 450	315 ... 450	315 ... 450
440 VΔ	60 Hz output	L2X	315 ... 450	315 ... 450	315 ... 450
460 VY	50 Hz output	L2S	–	–	–
460 VY	60 Hz output	L2E	–	–	–
460 VΔ	50 Hz output	L2T	315 ... 450	315 ... 450	315 ... 450
460 VΔ	60 Hz output	L2F	315 ... 450	315 ... 450	315 ... 450
575 VY	50 Hz output	L2U	–	–	–
575 VY	60 Hz output	L2L	–	–	–
575 VΔ	50 Hz output	L2V	315 ... 450	315 ... 450	315 ... 450
575 VΔ	60 Hz output	L2M	315 ... 450	315 ... 450	315 ... 450

Further voltages for explosion-proof motors

Voltage at 50 Hz	Required output at 50 Hz	Order code for 50 Hz constant-speed motors (not pole-changing)	Frame sizes for motors						
			1LA5, 1LA7	1LA6	1LA9	1LG4, 1LG6	1MA6, 1MA7 ²⁾	1MJ6	1MJ7
220 VΔ/380 VY ³⁾ (210 ... 230 VΔ/ 360 ... 400 VY)	50 Hz output	L1R	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 315 M	71 ... 200	225 ... 315 M
230 VΔ (220 ... 240 VΔ)	50 Hz output	L1E	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 315 M	71 ... 200	225 ... 315 M
380 VΔ/660 VY ⁴⁾ (360 ... 400 VΔ/ 625 ... 695 VY)	50 Hz output	L1L	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	71 ... 315 L	71 ... 200	225 ... 315 M
415 VY (395 ... 435 VY)	50 Hz output	L1C	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 315 M	71 ... 200	225 ... 315 M
415 VΔ (395 ... 435 VΔ)	50 Hz output	L1D	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	71 ... 315 L	71 ... 200	225 ... 315 M
400 VY (380 ... 420 VY)	50 Hz output	L1A	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	–	–	–
400 VΔ (380 ... 420 VΔ)	50 Hz output	L1B⁵⁾	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	–	–	–
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ)	50 Hz output	L1U	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	–	–	–
400 VΔ (only 4-8-pole)	87 Hz output	L3A	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	–	–	–

Voltage at 60 Hz	Required output at 60 Hz	Order code for 60 Hz constant-speed motors (not pole-changing)	Frame sizes for motors						
			1LA5, 1LA7	1LA6	1LA9	1LG4, 1LG6	1MA6, 1MA7 ⁶⁾	1MJ6	1MJ7
220 VΔ/380 VY	50 Hz output	L2A	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 315 M	71 ... 200	225 ... 315 M
220 VΔ/380 VY	60 Hz output	L2B	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	–	71 ... 200	225 ... 315 M
380 VΔ/660 VY	50 Hz output	L2C	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 315 L	71 ... 200	225 ... 315 M
380 VΔ/660 VY	60 Hz output	L2D	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	–	71 ... 200	225 ... 315 M
440 VY	50 Hz output	L2Q	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 315 M	71 ... 200	225 ... 315 M
440 VY	60 Hz output	L2W	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	–	71 ... 200	225 ... 315 M
440 VΔ	50 Hz output	L2R	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 315 L	71 ... 200	225 ... 315 M
440 VΔ	60 Hz output	L2X	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	–	71 ... 200	225 ... 315 M
460 VY	50 Hz output	L2S	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 315 M	71 ... 200	225 ... 315 M
460 VY	60 Hz output	L2E	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	–	71 ... 200	225 ... 315 M
460 VΔ	50 Hz output	L2T	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 315 L	71 ... 200	225 ... 315 M
460 VΔ	60 Hz output	L2F	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	–	71 ... 200	225 ... 315 M
575 VY	50 Hz output	L2U	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 315 M	71 ... 200	225 ... 315 M
575 VY	60 Hz output	L2L	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	–	71 ... 200	225 ... 315 M
575 VΔ	50 Hz output	L2V	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 315 L	71 ... 200	225 ... 315 M
575 VΔ	60 Hz output	L2M	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	–	71 ... 200	225 ... 315 M

1) For order codes **L1A**, **L1C**, **L1D**, **L1E**, **L1L**, **L1R** and **L1U**, a rated voltage range is also included on the rating plate, with the exception of versions in Zone 2 type of protection "n" or Ex n II T3.

2) For further information on the rated voltage range see Page 4/84.

3) For the order code **L1R** a voltage of 440 VY 60 Hz is also possible for 1LA5, 1LA7, 1LA9, 1LP5 and 1LP7 motor series.

4) For the order code **L1L** a voltage of 440 VΔ 60 Hz is also possible for 1LA5, 1LA7, 1LA9, 1LP5 and 1LP7 motor series.

5) For converter-fed operation, the converter output for a voltage according to the table is included on the rating plate.

6) A special certificate is required.

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Further voltages for fan motors

Voltage at 50 Hz	Required output at 50 Hz	Order code for 50 Hz constant-speed motors (not pole-changing) ¹⁾	Frame sizes for motors	
			1PP5, 1PP7	1PP4
220 VΔ/380 VY ²⁾ (210 ... 230 VΔ/ 360 ... 400 VY)	50 Hz output	L1R	63 ... 200	180 ... 315 M
230 VΔ (220 ... 240 VΔ)	50 Hz output	L1E	63 ... 200	180 ... 315 M
380 VΔ/660 VY ³⁾ (360 ... 400 VΔ/ 625 ... 695 VY)	50 Hz output	L1L	63 ... 200	180 ... 315 L
415 VY (395 ... 435 VY)	50 Hz output	L1C	63 ... 200	180 ... 315 M
415 VΔ (395 ... 435 VΔ)	50 Hz output	L1D	63 ... 200	180 ... 315 L
400 VY (380 ... 420 VY)	50 Hz output	L1A	63 ... 200	180 ... 315 M
400 VΔ (380 ... 420 VΔ)	50 Hz output	L1B	63 ... 200	180 ... 315 L
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ)	50 Hz output	L1U	63 ... 200	180 ... 315 L

Voltage at 60 Hz	Required output at 60 Hz	Order code for 60 Hz constant-speed motors (not pole-changing)	Frame sizes for motors	
			1PP5, 1PP7	1PP4
220 VΔ/380 VY	50 Hz output	L2A	63 ... 200	180 ... 315 M
220 VΔ/380 VY	60 Hz output	L2B	63 ... 200	180 ... 315 M
380 VΔ/660 VY	50 Hz output	L2C	63 ... 200	180 ... 315 L
380 VΔ/660 VY	60 Hz output	L2D	63 ... 200	180 ... 315 L
440 VY	50 Hz output	L2Q	63 ... 200	180 ... 315 M
440 VY	60 Hz output	L2W	63 ... 200	180 ... 315 M
440 VΔ	50 Hz output	L2R	63 ... 200	180 ... 315 L
440 VΔ	60 Hz output	L2X	63 ... 200	180 ... 315 L
460 VY	50 Hz output	L2S	63 ... 200	180 ... 315 M
460 VY	60 Hz output	L2E	63 ... 200	180 ... 315 M
460 VΔ	50 Hz output	L2T	63 ... 200	180 ... 315 L
460 VΔ	60 Hz output	L2F	63 ... 200	180 ... 315 L
575 VY	50 Hz output	L2U	63 ... 200	180 ... 315 M
575 VY	60 Hz output	L2L	63 ... 200	180 ... 315 M
575 VΔ	50 Hz output	L2V	63 ... 200	180 ... 315 L
575 VΔ	60 Hz output	L2M	63 ... 200	180 ... 315 L

Voltage at 60 Hz	Required output at 60 Hz	Order code for 60 Hz motors, multi-voltage	Frame sizes for motors	
			1PP5, 1PP7	1PP4
230 VYY/460 VY 60 Hz	50 Hz output	L3E	63 ... 200	–
230 VYY/460 VY 60 Hz	60 Hz output	L3F	63 ... 200	–
230 VΔΔ/460 VΔ 60 Hz	50 Hz output	L3G	100 ... 200	–
230 VΔΔ/460 VΔ 60 Hz	60 Hz output	L3H	100 ... 200	–

Voltage at 60 Hz	Required output at 60 Hz	Order code for 60 Hz motors, pole-changing	Frame sizes for motors	
			1LA5, 1LA7	1LG4
220 V	50 Hz output	L4A	80 ... 200	180 ... 280
220 V	60 Hz output	L4B	80 ... 200	180 ... 280
380 V	50 Hz output	L4C	80 ... 200	180 ... 280
380 V	60 Hz output	L4D	80 ... 200	180 ... 280
440 V	50 Hz output	L4G	80 ... 200	180 ... 280
440 V	60 Hz output	L4E	80 ... 200	180 ... 280
460 V	50 Hz output	L4J	80 ... 200	180 ... 280
460 V	60 Hz output	L4H	80 ... 200	180 ... 280
575 V	50 Hz output	L4N	80 ... 200	180 ... 280
575 V	60 Hz output	L4M	80 ... 200	180 ... 280

¹⁾ For order codes **L1A**, **L1B**, **L1C**, **L1D**, **L1E**, **L1L**, **L1R** and **L1U** a rated voltage range is also included on the rating plate.

²⁾ For the order code **L1R** a voltage of 440 VY 60 Hz is also possible for 1PP5 and 1PP7 motor series.

³⁾ For the order code **L1L** a voltage of 440 VΔ 60 Hz is also possible for 1PP5 and 1PP7 motor series.

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Rated currents for rated voltage range 380 V to 420 V at 50 Hz

	Currents for voltage and number of poles							
	380 V		420 V		380 V		420 V	
	2-pole		4-pole		6-pole		8-pole	
	A	A	A	A	A	A	A	A
1LA7, 1LA5 motors								
1LA7 050	0.27	0.26	0.21	0.21	–	–	–	–
1LA7 053	0.33	0.32	0.30	0.31	–	–	–	–
1LA7 060	0.52	0.53	0.42	0.44	–	–	–	–
1LA7 063	0.69	0.71	0.58	0.59	0.48	0.5	–	–
1LA7 070	1.05	1.02	0.80	0.77	0.66	0.64	0.36	0.36
1LA7 073	1.38	1.41	1.07	1.06	0.80	0.80	0.51	0.52
1LA7 080	1.75	1.79	1.50	1.50	1.18	1.25	0.73	0.80
1LA7 083	2.45	2.50	2.12	2.17	1.62	1.66	1.01	1.10
1LA7 090	3.40	3.35	2.60	2.60	2.10	2.15	1.15	1.18
1LA7 096	4.70	4.65	3.50	3.50	3.0	2.95	1.63	1.60
1LA7 106	6.25	6.15	4.8	4.8	4.0	4.1	2.25	2.2
1LA7 107	–	–	6.5	6.8	–	–	3.0	3.0
1LA7 113	8.2	7.7	8.4	8.3	5.4	5.3	4.1	4.2
1LA7 130	10.6	10.4	11.4	11.9	7.3	7.5	5.9	6.0
1LA7 131	14.1	13.8	–	–	–	–	–	–
1LA7 133	–	–	15.4	15.5	9.5	9.7	7.9	7.9
1LA7 134	–	–	–	–	13.0	13.1	–	–
1LA7 163	21.0	20.5	22.3	21.5	17.5	17.3	9.9	10.6
1LA7 164	28.0	26.0	–	–	–	–	13.1	13.4
1LA7 166	34.0	32.0	29.5	28.5	24.8	24.7	17.6	18.4
1LA5 183	40	38	36	35	–	–	–	–
1LA5 186	–	–	42	41	32.7	31	26.5	23.5
1LA5 206	55	52	–	–	40	38.5	–	–
1LA5 207	67	64	57	54	46.5	45.5	34	31
1LA5 220	–	–	69	64	–	–	40	37
1LA5 223	81	76	84	78	64	63	47	43
1LA6, 1LG4 motors								
1LA6 106	6.25	6.15	4.8	4.8	4.0	4.1	2.25	2.2
1LA6 107	–	–	6.5	6.8	–	–	3.0	3.0
1LA6 113	8.2	7.7	8.4	8.3	5.4	5.3	4.1	4.2
1LA6 130	10.6	10.4	11.4	11.9	7.3	7.5	5.9	6.0
1LA6 131	14.1	13.8	–	–	–	–	–	–
1LA6 133	–	–	15.4	15.5	9.5	9.7	7.9	7.9
1LA6 134	–	–	–	–	13.0	13.1	–	–
1LA6 163	21.0	20.5	22.3	21.5	17.5	17.3	9.9	10.6
1LA6 164	28.0	26.0	–	–	–	–	13.1	13.4
1LA6 166	34.0	32.0	29.5	28.5	24.8	24.7	17.6	18.4
1LG4 183	41.5	40	36	35	–	–	–	–
1LG4 186	–	–	42.5	41.5	30.5	28.5	25.5	25
1LG4 188	56	54	59	60	38.5	37	34.5	34.5
1LG4 206	56	52	–	–	37	37	–	–
1LG4 207	67	63	57	55	45	42.5	33.5	32
1LG4 208	82	77	70	69	61	60	40.5	39
1LG4 220	–	–	72	65	–	–	40.5	36.5
1LG4 223	83	75	85	77	60	54	46.5	42
1LG4 228	100	90	104	94	73	66	64	58
1LG4 253	100	93	104	98	73	68	60	57
1LG4 258	134	128	138	134	87	81	73	69
1LG4 280	136	126	144	132	87	80	76	70
1LG4 283	162	150	168	156	106	97	92	84
1LG4 288	196	182	204	190	146	134	112	102
1LG4 310	198	188	205	194	142	136	110	104
1LG4 313	230	215	245	230	170	162	146	136
1LG4 316	280	255	295	275	205	190	174	164
1LG4 317	345	315	360	330	245	225	210	198
1LG4 318	–	–	–	–	295	275	250	240

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Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

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	Currents for voltage and number of poles							
	380 V		420 V		380 V		420 V	
	2-pole		4-pole		6-pole		8-pole	
	A	A	A	A	A	A	A	A
1LG6, 1LA8 motors								
1LG6 183	40.5	37.5	36	34.5	–	–	–	–
1LG6 186	–	–	42.5	40.5	30.5	29	24.5	23
1LG6 206	54	51	–	–	37	35.5	–	–
1LG6 207	66	62	56	54	44	40.5	32.5	30.5
1LG6 220	–	–	70	64	–	–	38	34.5
1LG6 223	81	73	84	76	59	53	45	41
1LG6 253	97	90	99	94	72	67	59	55
1LG6 280	134	124	138	128	85	79	75	69
1LG6 283	158	146	166	154	104	96	91	83
1LG6 310	192	174	200	184	142	134	106	100
1LG6 313	230	210	235	215	166	156	142	136
1LG6 316	275	250	285	265	205	190	170	158
1LG6 317	340	305	355	330	245	225	205	194
1LG6 318	–	–	–	–	290	275	250	230
1LA8 315	435	400	450	425	360	340	310	295
1LA8 317	540	495	560	530	450	420	385	365
1LA8 353	620	570	640	590	–	–	–	–
1LA8 355	690	630	720	680	570	530	480	455
1LA8 357	860	790	880	820	720	670	600	560
1LA8 403	950	880	990	930	810	760	680	640
1LA8 405	1080	990	1100	1040	890	840	760	720
1LA8 407	690 ¹⁾	640 ²⁾	710 ¹⁾	670 ²⁾	1000	940	850	810
1LA8 453	780 ¹⁾	730 ²⁾	810 ¹⁾	750 ²⁾	1160	1060	960	910
1LA8 455	880 ¹⁾	810 ²⁾	910 ¹⁾	860 ²⁾	740 ¹⁾	690 ²⁾	1080	1020
1LA8 457	970 ¹⁾	890 ²⁾	1000 ¹⁾	940 ²⁾	830 ¹⁾	770 ²⁾	1200	1140

The rating plates of 1MJ6 motors specify the maximum current in the voltage range in addition to the rated current. This maximum is approximately 5 % higher than the rated current.

¹⁾ Only available for 690 V, see catalog part 3 "Non-standard motors frame size 315 and above"; but in 660 V design.

²⁾ Only available for 690 V, see catalog part 3 "Non-standard motors frame size 315 and above"; but in 725 V design.

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Outputs

The outputs and the rated outputs are listed in the selection tables and in the separate catalog parts for 50 Hz and in most

Table of rated output at 60 Hz for single-speed motors

Motor type	Admissible output at 60 Hz for voltages between 220 V or 380 V and 725 V			
	2-pole kW	4-pole kW	6-pole kW	8-pole kW
1LA6, 1LG4, 1LG6, 1LA7, 1MJ6, 1MJ7 motors				
1LA7 050 – –	0.105	0.07	–	–
1LA7 053 – –	0.14	0.105	–	–
1LA7 060 – –	0.21	0.14	–	–
1LA7 063 – –	0.29	0.21	0.1	–
1LA7 070 – 1MJ6 070	0.43	0.29	0.21	0.1
1LA7 073 – 1MJ6 073	0.63	0.43	0.29	0.14
1LA7 080 – 1MJ6 080	0.86	0.63	0.43	0.21
1LA7 083 – 1MJ6 083	1.3	0.86	0.63	0.29
1LA7 090 – 1MJ6 096	1.75	1.3	0.86	0.43
1LA7 096 – 1MJ6 097	2.55	1.75	1.3	0.63
1LA7 106 1LA6 106 1MJ6 106	3.45	2.55	1.75	0.86
1LA7 107 1LA6 107 1MJ6 107	–	3.45	–	1.3
1LA7 113 1LA6 113 1MJ6 113	4.6	4.6	2.55	1.75
1LA7 130 1LA6 130 1MJ6 130	6.3	6.3	3.45	2.55
1LA7 131 1LA6 131 1MJ6 131	8.6	–	–	–
1LA7 133 1LA6 133 1MJ6 133	–	8.6	4.6	3.45
1LA7 134 1LA6 134 1MJ6 134	–	–	6.3	–
1LA7 163 1LA6 163 1MJ6 163	12.6	12.6	8.6	4.6
1LA7 164 1LA6 164 1MJ6 164	17.3	–	–	6.3
1LA7 166 1LA6 166 1MJ6 166	21.3	17.3	12.6	8.6
1LA5 183 1LG . 183 1MJ6 183	24.5	21.3	–	–
1LA5 186 1LG . 186 1MJ6 186	–	25.3	18	3.2
– 1LG . 188 –	33.5	34.5	22	18
1LA5 206 1LG . 206 1MJ6 206	33.5	–	22	–
1LA5 207 1LG . 207 1MJ6 207	41.5	34.5	26.5	18
– 1LG . 208 –	51	42.5	36	22
1LA5 220 1LG . 220 1MJ7 220	–	42.5	–	22
1LA5 223 1LG . 223 1MJ7 223	51	52	36	26.5
– 1LG . 228 –	62	63	44.5	36
– 1LG . 253 1MJ7 253	62	63	44.5	36
– 1LG . 258 –	84	86	54	44.5
– 1LG . 280 1MJ7 280	84	86	54	44.5
– 1LG . 283 1MJ7 283	101	104	66	54
– 1LG . 288 –	123	127	90	66
– 1LG . 310 1MJ7 310	123	127	90	66
– 1LG . 313 1MJ7 313	148	152	108	90
– 1LG . 316 –	180	184	132	108
– 1LG . 317 –	224	230	158	132
– 1LG . 318 –	–	–	192	158

Table of rated output at 60 Hz for pole-changing motors

At 60 Hz, the output can be increased in accordance with the factors listed in the table below. The output is increased separately for each number of poles, i.e. for 6/4-pole motors, frame sizes 180 to 315, 60 Hz, the 6-pole output can be increased by 20 % and the 4-pole output can be increased by 15 %.

Possible versions of 2-pole motors

Frame size	Horizontal type of construction			Vertical type of construction		
	50 Hz with foot	60 Hz with foot	50 Hz with flange	60 Hz with flange	50 Hz	60 Hz
56 to 315 M	•	•	•	•	•	•
315 L	•	•	–	–	•	•
315	•	•	•	•	•	•
355 and 400	•	•	•	•	•	–
450	•	–	•	–	•	–

cases also for 60 Hz. For 60 Hz, the rated output values must, in some cases, be increased, e.g. for pole-changing motors.

Motor type	Admissible output at 60 Hz for voltages between 380 V and 725 V			
	2-pole kW	4-pole kW	6-pole kW	8-pole kW
1LA8 motors				
1LA8 315 – –	280	288	230	184
1LA8 317 – –	353	362	288	230
1LA8 353 – –	398	408	–	–
1LA8 355 – –	448	460	362	288
1LA8 357 – –	560	575	460	362
1LA8 403 – –	616	644	518	408
1LA8 405 – –	693	725	575	460
1LA8 407 – –	–	817	644	518
1LA8 453 – –	–	–	725	575
1LA8 455 – –	–	–	–	644
1LA8 457 – –	–	–	–	725

The speed increases to approx. 120 % in relation to 50 Hz motors.

Higher outputs/voltages are available on request!

Frame size	Number of poles	Factor for increased output at 60 Hz for voltages between 220 or 380 and 725 V
56 to 160	2 to 8	1.15
180 to 315	2	1.12
	4	1.15
	6 and 8	1.2

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Assignment of the standard power kW-HP and vice versa in accordance with IEC

$$\text{kW} \cdot 1,341 = \text{HP}$$

$$\text{HP} \cdot 0,746 = \text{kW}$$

P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP
0.06	0.08	0.37	0.5	2.2	3	11	15	37	50	110	150
0.09	0.12	0.55	0.75	3	4	15	20	45	60	132	200
0.12	0.16	0.75	1	4	5	18.5	25	55	75	160	250
0.18	0.25	1.1	1.5	5.5	7.5	22	30	75	100	200	300
0.25	0.33	1.5	2	7.5	10	30	40	90	125		

Efficiency, power factor, rated torque, rated speed and direction of rotation

Efficiency and power factor

The efficiency η and power factor $\cos \varphi$ for each rated output are listed in the selection tables in the individual sections of this catalog.

For EFF1 and EFF2 motors, the 3/4 load efficiency is also indicated.

Part-load efficiency % at					
1/4	1/2	3/4	4/4	5/4	
of full load					
93	96	97	97	96.5	
92	95	96	96	95.5	
90	93.5	95	95	94.5	
89	92.5	94	94	93.5	
88	91.5	93	93	92.5	
87	91	92	92	91.5	
86	90	91	91	90	
85	89	90	90	89	
84	88	89	89	88	
80	87	88	88	87	
79	86	87	87	86	
78	85	86	86	85	
76	84	85	85	83.5	
74	83	84	84	82.5	
72	82	83	83	81.5	
70	81	82	82	80.5	
68	80	81	81	79.5	
66	79	80	80	78.5	
64	77	79.5	79	77.5	
62	75.5	78.5	78	76.5	
60	74	77.5	77	75	
58	73	76	76	74	
56	72	75	75	73	
55	71	74	74	72	
54	70	73	73	71	
53	68	72	72	70	
52	67	71	71	69	
51	66	70	70	68	
50	65	69	69	67	
49	64	67.5	68	66	
48	62	66.5	67	65	
47	61	65	66	64	
46	60	64	65	63	
45	59	63	64	62	
44	57	62	63	61	
43	56	60.5	62	60.5	
42	55	59.5	61	59.5	
41	54	58.5	60	58.5	

The part-load values stated in the tables below are averages; precise values can be provided on request.

Part-load power factor at				
1/4	1/2	3/4	4/4	5/4
of full load				
0.70	0.86	0.90	0.92	0.92
0.65	0.85	0.89	0.91	0.91
0.63	0.83	0.88	0.90	0.90
0.61	0.80	0.86	0.89	0.89
0.57	0.78	0.85	0.88	0.88
0.53	0.76	0.84	0.87	0.87
0.51	0.75	0.83	0.86	0.86
0.49	0.73	0.81	0.85	0.86
0.47	0.71	0.80	0.84	0.85
0.45	0.69	0.79	0.83	0.84
0.43	0.67	0.77	0.82	0.83
0.41	0.66	0.76	0.81	0.82
0.40	0.65	0.75	0.80	0.81
0.38	0.63	0.74	0.79	0.80
0.36	0.61	0.72	0.78	0.80
0.34	0.59	0.71	0.77	0.79
0.32	0.58	0.70	0.76	0.78
0.30	0.56	0.69	0.75	0.78
0.29	0.55	0.68	0.74	0.77
0.28	0.54	0.67	0.73	0.77
0.27	0.52	0.63	0.72	0.76
0.26	0.50	0.62	0.71	0.76

Rated torque

The rated torque in Nm delivered at the motor shaft is

$$M = \frac{9.55 \cdot P \cdot 1000}{n}$$

P Rated output in kW
 n Speed in rpm

Note:

If the voltage deviates from its rated value within the allowed limits, the locked-rotor torque, the pull-up torque and the breakdown torque vary with the approximate square of the value, but the locked-rotor current varies approximately linearly.

In the case of squirrel-cage motors, the locked-rotor torque and breakdown torque are listed in the selection tables as multiples of the rated torque.

The normal practise is to start squirrel-cage motors directly on line. The torque class indicates that with direct-on-line starting, even if there is – 5 % undervoltage, it is possible to start up the motor against a load torque of

- 160 % for CL 16
- 130 % for CL 13
- 100 % for CL 10
- 70 % for CL 7
- 50 % for CL 5

of the rated torque.

The individual torque characteristics are available in the SD configurator. In addition, it is possible to perform calculations with the supplied start-up program.

⚠ For type 1MA motors in the standard design for T1/T2 and T3 and different rated outputs, the torque class specified for the higher output applies.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Rated speed and direction of rotation

The rated speeds are applicable for the rated data. The synchronous speed changes proportionally with the line frequency. The motors are suitable for clockwise and counter-clockwise rotation.

This does not apply to the following 2-pole motors:

- 1LA8, 1LL8 frame size 355 and above for clockwise rotation only; alternatively order code **K38** for counter-clockwise rotation only
- 1LA8, 1MJ6, 1MA6 and 1LG4 in VIK version from frame size 315 and above.

If U1, V1, W1 are connected to L1, L2, L3, clockwise rotation results as viewed onto the drive-end shaft extension. Counter-clockwise rotation is achieved by swapping two phases (see also "Heating and ventilation").

Rating plate and extra rating plates

DIN EN 60034-1 lays down that the approximate total weight for all motors from frame size 90 (from approx. 30 kg) is indicated on the rating plate.

An extra rating plate can be supplied loose for all motors, order code **K31**.

Supplementary data can be indicated on the rating plate or extra rating plate and on the packaging label (maximum of 20 characters), order code **Y84**.

An extra rating plate can also be supplied for the identification code, order code **Y82**.

An extra rating plate or a rating plate can also be ordered with different rating plate data, order code **Y80**.

An extra rating plate can be supplied loose for all motors of frame sizes 100 to 315, order code **B06**.

In the standard version, the rating plate is available in international format or in the English/German language. The language for the rating plate can be ordered by specifying in plain text. An overview of the languages that can be ordered, at additional cost in some cases, is provided by the table below.

 In addition, for 1MA motors:

With the exception of 2-pole motors from frame size 225 M or larger, all motors are suitable for both T1/T2 and T3 (uniform design).

If the rated output for T1/T2 differs from that of T3, the data for both output values is stated separately.

Overview of the languages on the rating plate

Motor type	Frame size	Rating plate							Double rating plate 50 Hz and 60 Hz data for		
		Inter- national	German (de)	English (en)	German (de)/ English (en)	French (fr)/ Spanish (es)	Italian (it)	Portuguese (pt)	Russian (ru)	500 VY and 575 VY	230 VΔ/ 400 VY and 460 VY 500 VΔ and 575 VΔ	400 VΔ/ 690 VY and 460 VΔ
1LA5	180 ... 225	☐		○						☐	☐
1LA6	100 ... 160	☐		○						☐	☐
1LA7	56 ... 160	☐		○						☐	☐
1LA8	315 ... 450				☐	○	○	○			
1LA9	56 ... 200	☐		○						☐	☐
1LG4	180 ... 315				☐				✓		☐
1LG6	180 ... 315	☐							✓		☐
1LL8	315 ... 450				☐	○	○	○			
1LP4	180 ... 315				☐				✓		☐
1LP5	63 ... 160	☐		○						☐	☐
1LP7	180 ... 200	☐		○						☐	☐
1MA6	100 ... 180			○	☐						
1MA6	180 ... 200			○	☐						
1MA6	225 ... 315			○	☐	○	○	○	✓		
1MA7	63 ... 160	☐		○							
1MJ6	71 ... 200	☐		○							
1MJ7	225 ... 315				☐	○	○	○	✓		
1PP4	180 ... 315				☐				✓		☐
1PP5	180 ... 200	☐		○						☐	☐
1PP6	100 ... 315				☐				✓		☐
1PP7	63 ... 160	☐		○						☐	☐
1PQ8	315 ... 450				☐	○	○	○			

- ☐ Standard version
- Without additional charge
- ✓ With additional charge

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Examples of rating plates

See the catalog part "Non-standard motors" for rating plates for motor series 1LA8, 1PQ8 and 1LL8.

Factory number		Temperature class	
Weight	Order No.		
SIEMENS 3-Mot. 1LA7166-2AA60 (EFF2) (H)			
D-91056 Erlangen E0107/471101 01 001 IEC/EN 60034			
93kg IM B3 160L IP55 Th.Cl. 155 (F) CE			
50 Hz 400/690 VΔ/Y		60 Hz 460 VΔ	
18.5 kW 32.5/18.8 A		21.3 kW 32.0 A	
cos φ 0.91 2940/min		cos φ 0.92 3540/min	
380-420/660-725 VΔ/Y		440-480 VΔ	
34.0-32.0/19.6-18.5 A		33.5-31.0 A	
50 Hz data		60 Hz data	
Date of manufacture YY MM		Degree of protection	

SIEMENS 3-Mot. 1LA9166-2KA60 (EFF1) (H)			
D-91056 Erlangen E0107/471101 01 002 IEC/EN 60034			
120 kg IM B3 160L IP55 Th.Cl. 155 (F) AMB 40°C CE			
50 Hz 400/690 VΔ/Y		60 Hz 460 VΔ	
18.5 kW 31.5/18.2 A		18.5 kW 27.7 A	
cos φ 0.92 2940/min		PF 0.92 3550RPM	
380-420/660-725 VΔ/Y		NEMA NOM.EFF 91.0% 25.0HP	
34.0-30.5/19.6-17.6 A		DESIGN A CODE J CC 032 A	
		MG1-12 SF1.15 CONT	

SIEMENS 3-Mot. 1LG6 186-4AA60-Z (EFF1) (H)			
D-91056 Erlangen UC 0202 /012415501			
180 kg IM B3 180L IP55 Th.Cl. 155 (F) AMB 40 °C			
50 Hz 400/690 VΔ/Y		60 Hz 460 VΔ	
22 kW 40.5/24 A		22 kW 36.5 A	
cos φ 0.84 1470/min		PF 0.83 1775RPM	
380-420/660-725 VΔ/Y		NEMA NOM.EFF 92.4% 30.0HP	
42.5-40.5/24.5-23.5 A		DESIGN A CODE K CC 032 A	
IEC/EN 60034		MG1-12 SF1.15 CONT	

SIEMENS 3-Mot. 1MJ6166-2CA60-Z (H)			
D-91056 Erlangen E0107/471101 13 003 IEC/EN 60034			
160 kg IM B3 160L IP55 Th.Cl. 155 (F) CE 0158			
50 Hz 400/690 VΔ/Y		VIK II 2 G	
18.5 kW 32.5/18.8 A		Ex de II C T4	
cos φ 0.91 2940/min		34.0/19.6 A	
380-420/660-725 VΔ/Y		PTB 01 ATEX 1093	
		IA/IN 7.0	

Coolant temperature and site altitude

The rated output specified in the selection tables is applicable for continuous duty in accordance with DIN EN 60034-1 at a frequency of 50 Hz, a coolant temperature (CT) or ambient temperature (AT) of 40 °C and a site altitude (SA) or up to 1000 m above sea level.

For higher coolant temperatures and/or site altitudes higher than 1000 m above sea level, the specified motor output must be reduced using the factor k_{HT} .

Depending on the frame size of the motor or the number of poles, special windings may be added to the motors for the different operating conditions.

This results in an admissible output of the motor of:

$$P_{adm.} = P_{rated} \cdot k_{HT}$$

Reduction factor k_{HT} for different site altitudes and/or coolant temperatures

Site altitude above sea level m	Site altitude above sea level Coolant temperature					
	<30 °C	30 °C ... 40 °C	45 °C	50 °C	55 °C	60 °C
1000	1.07	1.00	0.96	0.92	0.87	0.82
1500	1.04	0.97	0.93	0.89	0.84	0.79
2000	1.00	0.94	0.90	0.86	0.82	0.77
2500	0.96	0.90	0.86	0.83	0.78	0.74
3000	0.92	0.86	0.82	0.79	0.75	0.70
3500	0.88	0.82	0.79	0.75	0.71	0.67
4000	0.82	0.77	0.74	0.71	0.67	0.63

Coolant temperature and site altitude are rounded-off to 5 °C or 500 m.

If the admissible motor output is no longer adequate for the drive, it should be checked whether the motor with the next higher rate output fulfills the requirements.

Abbreviation	Description	Units
$P_{adm.}$	Admissible motor output	kW
P_{rated}	Rated output	kW
k_{HT}	Factor for abnormal coolant temperature and/or site altitude	

The motors are designed for temperature class 155 (F) and used in temperature class 130 (B). Under non-standard operating conditions, if they are to be used in class 130 (B), the admissible output must be determined from the tables below.

If explosion-proof motors are to be used (with the exception of 1MJ6) at coolant temperatures that exceed 40 °C and site altitudes higher than 1000 m above sea level, the appropriate correction factors must be requested.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

For the following outputs, rms values are specified for coolant temperatures (CT) of 45 °C and 50 °C that must be specified when ordering.

Power (kW)	Admissible output at 50 Hz	
	For CT 45 °C	For CT 50 °C
kW	kW	kW
11	10.5	10
15	14.5	13.8
18.5	17.8	17
22	21	20
30	29	27.5
37	35.5	34
45	43	41.5
55	53	51
75	72	69
90	86	83
110	106	101
132	127	122
145	139	133
160	153	147
180	173	166
200	192	184
250	240	230
280	269	258
315	302	290
355	340	325
400	384	368
450	432	414
500	480	460
560	538	515
630	605	580
710	682	663
800	768	736
900	864	828
1000	960	920

For details of derating for use in class 155 (F), see "DURIGNIT IR 2000" insulation system.

Motors for coolant temperatures other than 40 °C or site altitudes higher than 1000 m above sea level for use in temperature class 130 (B), must always be ordered with the supplementary order code "**-Z**" and plain text. In the case of extreme derating, the operating data for the motors will be less favourable due to partial utilization.

The following special versions are possible for 1LG4, 1LG6, 1LP4, 1PP4 and 1LA8 motors:

- Motors for coolant temperatures from -50 to +40 °C order code **D02** (not for 1LA8)
- Motors for coolant temperatures from -40 to +40 °C order code **D03**
- Motors for coolant temperatures from -30 to +40 °C order code **D04**

The following special versions are possible for 1LA8, 1PQ8 and 1LL8 motors:

- Motors for 45 °C coolant temperature, 4 % derating, order code **D11**
- Motors for 50 °C coolant temperature, 8 % derating, order code **D12**
- Motors for 55 °C coolant temperature, 13 % derating, order code **D13**
- Motors for 60 °C coolant temperature, 18 % derating, order code **D14**

For details of order codes for use in temperature class 155 (F), see "DURIGNIT IR 2000 insulation system" under "Windings and insulation".

The following applies to all motors:

The motors can withstand 1.5 times the rated current at rated voltage and frequency for two minutes (DIN EN 60034).

Ambient temperature:

All motors can be used in the standard version at ambient temperatures between -20 and +40 °C.

Motors can be used in temperature class 155 (F)

- at 40 °C with service factor 1.1, i.e. the motor can be continuously overloaded with 10 % of the rated output (for motors of 1LG6 and 1LA9 series, with the exception of 1LA9 with increased output, with service factor 1.15, i.e. 15 % of the rated output)
- above 40 °C at rated output.

When motors are used in temperature class 130 (B) for higher ambient temperatures and site altitudes, derating occurs in accordance with the table "Reduction factor k_{HT} for different site altitudes and/or coolant temperatures".

For motors ex-stock, the service factor is indicated on the rating plate.

For other temperatures, special measures are necessary.

When brakes are to be mounted on motors intended for operation at temperatures below freezing, please contact your local Siemens office.

Windings and insulation

DURIGNIT IR 2000 insulation system

The DURIGNIT IR 2000 insulation system comprises high-grade enameled wires and insulating sheet materials combined with solvent-free impregnating resin.

The system ensures a high level of mechanical and electrical strength as well as good serviceability and a long motor life.

The insulation system protects the winding against aggressive gases, vapors, dust, oil and increased air humidity. It can withstand the usual vibration stressing.

The insulation is suitable up to an absolute air humidity of 30 g water per m³ of air. Moisture condensation should be prevented from forming on the winding. Please contact your local Siemens office if higher values are present.

Please inquire about extreme applications.

Winding and insulation design with regard to temperature class and air humidity

All motors are designed for temperature class 155 (F).

At rated output with mains-fed operation, the motors can be used in temperature class 130 (B).

Temperature class 155 (F), used according to 155 (F), with service factor (SF)

For all 1LA motors (with the exception of 1LA9 with increased output, as these are already used according to temperature class 155 (F)), 1LG, 1LL8 and 1PP motors for mains-fed operation in frame sizes 56 to 355 for the rated output given in the selection table and rated voltage, a service factor of 1.1 can be specified (for 1LA9 and 1LG6 SF = 1.15) and 1.05 for frame sizes 400 and 450.

Order code **C11**.

Temperature class 155 (F), used according to 155 (F), for increased output

For motors supplied from stock (with the exception of 1LA9 with increased output, as these are already used according to temperature class 155 (F)) and 1LA8 motors, the service factor is indicated on the rating plate as standard. For use according to temperature class 155 (F), the rated output according to the selection and ordering data can be increased by 10 % (15 % for 1LA9, with the exception of 1LA9 with increased output, and 1LG6) and by 1.05 for frame sizes 400 and 450.

Order code **C12**.

Temperature class 155 (F), used according to 155 (F), with increased coolant temperature

At the output specified in the catalog under mains-fed operation, the coolant temperature can be increased to 55 °C (50 °C for frame sizes 400 and 450) with the exception of 1LA9 with increased output.

Order code **C13**

The service factor (SF) is not indicated on the rating plate for order codes C12 and C13.

For converter-fed operation at the output specified in the catalog, the motors are used according to temperature class 155 (F). Order codes C11, C12 and C13 are not possible. This applies to motors up to 500 V and to motors up to 690 V.

Temperature class 180 (H), used according to 155 (F), with Service Factor (SF1.1)

For all 1LA8, 1PQ8 and 1LL8 motors for mains-fed operation in frame sizes 315 to 355 for the rated output given in the selection table and rated voltage, a service factor of 1.1 and 1.05 can be specified (for frame sizes 400 and 450). For use according to temperature class 180 (H), as service factor of 1.1 for mains-fed operation is also permissible.

For all 1LA8, 1PQ8 and 1LL8 motors for converter-fed operation in frame sizes 315 to 450 for the rated output given in the selection table and rated voltage, a service factor of 1.1 can be specified. The thermal service life of the motor winding increases by at least 5 times when used in converter-fed operation.

Use according to temperature class 180 (H) is not possible for all motors. All 400 V versions are available only on request. Due to the rated current, a larger connection box of type 1XB9600 is generally provided for frame sizes 400 (2 and 4 pole) and 450 (all pole numbers) – part of order code C14. The temperature class 180 (H) does not apply to motors with separately driven fan with 1PQ8.

Order code **C14**

Temperature class 155 (F), used according to 130 (B), with increased coolant temperature and/or site altitude

For standard motors, explosion-proof motors and fan motors 1LA5, 1LA6, 1LA7, 1LA9 (with the exception of 1LA9 with increased output since these are already used according to temperature class 155 (F)), 1LG4, 1LG6, 1LP4, 1MJ6, 1MJ7, 1PP4, 1PP5, and 1PP7, a version designed for temperature class 155 (F) for use according to temperature class 130 (B) can be ordered with other customized requirements with specification in plain text.

Order code **Y50**

Temperature class 155 (F), used according to 155 (F), other requirements

For 1LA5, 1LA6, 1LA7, 1LA9, 1LG4, 1LG6, 1PP4, 1PP5 and 1PP7 standard motors and fan motors as well as 1MA6 and 1MA7 explosion-proof motors, a version can be ordered designed for temperature class 155 (F), for use according to temperature class 155 (F) with different customized requirements, by specifying the information in plain text. Certification costs may be charged in the case of 1MA6 and 1MA7 motors.

Order code **Y52**

Temperature class 180 (H) at rated output and maximum coolant temperature (CT) 60 °C

For motor series 1LA5, 1LA6, 1LA7, 1LG4, 1PP4, 1PP5 and 1PP7, use according to temperature class 180 (H) is permitted at rated output and at a maximum coolant temperature of 60 °C. This does not apply to explosion-proof motors of Zones 2, 21 and 22 and to motors with UL approval (order code **D31**). Not possible for CSA approval (order code **D40**) for 1LA5, 1LG4, 1PP4 and 1PP5 motor series. The specified grease life applies to a coolant temperature of 40 °C. For a 10 K increase in coolant temperature, the grease life or lubrication interval is halved.

Order code **C18**

Temperature class 155 (F), used according to 130 (B), coolant temperature 45 °C, approx. 4 % derating

For motors of series 1LA5, 1LA6, 1LA7, 1LA9 (with the exception of 1LA9 with increased output), 1LG4, 1LG6, 1MA6, 1MA7, 1MJ6, 1MJ7, 1PP4, 1PP5, and 1PP7, a version can be ordered that is designed to temperature class 155 (F), for use according to temperature class 130 (B) at a maximum coolant temperature of 45 °C at 4 % derating.

Order code **C22**

Temperature class 155 (F), used according to 130 (B), coolant temperature 50 °C, approx. 8 % derating

For motors of series 1LA5, 1LA6, 1LA7, 1LA9 (with the exception of 1LA9 with increased output), 1LG4, 1LG6, 1MA6, 1MA7, 1MJ6, 1MJ7, 1PP4, 1PP5, and 1PP7, a version can be ordered that is designed to temperature class 155 (F), for use according to temperature class 130 (B) at a maximum coolant temperature of 50 °C at 8 % derating.

Order code **C23**

Temperature class 155 (F), used according to 130 (B), coolant temperature 55 °C, approx. 13 % derating

For motors of series 1LA5, 1LA6, 1LA7, 1LA9 (with the exception of 1LA9 with increased output), 1LG4, 1LG6, 1MA6, 1MA7, 1MJ6, 1MJ7, 1PP4, 1PP5, and 1PP7, a version can be ordered that is designed to temperature class 155 (F), for use according to temperature class 130 (B) at a maximum coolant temperature of 55 °C at 13 % derating.

Order code **C24**

Temperature class 155 (F), used according to 130 (B), coolant temperature 60 °C, approx. 18 % derating

For motors of series 1LA5, 1LA6, 1LA7, 1LA9 (with the exception of 1LA9 with increased output), 1LG4, 1LG6, 1MA6, 1MA7, 1MJ6, 1MJ7, 1PP4, 1PP5, and 1PP7, a version can be ordered designed for temperature class 155 (F), for use according to temperature class 130 (B) at a maximum coolant temperature of 60 °C at 18 % derating.

Order code **C25**

Increased air temperature/humidity with 30 to 60 g water per m³ of air

For motors of series 1LA5, 1LA6, 1LA7, 1LA9, 1LG4, 1LG6, 1LP4, 1LP5, 1LP7, 1MA6, 1MA7, 1MJ6, 1MJ7, 1PP4, 1PP5 and 1PP7, a version can be ordered for increased air humidity of between 30 and 60 g water per m³ of air depending on the temperature as listed in the table below. This version includes condensation drainage holes (order code L12) – with the exception of 1MJ motors. A condensation protection by means of anti-condensation heaters for 230 V (order code K45) is included in 1MJ6 and 1MJ7 motors.

Order code **C19**.

Please contact your local Siemens office if order code **C19** is to be combined with additional mountings.

Increased air temperature/humidity with more than 60 g up to 100 g water per m³ of air

For motors of series 1LA5, 1LA6, 1LA7, 1LA9, 1LG4, 1LG6, 1LP4, 1LP5, 1LP7, 1MA6, 1MA7, 1MJ6, 1MJ7, 1PP4, 1PP5 and 1PP7, a version can be ordered for increased air humidity of between more than 60 g and 100 g water per m³ of air depending on the temperature as listed in the table below. This version includes condensation drainage holes (order code L12) – with the exception of 1MJ motors. A condensation protection by means of anti-condensation heaters for 230 V (order code K45) is included in 1MJ6 and 1MJ7 motors.

Order code **C26**.

Please contact your local Siemens office if order code **C26** is to be combined with additional mountings (e.g. rotary pulse encoders, brakes).

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Absolute/relative conversion of air humidity

Relative humidity	Temperature							
	20 °C	30 °C	40 °C	50 °C	60 °C	70 °C	80 °C	90 °C
10 %	2	3	5	8	13	20	29	42
15 %	3	5	8	12	19	30	44	63
20 %	3	6	10	17	26	39	58	84
25 %	4	8	13	21	32	49	73	105
30 %	5	9	15	25	39	59	87	126
35 %	6	11	18	29	45	69	102	146
40 %	7	12	20	33	52	79	116	167
45 %	8	14	23	37	58	89	131	188
50 %	9	15	26	41	65	98	145	209
55 %	10	17	28	46	71	108	160	230
60 %	10	19	31	50	78	118	174	251
65 %	11	20	33	54	84	128	189	272
70 %	12	21	36	58	91	138	203	293
75 %	13	23	38	62	97	148	218	314
80 %	14	24	41	66	104	157	233	335
85 %	15	26	43	70	110	167	247	356
90 %	16	27	46	74	117	177	262	377
95 %	16	29	49	79	123	187	276	398
100 %	17	30	51	83	130	197	291	419

The values in the table with a blue background are covered by the standard version (up to 30 g water per m³ of air).

The values in the table with a light gray background are covered by order code **C19** (30 to 60 g of water per m³ of air).

The values in the table with a dark gray background are covered by order code **C26** (60 to 100 g of water per m³ of air).

Please contact your local Siemens office regarding requirements exceeding 100 g water per m³ of air

Restarting against residual field and opposite phase

All motors can be reclosed against 100 % residual field after a mains voltage failure.

Motor protection

A distinction is made between current-dependent and motor-temperature-dependent protection devices.

Current-dependent protection devices

Fuses are only used to protect mains cables in the event of a short-circuit. They are not suitable for overload protection of the motor.

The motors are usually protected by delayed overload protection devices (circuit-breakers for motor protection or overload relays).

This protection is current-dependent and is particularly effective in the case of a locked rotor.

For standard duty with short start-up times and starting currents that are not excessive and for low numbers of switching operations, motor protection switches provide adequate protection. Motor protection switches are not suitable for high starting duty or large numbers of switching operations. Differences in the thermal time constants for the protection equipment and the motor results in unnecessary early tripping when the protection switch is set to rated current.

Motor-temperature-dependent protection devices

Temperature detectors installed in the motor winding are suitable protection devices in the case of slowly rising motor temperature.

When a limit temperature is reached, these **bimetal switches** (NC contacts) can deactivate an auxiliary circuit. The circuit can only be reclosed following a considerable fall in temperature. When the motor current rises quickly (e.g. with a locked rotor), these switches are not suitable due to their large thermal time constants.

Temperature detectors for tripping

Order code **A31**

The temperature monitors have the following current carrying capacity and switching capacity:

230 V AC cosφ: 2.5 A

24 V DC: 1.6 A

The most comprehensive protection against thermal overloading of the motor is provided by **PTC thermistors (thermistor motor protection)** installed in the motor winding. Due to its low heating capacity and excellent thermal contact with the winding, the winding temperature can be closely monitored. When a limit temperature is reached (nominal tripping temperature), the PTC thermistor undergoes a step change in resistance. This is evaluated by a tripping unit and can be used to open auxiliary circuits. The PTC thermistors themselves cannot be subjected to high currents and voltages. This would result in destruction of the semiconductor. The switching hysteresis of the PTC thermistor and tripping unit is low, which supports fast restarting of the drive. Motors with this type of protection are recommended for high duty starting, switching duty, extreme changes in load, high ambient temperatures or fluctuating supply systems.

Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping.

In the connection box, 2 auxiliary terminals are required. The maximum number of auxiliary terminals in the main connection box of the motor is specified under "Number of auxiliary terminals" in the section "Motor connection and connection box". An auxiliary connection box is required when the total number of auxiliary terminals in the connection box of the motor exceeds the specified values. For an additional charge, the connections can be routed through a separate auxiliary connection box (order code L97, M50 or M88, see "Auxiliary connection box" in the section "Motor connection and connection box").

Order code **A11**

For pole-changing motors with two separate windings, the number of temperature sensors must be doubled.

Two sets of three temperature sensors are used if a warning is required before the motor is shut down (tripped). The warning is normally set to 10 K below the tripping temperature.

Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm.

In the connection box, 4 auxiliary terminals are required.

Order code **A12**

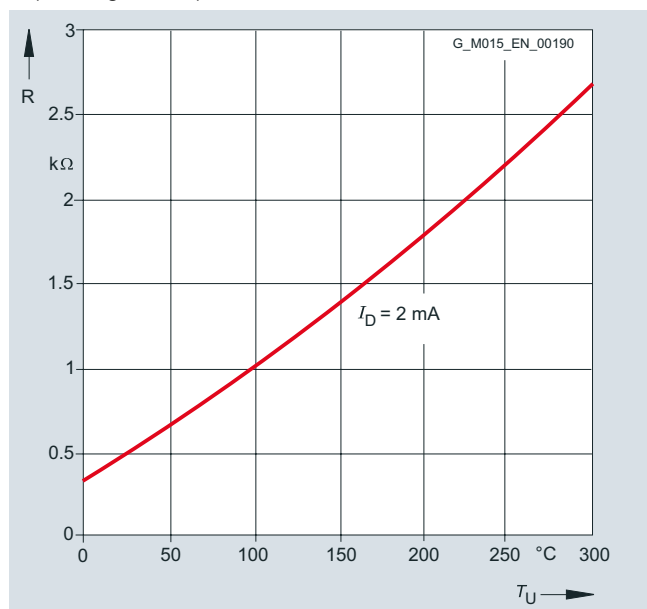
- All 1LA8 motors are equipped in the standard version with 6 PTC thermistors for alarm and tripping.
- For 1LA, 1MJ and 1LG motors, the tripping temperature corresponds to PTC thermistors for temperature class 155 (F).
- For 1LA8, 1LL and 1PQ motors, the tripping temperature corresponds to PTC thermistors for temperature class 155 (F), also for 1LA8 in Zone 22.
- For 1LA and 1LG motors for Zones 2, 21, 22 or VIK thermistors temperature class 130 (B) (see catalog part "Motors operating with frequency converters").

In order to achieve full thermal protection it is necessary to combine a thermally delayed overcurrent release and a PTC thermistor. For full motor protection implemented only with PTC thermistors, please inquire.

Motor temperature detection with converter-fed operation

KTY 84-130 temperature sensor

This sensor is a semi-conductor that changes its resistance depending on temperature in accordance with a defined curve.



KTY 84-130 temperature sensor characteristic

Some converters from Siemens determine the motor temperature using the resistance of the temperature sensor. They can be set to a required temperature for alarm and tripping.

Motor temperature detection with embedded temperature sensor KTY 84-130.

In the connection box, 2 auxiliary terminals are required.

The maximum number of auxiliary terminals in the main connection box of the motor is specified under "Number of auxiliary terminals" in the section "Motor connection and connection box".

An auxiliary connection box is required when the total number of auxiliary terminals in the connection box of the motor exceeds the specified values. For an additional charge, the connections can be routed through a separate auxiliary connection box (order code L97, M50 or M88, see "Auxiliary connection box" in the section "Motor connection and connection box").

Order code **A23**

For 1LA8 motors, the standard PTC thermistors are omitted when ordering with order code **A23**. A combination of A12 and A23 is possible, price on request.

OR

Motor temperature detection with embedded temperature sensors 2 x KTY 84-130.

In the connection box, 4 auxiliary terminals are required.

Order code **A25**

The temperature sensor is embedded in the winding head of the motor in the same manner as a PTC thermistor. Evaluation is performed, for example, in the converter.

For mains-fed operation, the temperature monitoring device 3RS10 that is part of the protection equipment can be ordered separately. For further details, see Catalog LV 1, Order No.: E86060-K1002-A101-A7-7600.

Motor protection

1LA and 1LG motors for Zones 2, 21 and 22 for converter-fed operation already have a PTC thermistor for tripping as standard. For converter-fed operation, a PTC thermistor for alarm can be ordered additionally.

PTC thermistor for alarm for converter-fed operation in Zones 2, 21 and 22.

In the connection box, 2 auxiliary terminals are required.

Order code **A10**

1MJ motors:

PTC thermistors must always be used if the duty is not S1 (continuous operation) in accordance with IEC 60034-1/DIN EN 60034-1.

If 1MJ motors are operated with converters, the PTC thermistor in the winding is essential. For 1MJ6/1MJ7 motors, an additional PTC thermistor is installed in the connection box.

Motor protection with PTC thermistors for converter-fed operation with 3 or 4 embedded temperature sensors for tripping.

In the connection box, 2 auxiliary terminals are required.

Order code **A15**.

or

Motor protection with PTC thermistors for converter-fed operation with 6 or 8 embedded temperature sensors for alarm and tripping.

In the connection box, 4 auxiliary terminals are required.

Order code **A16**.

For versions with temperature sensors, in some cases, anti-condensation heaters cannot be mounted or can only be mounted for certain frame sizes. See "Special versions" in the corresponding catalog parts.

If thermistor protection is required, 3 PTC thermistors connected in series are embedded in the stator winding of the motor.

The 3RN1 temperature monitoring device that is part of the protection equipment must be ordered separately – it is PTB certified. For further details about mode of operation, circuit and prices, see Catalog LV 1,

Order No.: E86060-K1002-A101-A7-7600.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Motor temperature detection with resistance thermometers

The resistance thermometers are embedded in the stator winding or in the rolling contact bearings or bearing plates of the motors. The following possibilities can be implemented:

Stator winding:

3 or 6 PT 100 resistance thermometers are embedded in the stator winding in 2-wire connection. The two connections for each resistance thermometer are routed through the main connection box. In the connection box, 6 or 12 auxiliary terminals are required. The maximum number of auxiliary terminals in the main connection box of the motor is specified under "Number of auxiliary terminals" in the section "Motor connection and connection box". An auxiliary connection box is required when the total number of auxiliary terminals in the connection box of the motor exceeds the specified values.

For an additional charge, the connections can be routed through a separate auxiliary connection box (order code L97, M50 or M88, see "Auxiliary connection box" in the section "Motor connection and connection box"); 3-wire or 4-wire connection (from the terminal strip) is also possible (please inquire).

The resistance thermometer embedded in the winding head is calibrated to 100 Ω at 0 °C. The base values for the resistances (i.e. the relationship between the resistance and temperature) as well as the admissible deviations are laid down in DIN IEC 751. The changes in temperature are transferred to a display device in the form of changes in resistance.

The display devices are not included in the price and are not included in the delivery package.

Installation of 3 PT 100 resistance thermometers in stator winding.

In the connection box, 6 auxiliary terminals are required.

Order code **A60**

Installation of 6 PT100 resistance thermometers in stator winding.

In the connection box, 12 auxiliary terminals are required.

Order code **A61**

Note regarding non-standard 1LA8 motors: When A61 is ordered, the PTC thermistors installed as standard in the motor are omitted. A combination of A12 and A61 is possible, price on request.

Rolling contact bearings or bearing plates:

The bearing thermometers are screwed into the bearing plates of the drive end (DE) and non-drive-end (NDE). The wires are routed through the main connection box.

In the connection box, auxiliary terminals are required. The maximum number of auxiliary terminals in the main connection box of the motor is specified under "Number of auxiliary terminals" in the section "Motor connection and connection box". An auxiliary connection box is required when the total number of auxiliary terminals in the connection box of the motor exceeds the specified values.

For an additional charge, the connections can be routed through a separate auxiliary terminal box (order code L97, M50 or M88, see "Auxiliary connection box" in the section "Motor connection and connection box"). The changes in temperature are transferred to a display device in the form of changes in resistance. The display device is not included in the price and is not included in the delivery package.

Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings.

In the connection box, 4 auxiliary terminals are required.

Order code **A72**

Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings.

In the connection box, 6 auxiliary terminals are required.

Order code **A78**

Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings.

In the connection box, 12 auxiliary terminals are required.

Order code **A80**

Heating and ventilation

Anti-condensation heaters

Supply voltage 230 V (1~)

Order code **K45**

or

Order code **M15**

Supply voltage 115 V (1~)

Order code **K46**

or

Order code **M14**

Motors whose windings are at risk of condensation due to the climatic conditions, e.g. inactive motors in humid atmospheres or motors that are subjected to widely fluctuating temperatures can be equipped with anti-condensation heaters.

An additional cable entry M16 x 1.5 or M20 x 1.5 (M20 x 1.5 or M25 x 1.5 for 1LA8, 1PQ8 and 1LL8 motor series) is provided for the connecting cable.

Anti-condensation heaters must not be switched on during operation.

1MJ6 motors:

For 1MJ6 motors up to frame size 160 L, a built-in anti-condensation heater is not possible for versions with PTC thermistors.

For 1MA and 1LA motors. In designs for Zone 21:

Built-in anti-condensation heaters are not possible up to frame size 200L.

For 1LA8 and 1PQ8 motor series in designs for Zone 2, the anti-condensation heater can only be switched on after the motor has been switched off for one hour.

Instead of an anti-condensation heater, another possibility (without additional charge) is connection of a voltage that is approximately 4 to 10 % of the rated motor voltage to stator terminals U1 and V1; 20 to 30 % of rated motor current is sufficient to heat the motor (this does not apply to 1MA6 frame sizes 225 M to 315 L, 1LA8, 1PQ8 and 1LL8).

Motor series	Frame size	Heater output of the anti-condensation heaters in Watt (W)	
		Supply voltage at	
		230 V	115 V
		Order code	Order code
		K45	K46
1LA5, 1LP5, 1PP5, 1LA6, 1LA7, 1LP7, 1PP7, 1LA9, 1MJ6	56 ... 80	25	25
	90 ... 112	50	50
	132 ... 200	100	100
	225	100	100
1LG4, 1LP4, 1PP4, 1LG6, 1MA6, 1MJ7	180 ... 200	55	55
	225 ... 250	92	92
1LG4, 1LG6 in designs for Zone 2	180 ... 200	48	48
	225 ... 250	92	92
	280 ... 315	105	105
1MA6	280 ... 315	105	105
1LG4, 1LP4, 1PP4, 1LG6, 1MJ7	280 ... 315	109	109
1LA8, 1PQ8, 1LL8	315 ... 450	200	183

Fans/Separately driven fans

Motors of frame sizes 63 to 450 have radial-flow fans in the standard version that cool regardless of the direction of rotation of the motor (cooling method IC 411 acc. to DIN EN 60034-6, IC01 for 1LL8 motor series). The air flow is forced from the non-drive-end (NDE) to the drive end (DE).

Motors of frame size 56 do not have a fan (IC 410).

For details of separately driven fans for frame sizes 100 to 315, see also Page 0/76.

1LA8 and 1LL8 (frame size 355 and above) 2-pole motors have an axial-flow fan for clockwise rotation in the standard version. The fan can be subsequently reinstalled for counter-clockwise rotation.

Motors of the 1LA8 series are also available in a version with a separately driven fan (cooling method IC 416 – 1PQ8 series) and in a version with through-ventilation (cooling method IC 01, IP23 degree of protection – 1LL8 series).

1PQ8 motors have separately driven fans that cool regardless of the speed of the main motor (IC416).

Supply voltages for 1PQ8 separately driven fans:
230 VΔ/400 VY ±10 %, 50 Hz, 460 VΔ ±10 %, 60 Hz.

Other voltages/frequencies can be ordered by specifying in plain text with order code **Y81** (additional charge).

Supply voltage of separately driven fan for 1LG motors:

The supply voltage of the separately driven fan conforms to the stated rated voltage ranges of table "Technical data of the separately driven fan", see Page 0/76. Deviating voltages/frequencies can be ordered with order code Y81 and plain text (additional charge).

When the motor is mounted and the air intake is restricted, then it must be ensured that a minimum clearance is maintained between the fan cover and the wall. This clearance is calculated from the difference between the protective cover and the fan cover (dimension LM – L) or is specified in the detail dimension drawing.

For design of the fan/separately driven fan and the fan cover, see the tables below.

Metal external fan impeller

The standard fan impeller made of plastic can be replaced with a fan impeller made of metal. This version can be supplied for motor series 1LA5, 1LA6, 1LA7, 1LA8, 1LA9, 1LG4, 1LG6, 1MA6, 1MA7, 1MJ6, 1MJ7 and 1LL8.

For motor series 1LA5, 1LA6, 1LA7, 1LA9, 1LG4 and 1LG6, the metal external fan can also be used with converter-fed operation.

A metal external fan is already included for the low-noise version.

Up to frame size 160, the metal external fan impeller is manufactured from sheet aluminum or steel and for frame size 180 and above it is manufactured from cast iron or sheet steel.

Order codes **K35**

Fan cover for textile industry

For motors 1LG4 and 1LG6, the fan cover can be used in the standard version for the textile industry.

For motor series 1LA5, 1LA6, 1LA7 and 1LA9, a version of the fan cover can be supplied specially for the textile industry. This has a protective cover and is made of non-corrosive sheet steel. Order code **H17**

Cast-iron fan cover

For 1MA6 motor series, frame sizes 225 to 315, the fan cover can be supplied in cast-iron instead of plastic.

Order code **K34**

Sheet metal fan cover

For 1LG4 and 1LG6 motor series, the fan cover can be supplied in sheet metal instead of plastic.

Order code **L36**

For 1LA8, 1PQ8 and 1LL8 motor series, the sheet-metal fan cover is supplied as standard.

Design of fan and fan cover for standard motors, explosion-proof motors, motors operating with frequency converters, fan motors and smoke extraction motors:

Motor series	Frame size	Fan material ¹⁾	Fan cover material ¹⁾
1LA5, 1LA7	63 ... 225	Plastic	Non-corrosive sheet steel
1LA9	63 ... 200		
1LA6	100 ... 160		
1MA7	63 ... 160		
1MA6	100 ... 315		
1MJ6	71 ... 200		
1MJ7	255 ... 315		
1LG4, 1LG6	180 ... 315	Plastic	Glass fiber strengthened plastic ²⁾

Design of the fan/separately driven fan and the fan cover for non-standard motors

Motor series	Frame size	Fan material ³⁾	Fan cover material
1LA8, 1LL8	315	Radial-flow fan, plastic	Non-corrosive sheet steel
1PQ8		Radial-flow fan, sheet steel	
1LA8, 1LL8	355 ... 400	Axial-flow fan, cast aluminum	Radial-flow fan, plastic
1PQ8		Radial-flow fan, sheet steel	Radial-flow fan, sheet steel
1LA8, 1LL8	450	Axial-flow fan, hub: cast aluminum, vane: plastic	Radial-flow fan, plastic
1PQ8		Radial-flow fan, sheet steel	Radial-flow fan, sheet steel

¹⁾ The plastic fan can be used at ambient temperatures of up to 70 °C. For designs for Zones 21 and 22 and VIK, other materials are used in some cases.

²⁾ For designs:
for Zones 2, 21 and 22 VIK (order code **K30**),
CSA (order code **D40**)
UL (order code **D31**)
a fan cover is used that is made of non-corrosive sheet steel.

³⁾ The plastic fan can be used at ambient temperatures of up to 70 °C. For designs for Zones 21 and 22, VIK and UL, other materials are used in some cases.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Motor connection and connection box

Connection, circuit and connection box

Location of the connection box

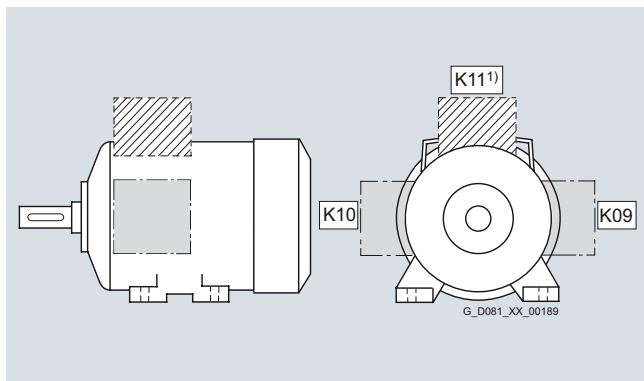
The connection box of the motor can be mounted in four different locations or positions. The position of the connection box must always be viewed from the drive end (DE). The standard position of the connection box is on top, with the exception of non-standard motors in which case the standard position of the connection box is on the right-hand side.

Connection box on right-hand side – Order code **K09**

Connection box on left-hand side – Order code **K10**

If rotation of the connection box is possible later for motors that are supplied as standard with cast feet, the version "Connection box on top, feet screwed on" is recommended.

Order code **K11**



The number of winding ends depends on the winding design. Three-phase motors are connected to the three phase conductors L1, L2 and L3 of a three-phase system. The rated voltage of the motor in the running connection must match the phase conductor voltages of the network.

When the three phases are operating in a time sequence and are connected to the terminals of the motor in alphabetical order U1, V1 and W1, clockwise rotation is established as viewed from the motor shaft. The direction of rotation of the motor can be reversed if two connecting leads are interchanged.

Labeled terminals are provided to connect the protective conductor.

A protective earth terminal is provided in the connection box for earthing. An earth terminal is located on the outside of the motor housing (special version in the case of 1LA5, 1LA6, 1LA7 and 1LA9 motors. Order code **L13**).

If a brake control system or thermal protection is installed, the connections will also be in the connection box. The motors are suitable for direct connection to the line supply.

Design of the connection box

Connection boxes for motors to Exn (Zone 2) type of protection and for protection against dust explosions (Zone 21) differ from the basic version. For dust explosion protection (Zone 22), the connection boxes of the basic version are used.

For 1LG4 and 1LG6 motors, frame sizes 180 to 225 and 1MA6 motors frame sizes 180 to 200, 1MJ6 frame sizes 71 to 160 M and frame sizes 180 to 200 L, a connection box is available in cast iron.

Order code **K15**

For 1LA6 and 1MA6 frame size 100 – 160, 1MJ6 frame size 160 L and 1MJ7, 1MA6 frame size 225 – 315 standard version. Not possible for 1LA7 and 1MA7.

For 1MJ motors:

The connection boxes are designed to Ex e type of protection. The ends of the windings for motors up to frame size 160 are routed through a shared explosion-proof leadthrough into the connection box; for frame size 180 and above, they are routed through single leadthroughs.

For 1MJ motors, an explosion-proof connection box with Ex d II C type of protection is available.

Order code **K53**

For motor series 1LA8, 1PQ8 and 1LL8, the ends of the windings are routed through single leadthroughs into the connection box.

The number of terminals and the size of the connection box is designed for standard requirements. For special requirements or if the customer requires a larger connection box, the connection box for the next larger frame size can be supplied.

For all motors except for non-standard motors and 1MJ motors:

Next larger connection box (only frame size 180 and above)

Order code **L00**

Detailed assignment of connection boxes, see Page 0/43 and 0/46.

For non-standard motors (motor series 1LA8, 1PQ8 and 1LL8)

Next larger 1XB1 621 connection box

Order code **M58**

Next larger 1XB1 631 connection box

Order code **L00**

Detailed assignment of connection boxes, see Page 0/43 and 0/44.

If the necessary installation angle of the motor would cause machine components to collide with the connection box, the connection box can be moved from the drive end (DE) to the non-drive end (NDE).

Order code **M64**

Not possible for explosion-proof motors.

Motor connection

Line feeder cables

The line feeder cables must be dimensioned acc. to DIN VDE 0298. The number of required feeder cables, if necessary in parallel, is defined by:

- The max. cable cross-section which can be connected
- The cable type
- Routing
- Ambient temperature and the corresponding admissible current in accordance with DIN VDE 0298

Parallel feeders

Some motors must be fitted with parallel feeders due to the admissible current per terminal. These motors are indicated in the selection and ordering data in the respective catalog parts. With 1XB7 connection boxes, 2 parallel feeders are possible; with 1XB1 631 connection boxes, up to 4 parallel feeders are possible; and with GT640 and 1XB1 621 connection boxes, 2 parallel feeders are possible.

For motors with an upper connection box section and auxiliary terminals (e.g. with order code **A11**), an M16 x 1.5 or M20 x 1.5 cable gland with plug is additionally available.

For further details, see the data sheet function in SD configurator.

¹⁾ Possible for frame size IM B3, IM B6, IM B7, IM B8, IM V6 with/without protective cover, IM B35.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

1LA7 and 1LA9 in frame size 100 L to 160 L

The connection box is integrated into the frame. Two knock-outs are provided at each side for boltings. The nuts for the boltings are supplied with the connection box.

Cable entry on connection box

Unless stated otherwise, the cable entry is located in the standard position as shown in the illustration below.

The connection box can also be rotated such that the cable entry is located

- Towards the drive end (DE)
(rotation of connection box by 90°, entry from DE)
Order code **K83**
- Towards the non-drive end (NDE)
(rotation of connection box by 90°, entry from NDE)
Order code **K84**

With options **K83** and **K84**, 1LA7 motors of frame sizes 100 to 160 require an additional connection box upper section. This measure results in increased height of the connection box. The dimension AD increases by approx. 30 mm, dimension AF changes depending on the frame size by between 45 and 47 mm. For the precise values of AD and AF, see "Dimension drawings" in the corresponding catalog parts.

If the cable entry is rotated by 180°, special measures are required for 1LA7 and 1LA5 motors of frame sizes 63 to 90 as well as 180 to 225 (without a change in dimensions). (Rotation of the connection box by 180°)
Order code **K85**

From frame size 100 to 160, the break-outs in the connection box can be used.

The dimensions of the connection box are listed in the relevant catalog parts in accordance with the frame size and the "Dimension drawings".

If the position of the connection box (connection box RHS, LHS or above) is changed, the position of the cable entry must be checked and, if necessary, it can be ordered with the corresponding order codes (**K83**; **K84**; **K85**).

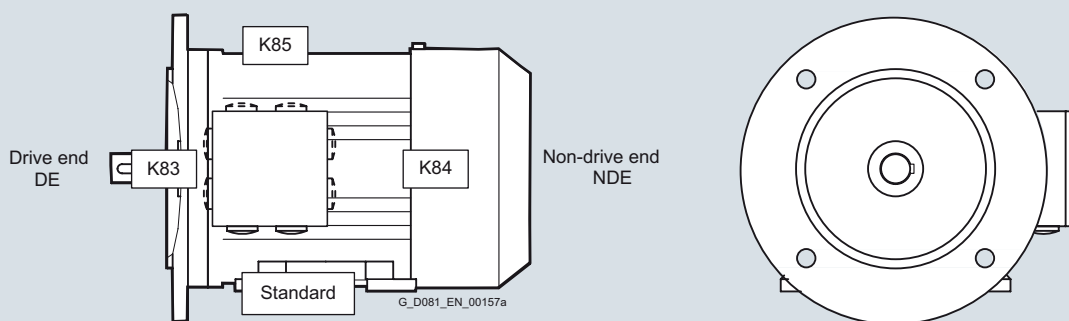
Ordering example

Connection box RHS (Order code **K09**):

If no other order code is specified, cable entry is from below.

With additional order code **K83**:

Cable entry from drive end (DE)



For cable entry to a standard connection box, a **cable gland** can be ordered for motor connection.

One cable gland, metal

Order code **K54**

For cable entry to a connection box with the options of motor protection or anti-condensation heating, **two cable glands** will be supplied.

Cable glands are supplied in metal as standard. For temperatures below -30 °C and/or higher than +60 °C, the material is selected/used according to the temperature.

Cable gland, maximum configuration

Order code **K55**

For non-standard motors (motor series 1LA8, 1PQ8 and 1LL8), the cable entry can be implemented in accordance with DIN 89280 for the maximum possible configuration of cable glands in the connection box.

Order code **K57**

A two-part plate on the connection box can be supplied if required.

Order code **K06**

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

For special requirements for which the standard holes for the cable entries are inadequate, too large or when the routing must be implemented differently, an undrilled entry plate can be supplied to allow holes to be drilled as required on assembly.
Order code **L01**

Protruding cable ends

For confined spaces, protruding cable ends can be ordered, without a connection box with cover plate.

For protruding cable ends for smoke extraction motors, see catalog part 9 "Smoke extraction motors".

The following lengths of protruding cables can already be ordered using order codes on request:

- 3 cables protruding, 0.5 m long ¹⁾
Order code **L44**
- 3 cables protruding, 1.5 m long ¹⁾
Order code **L45**
- 6 cables protruding, 0.5 m long
Order code **L47**
- 6 cables protruding, 1.5 m long
Order code **L48**
- 6 cables protruding, 3.0 m long
Order code **L49**

The cross-section of the named cables refers to a coolant temperature up to CT 40 °C

It is also possible to rotate the position of the three protruding cables:

- Cable connection on right side, as viewed from drive end (DE) ²⁾
Order code **L51**
- Cable connection on left side, as viewed from non-drive end (NDE) ²⁾
Order code **L52**

For 1LG4/1LG6/1LP4/1PP4 motors, it is also possible to order the length of protruding cable in plain text with order codes **L51** and **L52**.

In combination with winding monitoring (order code **A11, A12, A15, A16, A23, A25 or A31**) or anti-condensation heating (order code **K45 or K46**), option **L44, L45, L47, L48 or L49** must be specified twice on ordering.

Position of protruding cables

Motor series 1LA7

Frame sizes 56 to 160:

As standard, above at drive end (DE).

Motor series 1LA6

Frame sizes 100 to 160:

As standard, above at drive end (DE).

Motor series 1LA5

Frame sizes 180 to 225:

As standard, above at drive end (DE).

Motor series 1LA9

Frame sizes 56 to 200:

As standard, above at drive end (DE).

Motor series 1LG4/1LG6/1LP4/1PP4

Frame sizes 180 to 315:

As standard, above at drive end (DE).

Optionally left or right at drive end (DE)

¹⁾ With only 3 protruding cables additional plain text specifying star or delta connection is required.

²⁾ For motor series 1LA5, 1LA6, 1LA7, 1PP5 and 1PP6 only possible for smoke-extraction motors.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Connection, circuit and connection box

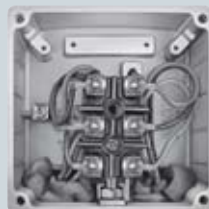
Type gk 030



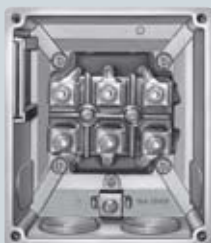
Type gk 127



Type gk 130, gk 230, gk 330 (not for 1LA5, 1LG4, 1LG6)



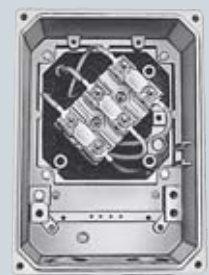
Type gk 330 (for 1LA5, 1LG4, 1LG6)



Type gk 135, gk 235, gk 335



Type gk 430, gk 431



Type 1XB7 222



Type gt 520, gt 540, gt 620, gt 640



Type 1XB7 422, 1XB7 522



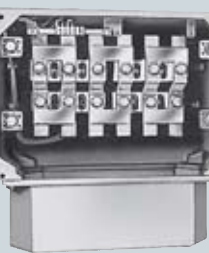
Type 1XB7 622



Type 1XB1 621



Type 1XB1 631



IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Type gk 465



Type 1XC1 270, 1XC1 380



Type 1XC1 480, 1XC1 580



Type 1XB7 322



Connection boxes for 1LA, 1LG, 1LP and 1PP motors

Motors	Frame size	Number of cable entries	Connection box material	Feeder connection
1LA7, 1LA9	56 ... 71	2 cable glands incl. Plugs	Aluminum alloy	Without cable lug or with cable lug
1LP7, 1PP7	80 ... 90			
	100 ... 160	2 holes 180° apart, 4 break-out openings sealed with cast iron skin (2 left, 2 right), connection box is moulded		
1LA5, 1LA9	180 ... 225	2 holes with plugs		
1LP5, 1PP5				
1LA6	100 ... 160		Cast iron	
1LG4, 1LG6	180 ... 200		Aluminum alloy ¹⁾	Without cable lug
1LP4, 1PP4, 1PP6	225			With cable lug
	250 ... 315		Cast iron	
1LA8, 1PQ8, 1LL8	315 ... 355 ^{2) 3)}			
	400 ... 450	4 holes with plugs		

Possible positions of connection boxes for 1LA, 1LG, 1LP and 1PP motors

Motors	Frame size	Connection box position			Rotation of connection box		Retrofitting possible
		top	Side, right or left	Retrofitting possible	90° ⁴⁾	180° ⁴⁾	
1LA5, 1LA7, 1LA9	56 ... 71	○	–	–	○	○	Yes
1LP5, 1LP7	80 ... 90	○	○	–	○	○	Yes
1PP5, 1PP7	100 ... 160	○	○	–	– ⁵⁾	○	Yes
	180 ... 225	○	○	–	○	○	Yes
1LA6	100 ... 160	○	○	–	○	○	Yes
1LG4, 1LG6	180 ... 315	○	○	– ⁶⁾	○	○	Yes
1LP4, 1PP4, 1PP6							
1LA8	315	○	○ ²⁾	–	○	○	–
	355	○	○ ²⁾	–	○	○	–
	400, 450	○	○ ²⁾	–	○	○	–

○ Available version

For further details of 1LA8 motors, see "Dimensions", "1LA8".

¹⁾ Connection box in cast-iron version **K15**.

²⁾ 15° to the vertical in each case

³⁾ Frame sizes 357-2 and 357-4 as for frame sizes 400 and 450

⁴⁾ The position of the cable entry must be specified when ordering.

⁵⁾ Design for 1LA7 motors available on request.

⁶⁾ Retrofittable with screwed on feet (order codes **K09**, **K10** and **K11**).

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Connection boxes for 1LA, 1LG, 1LL, 1LP, 1PP and 1PQ motors in standard version and for Zone 22

See the next section of the catalog for connection boxes for 1LA8, 1PQ8 and 1LL8.

Frame size	Connection box	Number of terminals	Contact screw thread	Max. conductor size	Sealing range	Cable entry ^{1) 2)}	Cable entry for CSA version order code D40 ³⁾
	Type			mm ²	mm	Size	Size
1LA5, 1LA7, 1LA9, 1LP5, 1PP7, 1PP5 and 1PP7							
56	gk 030	6	M4	1.5	9 ... 17	M25 x 1.5	NPT 1/2"
63	(gk 127) ⁴⁾			(2.5 with cable lug)	4.5 ... 10	M16 x 1.5	
71							
80							
90							
100	gk 130	6	M4	4	11 ... 21	2 x M32 x 1.5	NPT 3/4"
112							
132	gk 230	6	M4	6	11 ... 21	2 x M32 x 1.5	NPT 3/4"
160	gk 330	6	M5	16	19 ... 28	2 x M40 x 1.5	NPT 1"
180							NPT 1 1/2"
200	gk 430	6	M6	25	27 ... 35	2 x M50 x 1.5	NPT 2"
225	gk 431	6	M8	35	27 ... 35	2 x M50 x 1.5	
1LA6							
100	gk 135	6	M4	4	11 ... 21	2 x M32 x 1.5	NPT 1/2"
112							
132	gk 235	6	M4	6	11 ... 21	2 x M32 x 1.5	NPT 3/4"
160	gk 335	6	M5	16	19 ... 28	2 x M40 x 1.5	NPT 1"
1LG4, 1LG6, 1LP4, 1PP4 and 1PP6							
180	gk 330	6	M5	16	19 ... 28	M40 x 1.5	M40 x 1.5 ¹³⁾
200	gk 430	6	M6	25	27 ... 35	M50 x 1.5	M50 x 1.5 ¹³⁾
225	gk 431	6	M8	35	27 ... 35	M50 x 1.5	M50 x 1.5 ¹³⁾
250	gt 520	6	M10	120	34 ... 42	M63 x 1.5	M63 x 1.5 ¹³⁾
280							
315	gt 620	6	M12	240 ⁵⁾	38 ... 45	M63 x 1.5	M63 x 1.5 ¹³⁾

The connection box table does not apply to pole-changing motors with three speeds.

A two-part plate can be supplied. Order code **K06**. For frame size 250 M and above, with strain relief.

Connection boxes for 1LA8 and 1PQ8 motors in standard version

Mains-fed operation

Frame size	Connection box	Number of terminals	Contact screw thread	Max. rec. conductor cross-section	Outer cable diameter (sealing range)	Cable entry ⁶⁾	Cable gland option K57 ⁷⁾	Auxiliary lead Outer cable diameter	Cable entry	Two-part plate option K06	Auxiliary lead outer cable diameter
	Type			mm ²	mm	Size	Size	mm	Size	mm	mm
1LA8 ... 1PQ8 ...											
... 315	gt 640	6	M12	185	41.0 ... 56.5	2 x M72x2 + 2 x M20x1.5	2 x M72x2	7 ... 13	2 x M20x1.5	–	–
... 317	(8) (9) (11)										
... 353	1XB1 621	6	M16	240	56.0 ... 68.5	2 x M80x2 + 2 x M25x1.5	2 x M80x2	11.5 ... 15.5	2 x M25x1.5	40 ... 70	2 x D80 + 2 x M25x1.5
... 355	(8) (10)										
... 357-6											
... 357-8											
... 357-2	1XB1 631 ¹⁰⁾	12	M16	240	56.0 ... 68.5	4 x M80x2 + 2 x M25x1.5	4 x M80x2	11.5 ... 15.5	2 x M25x1.5	40 ... 75	4 x D80 + 2 x M25x1.5
... 357-4	1XB1 631 ¹²⁾										
... 40											
... 45											

1) Designed for cable glands with O-ring.

2) For 1LA7 motors frame sizes 100 to 160, speed nuts are enclosed for the cable glands.

3) Not possible for motors in Zone 22.

4) (gk 127) For frame sizes 63 to 90, with additional installation of several temperature sensors, order code **A12**, terminal strip for main and auxiliary terminals order code **M69** or a brake, a larger connection box will be necessary. The specified values do not change. The gk 127 is standard for Zone 22.

5) With cable cross-sections ≥ 240 mm², it is recommended that the next larger connection box is used (order code **L00**). Alternatively, order a two-part plate (order code **K06**).

6) Others available on request.

7) With option **K57**, the cable glands can be supplied.

8) With option **L00**, the motor can be supplied with the 1XB1 631 connection box (recommended for cable cross-sections ≥ 240 mm²).

9) Cable entry without removable plate, cable entry in connection box casing.

10) Cable entry with removable plate or supports.

11) With option **M58**, the motor can be supplied with the 1XB1 621 connection box (recommended for cable cross-sections > 185 mm²).

12) With option **K11** connection box on top the 1XB1 634 connection box will be supplied.

13) NPT-thread can be ordered with order code **Y61**.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Converter-fed operation

Frame size	Connection box	Number of terminals	Contact screw thread	Max. rec. conductor cross-section	Outer cable diameter (sealing range)	Cable entry ¹⁾	Cable gland option K57 ²⁾	Auxiliary lead Outer cable diameter	Cable gland option K57 ²⁾
Type				mm ²	mm	Size	Size	mm	Size
1LA8 ... 1PQ8 ...									
... 315 ... 317	gt 640 ^{3) 4) 6)}	6	M12	185	41.0 ... 56.5	2 x M72x2 + 2 x M20x1.5	2 x M72x2	9 ... 13	2 x M20x1.5
... 353 ... 355 ... 357-6 ... 357-8	1XB1 621 ^{3) 5)}	6	M16	240	56.0 ... 68.5	2 x M80x2 + 2 x M25x1.5	2 x M80x2	11 ... 16	2 x M25x1.5
... 357-2 ... 357-4 ... 40 ... 45	1XB1 631 ^{5) 7)}	12	M16	240	56.0 ... 68.5	4 x M80x2 + 2 x M25x1.5	4 x M80x2	11 ... 16	2 x M25x1.5

Connection boxes for 1LL8 motors in standard version

Mains-fed operation

Frame size	Connection box	Number of terminals	Contact screw thread	Max. rec. conductor cross-section	Outer cable diameter (sealing range)	Cable entry ¹⁾	Cable gland option K57 ⁸⁾	Auxiliary lead Outer cable diameter	Cable gland option K57 ⁸⁾	Two-part plate option K06 Admissible outer cable diameter	Cable entry	Auxiliary lead outer cable diameter
Type				mm ²	mm	Size	Size	mm	Size	mm	Size	mm
1LL8 ...												
... 31	1XB1 621 ^{9) 5)}	6	M16	240	56.0 ... 68.5	2 x M80x2 + 2 x M25x1.5	2 x M80x2	11.5 ... 15.5	2 x M25x1.5	40 ... 70	2 x D80 + 2 x M25x1.5	11.5 ... 15.5
... 35	1XB1 631 ⁵⁾	12	M16	240	56.0 ... 68.5	4 x M80x2 + 2 x M25x1.5	4 x M80x2	11.5 ... 15.5	2 x M25x1.5	40 ... 75	4 x D80 + 2 x M25x1.5	11.5 ... 15.5
... 40 ... 45	1XB1 631 ⁷⁾											

Converter-fed operation

Frame size	Connection box	Number of terminals	Contact screw thread	Max. rec. conductor cross-section	Outer cable diameter (sealing range)	Cable entry ¹⁾	Cable gland option K57 ²⁾	Auxiliary lead Outer cable diameter	Cable gland option K57 ²⁾
Type				mm ²	mm	Size	Size	mm	Size
1LL8 ...									
... 31	1XB1 621 ^{9) 5)}	6	M16	240	56.0 ... 68.5	2 x M80x2 + 2 x M25x1.5	2 x M80x2	11 ... 16	2 x M25x1.5
... 35	1XB1 631 ⁵⁾	12	M16	240	56.0 ... 68.5	4 x M80x2 + 2 x M25x1.5	4 x M80x2	11 ... 16	2 x M25x1.5
... 40 ... 45	1XB1 631 ⁷⁾								

¹⁾ Others available on request.

²⁾ Shielded cable (EMC); with option **K57**, the cable glands can be supplied.

³⁾ With option **L00**, the motor can be supplied with the 1XB1 631 connection box (recommended for cable cross-sections ≥ 240 mm²).

⁴⁾ Cable entry without removable plate, cable entry in connection box casing.

⁵⁾ Cable entry with removable plate or supports.

⁶⁾ With option **M58**, the motor can be supplied with the 1XB1 621 connection box (recommended for cable cross-sections > 185 mm²).

⁷⁾ With option **K11** connection box on top the 1XB1 634 connection box will be supplied.

⁸⁾ With option **K57**, the cable glands can be supplied.

⁹⁾ With option **L00**, the motor can be supplied with the 1XB1 631 connection box.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

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Connection boxes for 1MA6 and 1MA7 explosion-proof motors and for 1LA6/7/9 and 1LG4/6 motors in Ex n version or for Zone 2 and Zone 21

Motors	Frame size	Number of cable entries	Connection box material	Feeder connection
1MA7, 1LA7, 1LA9	56 ¹⁾ ... 90	2 holes incl. 1 certified cable gland with sealing washer and 1 certified plug	Aluminum alloy	Without cable lug ²⁾ or with cable lug
	100 ... 160	4 holes incl. 1 certified cable gland with sealing washer and 3 certified plugs		
1MA6, 1LA6	100 ... 160	2 holes incl. 1 certified cable gland with sealing washer and 1 certified plug	Cast iron	
1MA6, 1LA9	180 ... 200	2 holes incl. 1 certified cable gland with sealing washer and 1 certified plug	Aluminum alloy	
	225	2 holes with 2 certified cable glands with sealing washer	Cast iron	
	250 ... 315			
1LG4, 1LG6	180 ... 225	2 holes incl. 1 certified cable gland with sealing washer and 1 certified plug	Aluminum alloy	
	250 ... 315	2 holes with 2 certified cable glands with sealing washer	Cast iron	

Connection boxes for 1LA8 and 1PQ8 explosion-proof motors in Ex n version or for Zone 2 and Zone 22

Motors	Frame size	Number of cable entries	Connection box material	Feeder connection
1LA8, 1PQ8	315, 355 ^{3) 4)} 400, 450	Undrilled cable entry	Cast iron	With cable lug

Connection boxes for 1LA8 and 1PQ8 explosion-proof motors in Ex n version or for Zone 2 and Zone 22

Frame size	Connection box	Number of terminals	Contact screw thread	Recommended max. conductor cross-section	Cable entry ⁵⁾	Two-part plate option K06		
						Max. outer cable diameter	Cable entry	Auxiliary lead outer cable diameter
	Type			mm ²	Size	mm	Size	mm
1LA8 ... 1PQ8 ...								
... 315 ... 317	1XB1 621 6) 7)	6	M16	240	Undrilled cable entry 40 ... 70	2 x D80 + 2 x M25x1.5	2 x D80 + 2 x M25x1.5	11.5 ... 15.5
... 353 ... 355 ... 357-6 ... 357-8	1XB1 621 6) 8)	6	M16	240	Undrilled cable entry 40 ... 70	2 x D80 + 2 x M25x1.5	2 x D80 + 2 x M25x1.5	11.5 ... 15.5
... 357-2 ... 357-4 ... 40 ... 45	1XB1 631 8)	12	M16	240	Undrilled cable entry 40 ... 75	4 x D80 + 2 x M25x1.5	4 x D80 + 2 x M25x1.5	11.5 ... 15.5

Possible positions of connection boxes for 1MA6 and 1MA7 explosion-proof motors and for 1LA6 and 1LA7 motors in Ex n version or for Zone 2 and Zone 21

Motors	Frame size	Connection box position			Retrofitting possible	Rotation of connection box		Retrofitting possible
		Above	Side, right or left			90° ⁹⁾	180° ⁹⁾	
1MA7 and 1LA7 in Zones 2, 21	56 ¹⁰⁾ ... 71	○	–	–	○	○	Yes	
	80 ... 90	○	○	–	○	○	Yes	
	100 ... 160	○	○	○	–	○ ¹¹⁾	Yes	
1MA6 and 1LA6 in Zones 2, 21	100 ... 160	○	○	○	○	○	Yes	
	180 ... 225	○	○	–	○	○	Yes	
	250 ... 315	○	○	–	○	○	Yes	

○ Available version

¹⁾ 1MA7 motor series as well as 1LA7/1LA9 motor series in Zone 2, only frame size 63 and above.

²⁾ The components required for connection without cable lugs are supplied with motors of frame size 225 and above as an accessory pack in the connection box.

³⁾ 15° to the vertical in each case.

⁴⁾ Frame sizes 357-2 and 357-4 as for frame sizes 400 and 450.

⁵⁾ Others available on request.

⁶⁾ With option **L00**, the motor can be supplied with the 1XB1 631 connection box (recommended for cable cross-sections ≥ 240 mm²).

⁷⁾ Cable entry without removable plate, cable entry in connection box casing.

⁸⁾ Cable entry with removable plate or supports.

⁹⁾ The position of the cable entry must be specified when ordering.

¹⁰⁾ 1MA7 motor series as well as 1LA7 motor series in Zone 2, only frame size 63 and above.

¹¹⁾ From frame size 100 upwards.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Standard connection boxes for 1MA6, 1MA7 explosion-proof motors and for 1LA6, 1LA7, 1LA9, 1LG4 and 1LG6 motors in Ex n, VIK version, Zone 2 and Zone 21

Frame size	Connection box Type	Number of terminals	Contact screw thread	Max. connectable cross-section mm ²	Sealing range mm	Cable entry ¹⁾ Size	Two-part plate Max. outer cable diameter mm
1MA7, LA7, 1LA9							
56 ²⁾	gk 130	6	M4	4	9 ... 17	M25 x 1.5	–
63					4.5 ... 10	M16 x 1.5	
71							
80							
90							
100					14 ... 21	M32 x 1.5	–
112							
132	gk 230	6	M4	6	14 ... 21	M32 x 1.5	–
160	gk 330	6	M5	16	19 ... 28	M40 x 1.5	–
180	1XB7 222	6	M6	10	19 ... 28	M40 x 1.5	–
200	1XB7 322	6	M8	50	26 ... 35	M50 x 1.5	–
1MA6, 1LA6							
100	gk 135	6	M4	4	14 ... 21	M32 x 1.5	–
112							
132	gk 235	6	M4	6			
160	gk 335	6	M5	16	19 ... 28	M40 x 1.5	–
180	1XB7 222	6	M6	10	19 ... 28	M40 x 1.5	–
200	1XB7 322	6	M8	50	26 ... 35	M50 x 1.5	–
225							
250	1XB7 422	6	M10	120	34 ... 42	M63 x 1.5	–
280							
315	1XB7 522	6	M12	240	38 ... 45	M63 x 1.5	–
1LG4, 1LG6							
180	gt 351	6	M6	16	19 ... 27	M40 x 1.5	–
200	gt 451	6	M8	50	24 ... 35	M50 x 1.5	–
225							
250	gt 540	6	M10	120	34 ... 42	M63 x 1.5	–
280							
315	gt 640	6	M12	240	38 ... 45	M63 x 1.5	–

With 1MA motors, unused drilled holes must be sealed in accordance with EN 50014.

Connection boxes in Ex de IIC type of protection for explosion-proof motors 1MJ6 and 1MJ7

Motors	Frame size	Number of cable entries	Connection box material	Feeder connection
1MJ6	71 ... 160 M	2 holes incl. 1 certified cable gland with sealing washer and 1 certified plug	Aluminum alloy	Without cable lug ³⁾ or with cable lug
	160 L		Cast iron	
	180 ... 200		Aluminum alloy	
1MJ7	225	2 holes with 2 certified cable glands with sealing washer	Cast iron	
	250 ... 315			

Possible positions of the connection boxes in Ex de type of protection for explosion-proof motors 1MJ6 and 1MJ7

Motors	Frame size	Connection box position			Rotation of connection box		Retrofitting possible
		Above	Side, right or left	Retrofitting possible	90° ⁴⁾	180° ⁴⁾	
1MJ6	71 ... 200	○	○	–	○	○	Yes
1MJ7	225 ... 315	○	○	–	○	○	Yes

○ Available version

¹⁾ Designed for cable glands with O-ring.

²⁾ 1MA7 motor series as well as 1LA7/1LA9 motor series in Zone 2, only frame size 63 and above.

³⁾ The components required for connection without cable lugs are supplied with 1MJ7 motors of frame size 225 M and above as an accessory pack in the connection box.

⁴⁾ The position of the cable entry must be specified when ordering.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

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Standard connection boxes in Ex de type of protection for explosion-proof motors 1MJ6 and 1MJ7

Frame size	Connection box Type	Number of terminals	Contact screw thread	Max. connectable cross-section mm ²	Sealing range mm	Cable entry ¹⁾
						Size
1MJ6, 1MJ7						
71	gk 330	6	M4	4	9 ... 17	2 x M25 x 1.5
80						1 x M16 x 1.5
90	gk 420	6	M4	6	9 ... 17	
100					11 ... 21	2 x M32 x 1.5
112	gk 420	6	M4	6	11 ... 21	1 x M16 x 1.5
132						
160 M	gk 420	6	M4	6	19 ... 28	2 x M40 x 1.5
160 L	gk 465	6	M5	16		1 x M16 x 1.5
180	1XC1 270	6	M6	25	19 ... 28	2 x M40 x 1.5 Version with auxiliary circuit 2 x M40 x 1.5 2 x M16 x 1.5
200	1XC1 380	6	M8	50	26 ... 35	2 x M50 x 1.5
225						Version with auxiliary circuit 2 x M50 x 1.5 2 x M16 x 1.5
250	1XC1 480	6	M10	120	34 ... 42	2 x M63 x 1.5
280						
315	1XC1 580	6	M12	240	38 ... 45	2 x M63 x 1.5

With 1MJ motors, unused drilled holes must be sealed in accordance with EN 50014.

Connection boxes in cast iron version (order code K15) for motors 1LG4, 1LG6 and 1MA6, 1MJ6, 1MJ7 explosion-proof motors

Motors	Frame size	Number of cable entries	Connection box material	Feeder connection
1MJ6	71 ... 160 M 180 ... 200	2 holes incl. 1 certified cable gland with sealing washer and 1 certified plug	Cast iron	Without cable lug ³⁾ or with cable lug
1LG4, 1LG6, 1MA6, 1MJ7	180 ... 225	2 holes incl. 2 certified cable glands with sealing washer and 1 certified plug	Cast iron	

Possible positions of the connection boxes in cast iron version (order code K15) for 1LG4, 1LG6 motors and 1MA6, 1MJ6, 1MJ7 explosion-proof motors

Motors	Frame size	Connection box position			Rotation of connection box		
		Above	Side, right or left	Retrofitting possible	90° ⁴⁾	180° ⁴⁾	Retrofitting possible
1MJ6	71 ... 80	○	–	–	○	○	Yes
	90 ... 160 M	○	○	–	○	○	Yes
	180 ... 200	○	○	–	○	○	Yes
1LG4, 1LG6, 1MA6, 1MJ7	180 ... 225	○	○	–	○	○	Yes

○ Available version

- 1) Designed for cable glands with O-ring.
- 2) Standard version with cable entry glands split lengthwise for 35 to 75 mm and strain relief.
- 3) The components required for connection without cable lugs are supplied with 1MJ7 motors of frame size 225 M and above as an accessory pack in the connection box.
- 4) The position of the cable entry must be specified when ordering.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Connection boxes in cast iron version (order code K15) for motors 1LG4, 1LG6 and 1MA6, 1MJ6, 1MJ7 explosion-proof motors

Frame size	Connection box Type	Number of terminals	Contact screw thread	Max. connectable cross-section mm ²	Sealing range mm	Cable entry ¹⁾ Size
1MJ6						
71	gk 065	6	M4	4	9 ... 17	2 x M25 x 1.5 1 x M16 x 1.5
80						
90				6		
100	gk 065	6	M4	6	11 ... 21	2 x M32 x 1.5 1 x M16 x 1.5
112	gk 265	6	M4	6	11 ... 21	2 x M32 x 1.5 1 x M16 x 1.5
132	gk 465	6	M4	6	11 ... 21	2 x M32 x 1.5 1 x M16 x 1.5
160 M	gk 465	6	M4	6	19 ... 28	2 x M40 x 1.5 1 x M16 x 1.5
160 L ²⁾	gk 465	6	M5	16	19 ... 28	2 x M40 x 1.5 1 x M16 x 1.5
180	1XC1 290	6	M6	25	26 ... 35	2 x M50 x 1.5 Version with auxiliary circuit: 2 x M50 x 1.5 2 x M16 x 1.5
200	1XC1 390	6	M8	50	26 ... 35	2 x M50 x 1.5 Version with auxiliary circuit: 2 x M50 x 1.5 2 x M16 x 1.5
1LG4, 1LG6						
180	gt 320	6	M5	16	19 ... 28	M40 x 1.5
200	gt 420	6	M6	25	24 ... 35	M50 x 1.5
225	gt 421	6	M8	25	24 ... 35	M50 x 1.5
1MA6						
180	1XB7 323	6	M8	50	24 ... 35	M50 x 1.5
200	1XB7 323	6	M8	50	24 ... 35	M50 x 1.5

With 1MJ motors, unused drilled holes must be sealed in accordance with EN 50014.

Explosion-proof connection boxes in Ex d IIC type of protection (order code K53) for explosion-proof motors 1MJ6 and 1MJ7

Motors	Frame size	Number of cable entries	Connection box material	Feeder connection ³⁾
1MJ6	71 ... 200	In standard version: 1 certified plug In versions with PTC thermistors: 2 certified plugs	Cast iron	Without cable lug ⁴⁾ or with cable lug
1MJ7	225	In standard version: 1 certified cable gland and 1 certified plug In versions with auxiliary circuit: 2 certified cable glands	Welded steel	
	250 ... 315			

Possible positions of the explosion-proof connection boxes in Ex d IIC type of protection (order code K53) for explosion-proof motors 1MJ6 and 1MJ7

Motors	Frame size	Connection box position			Rotation of connection box		Retrofitting possible
		Above	Side, right or left	Retrofitting possible	90° ⁵⁾	180° ⁵⁾	
1MJ6	71 ... 80	○	–	–	○	○	Yes
	90 ... 200	○	○	–	○	○	Yes
1MJ7	225 ... 315	○	○	–	○	○	Yes

○ Available version

¹⁾ Designed for cable glands with O-ring.

²⁾ With 1MJ6 frame size 160 L, option **K15** is the standard version. The connection box corresponds to the standard connection box.

³⁾ The number of cables and their outer cable diameter must be specified when ordering – does not apply to 1MJ7 motors.

⁴⁾ The components required for connection without cable lugs are supplied with 1MJ7 motors of frame size 225 M and above as an accessory pack in the connection box.

⁵⁾ The position of the cable entry must be specified when ordering.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Explosion-proof connection boxes in Ex d IIC type of protection (order code K53) for explosion-proof motors 1MJ6 and 1MJ7

Frame size	Connection box Type	Number of terminals	Contact screw thread	Max. connectable cross-section mm ²	Sealing range mm	Cable entry Size
1MJ6, 1MJ7						
71	gk 065d	6	M4	4		Standard: 1 x M25 x 1.5 ¹⁾
80						Version with auxiliary circuit: 1 x M25 x 1.5 1 x M20 x 1.5
90						6
100	gk 065d	6	M4	6		Standard: 1 x M32 x 1.5 ¹⁾
112	gk 265d	6	M4	6		Version with auxiliary circuit: 1 x M32 x 1.5 1 x M20 x 1.5
132	gk 465d	6	M4	6		
160 M	gk 465d	6	M4	6		Standard: 1 x M40 x 1.5 ¹⁾
160 L	gk 465d	6	M5	16		Version with auxiliary circuit: 1 x M40 x 1.5 1 x M20 x 1.5
180	1XC3 22.	6	M6	25		Standard: 1 x M40 x 1.5 ¹⁾
						Version with auxiliary circuit: 1 x M40 x 1.5 1 x M20 x 1.5
200	1XC3 32.	6	M8	50		Standard: 1 x M50 x 1.5 ¹⁾
						Version with auxiliary circuit: 1 x M50 x 1.5 1 x M20 x 1.5
225	1XC3 32.	6	M8	50	M40: 23.5 ... 32 M20: 6.5 ... 12	Standard: 1 x M40 x 1.5 1 x plug M40 x 1.5
						Version with auxiliary circuit: 1 x M40 x 1.5 1 x M20 x 1.5
250	1XC3 42.	6	M10	120	M50: 31.5 ... 44 M20: 6.5 ... 12	Standard: 1 x M50 x 1.5
280						1 x plug M50 x 1.5
						Version with auxiliary circuit: 1 x M50 x 1.5 1 x M20 x 1.5
315	1XC3 52.	6	M12	240	M50: 31.5 ... 44 M20: 6.5 ... 12	Standard: 1 x M50 x 1.5 1 x plug M50 x 1.5
						Version with auxiliary circuit: 1 x M50 x 1.5 1 x M20 x 1.5

With 1MJ motors, unused drilled holes must be sealed in accordance with EN 50014.

Terminal connection

The terminal board accommodates the terminals that are connected to the leads to the motor windings. The terminals are designed so that up to frame size 225, the external (line) connections can be made without the need for cable lugs. With frame size 250 and above, standard connection is with cable lugs.

For the 1LG4/1LG6/1LP4/1PP4 motor series, for frame sizes 250 to 315, stud terminals are available for connection using cable lugs (accessory pack, 3 items).

Order code **M46**

With frame size 250 and above, if connection without cable lugs is required, the appropriate saddle terminals for connection without cable lugs (accessory pack, 6 items) must be ordered for motor series 1LG4/1LG6/1LP4/1PP4 frame sizes 250 to 315. In the connection box of 1MJ7 Ex motors, frame sizes 250 M to 315 L, 6 low saddle terminals are enclosed as standard for connection without cable lugs. When connecting cables with a large cross-section (not stranded), they can be connected optionally in two tiers. For this purpose, high saddle terminals can be supplied in the future as an accompanying pack (3 items).

Order code **M47**

For Exe and Exde motors, connection is generally without cable lugs.

The terminal board is permanently mounted on the housing for all motors so that if the connection box is rotated, rotation of the connections for the motor windings is prevented.

Exception:

With connection boxes 1XB1 621 and 1XB1 631, the terminal support is mounted on the lower section of the connection box.

For motor series 1LA7/1LP7/1PP7 frame sizes 63 to 90, a terminal strip can be supplied for the main and auxiliary terminals.

Order code **M69**

¹⁾ Designed for explosion-proof cable glands. The drilled holes for cable entry are closed with plugs certified for explosion-proof applications.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Number of auxiliary terminals for 1LA, 1LG, 1LL, 1LP, 1PP and 1PQ motors – Standard version

Motor series 1LA5, 1LA6, 1LA7, 1LP5, 1LP7, 1PP5, 1PP7 have no auxiliary terminals in the standard version.

The maximum number of auxiliary terminals in the main connection box of the motor is specified. An auxiliary connection box is required when the total number of auxiliary terminals exceeds the specified values. The connections can be routed through a separate auxiliary connection box.

For motor series

- 1LA8, 1PQ8 and 1LL8 frame sizes 315 to 450
- 1MA6 frame sizes 225 to 315
- 1MJ7 frame sizes 225 to 315

the 1XB3 020 connection box is available.

Order code **L97**

For non-standard motors (1LA8, 1PQ8 and 1LL8 motor series), the following can be supplied:

1XB9 016 auxiliary connection box – Order code **M50**

1XB9 014 auxiliary connection box (aluminum) – Order code **M88**

Type series	Frame size	Main connection box	Maximum No. of auxiliary terminals
1LG4, 1LG6, 1LP4, 1PP4, 1PP6	180	gk 330	4
	200	gk 430	10
	225	gk 431	10
	250	gt 520	12
	280		
	315	gt 620	18
1MA6	225	1XB7 322	8
	250	1XB7 422	12
	280		
	315	1XB7 522	14
1MJ7	225	1XC1 380	4
	250	1XC1 480	
	280		
	315	1XC1 580	6
1LA8, 1PQ8, 1LL8	315	gt 640	6
	355	1XB1 621	12
	400	1XB1 631	24
	450		













IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data


Types of construction

Standard types of construction and special types of construction

Type of construction acc. to DIN EN 60034-7		Frame size	Code 12th position	Order code
Without flange				
IM B3		56 M to 450	0 ⁴⁾	–
IM B6/IM 1051, IM B7/IM 1061, IM B8/IM 1071	  	56 M to 315 L	0	–
IM V5/IM1011 without protective cover		56 M to 315 M 315 L	0 ⁵⁾ 9 ¹⁾⁵⁾	– M1D
IM V6/IM 1031		56 M to 315 M 315 L	0 9 ¹⁾	– M1E
IM V5/IM 1011 with protective cover		63 M to 315 L	9 ¹⁾⁷⁾	M1F
With flange				
IM B5/IM 3001		56 M to 315 M	1 ²⁾	–
IM V1/IM 3011 without protective cover		56 M to 315 M 315 L to 450	1 ²⁾³⁾⁵⁾ 8 ¹⁾⁴⁾⁵⁾	– –
IM V1/IM 3011 with protective cover		63 M to 450	4 ¹⁾²⁾³⁾⁷⁾	–
IM V3/IM 3031		56 M to 160 L 180 M to 315 M	1 9 ²⁾³⁾	– M1G
IM B35/IM 2001 ⁶⁾		56 M to 450	6 ⁴⁾	–

In the DIN EN 50347 standard, flange FF with through holes and flange FT with tapped holes are specified.

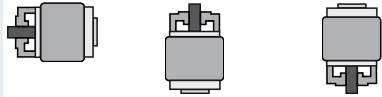


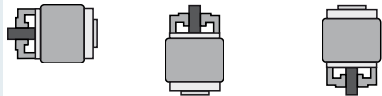


- 1) For 2-pole 1LG4 and 1LG6 motors, of frame size 315 L, a 60 Hz version is possible on request.
- 2) 1LG4/1LG6, 1MA6 and 1MJ7 motors in frame sizes 225 S to 315 L are supplied with two screw-in eyebolts (four eyebolts for 1LG6 318) in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- 3) For frame sizes 180 M to 225 M, the 1LA5 motors can be supplied with two additional eyebolts; state Order No. suffix "Z" and order code **K32**.
- 4) Frame size 450, 2-pole, 60 Hz is not possible.

- 5)  For explosion-proof motors: For types of construction with shaft extension pointing downwards, the version "with protective cover" is mandatory. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- 6) In the case of 1LA8, the corresponding flange diameter is greater than twice the shaft height.
- 7) A second **K16** shaft extension is not possible.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Type of construction acc. to DIN EN 60034-7	Frame size	Code 12th position	Order code
With standard flange			
IM B14/IM 3601, IM V19/IM 3631, IM V18/IM 3611 without protective cover	 56 M to 160 L	2 ^{2) 4)}	–
IM V 18/IM 3611 with protective cover	 63 M to 160 L	9 ^{1) 2)}	M2A
IM B34/IM 2101	 56 M to 160 L	7 ^{2) 4)}	–
With special flange			
IM B14/IM 3601, IM V19/IM 3631, IM V18/IM 3611 without protective cover	 56 M to 160 L	3 ^{3) 4)}	–
IM V18/IM 3611 with protective cover	 63 M to 160 L	9 ^{1) 3)}	M2B
IM B34/IM 2101	 56 M to 160 L	9 ³⁾	M2C

In DIN EN 50347, standard flanges are assigned to the frame sizes as FT with tapped holes. The special flange was assigned as a large flange in the previous DIN 42677.

The dimensions of the following types of construction are identical:

IM B3, IM B6, IM B7, IM B8, IM V5 and IM V6
IM B5, IM V1 and IM V3
IM B14, IM V18 and IM V19

Motors in the standard output range can be ordered in basic types of construction IM B3, IM B5 or IM B14 and operated in mounting positions IM B6, IM B7, IM B8, IM V5, IM V6, IM V1, IM V3 (up to frame size 160 L) or IM V18 and IM V19. Eyebolts are available for transport and installation in a horizontal position. In conjunction with the eyebolts, for the purpose of stabilizing the position when the motor is arranged vertically, additional lifting straps (DIN EN 1492-1) and/or clamping bands (DIN EN 12195-2) must be used. If mounting position IM V1 is ordered, eyebolts are supplied for vertical mounting.

- For this reason, they are normally designated only with the basic type of construction on the rating plate.
- If motors of frame size 180 M in a type of construction with feet are mounted on the wall, it is recommended that the motor feet are supported.

With motors that have a vertical shaft extension, the end user must prevent an ingress of fluid along the shaft.

In the case of all types of construction with shaft extension down, the version "with protective cover" is urgently recommended, see the section "Degrees of protection".

Motor series 1LA8, 1PQ8 and 1LL8 are available in types of construction IM B3, IM V1 with and without cover, as well as IM B35.


Frame design

Motors in the types of construction with feet have, in some case, two fixing holes at the non-drive end (NDE), see dimension tables. A code is cast into the motor close to the retaining holes to identify the frame size.

¹⁾ A second **K16** shaft extension is not possible.

²⁾ For 1MJ6 motors, only possible up to frame size 90.

³⁾ For 1MJ6 motors, only possible up to frame size 80.

⁴⁾  For explosion-proof motors:
For types of construction with shaft extension pointing downwards, the version "with protective cover" is mandatory. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Mechanical design and degrees of protection

Preparation for gear mounting

The flange-mounting motors can be equipped with a radial seal in order to mount gearing.
Order code **K17**.

It must be ensured that the sealing ring is lubricated using grease, oil mist or oil spray (it is not permissible to use pressurized oil > 0.1 bar).

We recommend that the admissible bearing loads are carefully checked.

Please inquire about gear mounting for 1LA8 non-standard motors.

Eyebolts and transport

1LA7, 1MA7 and 1LA5 motors of frame size 100 L and above have two horizontal eyebolts in the horizontal type of construction. For motors in vertical type of construction, two rotatable eyebolts are also supplied.

1LA6 and 1MA6 motors are supplied in a horizontal type of construction with feet complete with one eyebolt.

Horizontal types of construction for flange-mounting in frame sizes 100 to 160 are supplied with one eyebolt. With vertical types of construction, a rotatable eyebolt is also supplied. All flange-mounting types of construction in frame sizes 180 M to 315 L are supplied with two diagonal eyebolts. They can be relocated for vertical types of construction.

1LG4 and 1LG6 motors are supplied in a horizontal type of construction with two diagonal eyebolts. For vertical types of construction, the eyebolts can be rotated.

All the available eyebolts specifically provided for the type of construction must be used during transport.

1MA6, 1MJ6 and 1MJ7 motors of frame size 180 M and above have one eyebolt in type of construction IM B3 in the standard version and two eyebolts in type of construction IM B5. If type of construction IM V1 is used, one of the eyebolts must be rotated whereby it is important to note that forces perpendicular to the ring plane are not permitted.

1LA8, 1PQ8 and 1LL8 motors have two diagonally fixed eyebolts. The IM V1 types of construction have hinged eyebolts.

1MJ6 motors, frame sizes 90 L to 132 M have two eyebolts, frame sizes 160 M and 160 L have one eyebolt.

For frame sizes 180 M to 225 M, 1LA5 motors can be supplied with two additional eyebolts for types of construction IM V1/IM V3.

Order code **K32**

Frame material			
Type series	Frame size	Frame material	Frame feet
1LA5, 1LA7, 1LA9	56 to 100 ¹⁾ 112 to 225	Aluminum alloy Aluminum alloy	Cast Screwed on
1MA7	63 to 100 ¹⁾ 112 to 160	Aluminum alloy Aluminum alloy	Cast Screwed on
1LG4, 1LG6	180 M to 315 L	Cast iron	Cast ²⁾
1LA6, 1MA6	100 to 200 225 to 315 M 315 L	Cast iron Cast iron Cast iron	Screwed on Cast Screwed on
1MJ6	71 and 80 90 to 200	Cast iron Cast iron	Cast Screwed on
1MJ7	225 to 315	Cast iron	Screwed on
1LA8, 1PQ8, 1LL8	315 to 450	Cast iron	Cast

¹⁾ Frame sizes 80, 90 and 100 in the version "Connection box on LHS/RHS" order code **K09/K10** have feet that are screwed on.

²⁾ Basic version, cast feet: Special version "screwed on feet" for order codes **K09, K10** and **K11**.

Degrees of protection

All motors are designed to IP55 degree of protection. They can be installed in dusty or humid environments. The motors are suitable for operation in tropical climates. Guide value <60 % relative air humidity at CT 40 °C. Other requirements are available on request.

1LL8 motors are available to IP23 degree of protection and are of a similar construction to 1LA8 motors. IP23 degree of protection is achieved by opening the internal cooling circuit and supplying it with external cooling air. Motors of the 1LL8 type series are only intended for installation indoors. They must not be subjected to humid, salty or corrosive atmospheres.

Most motors can be supplied in IP56 and IP65 degrees of protection on request.

Brief explanation of the degrees of protection

IP55: Protection against harmful dust deposits, protection against water jets from any direction.

IP56 (non-heavy-sea):

Protection against harmful dust deposits, protection against water jets from any direction.

Order code **K52**

DIN EN 60034-5 defines protection level 6 for water protection as: "Protection against water due to heavy seas or water in a powerful jet". IP56 non-heavy-sea degree of protection can only be used with the requirement "Protection against a powerful jet" and not for the requirement "Protection against heavy sea".

This is not possible in combination with brake 2LM8 (used for motors up to and including frame size 225, order code G26) and/or in combination with order code (K23) without paint finish, cast iron primed.

IP65: Complete protection against dust deposits, protection against water jets from any direction.

Order code **K50**

In DIN EN 60034-5, the code 6 for protection against the ingress of foreign bodies and touch hazard protection for electrical machines is not listed – Data for code 6 (protection against the ingress of dust) is given in EN 60529.

Not possible in combination with rotary pulse encoder HOG 9 D 1024I (order code H72, H79) and / or brake 2LM8 (used for motors up to and including frame size 225, order code G26) and/or in combination with order code (K23) without paint finish, cast iron primed.

DIN EN 60529 contains a comprehensive description of this degree of protection as well as test conditions.

With motors that have a vertical shaft extension, the end user must prevent an ingress of fluid along the shaft.

For motors with shaft extension pointing downwards, the version "with protective cover" is urgently recommended, see "Types of construction".

With flange-mounting motors, for IM V3 type of construction, collection of fluid in the flange basin can be prevented by drainage holes (on request).

Drainage holes are usually available in 1MA6 and 1MA7 motors of frame size 225 and above and in all 1LG4 and 1LG6 motors.

1LG4, 1LG6, 1LA8, 1LL8, 1PQ8 motors and 1MA6 motors of frame size 225 and above have condensation drainage holes that are sealed with plugs.

Motors for Zones 2 and 21 (1MA6 of frame size 225 and above and 1LG4 and 1LG6) have condensation drainage holes that are sealed with screws.

Condensation drainage holes can also be implemented in motors designed for Zones 2, 21 and 22.

The condensation drainage holes at the drive end (DE) and non-drive end (NDE) are sealed (IP55) on delivery. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.

Order code **L12**

When the motors are used or are stored outdoors (not 1LL8) we recommend that they are kept under some sort of cover so that they are not subject to direct intensive solar radiation, rain, snow, ice or dust over a long period of time. In such cases, technical consultation may be appropriate.

When the motors are used outdoors or in a corrosive environment, it is recommended that non-rusting screws are used externally.

Order code **M27**

Vibration-proof version

A load of 1.5g in all 3 planes for up to 1 % of the service life of the motor is possible.

Order code **L03**

For availability of individual options for the relevant motor series, see Section "Special versions" in the individual catalog parts.

Noise levels for mains-fed operation

The noise levels are measured in accordance with DIN EN ISO 1680 in a dead room. It is specified as the A-weighted measuring-surface sound pressure level L_{pA} in dB (A).

This is the spatial mean value of the sound pressure levels measured on the measuring surface. The measuring surface is a cube 1 m away from the surface of the motor. The sound power level is also specified as L_{WA} in dB (A).

The specified values are valid at 50 Hz at rated output (see the selection and ordering data in the appropriate catalog parts). The tolerance is +3 dB. At 60 Hz, the values are approximately 4 dB (A) higher. Please inquire about the noise levels for pole-changing motors, motors with increased output or converter-fed motors.

To reduce noise levels, 2-pole motors with frame size 132 S and above and 1LA8 and 1LL8 2-pole motors of frame size 315 can be fitted with an axial-flow fan that is only suitable for one direction of rotation. The values can be taken from the table "Low-noise version" below and for 1LA8 or 1LL8 2-pole motors from the selection and ordering data in catalog part 3 "Non-standard motors of frame size 315 and above".

Clockwise rotation

Order code **K37**

Counter-clockwise rotation

Order code **K38**

The motors up to frame size 315 L are up to 80 mm longer than normal.

A second shaft extension and/or mounting of an encoder are not possible (see "Special versions" in the relevant catalog parts).

Low-noise version			
Type series	Frame size	2-pole motors	
		L_{pA} dB (A)	L_{WA} dB (A)
1LA5, 1LA6, 1LA7, 1MA7, 1MA6, 1MJ6, 1MJ7	132	64	76
	160	64	76
	180	63	76
	200	63	76
	225	68	80
	250	70	82
	280	72	84
	315	74	86
1LG4, 1LG6 ¹⁾	180	65	78
	200	70	83
	225	68	81
	250	70	83
	280	72	85
	315	74	87

¹⁾ Not necessary for 1LG6 motors because these motors are already noise optimized.

Earth brushes are available for converter-fed operation for 1LG4 and 1LG6 motors.

Order code **M44**

Only available on request.

The rotary pulse encoders of "modular technology" and "special technology" are fitted as standard with a protective cover made of plastic, with the exception of 1LG motors. A protective cover made of non-corrosive sheet steel is available for 1LA5, 1LA6 and 1LA7 motors, see "Mechanical protection for encoders".

Order code **M68**

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Balance and vibration quantity

All of the rotors are dynamically balanced with half key. This corresponds to vibration quantity level A (normal). The vibrational characteristics and behaviour of electrical machinery is specified in DIN EN 60034-14. Feather key agreement for balancing "half-key" (H) is specified here based on DIN ISO 8821.

The feather key agreement type for balancing is stamped on the face of the customer-specific drive-end (DE) / non-drive end (NDE) shaft extension.

F = Balancing with full key
(Agreement full-key)

H = Balancing with half key
(Agreement half-key)

N = Balancing without key – Plain text required
(without feather key agreement)

Motors up to frame size 112 have the type of balancing marked exclusively on the rating plate.

Full key balancing or balancing with full key can be supplied if order code **L68** is specified (additional charge).

Vibration quantity level	Machine installation	Limits (rms values) for max. vibration quantity of vibration distance (s), vibration speed (v) and acceleration (a) for the shaft height H								
		Shaft height H in mm 56 ≤ H ≤ 132			132 < H ≤ 280			H > 280		
		s_{rms} μm	v_{rms} mm/s	a_{rms} mm/s ²	s_{rms} μm	v_{rms} mm/s	a_{rms} mm/s ²	s_{rms} μm	v_{rms} mm/s	a_{rms} mm/s ²
A	Free suspension	25	1.6	2.5	35	2.2	3.5	45	2.8	4.4
	Rigid clamping	21	1.3	2.0	29	1.8	2.8	37	2.3	3.6
B	Free suspension	11	0.7	1.1	18	1.1	1.7	29	1.8	2.8
	Rigid clamping	–	–	–	14	0.9	1.4	24	1.5	2.4

For details, see standard DIN EN 60034-14 Sept. 2004.

Shaft and rotor

Shaft extension

60° center hole to DIN 332, Part 2 with M3 to M24 tapped hole depending on the shaft diameter (see dimension tables in the corresponding catalog parts)

Second standard shaft extension.

Order code **K16**.

Not possible for the motor version with protective cover.

The second shaft extension can transmit the full rated output via a coupling output up to frame size 315 M (please inquire about reduced transmitted power for frame sizes of 315 L and above). For motor series 1LA8 and 1LL8, the second shaft extension can transmit 50 % of the rated output with a coupling output. (Please contact your local Siemens office if higher values are required.) The full rated output is not applicable for 1LA motors, frame sizes 90 S to 112 M. These motors can only transmit the rated output of the next smaller size.

Please also inquire about the transmitted power and admissible cantilever force if belt pulleys, chains or gear pinions are used on the second shaft extension.

A second shaft extension is not available if a rotary pulse encoder and/or separately driven fan is mounted (also applicable to motor series 1PQ8). Please inquire if a brake is mounted. For motor series 1LA8 and 1LL8, the second standard shaft extension is only available on request for 2-pole motors – please specify the weight of the coupling and type of lever arm.

Balancing without key (N) is possible with order code **M37** on request (additional charge).

The vibration quantity level A is the standard version and is valid for a rated frequency up to 60 Hz.

For special requirements concerning smooth running, a low-vibration version B can be supplied (additional charge).

Vibration quantity level B.

Not possible with parallel roller bearings.

Order code **K02**

The limits stated in the table below are applicable to freely suspended motors running uncoupled and at no load as well as to rigidly installed 1LA8 motors, frame size 450.

For converter-fed operation with frequencies greater than 60 Hz, special balancing is required for compliance with the specified limit values (plain text: Max. supply frequency speed).

For further details, see the online help in SD configurator.

The non-drive end (NDE) of frame sizes 100 L to 225 M has an M8 center hole, DR form, for mounting the 1XP8 001 rotary pulse encoder or for fitting and extraction tools.

The non-drive end (NDE) of the 1LG4 and 1LG6 motors of frame sizes 180 M to 315 L, has an M16 center hole, DS form.

Shaft extension (DE)

Diameter mm	Thread mm
7 ... 10	DR M3
>10 ... 13	DR M4
>13 ... 16	DR M5
>16 ... 21	DR M6
>21 ... 24	DR M8
>24 ... 30	DR M10
>30 ... 38	DR M12
>38 ... 50	DS M16
>50 ... 85	DS M20
>85 ... 130	DS M24

Dimensions and tolerances for keyways and keys are designed to DIN EN 50347. The motors are always supplied with a key inserted in the shaft.

Shaft extension with standard dimensions, without featherkey way

For motor series 1LA5, 1LA6, 1LA7, 1LA8, 1LA9, 1LG4, 1LG6, 1LL8, 1LP4, 1LP5, 1LP7, 1MA6, 1MA7, 1PP4, 1PP5, 1PP7 and 1PQ8, the standard shaft extension can be ordered with standard dimensions without a featherkey way.

Order code **K42**

Standard shaft made of non-rusting steel

For motor series 1LA5, 1LA6, 1LA7, 1LP5, 1LP7, 1PP5 and 1PP7, a standard shaft made of non-rusting steel (material X20Cr13V) can be ordered. This is only possible for shaft extensions of standard dimensions. For non-standard shaft dimensions, there will be an additional charge!

Order code **M65**

Please inquire about other rust-resistant materials.

Please inquire regarding motor series 1LG4 and 1LG6.

Non-standard cylindrical shaft extension

The non-standard cylindrical shaft extension can be used on the drive end (DE) or non-drive end (NDE). The featherkey is always supplied with it.

Order code **Y55**

When motors are ordered which have a longer or shorter shaft extension as standard, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The location of the featherkey way is in the

center of the shaft extension and, in the case of non-standard motors, 5 mm from the shaft extension. The length is defined by the manufacturer normatively.

Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals, etc.), hollow shafts.

For 1MJ motors with longer shaft extensions than standard, the admissible cantilever force must be reduced accordingly. This will ensure that the shaft does not sag more than with the standard shaft extension (please inquire).

For order code **Y55** and second standard shaft extension **K16** (see previous page):

- Dimensions D and DA must be less than or equal to the inner diameter of the roller bearing (see dimension tables under "Dimensions" in the relevant catalog parts)
- Dimensions E and EA must be smaller than or equal to 2 x length E (standard) of the shaft extension

A non-standard cylindrical shaft extension can be supplied for the motor series listed in the table "Admissible changes to shaft extension" below up to the specified maximum lengths and diameters as compared to the standard shaft.

It is the responsibility of the customer to ensure that the admissible cantilever forces are reduced in accordance with the non-standard shaft extension.

Admissible changes to the shaft extension:

Motor series	Frame size	Number of poles	Shaft extension length E in mm		Shaft extension diameter D in mm	
			Standard	Up to max.	Standard	Up to max. ¹⁾
1LA6, 1LA7, 1LA9, 1MA6, 1LP7, 1PP7	56	2 ... 8	20	40	9	12
	63		23	46	11	
	71		30	60	14	15
	80		40	80	19	20
	90		50	100	24	25
	100		60	120	28	30
	112					
	132		80	160	38	40
	160		110	220	42	45
1LA5, 1LA9, 1LG4, 1LG6, 1MA6, 1LP4, 1LP5, 1PP4, 1PP5	180	2 ... 8			48	48
	200				55	55
	225	2				60
	250	4 ... 8	140	280	60	
		2				70
	280	4 ... 8			65	
		2				75
	315	4 ... 8			75	80
		2			65	
1LA8, 1PQ8	315 ²⁾	4 ... 8	170	340	80	90
		2	140	280	65	70
	355 ²⁾	4 ... 8	170	340	85	85
		2	140	280	75	80
	400	4 ... 8	170	340	95	95
		2			80	80
	450	4 ... 8	210	420	110	115
		2	170	340	90	90
		4 ... 8	210	420	120	125

Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors

The following are specified in DIN 42955 with Tolerance N (normal) and Tolerance R (reduced):

1. Concentricity tolerances for the shaft extension
2. Coaxiality tolerances for the shaft extension and flange centering
3. Linear movement tolerances for the shaft extension and flange surface

The concentricity of the shaft extension, coaxiality and linear movement according to DIN 42955 Tolerance R for flange-mounting motors can be ordered using order code **K04**.

This order code can be combined for motors with deep-groove bearings of series 60.., 62.. and 63... This cannot be supplied in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code K20), brake or encoder mounting.

Concentricity of the shaft extension can be ordered according to DIN 42955 Tolerance R for types of construction without a flange with order code **L39**.

¹⁾ At admissible diameter, a step increase in shaft diameter is not possible.

²⁾ For bearing design for increased cantilever forces order code **K20** a shaft diameter of 95 mm for frame size 315 and a shaft diameter of 100 mm for frame size 355 is possible for 4, 6 and 8-pole motors. See dimension drawings Page 3/65 and 3/67.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Bearings and lubrication

Bearing lifetime (nominal lifetime)

The nominal bearing lifetime is defined acc. to standardized calculation procedures (DIN ISO 281) and is reached or even exceeded for 90 % of the bearings when the motors are operated in the compliance with the data provided in the catalog.

Under average operating conditions, a lifetime (L_{h10}) of 100,000 hours can be achieved.

Generally, the bearing lifetime is defined by the bearing size, the bearing load, the operating conditions, the speed and the grease lifetime.

Bearing system

The bearing lifetime of motors with horizontal type of construction is at least 40,000 hours if there is no additional axial loading at the coupling output and at least 20,000 hours with the admissible permitted loads.

This assumes that the motor is operated at 50 Hz. The nominal bearing lifetime is reduced for converter-fed operation at higher frequencies.

For the admissible vibration values measured at the bearing plate, evaluation zones A and B specified in ISO 10816 are applicable in order to achieve the calculated lifetime under continuous duty. If higher vibration speeds will occur under the operating conditions, special arrangements will be necessary (please inquire).

For standard motors applies the following:

In the basic bearing system, the floating bearing is situated at the drive end (DE) and the located bearing (axially located from frame size 160 and above) is situated at the non-drive end (NDE). On request, the located bearing can also be supplied at the drive end (DE) (Fig. 3, Page 0/64).

For ordering standard motors quote order code **K94**.

For 1LA8, 1PQ8 and 1LL8 non-standard motors applies the following:

In the basic bearing system, the floating bearing is situated at the non-drive end (NDE) and the located bearing is situated at the drive end (DE).

On request, the located bearing can also be supplied at the non-drive end (NDE).

Price on request.

The bearing system is axially preloaded with a spring element to ensure smooth running of the motor without play.

This is not the case in versions with parallel roller bearings. The bearings of these motors must always run under adequate radial force (motors must not be operated on a testbed without additional radial loads).

Motors of series 1LA6, 1LA7, 1LA9 and 1MA7 up to and including frame size 132 have a "floating" bearing arrangement (see Fig. 1, Page 0/64).

Up to frame size 132, an additional axially-secured located bearing can be supplied on the non-drive end (NDE) complete with a retaining ring (see Figure 2, Page 0/64).

Order code **L04**

For frame size 160 and above, bearings are usually axially located (see Figures 2, 4 and 5, Page 0/64).

For increased cantilever forces (e.g. belt drives), reinforced bearings can be used at the drive end (DE).

Order code **K20**

Motors 1LG4/6 in frame sizes 180 to 315, 2-pole, can be supplied with reinforced deep-groove bearings at both ends (size range 03).

Special bearings for DE and NDE, bearing size 63

Order code **K36**

A measuring nipple for SPM shock pulse measurement is mounted to check bearing vibration. The motors have 1 or 2 tapped holes per bearing plate and a measuring nipple with a protective cap. If a second tapped holes is provided, it is fitted with a sealing cap.

Order code **G50**

Bearing arrangement for increased cantilever forces on Pages 0/62 and 0/63 – admissible loading on Pages 0/67 and 0/68.

Insulated bearings

To prevent damage as a result of bearing currents, insulated bearings can be supplied at the non-drive end NDE from frame size 225 to 315 and are recommended for frame size 225 and above. This bearing design is also possible for 1MJ7 motors from frame size 250 to 315. In a version in combination with mounting of brake (order code G26), the insulated motor bearings are mounted on the drive end (DE).

Order code **L27**

The insulated bearing is standard for all 1LA8, 1PQ8 and 1LL8 motors which are identified for converter-fed operation.

Permanent lubrication

For permanent lubrication, the bearing grease lifetime is matched to the bearing lifetime. This can, however, only be achieved if the motor is operated in accordance with the catalog specifications.

In the basic version, the motors up to and including shaft height 250 have permanent lubrication.

Regreasing

For motors which can be re-greased at defined re-greasing intervals, the bearing lifetime can be extended and/or unfavourable factors such as temperature, mounting conditions, speed, bearing size and mechanical load can be compensated.

From a shaft height of 280 upwards, regreasing with an M10 x 1 flat greasing nipple to DIN 3404 is provided.

It is possible to regrease motors, shaft heights 100 to 250. A lubricating nipple is optionally provided.

Order code **K40**

In the case of motors equipped with regreasing devices, information regarding greasing intervals, quantity and type of grease and any additional data is provided on the lubrication or rating plate. (Re-greasing intervals for basic version on Page 0/59). The regreasing device cannot be mounted in combination with mounting of the brake, order Code G26.

Mechanical stress and grease lifetime

High speeds that exceed the rated speed with converter-fed operation and the resulting increased vibrations alter the mechanical running smoothness and the bearings are subjected to increased mechanical stress. This reduces the grease lifetime and the bearing lifetime (please inquire where applicable).

For converter-fed operation in particular, compliance with the mechanical limit speeds n_{adm} at admissible supply frequency f_{max} is essential, see catalog part 5 "Motors operating with frequency converters".

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Grease lifetime and regreasing intervals for horizontal installation

Permanent lubrication ¹⁾				
Type series	Frame size	Type	Number of poles	Grease lifetime up to CT 40 °C ²⁾
All	56 to 250		2 to 8	20000 h or 40000 h ³⁾
Regreasing (basic version) ¹⁾				
Type series	Frame size	Type	Number of poles	Regreasing interval up to CT 40 °C ²⁾
1LA6, 1PP6	100 to 160	... 10 . to ... 16 .	2 to 8	8000 h
1LA5, 1LP5, 1PP5 1LA7, 1LP7, 1PP7 1LA9	100 to 225	... 10 . to ... 22 .	2 to 8	8000 h
1LA8.. 1PQ8..	315 to 400	... 31 . to ... 40 .	2	4000 h
		... 31 . to ... 40 .	4 to 8	6000 h
	450	... 45 .	2	3000 h
		... 45 .	4 to 8	6000 h
1LL8..	315	... 31 .	2	4000 h
		... 31 .	4 to 8	8000 h / 4000 h ⁴⁾
	355 to 450	... 35 . to ... 45 .	2	4000 h
		... 35 . to ... 45 .	4 to 8	6000 h / 3000 h ⁴⁾
1LG4, 1LP4, 1PP4 1LG6, 1PP6	180 to 280	... 18 . to ... 28 .	2	4000 h
		... 18 . to ... 28 .	4 to 8	8000 h
	315	... 31	2	3000 h
		... 31	4 to 8	6000 h
1MA6	100 to 200	... 10 . to ... 20 .	2 to 8	8000 h
	225 to 280	... 22 . to ... 28 .	2	4000 h
		... 22 . to ... 28 .	4 to 8	8000 h
	315	... 315	2	3000 h
		... 315	4 to 8	6000 h
1MA7	100 to 160	... 10 . to ... 16 .	2 to 8	8000 h
1MJ6, 1MJ7	180 to 200	... 18 . to ... 20 .	2 to 8	8000 h
		... 18 . to ... 20 .	2	4000 h
	225 to 280	... 22 . to ... 28 .	4 to 8	8000 h
		... 22 . to ... 28 .	2	4000 h
	315	... 315	2	4000 h
		... 315	4 to 8	8000 h

¹⁾ For special uses and special greases, please inquire about grease lifetime and regreasing intervals.

²⁾ If the coolant temperature is increased by 10 K, the grease lifetime and regreasing interval are halved.

³⁾ 40 000 h applies for horizontally installed motors with coupling output without additional axial loads.

⁴⁾ Regreasing interval for IM V1 type of construction.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Bearing selection table for 1LA5, 1LA6, 1LA7, 1LA9, 1LG, 1LP, 1MA and 1PP motors – basic version

The bearing selection tables are only intended for planning purposes. Authoritative information on the actual type of bearings fitted in motors already supplied can be obtained by the factory by quoting the serial number or can be read from the lubricating plate on 1LA8 motors.

When deep-groove ball bearings with sideplates are used, the side plate is on the inside. For located bearings on drive end DE for 1LA5, 1LA7, 1LA9, 1MA6 and 1MA7 motors, see special version in Figure 3 (Page 0/64).

For motors frame size	Type	Number of poles	Drive end (DE) bearing		Non-drive end NDE bearing		Figures on Pages 0/64 and 0/65	
			Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction		
1LA5 . . . , 1LA6 . . . , 1LA7 . . . , 1LA9 . . . , 1LP5 . . . , 1LP7 . . . , 1MA6 . . . , 1MA7 . . . , 1PP5 . . . , 1PP7 . . .								
56 M 05 .	2 to 8	6201 ZC3	6201 ZC3	6201 ZC3	6201 ZC3	Fig. 1	
63 M	.... 06 .	2 to 8	6201 ZC3	6201 ZC3	6201 ZC3	6201 ZC3	
71 M	.... 07 .	2 to 8	6202 ZC3	6202 ZC3	6202 ZC3	6202 ZC3	
80 M	.... 08 .	2 to 8	6004 ZC3	6004 ZC3	6004 ZC3	6004 ZC3	
90 S/L	.... 09 .	2 to 8	6205 ZC3	6205 ZC3	6004 ZC3	6004 ZC3	
100 L	.... 10 .	2 to 8	6206 ZC3 ¹⁾	6206 ZC3 ¹⁾	6205 ZC3 ¹⁾	6205 ZC3 ¹⁾	
112 M	.... 11 .	2 to 8	6206 ZC3 ¹⁾	6206 ZC3 ¹⁾	6205 ZC3 ¹⁾	6205 ZC3 ¹⁾	
132 S/M	.... 13 .	2 to 8	6208 ZC3 ¹⁾	6208 ZC3 ¹⁾	6208 ZC3 ¹⁾	6208 ZC3 ¹⁾	
160 M/L 16 .	2 to 8	6209 ZC3 ¹⁾	6209 ZC3 ¹⁾	6209 ZC3 ¹⁾	6209 ZC3 ¹⁾		Fig. 2
180 M/L 18 .	2 to 8	6210 ZC3 ²⁾	6210 ZC3 ²⁾	6210 ZC3 ²⁾	6210 ZC3 ²⁾		Fig. 4
200 L 20 .	2 to 8	6212 ZC3 ²⁾	6212 ZC3 ²⁾	6212 ZC3 ²⁾	6212 ZC3 ²⁾	Fig. 4	
225 S/M	.... 22 .	2 to 8	6213 ZC3 ²⁾	6213 ZC3 ²⁾	6212 ZC3 ²⁾⁵⁾	6212 ZC3 ²⁾⁵⁾	
250 M	.... 25 .	2 to 8	6215 ZC3 ²⁾	6215 ZC3 ²⁾	6215 ZC3 ²⁾	6215 ZC3 ²⁾	
280 S/M 28 .	2 4 to 8	6216 C3 6317 C3	6216 C3 6317 C3	6216 C3 6317 C3	6216 C3 6317 C3		Fig. 5
315 S/M	.... 310 313	2 4 to 8	6217 C3 6319 C3	6217 C3 6319 C3	6217 C3 6319 C3	6217 C3 6319 C3	
315 L	.... 316 317 318	2 4 to 8	6217 C3 6319 C3	6217 C3 6319 C3	6217 C3 6319 C3	7217 BEP 6319 C3	
1LG4 . . . , 1LG6 . . . , 1LP4 . . . , 1PP4 . . . , 1PP6 . . .								
180 M/L 18 .	2 to 8	6210 ZC3 ⁴⁾	6210 ZC3 ⁴⁾	6210 ZC3 ⁴⁾	6210 ZC3 ⁴⁾	Fig. 4	
200 L	.... 20 .	2 to 8	6212 ZC3 ⁴⁾	6212 ZC3 ⁴⁾	6212 ZC3 ⁴⁾	6212 ZC3 ⁴⁾	
225 S/M	.... 22 .	2 to 8	6213 ZC3 ⁴⁾	6213 ZC3 ⁴⁾	6213 ZC3 ⁴⁾	6213 ZC3 ⁴⁾	
250 M	.... 25 .	2 to 8	6215 ZC3 ⁴⁾	6215 ZC3 ⁴⁾	6215 ZC3 ⁴⁾	6215 ZC3 ⁴⁾	
280 S/M 28 .	2 4 to 8	6217 C3 6317 C3	6217 C3 6317 C3	6217 C3 6317 C3	6217 C3 6317 C3	Fig. 5	
315 S/M	.... 310 313	2 4 to 8	6219 C3 6319 C3	6219 C3 6319 C3	6219 C3 6319 C3	6219 C3 6319 C3	
315 L	.... 316 317 318	2 4 to 8	6219 C3 6319 C3	6219 C3 ³⁾ 6319 C3	6219 C3 6319 C3	7219 BEP ³⁾ 6319 C3	

¹⁾ Deep-groove bearings are used for regreasable versions (order code **K40**).

²⁾ Deep-groove bearings are not used for regreasable versions (order code **K40**) of 1MA6 motors of frame sizes 180 M to 250 M.

³⁾ Only at 50 Hz.

⁴⁾ Deep-groove bearings are not used for regreasable versions (order code **K40**).

⁵⁾ For 1MA6 motors frame size 225 S/M bearing 6213 ZC3 at the non-drive end NDE (BS).

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Bearing selection table for 1LA8, 1PQ8 and 1LL8 motors – basic version

For motors frame size	Type	Number of poles	Drive end (DE) bearing		Non-drive end (NDE) bearing		Figures on Pages 0/64 and 0/65	
			Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction		
1LA8 . . . , 1PQ8 . . .								
315 31 .	2	6218 C3	6218 C3	6218 C3	6218 C3	Fig. 6 and Fig. 7	
		4 to 8	6218 C3	6218 C3	6218 C3	6218 C3		
355	. . . . 35 .	2	6218 C3	7218 B + 6218 C3	6218 C3	6218 C3	
		4 to 8	6220 C3	7220 B + 6220 C3	6220 C3	6220 C3		
400	. . . . 40 .	2	6218 C3	7218 B + 6218 C3	6218 C3	6218 C3	
		4 to 8	6224 C3	7224 B + 6224 C3	6224 C3	6224 C3		
450	. . . . 45 .	2	6220 C3	7220 B + 6220 C3	6220 C3	6220 C3	
		4 to 8	6226 C3	7226 B + 6226 C3	6226 C3	6226 C3		
1LL8 . . .								
315 31 .	2	6218 C3	6218 C3	6218 C3	6218 C3		No figure
		4 to 8	6220 C3	7220 B + 6220 C3	6218 C3	6218 C3		
355	. . . . 35 .	2	6218 C3	6218 C3	6218 C3	6218 C3	
		4 to 8	6224 C3	7224 B + 6224 C3	6220 C3	6220 C3		
400	. . . . 40 .	2	6218 C3	6218 C3	6218 C3	6218 C3	
		4 to 8	6226 C3	7226 B + 6226 C3	6224 C3	6224 C3		
450	. . . . 45 .	2	6220 C3	6220 C3	6220 C3	6220 C3	
		4 to 8	6228 C3	7228 B + 6226 C3	6228 C3	6226 C3		

1LA8, 1PQ8 and 1LL8 non-standard motors are transported horizontally. They can be transported vertically at an additional charge on request.

Bearing selection table for 1MJ motors – basic version

For motors frame size	Type	Number of poles	Drive end (DE) bearing		Non-drive end (NDE) bearing		Figure on Page 0/65
			Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
71 M	1MJ6 07 .	2 to 8	6202 ZC3	6202 ZC3	6202 ZC3	6202 ZC3	Fig. 8
80 M	1MJ6 08 .	2 to 8	6004 ZC3	6004 ZC3	6004 ZC3	6004 ZC3	Fig. 9
90 S/L	1MJ6 09 .	2 to 8	6205 C3	6205 C3	6205 C3	6205 C3	
100 L	1MJ6 10 .	2 to 8	6206 C3	6206 C3	6206 C3	6206 C3	Fig. 10
112 M	1MJ6 11 .	2 to 8	6306 C3	6306 C3	6306 C3	6306 C3	
132 S/M	1MJ6 13 .	2 to 8	6308 C3	6308 C3	6308 C3	6308 C3	Fig. 11
160 M/L	1MJ6 16 .	2 to 8	6309 C3	6309 C3	6309 C3	6309 C3	
180 M/L	1MJ6 18 .	2 to 8	6210 C3	6210 C3	6210 C3	6210 C3	Fig. 12
200 L	1MJ6 20 .	2 to 8	6212 C3	6212 C3	6212 C3	6212 C3	
225 S/M	1MJ7 22 .	2 to 8	6213 C3	6213 C3	6213 C3	6213 C3	Fig. 12
250 M	1MJ7 25 .	2 to 8	6215 C3	6215 C3	6215 C3	6215 C3	
280 S/M	1MJ7 28 .	2 to 8	NU 216	NU 216	6216 C3	6216 C3	Fig. 12
315 S/M	1MJ7 31 .	2	NU 217 ¹⁾	NU 217 ¹⁾	6217 C3	6217 C3	
		4 to 8	NU 218 ²⁾	NU 218 ²⁾	6218 C3	6218 C3	

¹⁾ Special version with deep groove bearing 6216 C3 on request. Recommended for coupling output or low cantilever forces.

²⁾ Special version with deep groove bearing 6217 C3 on request. Recommended for coupling output or low cantilever forces.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Bearing selection table for 1LA5, 1LA6, 1LA7, 1LA9, 1LG, 1LP, 1MA and 1PP motors – Bearings for increased cantilever forces – Order code **K20**

Please inquire about noise and vibration data.

For NU bearings (parallel roller bearings), in contrast to standard bearings, a minimum cantilever force is required. Parallel roller bearings are not suitable for coupling output.

The bearing selection tables are only intended for planning purposes. Authoritative information on the actual type of bearings fitted in motors already supplied can be obtained by the factory

by quoting the serial number or can be read from the lubricating plate on 1LA8 motors.

When deep-groove ball bearings with sideplates are used, the side plate is on the inside.

1MJ8 motors at 60 Hz on request.

For motors frame size	Type	Number of poles	Drive end (DE) bearing		Non-drive end NDE bearing		Figure on Page 0/64	
			Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction		
1LA5 . . . , 1LA6 . . . , 1LA7 . . . , 1LA9 . . . , 1LP5 . . . , 1LP7 . . . , 1MA6 . . . , 1MA7 . . . , 1PP5 . . . , 1PP7 . . .								
100 L 10 .	2 to 8	6306 ZC3	6306 ZC3	6205 2ZC3 ¹⁾	6205 2ZC3 ¹⁾	No figure	
112 M	. . . . 11 .	2 to 8	6306 ZC3	6306 ZC3	6205 2ZC3 ¹⁾	6205 2ZC3 ¹⁾	
132 S/M	. . . . 13 .	2 to 8	6308 ZC3	6308 ZC3	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	
160 M/L	. . . . 16 .	2 to 8	6309 ZC3	6309 ZC3	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	
180 M/L	. . . . 18 .	2 to 8	6310 ZC3	6310 ZC3	6210 ZC3	6210 ZC3	
200 L	. . . . 20 .	2 to 8	6312 ZC3	6312 ZC3	6212 ZC3	6212 ZC3	
225 S/M	. . . . 22 .	2 to 8	NU 213 E ²⁾³⁾	NU 213 E ²⁾³⁾	6212 ZC3 ⁴⁾	6212 ZC3 ⁴⁾	
250 M	. . . . 25 .	2 to 8	NU 215 E ²⁾	NU 215 E ²⁾	6215 ZC3	6215 ZC3	
280 S/M	. . . . 28 .	2 4 to 8	NU 216 E NU 317 E	NU 216 E NU 317 E	6216 C3 6317 C3	6216 C3 6317 C3	
315 S/M	. . . . 310 313	2 4 to 8	NU 217 E NU 319 E	NU 217 E NU 319 E	6217 C3 6319 C3	6217 C3 6319 C3	
315 L	. . . . 316 317 318	2 4 to 8	NU 217 E NU 319 E	– NU 319 E	6217 C3 6319 C3	– 6319 C3	
1LG4 . . . , 1LG6 . . . , 1LP4 . . . , 1PP4 . . .								
180 M/L 18 .	2 to 8	NU 210	NU 210	6210 C3	6210 C3		Fig. 4
200 L	. . . . 20 .	2 to 8	NU 212	NU 212	6212 C3	6212 C3	
225 S/M	. . . . 22 .	2 to 8	NU 213	NU 213	6213 C3	6213 C3	
250 M	. . . . 25 .	2 to 8	NU 215	NU 215	6215 C3	6215 C3	
280 S/M 28 .	2 4 to 8	NU 217 NU 317	NU 217 NU 317	6217 C3 6317 C3	6217 C3 6317 C3	Fig. 5	
315 S/M	. . . . 310 313	2 4 to 8	NU 219 ⁵⁾ NU 319	NU 219 ⁵⁾ NU 319	6219 C3 6319 C3	6219 C3 6319 C3	
315 L	. . . . 316 317 318	2 4 to 8	NU 219 ⁵⁾ NU 319	NU 219 ⁵⁾ NU 319	6219 C3 6319 C3	6219 C3 6319 C3	

¹⁾ Bearings with a side plate are used for regreasable versions (order code **K40**).

²⁾ Deep-groove bearings of size range O3 are also possible (order code **K36**).

³⁾ For 1LA5 motors frame size 225 S/M bearing 6313 ZC3 at the drive end.

⁴⁾ For 1MA6 motors frame size 225 S/M bearing 6213 ZC3 at the non-drive end.

⁵⁾ Only at 50 Hz.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Bearing selection table for 1LA8, 1PQ8 and 1LL8 motors – bearings for increased cantilever forces – Order code **K20**

For motors frame size	Type	Number of poles	Drive end (DE) bearing		Non-drive end NDE bearing		
			Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LA8 . . . , 1PQ8 . . .							
315	. . . . 31 .	4 to 8	NU 320 E	On request	6218 C3	On request	No figure
355	. . . . 35 .	4 to 8	NU 322 E	On request	6220 C3	On request	

Please inquire about noise and vibration data. For NU bearings, in contrast to standard bearings, a minimum cantilever force is required. The bearing selection tables are only intended for planning purposes. Binding statements about the bearings for motors which have already been shipped can be requested. Please specify the serial number.

The motors are transported horizontally; they can be transported vertically at additional cost on request. Reinforced bearings are available for frame sizes 400 and 450 as well as IM V1 types of construction as well as for 1LL8 motors on request. Please specify cantilever force and dimension x. Reinforced bearings cannot be supplied for 2-pole motors.

Bearing selection table for 1MJ6 and 1MJ7 motors – Bearings for increased cantilever forces – Order code **K20**

For motors frame size	Type	Number of poles	Drive end (DE) bearing		Non-drive end NDE bearing		
			Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1MJ6 . . .							
180 M/L	. . . . 18 .	2 to 8	NU 210	NU 210	6210 ZC3	6210 ZC3	No figure
200 L	. . . . 20 .	2 to 8	NU 212	NU 212	6212 ZC3	6212 ZC3	
1MJ7 . . .							
225 M/L	. . . . 22 .	2 to 8	NU 213	NU 213	6213 C3	6213 C3	No figure
250 M	. . . . 25 .	2 to 8	NU 215	NU 215	6215 C3	6215 C3	

Bearing selection table for 1LG4, 1LG6, 1LP4 and 1PP4 motors – Deep-groove bearings reinforced at both ends – Order code **K36**

For motors frame size	Type	Number of poles	Drive end (DE) bearing		Non-drive end NDE bearing		Figure on Page 0/64
			Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LG4 . . . , 1LG6 . . . , 1LP4 . . . , 1PP4 . . .							
180 M/L 18 .	2 to 8	6310 ZC3 ¹⁾	6310 ZC3 ¹⁾	6310 ZC3 ¹⁾	6310 ZC3 ¹⁾	Fig. 4
200 L	. . . . 20 .	2 to 8	6312 ZC3 ¹⁾	6312 ZC3 ¹⁾	6312 ZC3 ¹⁾	6312 ZC3 ¹⁾
225 S/M	. . . . 22 .	2 to 8	6313 ZC3 ¹⁾	6313 ZC3 ¹⁾	6313 ZC3 ¹⁾	6313 ZC3 ¹⁾
250 M	. . . . 25 .	2 to 8	6315 ZC3 ¹⁾	6315 ZC3 ¹⁾	6315 ZC3 ¹⁾	6315 ZC3 ¹⁾
280 S/M 28 .	2 4 to 8	6317 C3 6317 C3 ²⁾	6317 C3 6317 C3 ²⁾	6317 C3 6317 C3 ²⁾	6317 C3 6317 C3 ²⁾	Fig. 5
315 S/M/L	. . . . 31 .	2 4 to 8	6316 C3 6319 C3 ²⁾	6316 C3 6319 C3 ²⁾	6316 C3 6319 C3 ²⁾	6316 C3 6319 C3 ²⁾

¹⁾ Deep-groove bearings are not used for regreasable versions (order code **K40**).

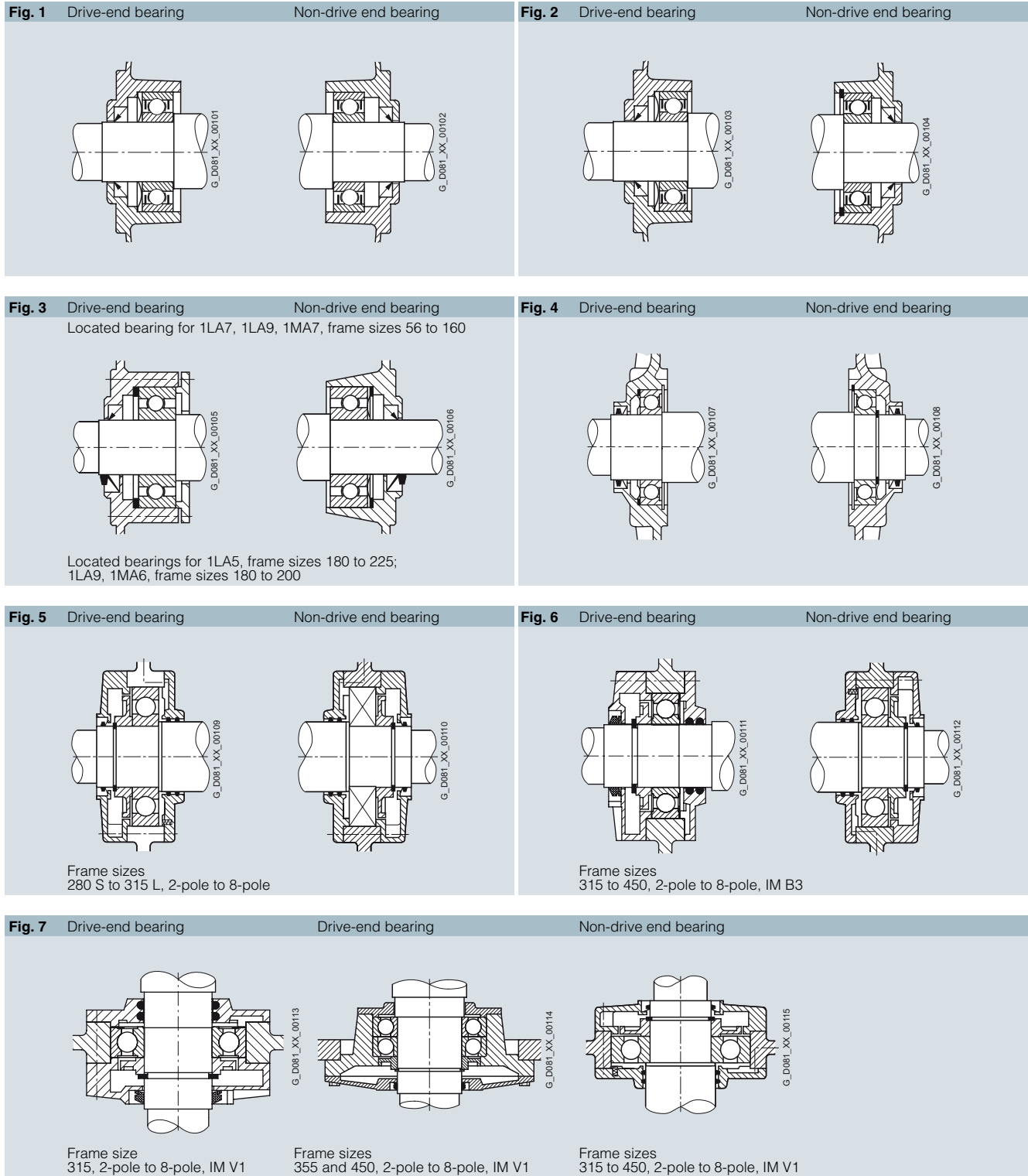
²⁾ As for basic version.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Diagrams of bearings

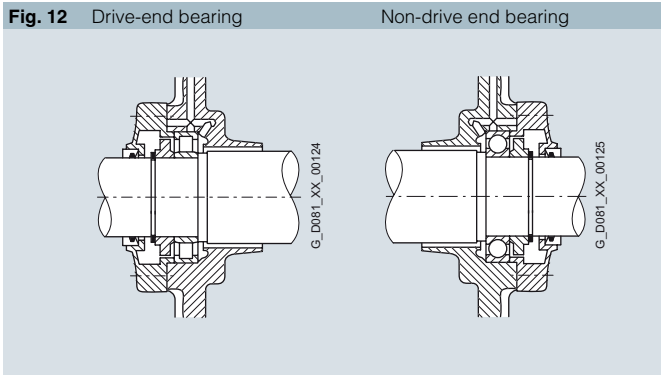
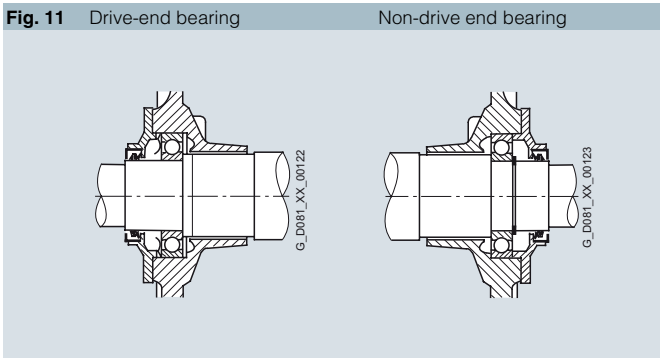
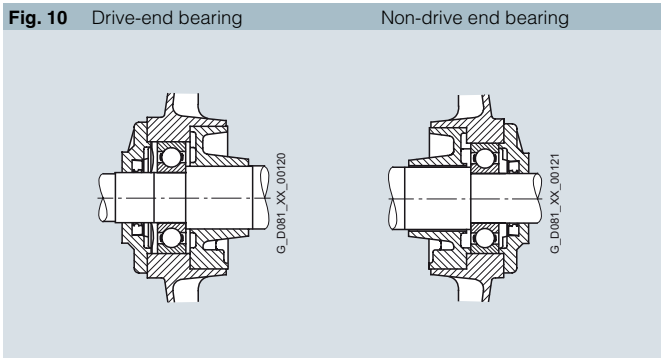
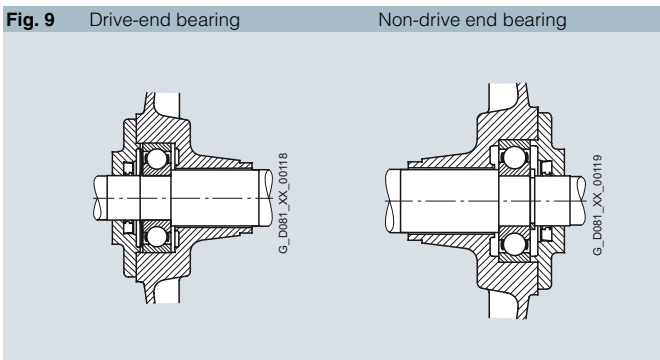
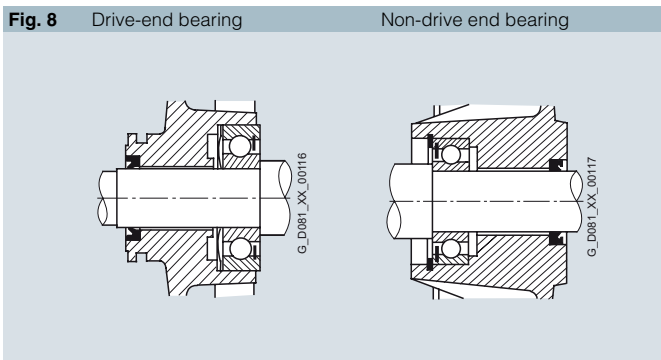


IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

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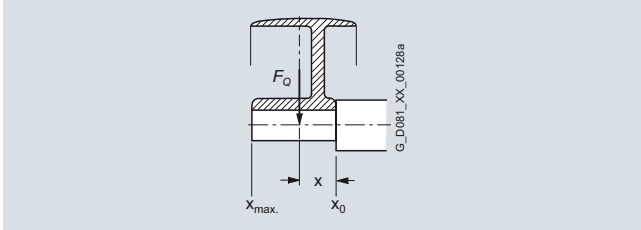
IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Admissible cantilever forces

Admissible cantilever forces, basic version



In order to calculate the admissible cantilever forces for a radial load, the line of force (i.e. the centerline of the pulley) of the cantilever force F_Q (N) must lie within the free shaft extension (dimension x).

Dimension x [mm] is the distance between the point of application of force F_Q and the shaft shoulder. Dimension x_{max} corresponds to the length of the shaft extension.

Total cantilever force $F_Q = c \cdot F_U$

The pre-tension factor c is a value gained from experience from the belt manufacturer. The following approximate value can be assumed:

For normal flat leather belts with an idler pulley $c = 2$;
 for V-belts $c = 2$ to 2.5;
 for special synthetic belts (depending on the type and load) $c = 2$ to 2.5.

The circumferential force F_U (N) is calculated using the following equation

$$F_U = 2 \cdot 10^7 \cdot \frac{P}{n \cdot D}$$

F_U circumferential force in N
 P rated motor power (transmitted power) in kW
 n rated motor speed
 D pulley diameter in mm

The pulleys are standardized acc. to DIN 2211, Sheet 3.

The admissible cantilever forces at 60 Hz are approx. 80 % of the 50 Hz values (please inquire).

Admissible cantilever forces for the basic 50 Hz version

Valid are: x_0 values for $x = 0$ and x_{max} values for $x = l$ (l = shaft extension)

For motors	Admissible cantilever force for x_0	Admissible cantilever force for x_{max} .					
		Type	Type				
Frame size	Number of poles	N	N	N	N	N	N
		1LG4	1MA6	1MJ6	1LG4	1MA6	1MJ6
		1LG6	1MJ7	1LG6	1MJ7		
250 M	2	3190	3650	3650	2530	2950	2950
	4	4000	4400	4400	3350	3600	3600
	6	4700	5350	5350	3900	4350	4350
	8	5200	5700	5700	4400	4700	4700
280 S 280 M	2	4000	3350	8100	3250	2800	6700
	4	8400	8400	9700	7000	7200	8050
	6	9700	10000	11700	8100	8900	9700
	8	10750	11000	12800	9000	9850	10600
315 S 315 M	2	4750	3950	9000	3890	3350	7600
	4	9100	9900	13100	7300	8100	10800
	6	10700	12100	15600	8700	9900	12800
	8	11600	13300	16900	9600	10900	13900
315 L	2	4000	3100	8800	3280	2700	7600
	4	8400	8800	24000	7500	7450	12000
	6	9700	11400	25000	9100	9600	12000
	8	11100	12500	26000	10200	10500	12000

Admissible cantilever forces for the basic 50 Hz version

Valid are: x_0 values for $x = 0$ and x_{max} values for $x = l$ (l = shaft extension)

For motors	Admissible cantilever force for x_0	Admissible cantilever force for x_{max} .					
		Type	Type				
Frame size	Number of poles	N	N	N	N	N	N
		1LA5	1LG4	1MJ6	1LA5	1LG4	1MJ6
		1LA7	1LG6	1MJ7	1LA7	1LG6	1MJ7
		1LA9	1LP4		1LA9	1LP4	
		1MA6	1PP4		1MA6	1PP4	
		1MA7	1PP6		1MA7	1PP6	
		1LA6			1LA6		
		1LP5			1LP5		
		1LP7			1LP7		
		1PP5			1PP5		
		1PP7			1PP7		
56 M	2	270	-	-	240	-	-
	4	350	-	-	305	-	-
	6	415	-	-	360	-	-
63 M	2	270	-	-	240	-	-
	4	350	-	-	305	-	-
	6	415	-	-	360	-	-
71 M	2	415	-	260	355	-	260
	4	530	-	260	450	-	260
	6	630	-	260	535	-	260
	8	690	-	-	585	-	-
80 M	2	485	-	485	400	-	400
	4	625	-	560	515	-	515
	6	735	-	560	605	-	560
	8	815	-	-	675	-	-
90 S 90 L	2	725	-	725	605	-	605
	4	920	-	920	775	-	775
	6	1090	-	1090	910	-	910
	8	1230	-	1230	1030	-	1030
100 L	2	1030	-	1030	840	-	840
	4	1310	-	1310	1060	-	1060
	6	1550	-	1550	1250	-	1250
	8	1720	-	1720	1400	-	1400
112 M	2	1010	-	1680	830	-	1490
	4	1270	-	1960	1040	-	1580
	6	1520	-	2140	1240	-	1720
	8	1690	-	2450	1380	-	1950
132 S 132 M	2	1490	-	2250	1180	-	1820
	4	1940	-	2720	1530	-	2170
	6	2260	-	3100	1780	-	2420
	8	2500	-	3400	1980	-	2700
160 M 160 L	2	1540	-	2800	1210	-	2250
	4	2040	-	3330	1590	-	2600
	6	2330	-	3750	1820	-	2900
	8	2660	-	3750	2080	-	2900
180 M 180 L	2	2000	1780	2000	1550	1410	1550
	4	2350	2240	2350	1950	1820	1950
	6	2800	2550	2800	2250	2120	2250
	8	3050	2860	3050	2500	2330	2500
200 L	2	2550	2380	2550	2100	1930	2100
	4	3350	3050	3350	2750	2530	2750
	6	3900	3500	3900	3200	2930	3200
	8	4150	3800	4150	3450	3210	3450
225 S 225 M	2	3050	2820	3050	2550	2290	2550
	4	3750	3500	3750	2950	2760	2950
	6	4550	4050	4550	3600	3240	3600
	8	4850	4500	4850	3900	3500	3900

Table continues overleaf

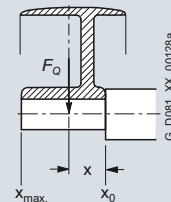
Admissible cantilever forces for the basic 50 Hz version**Valid are: x_0 values for $x = 0$ and x_{max} values for $x = l$ (l = shaft extension)**

For motors	Admissible cantilever force for x_0		Admissible cantilever force for x_{max}	
Frame size	Number of poles	Type	Type	Type
		N	N	N
		1LA8, 1PQ8¹⁾		1LA8, 1PQ8¹⁾
315 ... 450	2 ... 8	See diagrams Page 0/69	See diagrams Page 0/69	See diagrams Page 0/69

For 1LA8 motors in horizontal type of construction, the admissible cantilever forces are specified with regard to the axial forces.

It should be observed that for types of construction IM B6, IM B7, IM B8, IM V5 and IM V6 the belt tension is only permitted to act parallel to the mounting plane or towards the mounting plane and the feet must be supported. Both feet must be secured for foot-mounting types of construction.

Refer to Pages 0/67 to 0/68 if the cantilever forces are higher than those listed above.

Bearing design for increased cantilever forces**Admissible cantilever forces at 50 Hz for 1LA, 1MA, 1MJ, 1LP and 1PP motors****Deep-groove ball bearings at the drive end (DE) – Order code K20**

For motors	Frame size	Type	Number of poles	Admissible cantilever force F_Q	
				at x_0	at x_{max}
				N	N
				1LA5 ... , 1LA6 ... , 1LA7 ... , 1LA9 ... , 1MA6 ... , 1MA7 ... , 1MJ6 ... , 1MJ7 ... , 1LP5 ... , 1LP7 ... , 1PP5 ... , 1PP7 ...	
100		.... 10 .	2	1680	1490
			4	1960	1580
			6	2140	1720
			8	2450	1950
112		.... 113	2	1680	1490
			4	1960	1580
			6	2140	1720
			8	2450	1950
132		.... 13 .	2	2250	1820
			4	2720	2170
			6	3100	2420
			8	3400	2700
160		.... 16 .	2	2800	2250
			4	3330	2600
			6	3750	2900
			8	3750	2900
180		.... 18 .	2	3700	3000
			4	4450	3600
			6	5100	4150
			8	5550	4500
200		.... 20 .	2	5200	4300
			4	6450	5350
			6	7300	6100
			8	7900	6550
225		1LA522 .	2	5200	4300
		1LP5 ...	4	6450	5350
		1PP5 ...	6	7300	6100
			8	7900	6550

¹⁾ Data for 1LL8 is available on request.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Admissible cantilever forces at 50 Hz for 1LG motors

Parallel roller bearings at the drive end (DE) – Order code K20

Valid are: x_0 values for $x = 0$ and x_{max} values for $x = l$ (l = shaft extension)

Frame size	Type	Number of poles	Admissible cantilever force F_Q	
			at x_0	at x_{max}
			N	N
1LG4 ... , 1LG6 ... , 1LP4 ... , 1PP4 ...				
180 M, 180 L	.... 18 .	2	4550	3600
		4	5650	4050
		6	6350	4050
		8	6950	4050
200 L	.... 20 .	2	6600	5350
		4	8200	6850
		6	9300	6300
		8	10100	7400
225 S, 225 M	.... 22 .	2	7500	6250
		4	9150	7200
		6	10400	7400
		8	11300	7350
250 M	.... 25 .	2	9100	7300
		4	11300	9300
		6	12800	10500
		8	14100	10500
280 S ¹⁾ , 280 M ¹⁾ 28 .	2	11400	9350
315 S ¹⁾ , 315 M ¹⁾ 310 313	2	14700	12300
315 L ¹⁾ 316 317	2	14600	12700

Admissible cantilever forces at 50 Hz for 1LG motors

Deep-groove bearings reinforced at both ends DE/NDE – Order code K36

Valid are: x_0 values for $x = 0$ and x_{max} values for $x = l$ (l = shaft extension)

Frame size	Type	Number of poles	Admissible cantilever force F_Q	
			at x_0	at x_{max}
			N	N
1LG4 ... , 1LG6 ...				
180 M, 180 L	.... 18 .	2	3280	2600
		4	4150	3430
		6	4750	3950
		8	5250	4050
200 L	.... 20 .	2	4350	3500
		4	5550	4550
		6	6350	5350
		8	7000	5900
225 S, 225 M	.... 22 .	2	4850	3950
		4	6100	4850
		6	7050	5650
		8	7750	6150
250 M	.... 25 .	2	5800	4600
		4	7400	6050
		6	8500	7050
		8	9350	7850
280 S, 280 M	.... 28 .	2	–	–
315 S, 315 M	.... 310 313	2	5650	4650
315 L	.... 316 317	2	5450	4650

Admissible cantilever forces at 50 Hz for 1MA and 1MJ motors

Parallel roller bearings at the drive end (DE) – Order code K20

For motors

Frame size	Type	Number of poles	Admissible cantilever force F_Q	
			at x_0	at x_{max}
			N	N
1MA6 ... , 1MJ7 ...				
225	.... 22 .	2	8100	6800
		4	9800	7800
		6	11200	8800
		8	12200	9700
250	.... 25 .	2	9600	7900
		4	11600	9600
		6	13200	10800
		8	14400	11800
280 ^{1) 2)}	.... 28 .	2	10000	8400
315 S ^{1) 2)}	.... 310	2	12000	10200
315 M ^{1) 2)}	.... 313			
315 L ^{1) 2)}	.... 316	2	11800	10200
	.... 317		(horizontal type of construction)	
1LA8 , 1PQ8				
315 to 355		2 to 8	See diagrams Page 0/70	

It should be observed that for types of construction IM B6, IM B7, IM B8, IM V5 and IM V6 the belt tension is only permitted to act parallel to the mounting plane or towards the mounting plane and the feet must be supported.

¹⁾ Admissible cantilever forces for 1LG4, 1LG6, 1LP4, 1PP4 and 1MA6 frame sizes 280 to 315 L in 4-pole to 8-pole version, see Page 0/70.

²⁾ Not applicable to 1MJ motors with frame sizes 280 to 315, because this is the standard version.

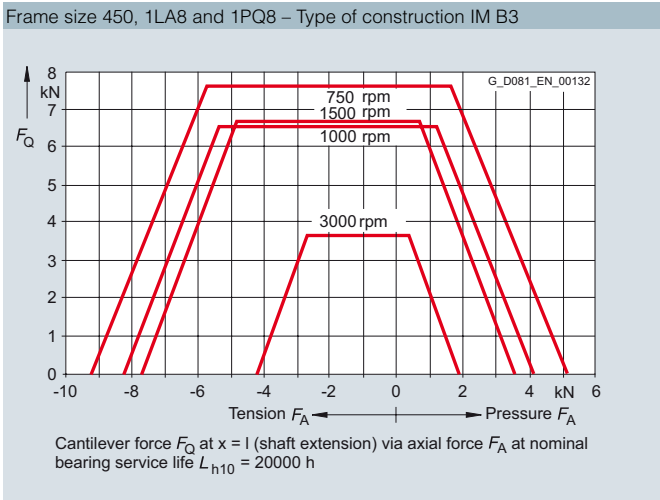
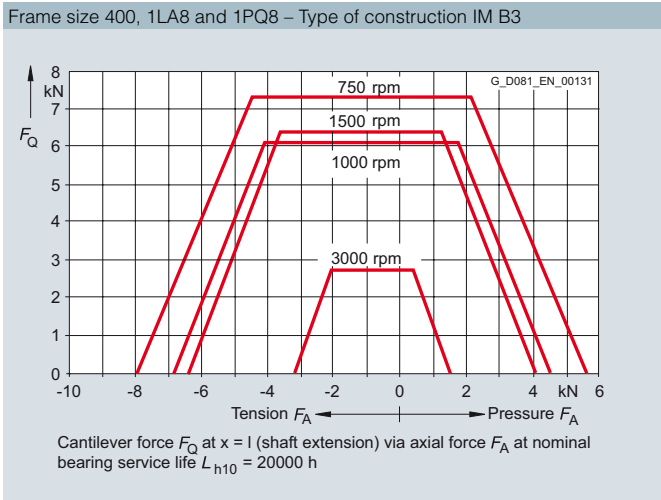
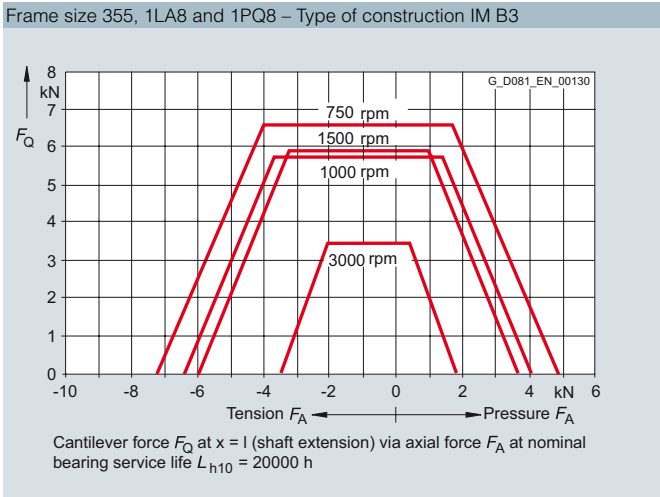
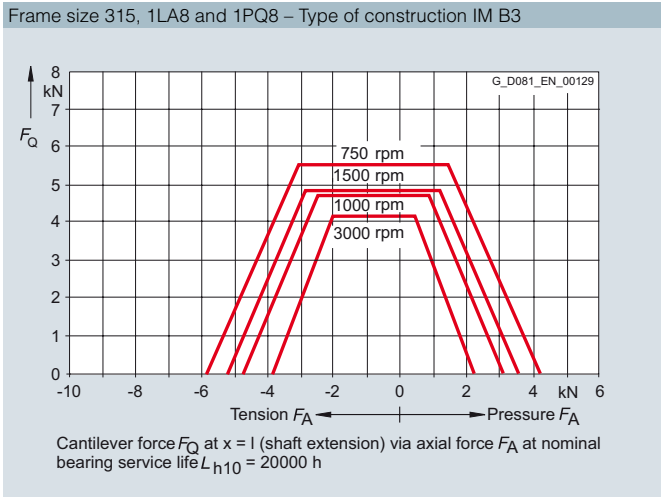
IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data



Admissible cantilever forces at 50 Hz for 1LA8 and 1PQ8 motors – basic version



IEC Squirrel-Cage Motors

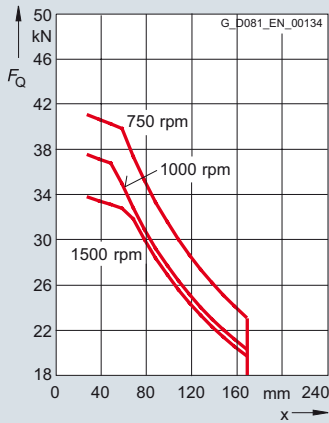
Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

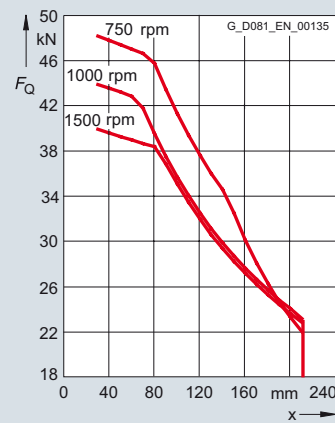
0

Admissible cantilever forces at 50 Hz for 1LA8 and 1PQ8 motors – Bearings for increased cantilever forces – Order code **K20**

Frame size 315, 1LA8 and 1PQ8 – Type of construction IM B3



Frame size 355, 1LA8 and 1PQ8 – Type of construction IM B3

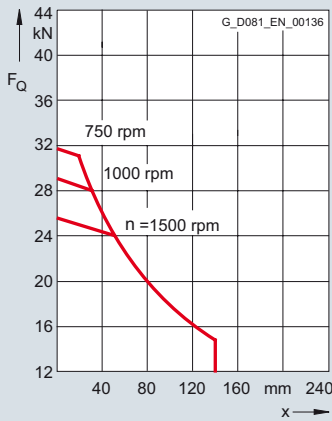


At 60 Hz, the admissible cantilever force must be reduced to 80 %.

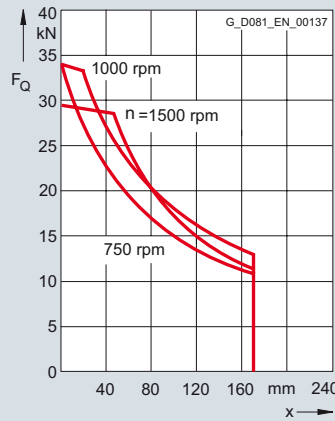
For all motors of frame sizes 400 and 450, IM V1 and 1LL8 motors with reinforced bearings available on request. Please specify cantilever force and lever arm.

Admissible cantilever forces at 50 Hz for 1LG motors – Bearings for increased cantilever forces – Order code **K20**

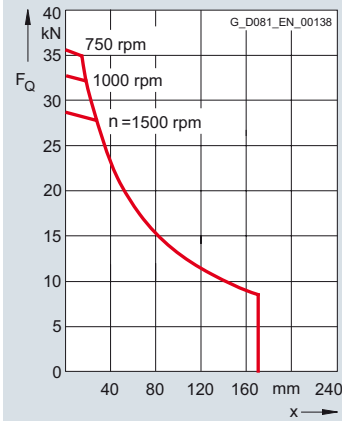
Frame size 280, 4-pole to 8-pole, 1LG4/1LG6, 1LP4/1PP4



Frame size 315, 4-pole to 8-pole, 1LG4/1LG6, 1LP4/1PP4

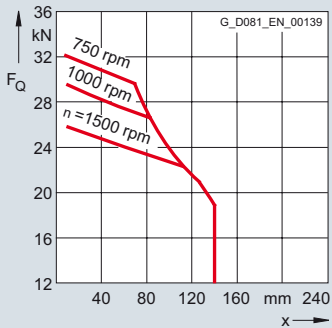


Frame size 315 S/M, 4-pole to 8-pole, 1LG4/1LG6, 1LP4/1PP4

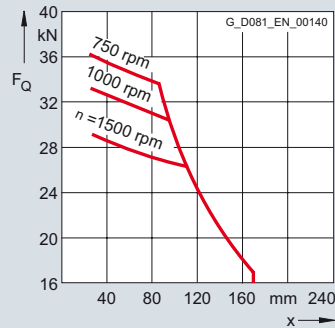


Admissible cantilever forces at 50 Hz for 1MA motors – Bearings for increased cantilever forces – Order code **K20**

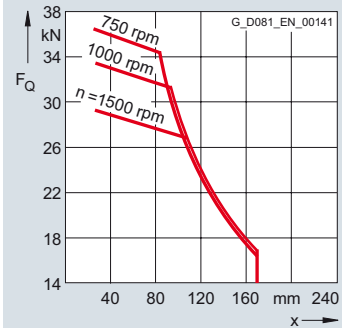
Frame size 280, 4-pole to 8-pole, 1MA6



Frame size 315 S/M, 4-pole to 8-pole, 1MA6



Frame size 315 L, 4-pole to 8-pole, 1MA6



IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Admissible axial load

1LA5, 1LA6, 1LA7, 1LP5, 1LP7, 1MA6, 1MA7, 1MJ6, 1MJ7, 1PP5, 1PP6, 1PP7 motors in vertical type of construction – basic version

Frame size	Shaft extension pointing															
	3000 rpm				1500 rpm				1000 rpm				750 rpm			
	downwards		upwards		downwards		upwards		downwards		upwards		downwards		upwards	
	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up
56	80	245	230	95	80	330	310	95	80	410	390	95	–	–	–	–
63	80	245	230	95	80	330	310	95	80	410	390	95	–	–	–	–
71	105	365	335	130	90	380	440	130	90	590	550	130	90	700	660	130
80	110	425	360	160	100	540	480	165	100	650	590	165	100	760	700	165
90	110	440	360	180	100	680	580	190	100	920	820	190	100	1150	1050	190
100	140	700	550	280	130	990	820	285	130	1280	1110	285	130	1560	1390	285
112	140 (140)*	710 (1050)*	550 (800)*	300 (300)*	130 (130)*	1000 (1350)*	820 (1100)*	310 (300)*	130 (130)*	1290 (1720)*	1110 (1500)*	310 (310)*	130 (130)*	1570 (2000)*	1390 (1850)*	310 (310)*
132	200 (1500)*	1200 (1550)*	950 (1300)*	470 (470)*	180 (1500)*	1680 (2100)*	1200 (1600)*	470 (470)*	180 (280)*	1900 (2400)*	1600 (2100)*	470 (470)*	190 (290)*	2200 (2800)*	1900 (2400)*	440 (440)*
160	1500 (2000)*	1400 (1720)*	950 (1300)*	1900 (2500)*	1900 (2500)*	1800 (2400)*	1300 (1720)*	2200 (2800)*	2200 (2800)*	1600 (2800)*	2700 (3600)*	2700 (3600)*	2700 (3600)*	2700 (3600)*	1950 (2600)*	2900 (3700)*

For motors Frame size	Shaft extension downwards																
	3000 rpm				1500 rpm				1000 rpm				750 rpm				
	Type	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up		
	1LA5... 1LA6... 1MA6... 1MJ6... 1PP5... 1MJ7... 1LP5... 1PP5...	1MA6	1MJ7	1MA6	1MJ7	1MA6	1MJ7	1MA6	1MJ7	1MA6	1MJ7	1MA6	1MJ7	1MA6	1MJ7	1MA6	1MJ7
		1LP5	1PP5	1LP5	1PP5	1LP5	1PP5	1LP5	1PP5	1LP5	1PP5	1LP5	1PP5	1LP5	1PP5	1LP5	1PP5
		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
180 M	... 183	1150	1150	1900	1900	1400	1400	2350	2350	–	–	–	–	–	–	–	–
180 L	... 186	–	–	–	–	1400	1400	2400	2400	1700	1700	2850	2850	2000	2000	3150	3150
200 L	... 206	1650	1650	2750	2750	–	–	–	–	2550	2550	3950	3950	–	–	–	–
	... 207	1550	1550	2800	2800	2000	2000	3350	3350	2400	2400	3950	3950	2800	2800	4500	4500
225 S	... 220	–	–	–	–	2300	2300	3020	3020	–	–	–	–	3200	3200	4080	4080
225 M	... 223	1890	1890	2190	2190	2180	2180	3060	3060	2700	2700	3500	3500	3040	3040	4120	4120
250 M	... 253	1750	1750	2790	2790	2160	2160	3760	3760	2740	2740	4340	4340	2990	2990	4890	4890
280 S	... 280	380	1150	4480	3850	3830	1350	8790	4950	5340	2350	10000	5650	6280	2850	11000	6250
280 M	... 283	180	900	4580	3900	3550	1000	8910	5000	5000	2000	10100	5700	5930	2450	11100	6300
315 S	... 310	210	900	5270	4500	3700	1700	10200	6400	5150	2300	11700	7050	6520	3400	13000	7950
315 M	... 313	100	650	5350	4550	3330	1600	10400	6900	4740	2050	11700	7500	5800	2800	13000	8400
315 L	... 316	9270	–	770	–	2330	–	10400	–	3650	–	11700	–	4630	–	13000	–
	... 317	9270	–	840	–	1370	–	10800	–	2990	–	11600	–	3760	–	13000	–
	... 318	9270	–	840	–	1370	–	10800	–	2990	–	11600	–	3760	–	13000	–

The values shown do not assume a cantilever force on the shaft extension.

The admissible loads are valid for operation at 50 Hz; for 60 Hz, please inquire.

The calculation of the admissible axial load was based on the drive with generally available coupling. For suppliers, see the relevant catalog part, section "Accessories".

Please inquire if the load direction alternates.

* The values in brackets for frame sizes 112 to 160 apply to 1MJ6 motors.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

1LA5, 1LA6, 1LA7, 1LP7, 1MA6, 1MA7, 1MJ6, 1MJ7, 1PP6, 1PP7 motors in horizontal type of construction – Basic version

Frame size	3000 rpm				1500 rpm				1000 rpm				750 rpm			
	Tensile load		Thrust load (N) with radial load at		Tensile load		Thrust load (N) with radial load at		Tensile load		Thrust load (N) with radial load at		Tensile load		Thrust load (N) with radial load at	
		X ₀	X _{max.}	without radial load		X ₀	X _{max.}	without radial load		X ₀	X _{max.}	without radial load		X ₀	X _{max.}	without radial load
	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
56	90	120	90	240	90	140	110	320	90	170	120	400	–	–	–	–
63	90	120	90	240	90	140	110	320	90	170	120	400	–	–	–	–
71	120	150	120	350	120	210	150	460	120	260	180	570	120	300	210	680
80	140	190	150	400	140	300	260	510	140	330	280	620	140	340	290	730
90	150	300	280	400	150	400	360	630	150	480	430	870	150	550	500	1100
100	220	450	350	630	220	600	500	910	220	650	550	1200	220	750	650	1480
112	220 (220)*	450 (850)*	350 (700)*	630 (1050)*	220 (220)*	600 (1150)*	500 (1000)*	910 (1350)*	220 (220)*	650 (1300)*	550 (1150)*	1200 (1720)*	220 (220)*	750 (1450)*	650 (1300)*	1480 (2000)*
132	350 (350)*	650 (1000)*	520 (900)*	1200 (1550)*	350 (350)*	850 (1250)*	700 (1150)*	1600 (2100)*	350 (350)*	1020 (1500)*	890 (1400)*	1900 (2400)*	350 (350)*	1150 (1750)*	1020 (1650)*	2200 (2800)*
160	1500 (2100)*	850 (1280)*	720 (1100)*	1500 (2100)*	1500 (2100)*	1050 (1680)*	920 (1700)*	1800 (2350)*	1500 (2100)*	1250 (2050)*	1120 (1920)*	2200 (2900)*	1500 (2100)*	1350 (2400)*	1220 (2200)*	2600 (3300)*

Frame size	Type	3000 rpm		1500 rpm		1000 rpm		750 rpm	
		Loading direction		Loading direction		Loading direction		Loading direction	
		Tension	Thrust	Tension	Thrust	Tension	Thrust	Tension	Thrust
	1LA5 ... 1MA6 ... 1MJ6 ... 1MJ7 ... 1LP5 ... 1PP5 ...	N	N	N	N	N	N	N	N
180 M	... 183	1400	1400	1700	1700	–	–	–	–
180 L	... 186	–	–	1700	1700	2050	2050	2400	2400
200 L	... 206	2000	2000	–	–	3000	3000	–	–
	... 207	1950	1950	2450	2450	2900	2900	3400	3400
225 S	... 220	–	–	2980	1960	–	–	3880	2860
225 M	... 223	2390	1370	2900	1880	3380	2360	3810	2790
250 M	... 253	2450	1655	3070	2270	3620	2820	4000	3200
280 S	... 280	1330 (3700)*	2900 (2100)*	5080 (4200)*	6740 (2600)*	6410 (5000)*	8070 (3400)*	7390 (5550)*	9050 (3950)*
280 M	... 283	1200 (3600)*	2800 (2000)*	4990 (4000)*	6650 (2400)*	6260 (4800)*	7920 (3200)*	7220 (5350)*	8880 (3750)*
315 S	... 310	1500 (3800)*	3160 (2200)*	5350 (4900)*	7450 (3300)*	6740 (5500)*	8810 (3900)*	8010 (6500)*	10110 (4900)*
315 M	... 313	1400 (3650)*	3180 (2050)*	5260 (4900)*	7360 (3300)*	6560 (5450)*	8660 (3850)*	7690 (6250)*	9790 (4650)*
315 L	... 316	1080	2740	4580	6680	5770	7870	6820	8920
	... 317	940	2600	4170	6270	5410	7510	6410	8510
	... 318	940	2600	4170	6270	5410	7510	6410	8510

The values shown do not assume a cantilever force on the shaft extension.

The admissible loads are valid for operation at 50 Hz; for 60 Hz, please inquire.

The calculation of the admissible axial load was based on the drive with generally available coupling. For suppliers, see the relevant catalog part, section "Accessories".

Please inquire if the load direction alternates.

* The values in brackets for frame sizes 112 to 160 apply to 1MJ6 motors and frame sizes 280 S to 315 M apply to 1MJ7 motors.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

1LG4, 1LG6, 1LP4, 1PP4 and 1PP6 motors in vertical type of construction – Basic version

For motors									
Frame size	Type	3000 rpm		1500 rpm		1000 rpm		750 rpm	
	1LG4 ...	Load	Load	Load	Load	Load	Load	Load	Load
	1LG6 ...	down	up	down	up	down	up	down	up
	1LP4 ...								
	1PP4 ...								
	1PP6 ...	N	N	N	N	N	N	N	N
Shaft extension downwards									
180 M	... 183	1140	1150	1500	1600	–	–	–	–
180 L	... 186	–	–	1380	1630	1650	2000	2020	2250
	... 188	1140	1190	1390	1650	1640	2030	1880	2280
200 L	... 206	1610	1480	–	–	2420	2550	–	–
	... 207	1510	1530	2030	2100	2220	2610	2610	2970
	... 208	1510	1590	1990	2120	2210	2680	2600	3060
225 S	... 220	–	–	2110	2690	–	–	2830	3710
225 M	... 223	1540	1990	1920	2770	2260	3300	2620	3770
	... 228	1540	2070	1950	2840	2240	3430	2610	3880
250 M	... 253	1680	2760	2110	3740	2740	4350	3070	4920
	... 258	1660	2870	2110	3960	2740	4520	3070	5160
280 S	... 280	390	4670	3190	8200	4510	9290	5510	10300
280 M	... 283	100	4780	2790	8340	4210	9450	5200	10400
	... 288	100	4950	2700	8570	4170	9600	5160	10600
315 S	... 310	840	6330	3380	10200	4760	11500	5860	12600
315 M	... 313	530	6490	2870	10500	4200	11800	5420	12900
315 L	... 316	8830	590	2450	11000	3680	12300	4800	13400
	... 317	8410	690	1800	11400	3100	12800	4410	13900
	... 318	8170	800	1620	12000	2690	13400	3820	14300
Shaft extension pointing upwards									
180 M	... 183	1900	390	2260	840	–	–	–	–
180 L	... 186	–	–	2140	870	2410	1240	2780	1490
	... 188	1900	430	2150	890	2400	1270	2640	1520
200 L	... 206	2760	330	–	–	3570	1400	–	–
	... 207	2660	380	3180	950	3370	1460	3760	1820
	... 208	2660	440	3140	970	3360	1530	3750	1910
225 S	... 220	–	–	3130	1670	–	–	3850	2690
225 M	... 223	2560	970	2940	1750	3280	2280	3640	2750
	... 228	2560	1050	2970	1820	3260	2410	3630	2860
250 M	... 253	2480	1960	2910	2940	3540	3550	3870	4120
	... 258	2460	2070	2910	3160	3540	3720	3870	4360
280 S	... 280	1960	3100	4760	6630	6080	7720	7080	8730
280 M	... 283	1670	3210	4360	6770	5780	7880	6770	8830
	... 288	1670	3380	4270	7000	5740	8030	6730	9030
315 S	... 310	2410	4760	5380	8200	6760	9500	7860	10600
315 M	... 313	2100	4920	4870	8500	6200	9800	7420	10900
315 L	... 316	10400	–	4450	9000	5680	10300	6800	11400
	... 317	9980	–	3800	9400	5100	10800	6410	11900
	... 318	9740	–	3620	10000	4690	11400	5820	12300

Values shown without assuming a cantilever force on the shaft extension.

The admissible loads apply to operation at 50 Hz; please inquire about 60 Hz.

The figures for the admissible axial loads have been calculated assuming that standard coupling types are used for the drive.

For suppliers, see the relevant catalog part, section "Accessories".

Please inquire if the loading direction alternates.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

1LG4, 1LG6, 1LP4, 1PP4 and 1PP6 motors in horizontal type of construction – Basic version

For motors Frame size	Type	3000 rpm		1500 rpm		1000 rpm		750 rpm	
		Loading direction		Loading direction		Loading direction		Loading direction	
		Tension	Thrust	Tension	Thrust	Tension	Thrust	Tension	Thrust
	1LG4 ...								
	1LG6 ...								
	1LP4 ...								
	1PP4 ...								
	1PP6 ...	N	N	N	N	N	N	N	N
180 M	... 183	1550	790	1950	1190	–	–	–	–
180 L	... 186	–	–	1890	1130	2220	1460	2470	1710
	... 188	1550	790	1900	1140	2220	1460	2460	1700
200 L	... 206	2150	990	–	–	3090	1940	–	–
	... 207	2130	970	2670	1520	3030	1880	3410	2260
	... 208	2130	970	2630	1480	3020	1870	3410	2250
225 S	... 220	–	–	2950	1920	–	–	3820	2790
225 M	... 223	2320	1290	2910	1880	3360	2330	3760	2740
	... 228	2320	1290	2910	1880	3350	2320	3760	2730
250 M	... 253	2510	1710	3150	2350	3750	2950	4180	3380
	... 258	2510	1710	3140	2340	3750	2950	4170	3370
280 S	... 280	1790	3360	4970	6540	6180	7750	7170	8740
280 M	... 283	1720	3290	4860	6430	6110	7680	7090	8660
	... 288	1720	3290	4850	6420	6100	7670	7080	8650
315 S	... 310	2610	4180	5520	7520	6830	8830	7940	9940
315 M	... 313	2500	4070	5320	7320	6520	8520	7850	9850
315 L	... 316	2450	4020	5230	7230	6370	8370	7520	9520
	... 317	2320	3890	5050	7050	6110	8110	7350	9350
	... 318	2300	3870	4950	6950	5950	7950	7080	9080

1LA8 and 1PQ8 motors in vertical type of construction – Basic version

For motors Frame size	Type	Shaft extension facing downwards				1000 rpm		750 rpm	
		3000 rpm		1500 rpm		Load down	Load up	Load down	Load up
		Load down	Load up	Load down	Load up				
	1LA8 ...								
	1PQ8 ...								
	1LL8 ...	N	N	N	N	N	N	N	N
315	... 315	1900	5240	2790	6930	3060	8600	3850	9390
	... 317	1440	5680	2280	7420	2390	9230	3190	10030
355	... 353	8480	5570	14550	7900	–	–	–	–
	... 355	8180	5860	14200	8240	15690	10650	17840	11650
	... 357	7530	6500	13400	9030	14540	11780	16690	12780
400	... 403	6780	7260	17640	11160	19500	14160	22260	15330
	... 405	6330	7700	17040	11750	18750	14910	21510	16070
	... 407	5930	8100	16340	12440	17900	15750	20660	16910
450	... 453	5330	9650	17720	13020	19950	16250	23040	17550
	... 455	4730	10250	17020	13720	19050	17140	22140	18440
	... 457	4130	10840	16270	14460	18000	18180	21090	19480

For 1LA8 and 1PQ8 motors in a horizontal type of construction, the admissible cantilever forces are specified with regard to the axial forces, see Page 0/69.

Data is available for 1LL8 motors on request.

Values shown without assuming a cantilever force on the shaft extension.

The admissible loads apply to operation at 50 Hz; please inquire about 60 Hz.

The figures for the admissible axial loads have been calculated assuming that standard coupling types are used for the drive.

For suppliers, see the relevant catalog part, section "Accessories".

Please inquire if the loading direction alternates.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Modular technology

Basic versions

The range of potential applications for the 1LA and 1LG motors can be broadened considerably by mounting the following modules (e.g. the motors can be used as brake motors).

- **1XP8 001** rotary pulse encoder, frame sizes 71 M to 315 L
- Separately driven fan, frame sizes 100 L to 315 L
- Brake, frame sizes 63 to 315 L

The brake must always be mounted in the factory for safety reasons. The rotary pulse encoder and/or the separately driven fan can also be retrofitted.

The degree of protection of the motors with modular technology is IP55. Higher degrees of protection on request.

When a rotary pulse encoder, brake or separately driven fan is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights".

1XP8 001 rotary pulse encoder



1XP8 001 rotary pulse encoder

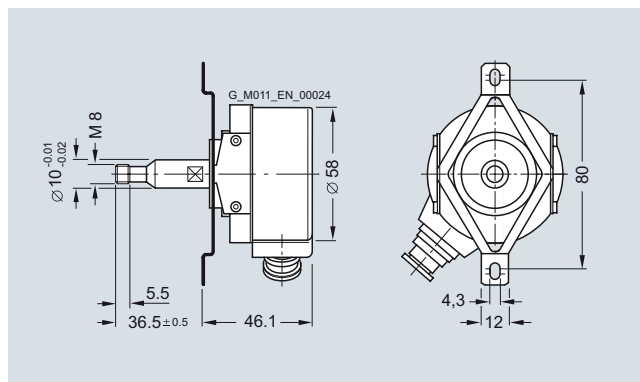
The rotary pulse encoder can be supplied already mounted in an HTL version as **1XP8 001-1** with order code **H57** or in a TTL version as **1XP8 001-2** with order code **H58**. The rotary pulse encoder can only be mounted on a standard non-drive end (NDE), i.e. a second shaft extension or protective cover cannot be supplied.

It can also be ordered separately and retrofitted (please inquire beforehand), Order No. **1XP8 001-1** or **1XP8 001-2** (see catalog part 2 "Standard motors", "Accessories").

The 1XP8 001 rotary pulse encoder is suitable for standard applications. The encoder does not have insulated bearings; therefore, it cannot be recommended at the risk of bearing currents in combination with insulated bearing cartridge NDE, order code L27, or with insulated bearing cartridge DE. For further encoders, see "Special technology" from Page 0/85.

All 1LG4 and 1LG6 motors that are listed in the catalog have an M16 center hole, form DS on the non-drive end (NDE). When a rotary pulse encoder is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights".

The rotary pulse encoders of "Modular technology" and "Special technology" are fitted as standard with a protective cover made of plastic. A protective cover made of non-corrosive sheet steel is available for 1LA5, 1LA6 and 1LA7 motors, see "Mechanical protection for encoders", order code **M68**, under "Mechanical design and degrees of protection".



Mounting dimensions of 1XP8 001 rotary pulse encoder

Mounting of encoder at temperatures below $-20\text{ }^{\circ}\text{C}$ and higher than $+40\text{ }^{\circ}\text{C}$ on request.

Technical data of rotary pulse encoders

	1XP8 001-1 (HTL version)	1XP8 001-2 (TTL version)
Supply voltage U_B	+10 V to +30 V	5 V $\pm 10\%$
Current input without load	200 mA	150 mA
Admissible load current per output	max. 100 mA	max. 20 mA
Pulses per revolution	1024	1024
Outputs	2 square-wave pulses A, B – 2 inverted square-wave pulses A, B Zero pulse and inverted zero pulse	
Pulse offset between the two outputs	$90^{\circ} \pm 20\%$	$90^{\circ} \pm 20\%$
Output amplitude	$U_{\text{High}} > U_B - 3.5\text{ V}$ $U_{\text{Low}} < 3\text{ V}$	$U_{\text{High}} > 2.5\text{ V}$ $U_{\text{Low}} < 0.5\text{ V}$
Minimum edge interval	0.8 μs at 160 kHz	0.45 μs at 300 kHz
Edge steepness (without load or cable)	$t_+, t_- \leq 200\text{ ns}$	$t_+, t_- \leq 100\text{ ns}$
Maximum frequency	160 kHz	300 kHz
Maximum speed	9000 rpm	12000 rpm
Temperature range	-20 to $+80\text{ }^{\circ}\text{C}$	-20 to $+100\text{ }^{\circ}\text{C}$
Degree of protection	IP66	IP66
Admissible radial cantilever force	60 N	60 N
Admissible axial force	40 N	40 N
Termination system	12-pin connector (mating connector is supplied)	
Certification	CSA, UL	CSA, UL
Weight	0.3 kg	0.3 kg

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Separately driven fan

The use of a separately driven fan is recommended to increase motor utilization at low speeds and to limit noise generation at speeds significantly higher than the synchronous speed. Both of these results can only be achieved with converter-fed operation. Please inquire about traction and vibratory operation.

The separately driven fan can be supplied already fitted, order code **G17**.

It can also be ordered separately and retrofitted. For selection information and order numbers, see catalog part 2 "Standard motors", "Accessories". A rating plate listing all the important data is fitted to the separately driven fan. Order code **Y81** and

plain text are required for supply voltages outside the rated voltage ranges for 1LG motors. Please note the direction of rotation of the separately driven fan (axial-flow fan) when connecting it. The admissible coolant temperatures for frame sizes 100 to 225 ¹⁾ are $CT_{min.} -25\text{ °C}$ and $CT_{max.} +65\text{ °C}$ ²⁾, lower/higher coolant temperatures on request. The admissible coolant temperatures for frame sizes 250 to 315 are $CT_{min.} -20\text{ °C}$ and $CT_{max.} +50\text{ °C}$, lower/higher coolant temperatures on request.

When a separately driven fan is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights".

Technical data of the separately driven fan (in accordance with tolerance DIN EN 60034-1)

Frame size	Rated voltage range		Frequency	Rated speed	Power consumption	Rated current
	V		Hz	rpm	kW	A
100	1 AC	230 to 277	50	2790	0.075	0.29
	3 AC	220 to 290 Δ	50	2830	0.086	0.27
	3 AC	380 to 500 Y	50	2830	0.086	0.16
	1 AC	230 to 277	60	3280	0.094	0.28
	3 AC	220 to 332 Δ	60	3490	0.093	0.27
	3 AC	380 to 575 Y	60	3490	0.093	0.16
112	1 AC	230 to 277	50	2720	0.073	0.26
	3 AC	220 to 290 Δ	50	2770	0.085	0.27
	3 AC	380 to 500 Y	50	2770	0.085	0.15
	1 AC	230 to 277	60	3000	0.107	0.31
	3 AC	220 to 332 Δ	60	3280	0.094	0.28
	3 AC	380 to 575 Y	60	3280	0.094	0.16
132	1 AC	230 to 277	50	2860	0.115	0.40
	3 AC	220 to 290 Δ	50	2880	0.138	0.45
	3 AC	380 to 500 Y	50	2880	0.138	0.24
	1 AC	230 to 277	60	3380	0.185	0.59
	3 AC	220 to 332 Δ	60	3470	0.148	0.41
	3 AC	380 to 575 Y	60	3470	0.148	0.24
160 to 225 ³⁾	1 AC	230 to 277	50	2780	0.236	0.96
	3 AC	220 to 290 Δ	50	2840	0.220	0.76
	3 AC	380 to 500 Y	50	2830	0.220	0.43
	3 AC	220 to 332 Δ	60	3400	0.284	0.94
	3 AC	380 to 575 Y	60	3400	0.284	0.56
250 M to 280 M	3 AC	200 to 240 Δ	50	2720	0.450	2.00
	3 AC	380 to 420 Y	50	2720	0.450	1.15
	3 AC	440 to 480 Y	60	3320	0.520	1.05
315 2-pole	3 AC	200 to 240 Δ	50	2750	0.650	2.85
	3 AC	380 to 420 Y	50	2750	0.650	1.64
	3 AC	440 to 480 Y	60	3365	0.750	1.60
315 4, 6, 8-pole	3 AC	200 to 240 Δ	50	2720	0.450	2.00
	3 AC	380 to 420 Y	50	2720	0.450	1.15
	3 AC	440 to 480 Y	60	3320	0.520	1.05

¹⁾ Separately driven fans with order numbers **1PP...** are used for 1LG motors of frame size 225 and above. The admissible coolant temperatures are $CT_{min.} -20\text{ °C}$ and $CT_{max.} +50\text{ °C}$

²⁾ The admissible coolant temperature for single phase versions (1AC) for frame size 160 and above is $CT_{max.} +50\text{ °C}$.

³⁾ Separately driven fans with order numbers **1PP...** are used for 1LG motors of frame size 225 and above. The values for frame sizes 250 M to 280 M are then applicable.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Mounting of separately driven fan and rotary pulse encoder with separately driven fan for 1LA5, 1LA6, 1LA7 and 1LG motors

Version	Frame size	Number of poles	Order No.
Separately driven fan incl. mounting parts ¹⁾	100	all	2CW2 180-8RF54-1AB0
	112	all	2CW2 210-8RF54-1AB1
	132	all	2CW2 250-8RF54-1AB2
	160	all	2CW2 300-8RF54-1AB3
	180	all	2CW2 300-8RF54-1AB4
	200	all	2CW2 300-8RF54-1AB5
	225 ²⁾	all	2CW2 300-8RF54-1AB6
	250	all	1PP9 063-2LA12-Z A11+K50 ³⁾
	280	all	1PP9 063-2LA12-Z A11+K50 ³⁾
	315	2	1PP9 070-2LA12-Z A11+K50 ³⁾
315	4 to 8	1PP9 063-2LA12-Z A11+K50 ³⁾	
Separately driven fan and rotary pulse encoder 1XP8 001-1 (HTL) ⁴⁾ incl. mounting parts ¹⁾	100	all	2CW2 180-8RF54-2AB0
	112	all	2CW2 210-8RF54-2AB1
	132	all	2CW2 250-8RF54-2AB2
	160	all	2CW2 300-8RF54-2AB3
	180	all	2CW2 300-8RF54-2AB4
	200	all	2CW2 300-8RF54-2AB5
	225 ²⁾	all	2CW2 300-8RF54-2AB6

Brakes

Spring-operated disk brakes are used for the brakes with order code **G26**. Depending on the selected motor, brake types **2LM8** or **KFB** are used. In the standard version, the brakes are supplied for connection to 230 V with rectifier. The supply voltage for brakes is explained under "Modular technology – Additional versions".

For the design of each brake type, the braking time, run-on revolutions, braking energy per braking procedure as well as the service life of the brake linings, see "Configuration of motors with brakes".

When a brake is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights". When a brake is mounted on a 1LA7 motor, a larger connection box (GK 127) is used for frame sizes 63 to 90.

2LM8 spring-operated disk brake

This brake is mounted on 1LA5 and 1LA7 motors in the frame sizes 63 to 225 and on 1LG motors in the frame sizes 180 to 225 as standard.

The 2LM8 brake has IP55 degree of protection.

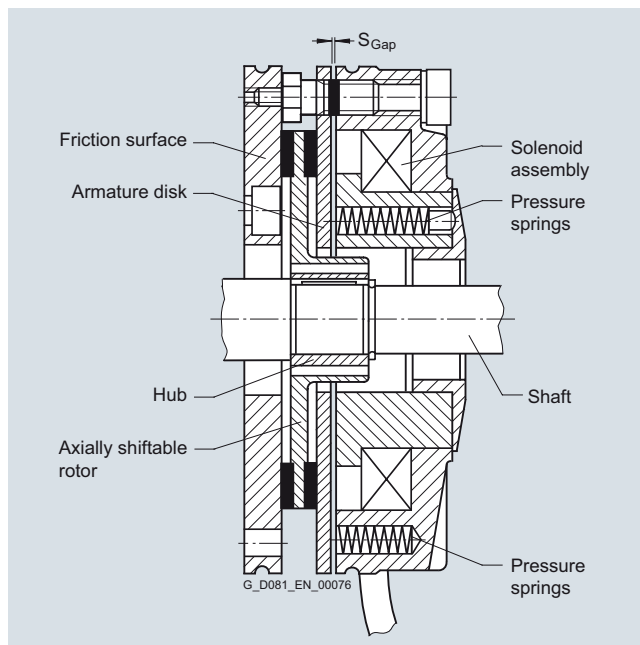
Please inquire if motors with brakes are to be operated below the freezing point or in very humid environments (e.g. close to the sea) with long standstill times.

Design and mode of operation

The brake takes the form of a single-disk brake with two friction surfaces.

The braking torque is generated by friction when pressure is applied by one or more pressure springs in the de-energized state. The brake is released electromagnetically.

When the motor brakes, the rotor which can be axially shifted on the hub or the shaft is pressed via the armature disk against the friction surface by means of the springs. In the braked state, there is a gap S_{Gap} between the armature disk and the solenoid component. To release the brake, the solenoid is energized with DC voltage. The resulting magnetic force pulls the armature disk against the spring force on to the solenoid component. The spring force is then no longer applied to the rotor which can rotate freely.



Design of the 2LM8 spring-operated disk brake

Rating plate

The motors have a second rating plate on the opposite side to the motor rating plate. The brake data is indicated on this second rating plate.

¹⁾ The separately driven fan **2CW2 ...** comprises a complete fan unit with impeller, the separately driven fan **1PP9 ...** only comprises the fan motor without mounting components and impeller.

²⁾ For 1LG motors with separately driven fan with Order No. **1PP9 063-2LA12-Z A11+K50** (weight 4.37 kg).

³⁾ For replacement purposes only.

⁴⁾ Rotary pulse encoder **1XP8001-2** (TTL) on request.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

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Operating values for spring-operated brakes with standard excitation

For motor frame size	Brake type	Rated braking torque at 100 rpm	Rated braking torque in relation to rated braking torque at 100 rpm in % for the following speeds			Supply voltage	Current/power input ¹⁾			Brake application time t_2 ²⁾	Brake release time	Brake moment of inertia	Noise level L_p with rated air gap	Service capability of the brake				
			1500 rpm	3000 rpm	Max. speed		A	W	ms					ms	kg m ²	dB (A)	Lifetime of brake lining L	Air gap adjustment required after braking energy L_N
63	2LM8 005-1NA10 2LM8 005-1NA60 2LM8 005-1NA80	5	87	80	65	AC 230	0.1	20	25	56	0.000013	77	105	16				
						AC 400	0.11											
						DC 24	0.83											
71	2LM8 005-2NA10 2LM8 005-2NA60 2LM8 005-2NA80	5	87	80	65	AC 230	0.1	20	25	56	0.000013	77	105	16				
						AC 400	0.11											
						DC 24	0.83											
80	2LM8 010-3NA10 2LM8 010-3NA60 2LM8 010-3NA80	10	85	78	65	AC 230	0.12	25	26	70	0.000045	75	270	29				
						AC 400	0.14											
						DC 24	1.04											
90	2LM8 020-4NA10 2LM8 020-4NA60 2LM8 020-4NA80	20	83	76	66	AC 230	0.15	32	37	90	0.00016	75	740	79				
						AC 400	0.17											
						DC 24	1.25											
100	2LM8 040-5NA10 2LM8 040-5NA60 2LM8 040-5NA80	40	81	74	66	AC 230	0.2	40	43	140	0.00036	80	1350	115				
						AC 400	0.22											
						DC 24	1.67											
112	2LM8 060-6NA10 2LM8 060-6NA60 2LM8 060-6NA80	60	80	73	65	AC 230	0.25	53	60	210	0.00063	77	1600	215				
						AC 400	0.28											
						DC 24	2.1											
132	2LM8 100-7NA10 2LM8 100-7NA60 2LM8 100-7NA80	100	79	72	65	AC 230	0.27	55	50	270	0.0015	77	2450	325				
						AC 400	0.31											
						DC 24	2.3											
160	2LM8 260-8NA10 2LM8 260-8NA60 2LM8 260-8NA80	260	75	68	65	AC 230	0.5	100	165	340	0.0073	79	7300	935				
						AC 400	0.47											
						DC 24	4.2											
180	2LM8 315-0NA10 2LM8 315-0NA60 2LM8 315-0NA80	315	75	68	65	AC 230	0.5	100	152	410	0.0073	79	5500	470				
						AC 400	0.56											
						DC 24	4.2											
200, 225	2LM8 400-0NA10 2LM8 400-0NA60 2LM8 400-0NA80	400	73	68	65	AC 230	0.55	110	230	390	0.0200	93	9450	1260				
						AC 400	0.61											
						DC 24	4.6											

¹⁾ For 400 V AC and for 24 V DC, the power can deviate by up to +10 % as a function of the selected supply voltage.

²⁾ The specified switching times are valid for switching on the DC side with a rated release travel and with the coil already warm. They are average values which may vary depending on factors such as the rectifier type and the release travel. The brake application time for switching on the AC side, for example, is approximately 6 times longer than for switching on the DC side.

Lifetime of the brake lining

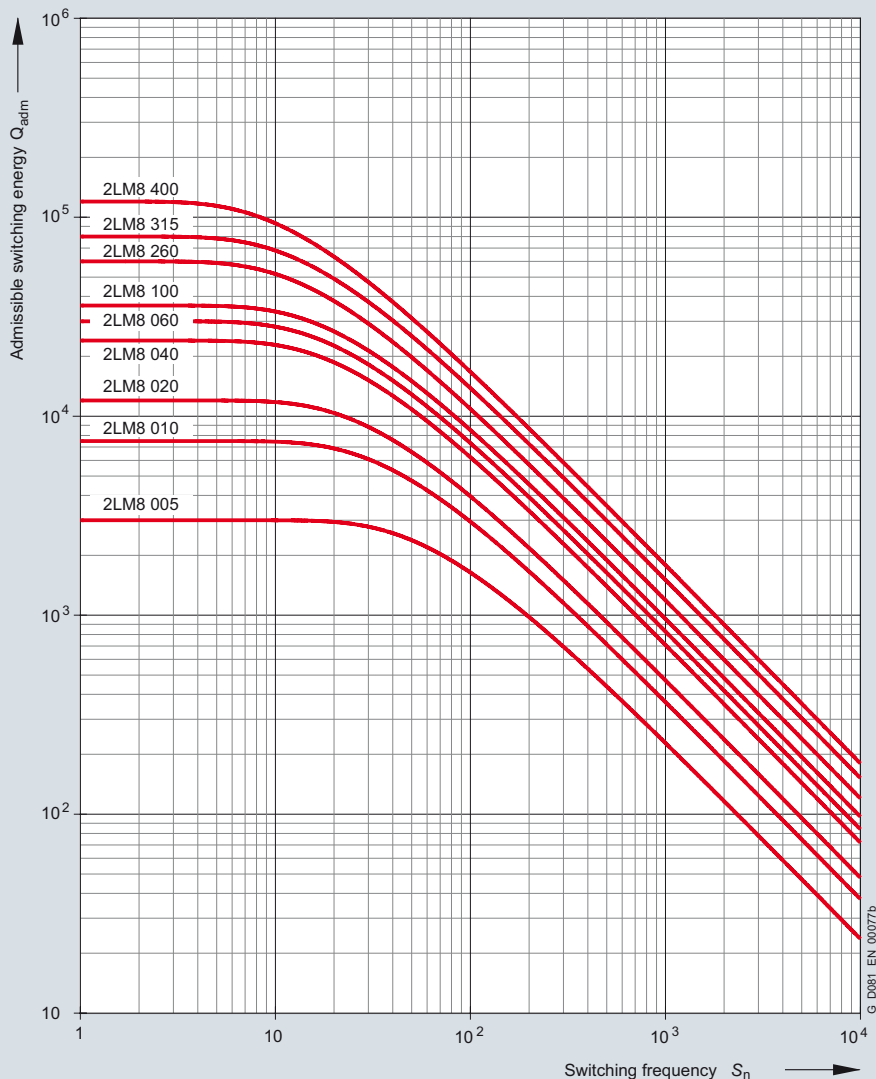
The braking energy L_N up to when the brake should be adjusted, depends on various factors. The main influencing factors include the masses to be braked, the operating speed, the switching frequency and therefore the temperature at the frictional surfaces. It is therefore not possible to specify a value for the friction energy until readjustment that is valid for all operating conditions.

The specific wear on the friction surfaces (volume of wear per unit of friction energy) is approximately 0.05 to 2 cm³/kWh when the brake is used as a service brake.

Admissible speeds

The maximum admissible speeds from which emergency stops can be made, are listed in the table. These speeds should be considered as recommended values and must be checked under actual operating conditions.

The maximum admissible friction energy depends on the switching frequency and is shown for the various brakes in the figure "Admissible switching energy as a function of the switching frequency". Increased wear can be expected when the brakes are used for emergency stops.



IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

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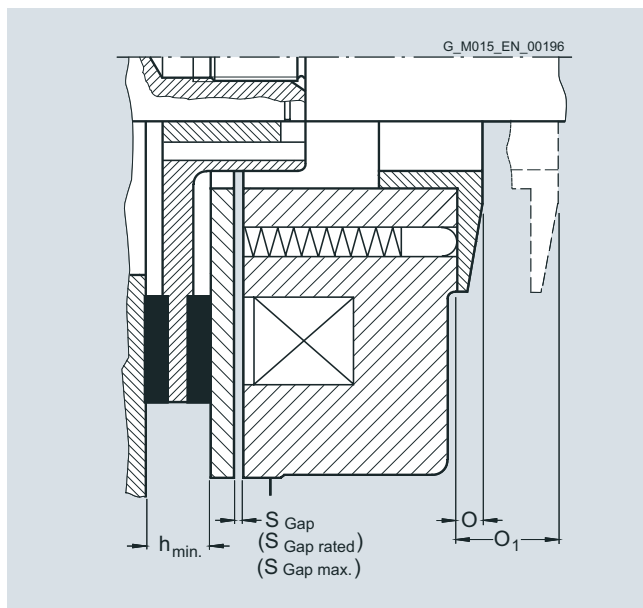
For motor frame size	Brake type	Admissible speeds			Changing the braking torque			Readjusting the air gap		
		Max. operating rpm if max. operating energy utilised	Max. no-load rpm with emergency stop function		Reduction per notch	Dim. "O ₁ "	Min. braking torque	Rated air gap S _{Gap Rated}	Max. air gap S _{Gap max.}	Min. rotor thickness h _{min.}
			Horizontal mounting	Vertical mounting						
		rpm	rpm	rpm	Nm	mm	Nm	mm	mm	mm
63	2LM8 005-1NA ..	3000	6000	6000	0.17	7.0	3.7	0.2	0.4	4.5
71	2LM8 005-2NA ..	3000	6000	6000	0.17	7.0	3.7	0.2	0.4	4.5
80	2LM8 010-3NA ..	3000	6000	6000	0.35	8.0	7.0	0.2	0.45	5.5
90	2LM8 020-4NA ..	3000	6000	6000	0.76	7.5	18.2	0.2	0.55	7.5
100	2LM8 040-5NA ..	3000	6000	6000	1.29	12.5	21.3	0.3	0.65	8.0
112	2LM8 060-6NA ..	3000	6000	6000	1.66	11.0	32.8	0.3	0.75	7.5
132	2LM8 100-7NA ..	3000	5300	5000	1.55	13.0	61.1	0.3	0.75	8.0
160	2LM8 260-8NA ..	1500	4400	3200	5.6	17.0	157.5	0.4	1.2	12.0
180	2LM8 315-0NA ..	1500	4400	3200	5.6	17.0	178.4	0.4	1.0	12.0
200, 225	2LM8 400-0NA ..	1500	3000	3000	6.15	21.0	248.7	0.5	1.5	15.5

Changing the braking torque

The brake is supplied with the braking torque already set. For 2LM8 brakes, the torque can be reduced to the dimension O₁ by unscrewing the adjusting ring with a hook spanner. The braking torque changes by the values shown in the above table for each notch of the adjusting ring.

Readjusting the air gap

Under normal operating conditions, the brake is practically maintenance-free. The air gap S_{Gap} must only be checked at regular intervals if the application requires an extremely large amount of frictional energy and readjusted to the rated gap S_{Gap Rated} at the latest when the maximum air gap S_{Gap max.} is reached.



KFB spring-operated brake

This brake is the standard brake for 1LG motors in frame sizes 250 to 315. For frame sizes 180 to 225, apart from the standard brake 2LM8, KFB brakes can also be supplied. Special brake selections are available on request.



KFB spring-operated brake

The KFB solenoid double-disk spring-operated brake is a safety brake which brakes the motor if the supply is disconnected (power failure, emergency stop). The KFB brake, IP65 degree of protection, is mainly used for electric motors for traversing, cross-traversing and lifting gear in cranes as well as for special industrial applications.

Design and mode of operation

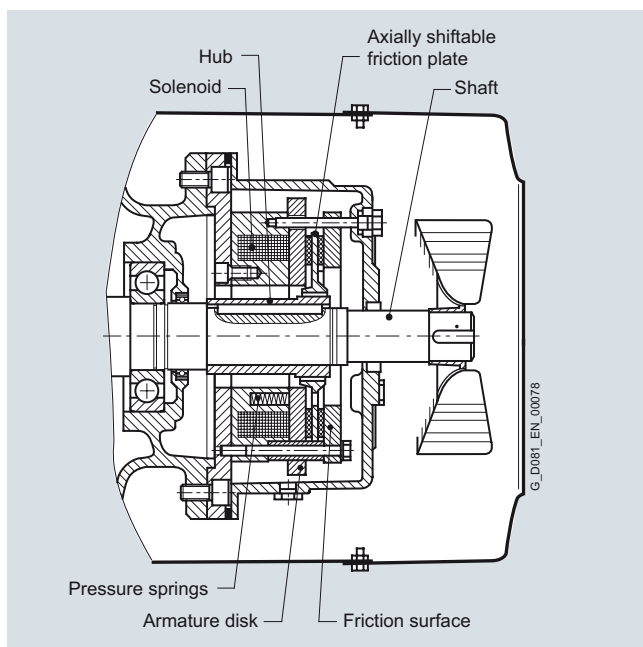
When the brake current is switched on, an electromagnetic field develops which overcomes the spring force of the brake. The corresponding modules, including the motor shaft, can rotate freely. The brake is released. If the brake current is switched off or if there is a power failure, the electromagnetic field of the brake disappears. The mechanical braking energy is transferred to the motor shaft. The motor is braked.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

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Rating plate

The motors have a rating plate that indicates the brake data on the opposite side to the motor rating plate.

Other characteristics of the KFB brake

- High IP65 degree of protection
- Corrosion-resistant in seawater and in the tropics.
- The brake is a dynamic brake, not simply a holding brake. For this reason there is less wear, especially in the case of emergency stops (commissioning).
- High wear reserves – repeated stepless air gap readjustment is possible. This results in extremely long operating times and low service and operating costs.
- The function and wear can be monitored with microswitches and proximity switches. Microswitch On/Off is standard for LG motors. Anti-condensation heating is possible as an option.
- Fully functional brake for enclosure acceptance test. Visual inspection of brake is possible during operation.
- The brake (air gap) can be adjusted in the factory, for example, and mounted on the motor without further adjustments.

The wear parts can be replaced without great outlay. After the housing has been opened (three screws), it is easy to replace the friction plate. It is not necessary to disassemble the entire brake.

Overview of brake selection for 1LG motors

		For motor Frame size					
		180 ¹⁾	200 ¹⁾	225 ¹⁾	250 ²⁾	280 ²⁾	315 ²⁾
Number of poles		2 to 8	2 to 8	2 to 8	2 to 8	4 to 8	4 to 8
NDE bearing		6310C3	6312C3	6313C3	6215C3	6317C3	6319C3
Flange bearing plate for NDE brake mounting		A300	A350	A350	A400	A450	A550
Max. diameter for 2nd. shaft extension		48k6	55m6	55m6	48m6	65m6	70m6
Brake type		KFB 25	KFB 40	KFB 40	KFB 63	KFB 100	KFB 160
Braking torque	Nm	250	400	400	630	1000	1600
n_{max} – IM B3	rpm	6000	5500	5500	4700	4000	3600
n_{max} – IM V1	rpm	6000	5500	5500	4700	4000	3600
Output at 110 V DC	W	158	196	196	220	307	344
Current at 230 V AC (207 V DC coil voltage)	A	0.77	0.91	0.91	1	1.53	1.64
Current at 400 V AC (180 V DC coil voltage)	A	0.8	1.18	1.18	1.25	1.8	2.1
Current at 110 V DC	A	1.44	1.78	1.78	2	2.79	3.13
Current at 24 V DC	A	5.21	6.92	9.62	8.17	12.2	12.8
Application time t_2	ms	70	80	80	110	125	180
Release time	ms	240	250	250	340	370	500
Brake moment of inertia	Kg m ²	0.0048	0.0068	0.0068	0.0175	0.036	0.050
Lifetime of brake lining L	Nm · 10 ⁶	3600	3110	3110	4615	7375	10945
Air gap adjustment required after braking energy L_N	Nm · 10 ⁶	810	935	935	1185	2330	3485

¹⁾ The standard brake for frame sizes 180 to 225 is the 2LM8 brake. KFB brake on request.

²⁾ The standard brake for frame sizes 250 to 315 is the KFB brake.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Configuration of motors with brakes

Braking time

The time it takes the motor to come to a standstill comprises two components:

a.) The application time of the brake t_2

b.) The braking time t_{Br}

$$t_{Br} = \frac{J \cdot n_{rated}}{9.55 \cdot (T_B \pm T_L)}$$

t_{Br} Braking time in s

J Total moment of inertia in kgm^2

n_{Rated} Rated speed of the motor with brake in rpm

T_B Rated braking torque in Nm

T_L Average load torque in Nm
(if T_L supports braking, T_L is positive)

Braking energy per braking operation Q_{adm}

The braking energy per braking operation in Nm comprises the energy of the moments of inertia to be braked Q_{Kin} and the energy Q_L , which must be applied in order to brake against a load torque.

$$Q_{adm} = Q_{Kin} + Q_L$$

a.) The energy of the moments of inertia in Nm

$$Q_{Kin} = \frac{J \cdot n_{rated}^2}{182.4}$$

n_{Rated} Rated speed before braking in rpm

J Total moment of inertia in kgm^2

b.) The braking energy in Nm against a load torque:

$$Q_L = \frac{\pm T_L \cdot n_{rated} \cdot t_{Br}}{19.1}$$

T_L average load torque in Nm

T_L is positive if it acts against the brake

T_L is negative if it supports the brake

Run-on revolutions U

The number of run-on revolutions U of the motor with brake can be calculated as follows:

$$U = \frac{n_{rated}}{60} \left(t_2 + \frac{t_{Br}}{2} \right)$$

t_2 Brake application time in ms

Lifetime of the brake lining L and readjustment of the air gap

The brake lining wears due to friction which increases the air gap and the release time for the brake at standard excitation.

When the brake lining is worn out, it can be replaced easily.

In order to calculate the lifetime of the brake lining in terms of operations S_{max} , then the lifetime of the brake lining L in Nm must be divided by the braking energy Q_{adm} :

$$S_{max} = \frac{L}{Q_{adm}}$$

The interval between adjustments N in can be calculated in terms of operations by dividing the braking energy L_N which the brake can output until it is necessary to readjust the working air gap by Q_{adm} :

$$N = \frac{L_N}{Q_{adm}}$$

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

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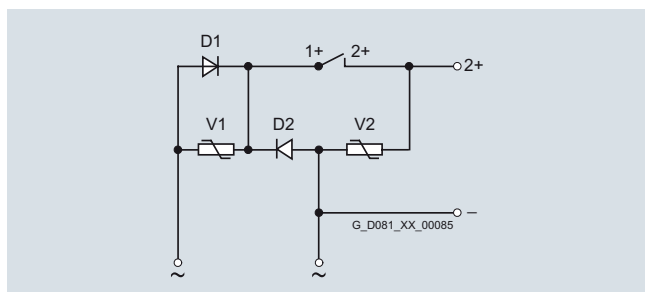
Additional versions

Depending on the selected motor, brake types 2LM8 or KFB are used.

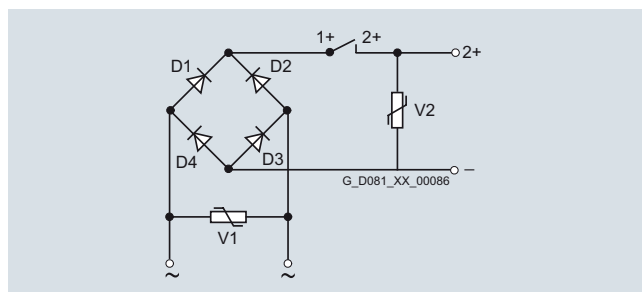
2LM8 spring-operated disk brake	KFB spring-operated brake
Motor series	
This brake is mounted on 1LA5 and 1LA7 motors in the frame sizes 63 to 225 and on 1LG motors in the frame sizes 180 to 225 as standard.	This brake is the standard brake for 1LG motors in frame sizes 250 to 315.
Voltage and frequency	
The solenoids and the rectifiers of the brakes are designed for connection to the following voltages: 1 AC 50 Hz 230 V $\pm 10\%$ or 1 AC 60 Hz 230 V $\pm 10\%$	The solenoids and the rectifiers of the brakes are designed for connection to the following voltages: 1 AC 50 Hz 230 V $\pm 10\%$
When 60 Hz is used, the voltage for the brake must not be increased!	When 60 Hz is used, the voltage for the brake must not be increased!
The brake can also be supplied for other voltages:	The brake can also be supplied for other voltages:
<ul style="list-style-type: none"> • Brake supply voltage: 24 V DC Order code C00 • Brake supply voltage: 400 V AC (directly at the terminal strip) Order code C01 • Brake supply voltage: 180 V DC, for operation on MM411 ECOFAST (directly at the terminal strip) Order code C02 	<ul style="list-style-type: none"> • Brake supply voltage: 24 V DC Order code C00 • Brake supply voltage: 400 V AC (directly at the terminal strip) Order code C01
Order codes C00 , C01 and C02 may only be used in conjunction with order code G26 .	The codes C00 and C01 may only be used in conjunction with Code G26 .
Connections	
Labeled terminals are provided in the main connection box of the motor to connect the brake.	The motors are equipped with an additional connection box on the side of the main connection box that is used specifically for connection of the brake. KFB brakes are connected through a standard bridge or half-wave rectifier. See the circuit diagrams below.
The AC voltage for the brake excitation winding is connected to the two free terminals of the rectifier block (~).	A special circuit is not required. Optimal switching times are achieved without the need to use special circuits.
The brake can be released when the motor is at a standstill by separately exciting the solenoid. In this case, an AC voltage must be connected at the rectifier block terminals. The brake remains released as long as this voltage is present.	
The rectifier is protected against overvoltages by varistors in the input and output circuits.	
For 24 V DC brakes, the brake terminals are directly connected to the DC voltage source.	
See the circuit diagrams below.	
Fast brake application	
If the brake is disconnected from the line supply, the brake is applied. The application time for the brake disk is delayed as a result of the inductance of the solenoid (shutdown on the AC side). This results in a considerable delay before the brake is mechanically applied. In order to achieve short brake application times, the circuit must be interrupted on the DC side. To realize this, the wire jumpers, located between contacts 1+ and 2+ at the rectifier are removed and replaced by the contact of an external switch (see circuit diagrams below).	Not available for the KFB brake.
For 1LG motors with a 2LM8 brake, "Fast application of the brake" is not possible in the standard version. Please contact your local Siemens office for advice.	
Manual brake release with lever	
The brakes can be supplied with a mechanical manual release with lever. Order code K82 .	The brake can be released manually with screws as standard. Mechanical manual release with a lever can be ordered with Order code K82 .
The dimensions of the brake lever depend on the motor frame size and can be read from the dimension drawing generator for motors in the SD configurator tool for low-voltage motors.	The dimensions of the brake lever depend on the motor frame size and can be read from the dimension drawing generator for motors in the SD configurator tool for low-voltage motors.

Bridge rectifier / half-wave rectifier

Brakes are connected through a standard bridge or half-wave rectifier or directly to the 2LM8 or KFB brake. See the circuit diagrams below.



Half-wave rectifier 400 V AC



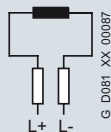
Bridge rectifier, 230 V AC

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0



Brake connection for 24 V DC

Combinations of basic versions

The following combinations of modular technology can be supplied by the factory when ordered using the predefined order codes:

Mounting of brake ¹⁾ and 1XP8 001 rotary pulse encoder

The brake (order code G26) and the rotary pulse encoder 1XP8 001-1 HTL (order code H57) can be supplied already mounted in combination.

Order code **H62**.

The brake (order code G26) and the rotary pulse encoder 1XP8 001-2 TTL (order code H58) can be supplied already mounted in combination.

Order code **H98**.

Mounting of separately driven fan and 1XP8 001 rotary pulse encoder

The separately driven fan (order code G17) and the rotary pulse encoder 1XP8 001-1 HTL (order code H57) can be supplied already mounted in combination.

Order code **H61**.

The separately driven fan (order code G17) and the rotary pulse encoder 1XP8 001-2 TTL (order code H58) can be supplied already mounted in combination.

Order code **H97**.

Mounting of brake ¹⁾ and separately driven fan

The brake (order code G26) and separately driven fan (order code G17) can be supplied already mounted in combination.

Order code **H63**.

Mounting of brake, ¹⁾ separately driven fan and 1XP8 001 rotary pulse encoder

The brake (order code G26), the separately driven fan (order code G17) and the rotary pulse encoder 1XP8 001-1 HTL (order code H57) can be supplied already mounted in combination.

Order code **H64**.

The brake (order code G26), the separately driven fan (order code G17) and the rotary pulse encoder 1XP8 001-2 TTL (order code H58) can be supplied already mounted in combination.

Order code **H99**.

When a rotary pulse encoder, brake or separately driven fan is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights".

¹⁾ The spring-operated brake 2LM8 (see from Page 0/77) is mounted as standard on 1LA5 and 1LA7 motors in the frame sizes 63 to 225 and on 1LG motors in frame sizes 180 to 225.
For 1LG motors in the frame sizes 250 to 315 the spring-operated brake KFB is the standard brake (see from Page 0/80).

General technical data

Special technology

Prepared for mounting MICROMASTER Integrated (MMI)

Converter mounting is possible for motor series 1LA7 frame sizes 56 to 132 for 230 V Δ /400 VY if the MICROMASTER DA 51.3 type is specified. Not possible for motors with special insulation for 690 V.

Order code **H15**

Brake (specially for 1LA8 and 1PQ8 motor series)

For motor series 1LA8 and 1PQ8, a solenoid double-disk spring-operated brake of type NFA (from Stromag) can be supplied at the drive end (DE). The brake can only be used as a holding brake. See the table below for values for the holding brake torque.

Order code **H47**, price on request

For motors	Brake size	Holding brake torque T_H
1LA8, 1PQ8	NFA	Nm
31 .	160/250	2500
35 .	160/250	2500
	250/400	4000
40 .	250/400	4000
	400/630	6300
45 .	400/630	6300
	630/1000	10000

When a brake is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights".

The brake is generally procured and mounted by the factory.

Further information is available on request.

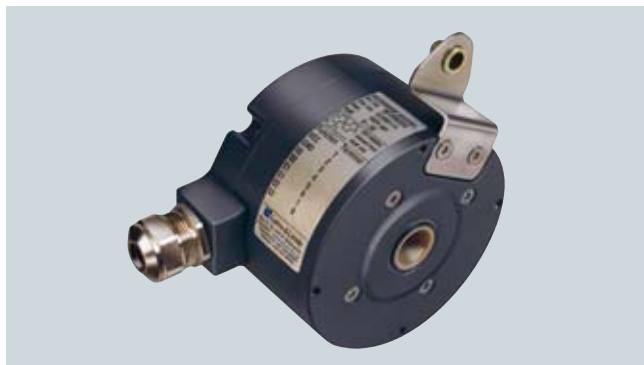
The "Special technology" comprises rotary pulse encoders for frame sizes 100 L to 450 of 1LA5, 1LA6, 1LA7, 1LA8 and 1LG4/6 motors. Please inquire about the specified rotary pulse encoders for 1LA9 motors.

The order codes listed under "Special technology" cannot be combined in the case of 1LA motors with order codes from the modular technology range.

For 1LG motors, order codes **G17** (mounting of separately driven fan), **G26** (mounting of brake) and **H63** (mounting of brake and separately driven fan) from the modular technology range can be combined with the "Special technology" rotary pulse encoders.

When a rotary pulse encoder is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights".

LL 861 900 220 rotary pulse encoder



With its rugged construction, this rotary pulse encoder is also suitable for difficult operating environments. It is resistant to shock and vibration and has insulated bearings.

The LL 861 900 220 rotary pulse encoder can be supplied already mounted.

Order code **H70**.

The LL 861 900 220 rotary pulse encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, order code **H78** must be specified. The rotary pulse encoder is not part of the scope of supply in this case. The mounting components required will be supplied. For motors in Zone 2 (Ex n), a special rotary pulse encoder can be supplied (please inquire).

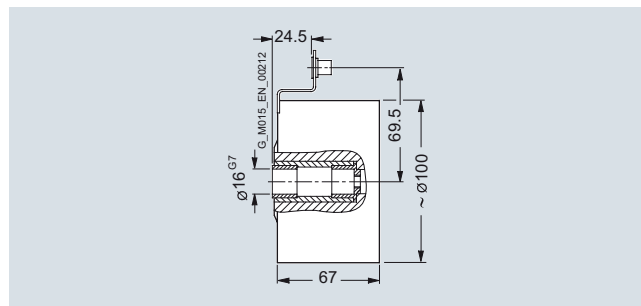
The version of the rotary pulse encoder with a diagnostics system (ADS) can be supplied by Leine and Linde.

Manufacturer:

Leine and Linde (Germany) GmbH
Bahnhofstraße 36
73430 Aalen
Tel. +49 (0)73 61-78093-0
Fax +49 (0)73 61-78093-11

<http://www.leinelinde.com>

e-mail: info@leinelinde.se



Mounting dimensions of LL 861 900 220 rotary pulse encoder

Technical data for LL 861 900 220 (HTL version)

Mounting of encoder at temperatures below $-20\text{ }^{\circ}\text{C}$ and higher than $+40\text{ }^{\circ}\text{C}$ on request.

Supply voltage U_B	9 V to +30 V
Current input without load	max. 80 mA
Admissible load current per output	40 mA
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, A', B, B', 0, 0', High Current HTL
Pulse offset between the two outputs	$90^{\circ} \pm 25^{\circ}$ el.
Output amplitude	$U_{\text{High}} > U_B - 4\text{ V}$ $U_{\text{Low}} < 2.5\text{ V}$
Mark space ratio	1:1 $\pm 10\%$
Edge steepness	50 V/ μs (without load)
Maximum frequency	100 kHz for 350 m cable
Admissible speed	4000 rpm
Temperature range	-20 to $+80\text{ }^{\circ}\text{C}$
Degree of protection	IP65
Admissible radial cantilever force	300 N
Admissible axial force	100 N
Termination system	Terminal strips in encoder, cable connection M20 x 1.5 radial
Weight	Approx. 1.3 kg

Mounting a special type of rotary pulse encoder

For motor series 1LA8, 1PQ8 and 1LL8, if the encoder designation is specified in the order, a special type of rotary pulse encoder can be supplied already mounted, provided the technical executability is given. In this case, the encoder is procured by the factory. When ordering, specify the rotary pulse encoder in plain text.

Order code **Y70**. Price and availability on request.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

HOG9 D 1024 I rotary pulse encoder



The encoder is fitted with insulated bearings.

The HOG 9 D 1024 I rotary pulse encoder can be supplied already mounted.

Order code **H72**.

The HOG 9 D 1024 I rotary pulse encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, order code **H79** must be specified. The rotary pulse encoder is not part of the scope of supply in this case. The mounting components required will be supplied.

Manufacturer:

Baumer Hübner GmbH

Planufer 92b

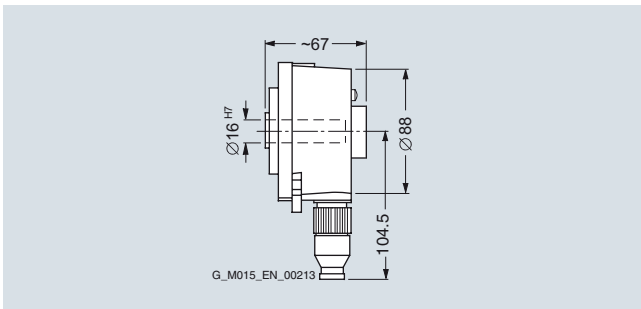
10967 Berlin

Tel. +49 (0)30-6 90 03-0

Fax +49 (0)30-6 90 03-1 04

<http://www.baumerhuebner.com>

e-mail: info@baumerhuebner.com



HOG 9 D 1024 I rotary pulse encoder

Technical data for HOG 9 D 1024 I rotary pulse encoder (HTL version)

Mounting of encoder at temperatures below -20 °C and higher than $+40\text{ °C}$ on request.

Supply voltage U_B	+9 V to +30 V
Current input without load	50 to 100 mA
Admissible load current per output	60 mA, 300 mA (peak)
Pulses per revolution	1024
Outputs	4 short-circuit proof square-wave pulses A, B and A', B'
Pulse offset between the two outputs	$90^\circ \pm 20\%$
Output amplitude	$U_{\text{High}} \geq U_B - 3.5\text{ V}$ $U_{\text{Low}} \leq 1.5\text{ V}$
Mark space ratio	1:1 $\pm 20\%$
Edge steepness	10 V/ μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	$-30\text{ to }+100\text{ °C}$
Degree of protection	IP56
Admissible radial cantilever force	300 N
Admissible axial force	200 N
Termination system	Radial plug (mating connector is part of the scope of supply)
Mech. design acc. to Hübner Ident. No.	73 522 E
Weight	Approx. 0.7 kg

HOG 10 D rotary pulse encoder

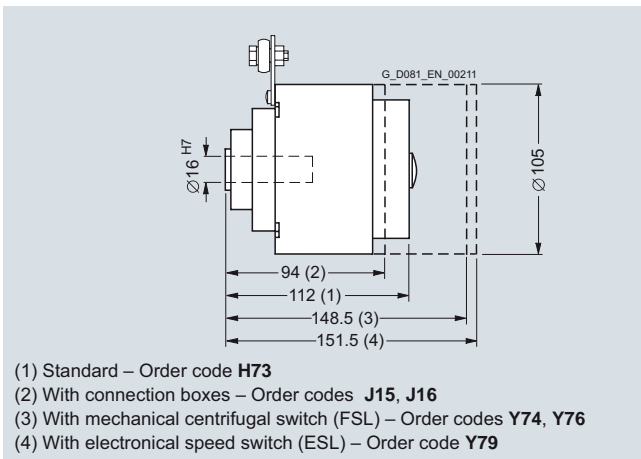
This encoder is extremely rugged and is therefore suitable for difficult operating conditions. It is fitted with insulated bearings.

The HOG 10 D rotary pulse encoder can be supplied already mounted in different versions. The manufacturer is the same; only the technical data and the respective dimensions and weights change.

Mounting of encoder at temperatures below -20 °C and higher than $+40\text{ °C}$ on request.

Manufacturer:
Baumer Hübner GmbH
Planufer 92b
10967 Berlin
Tel. +49 (0)30-6 90 03-0
Fax +49 (0)30-6 90 03-1 04

<http://www.baumerhuebner.com>
e-mail: info@baumerhuebner.com



- (1) Standard – Order code **H73**
 (2) With connection boxes – Order codes **J15, J16**
 (3) With mechanical centrifugal switch (FSL) – Order codes **Y74, Y76**
 (4) With electronic speed switch (ESL) – Order code **Y79**

HOG 10 D 1024 rotary pulse encoder

HOG 10 D 1024 I rotary pulse encoder

The rotary pulse encoder HOG 10 D 1024 I can be supplied already mounted.

Order code **H73**

The rotary pulse encoder HOG 10 D 1024 I can also be retrofitted to a motor prepared for this. When the motor is ordered, order code **H80** must be specified. The rotary pulse encoder is not part of the scope of supply in this case. The mounting components required will be supplied.

Technical data for HOG 10 D 1024 I (HTL version)

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible load current per output	60 mA, 300 mA (peak)
Pulses per revolution	1024
Outputs	4 short-circuit proof square-wave pulses A, B and A', B'
Pulse offset between the two outputs	$90^\circ \pm 20\%$
Output amplitude	$U_{High} \geq U_B - 3.5\text{ V}$ $U_{Low} \leq 1.5\text{ V}$
Mark space ratio	1:1 $\pm 20\%$
Edge steepness	10 V/ μ s
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-40 to $+100\text{ °C}$
Degree of protection	IP66
Admissible radial cantilever force	400 N
Admissible axial force	250 N
Termination system	Terminals, cable connection M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 055 E
Weight	Approx. 1.6 kg

Rotary pulse encoder HOG 10 DN 1024 I, connection box protection against moisture

The rotary pulse encoder HOG 10 DN 1024 I can be supplied with the already mounted connection box in version with protection against moisture (IP56).

Order code **J15**

Technical data HOG 10 DN 1024 I (HTL version), connection box protection against moisture

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, B and A', B', N, N'
Pulse offset between the two outputs	$90^\circ \pm 20\%$
Output amplitude	$U_{High} \geq U_B - 3.5\text{ V}$ $U_{Low} \leq 1.5\text{ V}$
Mark space ratio	1:1 $\pm 20\%$
Edge steepness	10 V/ μ s
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-40 to $+100\text{ °C}$
Degree of protection	IP66
Max. admissible radial cantilever force	400 N
Max. admissible axial force	250 N
Termination system	Terminals, cable connection M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 007E-HOG10
Weight	Approx. 1.6 kg

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Rotary pulse encoder HOG 10 DN 1024 I, connection box protection against dust

The rotary pulse encoder HOG 10 DN 1024 I can be supplied with the already mounted connection box in version with protection against dust (IP65).

Order code **J16**

Technical data HOG 10 DN 1024 I (HTL version), connection box protection against dust

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, B and A', B', N, N'
Pulse offset between the two outputs	90° ±20 %
Output amplitude	$U_{High} \geq U_B - 3.5 \text{ V}$ $U_{Low} \leq 1.5 \text{ V}$
Mark space ratio	1:1 ±20 %
Edge steepness	10 V/μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-40 to +100 °C
Degree of protection	IP66
Max. admissible radial cantilever force	400 N
Max. admissible axial force	250 N
Termination system	Terminals, cable connection M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 006E-HOG10
Weight	Approx. 1.6 kg

Rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed ... rpm), connection box protection against moisture

The rotary pulse encoder HOG 10 DN 1024 I can be supplied with the already mounted connection box in version with protection against moisture (IP56) and mechanical centrifugal switch (FSL).

An operating speed of the centrifugal switch within the admissible range must be specified in plain text, see technical data of the rotary pulse encoder.

Order code **Y74**

Technical data HOG 10 DN 1024 I (HTL version) + FSL, (speed rpm), connection box protection against moisture

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, B and A', B', N, N'
Pulse offset between the two outputs	90° ±20 %
Output amplitude	$U_{High} \geq U_B - 3.5 \text{ V}$ $U_{Low} \leq 1.5 \text{ V}$
Mark space ratio	1:1 ±20 %
Edge steepness	10 V/μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-40 to +100 °C
Degree of protection	IP66
Max. admissible radial cantilever force	400 N
Max. admissible axial force	250 N
Centrifugal switch	
Operating speed	850 ... 4900 rpm
Maximum speed	1.25 x n
Differential gap, clockwise/counter-clockwise	≈ 3 %
Speed hysteresis	≈ 40 %
Switching capacity	6 A/230 V AC; 1 A 125 V DC
Termination system	Terminals, cable connection M20 x 1.5 + M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 035F-HOG10
Weight	Approx. 2.1 kg

Rotary pulse encoder HOG 10 DN 1024 I +FSL, connection box protection against dust

The rotary pulse encoder HOG 10 DN 1024 I can be supplied with the already mounted connection box in version with protection against dust (IP65) and mechanical centrifugal switch (FSL). An operating speed of the centrifugal switch within the admissible range must be specified in plain text, see technical data of the rotary pulse encoder.

Order code **Y76**

Technical data HOG 10 DN 1024 I (HTL version +) + FSL, (speed rpm), connection box protection against dust

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, B and A', B', N, N'
Pulse offset between the two outputs	90° ±20 %
Output amplitude	$U_{High} \geq U_B - 3.5 V$ $U_{Low} \leq 1.5 V$
Mark space ratio	1:1 ±20 %
Edge steepness	10 V/μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-40 to +100 °C
Degree of protection	IP66
Max. admissible radial cantilever force	400 N
Max. admissible axial force	250 N
Centrifugal switch	
Operating speed	850 ... 4900 rpm
Maximum speed	1.25 x n
Differential gap, clockwise/counter-clockwise	≈ 3 %
Speed hysteresis	≈ 40 %
Switching capacity	6 A/230 V AC; 1 A 125 V DC
Termination system	Terminals, cable connection M20 x 1.5 + M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 022F-HOG10
Weight	Approx. 2.1 kg

Rotary pulse encoder HOG 10 DN 1024 I + ESL 93, (speed ... rpm), connection box protection against dust

The rotary pulse encoder HOG 10 DN 1024 I can be supplied with the already mounted connection box in version with protection against dust (IP65) and electronic speed switch (ESL). One up to three operating speeds of the electronic switch within the admissible range must be specified in plain text, see technical data of the rotary pulse encoder.

Order code **Y79**

Technical data HOG 10 DN 1024 I (HTL version) + ESL 93, (speed rpm), connection box protection against dust

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, B and A', B', N, N'
Pulse offset between the two outputs	90° ±20 %
Output amplitude	$U_{High} \geq U_B - 3.5 V$ $U_{Low} \leq 1.5 V$
Mark space ratio	1:1 ±20 %
Edge steepness	10 V/μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-40 to +100 °C
Degree of protection	IP66
Max. admissible radial cantilever force	400 N
Max. admissible axial force	250 N
Electronical switch	
Operating speed	3 x 200 ... 5000 rpm
Maximum speed	6000 rpm
Switching accuracy	± (2-4) %
Switching capacity	3 x 49 mADC
With relay module (external relay module required!)	3 x 6 A/230 V AC; 1 A 125 V DC
Differential gap, clockwise/counter-clockwise	≈ 3 %
Speed hysteresis	max. 30 %
Principle	Electronics
Auxiliary power	12 V/5 mA
Termination system	Terminals, cable connection M20 x 1.5 + M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 031E-HOG10
Weight	Approx. 2.9 kg

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Dimensions and weight

Fig. 1 Brake
Order code **G26**
[optionally with manual release, order code **K82**]

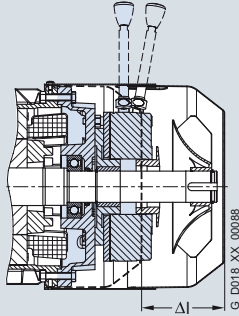


Fig. 2 Brake for 1LA8 and 1PQ8 motor series at drive end (DE)
Order code **H47**

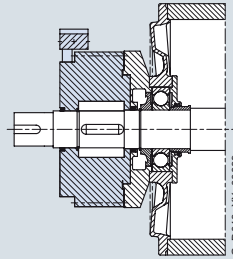


Fig. 3 Rotary pulse encoders (on cover)
Order codes **H57, H58, H70, H72, H73, (H78), (H79), (H80), J15, J16, Y74, Y76, Y79**

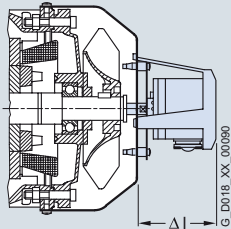
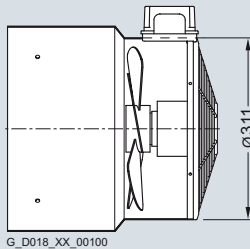
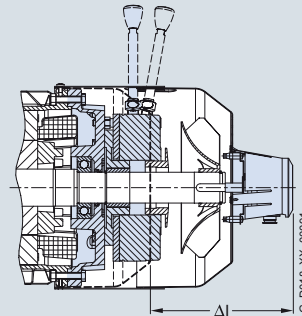


Fig. 4 Brake and rotary pulse encoder (on cover) 1XP8 001
Order codes **H62, H98**
[optionally with manual release, order code **K82**]



For motor series 1LA5 frame sizes 180 to 225 with separately driven fan, the fan attachment becomes narrower on the non-drive end (NDE) of the motor housing.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

**1LA frame sizes 100 to 225,
1LG frame sizes 180 and 200**

1LG frame size 225 and above

Fig. 5 Separately driven fan
Order code **G17**

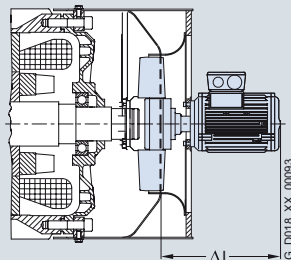
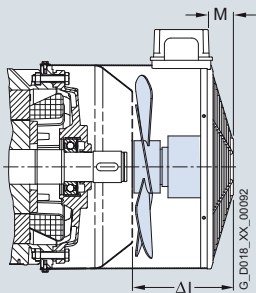


Fig. 6 Brake and separately driven fan
Order code **H63**
[optionally with manual release **K82**]

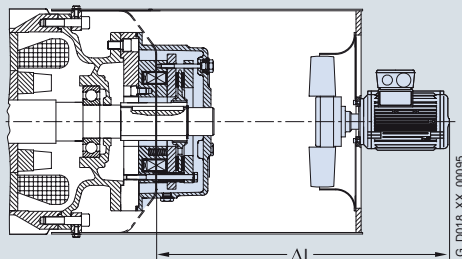
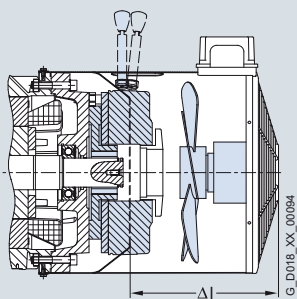


Fig. 7 Rotary pulse encoder (under cover) 1XP8 001 and separately driven fan
Order codes **H61, H97**

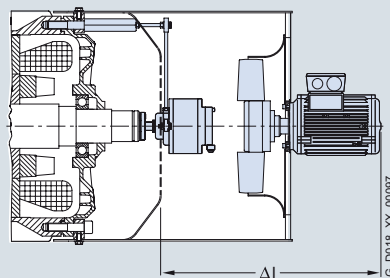
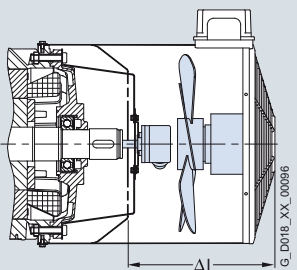
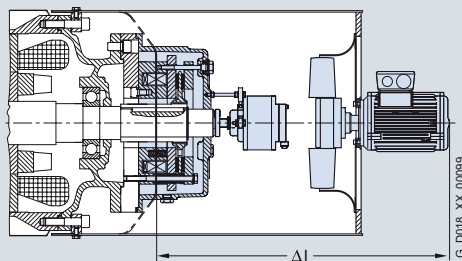
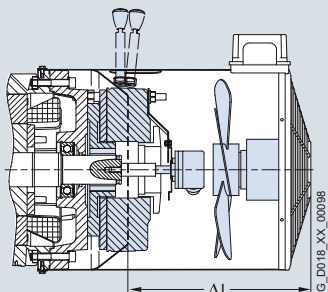


Fig. 8 Brake, rotary pulse encoder (under cover) 1XP8 001 and separately driven fan
Order codes **H64, H99**
[optionally with manual release (**K82**)]



IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Frame size	Assignment																	
	Fig. 1		Fig. 2		Fig. 3													
	Brake		Brake		Pulse encoder													
					1XP8 001		LL 861 900220		HOG9 D 1024 I		HOG10 D 1024 I		J15, J16		Y74, Y76		Y79	
Order code G26		Order code H47		Order code H57, H58		Order codes H70		Order codes H72		Order codes H73								
Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	
mm	kg	mm	kg	mm	kg	mm	kg	mm	kg	mm	kg	mm	kg	mm	kg	mm	kg	
1LA7, 1LA5																		
63	51	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
71	51	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
80	54	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
90	75	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
100	78	6	-	-	78	0.3	91	1.3	89	0.9	134	1.6	-	-	-	-	-	
112	87	8	-	-	78	0.3	91	1.3	89	0.9	134	1.6	-	-	-	-	-	
132	106	12	-	-	78	0.3	91	1.3	89	0.9	134	1.6	-	-	-	-	-	
160	129	26	-	-	78	0.3	91	1.3	89	0.9	134	1.6	-	-	-	-	-	
180	137	27	-	-	78	0.3	91	1.3	89	0.9	134	1.6	-	-	-	-	-	
200	142	41	-	-	78	0.3	91	1.3	89	0.9	134	1.6	-	-	-	-	-	
225	142	41	-	-	78	0.3	91	1.3	89	0.9	134	1.6	-	-	-	-	-	
1LA6																		
100	-	-	-	-	78	0.3	91	1.3	89	0.9	134	1.6	116	1.6	-	-	-	
112	-	-	-	-	78	0.3	91	1.3	89	0.9	134	1.6	116	1.6	-	-	-	
132	-	-	-	-	78	0.3	91	1.3	89	0.9	134	1.6	116	1.6	-	-	-	
160	-	-	-	-	78	0.3	91	1.3	89	0.9	134	1.6	116	1.6	-	-	-	
1LG4, 1LG6																		
180	125	22	-	-	63	0.3	86	1.3	72	0.9	116	1.6	98	1.6	153	2.1	156	2.9
200	137	32	-	-	63	0.3	86	1.3	72	0.9	116	1.6	98	1.6	153	2.1	156	2.9
225	239	63	-	-	63	0.3	86	1.3	72	0.9	116	1.6	98	1.6	153	2.1	156	2.9
250	225	83	-	-	63	0.3	86	1.3	72	0.9	116	1.6	98	1.6	153	2.1	156	2.9
280	227	118	-	-	63	0.3	86	1.3	72	0.9	116	1.6	98	1.6	153	2.1	156	2.9
315	265	255	-	-	63	0.3	86	1.3	72	0.9	116	1.6	98	1.6	153	2.1	156	2.9
1LA8, 1PQ8																		
315	-	-	205	120	-	-	125	1.3	-	-	125	1.6	-	-	-	-	-	
355	-	-	225	165	-	-	125	1.3	-	-	125	1.6	-	-	-	-	-	
400	-	-	251	220	-	-	125	1.3	-	-	125	1.6	-	-	-	-	-	
450	-	-	270	325	-	-	125	1.3	-	-	125	1.6	-	-	-	-	-	
1LL8																		
315	-	-	-	-	-	-	125	1.3	-	-	125	1.6	-	-	-	-	-	
355	-	-	-	-	-	-	125	1.3	-	-	125	1.6	-	-	-	-	-	
400	-	-	-	-	-	-	125	1.3	-	-	125	1.6	-	-	-	-	-	
450	-	-	-	-	-	-	125	1.3	-	-	125	1.6	-	-	-	-	-	

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

Frame size	Assignment											
	Fig. 4		Fig. 5			Fig. 6		Fig. 7		Fig. 8		Diameter of the fan cowl
Brake and rotary pulse encoder (on cowl) 1XP8 001	Order codes H62, H98		Separately driven fan ¹⁾			Brake and separately driven fan ¹⁾		Rotary pulse encoder (under the cowl) 1XP8 001 and separately driven fan ¹⁾		Brake, rotary pulse encoder (under the cowl) 1XP8 001 and separately driven fan ¹⁾		
	Δl	Weight, approx.	Δl	M	Weight, approx.	Δl	Weight, approx.	Δl	Weight, approx.	Δl	Weight, approx.	
	mm	kg	mm	mm	kg	mm	kg	kg	kg	mm	kg	mm
1LA7, 1LA5												
63	–	–	–	–	–	–	–	–	–	–	–	–
71	–	–	–	–	–	–	–	–	–	–	–	–
80	–	–	–	–	–	–	–	–	–	–	–	–
90	–	–	–	–	–	–	–	–	–	–	–	–
100	156	6.3	141	30	4.0	141	10.0	226	4.3	226	10.3	202
112	165	8.3	158	30	4.5	158	12.5	226	4.8	226	12.8	227
132	184	12.3	177	40	5.5	177	17.5	247	5.8	247	17.8	226
160	207	26.3	227	40	7.0	227	33.0	289	7.3	289	33.3	320
180	215	27.3	269	40	10.0	269	37.0	269	10.3	269	37.3	311 (358)
200	220	41.3	272	40	11.0	272	52.0	272	11.3	272	52.3	311 (398)
225	220	41.3	272	40	11.0	272	52.0	272	11.3	272	52.3	311 (398)
1LA6												
100	–	–	141	30	4.0	–	–	226	4.3	–	–	202
112	–	–	158	30	4.5	–	–	226	4.8	–	–	227
132	–	–	177	40	5.5	–	–	247	5.8	–	–	226
160	–	–	227	40	7.0	–	–	289	7.3	–	–	320
1LG4, 1LG6												
180	203	22.3	269	40	10.0	269	32	269	10.3	269	32.3	356
200	215	32.3	272	40	11.0	272	43	272	11.3	272	43.3	396
225	317	63.3	235	0	22.0	576	85	425	22.3	576	85.3	439
250	303	83.3	235	0	25.0	578	108	425	25.3	578	108.3	489
280	305	118.3	235	0	28.0	550	146	425	28.3	550	146.3	539
315	343	255.3	247	0	36.0	577	291	437	36.3	577	291.3	604

The values in brackets () refer to the diameter of the motor flange because this is larger than the diameter of the fan cowl (see figure on Page 0/90).

¹⁾ For frame sizes 100 to 200 and for 1LA5 up to frame size 225, the dimensions of the connection box for the separately driven fan, length x width x height, are 95 mm x 105 mm x 54 mm. For motor series 1LG4/1LG6 (frame sizes 225 to 315), the dimensions of the connection box for the separately driven fan, length x width x height, are 75 mm x 75 mm x 38 mm.

IEC Squirrel-Cage Motors

Introduction motors 1LE1, 1PC1

Order No. code

0

Overview

The order number consists of a combination of figures and letters and is divided into three blocks linked with hyphens for a better overview, e.g.

1LE1001-1DB20-1AA5-Z
H00

The first block (Positions 1 to 7) identifies the motor type; the second block (Positions 8 to 12) defines the motor frame size and length, the number of poles and in some cases the frequency/output; and in the third block (Positions 13 to 16), the frequency/output, type of construction and other design features are encoded.

For deviations in the second and third block from the catalog codes, either **-Z** or **9** should be used as appropriate.

Ordering data:

- Complete Order No. and order code(s) or plain text.
- If a quotation has been requested, please specify the quotation number in addition to the Order No.
- When ordering a complete motor as a spare part, please specify the works serial No. for the previously supplied motor as well as the Order No.

Structure of the Order No.:		Position:	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16	
IEC squirrel-cage motors, surface-cooled																					
Positions 1 to 4: Digit, letter, letter, digit	New generation Design or version (motor type)		1	L	E	1															
	<ul style="list-style-type: none"> • Standard: Self-ventilated by fan mounted on and driven by rotor • Expansion option (F90): Forced-air cooled by air flow from the fan to be driven • Special: Self-cooled without external fan and fan cover 																				
Positions 5 to 7: 3 digits	<ul style="list-style-type: none"> • Motors with high efficiency (High Efficiency, EFF1), aluminum housing • Motors with improved efficiency (Improved Efficiency, EFF2), aluminum housing 						0	0	1												
Positions 8, 9 and 11: Digit, letter, digit	Motor frame size (frame size as a combination of shaft height and overall length, encoded)										1	A ... D		0 ... 6							
Position 10: Letter	Number of poles A ... D = 2-, 4-, 6-, 8-pole												A ... D								
Positions 12 and 13: 2 digits	Voltage, circuit and frequency														0 ... 9		0 ... 8				
Position 14: Letter	Type of construction (A – V)																	A ... V			
Position 15: Letter	Motor protection (A – Z; special versions encoded)																		A ... Z		
Position 16: Digit	Mechanical design (motor version and connection box position)																			0	
	<ul style="list-style-type: none"> • General Line motors with shorter delivery times, limited options (connection box on top, cast feet, only basic versions possible, non-drive-end (NDE) cannot be modified) • All options are possible or can be modified <ul style="list-style-type: none"> - Connection box on top - Connection box on RHS (viewed from DE) - Connection box on LHS (viewed from DE) - Connection box below 																			4 5 6 7	
	Special order versions: encoded – additional order code required not encoded – additional plain text required																				- Z

Ordering example

Selection criteria	Requirement	Structure of the Order No.
Motor type	New generation Standard motor with high efficiency EFF1, IP55 degree of protection, aluminum version	1LE1001-□□□□□□-□□□□□
Motor frame size/No. of poles/speed	160/4-pole/1500 rpm	1LE1001-1DB2□-□□□□□
Rated output	11 kW	
Voltage and frequency	230 VΔ/400 VY, 50 Hz	1LE1001-1DB22-2□□□□
Type of construction	IM V5 with protective cover ¹⁾	1LE1001-1DB22-2C□□□-Z
(Special versions)	3 PTC thermistors (motor protection with 3 embedded temperature sensors for tripping ²⁾)	1LE1001-1DB22-2CB□□-Z
Mechanical design (motor version)	Connection box on RHS (viewed from DE)	1LE1001-1DB22-2CB5-Z
	Mounted separately driven fan	1LE1001-1DB22-2CB5-Z H00 F70

¹⁾ Standard without protective cover – the protective cover is defined with option **H00** and this option must be ordered in addition.

²⁾ No additional option must be specified in the order.

IEC Squirrel-Cage Motors

Introduction motors 1LE1, 1PC1

Special versions

0

Overview

The order codes and availability are assigned to the individual motor series in the "Selection and ordering data" in catalog part 1.

For

- Voltages
- Types of constructions
- Motor protection
- Motor connection and connection box

see the relevant heading in section "General technical data" in this catalog part.

All available options are listed according to topics in the following table. An alphanumerical listing according to order codes can be found in the appendix under "Overview of order codes".

Attention:

For 1LE1 and 1PC1 motors apply only the "Special versions" of the following table and of catalog part 1. Motor protection and motor connection or connection box can be defined as Order No. supplement with the positions 15 or 16 of the Order No.

Order code	Special versions	For further information, see Page
Motor connection and connection box		
R15	One cable gland, metal	0/114
R10	Rotation of the connection box through 90°, entry from DE	0/114
R11	Rotation of the connection box through 90°, entry from NDE	0/114
R12	Rotation of the connection box through 180°	0/114
R50	<i>New!</i> Larger connection box	0/113
R30	<i>New!</i> Reduction piece for M cable gland in accordance with British standard, both cable entries mounted	0/114
H04	External earthing	0/113
R20	<i>New!</i> 3 cables protruding, 0.5 m long	0/114
R21	<i>New!</i> 3 cables protruding, 1.5 m long	0/114
R22	<i>New!</i> 6 cables protruding, 0.5 m long	0/114
R23	<i>New!</i> 6 cables protruding, 1.5 m long	0/114
R24	<i>New!</i> 6 cables protruding, 3 m long	0/114
H08	<i>New!</i> Connection box on NDE	0/113
Windings and insulation		
N01	Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	0/108
N02	Temperature class 155 (F), used acc. to 155 (F), with increased output	0/108
N03	Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	0/108
N11	<i>New!</i> Temperature class 180 (H) at rated power and max. CT 60 °C	0/108
N20	<i>New!</i> Increased air humidity/temperature with 30 to 60 g water per m ³ of air	0/108
N05	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	0/108
N06	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	0/108
N07	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	0/108
N08	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	0/108
N21	<i>New!</i> Increased air humidity/temperature with 60 to 100 g water per m ³ of air	0/108
Y52	Temperature class 155 (F), used acc. to 155 (F), other requirements	0/108
Colors and paint finish		
Y54	Special finish in other standard RAL colors	0/101
Y51	Special finish in special RAL colors	0/101
S03	<i>New!</i> Special finish sea air resistant	0/100
S00	Unpainted (only cast iron parts primed)	0/100
S01	Unpainted, only primed	0/100
Modular technology – Basic versions		
F70	Mounting of separately driven fan	0/129
F01	Mounting of brake	0/130 ...
G01	Mounting of 1XP8012-10 (HTL) rotary pulse encoder	0/128
G02	Mounting of 1XP8012-20 (TTL) rotary pulse encoder	0/128
Modular technology – Additional versions		
F10	Brake supply voltage 24 V DC	0/133
F11	Brake supply voltage 230 V AC, 50/60 Hz	0/133
F12	Brake supply voltage 400 V AC, 50/60 Hz	0/133
F50	Mechanical manual brake release with lever (no locking)	0/133
Special technology		
G04	Mounting of LL 861 900 220 rotary pulse encoder	0/134
G05	Mounting of HOG 9 D 1024 I rotary pulse encoder	0/135
G06	Mounting of HOG 10 D 1024 I rotary pulse encoder	0/136

IEC Squirrel-Cage Motors

Introduction motors 1LE1, 1PC1

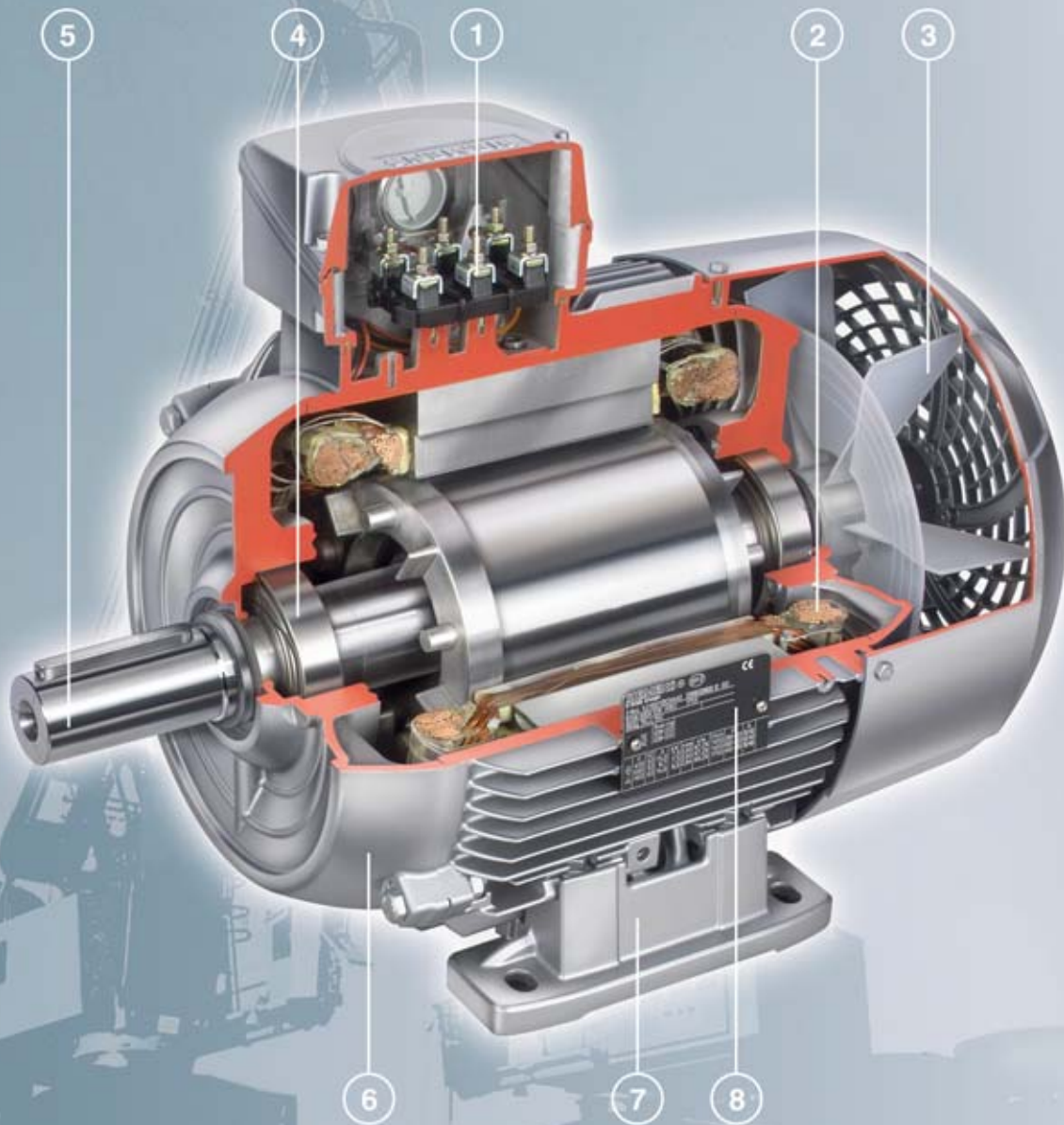
Special versions

Overview "Special versions" (Fortsetzung)

Order code	Special versions	For further information, see Page
Mechanical design and degrees of protection		
H00	Protective cover for types of construction	0/119
H01	Screwed-on feet (instead of cast)	0/113
H23	<i>New!</i> Radial seal on DE for flange-mounting motors with oil resistance to 0.1 bar	0/118
F77	<i>New!</i> Low-noise version for 2-pole motors with clockwise direction of rotation	0/119
F78	<i>New!</i> Low-noise version for 2-pole motors with counter-clockwise direction of rotation	0/119
H20	<i>New!</i> IP65 degree of protection	0/119
H22	<i>New!</i> IP56 degree of protection (non-heavy-sea)	0/119
H02	<i>New!</i> Vibration-proof version	0/119
H03	Condensation drainage holes	0/119
H07	<i>New!</i> Non-rusting screws (externally)	0/119
G40	Prepared for mountings, only center hole	0/118
G41	Prepared for mountings with D12 shaft	0/118
G42	Prepared for mountings with D16 shaft	0/118
G43	<i>New!</i> Protective cover for encoder (loosely enclosed – only for mountings acc. to order codes G40, G41 and G42)	0/118
Coolant temperature and site altitude		
D03	<i>New!</i> Coolant temperature –40 °C to +40 °C	0/107
D04	<i>New!</i> Coolant temperature –30 °C to +40 °C	0/107
Designs in accordance with standards and specifications		
D30	<i>New!</i> Electrical according to NEMA MG1-12	0/99
D31	<i>New!</i> Design according to UL with "Recognition Mark"	0/99
D40	<i>New!</i> Canadian regulations (CSA)	0/98, 0/99
D46	<i>New!</i> PSE Mark Japan	0/99
Bearings and lubrication		
Q01	Measuring nipple for SPM shock pulse measurement for bearing inspection	0/122
L22	Bearing design for increased cantilever forces	0/122, 0/124 ...
L25	Special bearing for DE and NDE, bearing size 63	0/122, 0/124 ...
L23	Regreasing device	0/122
L20	Located bearing at DE	0/122
L21	Located bearing at NDE	0/122
Balance and vibration quantity		
L00	Vibration quantity level B	0/120
L02	Full-key balancing	0/120
L01	Balancing without fitted key	0/120
Shaft and rotor		
L08	Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors	0/121
L05	Second standard shaft extension	0/121
L04	<i>New!</i> Shaft extension with standard dimensions, without featherkey way	0/121
L07	Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	0/121
L06	Standard shaft made of non-rusting steel	0/121
Y55	<i>New!</i> Non-standard cylindrical shaft extension	0/121
Heating and ventilation		
F75	<i>New!</i> Fan cover for textile industry	0/111
F76	<i>New!</i> Metal external fan	0/111
Q02	Anti-condensation heaters for 230 V	0/111
Q03	Anti-condensation heaters for 115 V	0/111
F74	Sheet metal fan cover	0/111
Rating plate and extra rating plates		
M10	Second rating plate, loose	0/106
M11	Nirosta rating plate	0/106
Y80	Extra rating plate or rating plate with deviating rating plate data	0/106
Y82	Extra rating plate with identification codes	0/106
Y84	Additional information on rating plate and on package label (max. of 20 characters)	0/106
Packaging, safety notes, documentation and test certificates		
B00	Without safety and commissioning note. Customer's declaration of renouncement required.	0/102
B01	With one safety and start-up guide per box pallet	0/102
B02	Acceptance test certificate 3.1 in accordance with EN 10204	0/102
B04	Printed operating instructions English/German enclosed	0/102
B83	<i>New!</i> Type test with heat run for horizontal motors, with acceptance	0/102
B99	Wire-lattice pallet	0/102
M01	Connected in star for dispatch	0/102
M02	Connected in delta for dispatch	0/102

Overview

Cut-away diagram of a low-voltage motor



- | | |
|---|--|
| <p>① Motor protection Page 0/110
Motor connection and connection box Page 0/113
Voltages, currents and frequencies Page 0/103</p> <p>② Windings and insulation Page 0/108
Coolant temperature and site altitude Page 0/107</p> <p>③ Heating and ventilation Page 0/111
Mechanical design and degrees of protection Page 0/118
Modular technology Page 0/127
Special technology Page 0/134</p> | <p>④ Bearings and lubrication Page 0/122</p> <p>⑤ Shaft and rotor Page 0/121
Balance and vibration quantity Page 0/120</p> <p>⑥ Colors and paint finish Page 0/100</p> <p>⑦ Types of construction Page 0/116</p> <p>⑧ Rating plates and extra rating plates Page 0/106</p> |
|---|--|

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

Designs in accordance with standards and specifications

Applicable standards and specifications

The motors comply with the appropriate standards and regulations, especially those listed in the table below.

Title	IEC/EN	DIN EN
General specifications for rotating electrical machines	IEC 60034-1, IEC 60085	DIN EN 60034-1
Specification of the losses and efficiency of rotating electrical machines	IEC 60034-2	DIN EN 60034-2
Asynchronous AC motors for general use with standardized dimensions and outputs	IEC 60072 mounting dimensions only	DIN EN 50347
Restart characteristics for rotating electrical machines	IEC 60034-12	DIN EN 60034-12
Terminal designations and direction of rotation for electrical machines	IEC 60034-8	DIN EN 60034-8
Designation for type of construction, installation and connection box position	IEC 60034-7	DIN EN 60034-7
Entry to connection box	–	DIN 42925
Built-in thermal protection	IEC 60034-11	DIN EN 60034-11
Noise limit values for rotating electrical machines	IEC 60034-9	DIN EN 60034-9
IEC standard voltages	IEC 60038	DIN IEC 60038
Cooling methods for rotating electrical machines	IEC 60034-6	DIN EN 60034-6
Vibration severity of rotating electrical machines	IEC 60034-14	DIN EN 60034-14
Vibration limits	–	DIN ISO 10816
Degrees of protection of rotating electrical machines	IEC 60034-5	DIN EN 60034-5

National standards

The motors comply with the IEC or European standards listed above. The European standards replace the national standards in the following EU member states: Germany (VDE), France (NF C), Belgium (NBNC), Great Britain (BS), Italy (CEI), Netherlands (NEN), Sweden (SS), Switzerland (SEV) etc.

The motors also comply with various national standards. The following standards have been harmonized with IEC publication 60034-1 or replaced with DIN EN 60034-1 so that the motors can be operated at standard rated output.

Title	Country
CSAC22.2, No. 100	Canada
IS 325 IS 4722	India
NEK – IEC 60034-1	Norway

Tolerances for electrical data

According to DIN EN 60034, the following tolerances are permitted:

Motors which comply with DIN EN 60034-1 must have a voltage tolerance of $\pm 5\%$ / frequency tolerance of $\pm 2\%$ (Design A). If utilized, the admissible limit temperature of the temperature class may be exceeded by 10 K.

A tolerance of $\pm 5\%$ also applies to the rated voltage range in accordance with DIN EN 60034-1. For rated voltage and rated voltage range, see Page 0/103.

Efficiency η at

$$P_{\text{rated}} \leq 150 \text{ kW: } -0.15 \cdot (1 - \eta)$$

$$P_{\text{rated}} > 150 \text{ kW: } -0.1 \cdot (1 - \eta)$$

With η being a decimal number.

$$\text{Power factor} = \frac{1 - \cos \varphi}{6}$$

- Minimum absolute value: 0.02
- Maximum absolute value: 0.07

Slip $\pm 20\%$ (for motors $< 1 \text{ kW}$ $\pm 30\%$ is admissible)

Locked-rotor current $+20\%$

Locked-rotor torque -15% to $+25\%$

Breakdown torque -10%

Moment of inertia $\pm 10\%$

Energy-saving motors with European efficiency classification in accordance with EU/CEMEP (European Committee of Manufacturers of Electrical Machines and Power Electronics)

Low-voltage motors in the output range of 1.1 to 90 kW, 2-pole and 4-pole are marked in accordance with the EU/CEMEP agreement with the efficiency class EFF2 (Improved Efficiency) or EFF3 (High Efficiency).

So that the requirements of efficiency classes EFF1 and EFF2 are fulfilled, the active parts of the motor have been optimized. The procedure for calculating the efficiency is based on the loss summation method according to IEC 60034-2.

Motors for the North American market

For motors which comply with North American regulations (NEMA, CSA, UL, etc.), it must always be checked whether the motors will be used in the US or Canada and whether they are subject to state laws.

Minimum efficiencies required by law

In 1997, an act was passed in the US to define minimum efficiencies for low-voltage three-phase motors (EPACT = Energy Policy Act). An act is in force in Canada that is largely identical, although it is based on different verification methods. The efficiency is verified for these motors for the USA using IEEE 112, Test Method B and for Canada using CSA-C390. Apart from a few exceptions, all low-voltage three-phase motors exported to the USA or Canada must comply with the legal requirements on efficiency.

The law requires minimum efficiencies for 2, 4 and 6-pole motors with a voltage of 230 and 460 V/60 Hz, in the output range of 1 to 200 HP (0.75 to 150 kW).

According to EPACT, the following are excluded from the efficiency requirements, for example.

- Motors whose frame size output classification does not correspond with the standard series according to NEMA MG1-12.
- Flange-mounting motors without feet
- Brake motors
- Converter-fed motors
- Motors with design letter C and higher

For more information on EPACT:

<http://www.eren.doe.gov/>

Special requirements for the USA: Energy Policy Act

The act lays down that the nominal efficiency at full load and a "CC" number (Compliance Certification) must be included on the rating plate. The "CC" number is issued by the US Department of Energy (DOE). The following information is stamped on the rating plate of EPACT motors which must be marked by law: Nominal efficiency (service factor SF 1.15), design letter, code letter, CONT, CC-Nr. CC 032A (Siemens) and NEMA MG1-12.

Special requirements for Canada: CSA – Energy Efficiency Verification

These motors fulfill the minimum efficiency requirements laid down by the CSA standard C390. These motors are available as 1LE1 and can be ordered with order code **D40** and are also marked with the CSA-E verification on the rating plate.



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NEMA – Order code D30

The motors with increased efficiency according to EPACT are designed to meet the NEMA MG1-12 electrical standard and are marked accordingly. The mechanical design of all motors is compliant only to IEC, not to NEMA dimensions.

All motors in the EPACT and **D30** version correspond to NEMA Design A (i. e. standard torque characteristic in accordance with NEMA and no starting current limitation).

For Design B, C and D, a special version is required (on request).

All other 1LE1/1PC1 motors must be ordered with order code **D30**.

Data on the rating plate: Rated voltage (voltage tolerance of 10 %), nominal efficiency, design letter, code letter, CONT and NEMA MG1-12.

UL approval – Order code D31

The motors based on the 1LE1/1PC1 basic series are listed for up to 600 V by Underwriters Laboratories Inc. ("Recognition Mark" = R/C).

This is not possible in combination with the option "temperature class 180 (H) at rated output and maximal coolant temperature of 60 °C", order code N11.

According to UL, motor voltages are only certified up to 600 V, i.e. voltage codes 22, 27 or 40. For this reason, the indication 690 VY for voltage code "34" (400 VΔ/690 VY/ 50 Hz or 460 VΔ/60 Hz), for example, is omitted on the rating plate.

The "UL Recognition Mark" is included on the rating plate of the motor.



In addition, the motor is designed to meet the NEMA MG1-12 electrical standard and includes the following data on the rating plate: Rated voltage (voltage tolerance of 10 %), nominal efficiency, design letter, code letter, CONT and NEMA MG1-12. The motors must only be ordered with order code **D31**.

Externally or internally mounted components such as

- Motor protection
- Heating element
- Separately driven fan
- Brake
- Encoder
- Power connection
- Plug connector

are UL-R/C, CSA or C-US listed or used by manufacturers in accordance with regulations. It may have to be decided whether the motor is suitable for the application.

The motors can be operated with a frequency converter with 50/60 Hz.

Deviating frequency settings must be tested at final acceptance.

The following versions are possible:

- 2-pole motors, only in combination with F77 or F78 low-noise versions
- 4, 6 and 8-pole motors, only in combination with F76 metal external fan

CSA approval – Order code D40

Motors based on the 1LE1/1PC1 basic series are approved for up to 690 V in accordance with the Canadian regulations of the "Canadian Standard Association" (CSA). Externally or internally mounted components which are used are listed by CSA or are used by manufacturers in accordance with regulations. It may have to be decided whether the motor is suitable for the application.

This is not possible in combination with the option "temperature class 180 (H) at rated output and maximal coolant temperature of 60 °C", order code N11, for 1LE1 and 1PC1 motor series.

The motors must be ordered with the order code **D40**, voltage code "90" and order code for voltage and frequency. The CSA mark and the rated voltage (voltage tolerance of 10 %) are included on the rating plate.



When energy-saving motors (1LE1 in design EFF1) are ordered, they also include the CSA-E mark on the rating plate.



Export of low-voltage motors to China

CCC – China Compulsory Certification – Order code D01

"Small power motors" which are exported to China must be certified up to a rated output of:

- 2-pole: ≤ 2.2 kW
- 4-pole: ≤ 1.1 kW
- 6-pole: ≤ 0.75 kW
- 8-pole: ≤ 0.55 kW

The **1LE1 motors which must be certified** have been certified by the CQC (China Quality Cert. Center). When ordered with the D01 order code, the "CCC" logo and "Factory Code" are included on the rating plate and packaging.



Factory Code:

A005216 = Works Bad Neustadt

A010607 = Works Mohelnice

Note:

Chinese customs checks the need for certification of imported products by means of commodity code.

The following do not need to be certified:

- Motors imported to China which have already been installed in a machine
- Repair parts

Export of low-voltage motors to Japan

PSE Mark Japan – Order Code D46

PSE marking is a mandatory certification in Japan in accordance with the electrical devices and safety of materials act. "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking.

The motors concerned are marked on the rating plate with the following "PSE" logo.



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Colors and paint finish

To protect the drives against corrosion and external influences, high-quality coatings based on 2-K epoxy resin are offered in various different colors.

Type	Suitability of paint finish for climate group in accordance with DIN IEC 60721, Part 2-1	
Special finish	Worldwide (global) for outdoor use in direct sunlight and/or weather conditions. Suitable for use in the tropics for <60 % relative humidity at 40 °C	Briefly: Up to 140 °C Contin.: Up to 120 °C Also: for aggressive atmospheres up to 1 % acid and alkali concentrations or permanent dampness in sheltered rooms

Special finish system "sea air resistant" – Order code **S03**

Field of application	Resistance
<ul style="list-style-type: none"> Recommended for indoor installations or outdoor installations exposed to direct weather conditions Industrial climate with moderate SO₂ exposure, inshore maritime climate, but not offshore maritime climate, e.g. for crane drives and also in the paper industry Complies with the test requirements of DIN EN ISO 12944-2 Corrosion Category C4 	<ul style="list-style-type: none"> Chemical exposure to 5 % acid and caustic solution concentration Suitable for use in the tropics up to 75 % relative humidity at 50 °C Thermal stability from –40 to 140 °C

All motors are painted with RAL 7030 (stone gray) if the color is not specified.

Other colors in special finish must be ordered with order codes **Y51** or **Y54** and the required RAL number in plain text (for a selection of the available RAL numbers/colors, see the following page for tables for order codes **Y51** and **Y54**).

Direct sunlight may change the color. If consistent colors are required, we recommend paint based on polyurethane. Please inquire.

All paint finishes can be painted over with commercially available paints. Special paints and increased layer thickness available on request.

If required, the motors can be supplied coated only in primer, order code **S01**, or unpainted (unmachined cast-iron surfaces, but primed) using order code **S00**.

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Special finish in standard RAL colors – Order code **Y54** (RAL number is required in plain text)

RAL No.	Color name	RAL No.	Color name
1002	Sand yellow	6011	Reseda green
1013	Pearl white	6019	Pastel green
1015	Light ivory	6021	Pale green
1019	Gray beige	7000	Squirrel gray
2003	Pastel orange	7001	Silver gray
2004	Pure orange	7004	Signal gray
3000	Flame red	7011	Iron gray
3007	Black red	7016	Anthracite gray
5007	Brilliant blue	7022	Umber gray
5009	Azure blue	7031	Blue gray
5010	Gentian blue	7032	Pebble gray
5012	Light blue	7033	Cement gray
5015	Sky blue	7035	Light gray
5017	Traffic blue	9001	Cream
5018	Teal blue	9002	Gray white
5019	Capri blue	9005	Jet black

Special finish in special RAL colors – Order code **Y51** (RAL number is required in plain text)

RAL No.	Color name	RAL No.	Color name	RAL No.	Color name	RAL No.	Color name
1000	Green beige	3014	Antique pink	6003	Olive green	7036	Platinum gray
1001	Beige	3015	Light pink	6004	Blue green	7037	Dusty gray
1003	Signal yellow	3016	Coral red	6005	Moss green	7038	Agate gray
1004	Golden yellow	3017	Rose	6006	Gray olive	7039	Quartz gray
1005	Honey yellow	3018	Strawberry red	6007	Bottle green	7040	Window gray
1006	Maize yellow	3020	Traffic red	6008	Brown green	7042	Traffic gray A
1007	Daffodil yellow	3022	Salmon pink	6009	Fir green	7043	Traffic gray B
1011	Brown beige	3027	Raspberry red	6010	Grass green	7044	Silk gray
1012	Lemon yellow	3031	Orient red	6012	Black green	7045	Tele gray 1
1014	Dark ivory	3032	Pearl ruby red	6013	Reed green	7046	Tele gray 2
1016	Sulfur yellow	3033	Pearl pink	6014	Yellow olive	7047	Tele gray 4
1017	Saffron yellow	4001	Red lilac	6015	Black olive	7048	Pearl mouse gray
1018	Zinc yellow	4002	Red violet	6016	Turquoise green	8000	Green brown
1020	Olive yellow	4003	Heather violet	6017	May green	8001	Ocher brown
1021	Rape yellow	4004	Claret violet	6018	Yellow green	8002	Signal brown
1023	Traffic yellow	4005	Blue lilac	6020	Chrome green	8003	Clay brown
1024	Ochre yellow	4006	Traffic purple	6022	Olive drab	8004	Copper brown
1027	Curry	4007	Purple violet	6024	Traffic green	8007	Fawn brown
1028	Melon yellow	4008	Signal violet	6025	Fern green	8008	Olive brown
1032	Broom yellow	4009	Pastel violet	6026	Opal green	8011	Nut brown
1033	Dahlia yellow	4010	Tele magenta	6027	Light green	8012	Red brown
1034	Pastel yellow	4011	Pearl violet	6028	Pine green	8014	Sepia brown
1035	Pearl beige	4012	Pearl blackberry	6029	Mint green	8015	Chestnut
1036	Pearl gold	5000	Violet blue	6032	Signal green	8016	Mahogany
1037	Sun yellow	5001	Green blue	6033	Mint turquoise	8017	Chocolate
2000	Yellow orange	5002	Ultramarine	6034	Pastel turquoise	8019	Gray brown
2001	Red orange	5003	Sapphire blue	6035	Pearl green	8022	Black brown
2002	Vermilion	5004	Black blue	6036	Pearl opal green	8023	Orange brown
2008	Bright red orange	5005	Signal blue	7002	Olive gray	8024	Beige brown
2009	Traffic orange	5008	Gray blue	7003	Moss gray	8025	Pale brown
2010	Signal orange	5011	Steel blue	7005	Mouse gray	8028	Terra brown
2011	Deep orange	5013	Cobalt blue	7006	Beige gray	8029	Pearl copper
2012	Salmon orange	5014	Pigeon blue	7008	Khaki gray	9003	Signal white
2013	Pearl orange	5020	Ocean blue	7009	Green gray	9004	Signal black
3001	Signal red	5021	Water blue	7010	Tarpaulin gray	9006	White aluminum
3002	Carmine red	5022	Night blue	7012	Basalt gray	9007	Gray aluminum
3003	Ruby red	5023	Distant blue	7013	Brown gray	9010	Pure white
3004	Purple red	5024	Pastel blue	7015	Slate gray	9011	Graphite black
3005	Wine red	5025	Pearl gentian	7021	Black gray	9016	Traffic white
3009	Oxide red	5026	Pearl night blue	7023	Concrete gray	9017	Traffic black
3011	Brown red	6000	Patina green	7024	Graphite gray	9018	Papyrus white
3012	Beige red	6001	Emerald green	7026	Granite gray	9022	Pearl light gray
3013	Tomato red	6002	Leaf green	7034	Yellow gray	9023	Pearl dark gray

Coating structure and colors not specified in the catalog are available on request.

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Packaging, safety notes, documentation and test certificates

Connected in star for dispatch – Order code **M01**

The terminal board of the motor is connected in star for dispatch.

Connected in delta for dispatch – Order code **M02**

The terminal board of the motor is connected in delta for dispatch.

Packing weights

Packing weights		For land transport				For sea transport			
Frame size	Type 1LE1 ... - 1PC1 ... -	Type of construction IM B3			Type of construction IM B5, IM V1				
		In box Tare	On wooden board ISPM covered by cardboard on top and sides Tare	On battens Tare	In crate Tare	In box Tare	On wooden board ISPM covered by cardboard on top and sides Tare	On battens Tare	In crate Tare
		kg	kg	kg	kg	kg	kg	kg	kg
100 L	1A.4	–	5.0	–	–	–	5.0	–	–
	1A.5	–	5.0	–	–	–	5.0	–	–
	1A.6	–	5.0	–	–	–	5.0	–	–
112 M	1B.2	–	5.0	–	–	–	5.0	–	–
	1B.6	–	5.0	–	–	–	5.0	–	–
132 S	1C.0	4.7	–	–	–	5.2	–	–	–
	1C.1	4.7	–	–	–	5.2	–	–	–
132 M	1C.2	4.7	–	–	–	5.2	–	–	–
	1C.3	4.7	–	–	–	5.2	–	–	–
	1C.6	8.7	–	–	–	9.2	–	–	–
160 M	1D.2	4.8	–	–	–	5.7	–	–	–
	1D.3	4.8	–	–	–	5.7	–	–	–
160 L	1D.4	4.8	–	–	–	5.7	–	–	–
	1D.6	8.8	–	–	–	9.7	–	–	–

Data apply for individual packaging. Packing in wire-lattice pallets can be used, order code **B99**.

Safety notes

If the motors are to be delivered without safety and commissioning notes, a customer's declaration of renouncement is required.

Without safety and commissioning note – Order code **B00**

The motors are supplied with only one set of safety and commissioning notes per wire-lattice pallet for most motor types and frame sizes.

Complete with one set of safety and commissioning notes per wire-lattice pallet – Order code **B01**

Documentation

The following documents are optionally available:

- Printed operating instructions English/German enclosed – Order code **B04**
- All manuals for low-voltage motors, geared motors and low-voltage converters are now available on DVD in 5 languages, see "SD Manual Collection for CA 01" in catalog part 11 "Appendix".

Test certificates

Acceptance test certificate 3.1 according to EN 10204 – Order code **B02**

An acceptance test certificate 3.1 according to EN 10204 can be supplied for most motors.

Type test with heat run for horizontal motors, with acceptance – Order code **B83**

During the type test, a temperature-rise test is performed; no-load, short-circuit and load characteristics are recorded; the iron losses and friction losses are determined and the efficiency is calculated from the summed losses. This option is only applicable to motors with a horizontal type of construction. The acceptance is carried out by an external representative (e.g. customer, classification society).

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Voltages, currents and frequencies

Standard voltages

EN 60034-1 differentiates between Category A (combination of voltage deviation $\pm 5\%$ and frequency deviation $\pm 2\%$) and Category B (combination of voltage deviation $\pm 10\%$ and frequency deviation $+3/-5\%$) for voltage and frequency fluctuations. The motors can supply their rated torque in both Category A and Category B. In Category A, the temperature rise is approx. 10 K higher than during rated duty.

Standard	Category	Category
60034 – 1	A	B
Voltage deviation	$\pm 5\%$	$\pm 10\%$
Frequency deviation	$\pm 2\%$	$+3\%/-5\%$
Rating plate data stamped with rated voltage a (e.g. 230 V)	a $\pm 5\%$ (e.g. 230 V $\pm 5\%$)	a $\pm 10\%$ (e.g. 230 $\pm 10\%$)
Rating plate data stamped with rated voltage ranges b to c (e.g. 220 to 240V)	b -5% to c $+5\%$ (e.g. 220 -5% to 240 $+5\%$)	b -10% to c $+10\%$ (e.g. 220 -10% to 240 $+10\%$)

According to the standard, longer duty is not recommended for Category B. See "Rating plates and extra rating plates" for details of the rating plate inscriptions and corresponding examples. The selection and ordering data state the rated current at 400 V. The DIN IEC 60038 standard specifies a tolerance of $\pm 10\%$ for mains voltages of 230 V, 400 V and 690 V. The rating plates of motors with voltage code 22 or 34 specify a rated voltage range in addition to the rated voltage (see table below).

The rated currents at 380/420 V are specified in the table "Rated currents for rated voltage range 380 V to 420 V at 50 Hz" and on the rating plate.

Mains voltages	Rated voltage range	Voltage code
1LE1 motors		
230 V Δ /400 VY, 50 Hz	220 ... 240 V Δ /380 ... 420 VY, 50 Hz	22
400 V Δ /690 VY, 50 Hz	380 ... 420 V Δ /660 ... 725 VY, 50 Hz	34
500 VY, 50 Hz	–	27
500 V Δ , 50 Hz	–	40

Non-standard voltages and/or frequencies

The tolerance laid down by DIN EN 60034-1 applies to all non-standard voltages. Order codes have been allocated for a number of non-standard voltages at 50 or 60 Hz. They are ordered by specifying the code digit 9 for voltage in the 12th position of the Order No. as well as the code digit 0 in the 13th position of the Order No. and the appropriate order code.

M1Y Non-standard winding for voltages between 200 V and 690 V and rated outputs.

For voltages and rated outputs outside the range, please inquire.

Motor series	Frame size	Rated voltages that are available for M1Y	
		Lowest/highest voltage in V for	Star connection
1LE1	100 ... 160	200/690	250/690

Order codes for other rated voltages are listed under "Order No. supplements" in the "Selection and ordering data" as well as "Special versions" under "Voltages".

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Rated currents for rated voltage range 380 V to 420 V at 50 Hz

Motor type	Frame size	Currents for voltage and number of poles							
		380 V		420 V		380 V		420 V	
		2-pole		4-pole		6-pole		8-pole	
		/	/	/	/	/	/	/	/
		A	A	A	A	A	A	A	A
General Line motors with shorter delivery time									
Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LE1									
Forced-air cooled motors without external fan and fan cover with improved efficiency – Aluminum series 1LE1									
1LE1002-1A.4	100 L	6.3	5.7	5.0	4.9	3.75	4.15	2.8	3.3
1LE1002-1A.5	100 L	–	–	6.4	6.1	–	–	3.65	4.1
1LE1002-1B.2	112 M	8.3	7.5	8.4	8.1	5.4	5.5	4.0	4.4
1LE1002-1C.0	132 S	10.9	10.3	11.5	11.4	7.3	7.7	5.9	6.0
1LE1002-1C.1	132 S	14.5	13.9	–	–	–	–	–	–
1LE1002-1C.2	132 M	–	–	15.2	15.2	9.3	9.4	7.9	8.1
1LE1002-1C.3	132 M	–	–	–	–	13.7	12.9	–	–
1LE1002-1D.2	160 M	21.7	20.7	22.4	22.8	17.0	17.7	10.5	11.6
1LE1002-1D.3	160 M	29.6	28.9	–	–	–	–	13.8	14.6
1LE1002-1D.4	160 L	35.0	33.5	30.0	30.2	22.3	24.7	18.9	19.4
Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LE1									
Forced-air cooled motors without external fan and fan cover with high efficiency – Aluminum series 1LE1									
1LE1001-1A.4	100 L	6.1	6.1	4.65	4.65	3.55	3.55	2.65	2.95
1LE1001-1A.5	100 L	–	–	6.2	6.1	–	–	3.85	4.35
1LE1001-1B.2	112 M	7.8	7.6	8.3	8.2	5.1	5.0	4.3	4.3
1LE1001-1C.0	132 S	10.1	10.5	11.4	11.4	7.0	7.1	6.6	6.6
1LE1001-1C.1	132 S	14.2	13.7	–	–	–	–	–	–
1LE1001-1C.2	132 M	–	–	14.8	14.4	8.6	8.9	7.9	8.2
1LE1001-1C.3	132 M	–	–	–	–	12	11.9	–	–
1LE1001-1D.2	160 M	20.0	21.0	21.5	20.5	16.1	15.8	9.8	9.6
1LE1001-1D.3	160 M	28.0	27.0	–	–	–	–	13.4	13.3
1LE1001-1D.4	160 L	34.0	33.0	28.5	27.5	22.5	21.5	17.5	16.8
Self-ventilated motors with increased output with improved efficiency – Aluminum series 1LE1									
1LE1002-1A.6	100 L	8.1	7.9	8.5	8.5	5.4	5	–	–
1LE1002-1B.6	112 M	11.2	10.2	12	10.8	7.5	8.0	–	–
1LE1002-1C.6	132 M	20.3	18.9	21.8	21.3	17.0	17.6	–	–
1LE1002-1D.6	160 L	40.2	37.9	36.1	35.5	33.5	34.0	–	–
Self-ventilated motors with increased output and high efficiency – Aluminum series 1LE1									
1LE1001-1A.6	100 L	7.8	7.6	8.3	8.4	5.0	4.95	–	–
1LE1001-1B.6	112 M	10.4	9.8	11.2	11.1	6.6	6.5	–	–
1LE1001-1C.6	132 M	20	19.1	21.5	21	16.5	16.5	–	–
1LE1001-1D.6	160 L	40.0	37.5	35.5	34.5	30.5	29.0	–	–

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Outputs

The outputs or rated outputs are listed in the selection tables for both 50 Hz and 60 Hz.

Assignment of the standard power kW-HP and vice versa in accordance with IEC

$$\text{kW} \cdot 1.341 = \text{HP}$$

$$\text{HP} \cdot 0.746 = \text{kW}$$

P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP
0.06	0.08	0.37	0.5	2.2	3	11	15	37	50	110	150
0.09	0.12	0.55	0.75	3	4	15	20	45	60	132	200
0.12	0.16	0.75	1	4	5	18.5	25	55	75	160	250
0.18	0.25	1.1	1.5	5.5	7.5	22	30	75	100	200	300
0.25	0.33	1.5	2	7.5	10	30	40	90	125		

Efficiency, power factor, rated torque, rated speed and direction of rotation

Efficiency and power factor

The efficiency η and power factor $\cos \varphi$ for each rated output are listed in the selection tables in the individual sections of this catalog.

For EFF1 and EFF2 motors, the 3/4-load-efficiency is also indicated in the selection tables.

The part-load values stated in the two tables below are averages; precise values can be provided on request.

Part-load efficiency in % at				
1/4	1/2	3/4	4/4	5/4
of full load				
93	96	97	97	96.5
92	95	96	96	95.5
90	93.5	95	95	94.5
89	92.5	94	94	93.5
88	91.5	93	93	92.5
87	91	92	92	91.5
86	90	91	91	90
85	89	90	90	89
84	88	89	89	88
80	87	88	88	87
79	86	87	87	86
78	85	86	86	85
76	84	85	85	83.5
74	83	84	84	82.5
72	82	83	83	81.5
70	81	82	82	80.5
68	80	81	81	79.5
66	79	80	80	78.5
64	77	79.5	79	77.5
62	75.5	78.5	78	76.5
60	74	77.5	77	75
58	73	76	76	74
56	72	75	75	73
55	71	74	74	72
54	70	73	73	71
53	68	72	72	70
52	67	71	71	69
51	66	70	70	68
50	65	69	69	67
49	64	67.5	68	66
48	62	66.5	67	65
47	61	65	66	64
46	60	64	65	63
45	59	63	64	62
44	57	62	63	61
43	56	60.5	62	60.5
42	55	59.5	61	59.5
41	54	58.5	60	58.5

Part-load power factor at

1/4	1/2	3/4	4/4	5/4
of full load				
0.70	0.86	0.90	0.92	0.92
0.65	0.85	0.89	0.91	0.91
0.63	0.83	0.88	0.90	0.90
0.61	0.80	0.86	0.89	0.89
0.57	0.78	0.85	0.88	0.88
0.53	0.76	0.84	0.87	0.87
0.51	0.75	0.83	0.86	0.86
0.49	0.73	0.81	0.85	0.86
0.47	0.71	0.80	0.84	0.85
0.45	0.69	0.79	0.83	0.84
0.43	0.67	0.77	0.82	0.83
0.41	0.66	0.76	0.81	0.82
0.40	0.65	0.75	0.80	0.81
0.38	0.63	0.74	0.79	0.80
0.36	0.61	0.72	0.78	0.80
0.34	0.59	0.71	0.77	0.79
0.32	0.58	0.70	0.76	0.78
0.30	0.56	0.69	0.75	0.78
0.29	0.55	0.68	0.74	0.77
0.28	0.54	0.67	0.73	0.77
0.27	0.52	0.63	0.72	0.76
0.26	0.50	0.62	0.71	0.76

Rated speed and direction of rotation

The rated speeds are applicable for the rated data. The synchronous speed changes proportionally with the line frequency. The motors are suitable for clockwise and counter-clockwise rotation.

If U1, V1, W1 are connected to L1, L2, L3, clockwise rotation results as viewed onto the drive-end shaft extension. Counter-clockwise rotation is achieved by swapping two phases (see also "Heating and ventilation", Page 0/111).

Rated torque

The rated torque in Nm delivered at the motor shaft is

$$M = \frac{9.55 \cdot P \cdot 1000}{n}$$

P Rated output in kW
 n Speed in rpm

Note:

If the voltage deviates from its rated value within the admissible limits, the locked-rotor torque, the pull-up torque and the breakdown torque vary with the approximate square of the value, but the locked-rotor current varies approximately linearly.

In the case of squirrel-cage motors, the locked-rotor torque and breakdown torque are listed in the selection tables as multiples of the rated torque.

The normal practice is to start squirrel-cage motors directly on line. The torque class indicates that with direct-on-line starting, even if there is an undervoltage of -5% , it is possible to start up the motor against a load torque of

- 160 % for CL 16
- 130 % for CL 13
- 100 % for CL 10
- 70 % for CL 7
- 50 % for CL 5

of the rated torque.

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

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Rating plate and extra rating plates

DIN EN 60034-1 lays down that the approximate total weight for all motors is indicated on the rating plate.

An extra rating plate can be supplied loose for all motors, order code **M10**.

Non-rusting steel rating plate, for scratch, heat, cold and acid resistance can be obtained, order code **M11**.

Supplementary data (max. of 20 characters) can be indicated on the rating plate or extra rating plate and on the packaging label, order code **Y84**.

An extra rating plate for identification codes is also possible, order code **Y82**.

An extra rating plate or a rating plate with different rating plate data can also be ordered, order code **Y80**.

In the standard version, the rating plate is available in international format or in the German/English language. The language for the rating plate can be ordered by specifying it in plain text. An overview of the languages that can be ordered, at additional cost in some cases, is provided in the table below.

Overview of the languages on the rating plate

Motor type	Frame size	Rating plate							Double rating plate 50/60 Hz data for		
		International	German (de)	English (en)	German (de)/ English (en)	French (fr)/ Spanish (es)	Italian (it)	Portu- guese (pt)	Russian (ru)	500 VY and 575 VY	230 VΔ/ 400 VY and 460 V
1LE1/1PC1	100 ... 160	<input checked="" type="checkbox"/>		<input type="checkbox"/>						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
										500 VΔ and 575 VΔ	400 VΔ/ 690 VY and 460 VΔ

- Standard version
 Without additional charge

Example of a rating plate

V	Hz	A	kW	cos φ	eta	1/min	V	A
400 Δ	50	29,5	15	0,82	89,4%	1460	380-420	30,0-30,2
690 Y	50	17,1	15	0,82	89,4%	1460	660-725	17,4-17,5
460 Δ	60	29,5	17,3	0,82	89,4%	1760	440-480	30,2-29,8

1 Machine type: Three-phase Low-voltage motor
2 Order No.
3 Factory number (Ident No., serial number)
4 Type of construction
5 Degree of protection
6 Rated voltage [V] and winding connections
7 Frequency [Hz]
8 Rated current [A]
9 Rated output [kW]
10 Power factor [cos φ]
11 Efficiency
12 Rated speed [rpm]
13 Voltage range [V]
14 Current range [A]
15 Machine weight [kg]
16 Standards and regulations
17 Temperature class
18 Frame size
19 Additional details (optional)
20 Operating temperature range (only if it deviates from normal)
21 Site altitude (only when higher than 1000 m)
22 Customer data (optional)
23 Date of manufacture YYMM

IEC Squirrel-Cage Motors

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Coolant temperature and site altitude

The rated output specified in the selection tables is applicable for continuous duty in accordance with DIN EN 60034-1 at the frequency of 50 Hz, a coolant temperature (CT) or ambient temperature of 40 °C and a site altitude (SA) up to 1000 m above sea level.

For higher coolant temperatures and/or site altitudes greater than 1000 m above sea level, the specified motor output must be reduced using the factor k_{HT} .

Depending on the frame size of the motor or the number of poles, special windings may be added to the motors for different operating conditions.

This results in an admissible output of the motor of:

$$P_{adm.} = P_{rated} \cdot k_{HT}$$

Reduction factor k_{HT} for different site altitudes and/or coolant temperatures

Site altitude above sea level m	Site altitude above sea level Coolant temperature					
	<30 °C	30 °C ... 40 °C	45 °C	50 °C	55 °C	60 °C
1000	1.07	1.00	0.96	0.92	0.87	0.82
1500	1.04	0.97	0.93	0.89	0.84	0.79
2000	1.00	0.94	0.90	0.86	0.82	0.77
2500	0.96	0.90	0.86	0.83	0.78	0.74
3000	0.92	0.86	0.82	0.79	0.75	0.70
3500	0.88	0.82	0.79	0.75	0.71	0.67
4000	0.82	0.77	0.74	0.71	0.67	0.63

Coolant temperature and site altitude are rounded-off to 5 °C or 500 m.

For the following outputs, rms values are specified for coolant temperatures (CT) of 45 °C and 50 °C that must be specified when ordering.

Power kW	Admissible output at 50 Hz	
	for CT 45 °C kW	for CT 50 °C kW
11	10.5	10
15	14.5	13.8
18.5	17.8	17
22	21	20
30	29	27.5

For details of derating for use in class 155 (F), see "DURIGNIT IR 2000 insulation system".

Motors for coolant temperatures other than 40 °C or site altitudes higher than 1000 m above sea level for use in temperature class 130 (B) must always be ordered with the supplementary order code "-Z" and plain text. In the case of extreme derating, the operating data for the motors will also be less favorable due to partial utilization.

The following special versions are possible for 1LE1 and 1PC1 motors:

- Motors for coolant temperatures from -40 to +40 °C order code **D03**
- Motors for coolant temperatures from -30 to +40 °C order code **D04**

When ordering with order codes **D03** and **D04** in combination with mountings, the respective technical data have to be observed; request required.

For details of order codes for use in temperature class 155 (F), see "DURIGNIT IR 2000 insulation system" under "Windings and insulation", Page 0/108.

The following applies to all motors:

The motors can withstand 1.5 times the rated current at rated voltage and frequency for two minutes (DIN EN 60034).

If the admissible motor output is no longer adequate for the drive, it should be checked whether the motor with the next higher rated output fulfills the requirements.

Abbreviation	Description	Unit
$P_{adm.}$	Admissible motor output	kW
P_{rated}	Rated output	kW
k_{HT}	Factor for abnormal coolant temperature and/or site altitude	

The motors are designed for temperature class 155 (F) and used in temperature class 130 (B). Under non-standard operating conditions, if they are to be used in class 130 (B), the admissible output must be determined from the tables below.

Ambient temperature:

All motors can be used in the standard version at ambient temperatures between -20 to +40 °C.

Motors can be used in temperature class 155 (F)

- at 40 °C with service factor 1.1, i.e. the motor can be continuously overloaded with 10 % of the rated output in the case of EFF2 motors
- at 40 °C with service factor 1.15, i.e. the motor can be continuously overloaded with 15 % of the rated output in the case of EFF1 motors
- above 40 °C at rated output.

When motors are used in temperature class 130 (B) for higher ambient temperatures and/or site altitudes, derating occurs in accordance with the table "Reduction factor k_{HT} for different site altitudes and/or coolant temperatures".

For motors ex stock, the service factor is indicated on the rating plate.

For other temperatures, special measures are necessary. When brakes are to be mounted on at temperatures below freezing, please inquire.

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Windings and insulation

DURIGNIT IR 2000 insulation system

The DURIGNIT IR 2000 insulation system comprises high-grade enameled wires and insulating sheet materials combined with solvent-free impregnating resin.

The system ensures a high level of mechanical and electrical strength as well as good serviceability and a long motor life.

The insulation system protects the winding against aggressive gases, vapors, dust, oil and increased air humidity. It can withstand the usual vibration stressing.

The insulation is suitable up to an absolute air humidity of 30 g water per m³ of air. Moisture condensation should be prevented from forming on the winding. Please inquire if higher values are required.

Please inquire about extreme applications.

Restarting against residual field and opposite phase

All motors can be reclosed against 100 % residual field after a mains voltage failure.

Winding and insulation design with regard to temperature class and air humidity

All motors are designed for temperature class 155 (F).

At rated output with mains-fed operation, the motors can be used in temperature class 130 (B).

Temperature class 155 (F), used according to 155 (F), with service factor (SF)

For all 1LE1/1PC1 motors for mains-fed operation for the rated output given in the selection table and rated voltage, a service factor of 1.1 can be specified for EFF2 motors (SF = 1.15 for EFF1 motors) also for motors with increased output.

Order code **N01**

Temperature class 155 (F), used according to 155 (F), for increased output

When used according to temperature class 155 (F), the rated output as specified in the selection and ordering data can be increased by 10 % for EFF2 motors (15 % for EFF1 motors) also for motors with increased output.

Order code **N02**

Temperature class 155 (F), used according to 155 (F), with increased coolant temperature

For mains-fed motors at outputs in accordance with the catalog, the coolant temperature can be raised to 55 °C.

Order code **N03**

The service factor (SF) is not indicated on the rating plate for order codes N02 and N03.

For converter-fed operation at the output specified in the catalog, the motors are used in accordance with temperature class 155 (F). Order codes N01, N02 and N03 are not possible. This applies to motors up to 460 V.

Temperature class 155 (F), used according to 155 (F), other requirements

The motors can be ordered according to temperature class 155 (F) for use according to temperature class 155 (F) with other customized requirements if they are specified in plain text in the order.

Order code **Y52**

Temperature class 180 (H) at rated output and maximum coolant temperature CT 60 °C

For motor series 1LE1 and 1PC1, use according to temperature class 180 (H) is permitted at rated output and at a maximum coolant temperature of 60 °C. This does not apply to motor series 1LE1 and 1PC1 with UL approval (order code D31) and CSA approval (order code D40). The specified grease life applies to a coolant temperature of 40 °C. For a 10 K increase in coolant temperature, the grease life or lubrication interval is halved.

Order code **N11**

Temperature class 155 (F), used according to 130 (B), coolant temperature 45 °C, approx. 4 % derating

For the 1LE1 motor series, a version for temperature class 155 (F) can be used according to temperature class 130 (B) at a maximum coolant temperature of 45 °C with a 4 % reduction in rated output.

Order code **N05**

Temperature class 155 (F), used according to 130 (B), coolant temperature 50 °C, approx. 8 % derating

For the 1LE1 motor series, a version for temperature class 155 (F) can be used according to temperature class 130 (B) at a maximum coolant temperature of 50 °C with a 8 % reduction in rated output.

Order code **N06**

Temperature class 155 (F), used according to 130 (B), coolant temperature 55 °C, approx. 13 % derating

For the 1LE1 motor series, a version for temperature class 155 (F) can be used according to temperature class 130 (B) at a maximum coolant temperature of 55 °C with a 13 % reduction in rated output.

Order code **N07**

Temperature class 155 (F), used according to 130 (B), coolant temperature 60 °C, approx. 18 % derating

For the 1LE1 motor series, a version for temperature class 155 (F) can be used according to temperature class 130 (B) at a maximum coolant temperature of 60 °C with a 18 % reduction in rated output.

Order code **N08**

Increased air temperature/humidity with 30 to 60 g water per m³ of air

For motors of series 1LE1 and 1PC1, a version can be ordered for increased air humidity of between 30 and 60 g water per m³ of air depending on the temperature as listed in the table below. This option includes condensation drainage holes (order code H03).

Order code **N20**

Please contact your local Siemens office if order code N20 is to be combined with additional mountings (eg. rotary pulse encoders, brakes).

Increased air temperature/humidity with 60 to 100 g water per m³ of air

For motors of series 1LE1 and 1PC1, a version can be ordered for increased air humidity of between 60 and 100 g water per m³ of air depending on the temperature as listed in the table below. This option includes condensation drainage holes (order code H03).

Order code **N21**

Please contact your local Siemens office if order code N21 is to be combined with additional mountings (eg. rotary pulse encoders, brakes).

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Absolute/relative conversion of air humidity

Relative humidity	Temperature							
	20 °C	30 °C	40 °C	50 °C	60 °C	70 °C	80 °C	90 °C
10 %	2	3	5	8	13	20	29	42
15 %	3	5	8	12	19	30	44	63
20 %	3	6	10	17	26	39	58	84
25 %	4	8	13	21	32	49	73	105
30 %	5	9	15	25	39	59	87	126
35 %	6	11	18	29	45	69	102	146
40 %	7	12	20	33	52	79	116	167
45 %	8	14	23	37	58	89	131	188
50 %	9	15	26	41	65	98	145	209
55 %	10	17	28	46	71	108	160	230
60 %	10	19	31	50	78	118	174	251
65 %	11	20	33	54	84	128	189	272
70 %	12	21	36	58	91	138	203	293
75 %	13	23	38	62	97	148	218	314
80 %	14	24	41	66	104	157	233	335
85 %	15	26	43	70	110	167	247	356
90 %	16	27	46	74	117	177	262	377
95 %	16	29	49	79	123	187	276	398
100 %	17	30	51	83	130	197	291	419

The values in the table with a blue background are covered by the standard version (up to 30 g water per m³ of air).

The values in the table with a light gray background are covered by order code **N20** (30 to 60 g of water per m³ of air).

The values in the table with a dark gray background are covered by order code **N21** (60 to 100 g of water per m³ of air).

Please contact your local Siemens office regarding requirements exceeding 100 g water per m³ of air

Restarting against residual field and opposite phase

All motors can be reclosed against 100 % residual field after a mains voltage failure.

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Motor protection

The order variants for motor protection are coded with letters in the 15th position of the Order No. and, if necessary, using order codes.

In the standard version, the motor is designed without motor protection.

15th position of Order No. letter **A**

A distinction is made between current-dependent and motor-temperature-dependent protection devices.

Current-dependent protection devices

Fuses are only used to protect mains cables in the event of a short-circuit. They are not suitable for overload protection of the motor.

The motors are usually protected by delayed overload protection devices (circuit breakers for motor protection or overload relays).

This protection is current-dependent and is particularly effective in the case of a locked rotor.

For standard duty with short start-up times and starting currents that are not excessive and for low numbers of switching operations, motor protection switches provide adequate protection. Motor protection switches are not suitable for heavy starting duty or large numbers of switching operations. Differences in the thermal time constants for the protection equipment and the motor results in unnecessary early tripping when the protection switch is set to rated current.

Motor-temperature-dependent protection devices

Temperature detectors installed in the motor winding are suitable protection devices in the case of slowly rising motor temperature.

When a limit temperature is reached, these **bimetal switches** (NC contacts) can deactivate an auxiliary circuit. The circuit can only be reclosed following a considerable fall in temperature. When the motor current rises quickly (e.g. with a locked rotor), these switches are not suitable due to their large thermal time constants.

Temperature detectors for tripping

15th position of Order No. letter **Z** and order code **Q3A**

The most comprehensive protection against thermal overloading of the motor is provided by **PTC thermistors (thermistor motor protection)** installed in the motor winding. The temperature of the winding can be accurately monitored thanks to its low heating capacity and the excellent heat contact with the winding. When a limit temperature is reached (rated tripping temperature), the PTC thermistors undergo a step change in resistance. This is evaluated by a tripping unit and can be used to open auxiliary circuits. The PTC thermistors themselves cannot be subjected to high currents and voltages. This would result in destruction of the semiconductor. The switching hysteresis of the PTC thermistor and tripping unit is low, which supports fast re-starting of the drive. Motors with this type of protection are recommended for heavy duty starting, switching duty, extreme changes in load, high ambient temperatures or fluctuating supply systems.

Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping. In the connection box, 2 auxiliary terminals are required.

15th position of Order No. letter **B**

The temperature detectors have the following current carrying capacity and switching capacity:

230 V AC $\cos\phi$: 2.5 A

24 V DC: 1.6 A

Two sets of three temperature sensors are used if a warning is required before the motor is shut down (tripped). The warning is normally set to 10 K below the tripping temperature.

Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping. In the connection box, 4 auxiliary terminals are required.

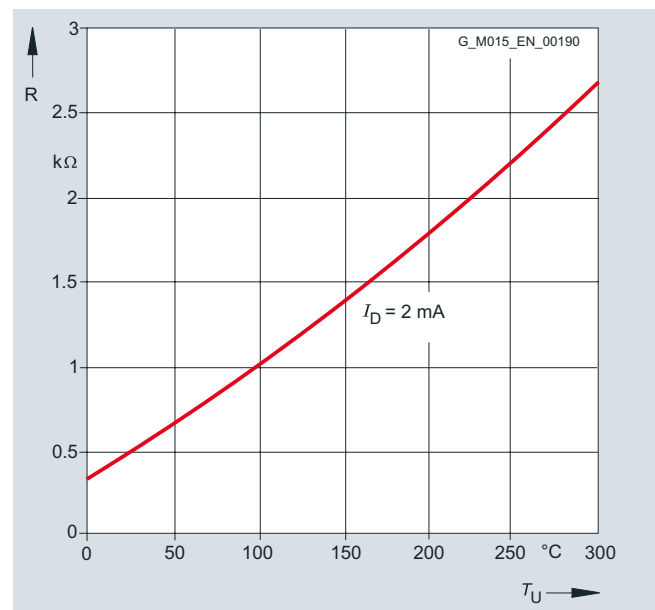
15th position of Order No. letter **C**

In order to achieve full thermal protection, it is necessary to combine a thermally delayed overcurrent release and a PTC thermistor. For full motor protection implemented only with PTC thermistors, please inquire.

Motor temperature detection with converter-fed operation

KTY 84-130 temperature sensor

This sensor is a semiconductor that changes its resistance depending on temperature in accordance with a defined curve.



KTY 84-130 temperature sensor characteristic

Some converters from Siemens determine the motor temperature using the resistance of the temperature sensor. They can be set to a required temperature for alarm and tripping.

Motor temperature detection with embedded temperature sensor KTY 84-130. Two auxiliary terminals are required in the connection box.

15th position of Order No. letter **F**

The temperature sensor is embedded in the winding head of the motor in the same manner as a PTC thermistor. Evaluation is performed, for example, in the converter.

For mains-fed operation, the temperature monitoring device 3RS10 that is part of the protection equipment can be ordered separately. For further details, see Catalog LV 1, Order No.: E86060-K1002-A101-A7-7600.

With NTC thermistors (mainly in the case of special machines), the tripping temperature can also be adjusted later on the tripping unit. NTC thermistors for tripping

15th position of Order No. letter **Z** and order code **Q2A**

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Heating and ventilation

Anti-condensation heaters

Supply voltage 230 V (1~)
Order code **Q02**

Supply voltage 115 V (1~)
Order code **Q03**

Motors whose windings are at risk of condensation due to the climatic conditions, e.g. inactive motors in humid atmospheres or motors that are subjected to widely fluctuating temperatures, can be equipped with anti-condensation heaters.

An additional M16 x 1.5 cable entry is provided for the connecting cable in the connection box.

Anti-condensation heaters must not be switched on during operation.

Motor series	Frame size	Heater output of anti-condensation heaters in Watt (W)	
		Supply voltage at 230 V	Supply voltage at 115 V
		Order code Q02	Order code Q03
1LE1/1PC1	100 ... 112	50	50
1LE1/1PC1	132 ... 160	100	100

Instead of an anti-condensation heater, another possibility (at no extra cost) is connection of a voltage that is approximately 4 to 10 % of the rated motor voltage to stator terminals U1 and V1; 20 to 30 % of the rated motor current are sufficient to heat the motor.

Fans/Separately driven fans

1LE1 motors of frame sizes 100 ... 160 have radial-flow fans in the standard version (with the exception of 1LE1 with option F90 – version “Forced-air cooled motors without external fan and fan cover”) that cool regardless of the direction of rotation of the motor (cooling method IC 411 acc. to DIN EN 60034-6). The air flow is forced from the non-drive-end (NDE) to the drive end (DE). For details of separately driven fans for frame sizes 100 ... 160, see Page 0/129.

Supply voltage of separately driven fan for 1LE1 motors:
The supply voltage tolerance of the separately driven fan is $\pm 5\%$; for voltage ranges, Page 0/129.

When the motor is mounted and the air intake is restricted, it must be ensured that a minimum clearance is maintained between the fan cover and the wall. This clearance is calculated from the difference between the protective cover and the fan cover (differential dimension LM – L) or is specified in the detailed dimension drawing (see also Dimensional drawings from Page 1/68).

For design of the fan/separately driven fan and the fan cover, see the table below.

Motor series	Frame size	Fan material	Fan cover material
1LE1	100 ... 160	plastic	plastic ¹⁾

Metal external fan impeller

The standard fan impeller made of plastic can be replaced with a fan impeller made of metal. This version can be supplied 1LE1 (with the exception of 1LE1 with option F90 – version “Forced-air cooled motors without external fan and fan cover”). With the 1LE1 motor series, the metal fan can also be used for converter-fed operation.

A metal external fan is already included for the low-noise version.

Up to frame size 160, the metal external fan impeller is manufactured from sheet aluminum or steel.

Order codes **F76**

Fan cover for textile industry

For motors 1LE1 (with the exception of 1LE1 with option F90 – version “Forced-air cooled motors without external fan and fan cover”), the fan cover can be used in the standard version for the textile industry.

For motor series 1LE1 (with the exception of 1LE1 with option F90 – version “Forced-air cooled motors without external fan and fan cover”), a version of the fan cover can be supplied specially for the textile industry. This has a protective cover and is made of non-corrosive sheet steel.

When a fan cover is mounted for the textile industry, the length of the motor increases by 64 mm for frame sizes 100/112 and by 71 mm for frame sizes 132/160.

Order code **F75**

Sheet metal fan cover

For 1LE1 motor series (with the exception of 1LE1 with option F90 – version “Forced-air cooled motors without external fan and fan cover”), the fan cover can be supplied in sheet metal instead of plastic.

Order code **F74**

¹⁾ The sheet metal fan cover is used for type of construction codes **A, D, F, H, J, K, L, N, T, U, V** in combination with option **H03** (condensation drainage holes). Mounted separately driven fans and brakes are only available for versions with sheet metal fan covers.

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Necessary minimum cooling air flow for forced-air-cooled motors in standard duty

The required cooling air flow indicated in the selection table applies to continuous duty according to DIN EN 60034-1 at a coolant temperature (CT) and ambient temperature, respectively, of 40 °C and a site altitude (SA) of up to 1000 m above sea level.

In the motor version without external fan and fan cover, order code **F90**, the motor is located in the air flow of the fan to be

driven which must drive the minimum cooling air flow over the motor housing. The minimum air flow must pass closely over the housing (comparable to self-ventilation of the motor). Otherwise, higher air flows are required to comply with admissible motor heating levels. For a higher cooling air flow, the operating temperature of the motor can be reduced.

Frame size	Required cooling air flow for number of poles									
	2		4				6		8	
	EFF1/EFF2		EFF1		EFF2		EFF1/EFF2		EFF1/EFF2	
	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
	m ³ /min.	m ³ /min.	m ³ /min.	m ³ /min.	m ³ /min.	m ³ /min.	m ³ /min.	m ³ /min.	m ³ /min.	m ³ /min.
100	3.8	4.4	2.1	2.6	2.3	2.8	1.5	1.8	1.2	1.3
112	5.0/5.4 ¹⁾	5.7/6.1 ¹⁾	2.9	3.5	2.9	3.5	1.9	2.3	1.4	1.6
132	6.3	7.3	4.6	5.7	4.6	5.7	3.1	3.8	2.4	2.9
160	10.9	13.3	6.7	8.1	7.6	9.1	5	6.1	3.8	4.5

¹⁾ Value: EFF1/EFF2

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Motor connection and connection box

Connection, circuit and connection box

Location of the connection box

The order variants for motor connection are coded with digits in the 16th position of the Order No.

The connection box of the motor can be mounted in four different locations or positions. The position of the connection box must always be viewed from the drive end (DE).

The standard position of the connection box for *General Line motors* is on top
16th position of Order No. digit **0**.

The standard position of the connection box for all other motors is on top
16th position of Order No. digit **4**.

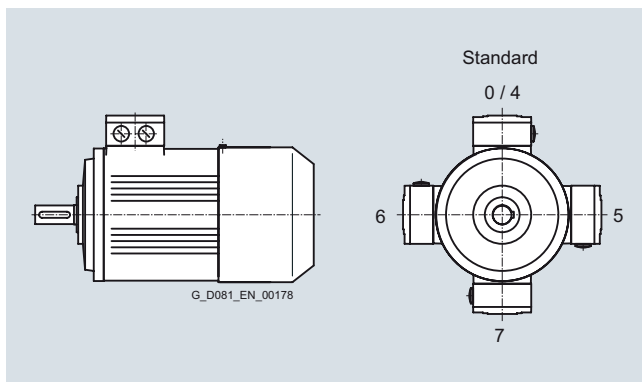
For all motors with feet (apart from motors with increased output), cast feet are standard. If rotation of the connection box in the future has to be provided for, it is recommended that the option "Screwed-on feet" (instead of cast feet), order code **H01**, is ordered.

For motors with feet and increased output, screwed-on feet are standard. The connection box can be rotated later.

Connection box on RHS
16th position of Order No. digit **5**.

Connection box on LHS
16th position of Order No. digit **6**.

Connection box bottom
16th position of Order No. digit **7**.



Location of the connection box with the corresponding digits in the 16th position of the order number

The number of winding ends depends on the winding design. Three-phase motors are connected to the three phase conductors L1, L2 and L3 of a three-phase system. The rated voltage of the motor in the running connection must match the phase conductor voltages of the network.

When the three phases are operating in a time sequence and are connected to the terminals of the motor in alphabetical order U1, V1 and W1, clockwise rotation is established as viewed from the motor shaft. The direction of rotation of the motor can be reversed if two connecting leads are interchanged.

Labeled terminals are provided to connect the protective conductor.

A PE terminal is provided in the connection box for grounding. A grounding terminal is provided on the outside of the motor frame – special version for 1LE1/1PC1 motors.

Order code **H04**.

If a brake control system or thermal protection is installed, the connections will also be in the connection box. The motors are suitable for direct connection to the line supply.

Design of the connection box

The number of terminals and the size of the connection box are designed for standard requirements.

For special requirements or upon the customer's request, a larger connection box, can be delivered.

Order code **R50**

If the necessary installation angle of the motor would cause machine components to collide with the connection box, the connection box can be moved from the drive end (DE) to the non-drive end (NDE). Only use according to temperature class 155 (F) possible.

Order code **H08**

Not possible for explosion-proof motors.

Motor connection

Line feeder cables

The line feeder cables must be dimensioned acc. to DIN VDE 0298. The number of required feeder cables, if necessary in parallel, is defined by:

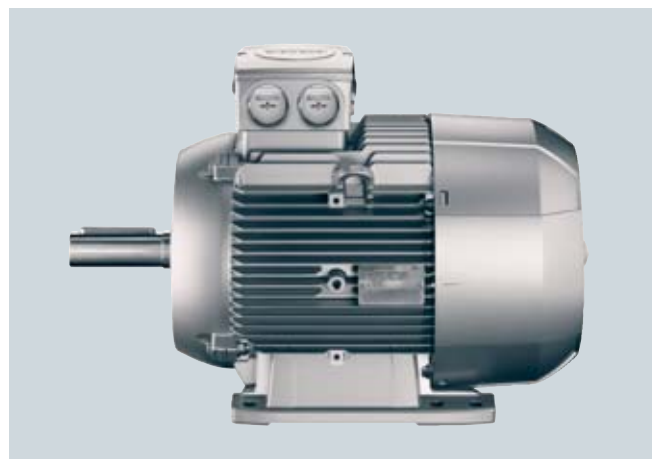
- The max. cable cross-section which can be connected
- The cable type
- Routing
- Ambient temperature and the corresponding admissible current in accordance with DIN VDE 0298

For motors with auxiliary terminals (e.g. 15th position of Order No. is letter **B**) an M16 x 1.5 cable gland with plug is additionally provided.

For further details, see the data sheet function in the SD generator.

The connection box is located on the housing and bolted in place. The connection box can be turned 4 x 90° on the terminal base of the machine's housing in the case of a terminal board with 6 terminal studs (standard design).

There are 2 entry holes at the standard position complete with sealing plugs and locknuts (see figure).



Connection box in standard position

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Cable entry on connection box

Unless stated otherwise, the cable entry is located in the standard position as shown in the illustration.

The connection box can also be rotated such that the cable entry is located

- Towards the drive end (DE)
(rotation of connection box by 90°, entry from DE)
Order code **R10**
- Towards the non-drive end (NDE)
(rotation of connection box by 90°, entry from NDE)
Order code **R11**
- Opposite
(rotation of connection box by 180°, entry from opposite end)
Order code **R12**

The dimensions of the connection box are listed in part "Dimensions", see Pages 1/65 to 1/75 in accordance with the frame size and the "Dimension drawings".

If the position of the connection box (connection box RHS, LHS or above) is changed, the position of the cable entry must be checked and, if necessary, it can be ordered with the corresponding order codes (**R10**, **R11** and **R12**).

Ordering example:

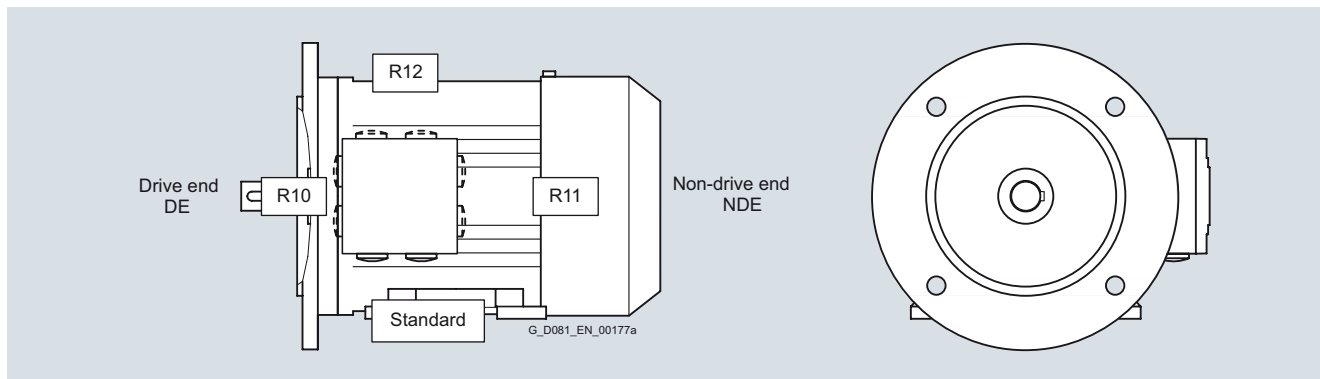
Connection box on RHS (16th position of Order No. digit 5):
Without additional order code, cable entry from below.

With additional order code **R10**:
Cable entry from drive end (DE)



Connection box in standard position, detailed view

For cable entry to a standard connection box, a metal cable entry can be ordered for motor connection.
One cable gland, metal
Order code **R15**



Locations of the cable entries with corresponding order codes

For special requirements for which standard holes for the cable entries are inadequate for the British market in UK, reduction pieces for M cable glands in accordance with British Standard that are mounted on both cable entries can be supplied.

Order code **R30**

Frame size	Cable entry acc. to	
	IEC	British Standard
100	2 x M32	2 x M20
112/132	2 x M32	2 x M25
160	2 x M40	2 x M32

Protruding cable ends

For confined spaces, protruding cable ends can be ordered, without a connection box with cover plate.

The following lengths of protruding cables can already be ordered using order codes on request:

- 3 cables protruding, 0.5 m long ¹⁾
Order code **R20**
- 3 cables protruding, 1.5 m long ¹⁾
Order code **R21**
- 6 cables protruding, 0.5 m long
Order code **R22**
- 6 cables protruding, 1.5 m long
Order code **R23**
- 6 cables protruding, 3.0 m long
Order code **R24**

The cross-section of the named cables refers to a coolant temperature up to CT 40 °C.

¹⁾ With only 3 protruding cables additional plain text specifying star or delta connection is required.

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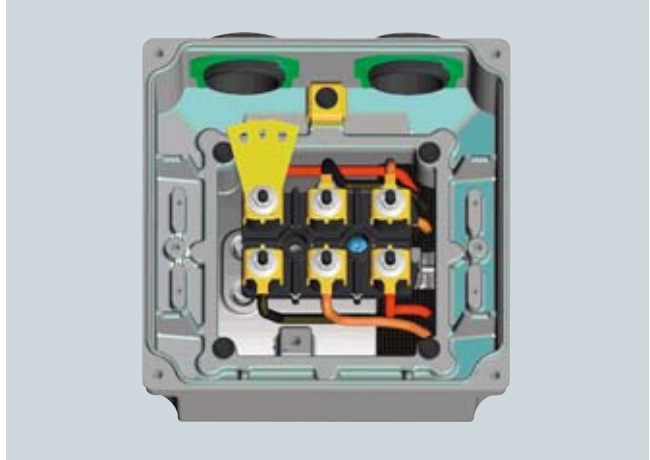
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Connection, circuit and connection box

Standard connection box TB1 F00, TB1 H00, TB1 J00



Larger connection box type TB1F10, TB1H10, TB1J10



Standard connection boxes/larger connection box for 1LE1/1PC1 motors – basic data

Motors	Frame size	Number of cable entries	Connection box material	Feeder connection
1LE1	100 ... 160	2 entries complete with sealing plugs and locknuts Connection box is mounted and bolted in place.	Aluminum alloy	Without cable lug

Possible positions of the standard connection boxes/Larger connection box for 1LE1/1PC1 motors

Motors	Frame size	Connection box position			Rotation of connection box		Retrofitting possible
		Above	Side, right or left	Retrofitting possible	90°	180°	
1LE1	100 ... 160	○	○	– ¹⁾	○	○	Yes

○ Available version

Standard connection boxes/larger connection box for 1LE1/1PC1 motors in standard version

Frame size	Connection box	Number of terminals	Contact screw thread	Max. connectable cross-section	Outer cable diameter (sealing range)	Cable entry ²⁾	Two-part plate Adm. outer cable diameter
	standard / larger			mm ²	mm		mm
1LE1							
100	TB1 F00/TB1F10	6	M4	4	11 ... 21	2 x M32 x 1.5	–
112							
132	TB1 H00/TB1H10	6	M4	6	11 ... 21	2 x M32 x 1.5	–
160	TB1 J00/TB1J10	6	M5	16	19 ... 28	2 x M40 x 1.5	–

– Not available

Terminal connection

The terminal board accommodates the terminals that are connected to the leads to the motor windings. The terminals are designed so that for frame sizes 100 ... 160 the external (line) connections can be made without the need for cable lugs.

¹⁾ Retrofittable screwed-on feet (16th position of Order No. digit **5, 6, 7** and **4** with order code **H01**).

²⁾ Designed for cable glands with O-ring.

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





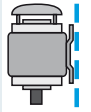





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Types of construction

Standard types of construction and special types of construction

Type of construction acc. to DIN EN 60034-7		Frame size	Letter 14th position of the Order No.	Order No. supplement -Z with order code
Without flange				
IM B3		100 L to 160 L	A	–
IM B6/IM 1051		100 L to 160 L	T	–
IM B7/IM 1061		100 L to 160 L	U	–
IM B8/IM 1071		100 L to 160 L	V	–
IM V5/IM 1011 without protective cover		100 L to 160 L	C	–
IM V6/IM 1031		100 L to 160 L	D	–
IM V5/IM 1011 with protective cover		100 L to 160 L	C	+ H00 ¹⁾
With flange				
IM B5/IM 3001		100 L to 160 L	F	–
IM V1/IM 3011 without protective cover		100 L to 160 L	G	–
IM V1/IM 3011 with protective cover		100 L to 160 L	G	+ H00 ¹⁾
IM V3/IM 3031		100 L to 160 L	H	–
IM B35/IM 2001		100 L to 160 L	J	–











In the DIN EN 50347 standard, flanges FF with through holes and flanges FT with tapped holes are specified.

¹⁾ A second shaft extension **L05** is not possible.

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Type of construction acc. to DIN EN 60034-7		Frame size	Letter 14th position of the Order No.	Order No. supplement -Z with order code
With standard flange				
IM B14/IM 3601		100 L to 160 L	K	–
IM V19/IM 3631		100 L to 160 L	L	–
IM V18/IM 3611 without protective cover		100 L to 160 L	M	–
IM V 18/IM 3611 with protective cover		100 L to 160 L	M	+ H00 ¹⁾
IM B34/IM 2101		100 L to 160 L	N	–
With special flange (next larger standard flange)				
IM B14/IM 3601		100 L to 160 L	K	+ P01
IM V19/IM 3631		100 L to 160 L	L	+ P01
IM V18/IM 3611 without protective cover		100 L to 160 L	M	+ P01
IM V 18/IM 3611 with protective cover		100 L to 160 L	M	+ P01 + H00 ¹⁾
IM B34/IM 2101		100 L to 160 L	N	+ P01

In DIN EN 50347, standard flanges are assigned to the frame sizes as FT with tapped holes. The special flange was assigned as a large flange in the previous DIN 42677.

The dimensions of the following types of construction are identical:

IM B3, IM B6, IM B7, IM B8, IM V5 and IM V6
IM B5, IM V1 and IM V3
IM B14, IM V18 and IM V19

Motors in the standard output range can be ordered in basic types of construction IM B3, IM B5 and IM B14 and can be operated in the following mounting positions – IM B6, IM B7, IM B8, IM V5, IM V6, IM V1, IM V3 (up to frame size 160 L) or IM V18 and IM V19. Eyebolts are available for transport and installation in a horizontal position. In conjunction with the eyebolts, for the purpose of stabilizing the position when the motor is arranged vertically, additional lifting straps (DIN EN 1492-1) and/or clamp bands (DIN EN 12195-2) must be used.

If mounting position IM V1 is ordered, eyebolts are supplied for vertical mounting.

The motors are designated in accordance with the types of construction on the rating plate.

With motors that have a vertical shaft extension, the end user must prevent an ingress of fluid along the shaft.

In the case of all types of construction with shaft extension down, the version “with protective cover” is urgently recommended, see the section “Degrees of protection”, Page 0/119.

Frame design

Motors in the types of construction with feet have, in some cases, two fixing holes at the feet at the non-drive end (NDE), see dimension tables, Pages 1/68 to 1/75. A code is cast into the motor close to the fixing retaining holes to identify the frame size.

A metal fan cover is used as standard for horizontal types of construction and types of constructions with shaft extension facing upwards (14th position of Order No. letter **A, T, U, V, D, F, H, J, K, L** or **N**) in combination with condensation drainage holes, order code **H03**.

¹⁾ A second shaft extension **L05** is not possible.

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Mechanical design and degrees of protection

Preparation for gear mounting

The flange-mounting motors can be equipped with a radial seal in order to mount gearing.

Order code **H23**

It must be ensured that the sealing ring is lubricated using grease, oil mist or oil spray (it is not permissible to use pressurized oil > 0.1 bar).

We recommend that the admissible bearing loads are carefully checked.

Eyebolts and transport

1LE1/1PC1 motors without feet have four cast eyebolts as standard, each offset by 90°; in the case of screwed-on feet, two eyebolts are covered by the feet, so in this case only two eyebolts are available for use.

Frame material

Type series	Frame size	Frame material	Frame feet
1LE1/1PC1	100 ... 160	Aluminum alloy	Cast ¹⁾

Preparation for mountings

The encoders of the “modular and special technology” can be fitted at a later time. The motor must be prepared for this. Possible for all 1LE1 motors (with the exception of 1LE1 with option F90 – version “Forced-air cooled motors without external fan and fan cover”).

For the brake with order code F01 and for all encoders from the “modular and special technology”, this preparation of the shaft extension on NDE can be ordered with the option “Prepared for mounting, only center hole”.

Order code **G40**

The length of the motor does not change because the shaft extension is still under the fan cover.

For the encoders

- 1XP8 012-10 order code G01
- 1XP8 012-20 order code G02

from the “modular technology”, this preparation of the shaft extension on NDE can be ordered with the option “Prepared for mounting with shaft D12”.

Order code **G41**

By using option **G41**, the motor length increases by dimension Δl . For explanations of additional dimensions and weights, see “Technology”, “Dimensions and weights” from Page 0/137.

For the encoders

- LL 861 900 220 order code G04
- HOG 9 D 1024 I order code G05
- HOG 10 D 1024 I order code G06

from the “special technology”, this preparation of the shaft extension on NDE can be ordered with the option “Prepared for mounting with shaft D16”.

Order code **G42**

By using option **G42**, the motor length increases by dimension Δl . For explanations of additional dimensions and weights, see “Technology”, “Dimensions and weights” from Page 0/137.

Motors that are prepared for additional mountings (order codes G40, G41, G42) are supplied without protective cover as standard.

If a protective cover is requested as cover or as mechanical protection for mounting provided by the customer, it can be ordered with order code **G43**. It must be mounted according to the supplied installation instructions. The protective cover has supports of different lengths that, depending on the height of the mounting, can be used during the installation.

The standard protective cover (order code **H00**) is not suitable for protecting additional mountings such as the rotary pulse encoder.

The order codes **G40**, **G41** and **G42** are not possible in combination with order code **L00**, vibration quantity level B.

¹⁾ Basic version, cast feet: Special version “Screwed-on feet (instead of cast)” with digit **5**, **6** and **7** in the 16th position of the Order No. or digit **4** with order code **H01**. Screwed-on feet are standard for motors with increased output.

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Degrees of protection

All motors are designed to IP55 degree of protection. They can be installed in dusty or humid environments. The motors are suitable for operation in tropical climates. Guide value <60 % relative air humidity at CT 40 °C. Other requirements are available on request.

Brief explanation of the degree of protection

IP55: Protection against harmful dust deposits, protection against water jets from any direction.

IP56 (non-heavy-sea):

Protection against harmful dust deposits, protection against water jets from any direction.

Order code **H22**

DIN EN 60034-5 defines protection level 6 for water protection as: "Protection against water due to heavy seas or water in a powerful jet". IP56 non-heavy-sea degree of protection can only be used with the requirement "Protection against a powerful jet" and not for the requirement "Protection against heavy sea". Not possible in combination with brake 2LM8 (order code **F01**).

IP65: Complete protection against dust deposits, protection against water jets from any direction.

Order code **H20**

In DIN EN 60034-5, the code 6 for protection against the ingress of foreign bodies and touch hazard protection for electrical machines is not listed – data for code 6 (protection against the ingress of dust) is given in EN 60529.

Not possible in combination with rotary pulse encoder HOG 9 D 1024I (order code **G05**) and/or brake 2LM8 (order code **F01**) and/or in combination with option "unpainted, only cast iron parts primed" (**S00**).

DIN EN 60529 contains a comprehensive description of this degree of protection as well as test conditions.

With motors that have a vertical shaft extension, the end user must prevent an ingress of fluid along the shaft.

For motors with shaft extension pointing downwards, the version "protective cover for types of construction", order code **H00**, is urgently recommended, see also "Types of construction", Page 0/116.

With flange-mounting motors, for IM V3 type of construction, collection of fluid in the flange basin can be prevented by drainage holes (on request).

The condensation drainage holes at the drive end (DE) and non-drive end (NDE) are sealed (IP55) on delivery. If the condensation drainage holes are ordered for motors to the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), the position of the drainage holes will be in the correct position for the type of construction.

Order code **H03**

A metal fan cover is used as standard for horizontal types of construction and types of constructions with shaft extension facing upwards (14th position of Order No. letter **A, T, U, V, D, F, H, J, K, L** or **N**) in combination with condensation drainage holes, order code **H03**, to facilitate mounting/demounting.

When the motors are used or stored outdoors we recommend that they are kept under some sort of cover so that they are not subjected to direct intensive solar radiation, rain, snow, ice or dust over a long period of time. In such cases, technical consultation may be appropriate.

When the motors are used outdoors or in a corrosive environment, it is recommended that non-rusting screws are used externally.

Order code **H07**

Vibration-proof version

A load of 1.5 g in all 3 planes for up to 1 % of the service life of the motor is possible.

Order code **H02**

For availability of individual options for the relevant motor series, see section "Special versions" in catalog part 1.

Noise levels for mains-fed operation

The noise levels are measured in accordance with DIN EN ISO 1680 in a dead room. It is specified as the A-valued measuring-surface sound pressure level L_{pFA} in dB (A).

This is the spatial mean value of the sound pressure levels measured on the measuring surface. The measuring surface is a cube 1 m away from the surface of the motor. The sound power level is also specified as L_{WA} in dB (A).

The specified values are valid at 50 Hz at rated output (see the Selection and ordering data). The tolerance is +3 dB. At 60 Hz, the values are approximately 4 dB (A) higher. Please inquire about the noise levels for motors with converter-fed operation.

To reduce noise levels, 2-pole motors with frame size 132 S can be fitted with an axial-flow fan that is only suitable for one direction of rotation. The values can be taken from the table "Low-noise version" below.

Clockwise rotation

Order code **F77**

Counter-clockwise rotation

Order code **F78**

A second shaft extension and/or mountings (mounting of brake, external fan, or encoder) are not possible.

Low-noise version

Type series	Frame size	2-pole motors	
		L_{pFA} dB (A)	L_{WA} dB (A)
1LE1 ¹⁾	132	60	72
	160	60	72

¹⁾ With the exception of 1LE1 with option F90 – version "Forced-air cooled motors without external fan and fan cover".

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Balance and vibration quantity

All of the rotors are dynamically balanced with an inserted half key. This corresponds to vibration quantity level A (normal/standard). The vibrational characteristics and behavior of electrical machinery is specified in DIN EN 60034-14 Sept. 2004. Based on DIN ISO 8821, the key convention "half key" (H) must be used for balancing.

The type of key convention used for balancing is stamped on the face of the DE/NDE.

- F = Balancing with full key
(Full-key convention)
- H = Balancing with half key
(Half-key convention) – standard
- N = Balancing without key –
Plain text required (Convention without key)

This is indicated on the rating plate of motors up to frame size 112. Full-key balancing or balancing with full-key (F) is possible on request with order code **L02** (additional charge).

Balancing without featherkey (N) is possible on request by specifying code **L01** (additional charge).

Vibration quantity level A is the standard version and is valid for a rated frequency of 60 Hz.

Low-vibration version B can be supplied to fulfill stricter requirements on smooth running (additional charge).

Vibration quantity level B
Not possible with parallel roller bearings.
Order code **L00**

The order code **L00** vibration quantity level B is not possible in combination with order codes **G40**, **G41** and **G42**.

The limits stated in the table are applicable for uncoupled, idling motors in free suspension.

For converter-fed operation with frequencies greater than 60 Hz, special balancing is required for compliance with the specified limit values (plain text: max. supply frequency/speed).

For further details, see the online help in the SD configurator (available soon).

Limits (rms values) for max. vibration quantity of vibration distance (s), vibration speed (v) and acceleration (a) for the shaft height H

Vibration quantity level	Machine installation	Shaft height H in mm								
		56 ≤ H ≤ 132			132 < H ≤ 280			H > 280		
		s_{rms} μm	v_{rms} mm/s	a_{rms} mm/s ²	s_{rms} μm	v_{rms} mm/s	a_{rms} mm/s ²	s_{rms} μm	v_{rms} mm/s	a_{rms} mm/s ²
A	Free suspension	25	1.6	2.5	35	2.2	3.5	45	2.8	4.4
	Rigid clamping	21	1.3	2.0	29	1.8	2.8	37	2.3	3.6
B	Free suspension	11	0.7	1.1	18	1.1	1.7	29	1.8	2.8
	Rigid clamping	–	–	–	14	0.9	1.4	24	1.5	2.4

For details, see standard DIN EN 60034-14, Sept. 2004.

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Shaft and rotor

Shaft extension

60° center hole to DIN 332, Part 2 with M3 to M24 tapped hole depending on the shaft diameter (see dimension tables, Pages 1/68 to 1/75.)

Second standard shaft extension.

Order code **L05**

Possible for all 1LE1 motors (with the exception of 1LE1 with option F90 – version “Forced-air cooled motors without external fan and fan cover”).

The second shaft extension can transmit the full rated output via coupling output.

Please also inquire about the transmitted power and admissible cantilever force if belt pulleys, chains or gear pinions are used on the second shaft extension.

A second shaft extension is not available if a rotary pulse encoder and/or separately driven fan is mounted. Please inquire if a brake is mounted.

DE (shaft extension)	
Diameter mm	Thread mm
7 ... 10	DR M3
>10 ... 13	DR M4
>13 ... 16	DR M5
>16 ... 21	DR M6
>21 ... 24	DR M8
>24 ... 30	DR M10
>30 ... 38	DR M12
>38 ... 50	DS M16
>50 ... 85	DS M20
>85 ... 130	DS M24

Dimensions and tolerances for keyways and keys are designed to DIN EN 50347. The motors are always supplied with a key inserted in the shaft.

Admissible changes to the shaft extension:

Motor series	Frame size	Shaft extension length E in mm		Shaft extension diameter D in mm	
		Standard	Up to max.	Standard	Up to max. ¹⁾
1LE1, 1PC1	100	60	120	28	30
	112				
	132	80	160	38	40
	160	110	220	42	45

Shaft extension with standard dimensions, without featherkey way

For motor series 1LE1 and 1PC1, the standard shaft extension can be ordered with standard dimensions without featherkey way.

Order code **L04**

Standard shaft made of non-rusting steel

For motor series 1LE1, a standard shaft made of non-rusting steel can be ordered. This is only possible for shaft extensions of standard dimensions. For non-standard shaft dimensions, there will be an additional charge!

Order code **L06**

Please inquire about other non-rusting materials.

Non-standard cylindrical shaft extension

The non-standard cylindrical shaft extension can be used on the drive end (DE) or non-drive end (NDE). The featherkey is always supplied with it.

Order code **Y55**

When motors are ordered which have a longer or shorter shaft extension as standard, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The location of the featherkey way is in the center of the shaft extension. The length is defined by the manufacturer normatively.

Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely “thin” shafts, special geometry dimensions (e.g. square journals, etc.), hollow shafts.

For order code **Y55** and second standard shaft extension **L05** (see previous page):

- Dimensions D and DA must be less than or equal to the inner diameter of the roller bearing (see dimension tables under “Dimensions” in catalog part 1)
- Dimensions E and EA must be smaller than or equal to 2 x length E (standard) of the shaft extension

A non-standard cylindrical shaft extension can be supplied for the motor series listed in the table “Admissible changes to shaft extension” below up to the specified maximum lengths and diameters as compared to the standard shaft.

It is the responsibility of the customer to ensure that the admissible cantilever forces are reduced in accordance with the non-standard shaft extension.

Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors

The following are specified in DIN 42955 with Tolerance N (normal) and Tolerance R (reduced):

1. Concentricity tolerances for the shaft extension
2. Coaxiality tolerances for the shaft extension and flange centering
3. Linear movement tolerances for the shaft extension and flange surface

The concentricity of the shaft extension, coaxiality and linear movement according to DIN 42955 Tolerance R for flange-mounting motors can be ordered using order code **L08**. This order code can be combined for motors with deep-groove bearings of series 60..., 62... and 63... This cannot be supplied in combination with brake or encoder mounting.

Concentricity of the shaft extension can be ordered according to DIN 42955 Tolerance R for types of construction without flange with order code **L07**.

¹⁾ At maximum admissible diameter, a step increase in shaft diameter is not possible.

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Bearings and lubrication

Bearing lifetime (nominal lifetime)

The nominal bearing lifetime is defined acc. to standardized calculation procedures (DIN ISO 281) and is reached or even exceeded for 90 % of the bearings when the motors are operated in compliance with the data provided in the catalog.

Under average operating conditions, a lifetime (L_{h10}) of 100 000 hours can be achieved.

Generally, the bearing lifetime is defined by the bearing size, the bearing load, the operating conditions, the speed and the grease lifetime.

Bearing system

The bearing lifetime of motors with horizontal type of construction is at least 40 000 hours if there is no additional axial loading at the coupling output and at least 20 000 hours with the maximum admissible loads.

This assumes that the motor is operated at 50 Hz. The nominal bearing lifetime is reduced for converter-fed operation at higher frequencies.

For the admissible vibration values measured at the bearing plate, evaluation zones A and B specified in ISO 10816 are applicable in order to achieve the calculated lifetime under continuous duty. If higher vibration speeds will occur under the operating conditions, special arrangements will be necessary (please inquire).

In the basic bearing system, the floating bearing is situated at the drive end (DE) and the located bearing is situated at the non-drive end (NDE).

The bearing system is axially preloaded with a spring element at the drive end (DE) to ensure smooth running of the motor without play. (see Figure 1 of the Diagrams of bearings, Page 0/124).

For frame size 160 and above, the located bearing is axially secured at the non-drive end (NDE). Up to frame size 132, an additional axially-secured located bearing can be supplied on the non-drive end (NDE) complete with a retaining ring (see Figure 2 of the Diagrams of bearings, Page 0/124).
Order code **L21**

On request, the located bearing can also be supplied at the drive end (DE) (see Figure 3 of the Diagrams of bearings, Page 0/124).
Order code **L20**

For increased cantilever forces (e.g. belt drives), reinforced bearings can be used at the drive end (DE).
Order code **L22**

Motors 1LE1/1PC1 can be supplied with reinforced deep-groove bearings at both ends (size range 03).
Special bearings for DE and NDE, bearing size 63, the bearing plates are manufactured from cast-iron for this purpose.
Order code **L25**

A measuring nipple for SPM shock pulse measurement is mounted to check bearing vibration. The motors have a tapped hole for each bearing plate and a measuring nipple with a protective plug. If a second tapped hole is provided, it is fitted with a sealing plug.
Order code **Q01**

Bearing selection for increased cantilever forces (see the table "Bearing selection for 1LE1/1PC1 motors – Bearing for increased cantilever forces", Page 0/124) – "Admissible axial load" from Page 0/126.

Permanent lubrication

For permanent lubrication, the bearing grease lifetime is matched to the bearing lifetime. This can, however, only be achieved if the motor is operated in accordance with the catalog specifications.

In the basic version, the motors have permanent lubrication.

Regreasing

For motors which can be regreased at defined regreasing intervals, the bearing lifetime can be extended and/or unfavorable factors such as temperature, mounting conditions, speed, bearing size and mechanical load can be compensated.

It is possible to regrease motors, shaft heights 100 to 160. A lubricating nipple is optionally provided.
Order code **L23**

For motors with regreasing device, data concerning regreasing intervals, grease quantity, type of grease and, where applicable, additional data are stated on the rating plate or lubricating plate. For regreasing intervals for basic versions see table "Grease lifetime and regreasing intervals for horizontal installation".
The regreasing device cannot be mounted in combination with mounting of the brake, order code F01.

Mechanical stress and grease lifetime

High speeds that exceed the rated speed with converter-fed operation and the resulting increased vibrations alter the mechanical running smoothness and the bearings are subjected to increased mechanical stress. This reduces the grease lifetime and the bearing lifetime (please inquire where applicable).

For converter-fed operation in particular, compliance with the mechanical limit speeds n_{max} at maximum supply frequency f_{max} is essential, see the following table "Mechanical limit speeds n_{max} at maximum supply frequency f_{max} ".

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Mechanical limit speeds n_{max} at maximum supply frequency f_{max} (standard values)

Motor frame size	2-pole		4-pole		6-pole		8-pole	
	n_{max} rpm	f_{max} Hz	n_{max} rpm	f_{max} Hz	n_{max} rpm	f_{max} Hz	n_{max} rpm	f_{max} Hz
1LE1/1PC1								
100 L	6000	100	4200	140	3600	180	3000	200
112 M	6000	100	4200	140	3600	180	3000	200
132 S/M	5600	90	4200	140	3600	180	3000	200
160 M/L	4800	80	4200	140	3600	180	3000	200

Grease lifetime and regreasing intervals for **horizontal** installation

Permanent lubrication ¹⁾			
Type series	Frame size	Number of poles	Grease lifetime up to CT 40 °C ²⁾
1LE1/1PC1	100 ... 160	2 to 8	20000 h or 40000 h ³⁾
Regreasing (basic version) ¹⁾			
Type series	Frame size	Number of poles	Regreasing interval up to CT 40 °C ²⁾
1LE1/1PC1	100 ... 160	2 to 8	8000 h

¹⁾ For special uses and special greases, please inquire about grease lifetime and regreasing intervals.

²⁾ If the coolant temperature is increased by 10 K, the grease lifetime and regreasing interval are halved.

³⁾ 40000 h apply to horizontally installed motors with coupling output without additional axial loads.

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Bearing selection table for 1LE1/1PC1 motors – basic version

The bearing selection tables are only intended for planning purposes. Authoritative information on the actual type of bearings fitted in motors already supplied can be obtained by the factory by quoting the serial number or can be read from the rating plate.

When deep-groove ball bearings with side plates are used, the side plate is on the inside. Located bearing at drive end (DE) for 1LE1/1PC1 motors, see special version Figure 2 in the “Diagrams of bearings”, below on this page.

For motors frame size	Number of poles	Drive end (DE) bearing		Non-drive end (NDE) bearing		Figure, below on this page
		Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LE1/1PC1						
100 L	2 to 8	6206 2ZC3	6206 2ZC3	6206 2ZC3	6206 2ZC3	Fig. 1
112 M	2 to 8	6206 2ZC3	6206 2ZC3	6206 2ZC3	6206 2ZC3	Fig. 1
132 S/M	2 to 8	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	Fig. 1
160 M/L	2 to 8	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	Fig. 2

Bearing selection table for 1LE1/1PC1 motors – Bearings for increased cantilever forces – Order code **L22**

Please inquire about noise and vibration data. The bearing selection tables are only intended for planning purposes. Authoritative information on the actual type of bearings fitted in motors already supplied can be obtained by the factory by quoting the

serial number or can be read from the rating plate. When deep-groove ball bearings with side plates are used, the side plate is on the inside.

For motors frame size	Number of poles	Drive end (DE) bearing		Non-drive end (NDE) bearing		Figure, below on this page
		Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LE1/1PC1						
100 L	2 to 8	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6206 2ZC3 ¹⁾	6206 2ZC3 ¹⁾	Fig. 1
112 M	2 to 8	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6206 2ZC3 ¹⁾	6206 2ZC3 ¹⁾	Fig. 1
132 S/M	2 to 8	6308 2ZC3 ¹⁾	6308 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	Fig. 1
160 M/L	2 to 8	6309 2ZC3 ¹⁾	6309 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	Fig. 2

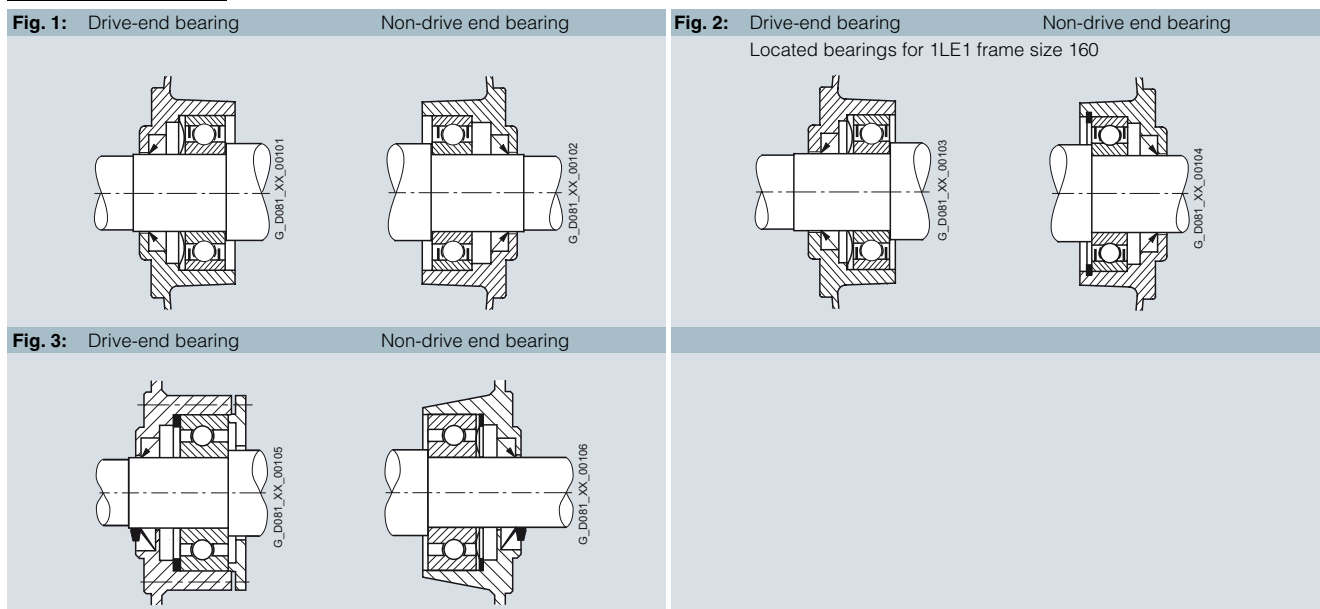
Bearing selection table for 1LE1/1PC1 motors – Deep-groove bearings reinforced at both ends – Order code **L25**

Please inquire about noise and vibration data. The bearing selection tables are only intended for planning purposes. Authoritative information on the actual type of bearings fitted in motors already supplied can be obtained by the factory by quoting the

serial number or can be read from the rating plate. When deep-groove ball bearings with side plates are used, the side plate is on the inside.

For motors frame size	Number of poles	Drive end (DE) bearing		Non-drive end (NDE) bearing		Figure, below on this page
		Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LE1/1PC1						
100 L	2 to 8	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	Fig. 1
112 M	2 to 8	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	Fig. 1
132 S/M	2 to 8	6308 2ZC3 ¹⁾	6308 2ZC3 ¹⁾	6308 2ZC3 ¹⁾	6308 2ZC3 ¹⁾	Fig. 1
160 M/L	2 to 8	6309 2ZC3 ¹⁾	6309 2ZC3 ¹⁾	6309 2ZC3 ¹⁾	6309 2ZC3 ¹⁾	Fig. 2

Diagrams of bearings



¹⁾ Bearings with a side plate are used for regreasable versions (order code **L23**).

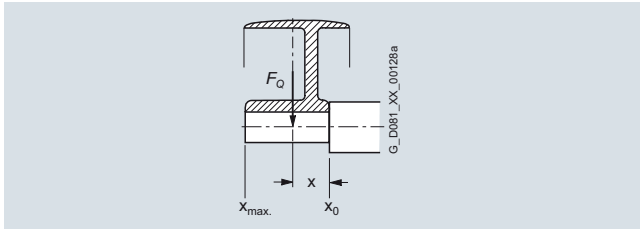
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Admissible cantilever forces

Admissible cantilever forces, basic version



In order to calculate the admissible cantilever forces for a radial load, the line of force (i.e. the centerline of the pulley) of the cantilever force F_Q (N) must lie within the free shaft extension (dimension X).

Dimension x [mm] is the distance between the point of application of force F_Q and the shaft shoulder. Dimension x_{max} , corresponds to the length of the shaft extension.

Total cantilever force $F_Q = c \cdot F_u$

The pre-tension factor c is a value gained from experience from the belt manufacturer. The following approximate value can be assumed:

For normal flat leather belts with an idler pulley $c = 2$;
for V-belts $c = 2$ to 2.5;
for special synthetic belts (depending on the type of load and type of belt) $c = 2$ to 2.5.

The circumferential force F_u (N) is calculated using the following equation

$$F_u = 2 \cdot 10^7 \frac{P}{n \cdot D}$$

F_u circumferential force in N
 P rated motor output (transmitted power) in kW
 n fan speed in rpm
 D belt pulley diameter in mm

The pulleys are standardized acc. to DIN 2211, Sheet 3.

The admissible cantilever forces at 60 Hz are approx. 80 % of the 50 Hz values (please inquire).

It should be observed that for types of construction IM B6, IM B7, IM B8, IM V5 and IM V6 the belt tension is only permitted to act parallel to the mounting plane or towards the mounting plane and the feet must be supported. Both feet must be secured for foot-mounting types of construction.

Refer to "Bearing design for increased cantilever forces", Page 0/126.

Admissible cantilever forces for the basic 50 Hz version

Valid are: x_0 values for $x = 0$ and x_{max} values für $x = l$ (l = shaft extension)

Frame size	Order No.	Number of poles	Admissible cantilever force	
			at x_0 Type	at x_{max} . Type
			N	N

1LE1 motor values for EFF1 motors with increased output ¹⁾ (Self-ventilated motors with increased output and high efficiency):

100	1LE1001-1AA	2	1010	825
	1LE1001-1AB	4	1230	1010
	1LE1001-1AC	6	1440	1180
112	1LE1001-1BA	2	970	785
	1LE1001-1BB	4	1235	1000
	1LE1001-1BC	6	1440	1165
132	1LE1001-1CA	2	1470	1180
	1LE1001-1CB	4	1830	1470
	1LE1001-1CC	6	2150	1730
160	1LE1001-1DA	2	1550	1270
	1LE1001-1DB	4	1910	1550
	1LE1001-1DC	6	2230	1810

Admissible cantilever forces for the basic 50 Hz version

Valid are: x_0 values for $x = 0$ and x_{max} values für $x = l$ (l = shaft extension)

Frame size	Order No.	Number of poles	Admissible cantilever force	
			at x_0 Type	at x_{max} . Type
			N	N

1LE1 motors, standard values for EFF1 motors ¹⁾ (Self-ventilated energy-saving motors with high efficiency/ Forced-air cooled motors without external fan and fan cover with high efficiency)

1PC1 motors, standard values for EFF1 motors ¹⁾ (Self-cooled motors with high efficiency):

100	1LE1001-1AA	2	1020	815
	1PC1001-1AA			
	1LE1001-1AB	4	1250	1000
	1PC1001-1AB			
	1LE1001-1AC	6	1450	1155
	1PC1001-1AC			
	1LE1001-1AD	8	1615	1290
	1PC1001-1AD			
112	1LE1001-1BA	2	1000	790
	1PC1001-1BA			
	1LE1001-1BB	4	1250	990
	1PC1001-1BB			
	1LE1001-1BC	6	1450	1150
	1PC1001-1BC			
	1LE1001-1BD	8	1610	1275
	1PC1001-1BD			
132	1LE1001-1CA	2	1505	1170
	1PC1001-1CA			
	1LE1001-1CB	4	1880	1460
	1PC1001-1CB			
	1LE1001-1CC	6	2170	1680
	1PC1001-1CC			
	1LE1001-1CD	8	2420	1880
	1PC1001-1CD			
160	1LE1001-1DA	2	1560	1240
	1PC1001-1DA			
	1LE1001-1DB	4	2040	1590
	1PC1001-1DB			
	1LE1001-1DC	6	2350	1820
	1PC1001-1DC			
	1LE1001-1DD	8	2610	2030
	1PC1001-1DD			

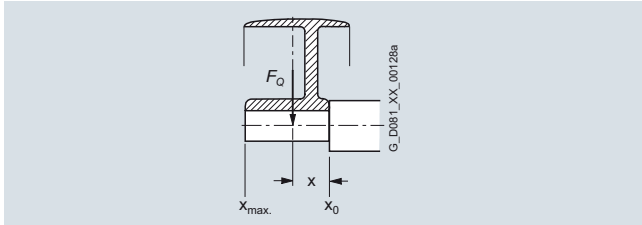
¹⁾ The admissible cantilever force load of EFF2 motors can be increased by up to 5 %.

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Bearing design for increased cantilever forces



It should be observed that for types of construction IM B6, IM B7, IM B8, IM V5 and IM V6 the belt tension is only permitted to act parallel to the mounting plane or towards the mounting plane and the feet must be supported. Both feet must be secured for foot-mounted types of construction.

Admissible cantilever forces for the basic 50 Hz version Deep-groove ball bearings at the drive end (DE) – Order code L22 Valid are: x_0 values for $x = 0$ and x_{max} . values für $x = l$ (l = shaft extension)

Frame size	Order No.	Number of poles	Admissible cantilever force	
			at x_0	at x_{max} .
			Type	Type
			N	N

1LE1 motor values for EFF 1 motors with increased output ¹⁾ (Self-ventilated motors with increased output and high efficiency):

100	1LE1001-1AA	2	1585	1300
	1LE1001-1AB	4	1960	1610
	1LE1001-1AC	6	2270	1865
112	1LE1001-1BA	2	1545	1250
	1LE1001-1BB	4	1960	1585
	1LE1001-1BC	6	2270	1835
132	1LE1001-1CA	2	2285	1840
	1LE1001-1CB	4	2860	2300
	1LE1001-1CC	6	3320	2670
160	1LE1001-1DA	2	2800	2240
	1LE1001-1DB	4	3450	2270
	1LE1001-1DC	6	4000	3200

Admissible cantilever forces for the basic 50 Hz version

Deep-groove ball bearings at the drive end (DE) – Order code L22

Valid are: x_0 values for $x = 0$ and x_{max} . values für $x = l$ (l = shaft extension)

Frame size	Order No.	Number of poles	Admissible cantilever force	
			at x_0	at x_{max} .
			Type	Type
			N	N

1LE1 motors standard values for EFF1 motors ¹⁾ (Self-ventilated energy-saving motors with high efficiency/ Forced-air cooled motors without external fan and fan cover with high efficiency) 1PC1 motors, standard values for EFF1 motors ¹⁾ (Self-cooled motors with high efficiency):

100	1LE1001-1AA	2	1590	1270
	1PC1001-1AA			
	1LE1001-1AB	4	1970	1575
	1PC1001-1AB			
	1LE1001-1AC	6	2270	1815
	1PC1001-1AC			
	1LE1001-1AD	8	2520	2015
	1PC1001-1AD			
112	1LE1001-1BA	2	1565	1240
	1PC1001-1BA			
	1LE1001-1BB	4	1965	1555
	1PC1001-1BB			
	1LE1001-1BC	6	2270	1800
	1PC1001-1BC			
	1LE1001-1BD	8	2510	1990
	1PC1001-1BD			
132	1LE1001-1CA	2	2310	1795
	1PC1001-1CA			
	1LE1001-1CB	4	2900	2250
	1PC1001-1CB			
	1LE1001-1CC	6	3330	2580
	1PC1001-1CC			
	1LE1001-1CD	8	3700	2870
	1PC1001-1CD			
160	1LE1001-1DA	2	2810	2170
	1PC1001-1DA			
	1LE1001-1DB	4	3540	2750
	1PC1001-1DB			
	1LE1001-1DC	6	4070	3160
	1PC1001-1DC			
	1LE1001-1DD	8	4510	3500
	1PC1001-1DD			

Admissible axial load

1LE1 motors in vertical type of construction – basic version (except motors with increased output)

Frame size	Shaft extension pointing															
	3000 rpm				1500 rpm				1000 rpm				750 rpm			
	downwards		upwards		downwards		upwards		downwards		upwards		downwards		upwards	
	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up
100	140	700	550	280	130	990	820	285	130	1280	1110	285	130	1560	1390	285
112	140	710	550	300	130	1000	820	310	130	1290	1110	310	130	1570	1390	310
132	200	1200	950	470	180	1680	1200	470	180	1900	1600	470	190	2200	1900	440
160	1500	1400	950	1900	1900	1800	1300	2200	2200	2200	1600	2700	2700	2700	1950	2900

The values shown do not assume a cantilever force on the shaft extension.
The admissible loads are valid for operation at 50 Hz; for 60 Hz, please inquire.

The calculation of the admissible axial load was based on the drive with generally available coupling. For suppliers, see the relevant section of the catalog, section "Accessories", Page 1/64.
Please inquire if the load direction alternates.

¹⁾ The admissible cantilever force load of EFF2 motors can be increased by up to 5 %.

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1LE1/1PC1 motors in horizontal type of construction – basic version (except motors with increased output)

Frame size	3000 rpm				1500 rpm				1000 rpm				750 rpm			
	Ten-sile load	Thrust load (N) with radial load at			Ten-sile load	Thrust load (N) with radial load at			Ten-sile load	Thrust load (N) with radial load at			Ten-sile load	Thrust load (N) with radial load at		
		x_0	$x_{max.}$	without radial load		x_0	$x_{max.}$	without radial load		x_0	$x_{max.}$	without radial load		x_0	$x_{max.}$	without radial load
N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
100	220	450	350	630	220	600	500	910	220	650	550	1200	220	750	650	1480
112	220	450	350	630	220	600	500	910	220	650	550	1200	220	750	650	1480
132	350	650	520	1200	350	850	700	1600	350	1020	890	1900	350	1150	1020	2200
160	1500	850	720	1500	1500	1050	920	1800	1500	1250	1120	2200	1500	1350	1220	2600

The values shown do not assume a cantilever force on the shaft extension.

The admissible loads are valid for operation at 50 Hz; for 60 Hz, please inquire.

The calculation of the admissible axial load was based on the drive with generally available coupling. For suppliers, see the relevant section of the catalog "Accessories", Page 1/64. Please inquire if the load direction alternates.

Modular technology

Basic versions

The range of potential applications for the 1LE1 motors (with the exception of 1LE1 with option F90 – version "Forced-air cooled motors without external fan and fan cover" and 1PC1) can be broadened considerably by mounting the following modules (e.g. as brake motors).

- **1XP8 012** rotary pulse encoder
- Separately driven fan
- Brake

The brake must always be mounted in the factory for safety reasons. The rotary pulse encoder and/or the separately driven fan can also be retrofitted.

The degree of protection of the motors with modular technology is IP55. Higher degrees of protection on request.

When a rotary pulse encoder, brake or separately driven fan is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights" from Page 0/137.

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Introduction motors 1LE1/1PC1

General technical data

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1XP8 012 rotary pulse encoder

The rotary pulse encoder can be supplied already mounted in an HTL version as **1XP8 012-10** with order code **G01** or in a TTL version as **1XP8 012-20** with order code **G02**. The rotary pulse encoder can only be mounted on a standard non-drive end (NDE), i.e. a second shaft extension cannot be supplied.

The encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, the option "Prepared for mountings, center hole only", order code **G40**, or the option "Prepared for mountings with shaft D12", order code **G41**, must be specified (see "Mechanical design and degrees of protection", Page 0/118).

The 1XP8 012 rotary pulse encoder is suitable for standard applications. For further encoders, see "Special technology", Page 0/134.

When the rotary pulse encoder is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights" from Page 0/137.

The rotary pulse encoders of "Modular technology" and "Special technology" are fitted as standard with a protective cover made of non-corrosive sheet steel.

Mounting of encoder at temperatures below -20 °C and higher than $+40\text{ °C}$ on request.

Technical data of rotary pulse encoders

	1XP8 012-10 (HTL version) +10 V to +30 V	1XP8 012-20 (TTL version) 5V \pm 10 %
Supply voltage U_B		
Current input without load	150 mA	120 mA
Admissible load current per output	max. 100 mA	max. 20 mA
Pulses per revolution	1024	1024
Outputs	2 square-wave pulses A, B – 2 inverted square-wave pulses A, B Zero pulse and inverted zero pulse	
Pulse offset between the two outputs	90°	90°
Output amplitude	$U_{\text{high}} = U_B - 2.5\text{ V}$ $U_{\text{low}} = 1.6\text{ V}$	$U_{\text{high}} > 2.5\text{ V}$ $U_{\text{low}} < 0.5\text{ V}$
Edge interval	$\geq 0.43\text{ }\mu\text{s}$	$\geq 0.43\text{ }\mu\text{s}$
Sampling rate	$\leq 300\text{ kHz}$	$\leq 300\text{ kHz}$
Maximum speed	6000 rpm	6000 rpm
Transportation/storage temperature range	$-30\text{ to }+80\text{ °C}$	$-30\text{ to }+80\text{ °C}$
Operating temperature range flange socket or fixed cable	$-40\text{ to }+100\text{ °C}$	$-40\text{ to }+100\text{ °C}$
Operating temperature range flexible cable	$-10\text{ to }+100\text{ °C}$	$-10\text{ to }+100\text{ °C}$
Degree of protection	IP66	IP66
Maximum admissible radial cantilever force	60 N	60 N
Maximum admissible axial force	40 N	40 N
Connection system	12-pin connector (mating connector is supplied)	
Certification	CSA, UL	CSA, UL
Weight	0.3 kg	0.3 kg

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Introduction motors 1LE1/1PC1

General technical data

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Separately driven fan

The use of a separately driven fan is recommended to increase motor utilization at low speeds and to limit noise generation at speeds significantly higher than the synchronous speed. Both of these results can only be achieved with converter-fed operation. Please inquire about traction and vibratory operation.

The separately driven fan can be supplied already fitted, order code **F70**.

It can also be ordered separately and retrofitted. For selection information and order numbers, see the section "Accessories" (available soon). A rating plate listing all the important data is fitted to the separately driven fan. Please note the direction of rotation of the separately driven fan (axial-flow fan) when connecting it. Admissible coolant temperatures $CT_{min.}$ -25 °C , $CT_{max.}$ $+65\text{ °C}$ ¹⁾, lower/higher coolant temperatures on request. When the separately driven fan is mounted, the length of the motor increases by Δ l. For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights" from Page 0/137.

Technical data of the separately driven fan (acc. to DIN EN 60034-1 Tolerance)

Frame size	Rated voltage range		Frequency	Rated speed	Power consumption	Rated current
	V		Hz	rpm	kW	A
100	1 AC	230 to 277	50	2790	0.075	0.29
	3 AC	220 to 290 Δ	50	2830	0.086	0.27
	3 AC	380 to 500 Y	50	2830	0.086	0.16
	1 AC	230 to 277	60	3280	0.094	0.28
	3 AC	220 to 332 Δ	60	3490	0.093	0.27
	3 AC	380 to 575 Y	60	3490	0.093	0.16
112	1 AC	230 to 277	50	2720	0.073	0.26
	3 AC	220 to 290 Δ	50	2770	0.085	0.27
	3 AC	380 to 500 Y	50	2770	0.085	0.15
	1 AC	230 to 277	60	3000	0.107	0.31
	3 AC	220 to 332 Δ	60	3280	0.094	0.28
	3 AC	380 to 575 Y	60	3280	0.094	0.16
132	1 AC	230 to 277	50	2860	0.115	0.40
	3 AC	220 to 290 Δ	50	2880	0.138	0.45
	3 AC	380 to 500 Y	50	2880	0.138	0.24
	1 AC	230 to 277	60	3380	0.185	0.59
	3 AC	220 to 332 Δ	60	3470	0.148	0.41
	3 AC	380 to 575 Y	60	3470	0.148	0.24
160	1 AC	230 to 277	50	2780	0.236	0.96
	3 AC	220 to 290 Δ	50	2840	0.220	0.76
	3 AC	380 to 500 Y	50	2830	0.220	0.43
	3 AC	220 to 332 Δ	60	3400	0.284	0.94
	3 AC	380 to 575 Y	60	3400	0.284	0.56

¹⁾ The admissible coolant temperature for single phase versions (1 AC) for frame size 160 is $CT_{max.}$ $+50\text{ °C}$.

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Brakes

Spring-operated disk brakes are used for the brakes with order code **F01**. When the brake is ordered, the supply voltage must be specified. The supply voltage for brakes is explained under "Modular technology – Additional versions", Page 0/133.

For the design of each brake type, the braking time, run-on revolutions, braking energy per braking procedure as well as the service life of the brake linings, see "Configuration of motors with brakes", Page 0/132.

When a brake is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights" from Page 0/137.

The brake can be retrofitted by authorized partners. The motor must be prepared for this. When the motor is ordered, the option "Prepared for mountings, center hole only", order code G40, must be specified (see "Mechanical design and degrees of protection", Page 0/118).

2LM8 spring-operated disk brake

The 2LM8 brake has IP55 degree of protection.

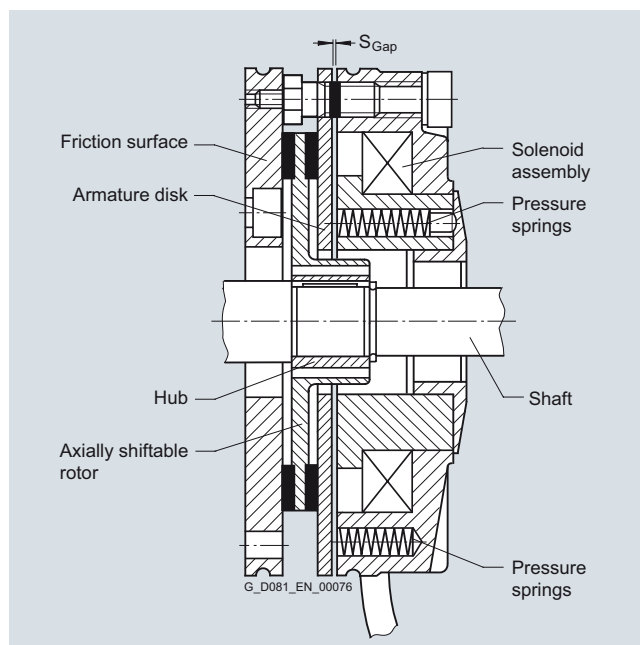
Please inquire if motors with brakes are to be operated below the freezing point or in very humid environments (e.g. close to the sea) with long standstill times. Please inquire if the brake motors are used for converter-fed operation with low speeds.

Design and mode of operation

The brake takes the form of a single-disk brake with two friction surfaces.

The braking torque is generated by friction when pressure is applied by one or more pressure springs in the de-energized state. The brake is released electromagnetically.

When the motor brakes, the rotor which can be axially shifted on the hub or the shaft is pressed via the armature disk against the friction surface by means of the springs. In the braked state, there is a gap S_{Gap} between the armature disk and the solenoid component. To release the brake, the solenoid is energized with DC voltage. The resulting magnetic force pulls the armature disk against the spring force on to the solenoid component. The spring force is then no longer applied to the rotor which can rotate freely.



Design of the 2LM8 spring-operated disk brake

Rating plate

The following brake data are specified on the motor rating plate.

Brake type, supply voltage, frequency, current, temperature class, braking torque

Operating values for spring-operated brakes with standard excitation

For motor Frame size	Brake type	Rated braking torque at 100 rpm	Rated braking torque at 100 rpm in % at the following speeds			Supply voltage	Current/power input ¹⁾			Brake applica- tion time t_2 ²⁾	Brake release time	Brake moment of inertia	Noise level L_p with rated air gap	Service capabili- ty of the brake	
			1500 rpm	3000 rpm	Max. speed		V	A	W					Lifetime of brake lining L	Air gap adjust- ment required after braking energy L_N
		Nm	%	%	%	V	A	W	ms	ms	kgm ²	dB (A)	Nm · 10	Nm · 10	
100	2LM8 040-5NA10	40	81	74	66	AC 230	0.2	40	43	140	0.00036	80	1350	115	
	2LM8 040-5NA60					AC 400	0.22								
	2LM8 040-5NA80					DC 24	1.67								
112	2LM8 060-6NA10	60	80	73	65	AC 230	0.25	53	60	210	0.00063	77	1600	215	
	2LM8 060-6NA60					AC 400	0.28								
	2LM8 060-6NA80					DC 24	2.1								
132	2LM8 100-7NA10	100	79	72	65	AC 230	0.27	55	50	270	0.0015	77	2450	325	
	2LM8 100-7NA60					AC 400	0.31								
	2LM8 100-7NA80					DC 24	2.3								
160	2LM8 260-8NA10	260	75	68	65	AC 230	0.5	100	165	340	0.0073	79	7300	935	
	2LM8 260-8NA60					AC 400	0.47								
	2LM8 260-8NA80					DC 24	4.2								

¹⁾ For 400 V AC and for 24 V DC, the power can deviate by up to +10 % as a result of the selected supply voltage.

²⁾ The specified switching times are valid for switching on the DC side with a rated release travel and with the coil already warm. They are average values which may vary depending on factors such as the rectifier type and the release travel. The brake application time for switching on the AC side, for example, is approximately 6 times longer than for switching on the DC side.

IEC Squirrel-Cage Motors

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Lifetime of the brake lining

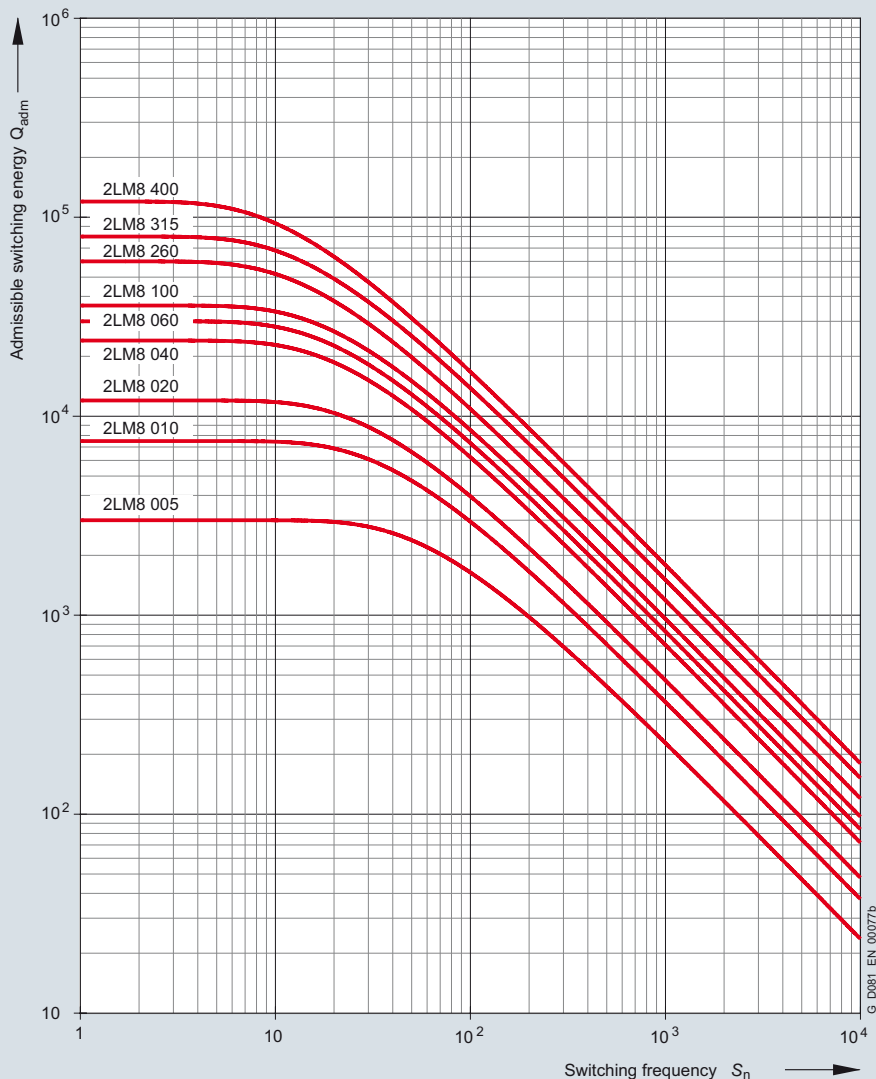
The braking energy L_N up to when the brake should be adjusted, depends on various factors. The main influencing factors include the masses to be braked, the operating speed, the switching frequency and therefore the temperature at the frictional surfaces. It is therefore not possible to specify a value for the friction energy until readjustment that is valid for all operating conditions.

When used as operating brake, the specific frictional surface wear (wear volume for the frictional work) is approximately 0.05 up to 2 cm³/kWh.

Maximum admissible speeds

The maximum admissible speeds from which emergency stops can be made, are listed in the next table. These speeds should be considered as recommended values and must be checked under actual operating conditions.

The maximum admissible friction energy depends on the switching frequency and is shown for the individual brakes in the following diagram. Increased wear can be expected when the brakes are used for emergency stops.



For motor Frame size	Brake type	Maximum admissible speeds			Changing the braking torque			Readjusting the air gap		
		Max. adm. operating speed if max. adm. operating energy utilized	Max. adm. no-load speed with emergency stop function	Horizontal mounting	Vertical mounting	Reduction per notch	Dimension "O1"	Min. brak- ing torque	Rated air gap $S_{Gap \text{ Rated}}$	Maximum air gap $S_{Gap \text{ max.}}$	Min. rotor thickness $h_{\text{min.}}$
		rpm	rpm	rpm	Nm	mm	Nm	mm	mm	mm
100	2LM8 040-5NA ..	3000	6000	6000	1.29	12.5	21.3	0.3	0.65	8.0
112	2LM8 060-6NA ..	3000	6000	6000	1.66	11.0	32.8	0.3	0.75	7.5
132	2LM8 100-7NA ..	3000	5300	5000	1.55	13.0	61.1	0.3	0.75	8.0
160	2LM8 260-8NA ..	1500	4400	3200	5.6	17.0	157.5	0.4	1.2	12.0

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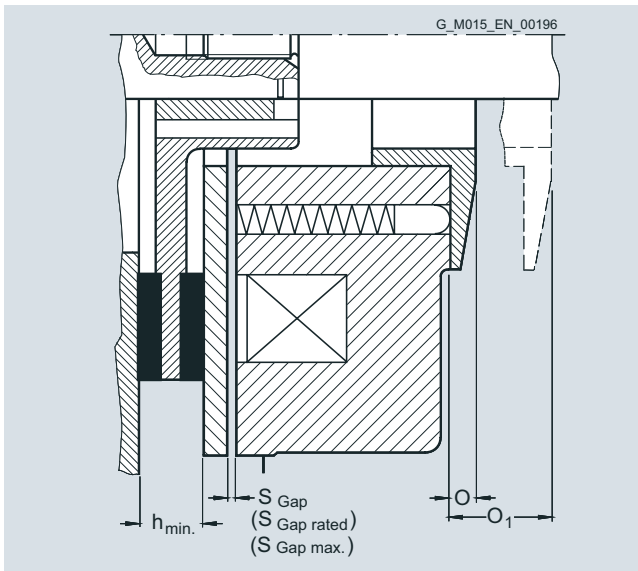
0

Changing the braking torque

The brake is supplied with the braking torque already set. For 2LM8 brakes, the torque can be reduced to the dimension O_1 by unscrewing the adjusting ring with a hook spanner. The braking torque changes by the values shown in the above table for each notch of the adjusting ring.

Readjusting the air gap

Under normal operating conditions, the brake is practically maintenance-free. The air gap S_{Gap} must only be checked at regular intervals if the application requires an extremely large amount of frictional energy and readjusted to the rated gap $S_{\text{Gap rated}}$ at the latest when the maximum air gap $S_{\text{Gap max.}}$ is reached.



Configuration of motors with brakes

Braking time

The time it takes the motor to come to a standstill comprises two components:

- The application time of the brake t_2
- The braking time t_{Br}

$$t_{\text{Br}} = \frac{J \cdot n_{\text{rated}}}{9.55 \cdot (T_{\text{B}} \pm T_{\text{L}})}$$

t_{Br}	Braking time in s
J	Total moment of inertia in kgm^2
n_{rated}	Rated speed of the motor with brake in rpm
T_{B}	Rated braking torque in Nm
T_{L}	Average load torque in Nm (if T_{L} supports braking, T_{L} is positive)

Braking energy per braking operation Q_{adm}

The braking energy per braking operation in Nm comprises the energy of the moments of inertia to be braked Q_{Kin} and the energy Q_{L} , which must be applied in order to brake against a load torque:

$$Q_{\text{adm}} = Q_{\text{Kin}} + Q_{\text{L}}$$

- The energy of the moments of inertia in Nm

$$Q_{\text{Kin}} = \frac{J \cdot n_{\text{rated}}^2}{182.4}$$

n_{rated} Rated speed before braking in rpm
 J Total moment of inertia in kg m^2

- The braking energy in Nm against a load torque

$$Q_{\text{L}} = \frac{\pm T_{\text{L}} \cdot n_{\text{rated}} \cdot t_{\text{Br}}}{19.1}$$

T_{L} average load torque in Nm
 T_{L} is positive if it acts against the brake
 T_{L} is negative if it supports the brake

Run-on revolutions U

The number of run-on revolutions U of the motor with brake can be calculated as follows:

$$U = \frac{n_{\text{rated}}}{60} \left(t_2 + \frac{t_{\text{Br}}}{2} \right)$$

t_2 Brake application time in ms

Lifetime of the brake lining L and readjustment of the air gap

The brake lining wears due to friction which increases the air gap and the release time for the brake at standard excitation.

When the brake lining is worn out, it can be replaced easily.

In order to calculate the lifetime of the brake lining in terms of operations $S_{\text{max.}}$, the lifetime of the brake lining L in Nm must be divided by the braking energy Q_{adm} :

$$S_{\text{max}} = \frac{L}{Q_{\text{adm}}}$$

The interval between adjustments N in switching frequencies can be calculated in terms of operations by dividing the braking energy L_{N} which the brake can output until it is necessary to readjust the working air gap by Q_{adm} :

$$N = \frac{L_{\text{N}}}{Q_{\text{adm}}}$$

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Additional versions

2LM8 spring-operated disk brake

Motor series

This brake is mounted on 1LE1 motors as standard (with the exception of 1LE1 with order code F90 – version “Forced-air cooled motors without external fan and fan cover”, and 1PC1).

Voltage and frequency

The solenoid coil and the brake rectifier can be connected to the following voltages or can be supplied for the following voltages:

- Brake supply voltage: 24 V DC
Order code **F10**
- Brake supply voltage: 230 V AC
Order code **F11**
- Brake supply voltage: 400 V AC
(directly at the terminal strip)
Order code **F12**

When 60 Hz is used, the voltage for the brake must not be increased!

Order codes **F10**, **F11** and **F12** may only be used in conjunction with order code **F01**.

Connections

Labeled terminals are provided in the main connection box of the motor to connect the brake.

The AC voltage for the brake excitation winding is connected to the two free terminals of the rectifier block (~).

The brake can be released when the motor is at a standstill by separately exciting the solenoid. In this case, an AC voltage must be connected at the rectifier block terminals. The brake remains released as long as this voltage is present.

The rectifier is protected against overvoltages by varistors in the input and output circuits.

For 24 V DC brakes, the brake terminals are directly connected to the DC voltage source.

See the circuit diagrams below.

Fast brake application

If the brake is disconnected from the line supply, the brake is applied. The application time for the brake disk is delayed as a result of the inductance of the solenoid (shutdown on the AC side). This results in a considerable delay before the brake is mechanically applied. In order to achieve short brake application times, the circuit must be interrupted on the DC side. To realize this, the wire jumpers, located between contacts 1+ and 2+ at the rectifier are removed and replaced by the contacts of an external switch (see circuit diagrams below).

Manual brake release with lever

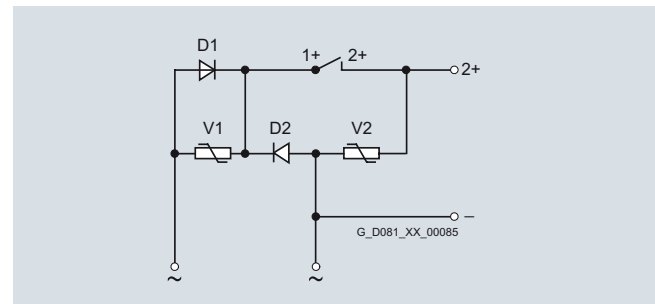
The brakes can be supplied with a mechanical manual release with lever.

Order code **F50**.

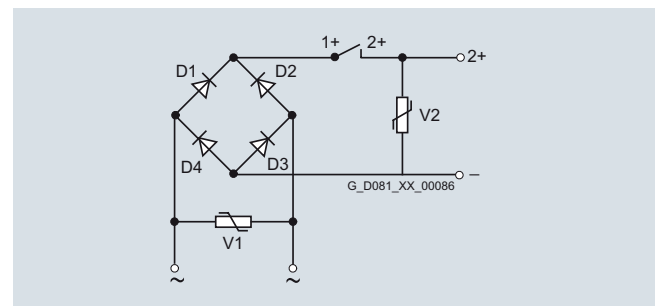
The dimensions of the brake lever depend on the motor frame size and can be read from the dimension drawing generator for motors in the SD configurator tool for low-voltage motors.

Bridge rectifier / half-wave rectifier

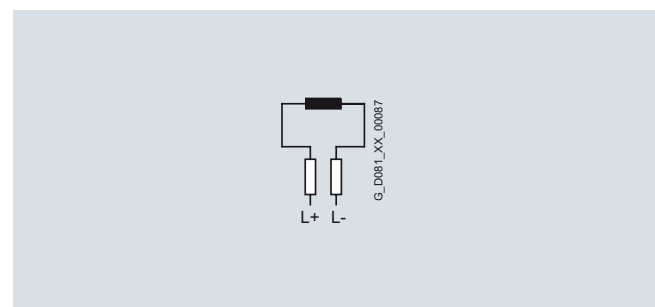
Brakes are connected through a standard bridge or half-wave rectifier or directly to the 2LM8 brake. See the circuit diagrams below.



Half-wave rectifier, 400 V AC



Bridge rectifier, 230 V AC



Brake connection for 24 V DC

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Special technology

The range of "Special technology" comprises rotary pulse encoders for the 1LE1 motors (with the exception of 1LE1 with order code F90 – version "Forced-air cooled motors without external fan and fan cover", and 1PC1).

The 1LE1 motors with the order codes **F70** (mounted separately driven fan), **F01** (mounted brake) and **F01 + F70** (mounted brake and separately driven fan) from the "Modular technology" range can be combined with the LL 861 900 200, HOG 9 D 1024 I and HOG 10 D 1024 I rotary pulse encoders from the "Special technology" range.

When a rotary pulse encoder is mounted, the length of the motor increases by Δ l. For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights" from Page 0/137.

The rotary pulse encoders of "Modular technology" and "Special technology" are fitted as standard with a protective cover made of non-corrosive sheet steel.

Rotary pulse encoder LL 861 900 220



With its rugged construction, this rotary pulse encoder is also suitable for difficult operating environments. It is resistant to shock and vibration and has insulated bearings.

The LL 861 900 220 rotary pulse encoder can be supplied already mounted.

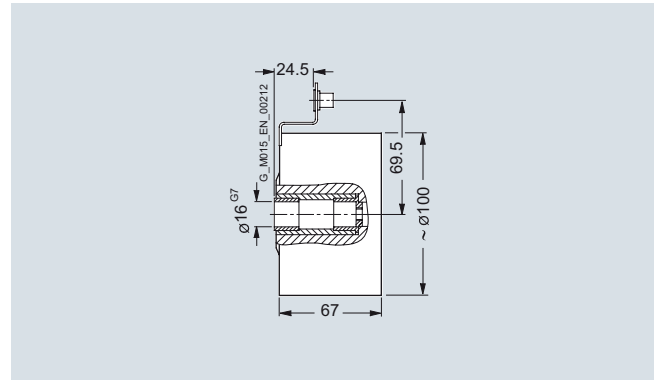
Order code **G04**.

*The LL 861 900 220 rotary pulse encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, the option "Prepared for mountings, center hole only", order code **G40**, or the option "Prepared for mountings with shaft D16", order code **G42**, must be specified (see "Mechanical design and degrees of protection", Page 0/118). The rotary pulse encoder is not part of the scope of supply in this case.*

The version of the rotary pulse encoder with a diagnostics system (ADS) can be supplied by Leine and Linde.

Manufacturer:
Leine and Linde (Deutschland) GmbH
Bahnhofstraße 36
73430 Aalen
Tel. +49 (0) 73 61-78093-0
Fax +49 (0) 73 61-78093-11

<http://www.leinelinde.com>
e-mail: info@leinelinde.se



Mounting dimensions of rotary pulse encoder LL 861 900 220

Technical data for LL 861 900 220 (HTL version)

Mounting of encoder at temperatures below -20 °C and higher than $+40$ °C on request.

Supply voltage U_B	+9 V to +30 V
Current input without load	max. 80 mA
Admissible load current per output	40 mA
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, A', B, B', 0, 0'
Pulse offset between the two outputs	$90^\circ \pm 25^\circ$ el.
Output amplitude	$U_{High} > 20$ V $U_{Low} < 2.5$ V
Mark space ratio	1:1 ± 10 %
Edge steepness	50 V/ μ s (without load)
Maximum frequency	100 kHz for 350 m cable
Maximum speed	4000 rpm
Temperature range	-20 to $+80$ °C
Degree of protection	IP65
Maximum adm. radial cantilever force	300 N
Maximum adm. axial force	100 N
Connection system	Terminal strips in encoder Cable connection M20 x 1.5 radial
Weight	Approx. 1.3 kg

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HOG 9 D 1024 rotary pulse encoder



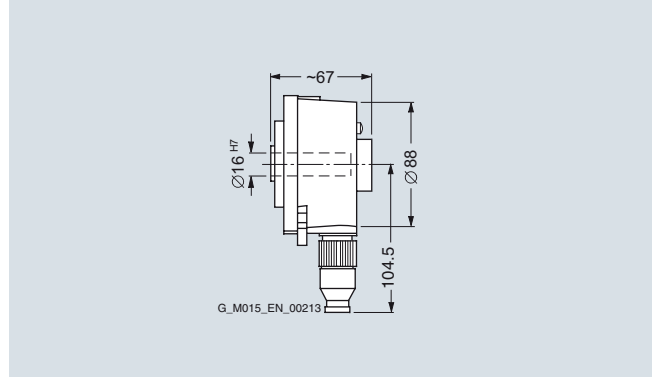
The encoder is fitted with insulated bearings.

The HOG 9 D 1024 I rotary pulse encoder can be supplied already mounted.
Order code **G05**.

The HOG 9 D 1024 I rotary pulse encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, the option "Prepared for mountings, center hole only", order code **G40**, or the option "Prepared for mountings with shaft D16", order code **G42**, must be specified (see "Mechanical design and degrees of protection", Page 0/118). The rotary pulse encoder is not part of the scope of supply in this case.

Manufacturer:
Baumer Hübner GmbH
Planufer 92b
10967 Berlin
Tel. +49 (0) 30-6 90 03-0
Fax +49 (0) 30-6 90 03-1 04

<http://www.baumerhuebner.com>
e-mail: info@baumerhuebner.com



Mounting dimensions for HOG 9 D 1024 I rotary pulse encoder

Technical data for HOG 9 D 1024 (TTL version)

Mounting of encoder at temperatures below -20 °C and higher than $+40\text{ °C}$ on request.

Supply voltage U_B	+9 V to +30 V
Current input without load	50 mA to 100 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	4 short-circuit proof square-wave pulses A, B and A', B'
Pulse offset between the two outputs	$90^\circ \pm 20\%$
Output amplitude	$U_{\text{High}} \geq U_B - 3.5\text{ V}$ $U_{\text{Low}} \leq 1.5\text{ V}$
Mark space ratio	$1:1 \pm 20\%$
Edge steepness	10 V/ μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-20 to $+100\text{ °C}$
Degree of protection	IP56
Maximum adm. radial cantilever force	150 N
Maximum adm. axial force	100 N
Connection system	Radial right-angle plug (mating connector is part of the scope of supply)
Mech. design acc. to Hübner Ident. No.	73 522 B
Weight	Approx. 0.9 kg

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HOG 10 D 1024 I rotary pulse encoder



This encoder is extremely rugged and is therefore suitable for difficult operating conditions. It is fitted with insulated bearings.

The HOG 10 D 1024 I rotary pulse encoder can be supplied already mounted.

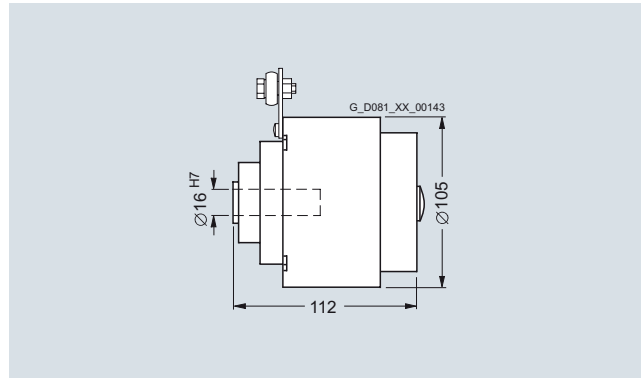
Order code **G06**.

*The HOG 10 D 1024 I rotary pulse encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, the option "Prepared for mountings, center hole only", order code **G40**, or the option "Prepared for mountings with shaft D16", order code **G42**, must be specified (see "Mechanical design and degrees of protection", Page 0/118). The rotary pulse encoder is not part of the scope of supply in this case.*

Manufacturer:

Baumer Hübner GmbH
Planufer 92b
10967 Berlin
Tel. +49 (0) 30-6 90 03-0
Fax +49 (0) 30-6 90 03-1 04

<http://www.baumerhuebner.com>
e-mail: info@baumerhuebner.com



Mounting dimensions for HOG 10 D 1024 I rotary pulse encoder

Technical data for HOG 10 D 1024 (HTL version)

Mounting of encoder at temperatures below -20 °C and higher than $+40\text{ °C}$ on request.

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	4 short-circuit proof square-wave pulses A, B and A', B'
Pulse offset between the two outputs	$90^\circ \pm 20\%$
Output amplitude	$U_{High} \geq U_B - 3.5\text{ V}$ $U_{Low} \leq 1.5\text{ V}$
Mark space ratio	$1:1 \pm 20\%$
Edge steepness	10 V/ μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	$-20\text{ to }+100\text{ °C}$
Degree of protection	IP66
Maximum adm. radial cantilever force	150 N
Maximum adm. axial force	80 N
Connection system	Terminals, cable connection M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 055 B
Weight	Approx. 1.6 kg

Dimensions and weight

Fig. 1 Brake
Order code **F01**
[optionally with manual release, order code **F50**]

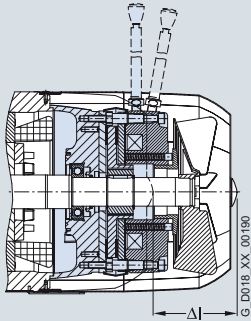


Fig. 2 Standard protective cover for types of construction
Order code **H00**

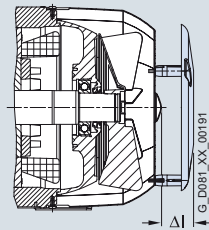


Fig. 3 Rotary pulse encoder (on cover)
Order code **G01/G02/G04/G05/G06**
[protective cover as standard]

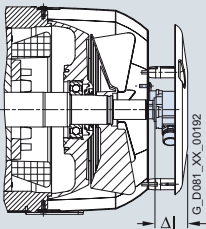


Fig. 4 Brake and rotary pulse encoder (on cover)
Order code **F01**
+ G01/G02/G04/G05/G06
[optionally with manual release, order code **F50**;
protective cover as standard]

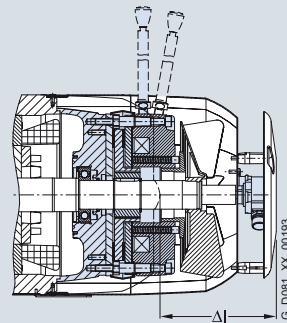


Fig. 5 Separately driven fan
Order code **F70**

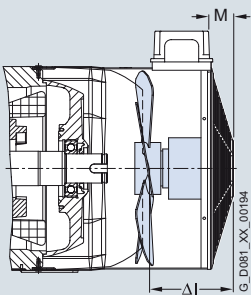
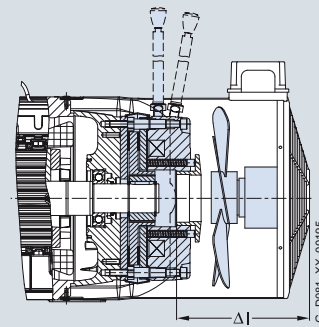


Fig. 6 Brake and separately driven fan
Order code **F01 + F70**
[optionally with manual release, order code **F50**]



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Fig. 7 Rotary pulse encoder (under the cover) and separately driven fan
Order code **F70**
+ **G01/G02/G04/G05/G06**

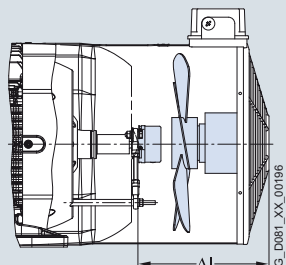


Fig. 8 Brake, rotary pulse encoder (under the cover) and separately driven fan
Order code **F01 + F70**
+ **G01/G02/G04/G05/G06**
[optionally with manual release, order code **F50**]

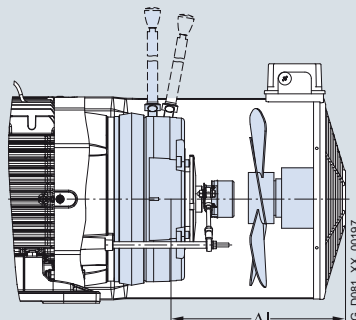


Fig. 9 Protective cover for separately driven fan
Order code **H00**

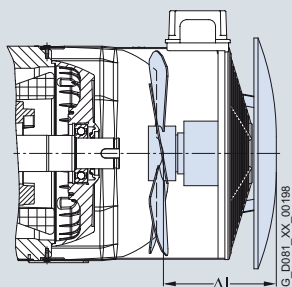


Fig. 10 Prepared for mountings – only center hole
(for brake order code **F01** and/or rotary pulse encoder
order codes **G01/G02/G04/G05/G06**)
Order code **G40**

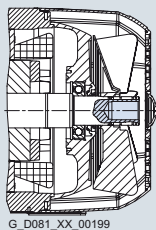
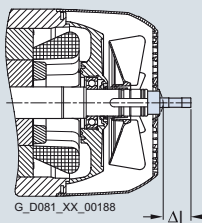


Fig. 11 Prepared for mountings with shaft D12/D16
Order codes **G41/G42**



Dimensions Δl and weights, see from Page 0/139.

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Assignment												
Frame size	Fig. 1		Fig. 2		Fig. 3							
	Brake		Protective cover		Rotary pulse encoder including protective cover							
	Order code F01		Order code H00		1XP8 012 Order codes G01, G02		LL 861 900 220 Order code G04		HOG9 D 1024 I Order code G05		HOG10 D 1024 I Order code G06	
	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.
	mm	kg	mm	kg	mm	kg	mm	kg	mm	kg	mm	kg
1LE1												
100	81	5.9	33	0.4	49	0.9	76	1.9	76	1.5	119	2.2
112	88	7.8	33	0.4	49	0.8	76	1.9	76	1.5	119	2.2
132	114	11.9	51.5	0.7	51.5	1.3	78.5	2.4	78.5	2	121.5	2.7
160	130	30.7	50	0.7	50	1.5	77	2.7	77	2.3	120	3

Assignment												
Frame size	Fig. 4								Fig. 5			
	Brake and rotary pulse encoder (on cover)								Separately driven fan			
	1XP8 012 Order codes F01 + G01/G02		LL 861 900 220 Order codes F01 + G04		HOG9 D 1024 I Order codes F01 + G05		HOG10 D 1024 I Order codes F01 + G06		Order code F70			
	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	M	Weight approx.	
	mm	kg	mm	kg	mm	kg	mm	kg	mm	mm	kg	
1LE1												
100	130	6.8	157	7.8	157	7.4	200	8.1	86.5	30	2.4	
112	137	8.6	164	9.7	164	9.3	207	10	81.5	30	2.6	
132	165.5	13.2	192.5	14.3	192.5	13.9	235.5	14.6	116	40	3.8	
160	180	32.2	207	33.4	207	33	250	33.7	135.5	40	6.5	

Assignment												
Frame size	Fig. 6				Fig. 7							
	Brake and separately driven fan				Separately driven fan and rotary pulse encoder (under cover)							
	Order codes F01 + F70		Order codes F01 + F70 + G01/G02		Order codes F70 + G01/G02		Order codes F70 + G04		Order codes F70 + G05		Order codes F70 + G06	
	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.
	mm	kg	mm	kg	mm	kg	mm	kg	mm	kg	mm	kg
1LE1												
100	161.5	8.3	161.5	3.3	161.5	4.3	161.5	3.9	196.5	4.6		
112	156.5	10.4	156.5	3.4	156.5	4.5	156.5	4.1	191.5	4.8		
132	186	15.7	186	5.1	186	6.2	186	5.8	241	6.5		
160	205.5	37.2	205.5	8	205.5	9.2	205.5	8.8	270.5	9.5		

Assignment												
Frame size	Fig. 8								Fig. 9			
	Brake, separately driven fan and rotary pulse encoder (under cover)								Protective cover for separately driven fan			
	Order codes F01 + F70 + G01/G02		Order codes F01 + F70 + G04		Order codes F01 + F70 + G05		Order codes F01 + F70 + G06		Order code H00			
	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Diameter of the fan cover	
	mm	kg	mm	kg	mm	kg	mm	kg	mm	kg	mm	
1LE1												
100	196.5	9.2	196.5	10.2	196.5	9.8	246.5	10.5	30	1.4	210	
112	191.5	11.2	191.5	12.3	191.5	11.9	241.5	12.6	33	1.8	249	
132	241	17	241	18.1	241	17.7	291	18.4	24	2.4	300	
160	270.5	38.7	270.5	39.9	270.5	39.5	320.5	40.2	31	3	338	

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Assignment		Fig. 10		Fig. 11				
Frame size	Prepared for mountings – only center hole (for Brake order code F01 and/or rotary pulse encoder order codes G01/G02/G04/G05/G06) Order code G40	Order code G40	Weight approx. kg	Prepared for mountings with shaft D12/D16 Order codes G41/G42	Order code G41	Weight approx. kg	Order code G42	Weight approx. kg
	Δl	Δl		Δl	Δl		Δl	
	mm	mm		mm	mm		mm	
1LE1								
100	0	0		11.3	0.15		47.3	0.2
112	0	0		7.5	0.15		47.3	0.2
132	0	0.1		10.3	0.3		50.3	0.4
160	0	0.2		5.6	0.4		45.6	0.7

New Generation 1LE1/1PC1



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IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Orientation

Overview

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Increasing energy costs have resulted in greater emphasis on the power consumption of drive systems. It is extremely important to utilize the full potential for minimization here to secure competitiveness today and in the future. The environment will also profit from reduced energy consumption.

With this in mind, we have already developed a new generation of low-voltage motors that you can use in drives to move even more than before. Innovative copper rotors that we develop and manufacture entirely in-house create the perfect conditions for motors with a high degree of efficiency (EFF2 and EFF1 motors are located in the same housing). The new motors for EFF1 (High Efficiency) offer considerable energy savings and protect our environment.

The modular mounting concept also provides total flexibility: Each motor is based on a uniform concept for all markets worldwide. Our motors are manufactured in accordance with modern ecological principles and give machines and plants more drive. Worldwide and for every application. Efficiency over the complete life cycle is a clear benefit of our motors especially for the use of 1LE1/1PC1 designed to EFF1. All machine manufacturers and plant operators can profit from this – not to mention the environment. We will be launching our new 1LE1/1PC1 motors onto the market step by step.

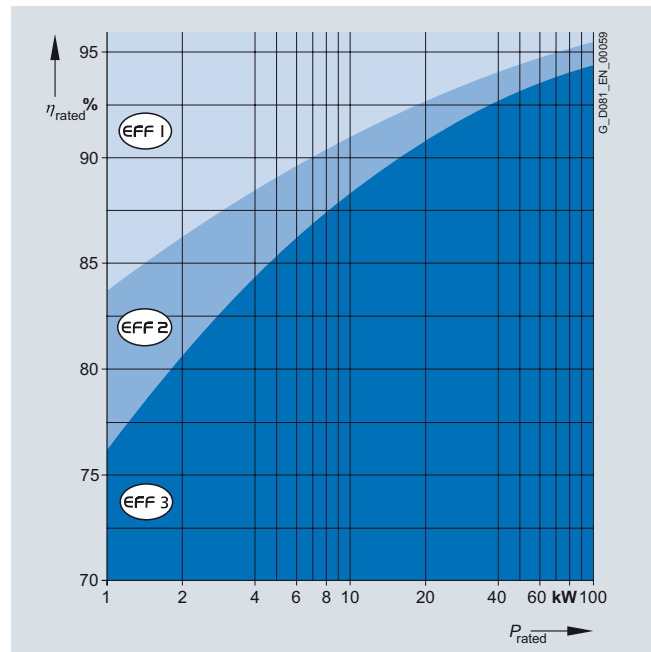
Classified energy-saving motors for an efficient energy balance

Depending on requirements, energy-saving motors are available for an efficient energy balance for the EU in accordance with CEMEP (European Committee of Manufacturers of Electrical Machines and Power Electronics) as well as for the North American market in accordance with EPACT (US Energy Policy Act).

Efficiency requirements according to CEMEP

CEMEP classifies efficiency levels for 2-pole and 4-pole motors with outputs of 1.1 to 90 kW. Three efficiency classes are defined:

- **EFF1** (High Efficiency motors – referred to below as “Motors with high efficiency”)
- **EFF2** (Improved Efficiency motors – referred to below as “Motors with improved efficiency”)
- **EFF3** (Conventional Efficiency motors)



At a glance: EU/CEMEP for Europe

- **Status**
Voluntary compliance with efficiency classification
- **Covers**
2-pole, 4-pole 50 Hz squirrel-cage motors from 1.1 to 90 kW (at 400 V and 50 Hz)
- **Required marking**
Efficiency class on the motor rating plate
 η_{rated} , $\eta_{3/4}$ load and efficiency class in the documentation

Efficiency requirements according to EPACT

In 1997, an act was passed in the US to define minimum efficiencies for low-voltage three-phase motors (EPACT).

An act is in force in Canada that is largely identical, although it is based on different verification methods. The efficiency is verified for these motors for the USA using IEEE 112, Test Method B and for Canada using CSA-C390. Apart from a few exceptions, all three-phase low-voltage motors imported into the USA or Canada must comply with the legal efficiency requirements. The law demands minimum efficiency levels for motors with a voltage of 230 and 460 V at 60 Hz, in the output range of 1 to 200 HP (0.75 to 150 kW) with 2, 4 and 6 poles. Explosion-proof motors must also be included.

The EPACT efficiency requirements exclude, for example:

- Motors whose frame size-output classification does not correspond with the standard series according to NEMA MG1-12.
- Flange-mounting motors
- Brake motors
- Converter-fed motors
- Motors with design letter C and higher

Overview (continued)

EPACT lays down that the nominal efficiency at full load and a "CC" number (Compliance Certification) must be included on the rating plate. The "CC" number is issued by the US Department of Energy (DOE). The following information is stamped on the rating plate of EPACT motors which must be marked by law:

- Nominal efficiency
- Design letter
- Code letter
- CONT
- CC No. CC 032A (Siemens) and NEMA MG1-12.

At a glance: EPACT/CSA for North America

- Status
Minimum efficiencies required by law
- Covers
2-, 4- and 6-pole 60 Hz squirrel-cage motors from 1 to 200 HP (0.75 to 150 kW) for 230 V and/or 460 V 60 Hz
- Required marking
Efficiency η_{rated} on the motor rating plate

Motors with increased output and compact construction (1LE1)

Motors with increased output and compact construction can be used to advantage in confined spaces. For a slightly longer overall length, the output is at least as high as that of the next larger shaft height. These compact motors are also optimized for efficiency. They are available in EFF1 and EFF2 and therefore reduce the operating costs.

Benefits

There is considerable potential in our new 1LE1/1PC1 series of low-voltage motors. As a consistent further development of our existing motors, the 1LE1/1PC1 motors offer numerous advantages:

Greater efficiency

Instead of cast-aluminum rotors, the new copper technology is used in the EFF1 motors. The motors are therefore considerably more compact. EFF2 and EFF1 motors are based on the same housing. For changeover to the higher efficiency class – from EFF2 to EFF1 – reconstruction of the machine is no longer necessary. Savings are achieved in time and costs. And what is more: You can save a considerable amount of energy with EFF1 motors because they have power losses of up to 40 % less than EFF2 motors. The energy saving potential and life cycle costs of the new motors can be calculated with our SinaSave™ software. You can download the SinaSave program in the Internet using the following link: <http://www.siemens.com/energysaving>. For more information, see catalog part 11 "Appendix", "Energy-saving program SinaSave". Our 1LE1 motors also impress customers with their extremely long life and their weight-optimized design has a positive effect on the stability of the equipment unit.

Motors without fan cover and external fan (1LE1 with order code F90)

Forced-air cooled motors with surface cooling without fan cover and external fan are mainly used for driving fans.

Standard motors with reduced output without fan cover and external fan (1PC1)

Self-cooled motors with surface cooling without fan cover and external fan are suitable for the following operating conditions:

- Types of duty with adequate cooling times (e.g. temporary duty for positioning drives)
- Environmental conditions that demand compact installation space (e.g. in motors with a stopping function)

Conditions under which an external fan has an adverse effect (e.g. simple cleaning in the food industry, textile industry)

Motors delivered ex-stock with shorter delivery time – General Line 1LE1

The most popular basic versions of the 1LE1 motor series can be supplied ex-stock and are termed the "General Line".

A so-called "Sector version" will be available soon for some of the motors available from stock. These include a located bearing at the drive end (DE), PTC thermistor and screwed-on feet for the IM B35 type of construction.

The normal delivery time for General Line motors is 1 to 2 days from the time of clarification of the order at the factory until delivery from the factory. To determine the time of arrival at the customer site, the appropriate shipping time must be added.

More application

The motors are approved and certified for worldwide use and meet high quality standards (confirmed, for example, by CSA ¹⁾, UL ²⁾, and CQC ³⁾).

Improved design

The new, optimized housing in modern EMC design has an attractive appearance and enhances functionality. The rotatable, accessible connection boxes, integral eyebolts, screwed-on feet and reinforced bearing plates ensure this.

Greater output

For the same shaft height, our high-performance motors offer an additional complete rated output level. The best is: We are also consistently implementing energy efficiency improvements here, too. The motors are offered – based on the categories of CEMEP – in high efficiency and improved efficiency versions.

More flexibility

The optimized architecture of the motors makes installation easier in general. Encoders, brakes and separately driven fans can be retrofitted easily. Connection boxes and feet for flexible mounting can be selected. Smaller inventories make stockkeeping easier and motor suppliers can respond to customer requirements more quickly. Optimized manufacturing processes support fast availability. All motors up to 460 V can be operated either directly on line or converter-fed – without the need for any additional measures.

1) Canadian Standard Association

2) Underwriters Laboratories Inc.

3) China Quality Certification

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Orientation

Application

As soon as the range of motors and options is complete, it will be possible to use the 1LE1/1PC1 motors from Siemens in all areas and sectors of industry due to their numerous options. They are suitable both for special environmental conditions such as those that predominate in the chemical or petrochemical industries as well as for most climatic requirements such as those of offshore applications. Their large range of mains voltages enables them to be used all over the world.

The wide field of implementation includes the following applications:

- Pumps
- Fans
- Compressors
- Conveyor systems such as cranes, belts and lifting gear
- High-bay warehouses
- Packaging machines
- Automation and Drives

Technical specifications

Technical data at a glance

This table lists the most important technical data. For more information and details, see catalog part 0 "Introduction".

Type of motor	IEC Squirrel-Cage Motors 1LE1/1PC1
Connection types	Star connection/delta connection You can establish the connection type used from the Order No. supplements in the selection and ordering data for the required motor.
Number of poles	2, 4, 6, 8
Frame sizes	100 L to 160 L
Rated output	0.75 ... 22 kW (motor series 1LE1)/0.3 ... 9 kW (motor series 1PC1)
Frequencies	50 Hz and 60 Hz
Versions	Self-ventilated 1LE1 energy-saving motors with: <ul style="list-style-type: none"> • Improved efficiency (EFF2) • High efficiency (EFF1) Self-ventilated 1LE1 motors with increased output and: <ul style="list-style-type: none"> • Improved efficiency (EFF2) • High efficiency (EFF1) Forced-air-cooled 1LE1 motors without external fan and fan cover with: <ul style="list-style-type: none"> • Improved efficiency (EFF2) • High efficiency (EFF1) Self-cooled 1PC1 motors without external fan and fan cover with: <ul style="list-style-type: none"> • Improved efficiency • High efficiency
Marking	EU/CEMPEP efficiency classification, EFF1: 2-, 4-pole, EFF2: 2-, 4-pole US Energy Policy Act EPACT: 2-, 4-, 6-pole
Rated speed (synchronous speed)	750 ... 3000 rpm
Rated torque	9.9 ... 150 Nm (motor series 1LE1)/4.05 ... 60 Nm (motor series 1PC1)
Insulation of the stator winding according to EN 60034-1 (IEC 60034-1)	Temperature class 155 (F), used acc. to temperature class 130 (B) (also for motors with increased output) DURIGNIT IR 2000 insulation system
Degree of protection according to EN 60034-5 (IEC 60034-5)	IP55 as standard
Cooling according to EN 60034-6 (IEC 60034-6)	Self-ventilated (motor series 1LE1) frame sizes 100 L to 160 L (IC 411), Forced-air-cooled (motor series 1LE1 with order code F90) frame sizes 100 L to 160 L (IC 416) Self-cooled (motor series 1PC1) frame sizes 100 L to 160 L (IC 410)
Admissible coolant temperature and site altitude	-20 °C ... +40 °C as standard, site altitude up to 1000 m above sea level. See "Coolant temperature and site altitude" in catalog part 0 "Introduction".
Standard voltages according to EN 60038 (IEC 60038)	50 Hz: 230 V, 400 V, 500 V, 690 V The voltage to be used can be found in the selection and ordering data for the required motor.
Type of construction according to EN 60034-7 (IEC 60034-7)	Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6, IM V5 with protective cover With flange: IM B5, IM V1 without protective cover, IM V1 with protective cover, IM V3, IM B35 With standard flange and special flange (next larger flange): IM B14, IM V19, IM V18 without protective cover, IM V18 with protective cover, IM B34
Paint finish Suitability of paint finish for climate group according to IEC 60721, Part 2-1	Standard: Color RAL 7030 stone gray See "Paint finish" in catalog part 0 "Introduction".
Vibration quantity level according to EN 60034-14 (IEC 60034-14)	Level A (normal – without special vibration requirements) Optionally: Level B (with special vibration requirements) See "Balance and vibration quantity" in catalog part 0 "Introduction".
Shaft extension according to DIN 748 (IEC 60072)	Balance type: Half-key balancing as standard See "Balance and vibration quantity" in catalog part 0 "Introduction".
Sound pressure level according to DIN EN ISO 1680 (tolerance +3 dB)	The sound pressure level is listed in the selection and ordering data for the required motor.
Weights	The weight is listed in the selection and ordering data for the required motor.
Modular mounting concept	Rotary pulse encoder, brake, separately driven fan or prepared for mountings
Consistent series concept	<ul style="list-style-type: none"> • Cast housing feet, screw-mounted feet available as an option and retrofittable • Connection box obliquely partitioned and rotatable through 4 x 90° • Bearings at DE and NDE are of identical design, reinforced bearings available as an option
Options	See the selection and ordering data for "Special versions"

Selection and ordering data

Preliminary selection of the motor according to motor type/series, speed or number of poles, frame size, rated output, rated torque, rated speed and rated current

General Line motors with shorter delivery time

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (motors with external fan)						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2835 ... 2935	10 ... 60	6 ... 34	1/8 ... 1/11
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1425 ... 1460	14.8 ... 98	4.85 ... 29.5	1/12 ... 1/15
1000, 6-pole	100 L ... 160 L	1.5 ... 11	930 ... 970	15.3 ... 110	3.95 ... 23.5	1/16 ... 1/17

Self-ventilated energy-saving motors with improved efficiency (Improved Efficiency EFF2)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (motors with external fan)						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2835 ... 2935	10 ... 60	6 ... 34	1/18 ... 1/19
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1425 ... 1460	14.8 ... 98	4.85 ... 29.5	1/18 ... 1/19
1000, 6-pole	100 L ... 160 L	1.5 ... 11	930 ... 970	15.3 ... 110	3.95 ... 23.5	1/18 ... 1/19
750, 8-pole	100 L ... 160 L	0.75 ... 7.5	700 ... 720	10.4 ... 100	2.65 ... 18.6	1/18 ... 1/19

Self-ventilated energy-saving motors with high efficiency (High Efficiency EFF1)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW/HP	rpm	Nm	A	
Aluminum series 1LE1 (motors with external fan)						
For use according to CEMEP						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2905 ... 2955	9.9 ... 60	5.9 ... 33	1/22 ... 1/23
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1455 ... 1475	14 ... 97	4.55 ... 27.5	1/22 ... 1/23
1000, 6-pole	100 L ... 160 L	1.5 ... 11	965 ... 975	15 ... 108	3.5 ... 22	1/22 ... 1/23
750, 8-pole	100 L ... 160 L	0.75 ... 7.5	720 ... 735	9.9 ... 98	2.75 ... 17.4	1/22 ... 1/23
For use in the North American market according to EPACT						
3000, 2-pole	100 L ... 160 L	4 ... 25	3520 ... 3565	8.1 ... 50	5.2 ... 29	1/26 ... 1/27
1500, 4-pole	100 L ... 160 L	3 ... 20	1760 ... 1780	12 ... 80	4.05 ... 24.5	1/26 ... 1/27
1000, 6-pole	100 L ... 160 L	2 ... 15	1170 ... 1180	12 ... 89	3.15 ... 19.6	1/26 ... 1/27

Self-ventilated motors with increased output and improved efficiency (Improved Efficiency EFF2)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (motors with external fan)						
3000, 2-pole	100 L ... 160 L	4 ... 22	2850 ... 2930	13.3 ... 72	7.9 ... 39.5	1/30 ... 1/31
1500, 4-pole	100 L ... 160 L	4 ... 18.5	1430 ... 1460	26.8 ... 121	8.5 ... 35	1/30 ... 1/31
1000, 6-pole	100 L ... 160 L	2.2 ... 15	930 ... 965	22.5 ... 148	5.3 ... 33	1/30 ... 1/31

Self-ventilated motors with increased output and high efficiency (High Efficiency EFF1)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (motors with external fan)						
3000, 2-pole	100 L ... 160 L	4 ... 22	2905 ... 2955	13 ... 71	7.6 ... 38.5	1/34 ... 1/35
1500, 4-pole	100 L ... 160 L	4 ... 18.5	1460 ... 1475	26 ... 120	8.2 ... 34	1/34 ... 1/35
1000, 6-pole	100 L ... 160 L	2.2 ... 15	960 ... 975	22 ... 147	4.95 ... 29.5	1/34 ... 1/35

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Orientation

Selection and ordering data (continued)

Forced-air cooled motors without external fan and fan cover with improved efficiency (Improved Efficiency EFF2)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (motors without external fan and fan cover)						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2835 ... 2935	10 ... 60	6 ... 34	1/38 ... 1/39
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1425 ... 1460	14.8 ... 98	4.85 ... 29.5	1/38 ... 1/39
1000, 6-pole	100 L ... 160 L	1.5 ... 11	930 ... 970	15.3 ... 110	3.95 ... 23.5	1/38 ... 1/39
750, 8-pole	100 L ... 160 L	0.75 ... 7.5	700 ... 720	10.4 ... 100	2.65 ... 18.6	1/38 ... 1/39

Forced-air cooled motors without external fan and fan cover with high efficiency (High Efficiency EFF1)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (motors without external fan and fan cover)						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2905 ... 2955	9.9 ... 60	5.9 ... 33	1/42 ... 1/43
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1455 ... 1475	14 ... 97	4.55 ... 27.5	1/42 ... 1/43
1000, 6-pole	100 L ... 160 L	1.5 ... 11	965 ... 975	15 ... 108	3.5 ... 22	1/42 ... 1/43
750, 8-pole	100 L ... 160 L	0.75 ... 7.5	720 ... 735	9.9 ... 98	2.75 ... 17.4	1/42 ... 1/43

Self-cooled motors without external fan and fan cover with improved efficiency

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1PC1 (motors without external fan and fan cover)						
3000, 2-pole	100 L ... 160 L	1.2 ... 7.4	2830 ... 2935	4.05 ... 24	2.3 ... 12.9	1/46 ... 1/47
1500, 4-pole	100 L ... 160 L	0.88 ... 6	1420 ... 1460	5.92 ... 39	1.8 ... 10.9	1/46 ... 1/47
1000, 6-pole	100 L ... 160 L	0.6 ... 4.4	930 ... 970	6.12 ... 43	1.4 ... 8.9	1/46 ... 1/47
750, 8-pole	100 L ... 160 L	0.3 ... 3	695 ... 730	4.05 ... 24	0.97 ... 6.8	1/46 ... 1/47

Self-cooled motors without external fan and fan cover with high efficiency

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1PC1 (motors without external fan and fan cover)						
3000, 2-pole	100 L ... 160 L	1.4 ... 9	2920 ... 2960	4.6 ... 29	2.6 ... 15.2	1/50 ... 1/51
1500, 4-pole	100 L ... 160 L	1.1 ... 6.2	1460 ... 1480	7.2 ... 40	2.2 ... 11.4	1/50 ... 1/51
1000, 6-pole	100 L ... 160 L	0.85 ... 6.5	960 ... 975	8.5 ... 64	1.92 ... 13.2	1/50 ... 1/51
750, 8-pole	100 L ... 160 L	0.37 ... 4.6	720 ... 730	4.8 ... 60	1.28 ... 10.8	1/50 ... 1/51

More information

For further information, please get in touch with your local Siemens contact.

At <http://www.siemens.com/automation/partner> you can find details of Siemens contact partners worldwide responsible for particular technologies.

You can obtain in most cases a contact partner for

- technical support
- spare parts/repairs
- service
- training
- sales or
- technical support/engineering

The selection procedure starts with:

- a country
- a product or
- a sector.

By further specifying the remaining criteria you will find exactly the right contact partner with his/her respective expertise.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

Selection and ordering data

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A		m kg	
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
3	3.45	100 L	2835	10	EFF2	82.6	83.2	0.87	6	1LE1002-1AA42-2AA0	20	
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA22-2AA0	25	
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA02-2AA0	35	
7.5	8.6	132 S	2925	24	EFF2	87.6	88.7	0.88	14	1LE1002-1CA12-2AA0	40	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
3	3.45	100 L	2835	10	EFF2	82.6	83.2	0.87	6	1LE1002-1AA42-2FA0	21	
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA22-2FA0	26	
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA02-2FA0	40	
7.5	8.6	132 S	2925	24	EFF2	87.6	88.7	0.88	14	1LE1002-1CA12-2FA0	45	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
3	3.45	100 L	2835	10	EFF2	82.6	83.2	0.87	6	1LE1002-1AA42-2FB0	21	
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾												
- Without motor protection												
3	3.45	100 L	2835	10	EFF2	82.6	83.3	0.87	6	1LE1002-1AA42-2KA0	22	
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA22-2KA0	27	

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

1) Only the type of construction IM B3 will be stamped on the rating plate.

2) Only the type of construction IM B5 will be stamped on the rating plate.

3) Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output		Flange size according to DIN EN 50347
	with direct starting as multiple of rated torque	as multiple of rated current	torque			Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pFA} dB(A)	L_{WA} dB(A)	
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)								
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz								
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1AA42-2AA0	3.2	6.2	2.9	16	0.0034	67	79	
1LE1002-1BA22-2AA0	2.7	7.3	3.7	16	0.0067	69	81	
1LE1002-1CA02-2AA0	2	5.6	2.6	16	0.01267	68	80	
1LE1002-1CA12-2AA0	2.2	6.4	3	16	0.01601	68	80	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1AA42-2FA0	3.2	6.2	2.9	16	0.0034	67	79	FF 215
1LE1002-1BA22-2FA0	2.7	7.3	3.7	16	0.0067	69	81	FF 215
1LE1002-1CA02-2FA0	2	5.6	2.6	16	0.01267	68	80	FF 265
1LE1002-1CA12-2FA0	2.2	6.4	3	16	0.01601	68	80	FF 265
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AA42-2FB0	3.2	6.2	2.9	16	0.0034	67	79	FF 215
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾								
- Without motor protection								
1LE1002-1AA42-2KA0	3.2	6.2	2.9	16	0.0034	67	79	FT 130
1LE1002-1BA22-2KA0	2.7	7.3	3.7	16	0.0067	69	81	FT 130

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

1) Only the type of construction IM B3 will be stamped on the rating plate.
 2) Only the type of construction IM B5 will be stamped on the rating plate.
 3) Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A		m kg	
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
3	3.45	100 L	2835	10	EFF2	82.6	83.2	0.87	6	1LE1002-1AA43-4AA0	20	
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA23-4AA0	25	
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA03-4AA0	35	
7.5	8.6	132 S	2925	24	EFF2	87.6	88.7	0.88	14	1LE1002-1CA13-4AA0	40	
11	12.6	160 M	2920	36	EFF2	88.4	88.5	0.85	21	1LE1002-1DA23-4AA0	60	
15	17.3	160 M	2930	49	EFF2	89.5	89.7	0.84	29	1LE1002-1DA33-4AA0	68	
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA43-4AA0	78	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
3	3.45	100 L	2835	10	EFF2	82.6	83.2	0.87	6	1LE1002-1AA43-4AB0	20	
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA23-4AB0	25	
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA03-4AB0	35	
7.5	8.6	132 S	2925	24	EFF2	87.6	88.7	0.88	14	1LE1002-1CA13-4AB0	40	
11	12.6	160 M	2920	36	EFF2	88.4	88.5	0.85	21	1LE1002-1DA23-4AB0	60	
15	17.3	160 M	2930	49	EFF2	89.5	89.7	0.84	29	1LE1002-1DA33-4AB0	68	
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA43-4AB0	78	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
3	3.45	100 L	2835	10	EFF2	82.6	83.2	0.87	6	1LE1002-1AA43-4FA0	21	
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA23-4FA0	26	
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA03-4FA0	40	
7.5	8.6	132 S	2925	24	EFF2	87.6	88.7	0.88	14	1LE1002-1CA13-4FA0	45	
11	12.6	160 M	2920	36	EFF2	88.4	88.5	0.85	21	1LE1002-1DA23-4FA0	69	
15	17.3	160 M	2930	49	EFF2	89.5	89.7	0.84	29	1LE1002-1DA33-4FA0	77	
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA43-4FA0	87	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA23-4FB0	26	
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA03-4FB0	40	
7.5	8.6	132 S	2925	24	EFF2	87.6	88.7	0.88	14	1LE1002-1CA13-4FB0	45	
11	12.6	160 M	2920	36	EFF2	88.4	88.5	0.85	21	1LE1002-1DA23-4FB0	69	
15	17.3	160 M	2930	49	EFF2	89.5	89.7	0.84	29	1LE1002-1DA33-4FB0	77	
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA43-4FB0	87	

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output		Flange size according to DIN EN 50347
	with direct starting as multiple of rated torque	as multiple of rated current	torque			Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pFA} dB(A)	L_{WA} dB(A)	
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)								
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz								
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1AA43-4AA0	3.2	6.2	2.9	16	0.0034	67	79	
1LE1002-1BA23-4AA0	2.7	7.3	3.7	16	0.0067	69	81	
1LE1002-1CA03-4AA0	2	5.6	2.6	16	0.01267	68	80	
1LE1002-1CA13-4AA0	2.2	6.4	3	16	0.01601	68	80	
1LE1002-1DA23-4AA0	2.1	6.1	2.7	16	0.02971	70	82	
1LE1002-1DA33-4AA0	2.5	6.1	3.2	16	0.03619	70	82	
1LE1002-1DA43-4AA0	2.5	7	3.2	16	0.04395	70	82	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AA43-4AB0	3.2	6.2	2.9	16	0.0034	67	79	
1LE1002-1BA23-4AB0	2.7	7.3	3.7	16	0.0067	69	81	
1LE1002-1CA03-4AB0	2	5.6	2.6	16	0.01267	68	80	
1LE1002-1CA13-4AB0	2.2	6.4	3	16	0.01601	68	80	
1LE1002-1DA23-4AB0	2.1	6.1	2.7	16	0.02971	70	82	
1LE1002-1DA33-4AB0	2.5	6.1	3.2	16	0.03619	70	82	
1LE1002-1DA43-4AB0	2.5	7	3.2	16	0.04395	70	82	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1AA43-4FA0	3.2	6.2	2.9	16	0.0034	67	79	FF 215
1LE1002-1BA23-4FA0	2.7	7.3	3.7	16	0.0067	69	81	FF 215
1LE1002-1CA03-4FA0	2	5.6	2.6	16	0.01267	68	80	FF 265
1LE1002-1CA13-4FA0	2.2	6.4	3	16	0.01601	68	80	FF 265
1LE1002-1DA23-4FA0	2.1	6.1	2.7	16	0.02971	70	82	FF 300
1LE1002-1DA33-4FA0	2.5	6.1	3.2	16	0.03619	70	82	FF 300
1LE1002-1DA43-4FA0	2.5	7	3.2	16	0.04395	70	82	FF 300
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1BA23-4FB0	2.7	7.3	3.7	16	0.0067	69	81	FF 215
1LE1002-1CA03-4FB0	2	5.6	2.6	16	0.01267	68	80	FF 265
1LE1002-1CA13-4FB0	2.2	6.4	3	16	0.01601	68	80	FF 265
1LE1002-1DA23-4FB0	2.1	6.1	2.7	16	0.02971	70	82	FF 300
1LE1002-1DA33-4FB0	2.5	6.1	3.2	16	0.03619	70	82	FF 300
1LE1002-1DA43-4FB0	2.5	7	3.2	16	0.04395	70	82	FF 300

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A		m kg	
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB42-2AA0	18	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB52-2AA0	22	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB22-2AA0	27	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB02-2AA0	38	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB22-2AA0	44	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB22-2AA0	62	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB42-2AA0	73	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB42-2AB0	18	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB42-2FA0	19	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB52-2FA0	23	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB22-2FA0	28	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB02-2FA0	43	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB22-2FA0	49	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB22-2FA0	71	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB42-2FA0	82	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB42-2FB0	19	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB52-2FB0	23	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB22-2FB0	28	
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾												
- Without motor protection												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB42-2KA0	20	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB52-2KA0	24	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB22-2KA0	29	

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

1) Only the type of construction IM B3 will be stamped on the rating plate.

2) Only the type of construction IM B5 will be stamped on the rating plate.

3) Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output		Flange size according to DIN EN 50347
	with direct starting as multiple of rated torque	as multiple of rated current	torque			Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pFA} dB(A)	L_{WA} dB(A)	
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)								
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz								
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1AB42-2AA0	2.3	5.1	2.7	16	0.0059	60	72	
1LE1002-1AB52-2AA0	2.4	5.4	2.6	16	0.0078	60	72	
1LE1002-1BB22-2AA0	2.2	5.3	2.6	16	0.0102	58	70	
1LE1002-1CB02-2AA0	2.3	6.2	2.7	16	0.0186	64	76	
1LE1002-1CB22-2AA0	2.5	6.6	2.9	16	0.02371	64	76	
1LE1002-1DB22-2AA0	2.3	6.4	3.1	16	0.04395	65	77	
1LE1002-1DB42-2AA0	2.5	7	3.4	16	0.05616	65	77	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AB42-2AB0	2.3	5.1	2.7	16	0.0059	63	75	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1AB42-2FA0	2.3	5.1	2.7	16	0.0059	60	72	FF 215
1LE1002-1AB52-2FA0	2.4	5.4	2.6	16	0.0078	60	72	FF 215
1LE1002-1BB22-2FA0	2.2	5.3	2.6	16	0.0102	58	70	FF 215
1LE1002-1CB02-2FA0	2.3	6.2	2.7	16	0.0186	64	76	FF 265
1LE1002-1CB22-2FA0	2.5	6.6	2.9	16	0.02371	64	76	FF 265
1LE1002-1DB22-2FA0	2.3	6.4	3.1	16	0.04395	65	77	FF 300
1LE1002-1DB42-2FA0	2.5	7	3.4	16	0.05616	65	77	FF 300
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AB42-2FB0	2.3	5.1	2.7	16	0.0059	60	72	FF 215
1LE1002-1AB52-2FB0	2.4	5.4	2.6	16	0.0078	60	72	FF 215
1LE1002-1BB22-2FB0	2.2	5.3	2.6	16	0.0102	58	70	FF 215
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾								
- Without motor protection								
1LE1002-1AB42-2KA0	2.3	5.1	2.7	16	0.0059	60	72	FT 130
1LE1002-1AB52-2KA0	2.4	5.4	2.6	16	0.0078	63	75	FT 130
1LE1002-1BB22-2KA0	2.2	5.3	2.6	16	0.0102	58	70	FT 130

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

- 1) Only the type of construction IM B3 will be stamped on the rating plate.
- 2) Only the type of construction IM B5 will be stamped on the rating plate.
- 3) Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A		m kg	
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB43-4AA0	18	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB53-4AA0	22	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB23-4AA0	27	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB03-4AA0	38	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB23-4AA0	44	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB23-4AA0	62	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB43-4AA0	73	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB43-4AB0	18	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB53-4AB0	22	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB23-4AB0	27	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB03-4AB0	38	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB23-4AB0	44	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB23-4AB0	62	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB43-4AB0	73	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB43-4FA0	19	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB53-4FA0	23	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB23-4FA0	28	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB03-4FA0	43	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB23-4FA0	49	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB23-4FA0	71	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB43-4FA0	82	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB23-4FB0	28	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB03-4FB0	43	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB23-4FB0	49	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB23-4FB0	71	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB43-4FB0	82	
• With flange: IM B35												
- Without motor protection												
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB03-4JA0	43	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB23-4JA0	49	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB23-4JA0	71	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB43-4JA0	82	

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time
Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output		Flange size according to DIN EN 50347
	with direct starting as multiple of rated torque	as multiple of rated current	torque			Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pFA} dB(A)	L_{WA} dB(A)	
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)								
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz								
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1AB43-4AA0	2.3	5.1	2.7	16	0.0059	60	72	
1LE1002-1AB53-4AA0	2.4	5.4	2.6	16	0.0078	60	72	
1LE1002-1BB23-4AA0	2.2	5.3	2.6	16	0.0102	58	70	
1LE1002-1CB03-4AA0	2.3	6.2	2.7	16	0.0186	64	76	
1LE1002-1CB23-4AA0	2.5	6.6	2.9	16	0.02371	64	76	
1LE1002-1DB23-4AA0	2.3	6.4	3.1	16	0.04395	65	77	
1LE1002-1DB43-4AA0	2.5	7	3.4	16	0.05616	65	77	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AB43-4AB0	2.3	5.1	2.7	16	0.0059	60	72	
1LE1002-1AB53-4AB0	2.4	5.4	2.6	16	0.0078	60	72	
1LE1002-1BB23-4AB0	2.2	5.3	2.6	16	0.0102	58	70	
1LE1002-1CB03-4AB0	2.3	6.2	2.7	16	0.0186	64	76	
1LE1002-1CB23-4AB0	2.5	6.6	2.9	16	0.02371	64	76	
1LE1002-1DB23-4AB0	2.3	6.4	3.1	16	0.04395	65	77	
1LE1002-1DB43-4AB0	2.5	7	3.4	16	0.05616	65	77	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1AB43-4FA0	2.3	5.1	2.7	16	0.0059	60	72	FF 215
1LE1002-1AB53-4FA0	2.4	5.4	2.6	16	0.0078	60	72	FF 215
1LE1002-1BB23-4FA0	2.2	5.3	2.6	16	0.0102	58	70	FF 215
1LE1002-1CB03-4FA0	2.3	6.2	2.7	16	0.0186	64	76	FF 265
1LE1002-1CB23-4FA0	2.5	6.6	2.9	16	0.02371	64	76	FF 265
1LE1002-1DB23-4FA0	2.3	6.4	3.1	16	0.04395	65	77	FF 300
1LE1002-1DB43-4FA0	2.5	7	3.4	16	0.05616	65	77	FF 300
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1BB23-4FB0	2.2	5.3	2.6	16	0.0102	58	70	FF 215
1LE1002-1CB03-4FB0	2.3	6.2	2.7	16	0.0186	64	76	FF 265
1LE1002-1CB23-4FB0	2.5	6.6	2.9	16	0.02371	64	76	FF 265
1LE1002-1DB23-4FB0	2.3	6.4	3.1	16	0.04395	65	77	FF 300
1LE1002-1DB43-4FB0	2.5	7	3.4	16	0.05616	65	77	FF 300
• With flange: IM B35								
- Without motor protection								
1LE1002-1CB03-4JA0	2.3	6.2	2.7	16	0.0186	64	76	FF 265
1LE1002-1CB23-4JA0	2.5	6.6	2.9	16	0.02371	64	76	FF 265
1LE1002-1DB23-4JA0	2.3	6.4	3.1	16	0.04395	65	77	FF 300
1LE1002-1DB43-4JA0	2.5	7	3.4	16	0.05616	65	77	FF 300

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.


²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A		m kg	
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
1.5	1.75	100 L	940	15.3		74	72.6	0.74	3.95	1LE1002-1AC42-2AA0	19	
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC22-2AA0	25	
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC02-2AA0	34	
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC22-2AA0	39	
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC32-2AA0	48	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
1.5	1.75	100 L	940	15.3		74	72.6	0.74	3.95	1LE1002-1AC42-2FA0	20	
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC22-2FA0	26	
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC02-2FA0	39	
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC22-2FA0	44	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
1.5	1.75	100 L	940	15.3		74	72.6	0.74	3.95	1LE1002-1AC42-2FB0	20	
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC22-2FB0	26	
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC02-2FB0	39	
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾												
- Without motor protection												
1.5	1.75	100 L	940	15.3		74	72.6	0.74	3.95	1LE1002-1AC42-2KA0	21	
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC22-2KA0	27	
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC03-4AA0	34	
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC23-4AA0	39	
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC33-4AA0	48	
7.5	8.6	160 M	970	75		86	85.4	0.73	17.2	1LE1002-1DC23-4AA0	72	
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC43-4AA0	92	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC03-4AB0	34	
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC23-4AB0	39	
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC33-4AB0	48	
7.5	8.6	160 M	970	75		86	86.5	0.73	17.2	1LE1002-1DC23-4AB0	72	
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC43-4AB0	92	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC03-4FA0	39	
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC23-4FA0	44	
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC33-4FA0	53	
7.5	8.6	160 M	970	75		86	85.4	0.73	17.2	1LE1002-1DC23-4FA0	81	
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC43-4FA0	101	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC23-4FB0	44	
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC33-4FB0	53	
7.5	8.6	160 M	970	75		86	85.4	0.73	17.2	1LE1002-1DC23-4FB0	81	
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC43-4FB0	101	

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

1) Only the type of construction IM B3 will be stamped on the rating plate.

2) Only the type of construction IM B5 will be stamped on the rating plate.

3) Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output		Flange size according to DIN EN 50347
	with direct starting as multiple of rated torque	as multiple of rated current	as multiple of rated torque			Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pFA} dB(A)	L_{WA} dB(A)	
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)								
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz								
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1AC42-2AA0	2	4	2.2	16	0.0065	59	71	
1LE1002-1BC22-2AA0	2.1	4.1	2.4	16	0.0065	57	69	
1LE1002-1CC02-2AA0	2	4.6	2.6	16	0.0167	63	75	
1LE1002-1CC22-2AA0	2.1	4.7	2.5	16	0.02116	63	75	
1LE1002-1CC32-2AA0	2.5	5.2	2.8	16	0.02734	63	75	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1AC42-2FA0	2	4	2.2	16	0.0065	59	71	FF 215
1LE1002-1BC22-2FA0	2.3	4.1	2.5	16	0.0092	57	69	FF 215
1LE1002-1CC02-2FA0	2	4.6	2.6	16	0.0167	63	75	FF 265
1LE1002-1CC22-2FA0	2.1	4.7	2.5	16	0.02116	63	75	FF 265
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AC42-2FB0	2	4	2.2	16	0.0065	59	71	FF 215
1LE1002-1BC22-2FB0	2.3	4.1	2.5	16	0.0092	68	80	FF 215
1LE1002-1CC02-2FB0	2	4.6	2.6	16	0.0167	63	75	FF 265
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾								
- Without motor protection								
1LE1002-1AC42-2KA0	2	4	2.2	16	0.0065	59	71	FT 130
1LE1002-1BC22-2KA0	2.3	4.1	2.5	16	0.0092	68	80	FT 130
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1CC03-4AA0	2	4.6	2.6	16	0.017	63	75	
1LE1002-1CC23-4AA0	2.1	4.7	2.5	16	0.02116	63	75	
1LE1002-1CC33-4AA0	2.5	5.2	2.8	16	0.02734	63	75	
1LE1002-1DC23-4AA0	2.1	5.5	2.9	16	0.04993	68	80	
1LE1002-1DC43-4AA0	1.9	5.9	2.7	16	0.0678	68	80	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1CC03-4AB0	2	4.6	2.6	16	0.0167	63	75	
1LE1002-1CC23-4AB0	2.1	4.7	2.5	16	0.02116	63	75	
1LE1002-1CC33-4AB0	2.5	5.2	2.8	16	0.02734	63	75	
1LE1002-1DC23-4AB0	2.1	5.5	2.9	16	0.04993	68	80	
1LE1002-1DC43-4AB0	1.9	5.9	2.7	16	0.0678	68	80	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1CC03-4FA0	2	4.6	2.6	16	0.0167	63	75	FF 265
1LE1002-1CC23-4FA0	2.1	4.7	2.5	16	0.02116	63	75	FF 265
1LE1002-1CC33-4FA0	2.5	5.2	2.8	16	0.02734	63	75	FF 265
1LE1002-1DC23-4FA0	2.1	5.5	2.9	16	0.04993	68	80	FF 300
1LE1002-1DC43-4FA0	1.9	5.9	2.7	16	0.0678	68	80	FF 300
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1CC23-4FB0	2.1	4.7	2.5	16	0.02116	63	75	FF 265
1LE1002-1CC33-4FB0	2.5	5.2	2.8	16	0.02734	63	75	FF 265
1LE1002-1DC23-4FB0	2.1	5.5	2.9	16	0.04993	68	80	FF 300
1LE1002-1DC43-4FB0	1.9	5.9	2.7	16	0.0678	68	80	FF 300

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)


- 1) Only the type of construction IM B3 will be stamped on the rating plate.
- 2) Only the type of construction IM B5 will be stamped on the rating plate.
- 3) Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated energy-saving motors
with improved efficiency

Selection and ordering data

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\varphi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage, type of construction, motor protection and connection box, see table from Page 1/20.	IM B3 type of construction	IM B3 type of construction approx. m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
3	3.45	100 L	2835	10	EFF2	82.6	83.2	0.87	6	1LE1002-1AA4Q-QQQQ		20
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA2Q-QQQQ		25
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA0Q-QQQQ		35
7.5	8.6	132 S	2925	24	EFF2	87.6	88.7	0.88	14	1LE1002-1CA1Q-QQQQ		40
11	12.6	160 M	2920	36	EFF2	88.4	88.5	0.85	21	1LE1002-1DA2Q-QQQQ		60
15	17.3	160 M	2930	49	EFF2	89.5	89.7	0.84	29	1LE1002-1DA3Q-QQQQ		68
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA4Q-QQQQ		78
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB4Q-QQQQ		18
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB5Q-QQQQ		22
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB2Q-QQQQ		27
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB0Q-QQQQ		38
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB2Q-QQQQ		44
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB2Q-QQQQ		62
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB4Q-QQQQ		73
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
1.5	1.75	100 L	940	15.3		74	72.6	0.74	3.95	1LE1002-1AC4Q-QQQQ		19
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC2Q-QQQQ		25
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC0Q-QQQQ		34
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC2Q-QQQQ		39
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC3Q-QQQQ		48
7.5	8.6	160 M	970	75		86	85.4	0.73	17.2	1LE1002-1DC2Q-QQQQ		72
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC4Q-QQQQ		92
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.75	0.86	100 L	705	10.4		65.4	60.2	0.62	2.65	1LE1002-1AD4Q-QQQQ		17
1.1	1.3	100 L	705	15.1		68.3	67.6	0.63	3.7	1LE1002-1AD5Q-QQQQ		22
1.5	1.75	112 M	700	20		75.9	72.8	0.68	4.2	1LE1002-1BD2Q-QQQQ		25
2.2	2.55	132 S	715	29		81	80.4	0.66	5.9	1LE1002-1CD0Q-QQQQ		37
3	3.45	132 M	710	40		81.6	81.4	0.68	7.8	1LE1002-1CD2Q-QQQQ		44
4	4.6	160 M	720	53		80	78.7	0.69	10.4	1LE1002-1DD2Q-QQQQ		60
5.5	6.3	160 M	720	73		83.5	83.9	0.70	13.6	1LE1002-1DD3Q-QQQQ		72
7.5	8.6	160 L	715	100		83.5	84.7	0.70	18.6	1LE1002-1DD4Q-QQQQ		91

Note:

The 2-, 4-, and 6-pole motors listed above can be delivered ex stock with shorter delivery time.
These motors can be selected from defined versions (voltages, types of construction, motor protection and position of the connection box) in section "General Line motors with shorter delivery time" on Pages 1/8 to 1/17.

Order No. supplements, see from Page 1/20.

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Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting torque	as multiple of rated current	torque			Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pFA} dB(A)	L_{WA} dB(A)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1002-1AA4Q-QQQQ	3.2	6.2	2.9	16	0.0034	67	79
1LE1002-1BA2Q-QQQQ	2.7	7.3	3.7	16	0.0067	69	81
1LE1002-1CA0Q-QQQQ	2	5.6	2.6	16	0.01267	68	80
1LE1002-1CA1Q-QQQQ	2.2	6.4	3	16	0.01601	68	80
1LE1002-1DA2Q-QQQQ	2.1	6.1	2.7	16	0.02971	70	82
1LE1002-1DA3Q-QQQQ	2.5	6.1	3.2	16	0.03619	70	82
1LE1002-1DA4Q-QQQQ	2.5	7	3.2	16	0.04395	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1002-1AB4Q-QQQQ	2.3	5.1	2.7	16	0.0059	60	72
1LE1002-1AB5Q-QQQQ	2.4	5.4	2.6	16	0.0078	60	72
1LE1002-1BB2Q-QQQQ	2.2	5.3	2.6	16	0.0102	58	70
1LE1002-1CB0Q-QQQQ	2.3	6.2	2.7	16	0.0186	64	76
1LE1002-1CB2Q-QQQQ	2.5	6.6	2.9	16	0.02371	64	76
1LE1002-1DB2Q-QQQQ	2.3	6.4	3.1	16	0.04395	65	77
1LE1002-1DB4Q-QQQQ	2.5	7	3.4	16	0.05616	65	77
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1002-1AC4Q-QQQQ	2	4	2.2	16	0.0065	61	73
1LE1002-1BC2Q-QQQQ	2.3	4.1	2.5	16	0.0092	68	80
1LE1002-1CC0Q-QQQQ	2	4.6	2.6	16	0.0167	63	75
1LE1002-1CC2Q-QQQQ	2.1	4.7	2.5	16	0.02116	63	75
1LE1002-1CC3Q-QQQQ	2.5	5.2	2.8	16	0.02734	63	75
1LE1002-1DC2Q-QQQQ	2.1	5.5	2.9	16	0.04993	68	80
1LE1002-1DC4Q-QQQQ	1.9	5.9	2.7	16	0.0678	68	80
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
1LE1002-1AD4Q-QQQQ	1.9	3	2.2	16	0.0056	60	72
1LE1002-1AD5Q-QQQQ	2	3.2	2.3	16	0.0078	60	72
1LE1002-1BD2Q-QQQQ	1.9	3.4	2.1	16	0.0094	63	75
1LE1002-1CD0Q-QQQQ	1.7	3.9	2.4	13	0.0186	63	75
1LE1002-1CD2Q-QQQQ	1.8	3.9	2.2	13	0.02372	63	75
1LE1002-1DD2Q-QQQQ	1.7	3.8	2.3	13	0.0439	63	75
1LE1002-1DD3Q-QQQQ	1.6	4	2.2	13	0.0562	63	75
1LE1002-1DD4Q-QQQQ	1.7	3.8	2.2	13	0.0772	63	75

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Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		<u>60 Hz</u>				<u>Rated voltage range</u>			
		460 VY	460 VΔ			(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1LE1002-1A...-□-□...	100 L	○	○	○	○	✓	✓	✓	✓
1LE1002-1B...-□-□...	112 M	○	○	○	○	✓	✓	✓	✓
1LE1002-1C...-□-□...	132 S/M	○	○	○	○	✓	✓	✓	✓
1LE1002-1D...-□-□...	160 M/L	○	○	○	○	✓	✓	✓	✓

- Without additional charge
- ✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Types of construction (type letter)												
		Without flange							With flange (acc. to DIN EN 50347)					
		IM B3 ²⁾³⁾	IM B6 ³⁾	IM B7 ³⁾	IM B8 ³⁾	IM V6 ³⁾	IM V5 without protective cover ³⁾	IM V5 with protective cover ³⁾⁴⁾⁵⁾	Flange size	IM B5 ³⁾⁶⁾	IM V1 without protective cover ³⁾	IM V1 with protective cover ³⁾⁴⁾⁵⁾	IM V3 ³⁾	IM B35
		A	T	U	V	D	C	C	F	G	G	H	J	
		Order No. supplement -Z with order code												
		-	-	-	-	-	-	-Z H00	-	-	-Z H00	-	-	
1LE1002-1A...-□-□...	100 L	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	
1LE1002-1B...-□-□...	112 M	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	
1LE1002-1C...-□-□...	132 S/M	□	□	□	□	□	□	✓	FF 265	✓	✓	✓	✓	
1LE1002-1D...-□-□...	160 M/L	□	□	□	□	□	□	✓	FF 300	✓	✓	✓	✓	

Motor type	Frame size	Position 14: Types of construction (type letter)												
		With standard flange (acc. to DIN EN 50347)						With standard flange (next larger standard flange acc. to DIN EN 50347)						
		Flange size	IM B14 ³⁾⁷⁾	IM V19 ³⁾	IM V18 without protective cover ³⁾	IM V18 with protective cover ³⁾⁴⁾⁵⁾	IM B34	Flange size	IM B14 ³⁾⁷⁾	IM V19 ³⁾	IM V18 without protective cover ³⁾	IM V18 with protective cover ³⁾⁴⁾⁵⁾	IM B34	
			K	L	M	M	N		K	L	M	M	N	
		Order No. supplement -Z with order code												
		-	-	-	-	-Z H00	-	-Z	-Z	-Z	-Z	-Z H00	-Z	
			P01	P01	P01	P01	P01		P01	P01	P01	P01	P01	
1LE1002-1A...-□-□...	100 L	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓	
1LE1002-1B...-□-□...	112 M	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓	
1LE1002-1C...-□-□...	132 S/M	FT 165	✓	✓	✓	✓	✓	FT 215	✓	✓	✓	✓	✓	
1LE1002-1D...-□-□...	160 M/L	FT 215	✓	✓	✓	✓	✓	-	-	-	-	-	-	

- Standard version
- ✓ With additional charge

¹⁾ A rated voltage range is also specified on the rating plate.
²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate. With type of construction IM V5 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.
³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.
⁴⁾ Option second shaft extension (order code **L05**) not possible.

⁵⁾ In combination with an encoder, it is not necessary to order the protective cover (order code **H00**), as this is delivered as a protection for the encoder as standard. In this case, the protective cover is standard design (without additional charge).
⁶⁾ The types of construction IM V3 and IM V1 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate. With type of construction IM V1 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.
⁷⁾ The types of construction IM V19 and IM V18 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate. With type of construction IM V18 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

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Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
Order code		A	B	C	F	Z Q2A	Z Q3A
1LE1002-1A...-...□	100 L	□	✓	✓	✓	✓	✓
1LE1002-1B...-...□	112 M	□	✓	✓	✓	✓	✓
1LE1002-1C...-...□	132 S/M	□	✓	✓	✓	✓	✓
1LE1002-1D...-...□	160 M/L	□	✓	✓	✓	✓	✓

- Standard version
✓ With additional charge

Motortyp	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1LE1002-1A...-...□	100 L	□	✓	✓	✓
1LE1002-1B...-...□	112 M	□	✓	✓	✓
1LE1002-1C...-...□	132 S/M	□	✓	✓	✓
1LE1002-1D...-...□	160 M/L	□	✓	✓	✓

- Standard version
✓ With additional charge


¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".
³⁾ With type of construction, screwed-on feet as standard.

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Selection and ordering data

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\varphi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage, type of construction, motor protection and connection box, see table from Page 1/24.	IM B3 type of construction	IM B3 type of construction approx. m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
For use according to CEMEP												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
3	3.45	100 L	2905	9.9	EFF1	86.7	87.5	0.84	5.9	1LE1001-1AA4Q-QQQQ		21
4	4.6	112 M	2950	13	EFF1	88	88.5	0.86	7.4	1LE1001-1BA2Q-QQQQ		27
5.5	6.3	132 S	2950	18	EFF1	89.5	90.6	0.87	10.2	1LE1001-1CA0Q-QQQQ		39
7.5	8.6	132 S	2950	24	EFF1	90	91	0.87	13.8	1LE1001-1CA1Q-QQQQ		43
11	12.6	160 M	2955	36	EFF1	90.8	91	0.87	20	1LE1001-1DA2Q-QQQQ		67
15	17.3	160 M	2955	48	EFF1	91.4	91.5	0.88	27	1LE1001-1DA3Q-QQQQ		75
18.5	21.3	160 L	2955	60	EFF1	92	92.5	0.88	33	1LE1001-1DA4Q-QQQQ		84
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
2.2	2.55	100 L	1455	14	EFF1	86.4	87	0.81	4.55	1LE1001-1AB4Q-QQQQ		21
3	3.45	100 L	1455	20	EFF1	87.4	88	0.82	6	1LE1001-1AB5Q-QQQQ		25
4	4.6	112 M	1460	26	EFF1	88.3	88.5	0.81	8.1	1LE1001-1BB2Q-QQQQ		29
5.5	6.3	132 S	1465	36	EFF1	89.2	89.5	0.80	11.2	1LE1001-1CB0Q-QQQQ		42
7.5	8.6	132 M	1465	49	EFF1	90.1	91	0.83	14.4	1LE1001-1CB2Q-QQQQ		49
11	12.6	160 M	1470	71	EFF1	91.2	91.8	0.85	20.5	1LE1001-1DB2Q-QQQQ		71
15	17.3	160 L	1475	97	EFF1	92	92.4	0.85	27.5	1LE1001-1DB4Q-QQQQ		83
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
1.5	1.75	100 L	970	15		84.5	84.5	0.73	3.5	1LE1001-1AC4Q-QQQQ		25
2.2	2.55	112 M	965	22		85	85	0.75	5	1LE1001-1BC2Q-QQQQ		29
3	3.45	132 S	970	30		85	85	0.74	6.9	1LE1001-1CC0Q-QQQQ		38
4	4.6	132 M	970	39		86	86	0.78	8.6	1LE1001-1CC2Q-QQQQ		43
5.5	6.3	132 M	970	54		88	88	0.77	11.8	1LE1001-1CC3Q-QQQQ		52
7.5	8.6	160 M	975	73		89	89	0.77	15.8	1LE1001-1DC2Q-QQQQ		77
11	12.6	160 L	975	108		89.5	89	0.80	22	1LE1001-1DC4Q-QQQQ		93
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.75	0.86	100 L	725	9.9		68	65	0.58	2.75	1LE1001-1AD4Q-QQQQ		21
1.1	1.3	100 L	725	14		68	64.5	0.58	4.05	1LE1001-1AD5Q-QQQQ		25
1.5	1.75	112 M	720	20		77	75.5	0.67	4.2	1LE1001-1BD2Q-QQQQ		29
2.2	2.55	132 S	725	29		77.5	76.7	0.63	6.5	1LE1001-1CD0Q-QQQQ		41
3	3.45	132 M	730	40		84	82	0.65	7.9	1LE1001-1CD2Q-QQQQ		49
4	4.6	160 M	730	52		87	88	0.69	9.6	1LE1001-1DD2Q-QQQQ		69
5.5	6.3	160 M	735	72		87.5	89	0.69	13.2	1LE1001-1DD3Q-QQQQ		82
7.5	8.6	160 L	730	98		88	89	0.72	17	1LE1001-1DD4Q-QQQQ		94

Order No. supplements, see from Page 1/24.

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Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting torque	as multiple of rated current	torque			Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pFA} dB(A)	L_{WA} dB(A)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
For use according to CEMEP							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1001-1AA4Q-QQQQ	2.3	7	3.3	16	0.0044	67	79
1LE1001-1BA2Q-QQQQ	2.4	7.4	3.3	16	0.0092	69	81
1LE1001-1CA0Q-QQQQ	1.8	6.7	2.9	16	0.02012	68	80
1LE1001-1CA1Q-QQQQ	2.2	7.5	3.1	16	0.02353	68	80
1LE1001-1DA2Q-QQQQ	2.1	7.4	3.2	16	0.04471	70	82
1LE1001-1DA3Q-QQQQ	2.4	7.6	3.4	16	0.05277	70	82
1LE1001-1DA4Q-QQQQ	2.9	7.9	3.6	16	0.06085	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1001-1AB4Q-QQQQ	2.1	6.9	3.3	16	0.0086	60	72
1LE1001-1AB5Q-QQQQ	2	6.9	3.1	16	0.0109	60	72
1LE1001-1BB2Q-QQQQ	2.5	7.1	3.2	16	0.014	58	70
1LE1001-1CB0Q-QQQQ	2.3	6.9	2.9	16	0.02698	64	76
1LE1001-1CB2Q-QQQQ	2.3	6.9	2.9	16	0.03353	64	76
1LE1001-1DB2Q-QQQQ	2.2	6.7	2.8	16	0.06495	65	77
1LE1001-1DB4Q-QQQQ	2.5	7.3	3	16	0.08281	65	77
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1001-1AC4Q-QQQQ	2	6.2	2.9	16	0.0113	59	71
1LE1001-1BC2Q-QQQQ	2.1	6	3.1	16	0.0139	57	69
1LE1001-1CC0Q-QQQQ	1.6	5.6	2.6	13	0.02371	63	75
1LE1001-1CC2Q-QQQQ	1.6	5.6	2.5	13	0.02918	63	75
1LE1001-1CC3Q-QQQQ	1.9	6.1	2.8	16	0.03673	63	75
1LE1001-1DC2Q-QQQQ	1.8	6.3	2.8	16	0.0754	67	79
1LE1001-1DC4Q-QQQQ	1.7	6.2	2.7	16	0.0975	67	79
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
1LE1001-1AD4Q-QQQQ	1.6	4	2.8	13	0.0086	60	72
1LE1001-1AD5Q-QQQQ	1.8	4	2.8	13	0.0109	60	72
1LE1001-1BD2Q-QQQQ	1.4	4.2	2.4	13	0.014	63	75
1LE1001-1CD0Q-QQQQ	1.4	3.6	1.8	10	0.02698	63	75
1LE1001-1CD2Q-QQQQ	1.4	5	2.4	10	0.03463	63	75
1LE1001-1DD2Q-QQQQ	1.8	4.3	2	13	0.0649	63	75
1LE1001-1DD3Q-QQQQ	2.1	4.4	2.1	13	0.0828	63	75
1LE1001-1DD4Q-QQQQ	1.9	4.5	2.1	13	0.0982	63	75

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated energy-saving motors
with high efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		<u>60 Hz</u>				<u>Rated voltage range</u>			
		460 VY	460 VΔ			(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1LE1001-1A...-□-□...	100 L	○	○	○	○	✓	✓	✓	✓
1LE1001-1B...-□-□...	112 M	○	○	○	○	✓	✓	✓	✓
1LE1001-1C...-□-□...	132 S/M	○	○	○	○	✓	✓	✓	✓
1LE1001-1D...-□-□...	160 M/L	○	○	○	○	✓	✓	✓	✓

○ Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Types of construction (type letter)												
		Without flange							With flange (acc. to DIN EN 50347)					
		IM B3 ₂₎₃₎	IM B6 ₃₎	IM B7 ₃₎	IM B8 ₃₎	IM V6 ₃₎	IM V5 without protective cover ₃₎	IM V5 with protective cover ₃₎₄₎₅₎	Flange size	IM B5 ₃₎₆₎	IM V1 without protective cover ₃₎	IM V1 with protective cover ₃₎₄₎₅₎	IM V3 ₃₎	IM B35
		A	T	U	V	D	C	C	F	G	G	H	J	
		Order No. supplement -Z with order code												
		-	-	-	-	-	-	-Z H00	-	-	-Z H00	-	-	-
1LE1001-1A...-□-□...	100 L	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1001-1B...-□-□...	112 M	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1001-1C...-□-□...	132 S/M	□	□	□	□	□	□	✓	FF 265	✓	✓	✓	✓	✓
1LE1001-1D...-□-□...	160 M/L	□	□	□	□	□	□	✓	FF 300	✓	✓	✓	✓	✓

Motor type	Frame size	Position 14: Types of construction (type letter)											
		With standard flange (acc. to DIN EN 50347)					With standard flange (next larger standard flange acc. to DIN EN 50347)						
		Flange size	IM B14 ₃₎₇₎	IM V19 ₃₎	IM V18 without protective cover ₃₎	IM V18 with protective cover ₃₎₄₎₅₎	IM B34	Flange size	IM B14 ₃₎₇₎	IM V19 ₃₎	IM V18 without protective cover ₃₎	IM V18 with protective cover ₃₎₄₎₅₎	IM B34
		K	L	M	M	N	K	L	M	M	N	N	
		Order No. supplement -Z with order code											
		-	-	-	-Z H00	-	-Z P01	-Z P01	-Z P01	-Z H00	-Z P01	-Z P01	-Z P01
1LE1001-1A...-□-□...	100 L	FT 130	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓	✓
1LE1001-1B...-□-□...	112 M	FT 130	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓	✓
1LE1001-1C...-□-□...	132 S/M	FT 165	✓	✓	✓	✓	FT 215	✓	✓	✓	✓	✓	✓
1LE1001-1D...-□-□...	160 M/L	FT 215	✓	✓	✓	✓	-	-	-	-	-	-	-

□ Standard version
✓ With additional charge

¹⁾ A rated voltage range is also specified on the rating plate.

²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate. With type of construction IM V5 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

⁴⁾ Option second shaft extension (order code **L05**) not possible.

⁵⁾ In combination with an encoder, it is not necessary to order the protective cover (order code **H00**), as this is delivered as a protection for the encoder as standard. In this case, the protective cover is standard design (without additional charge).

⁶⁾ The types of construction IM V3 and IM V1 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate. With type of construction IM V1 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

⁷⁾ The types of construction IM V19 and IM V18 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate. With type of construction IM V18 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

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New Generation 1LE1/1PC1

Self-ventilated energy-saving motors
with high efficiency

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
Order code		A	B	C	F	Z Q2A	Z Q3A
1LE1001-1A...-...□	100 L	□	✓	✓	✓	✓	✓
1LE1001-1B...-...□	112 M	□	✓	✓	✓	✓	✓
1LE1001-1C...-...□	132 S/M	□	✓	✓	✓	✓	✓
1LE1001-1D...-...□	160 M/L	□	✓	✓	✓	✓	✓

- Standard version
✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1LE1001-1A...-...□	100 L	□	✓	✓	✓
1LE1001-1B...-...□	112 M	□	✓	✓	✓
1LE1001-1C...-...□	132 S/M	□	✓	✓	✓
1LE1001-1D...-...□	160 M/L	□	✓	✓	✓

- Standard version
✓ With additional charge

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".
³⁾ With type of construction, screwed-on feet as standard.

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with high efficiency

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 60 Hz	Rated torque at 60 Hz	EPACT with CC-No. CCxxx	Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz			
P_{rated} kW	P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage, type of construction, motor protection and connection box, see from Page 1/28	IM B3 type of construction	IM B3 type of construction approx. m kg	
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)											
For use in the North American market according to EPACT											
2-pole – 3600 rpm at 60 Hz											
3	4	100 L	3520	8.1	A. S.	86.5	0.83	5.2	1LE1001-1AA4Q-Q000Q	21	
4	5	112 M	3565	9.9	A. S.	87.5	0.84	6.3	1LE1001-1BA2Q-Q000Q	27	
5.5	7.5	132 S	3560	15	A. S.	89.5	0.86	9	1LE1001-1CA0Q-Q000Q	39	
7.5	10	132 S	3560	20	A. S.	90.2	0.87	12	1LE1001-1CA1Q-Q000Q	43	
11	15	160 M	3560	30	A. S.	90.2	0.86	17.8	1LE1001-1DA2Q-Q000Q	67	
15	20	160 M	3565	40	A. S.	91	0.87	24	1LE1001-1DA3Q-Q000Q	75	
18.5	25	160 L	3565	50	A. S.	91.7	0.87	29	1LE1001-1DA4Q-Q000Q	84	
4-pole – 1800 rpm at 60 Hz											
2.2	3	100 L	1760	12	A. S.	87.5	0.78	4.05	1LE1001-1AB4Q-Q000Q	21	
3	4	100 L	1765	16	A. S.	87.5	0.79	5.4	1LE1001-1AB5Q-Q000Q	25	
4	5	112 M	1770	20	A. S.	88.5	0.77	6.8	1LE1001-1BB2Q-Q000Q	29	
5.5	7.5	132 S	1770	30	A. S.	89.5	0.78	9.9	1LE1001-1CB0Q-Q000Q	42	
7.5	10	132 M	1770	40	A. S.	89.5	0.82	12.8	1LE1001-1CB2Q-Q000Q	49	
11	15	160 M	1775	59	A. S.	91	0.84	18.1	1LE1001-1DB2Q-Q000Q	71	
15	20	160 L	1780	80	A. S.	91.7	0.84	24.5	1LE1001-1DB4Q-Q000Q	83	
6-pole – 1200 rpm at 60 Hz											
1.5	2	100 L	1175	12	A. S.	86.5	0.69	3.15	1LE1001-1AC4Q-Q000Q	25	
2.2	3	112 M	1170	18	A. S.	87.5	0.73	4.3	1LE1001-1BC2Q-Q000Q	29	
3	4	132 S	1175	24	A. S.	87.5	0.7	6.1	1LE1001-1CC0Q-Q000Q	38	
4	5	132 M	1180	30	A. S.	87.5	0.73	7.3	1LE1001-1CC2Q-Q000Q	43	
5.5	7.5	132 M	1175	45	A. S.	89.5	0.74	10.4	1LE1001-1CC3Q-Q000Q	52	
7.5	10	160 M	1180	61	A. S.	89.5	0.74	14.2	1LE1001-1DC2Q-Q000Q	77	
11	15	160 L	1180	89	A. S.	90.2	0.78	19.6	1LE1001-1DC4Q-Q000Q	93	

A. S. Available soon

Order No. supplements, see from Page 1/28.

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Self-ventilated energy-saving motors
with high efficiency

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breaddown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring-surface sound pressure level at 60 Hz $L_{p(A)}$	Sound pressure level at 60 Hz L_{WA}
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
For use in the North American market according to EPACT							
2-pole – 3600 rpm at 60 Hz							
1LE1001-1AA4Q-□□□□	2.56	7.3	3.83	16	0.0044	71	83
1LE1001-1BA2Q-□□□□	2.9	7.8	4	16	0.0092	73	85
1LE1001-1CA0Q-□□□□	2.04	6.9	3.3	16	0.02012	72	84
1LE1001-1CA1Q-□□□□	2.3	7.4	3.56	16	0.02353	72	84
1LE1001-1DA2Q-□□□□	2.38	7.4	3.63	16	0.04471	77	89
1LE1001-1DA3Q-□□□□	2.76	7.6	3.91	16	0.05277	77	89
1LE1001-1DA4Q-□□□□	3.31	7.9	4.1	16	0.06085	77	89
4-pole – 1800 rpm at 60 Hz							
1LE1001-1AB4Q-□□□□	2.45	7.3	3.85	16	0.0086	62	74
1LE1001-1AB5Q-□□□□	2.38	7.5	3.68	16	0.0109	62	74
1LE1001-1BB2Q-□□□□	3	7.5	4	16	0.014	62	74
1LE1001-1CB0Q-□□□□	2.61	7.3	3.29	16	0.02698	68	80
1LE1001-1CB2Q-□□□□	2.7	7.1	3.407	16	0.03353	68	80
1LE1001-1DB2Q-□□□□	2.65	7	3.22	16	0.06495	69	81
1LE1001-1DB4Q-□□□□	2.79	7.7	3.37	16	0.08281	69	81
6-pole – 1200 rpm at 60 Hz							
1LE1001-1AC4Q-□□□□	2.33	6.4	3.38	16	0.0113	62	74
1LE1001-1BC2Q-□□□□	2.3	6.5	3.4	16	0.0139	60	72
1LE1001-1CC0Q-□□□□	1.75	5.8	3.03	13	0.02371	67	79
1LE1001-1CC2Q-□□□□	2.08	5.8	3.166	13	0.02918	67	79
1LE1001-1CC3Q-□□□□	2.04	6.3	3.17	16	0.03673	67	79
1LE1001-1DC2Q-□□□□	1.95	6.3	3.213	16	0.0754	70	82
1LE1001-1DC4Q-□□□□	1.834	6.2	2.98	16	0.0975	70	82

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Self-ventilated energy-saving motors
with high efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)	
		Standard voltages	
		60 Hz	
		460 VY	460 VΔ
		see "Selection and ordering data" for outputs at 60 Hz	
		22	34
1LE1001-1A...-□-□...	100 L	○	○
1LE1001-1B...-□-□...	112 M	○	○
1LE1001-1C...-□-□...	132 S/M	○	○
1LE1001-1D...-□-□...	160 M/L	○	○

- Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Type of construction (type letter)												
		With flange						With flange (acc. to DIN EN 50347)						
		IM B3 1) 2)	IM B6 2)	IM B7 2)	IM B8 2)	IM V6 2)	IM V5 without protective cover 2)	IM V5 with protective cover 2) 3) 4)	Flange size	IM B5 2) 5)	IM V1 without protective cover 2)	IM V1 with protective cover 2) 3) 4)	IM V3 2)	IM B35
		A	T	U	V	D	C	C		F	G	G	H	J
		Order No. supplement -Z with order code												
		-	-	-	-	-	-	-Z H00		-	-	-Z H00	-	-
1LE1001-1A...-□...	100 L	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1001-1B...-□...	112 M	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1001-1C...-□...	132 S/M	□	□	□	□	□	□	✓	FF 265	✓	✓	✓	✓	✓
1LE1001-1D...-□...	160 M/L	□	□	□	□	□	□	✓	FF 300	✓	✓	✓	✓	✓

Motor type	Frame size	Position 14: Type of construction (type letter)											
		With standard flange (acc. to DIN EN 50347)					With standard flange (next larger standard flange acc. to DIN EN 50347)						
		Flange size	IM B14 2) 6)	IM V19 2)	IM V18 without protective cover 2)	IM V18 with pro- tective cover 2) 3) 4)	IM B34	Flange size	IM B14 2) 6)	IM V19 2)	IM V18 without protective cover 2)	IM V18 with protective cover 2) 3) 4)	IM B34
			K	L	M	M	N		K	L	M	M	N
		Order No. supplement -Z with order code											
			-	-	-	-Z H00	-		-Z	-Z	-Z	-Z H00	-Z
			P01	P01	P01	P01	P01		P01	P01	P01	P01	P01
1LE1001-1A...-□...	100 L	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓
1LE1001-1B...-□...	112 M	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓
1LE1001-1C...-□...	132 S/M	FT 165	✓	✓	✓	✓	✓	FT 215	✓	✓	✓	✓	✓
1LE1001-1D...-□...	160 M/L	FT 215	✓	✓	✓	✓	✓	-	-	-	-	-	-

- Standard version
✓ With additional charge

- The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate. With type of construction IM V5 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.
- The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.
- Option second shaft extension (order code **L05**) not possible
- In combination with an encoder, it is not necessary to order the protective cover (order code **H00**), as this is delivered as a protection for the encoder as standard. In this case, the protective cover is standard design (without additional charge).
- The types of construction IM V3 and IM V1 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate. With type of construction IM V1 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.
- The types of construction IM V19 and IM V18 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate. With type of construction IM V18 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

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New Generation 1LE1/1PC1

Self-ventilated energy-saving motors
with high efficiency

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
Order code		A	B	C	F	Z Q2A	Z Q3A
1LE1001-1A...-...□	100 L	□	✓	✓	✓	✓	✓
1LE1001-1B...-...□	112 M	□	✓	✓	✓	✓	✓
1LE1001-1C...-...□	132 S/M	□	✓	✓	✓	✓	✓
1LE1001-1D...-...□	160 M/L	□	✓	✓	✓	✓	✓

- Standard version
✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1LE1001-1A...-...□	100 L	□	✓	✓	✓
1LE1001-1B...-...□	112 M	□	✓	✓	✓
1LE1001-1C...-...□	132 S/M	□	✓	✓	✓
1LE1001-1D...-...□	160 M/L	□	✓	✓	✓

- Standard version
✓ With additional charge


¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".
³⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated motors with increased output and improved efficiency

Selection and ordering data

Rated output at		Frame size	Operating values at rated output								Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz				
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\varphi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage, type of construction, motor protection and connection box, see table from Page 1/32.	IM B3 type of construction	IM B3 type of construction approx. m kg	
Motor version: temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B) ¹⁾													
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz													
4	4.6	100 L	2850	13.3	EFF2	85.6	86.2	0.85	7.9	1LE1002-1AA6Q-QQQQ		25	
5.5	6.3	112 M	2935	18	EFF2	87	85.5	0.86	10.6	1LE1002-1BA6Q-QQQQ		31	
11	12.6	132 M	2920	36	EFF2	90	90.7	0.90	19.6	1LE1002-1CA6Q-QQQQ		53	
22	24.5	160 L	2930	72	EFF2	91.6	91.4	0.88	39.5	1LE1002-1DA6Q-QQQQ		85	
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz													
4	4.6	100 L	1430	26.8	EFF2	84.2	85.1	0.81	8.5	1LE1002-1AB6Q-QQQQ		27	
5.5	6.3	112 M	1420	37	EFF2	85.7	86.5	0.81	11	1LE1002-1BB6Q-QQQQ		33	
11	12.6	132 M	1450	72	EFF2	88.8	89.3	0.84	21.5	1LE1002-1CB6Q-QQQQ		58	
18.5	21.3	160 L	1460	121	EFF2	90	90.2	0.85	35	1LE1002-1DB6Q-QQQQ		85	
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz													
2.2	2.55	100 L	930	22.5		76	77.3	0.78	5.3	1LE1002-1AC6Q-QQQQ		24	
3	3.45	112 M	945	30		79	78.2	0.72	7.6	1LE1002-1BC6Q-QQQQ		32	
7.5	8.6	132 M	950	75		85.5	85.7	0.74	17.2	1LE1002-1CC6Q-QQQQ		54	
15	17.3	160 L	965	148		88	88	0.75	33	1LE1002-1DC6Q-QQQQ		109	

Order No. supplements, see from Page 1/32.

¹⁾ For Order No. 1LE1002-1CC6Q-QQQQ use acc. to temperature class 155 (F).

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated motors with increased output
and improved efficiency

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting torque	as multiple of rated current	torque			Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pFA} dB(A)	L_{WA} dB(A)
Motor version: temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1002-1AA6□-□□□□	4.5	7	4.1	16	0.0044	67	79
1LE1002-1BA6□-□□□□	2.9	7.5	3.8	16	0.0085	69	81
1LE1002-1CA6□-□□□□	2.8	7.5	3.7	16	0.02233	68	80
1LE1002-1DA6□-□□□□	2.6	7.5	3.4	16	0.04913	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1002-1AB6□-□□□□	2.9	5.8	3.1	16	0.01	60	72
1LE1002-1BB6□-□□□□	3	5.8	3.1	16	0.0124	58	70
1LE1002-1CB6□-□□□□	2.5	7.2	3	16	0.03259	64	76
1LE1002-1DB6□-□□□□	2.7	7.2	3.2	16	0.06843	65	77
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1002-1AC6□-□□□□	2	4	2.2	16	0.0084	59	71
1LE1002-1BC6□-□□□□	2.9	4.6	3	16	0.0128	57	69
1LE1002-1CC6□-□□□□	2.4	5.3	3	16	0.032	63	75
1LE1002-1DC6□-□□□□	2.9	6	3.4	16	0.0936	67	79

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated motors with increased output and improved efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		<u>60 Hz</u>				<u>Rated voltage range</u>			
		460 VY	460 VΔ			(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1LE1002-1A...-□-□...	100 L	○	○	○	○	✓	✓	✓	✓
1LE1002-1B...-□-□...	112 M	○	○	○	○	✓	✓	✓	✓
1LE1002-1C...-□-□...	132 M	○	○	○	○	✓	✓	✓	✓
1LE1002-1D...-□-□...	160 L	○	○	○	○	✓	✓	✓	✓

- Without additional charge
 ✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Types of construction (type letter)												
		Without flange						With flange (acc. to DIN EN 50347)						
		IM B3 ₂₎₃₎	IM B6 ₃₎	IM B7 ₃₎	IM B8 ₃₎	IM V6 ₃₎	IM V5 without protective cover ₃₎	IM V5 with protective cover ₃₎₄₎₅₎	Flange size	IM B5 ₃₎₆₎	IM V1 without protective cover ₃₎	IM V1 with protective cover ₃₎₄₎₅₎	IM V3 ₃₎	IM B35
		A	T	U	V	D	C	C	F	G	G	H	J	
		Order No. supplement -Z with order code												
		-	-	-	-	-	-	-Z H00	-	-	-Z H00	-	-	
1LE1002-1A...-□-□...	100 L	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1002-1B...-□-□...	112 M	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1002-1C...-□-□...	132 M	□	□	□	□	□	□	✓	FF 265	✓	✓	✓	✓	✓
1LE1002-1D...-□-□...	160 L	□	□	□	□	□	□	✓	FF 300	✓	✓	✓	✓	✓

Motor type	Frame size	Position 14: Types of construction (type letter)												
		With standard flange (acc. to DIN EN 50347)					With standard flange (next larger standard flange acc. to DIN EN 50347)							
		Flange size	IM B14 ₃₎₇₎	IM V19 ₃₎	IM V18 without protective cover ₃₎	IM V18 with protective cover ₃₎₄₎₅₎	IM B34	Flange size	IM B14 ₃₎₇₎	IM V19 ₃₎	IM V18 without protective cover ₃₎	IM V18 with protective cover ₃₎₄₎₅₎	IM B34	
			K	L	M	M	N		K	L	M	M	N	
		Order No. supplement -Z with order code												
			-	-	-	-Z H00	-	-Z	-Z	-Z	-Z	-Z	-Z	
			P01	P01	P01	P01	P01	P01	P01	P01	P01	P01	P01	
1LE1002-1A...-□-□...	100 L	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓	✓
1LE1002-1B...-□-□...	112 M	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓	✓
1LE1002-1C...-□-□...	132 S/M	FT 165	✓	✓	✓	✓	✓	FT 215	✓	✓	✓	✓	✓	✓
1LE1002-1D...-□-□...	160 M/L	FT 215	✓	✓	✓	✓	✓	-	-	-	-	-	-	-

- Standard version
 ✓ With additional charge

- A rated voltage range is also specified on the rating plate.
- The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate. With type of construction IM V5 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.
- The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.
- Option second shaft extension (order code **L05**) not possible.

- In combination with an encoder, it is not necessary to order the protective cover (order code **H00**), as this is delivered as a protection for the encoder as standard. In this case, the protective cover is standard design (without additional charge).
- The types of construction IM V3 and IM V1 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate. With type of construction IM V1 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.
- The types of construction IM V19 and IM V18 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate. With type of construction IM V18 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated motors with increased output
and improved efficiency

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
Order code		A	B	C	F	Z Q2A	Z Q3A
1LE1002-1A...-...□	100 L	□	✓	✓	✓	✓	✓
1LE1002-1B...-...□	112 M	□	✓	✓	✓	✓	✓
1LE1002-1C...-...□	132 M	□	✓	✓	✓	✓	✓
1LE1002-1D...-...□	160 L	□	✓	✓	✓	✓	✓

- Standard version
✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ²⁾	Connection box on LHS ²⁾	Connection box bottom ²⁾
		4	5	6	7
1LE1002-1A...-...□	100 L	□	✓	✓	✓
1LE1002-1B...-...□	112 M	□	✓	✓	✓
1LE1002-1C...-...□	132 M	□	✓	✓	✓
1LE1002-1D...-...□	160 L	□	✓	✓	✓

- Standard version
✓ With additional charge

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.


²⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated motors with increased output and high efficiency

Selection and ordering data

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\varphi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage, type of construction, motor protection and connection box, see table from Page 1/36.	IM B3 type of construction	IM B3 type of construction approx. m kg
Motor version: temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
4	4.6	100 L	2905	13	EFF1	88	89	0.86	7.6	1LE1001-1AA6Q-QQQQ		26
5.5	6.3	112 M	2950	18	EFF1	89	88.5	0.89	10	1LE1001-1BA6Q-QQQQ		34
11	12.6	132 M	2955	36	EFF1	91.5	92.5	0.89	19.4	1LE1001-1CA6Q-QQQQ		57
22	25.3	160 L	2955	71	EFF1	92.8	93.5	0.89	38.5	1LE1001-1DA6Q-QQQQ		94
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
4	4.6	100 L	1460	26	EFF1	88.3	88.3	0.8	8.2	1LE1001-1AB6Q-QQQQ		30
5.5	6.3	112 M	1460	36	EFF1	89.2	89.2	0.81	11	1LE1001-1BB6Q-QQQQ		34
11	12.6	132 M	1465	72	EFF1	91	91.0	0.84	21	1LE1001-1CB6Q-QQQQ		64
18.5	21.3	160 L	1475	120	EFF1	92.4	92.4	0.85	34	1LE1001-1DB6Q-QQQQ		100
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
2.2	2.55	100 L	965	22		84.5	85.6	0.76	4.95	1LE1001-1AC6Q-QQQQ		30
3	3.45	112 M	960	30		84.5	84.7	0.79	6.5	1LE1001-1BC6Q-QQQQ		34
7.5	8.6	132 M	970	74		88.5	88.5	0.77	15.4	1LE1001-1CC6Q-QQQQ		64
15	17.3	160 L	975	147		90.6	91	0.81	29.5	1LE1001-1DC6Q-QQQQ		115

Order No. supplements, see from Page 1/36.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated motors with increased output
and high efficiency

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting torque	as multiple of rated current	torque			Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pFA} dB(A)	L_{WA} dB(A)
Motor version: temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1001-1AA6□-□□□□	2.5	7.6	3.5	16	0.0054	67	79
1LE1001-1BA6□-□□□□	2.2	7.7	3.3	16	0.0119	73	85
1LE1001-1CA6□-□□□□	2.5	7.9	3.2	16	0.03143	68	80
1LE1001-1DA6□-□□□□	3.1	8.4	3.7	16	0.06764	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1001-1AB6□-□□□□	2.2	7.5	3.5	16	0.0137	60	72
1LE1001-1BB6□-□□□□	2.5	7.1	3.1	16	0.0166	58	70
1LE1001-1CB6□-□□□□	2.9	7.7	3.1	16	0.04571	64	76
1LE1001-1DB6□-□□□□	2.8	7.7	3.3	16	0.09854	65	77
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1001-1AC6□-□□□□	1.9	5.7	2.9	16	0.0137	59	71
1LE1001-1BC6□-□□□□	2.1	6	3.1	16	0.0166	57	69
1LE1001-1CC6□-□□□□	2.1	6.5	3	16	0.04572	63	75
1LE1001-1DC6□-□□□□	1.9	6.5	2.9	16	0.1208	67	79

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated motors with increased output and high efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		60 Hz				Rated voltage range			
		460 VY	460 VΔ			(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1LE1001-1A...-□-□...	100 L	○	○	○	○	✓	✓	✓	✓
1LE1001-1B...-□-□...	112 M	○	○	○	○	✓	✓	✓	✓
1LE1001-1C...-□-□...	132 M	○	○	○	○	✓	✓	✓	✓
1LE1001-1D...-□-□...	160 L	○	○	○	○	✓	✓	✓	✓

- Without additional charge
 ✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Types of construction (type letter)												
		Without flange						With flange (acc. to DIN EN 50347)						
		IM B3 ₂₎₃₎	IM B6 ₃₎	IM B7 ₃₎	IM B8 ₃₎	IM V6 ₃₎	IM V5 without protective cover ₃₎	IM V5 with protective cover ₃₎₄₎₅₎	Flange size	IM B5 ₃₎₆₎	IM V1 without protective cover ₃₎	IM V1 with protective cover ₃₎₄₎₅₎	IM V3 ₃₎	IM B35
		A	T	U	V	D	C	C	F	G	G	H	J	
		Order No. supplement -Z with order code												
		-	-	-	-	-	-	-Z H00	-	-	-Z H00	-	-	
1LE1001-1A...-□..	100 L	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	
1LE1001-1B...-□..	112 M	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	
1LE1001-1C...-□..	132 M	□	□	□	□	□	□	✓	FF 265	✓	✓	✓	✓	
1LE1001-1D...-□..	160 L	□	□	□	□	□	□	✓	FF 300	✓	✓	✓	✓	

Motor type	Frame size	Position 14: Types of construction (type letter)											
		With standard flange (acc. to DIN EN 50347)					With standard flange (next larger standard flange acc. to DIN EN 50347)						
		Flange size	IM B14 ₃₎₇₎	IM V19 ₃₎	IM V18 without protective cover ₃₎	IM V18 with protective cover ₃₎₄₎₅₎	IM B34	Flange size	IM B14 ₃₎₇₎	IM V19 ₃₎	IM V18 without protective cover ₃₎	IM V18 with protective cover ₃₎₄₎₅₎	IM B34
			K	L	M	N		K	L	M	M	N	
		Order No. supplement -Z with order code											
			-	-	-	-Z H00	-	-Z	-Z	-Z	-Z H00	-Z	-Z
			P01	P01	P01	P01		P01	P01	P01	P01	P01	
1LE1001-1A...-□..	100 L	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓
1LE1001-1B...-□..	112 M	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓
1LE1001-1C...-□..	132 S/M	FT 165	✓	✓	✓	✓	✓	FT 215	✓	✓	✓	✓	✓
1LE1001-1D...-□..	160 M/L	FT 215	✓	✓	✓	✓	✓	-	-	-	-	-	-

- Standard version
 ✓ With additional charge

¹⁾ A rated voltage range is also specified on the rating plate.

²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate. With type of construction IM V5 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

⁴⁾ Option second shaft extension (order code **L05**) not possible.

⁵⁾ In combination with an encoder, it is not necessary to order the protective cover (order code **H00**), as this is delivered as a protection for the encoder as standard. In this case, the protective cover is standard design (without additional charge).

⁶⁾ The types of construction IM V3 and IM V1 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate. With type of construction IM V1 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

⁷⁾ The types of construction IM V19 and IM V18 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate. With type of construction IM V18 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated motors with increased output
and high efficiency

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
Order code		A	B	C	F	Z Q2A	Z Q3A
1LE1001-1A...-...□	100 L	□	✓	✓	✓	✓	✓
1LE1001-1B...-...□	112 M	□	✓	✓	✓	✓	✓
1LE1001-1C...-...□	132 M	□	✓	✓	✓	✓	✓
1LE1001-1D...-...□	160 L	□	✓	✓	✓	✓	✓

- Standard version
✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ²⁾	Connection box on LHS ²⁾	Connection box bottom ²⁾
		4	5	6	7
1LE1001-1A...-...□	100 L	□	✓	✓	✓
1LE1001-1B...-...□	112 M	□	✓	✓	✓
1LE1001-1C...-...□	132 M	□	✓	✓	✓
1LE1001-1D...-...□	160 L	□	✓	✓	✓

- Standard version
✓ With additional charge

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.


²⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Forced-air cooled motors without external fan and fan cover with improved efficiency

Selection and ordering data

Rated output at		Frame size	Operating values at rated output							Order No. with -Z and order code	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\varphi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage, type of construction, motor protection and connection box, see table from Page 1/40.	IM B3 type of construction	IM B3 type of construction approx. m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
3	3.45	100 L	2835	10	EFF2	82.6	83.2	0.87	6	1LE1002-1AA4Q-0000-Z F90		20
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA2Q-0000-Z F90		25
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA0Q-0000-Z F90		35
7.5	8.6	132 S	2925	24	EFF2	87.6	88.7	0.88	14	1LE1002-1CA1Q-0000-Z F90		40
11	12.6	160 M	2920	36	EFF2	88.4	88.5	0.85	21	1LE1002-1DA2Q-0000-Z F90		60
15	17.3	160 M	2930	49	EFF2	89.5	89.7	0.84	29	1LE1002-1DA3Q-0000-Z F90		68
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA4Q-0000-Z F90		78
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB4Q-0000-Z F90		18
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB5Q-0000-Z F90		22
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB2Q-0000-Z F90		27
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB0Q-0000-Z F90		38
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB2Q-0000-Z F90		44
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB2Q-0000-Z F90		62
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB4Q-0000-Z F90		73
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
1.5	1.75	100 L	940	15.3		74	72.6	0.74	3.95	1LE1002-1AC4Q-0000-Z F90		19
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC2Q-0000-Z F90		25
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC0Q-0000-Z F90		34
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC2Q-0000-Z F90		39
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC3Q-0000-Z F90		48
7.5	8.6	160 M	970	75		86	85.4	0.73	17.2	1LE1002-1DC2Q-0000-Z F90		72
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC4Q-0000-Z F90		92
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.75	0.86	100 L	705	10.4		65.4	60.2	0.62	2.65	1LE1002-1AD4Q-0000-Z F90		17
1.1	1.3	100 L	705	15.1		68.3	67.6	0.63	3.71	1LE1002-1AD5Q-0000-Z F90		22
1.5	1.75	112 M	700	20		75.9	72.8	0.68	4.2	1LE1002-1BD2Q-0000-Z F90		25
2.2	2.55	132 S	715	29		81	80	0.66	5.9	1LE1002-1CD0Q-0000-Z F90		37
3	3.45	132 M	710	40		81.6	81	0.68	7.8	1LE1002-1CD2Q-0000-Z F90		44
4	4.6	160 M	720	53		80	78.7	0.69	10.4	1LE1002-1DD2Q-0000-Z F90		60
5.5	6.3	160 M	720	73		83.5	83.9	0.70	13.6	1LE1002-1DD3Q-0000-Z F90		72
7.5	8.6	160 L	715	100		83.5	84.7	0.70	18.6	1LE1002-1DD4Q-0000-Z F90		91

Order No. supplements, see from Page 1/40.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Forced-air cooled motors without external fan and fan cover with improved efficiency

Selection and ordering data (continued)

Order No. with -Z and order code	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting as multiple of rated torque	as multiple of rated current	torque			Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1002-1AA4Q-QQQQ-Z F90	3.2	6.2	2.9	16	0.0034	67	79
1LE1002-1BA2Q-QQQQ-Z F90	2.7	7.3	3.7	16	0.0067	69	81
1LE1002-1CA0Q-QQQQ-Z F90	2	5.6	2.6	16	0.01267	68	80
1LE1002-1CA1Q-QQQQ-Z F90	2.2	6.4	3	16	0.01601	68	80
1LE1002-1DA2Q-QQQQ-Z F90	2.1	6.1	2.7	16	0.02971	70	82
1LE1002-1DA3Q-QQQQ-Z F90	2.5	6.1	3.2	16	0.03619	70	82
1LE1002-1DA4Q-QQQQ-Z F90	2.5	7	3.2	16	0.04395	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1002-1AB4Q-QQQQ-Z F90	2.3	5.1	2.7	16	0.0059	60	72
1LE1002-1AB5Q-QQQQ-Z F90	2.4	5.4	2.6	16	0.0078	60	72
1LE1002-1BB2Q-QQQQ-Z F90	2.2	5.3	2.6	16	0.0102	58	70
1LE1002-1CB0Q-QQQQ-Z F90	2.3	6.2	2.7	16	0.0186	64	76
1LE1002-1CB2Q-QQQQ-Z F90	2.5	6.6	2.9	16	0.02371	64	76
1LE1002-1DB2Q-QQQQ-Z F90	2.3	6.4	3.1	16	0.04395	65	77
1LE1002-1DB4Q-QQQQ-Z F90	2.5	7	3.4	16	0.05616	65	77
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1002-1AC4Q-QQQQ-Z F90	2	4	2.2	16	0.0065	59	71
1LE1002-1BC2Q-QQQQ-Z F90	2.3	4.1	2.5	16	0.0092	57	69
1LE1002-1CC0Q-QQQQ-Z F90	2	4.6	2.6	16	0.0167	63	75
1LE1002-1CC2Q-QQQQ-Z F90	2.1	4.7	2.5	16	0.02116	63	75
1LE1002-1CC3Q-QQQQ-Z F90	2.5	5.2	2.8	16	0.02734	63	75
1LE1002-1DC2Q-QQQQ-Z F90	2.1	5.5	2.9	16	0.04993	68	80
1LE1002-1DC4Q-QQQQ-Z F90	1.9	5.9	2.7	16	0.0678	68	80
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
1LE1002-1AD4Q-QQQQ-Z F90	1.9	3	2.2	16	0.0056	60	72
1LE1002-1AD5Q-QQQQ-Z F90	2	3.2	2.3	16	0.0078	60	72
1LE1002-1BD2Q-QQQQ-Z F90	1.9	3.4	2.1	16	0.0094	63	75
1LE1002-1CD0Q-QQQQ-Z F90	1.7	3.9	2.4	13	0.0186	63	75
1LE1002-1CD2Q-QQQQ-Z F90	1.8	3.9	2.2	13	0.02372	63	75
1LE1002-1DD2Q-QQQQ-Z F90	1.7	3.8	2.3	13	0.0439	63	75
1LE1002-1DD3Q-QQQQ-Z F90	1.6	4	2.2	13	0.0562	63	75
1LE1002-1DD4Q-QQQQ-Z F90	1.7	3.8	2.2	13	0.0772	63	75

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Forced-air cooled motors without external fan and fan cover with improved efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)					Further voltages				
		Standard voltages					50 Hz				
		50 Hz	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ	
		60 Hz	460 VY	460 VΔ			Rated voltage range				
							(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾	
		see "Selection and ordering data" for outputs at 60 Hz									
		22	34	27	40	21	33	23	35		
1LE1002-1A...-□-□...-Z F90	100 L	○	○	○	○	✓	✓	✓	✓		
1LE1002-1B...-□-□...-Z F90	112 M	○	○	○	○	✓	✓	✓	✓		
1LE1002-1C...-□-□...-Z F90	132 S/M	○	○	○	○	✓	✓	✓	✓		
1LE1002-1D...-□-□...-Z F90	160 M/L	○	○	○	○	✓	✓	✓	✓		

- Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Types of construction (type letter)										
		Without flange							With flange (acc. to DIN EN 50347)			
		IM B3 2)3)	IM B6 3)	IM B7 3)	IM B8 3)	IM V6 3)	IM V5 without protective cover ³⁾	Flange size	IM B5 3)4)	IM V1 without protective cover ³⁾	IM V3 3)	IM B35
		A	T	U	V	D	C		F	G	H	J
		Order No. supplement -Z with order code										
1LE1002-1A...-□-□...-Z F90	100 L	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1LE1002-1B...-□-□...-Z F90	112 M	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1LE1002-1C...-□-□...-Z F90	132 S/M	□	□	□	□	□	□	FF 265	✓	✓	✓	✓
1LE1002-1D...-□-□...-Z F90	160 M/L	□	□	□	□	□	□	FF 300	✓	✓	✓	✓

Motor type	Frame size	Position 14: Types of construction (type letter)									
		With standard flange (acc. to DIN EN 50347)					With standard flange (next larger standard flange acc. to DIN EN 50347)				
		Flange size	IM B14 3)5)	IM V19 3)	IM V18 without protective cover ³⁾	IM B34	Flange size	IM B14 3)5)	IM V19 3)	IM V18 without protective cover ³⁾	IM B34
			K	L	M	N		K	L	M	N
		Order No. supplement -Z with order code									
			-	-	-	-		-Z	-Z	-Z	-Z
			P01	P01	P01	P01		P01	P01	P01	P01
1LE1002-1A...-□-□...-Z F90	100 L	FT 130	✓	✓	✓	✓	FT 165	✓	✓	✓	✓
1LE1002-1B...-□-□...-Z F90	112 M	FT 130	✓	✓	✓	✓	FT 165	✓	✓	✓	✓
1LE1002-1C...-□-□...-Z F90	132 S/M	FT 165	✓	✓	✓	✓	FT 215	✓	✓	✓	✓
1LE1002-1D...-□-□...-Z F90	160 M/L	FT 215	✓	✓	✓	✓	-	-	-	-	-

- Standard version
✓ With additional charge

- 1) A rated voltage range is also specified on the rating plate.
2) The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate.
3) The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

- 4) The types of construction IM V3 and IM V1 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate.
5) The types of construction IM V19 and IM V18 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate.

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Forced-air cooled motors without external fan and fan cover with improved efficiency

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
	Order code	A	B	C	F	Z Q2A	Z Q3A
1LE1002-1A...-...Q-Z F90	100 L	☐	✓	✓	✓	✓	✓
1LE1002-1B...-...Q-Z F90	112 M	☐	✓	✓	✓	✓	✓
1LE1002-1C...-...Q-Z F90	132 S/M	☐	✓	✓	✓	✓	✓
1LE1002-1D...-...Q-Z F90	160 M/L	☐	✓	✓	✓	✓	✓

- ☐ Standard version
 ✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1LE1002-1A...-...Q-Z F90	100 L	☐	✓	✓	✓
1LE1002-1B...-...Q-Z F90	112 M	☐	✓	✓	✓
1LE1002-1C...-...Q-Z F90	132 S/M	☐	✓	✓	✓
1LE1002-1D...-...Q-Z F90	160 M/L	☐	✓	✓	✓

- ☐ Standard version
 ✓ With additional charge

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.

²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".


³⁾ With type of construction, screwed-on feet as standard.

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Forced-air cooled motors without external fan and fan cover with high efficiency

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No. with -Z and order code	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\varphi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage, type of construction, motor protection and connection box, see table from Page 1/44.	IM B3 type of construction	IM B3 type of construction approx. m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
3	3.45	100 L	2905	9.9	EFF1	86.7	87.5	0.84	5.9	1LE1001-1AA4Q-0000-Z F90		21
4	4.6	112 M	2950	13	EFF1	88	88.5	0.86	7.4	1LE1001-1BA2Q-0000-Z F90		27
5.5	6.3	132 S	2950	18	EFF1	89.5	90.6	0.87	10.2	1LE1001-1CA0Q-0000-Z F90		39
7.5	8.6	132 S	2950	24	EFF1	90	91	0.87	13.8	1LE1001-1CA1Q-0000-Z F90		43
11	12.6	160 M	2955	36	EFF1	90.8	91	0.87	20	1LE1001-1DA2Q-0000-Z F90		67
15	17.3	160 M	2955	48	EFF1	91.4	91.5	0.88	27	1LE1001-1DA3Q-0000-Z F90		75
18.5	21.3	160 L	2955	60	EFF1	92	92.5	0.88	33	1LE1001-1DA4Q-0000-Z F90		84
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
2.2	2.55	100 L	1455	14	EFF1	86.4	87	0.81	4.55	1LE1001-1AB4Q-0000-Z F90		21
3	3.45	100 L	1455	20	EFF1	87.4	88	0.82	6	1LE1001-1AB5Q-0000-Z F90		25
4	4.6	112 M	1460	26	EFF1	88.3	88.5	0.81	8.1	1LE1001-1BB2Q-0000-Z F90		29
5.5	6.3	132 S	1465	36	EFF1	89.2	89.5	0.80	11.2	1LE1001-1CB0Q-0000-Z F90		42
7.5	8.6	132 M	1465	49	EFF1	90.1	91	0.83	14.4	1LE1001-1CB2Q-0000-Z F90		49
11	12.6	160 M	1470	71	EFF1	91.2	91.8	0.85	20.5	1LE1001-1DB2Q-0000-Z F90		71
15	17.3	160 L	1475	97	EFF1	92	92.4	0.85	27.5	1LE1001-1DB4Q-0000-Z F90		83
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
1.5	1.75	100 L	970	15		84.5	84.5	0.73	3.5	1LE1001-1AC4Q-0000-Z F90		25
2.2	2.55	112 M	965	22		85	85	0.75	5	1LE1001-1BC2Q-0000-Z F90		29
3	3.45	132 S	970	30		85	85	0.74	6.9	1LE1001-1CC0Q-0000-Z F90		38
4	4.6	132 M	970	39		86	86	0.78	8.6	1LE1001-1CC2Q-0000-Z F90		43
5.5	6.3	132 M	970	54		88	88	0.77	11.8	1LE1001-1CC3Q-0000-Z F90		52
7.5	8.6	160 M	975	73		89	89	0.77	15.8	1LE1001-1DC2Q-0000-Z F90		77
11	12.6	160 L	975	108		89.5	89	0.80	22	1LE1001-1DC4Q-0000-Z F90		93
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.75	0.86	100 L	725	9.9		68	65	0.58	2.75	1LE1001-1AD4Q-0000-Z F90		21
1.1	1.3	110 L	725	14		68	64.5	0.58	4.05	1LE1001-1AD5Q-0000-Z F90		25
1.5	1.75	112 M	720	20		77	75.5	0.67	4.2	1LE1001-1BD2Q-0000-Z F90		29
2.2	2.55	132 S	725	29		77.5	76.7	0.63	6.5	1LE1001-1CD0Q-0000-Z F90		41
3	3.45	132 M	730	40		84	82	0.65	7.9	1LE1001-1CD2Q-0000-Z F90		49
4	4.6	160 M	730	52		87	88	0.69	9.6	1LE1001-1DD2Q-0000-Z F90		69
5.5	6.3	160 M	735	72		87.5	89	0.69	13.2	1LE1001-1DD3Q-0000-Z F90		82
7.5	8.6	160 L	730	98		88	89	0.72	17	1LE1001-1DD4Q-0000-Z F90		94

Order No. supplements, see from Page 1/44.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Forced-air cooled motors without external fan and fan cover with high efficiency

Selection and ordering data (continued)

Order No. with -Z and order code	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting as multiple of rated torque	as multiple of rated current	torque			Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1001-1AA4Q-QQQQ-Z F90	2.3	7	3.3	16	0.0044	67	79
1LE1001-1BA2Q-QQQQ-Z F90	2.4	7.4	3.3	16	0.0092	69	81
1LE1001-1CA0Q-QQQQ-Z F90	1.8	6.7	2.9	16	0.02012	68	80
1LE1001-1CA1Q-QQQQ-Z F90	2.2	7.5	3.1	16	0.02353	68	80
1LE1001-1DA2Q-QQQQ-Z F90	2.1	7.4	3.2	16	0.04471	70	82
1LE1001-1DA3Q-QQQQ-Z F90	2.4	7.6	3.4	16	0.05277	70	82
1LE1001-1DA4Q-QQQQ-Z F90	2.9	7.9	3.6	16	0.06085	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1001-1AB4Q-QQQQ-Z F90	2.1	6.9	3.3	16	0.0086	60	72
1LE1001-1AB5Q-QQQQ-Z F90	2	6.9	3.1	16	0.0109	60	72
1LE1001-1BB2Q-QQQQ-Z F90	2.5	7.1	3.2	16	0.014	58	70
1LE1001-1CB0Q-QQQQ-Z F90	2.3	6.9	2.9	16	0.02698	64	76
1LE1001-1CB2Q-QQQQ-Z F90	2.3	6.9	2.9	16	0.03353	64	76
1LE1001-1DB2Q-QQQQ-Z F90	2.2	6.7	2.8	16	0.06495	65	77
1LE1001-1DB4Q-QQQQ-Z F90	2.5	7.3	3	16	0.08281	65	77
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1001-1AC4Q-QQQQ-Z F90	2	6.2	2.9	16	0.0113	59	71
1LE1001-1BC2Q-QQQQ-Z F90	2.1	6	3.1	16	0.0139	57	69
1LE1001-1CC0Q-QQQQ-Z F90	1.6	5.6	2.6	13	0.02371	63	75
1LE1001-1CC2Q-QQQQ-Z F90	1.6	5.6	2.5	13	0.02918	63	75
1LE1001-1CC3Q-QQQQ-Z F90	1.9	6.1	2.8	16	0.03673	63	75
1LE1001-1DC2Q-QQQQ-Z F90	1.8	6.3	2.8	16	0.0754	67	79
1LE1001-1DC4Q-QQQQ-Z F90	1.7	6.2	2.7	16	0.0975	67	79
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
1LE1001-1AD4Q-QQQQ-Z F90	1.6	4	2.8	13	0.0086	60	72
1LE1001-1AD5Q-QQQQ-Z F90	1.8	4	2.8	13	0.0109	60	72
1LE1001-1BD2Q-QQQQ-Z F90	1.4	4.2	2.4	13	0.014	63	75
1LE1001-1CD0Q-QQQQ-Z F90	1.4	3.6	1.8	10	0.02698	63	75
1LE1001-1CD2Q-QQQQ-Z F90	1.4	5	2.4	10	0.03463	63	75
1LE1001-1DD2Q-QQQQ-Z F90	1.8	4.3	2	13	0.0649	63	75
1LE1001-1DD3Q-QQQQ-Z F90	2.1	4.4	2.1	13	0.0828	63	75
1LE1001-1DD4Q-QQQQ-Z F90	1.9	4.5	2.1	13	0.0982	63	75

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Forced-air cooled motors without external fan and fan cover with high efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)					Further voltages			
		Standard voltages					50 Hz			
		50 Hz	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		60 Hz	460 VY	460 VΔ			Rated voltage range			
							(210 ... 230 VΔ/360 ... 400 VY) ¹⁾ (360 ... 400 VΔ/625 ... 695 VY) ¹⁾ (395 ... 435 VY) ¹⁾ (395 ... 435 VΔ) ¹⁾			
		see "Selection and ordering data" for outputs at 60 Hz								
		22	34	27	40	21	33	23	35	
1LE1001-1A...-□...-Z 100 L F90	○	○	○	○	✓	✓	✓	✓	✓	
1LE1001-1B...-□...-Z 112 M F90	○	○	○	○	✓	✓	✓	✓	✓	
1LE1001-1C...-□...-Z 132 S/M F90	○	○	○	○	✓	✓	✓	✓	✓	
1LE1001-1D...-□...-Z 160 M/L F90	○	○	○	○	✓	✓	✓	✓	✓	

- Without additional charge
 ✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Types of construction (type letter)										
		Without flange						With flange (acc. to DIN EN 50347)				
		IM B3 ²⁾³⁾	IM B6 ³⁾	IM B7 ³⁾	IM B8 ³⁾	IM V6 ³⁾	IM V5 without protective cover ³⁾	Flange size	IM B5 ³⁾⁴⁾	IM V1 without protective cover ³⁾	IM V3 ³⁾	IM B35
		A	T	U	V	D	C	F	G	H	J	
		Order No. supplement -Z with order code										
		-	-	-	-	-	-	-	-	-	-	-
1LE1001-1A...-□...-Z 100 L F90	□	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1LE1001-1B...-□...-Z 112 M F90	□	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1LE1001-1C...-□...-Z 132 S/M F90	□	□	□	□	□	□	□	FF 265	✓	✓	✓	✓
1LE1001-1D...-□...-Z 160 M/L F90	□	□	□	□	□	□	□	FF 300	✓	✓	✓	✓

Motor type	Frame size	Position 14: Types of construction (type letter)										
		With standard flange (acc. to DIN EN 50347)				With standard flange (next larger standard flange acc. to DIN EN 50347)						
		Flange size	IM B14 ³⁾⁵⁾	IM V19 ³⁾	IM V18 without protective cover ³⁾	IM B34	Flange size	IM B14 ³⁾⁵⁾	IM V19 ³⁾	IM V18 without protective cover ³⁾	IM B34	
			K	L	M	N		K	L	M	N	
		Order No. supplement -Z with order code										
			-	-	-	-		-Z	-Z	-Z	-Z	
			P01	P01	P01	P01		P01	P01	P01	P01	
1LE1001-1A...-□...-Z 100 L F90	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	
1LE1001-1B...-□...-Z 112 M F90	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	
1LE1001-1C...-□...-Z 132 S/M F90	FT 165	✓	✓	✓	✓	✓	FT 215	✓	✓	✓	✓	
1LE1001-1D...-□...-Z 160 M/L F90	FT 215	✓	✓	✓	✓	✓	-	-	-	-	-	

- Standard version
 ✓ With extra price

- 1) A rated voltage range is also specified on the rating plate.
 2) The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate.
 3) The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

- 4) The types of construction IM V3 and IM V1 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate.
 5) The types of construction IM V19 and IM V18 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Forced-air cooled motors without external fan and fan cover with high efficiency

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
Order code		A	B	C	F	Z Q2A	Z Q3A
1LE1001-1A...-Q-Z F90	100 L	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1LE1001-1B...-Q-Z F90	112 M	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1LE1001-1C...-Q-Z F90	132 S/M	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1LE1001-1D...-Q-Z F90	160 M/L	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

- Standard version
 With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1LE1001-1A ...-Q-Z F90	100 L	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1LE1001-1B ...-Q-Z F90	112 M	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1LE1001-1C ...-Q-Z F90	132 S/M	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1LE1001-1D ...-Q-Z F90	160 M/L	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

- Standard version
 With additional charge

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.

²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".

³⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-cooled motors without external fan and fan cover with improved efficiency

Selection and ordering data

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage, type of construction, motor protection and connection box, see from Page 1/48	IM B3 type of construction	IM B3 type of construction approx. m kg	
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
1.2		100 L	2830	4.05		81.4		0.92	2.3	1PC1002-1AA4Q-0000	20	
1.6		112 M	2925	5.2		83.6		0.93	2.95	1PC1002-1BA2Q-0000	25	
2.2		132 S	2910	7.24		84		0.94	4	1PC1002-1CA0Q-0000	35	
3		132 S	2920	9.8		87		0.93	5.35	1PC1002-1CA1Q-0000	40	
4.4		160 M	2830	15		89.6		0.9	7.9	1PC1002-1DA2Q-0000	60	
6		160 M	2935	20		90		0.91	10.6	1PC1002-1DA3Q-0000	68	
7.4		160 L	2930	24		90.6		0.92	12.9	1PC1002-1DA4Q-0000	78	
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
0.88		100 L	1420	5.92		80.7		0.88	1.8	1PC1002-1AB4Q-0000	18	
1.2		100 L	1420	8.06		83		0.89	2.35	1PC1002-1AB5Q-0000	22	
1.6		112 M	1430	11		83.7		0.89	3.1	1PC1002-1BB2Q-0000	27	
2.2		132 S	1450	14.53		85.8		0.89	4.15	1PC1002-1CB0Q-0000	38	
3		132 M	1450	19.8		87.2		0.89	5.58	1PC1002-1CB2Q-0000	44	
4.4		160 M	1460	29		88		0.88	8.2	1PC1002-1DB2Q-0000	62	
6		160 L	1460	39		89.5		0.89	10.9	1PC1002-1DB4Q-0000	73	
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
0.6		100 L	935	6.12		76.1		0.81	1.4	1PC1002-1AC4Q-0000	19	
0.88		112 M	930	9		79		0.82	1.96	1PC1002-1BC2Q-0000	25	
1.2		132 S	950	12		80.7		0.83	2.58	1PC1002-1CC0Q-0000	34	
1.6		132 M	950	16		83.2		0.83	3.35	1PC1002-1CC2Q-0000	39	
2.2		132 M	950	22.13		85.1		0.83	4.5	1PC1002-1CC3Q-0000	48	
3		160 M	970	30		86.5		0.81	6.2	1PC1002-1DC2Q-0000	72	
4.4		160 L	970	43		88		0.81	8.9	1PC1002-1DC4Q-0000	92	
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.3		100 L	710	4.05		66.3		0.67	0.97	1PC1002-1AD4Q-0000	17	
0.44		100 L	705	6		71		0.69	1.3	1PC1002-1AD5Q-0000	22	
0.6		112 M	695	8.2		75.2		0.72	1.6	1PC1002-1BD2Q-0000	25	
0.88		132 S	720	11.66		80.6		0.71	2.2	1PC1002-1CD0Q-0000	37	
1.2		132 M	720	16		81.5		0.72	2.95	1PC1002-1CD2Q-0000	44	
1.6		160 M	730	21		82		0.74	3.8	1PC1002-1DD2Q-0000	60	
2.2		160 M	730	29		85		0.74	5.1	1PC1002-1DD3Q-0000	72	
3		160 L	730	39		86		0.74	6.8	1PC1002-1DD4Q-0000	91	

Order No. supplements, see from Page 1/48.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-cooled motors without external fan and fan cover with improved efficiency

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breaddown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring- surface sound pressure level at 50 Hz $L_{p(A)}$	Sound pressure level at 50 Hz L_{WA} dB(A)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1PC1002-1AA4□-□□□□	3	6	3	16	0.0034	67	79
1PC1002-1BA2□-□□□□	2.3	7.2	3	13	0.0067	69	81
1PC1002-1CA0□-□□□□	1.7	5.3	2.3	10	0.0127	62	74
1PC1002-1CA1□-□□□□	2	6.3	2.8	13	0.0160	62	74
1PC1002-1DA2□-□□□□	2.1	6.3	2.9	13	0.0297	60	72
1PC1002-1DA3□-□□□□	2.5	7	3.1	16	0.0362	60	72
1PC1002-1DA4□-□□□□	2.5	7	3.1	16	0.0439	60	72
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1PC1002-1AB4□-□□□□	2	5.1	2.2	13	0.0059	60	72
1PC1002-1AB5□-□□□□	2.2	5.4	2.4	13	0.0078	60	72
1PC1002-1BB2□-□□□□	1.9	5.4	2.2	13	0.0102	58	70
1PC1002-1CB0□-□□□□	2.2	5.7	2.6	13	0.0186	64	76
1PC1002-1CB2□-□□□□	2.4	6.4	2.7	16	0.0237	64	76
1PC1002-1DB2□-□□□□	2.1	7	2.8	13	0.0439	64	76
1PC1002-1DB4□-□□□□	2.4	7.5	3	16	0.0562	64	76
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1PC1002-1AC4□-□□□□	1.8	4.1	2	10	0.0065	59	71
1PC1002-1BC2□-□□□□	2.1	4.2	2.2	13	0.0092	55	67
1PC1002-1CC0□-□□□□	1.7	4.5	2.2	10	0.0167	63	75
1PC1002-1CC2□-□□□□	1.9	4.6	2.2	13	0.0212	63	75
1PC1002-1CC3□-□□□□	2.2	5	2.5	13	0.0274	63	75
1PC1002-1DC2□-□□□□	2.1	6	2.7	13	0.0563	67	79
1PC1002-1DC4□-□□□□	2.1	6.4	2.8	13	0.0780	67	79
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
1PC1002-1AD4□-□□□□	1.8	3.3	2.2	10	0.0056	60	72
1PC1002-1AD5□-□□□□	1.8	3.4	2.2	10	0.0078	60	72
1PC1002-1BD2□-□□□□	1.7	3.3	1.9	10	0.0094	63	75
1PC1002-1CD0□-□□□□	1.6	4.2	2.3	10	0.0186	63	75
1PC1002-1CD2□-□□□□	1.7	4.2	2.3	10	0.0237	63	75
1PC1002-1DD2□-□□□□	1.7	4.9	2.3	10	0.0439	63	75
1PC1002-1DD3□-□□□□	1.5	5	2.3	10	0.0562	63	75
1PC1002-1DD4□-□□□□	1.8	5.4	2.5	10	0.0772	63	75

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-cooled motors without external fan and fan cover with improved efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		60 Hz				Rated voltage range			
		460 VY	460 VΔ			(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾	(395 ... 435 VY)	(395 ... 435 VΔ)
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1PC1002-1A...-□...	100 L	○	○	○	○	✓	✓	✓	✓
1PC1002-1B...-□...	112 M	○	○	○	○	✓	✓	✓	✓
1PC1002-1C...-□...	132 S/M	○	○	○	○	✓	✓	✓	✓
1PC1002-1D...-□...	160 M/L	○	○	○	○	✓	✓	✓	✓

- Without additional charge
 ✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Type of construction (type letter)										
		With flange						With flange (acc. to DIN EN 50347)				
		IM B3 ²⁾³⁾	IM B6 ³⁾	IM B7 ³⁾	IM B8 ³⁾	IM V6 ³⁾	IM V5 without protective cover ³⁾	Flange size	IM B5 ³⁾⁴⁾	IM V1 without protective cover ³⁾	IM V3 ³⁾	IM B35
		A	T	U	V	D	C		F	G	H	J
		Order No. supplement -Z with order code										
1PC1002-1A...-□..	100 L	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1PC1002-1B...-□..	112 M	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1PC1002-1C...-□..	132 S/M	□	□	□	□	□	□	FF 265	✓	✓	✓	✓
1PC1002-1D...-□..	160 M/L	□	□	□	□	□	□	FF 300	✓	✓	✓	✓

Motor type	Frame size	Position 14: Type of construction (type letter)									
		With standard flange (acc. to DIN EN 50347)					With standard flange (next larger standard flange acc. to DIN EN 50347)				
		Flange size	IM B14 ³⁾⁵⁾	IM V19 ³⁾	IM V18 without protective cover ³⁾	IM B34	Flange size	IM B14 ³⁾⁵⁾	IM V19 ³⁾	IM V18 without protective cover ³⁾	IM B34
			K	L	M	N		K	L	M	N
		Order No. supplement -Z with order code									
			-	-	-	-		-Z	-Z	-Z	-Z
			P01	P01	P01	P01		P01	P01	P01	P01
1PC1002-1A...-□..	100 L	FT 130	✓	✓	✓	✓	FT 165	✓	✓	✓	✓
1PC1002-1B...-□..	112 M	FT 130	✓	✓	✓	✓	FT 165	✓	✓	✓	✓
1PC1002-1C...-□..	132 S/M	FT 165	✓	✓	✓	✓	FT 215	✓	✓	✓	✓
1PC1002-1D...-□..	160 M/L	FT 215	✓	✓	✓	✓	-	-	-	-	-

- Standard version
 ✓ With additional charge

- A rated voltage range is also specified on the rating plate.
- The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate.
- The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

- The types of construction IM V3 and IM V1 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate.
- The types of construction IM V19 and IM V18 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-cooled motors without external fan and fan cover with improved efficiency

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
Order code		A	B	C	F	Z Q2A	Z Q3A
1PC1002-1A...-...□	100 L	□	✓	✓	✓	✓	✓
1PC1002-1B...-...□	112 M	□	✓	✓	✓	✓	✓
1PC1002-1C...-...□	132 S/M	□	✓	✓	✓	✓	✓
1PC1002-1D...-...□	160 M/L	□	✓	✓	✓	✓	✓

- Standard version
 ✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1PC1002-1A...-...□	100 L	□	✓	✓	✓
1PC1002-1B...-...□	112 M	□	✓	✓	✓
1PC1002-1C...-...□	132 S/M	□	✓	✓	✓
1PC1002-1D...-...□	160 M/L	□	✓	✓	✓

- Standard version
 ✓ With additional charge

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.

²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".

³⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-cooled motors without external fan and fan cover with high efficiency

Selection and ordering data

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$ %	I_{rated} A	For Order No. supplements for voltage, type of construction, motor protection and connection box, see from Page 1/52	IM B3 type of construction	IM B3 type of construction approx. <i>m</i> kg	
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
1.4		100 L	2920	4.6		87.5		0.88	2.6	1PC1001-1AA4Q-0000	21	
1.6		112 M	2955	5.2		82		0.9	3.15	1PC1001-1BA2Q-0000	27	
3.1		132 S	2955	10		91		0.89	5.5	1PC1001-1CA0Q-0000	39	
4.3		132 S	2955	14		91.5		0.9	7.5	1PC1001-1CA1Q-0000	43	
6.3		160 M	2955	20		94.5		0.89	10.8	1PC1001-1DA2Q-0000	67	
6.5		160 M	2960	21		91.5		0.9	11.4	1PC1001-1DA3Q-0000	75	
9		160 L	2960	29		93.5		0.91	15.2	1PC1001-1DA4Q-0000	84	
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
1.1		100 L	1460	7.2		86		0.83	2.2	1PC1001-1AB4Q-0000	21	
1.5		100 L	1460	9.8		86		0.84	3	1PC1001-1AB5Q-0000	25	
2		112 M	1460	13		88.5		0.83	3.95	1PC1001-1BB2Q-0000	29	
2.6		132 S	1465	17		89.5		0.83	5.1	1PC1001-1CB0Q-0000	42	
4		132 M	1465	26		89.5		0.84	7.7	1PC1001-1CB2Q-0000	49	
6		160 M	1470	39		91		0.87	11	1PC1001-1DB2Q-0000	71	
6.2		160 L	1480	40		91.5		0.86	11.4	1PC1001-1DB4Q-0000	83	
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
0.85		100 L	960	8.5		85		0.75	1.92	1PC1001-1AC4Q-0000	25	
1.2		112 M	960	12		83.5		0.75	2.75	1PC1001-1BC2Q-0000	29	
1.5		132 S	970	15		86.5		0.77	3.25	1PC1001-1CC0Q-0000	38	
2.5		132 M	970	25		87		0.79	5.3	1PC1001-1CC2Q-0000	43	
2.7		132 M	975	26		88		0.77	5.8	1PC1001-1CC3Q-0000	52	
5		160 M	975	49		89		0.77	10.6	1PC1001-1DC2Q-0000	77	
6.5		160 L	975	64		89.5		0.8	13.2	1PC1001-1DC4Q-0000	93	
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.37		100 L	730	4.8		72.5		0.58	1.28	1PC1001-1AD4Q-0000	21	
0.55		100 L	720	7.3		73		0.62	1.76	1PC1001-1AD5Q-0000	25	
0.75		112 M	720	9.9		77.5		0.66	2.1	1PC1001-1BD2Q-0000	29	
1.1		132 S	730	14		82.5		0.65	2.95	1PC1001-1CD0Q-0000	41	
1.5		132 M	730	20		84		0.68	3.8	1PC1001-1CD2Q-0000	49	
2.4		160 M	730	31		88.5		0.7	5.6	1PC1001-1DD2Q-0000	69	
3.3		160 M	730	43		88		0.7	7.7	1PC1001-1DD3Q-0000	82	
4.6		160 L	730	60		88		0.7	10.8	1PC1001-1DD4Q-0000	94	

Order No. supplements, see from Page 1/52.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-cooled motors without external fan and fan cover with high efficiency

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breaddown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting torque	as multiple of rated current	torque			Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	$L_{p(A)}$ dB(A)	L_{WA} dB(A)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1PC1001-1AA4Q-QQQQ	2.1	8.3	3.6	13	0.0044	67	79
1PC1001-1BA2Q-QQQQ	2.5	9.5	3.5	16	0.0092	69	81
1PC1001-1CA0Q-QQQQ	1.9	7.1	2.9	13	0.0201	62	74
1PC1001-1CA1Q-QQQQ	1.9	7.6	2.9	13	0.0235	62	74
1PC1001-1DA2Q-QQQQ	1.8	7.1	3	10	0.0447	60	72
1PC1001-1DA3Q-QQQQ	2.3	8.7	3.3	13	0.0528	60	72
1PC1001-1DA4Q-QQQQ	2.4	8.7	3.2	16	0.0608	60	72
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1PC1001-1AB4Q-QQQQ	2.1	7.6	3.3	13	0.0086	60	72
1PC1001-1AB5Q-QQQQ	2.2	7.8	3.5	13	0.0109	60	72
1PC1001-1BB2Q-QQQQ	2.3	7.4	3.1	13	0.0140	58	70
1PC1001-1CB0Q-QQQQ	2.2	7.5	2.8	13	0.0270	64	76
1PC1001-1CB2Q-QQQQ	2.1	7.3	2.9	13	0.0335	64	76
1PC1001-1DB2Q-QQQQ	1.8	6	2.5	10	0.0649	64	76
1PC1001-1DB4Q-QQQQ	2.6	8.6	3.5	16	0.0828	64	76
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1PC1001-1AC4Q-QQQQ	1.7	5.5	2.6	10	0.0113	59	71
1PC1001-1BC2Q-QQQQ	1.7	5.7	2.7	10	0.0139	55	67
1PC1001-1CC0Q-QQQQ	1.4	5.5	2.4	7	0.0237	63	75
1PC1001-1CC2Q-QQQQ	1.4	5.4	2.3	7	0.0292	63	75
1PC1001-1CC3Q-QQQQ	1.9	6.8	3	13	0.0367	63	75
1PC1001-1DC2Q-QQQQ	1.6	6	2.6	10	0.0754	67	79
1PC1001-1DC4Q-QQQQ	1.6	6	2.6	10	0.0975	67	79
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
1PC1001-1AD4Q-QQQQ	1.5	4.5	2.7	10	0.0086	60	72
1PC1001-1AD5Q-QQQQ	1.6	4.4	2.5	10	0.0109	60	72
1PC1001-1BD2Q-QQQQ	1.3	4.4	2.4	7	0.0140	63	75
1PC1001-1CD0Q-QQQQ	1.2	4.5	2.1	7	0.0270	63	75
1PC1001-1CD2Q-QQQQ	1.2	4.7	2.3	7	0.0346	63	75
1PC1001-1DD2Q-QQQQ	1.6	4.4	1.8	10	0.0649	63	75
1PC1001-1DD3Q-QQQQ	1.6	4.6	1.8	10	0.0828	63	75
1PC1001-1DD4Q-QQQQ	1.5	4.5	1.8	10	0.0982	63	75

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-cooled motors without external fan and fan cover with high efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		60 Hz				Rated voltage range			
		460 VY	460 VΔ			(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾	(395 ... 435 VY)	(395 ... 435 VΔ)
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1PC1001-1A...-□...-	100 L	○	○	○	○	✓	✓	✓	✓
1PC1001-1B...-□...-	112 M	○	○	○	○	✓	✓	✓	✓
1PC1001-1C...-□...-	132 S/M	○	○	○	○	✓	✓	✓	✓
1PC1001-1D...-□...-	160 M/L	○	○	○	○	✓	✓	✓	✓

- Without additional charge
 ✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Type of construction (type letter)										
		With flange						With flange (acc. to DIN EN 50347)				
		IM B3 ²⁾³⁾	IM B6 ³⁾	IM B7 ³⁾	IM B8 ³⁾	IM V6 ³⁾	IM V5 without protective cover ³⁾	Flange size	IM B5 ³⁾⁴⁾	IM V1 without protective cover ³⁾	IM V3 ³⁾	IM B35
		A	T	U	V	D	C		F	G	H	J
		Order No. supplement -Z with order code										
1PC1001-1A...-□...-	100 L	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1PC1001-1B...-□...-	112 M	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1PC1001-1C...-□...-	132 S/M	□	□	□	□	□	□	FF 265	✓	✓	✓	✓
1PC1001-1D...-□...-	160 M/L	□	□	□	□	□	□	FF 300	✓	✓	✓	✓

Motor type	Frame size	Position 14: Type of construction (type letter)									
		With standard flange (acc. to DIN EN 50347)					With standard flange (next larger standard flange acc. to DIN EN 50347)				
		Flange size	IM B14 ³⁾⁵⁾	IM V19 ³⁾	IM V18 without protective cover ³⁾	IM B34	Flange size	IM B14 ³⁾⁵⁾	IM V19 ³⁾	IM V18 without protective cover ³⁾	IM B34
			K	L	M	N		K	L	M	N
		Order No. supplement -Z with order code									
			-	-	-	-		-Z	-Z	-Z	-Z
			P01	P01	P01	P01		P01	P01	P01	P01
1PC1001-1A...-□...-	100 L	FT 130	✓	✓	✓	✓	FT 165	✓	✓	✓	✓
1PC1001-1B...-□...-	112 M	FT 130	✓	✓	✓	✓	FT 165	✓	✓	✓	✓
1PC1001-1C...-□...-	132 S/M	FT 165	✓	✓	✓	✓	FT 215	✓	✓	✓	✓
1PC1001-1D...-□...-	160 M/L	FT 215	✓	✓	✓	✓	-	-	-	-	-

- Standard version
 ✓ With additional charge

- ¹⁾ A rated voltage range is also specified on the rating plate.
²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate.
³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

- ⁴⁾ The types of construction IM V3 and IM V1 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate.
⁵⁾ The types of construction IM V19 and IM V18 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-cooled motors without external fan and fan cover with high efficiency

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
	Order code	A	B	C	F	Z Q2A	Z Q3A
1PC1001-1A...-...□	100 L	□	✓	✓	✓	✓	✓
1PC1001-1B...-...□	112 M	□	✓	✓	✓	✓	✓
1PC1001-1C...-...□	132 S/M	□	✓	✓	✓	✓	✓
1PC1001-1D...-...□	160 M/L	□	✓	✓	✓	✓	✓

- Standard version
 ✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1PC1001-1A...-...□	100 L	□	✓	✓	✓
1PC1001-1B...-...□	112 M	□	✓	✓	✓
1PC1001-1C...-...□	132 S/M	□	✓	✓	✓
1PC1001-1D...-...□	160 M/L	□	✓	✓	✓

- Standard version
 ✓ With additional charge

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".
³⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

Selection and ordering data

Voltages

Additional order codes for other voltages or voltage codes
(without **-Z** supplement)

Not possible for General Line motors with shorter delivery time.

For some non-standard voltages at 50 or 60 Hz, order codes are specified. They are ordered by specifying the code digit **9** for voltage in the 12th position and **0** in the 13th position of the Order No. and the appropriate order code.

Special versions	Voltage code 12th / 13th position of the Order No.	Additional identi- fication code with order code and plain text if required	Motor type frame size										
			56	63	71	80	90	100	112	132	160		
Self-ventilated energy-saving motors with improved efficiency Self-ventilated energy-saving motors with high efficiency Self-ventilated motors with increased output and improved efficiency Self-ventilated motors with increased output and high efficiency Forced-air cooled motors without external fan and fan cover with improved efficiency Forced-air cooled motors without external fan and fan cover with high efficiency Self-cooled motors without external fan and fan cover with improved efficiency Self-cooled motors without external fan and fan cover with high efficiency													
										1LE1/1PC1 (Aluminum)			
Voltage at 60 Hz													
220 VΔ/380 VY; 50 Hz output	9	0	M2A							✓	✓	✓	✓
220 VΔ/380 VY; 60 Hz output	9	0	M1A							✓	✓	✓	✓
380 VΔ/660 VY; 50 Hz output	9	0	M2B							✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	0	M1B							✓	✓	✓	✓
440 VY; 50 Hz output	9	0	M2C							✓	✓	✓	✓
440 VY; 60 Hz output	9	0	M1C							✓	✓	✓	✓
440 VΔ; 50 Hz output	9	0	M2D							✓	✓	✓	✓
440 VΔ; 60 Hz output	9	0	M1D							✓	✓	✓	✓
460 VY; 50 Hz output	9	0	M2E							✓	✓	✓	✓
460 VY; 60 Hz output	9	0	M1E							○	○	○	○
460 VΔ; 50 Hz output	9	0	M2F							✓	✓	✓	✓
460 VΔ; 60 Hz output	9	0	M1F							○	○	○	○
575 VY; 50 Hz output	9	0	M2G							✓	✓	✓	✓
575 VY; 60 Hz output	9	0	M1G							✓	✓	✓	✓
575 VΔ; 50 Hz output	9	0	M2H							✓	✓	✓	✓
575 VΔ; 60 Hz output	9	0	M1H							✓	✓	✓	✓
Non-standard voltages and / or frequencies													
Non-standard winding for volt- ages between 200 V and 690 V (voltages outside this range are available on request) ¹⁾	9	0	M1Y							✓	✓	✓	✓

- Without additional charge
✓ With additional charge

¹⁾ Plain text must be specified in the order: voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

Options

Options or order codes (supplement **-Z** is required)

Not possible for General Line motors with shorter delivery time.

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size									
		56	63	71	80	90	100	112	132	160	
Self-ventilated energy-saving motors with improved efficiency											
Self-ventilated energy-saving motors with high efficiency											
Self-ventilated motors with increased output and improved efficiency											
Self-ventilated motors with increased output and high efficiency											
								1LE1 (Aluminum)			
Motor connection and connection box											
One cable gland, metal	R15							✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	R10							○	○	○	○
Rotation of the connection box through 90°, entry from NDE	R11							○	○	○	○
Rotation of the connection box through 180°	R12							○	○	○	○
Larger connection box	R50							✓	✓	✓	✓
Reduction piece for M cable gland in accordance with British standard, both cable entries mounted	R30							✓	✓	✓	✓
External earthing	H04							✓	✓	✓	✓
3 cables protruding, 0.5 m long ²⁾³⁾	R20							✓	✓	✓	✓
3 cables protruding, 1.5 m long ²⁾³⁾	R21							✓	✓	✓	✓
6 cables protruding, 0.5 m long ²⁾	R22							✓	✓	✓	✓
6 cables protruding, 1.5 m long ²⁾	R23							✓	✓	✓	✓
6 cables protruding, 3 m long ²⁾	R24							✓	✓	✓	✓
Connection box on NDE ⁴⁾	H08							✓	✓	✓	✓
Windings and insulation											
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	N01							✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output	N02							✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	N03							✓	✓	✓	✓
Temperature class 180 (H) at rated power and max. CT 60 °C ⁵⁾	N11							✓	✓	✓	✓
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	N20							✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	N05							✓	✓	✓	✓

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		56	63	71	80	90	100	112	132	160
Self-ventilated energy-saving motors with improved efficiency Self-ventilated energy-saving motors with high efficiency Self-ventilated motors with increased output and improved efficiency Self-ventilated motors with increased output and high efficiency										
1LE1 (Aluminum)										
Windings and insulation (continued)										
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	N06						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	N07						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	N08						✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	N21						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and identification code						✓	✓	✓	✓
Colors and paint finish										
Special finish in RAL 7030 stone gray							□	□	□	□
Special finish in other standard RAL colors : RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005, Page 0/101	Y54 • and special finish RAL....						✓	✓	✓	✓
Special finish in special RAL colors: for RAL colors, see "Special finish in special RAL colors", Page 0/101	Y51 • and special finish RAL....						✓	✓	✓	✓
Special finish sea air resistant	S03						O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	S00						○	○	○	○
Unpainted, only primed	S01						✓	✓	✓	✓
Modular technology – Basic versions ⁶⁾										
Mounting of separately driven fan	F70						✓	✓	✓	✓
Mounting of brake ⁷⁾	F01						✓	✓	✓	✓
Mounting of 1XP8012-10 (HTL) rotary pulse encoder ⁸⁾	G01						✓	✓	✓	✓
Mounting of 1XP8012-20 (TTL) rotary pulse encoder ⁸⁾	G02						✓	✓	✓	✓
Modular technology – Additional versions										
Brake supply voltage 24 V DC	F10						✓	✓	✓	✓
Brake supply voltage 230 V AC, 50/60 Hz	F11						○	○	○	○
Brake supply voltage 400 V AC, 50/60 Hz	F12						✓	✓	✓	✓
Mechanical manual brake release with lever (no locking)	F50						✓	✓	✓	✓

For legend and footnotes, see Page 1/59.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size										
		56	63	71	80	90	100	112	132	160		
Self-ventilated energy-saving motors with improved efficiency Self-ventilated energy-saving motors with high efficiency Self-ventilated motors with increased output and improved efficiency Self-ventilated motors with increased output and high efficiency												
										1LE1 (Aluminum)		
Special technology ⁶⁾												
Mounting of LL 861 900 220 rotary pulse encoder ⁸⁾	G04								✓	✓	✓	✓
Mounting of HOG 9 D 1024 I rotary pulse encoder ⁸⁾	G05								✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder ⁸⁾	G06								✓	✓	✓	✓
Mechanical design and degrees of protection												
Protective cover for types of construction ⁸⁾	H00								✓	✓	✓	✓
Screwed-on feet (instead of cast)	H01								✓	✓	✓	✓
Radial seal on DE for flange-mounting motors with oil resistance to 0.1 bar ⁹⁾	H23								✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation	F77								–	–	✓	✓
Low-noise version for 2-pole motors with counter-clockwise direction of rotation	F78								–	–	✓	✓
IP65 degree of protection ¹⁰⁾	H20								✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea) ¹¹⁾	H22								✓	✓	✓	✓
Vibration-proof version	H02								✓	✓	✓	✓
Condensation drainage holes ¹²⁾	H03								✓	✓	✓	✓
Non-rusting screws (externally)	H07								✓	✓	✓	✓
Prepared for mountings, only center hole ¹³⁾	G40								✓	✓	✓	✓
Prepared for mountings with D12 shaft ¹³⁾	G41								✓	✓	✓	✓
Prepared for mountings with D16 shaft ¹³⁾	G42								✓	✓	✓	✓
Protective cover for encoder (loosely enclosed – only for mountings acc. to order codes G40, G41 and G42)	G43								✓	✓	✓	✓
Coolant temperature and site altitude												
Coolant temperature –40 °C to +40 °C ¹⁴⁾	D03								✓	✓	✓	✓
Coolant temperature –30 °C to +40 °C ¹⁴⁾	D04								✓	✓	✓	✓
Designs in accordance with standards and specifications												
Electrical according to NEMA MG1-12 ¹⁵⁾	D30								✓	✓	✓	✓
Design according to UL with "Recognition Mark" ¹⁶⁾	D31								✓	✓	✓	✓
Canadian regulations (CSA) ¹⁷⁾	D40								✓	✓	✓	✓
PSE Mark Japan ¹⁸⁾	D46								✓	✓	✓	–

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		56	63	71	80	90	100	112	132	160
Self-ventilated energy-saving motors with improved efficiency Self-ventilated energy-saving motors with high efficiency Self-ventilated motors with increased output and improved efficiency Self-ventilated motors with increased output and high efficiency										
1LE1 (Aluminum)										
Bearings and lubrication										
Measuring nipple for SPM shock pulse measurement for bearing inspection ¹⁹⁾	Q01						✓	✓	✓	✓
Bearing design for increased cantilever forces	L22						✓	✓	✓	✓
Special bearing for DE and NDE, bearing size 63	L25						✓	✓	✓	✓
Regreasing device ¹⁹⁾	L23						✓	✓	✓	✓
Located bearing at DE	L20						✓	✓	✓	✓
Located bearing at NDE	L21						✓	✓	✓	□
Balance and vibration quantity										
Vibration quantity A							□	□	□	□
Vibration quantity B	L00						✓	✓	✓	✓
Half-key balancing (standard)							□	□	□	□
Full-key balancing	L02						✓	✓	✓	✓
Balancing without key	L01						✓	✓	✓	✓
Shaft and rotor										
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors	L08						✓	✓	✓	✓
Second standard shaft extension	L05						✓	✓	✓	✓
Shaft extension with standard dimensions, without featherkey way	L04						✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L07						✓	✓	✓	✓
Standard shaft made of non-rusting steel	L06						✓	✓	✓	✓
Non-standard cylindrical shaft extension ²⁰⁾	Y55 • and identification code						✓	✓	✓	✓
Heating and ventilation										
Fan cover for textile industry	F75						✓	✓	✓	✓
Metal external fan ²¹⁾	F76						✓	✓	✓	✓
Anti-condensation heaters for 230 V	Q02						✓	✓	✓	✓
Anti-condensation heaters for 115 V	Q03						✓	✓	✓	✓
Sheet metal fan cover	F74						✓	✓	✓	✓
Rating plate and extra rating plates										
Second rating plate, loose	M10						✓	✓	✓	✓
Nirosta rating plate	M11						✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code						✓	✓	✓	✓
Extra rating plate with identification codes	Y82 • and identification code						✓	✓	✓	✓
Additional information on rating plate and on package label (max. of 20 characters)	Y84 • and identification code						✓	✓	✓	✓

For legend and footnotes, see Page 1/59.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		56	63	71	80	90	100	112	132	160
Self-ventilated energy-saving motors with improved efficiency Self-ventilated energy-saving motors with high efficiency Self-ventilated motors with increased output and improved efficiency Self-ventilated motors with increased output and high efficiency										
									1LE1 (Aluminum)	
Packaging, safety notes, documentation and test certificates										
Without safety and commissioning note. Customer's declaration of renouncement required.	B00									○ ○ ○ ○
With one safety and start-up guide per box pallet	B01									○ ○ ○ ○
Acceptance test certificate 3.1 in accordance with EN 10204	B02									✓ ✓ ✓ ✓
Printed operating instructions English/German enclosed	B04									✓ ✓ ✓ ✓
Type test with heat run for horizontal motors, with acceptance	B83									✓ ✓ ✓ ✓
Wire-lattice pallet	B99									○ ○ ○ ○
Connected in star for dispatch	M01									✓ ✓ ✓ ✓
Connected in delta for dispatch	M02									✓ ✓ ✓ ✓

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Available on request
- ✓ With additional charge

- 1) Not possible in combination with order code **R15** "One cable gland, metal".
- 2) In combination with motor protection (position 15 of the Order No.) or with option anti-condensation heater request required.
- 3) Not possible in combination with voltage code **22** or **34**.
- 4) Not possible in combination with the following order codes: **N01, N02, N03, N05, N06, N07, N08, N11**.
Use according to temperature class 155 (F) possible only.
- 5) Cannot be used for motors in UL version (order code **D31**). The grease lifetime specified in catalog part 0 "Introduction" refers to CT 40 °C. When the coolant temperature rises by 10 K, the grease lifetime or relubrication interval is halved.
- 6) A second shaft extension is not possible. Please inquire for mounted brakes.
- 7) When quoting or ordering, it is necessary to provide the brake supply voltage for order codes **F10, F11** and **F12**.
- 8) All encoders are supplied with a protective cover as standard. The protective cover is not supplied with the combination rotary pulse encoder with separately driven fan, as, in this case, the rotary pulse encoder is installed under the fan cover.
- 9) Not possible for type of construction IM V3.
- 10) Not possible in combination with rotary pulse encoder HOG 9 D 1024 (order code **G05**) and/or brake 2LM8 (order code **F01**).
- 11) Not possible in combination with brake 2LM8 – order code **F01**.
- 12) Supplied with the condensation drainage holes sealed at the drive end (DE) and non-drive end (NDE) (IP55, IP56, IP65). If condensation drainage holes are required for motors with IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to order the motors in their respective type of construction and order code **H03**, so that the condensation drainage holes can be mounted in the correct positional arrangement.
- 13) Motors that are prepared for additional mountings (order codes **G40, G41, G42**) are supplied without protective cover as standard. If a protective cover is requested as cover or as mechanical protection for mounting provided by the customer, it can be ordered with order code **G43**.
Not possible in combination with order code **L00**, vibration quantity level B.
- 14) In connection with mountings, the respective technical data must be observed; request required.
- 15) 1LE1 motors in EFF1 version without additional charge (standard version).
- 16) Possible up to 600 V max. The rated voltage is indicated on the rating plate without voltage range.
- 17) The rated voltage is indicated on the rating plate without voltage range.
- 18) "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking.
- 19) Not possible when brake is mounted.
- 20) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **L05**:
- Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
- Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
For an explanation of the order codes, see catalog part 0 "Introduction".
- 21) For 1LE1 motors with metal external fan, converter-fed operation is permitted. The metal external fan is not possible in combination with the low-noise version – order code **F77** or **F78**.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

Options or order codes (supplement **-Z** is required)

Not possible for General Line motors with shorter delivery time.

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		56	63	71	80	90	100	112	132	160
Forced-air cooled motors without external fan and fan cover with improved efficiency										
Forced-air cooled motors without external fan and fan cover with high efficiency										
Self-cooled motors without external fan and fan cover with improved efficiency										
Self-cooled motors without external fan and fan cover with high efficiency										
1LE1/1PC1 (Aluminum)										
Motor connection and connection box										
One cable gland, metal	R15						✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	R10						○	○	○	○
Rotation of the connection box through 90°, entry from NDE	R11						○	○	○	○
Rotation of the connection box through 180°	R12						○	○	○	○
Larger connection box	R50						✓	✓	✓	✓
Reduction piece for M cable gland in accordance with British standard, both cable entries mounted ¹⁾	R30						✓	✓	✓	✓
External earthing	H04						✓	✓	✓	✓
3 cables protruding, 0.5 m long ²⁾³⁾	R20						✓	✓	✓	✓
3 cables protruding, 1.5 m long ²⁾³⁾	R21						✓	✓	✓	✓
6 cables protruding, 0.5 m long ²⁾	R22						✓	✓	✓	✓
6 cables protruding, 1.5 m long ²⁾	R23						✓	✓	✓	✓
6 cables protruding, 3 m long ²⁾	R24						✓	✓	✓	✓
Connection box on NDE ⁴⁾	H08						✓	✓	✓	✓
Windings and insulation										
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	N01						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output	N02						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	N03						✓	✓	✓	✓
Temperature class 180 (H) at rated power and max. CT 60 °C ⁵⁾	N11						✓	✓	✓	✓
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	N20						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	N05						✓	✓	✓	✓

For legend and footnotes, see Page 1/63.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		56	63	71	80	90	100	112	132	160
Forced-air cooled motors without external fan and fan cover with improved efficiency										
Forced-air cooled motors without external fan and fan cover with high efficiency										
Self-cooled motors without external fan and fan cover with improved efficiency										
Self-cooled motors without external fan and fan cover with high efficiency										
1LE1/1PC1 (Aluminum)										
Windings and insulation (continued)										
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	N06						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	N07						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	N08						✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	N21						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and identification code						✓	✓	✓	✓
Colors and paint finish										
Special finish in RAL 7030 stone gray							□	□	□	□
Special finish in other standard RAL colors : RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005, Page 0/101	Y54 • and special finish RAL....						✓	✓	✓	✓
Special finish in special-RAL colors: for RAL colors, see "Special finish in special RAL colors", Page 0/101	Y51 • and special finish RAL....						✓	✓	✓	✓
Special finish sea air resistant	S03						O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	S00						○	○	○	○
Unpainted, only primed	S01						✓	✓	✓	✓
Mechanical design and degree of protection										
Screwed-on feet (instead of cast)	H01						✓	✓	✓	✓
Radial seal on DE for flange-mounting motors with oil resistance to 0.1 bar ⁶⁾	H23						✓	✓	✓	✓
IP65 degree of protection	H20						✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea)	H22						✓	✓	✓	✓
Vibration-proof version	H02						✓	✓	✓	✓
Condensation drainage holes ⁷⁾	H03						✓	✓	✓	✓
Non-rusting screws (externally)	H07						✓	✓	✓	✓
Coolant temperature and site altitude										
Coolant temperature -40 °C to +40 °C	D03						✓	✓	✓	✓
Coolant temperature -30 °C to +40 °C	D04						✓	✓	✓	✓

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		56	63	71	80	90	100	112	132	160
Forced-air cooled motors without external fan and fan cover with improved efficiency										
Forced-air cooled motors without external fan and fan cover with high efficiency										
Self-cooled motors without external fan and fan cover with improved efficiency										
Self-cooled motors without external fan and fan cover with high efficiency										
1LE1/1PC1 (Aluminum)										
Designs in accordance with standards and specifications										
Electrical according to NEMA MG1-12 ⁸⁾	D30									
Design according to UL with "Recognition Mark" ⁹⁾	D31									
Canadian regulations (CSA) ¹⁰⁾	D40									
PSE Mark Japan ¹¹⁾	D46									
Bearings and lubrication										
Measuring nipple for SPM shock pulse measurement for bearing inspection	Q01									
Bearing design for increased cantilever forces	L22									
Special bearing for DE and NDE, bearing size 63	L25									
Regreasing device	L23									
Located bearing at DE	L20									
Located bearing at NDE	L21									□
Balance and vibration quantity										
Vibration quantity A										□
Vibration quantity B	L00									
Half-key balancing (standard)										□
Full-key balancing	L02									
Balancing without key	L01									
Shaft and rotor										
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors	L08									
Shaft extension with standard dimensions, without featherkey way	L04									
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L07									
Standard shaft made of non-rusting steel	L06									
Non-standard cylindrical shaft extension ¹²⁾	Y55 • and identification code									
Heating and ventilation										
Anti-condensation heaters for 230 V	Q02									
Anti-condensation heaters for 115 V	Q03									

For legend and footnotes, see Page 1/63.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		56	63	71	80	90	100	112	132	160
Forced-air cooled motors without external fan and fan cover with improved efficiency										
Forced-air cooled motors without external fan and fan cover with high efficiency										
Self-cooled motors without external fan and fan cover with improved efficiency										
Self-cooled motors without external fan and fan cover with high efficiency										
1LE1/1PC1 (Aluminum)										
Rating plate and extra rating plates										
Second rating plate, loose	M10						✓	✓	✓	✓
Nirosta rating plate	M11						✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code						✓	✓	✓	✓
Extra rating plate with identification codes	Y82 • and identification code						✓	✓	✓	✓
Additional information on rating plate and on package label (max. of 20 characters)	Y84 • and identification code						✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates										
Without safety and commissioning note. Customer's declaration of renouncement required.	B00						○	○	○	○
With one safety and start-up guide per box pallet	B01						○	○	○	○
Acceptance test certificate 3.1 in accordance with EN 10204	B02						✓	✓	✓	✓
Printed operating instructions English/German enclosed	B04						✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	B83						✓	✓	✓	✓
Wire-lattice pallet	B99						○	○	○	○
Connected in star for dispatch	M01						✓	✓	✓	✓
Connected in delta for dispatch	M02						✓	✓	✓	✓

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Available on request
- ✓ With additional charge

- 1) Not possible in combination with order code **R15** "One cable gland, metal".
- 2) In combination with motor protection (position 15 of the Order No.) or with option anti-condensation heater request required.
- 3) Not possible in combination with voltage code **22** or **34**.
- 4) Not possible in combination with the following order codes: **N01, N02, N03, N05, N06, N07, N08, N11**. Use according to temperature class 155 (F) possible only.
- 5) Cannot be used for motors in UL version (order code **D31**). The grease lifetime specified in catalog part 0 "Introduction" refers to CT 40 °C. When the coolant temperature rises by 10 K, the grease lifetime or relubrication interval is halved.
- 6) Not possible for type of construction IM V3.
- 7) Supplied with the condensation drainage holes sealed at the drive end (DE) and non-drive end (NDE) (IP55, IP56, IP65). If condensation drainage holes are required for motors with IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to order the motors in their respective type of construction and order code **H03**, so that the condensation drainage holes can be mounted in the correct positional arrangement.
- 8) 1LE1 motors in EFF1 version without additional charge (standard version).
- 9) Possible up to 600 V max. The rated voltage is indicated on the rating plate without voltage range.
- 10) The rated voltage is indicated on the rating plate without voltage range.
- 11) "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking.
- 12) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order code **Y55**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see catalog part 0 "Introduction".

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Accessories

Overview

Couplings

The motor from Siemens is connected to the machine or gear unit through a coupling. Flender is an important coupling manufacturer with a wide range of products. For standard applications, Siemens recommends that elastic couplings of Flender types N-Eupex and Rupex or torsionally rigid couplings of types Arpex and Zapex are used. For special applications, Fludex and Elpex couplings are recommended.

Source of supply:
Siemens contact partner – ordering from Catalog Siemens MD 10.1 “FLENDER Standard Couplings”

or

A. Friedr. Flender AG
Kupplungswerk Mussum
Industriepark Bocholt
Schlavenhorst 100
46395 Bocholt, Germany
Tel. +49 (0) 2871-92 2185
Fax +49 (0) 2871-92 2579

<http://www.flender.com>
e-mail: couplings@flender.com

Mounting of encoder

In the case of mounting by the customer.

Baumer Hübner GmbH
Planufer 92b
10967 Berlin, Germany
Tel. +49 (0) 30-690 03-0
Fax +49 (0) 30-690 03-104

<http://www.baumerhuebner.com>
e-mail: info@baumerhuebner.com

Leine & Linde (Deutschland) GmbH
Bahnhofstraße 36
73430 Aalen, Germany
Tel. +49 (0) 7361-78 093-0
Fax +49 (0) 7361-78 093-11

<http://www.leinelinde.com>
e-mail: info@leinelinde.se

More information

Spare motors and repair parts

- Supply commitment for spare motors and repair parts following delivery of the motor
 - For up to 5 years, in the event of total motor failure, Siemens will supply a comparable motor with regard to the mounting dimensions and functions (the type series may vary).
 - Repair parts will be supplied for up to 5 years.
 - For up to 10 years, Siemens will provide information and will, if necessary, supply documentation for repair parts.
- When repair parts are ordered, the following details must be provided:
 - Designation and part number
 - Order No. and factory number of the motor
- For bearing types, see the „Orientation”, “Technical data”, Page 0/124.
- For standard components, a supply commitment does not apply.
- Support – Hotline
In Germany
Tel.: 01 80 – 5 05 04 48

You will find telephone numbers for other countries on our Internet site:

<http://www.siemens.com/automation/service&support>

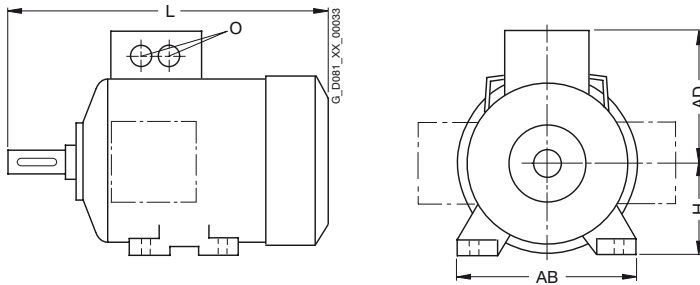
IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Dimensions

Overview

Overall dimensions



Frame size	Type	Number of poles	Dimensions				
			L	AD	H	AB	O
100 L	General Line motors with shorter delivery time		395.5 ¹⁾	166	100	196	2 x M32 x 1.5
	Self-ventilated energy-saving motors with improved/high efficiency		395.5 ¹⁾	166	100	196	2 x M32 x 1.5
	Self-ventilated motors with increased output and improved/high efficiency		430.5 ¹⁾	166	100	196	2 x M32 x 1.5
	Forced-air-cooled motors without external fan and fan cover with improved/high efficiency		321.5	166	100	196	2 x M32 x 1.5
	Self-cooled motors without external fan and fan cover with improved/high efficiency		321.5	166	100	196	2 x M32 x 1.5
112 M	General Line motors with shorter delivery time		389 ¹⁾	177	112	226	2 x M32 x 1.5
	Self-ventilated energy-saving motors with improved/high efficiency		389 ¹⁾	177	112	226	2 x M32 x 1.5
	Self-ventilated motors with increased output and improved/high efficiency		414 ¹⁾	177	112	226	2 x M32 x 1.5
	Forced-air-cooled motors without external fan and fan cover with improved/high efficiency		311	177	112	226	2 x M32 x 1.5
	Self-cooled motors without external fan and fan cover with improved/high efficiency		311	177	112	226	2 x M32 x 1.5

Frame size	Type	Number of poles	Dimensions				
			L	AD	H	AB	O
132 S/ 132 M	General Line motors with shorter delivery time		465 ¹⁾	202	132	256	2 x M32 x 1.5
	Self-ventilated energy-saving motors with improved/high efficiency		465 ¹⁾	202	132	256	2 x M32 x 1.5
	Self-ventilated motors with increased output and improved/high efficiency		515 ¹⁾	202	132	256	2 x M32 x 1.5
	Forced-air-cooled motors without external fan and fan cover with improved/high efficiency		380.5	202	132	256	2 x M32 x 1.5
	Self-cooled motors without external fan and fan cover with improved/high efficiency		380.5	202	132	256	2 x M32 x 1.5
160 M/ 160 L	General Line motors with shorter delivery time		604 ¹⁾	236.5	160	300	2 x M40 x 1.5
	Self-ventilated energy-saving motors with improved/high efficiency		604 ¹⁾	236.5	160	300	2 x M40 x 1.5
	Self-ventilated motors with increased output and improved/high efficiency		664 ¹⁾	236.5	160	300	2 x M40 x 1.5
	Forced-air-cooled motors without external fan and fan cover with improved/high efficiency		510	236.5	160	300	2 x M40 x 1.5
	Self-cooled motors without external fan and fan cover with improved/high efficiency		510	236.5	160	300	2 x M40 x 1.5

¹⁾ The length is specified as far as the tip of the fan cover.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Dimensions

Overview (continued)

Notes on the dimensions

■ Dimension drawings according to DIN EN 50347 and IEC 60072.

■ Fits

The shaft extensions specified in the dimension tables (DIN 748) and centering spigot diameters (DIN EN 50347) are machined with the following fits:

Dimension designation	ISO fit DIN ISO 286-2	
D, DA	up to 30	j6
	over 30 to 50	k6
	over 50	m6
N	up to 250	j6
	over 250	h6
F, FA		h9
K		H17
S	Flange (FF)	H17

The drilled holes of couplings and belt pulleys should have an ISO fit of at least H7.

■ Dimension tolerances

For the following dimensions, the admissible deviations are given below:

Dimension designation	Dimensions	Admissible deviation
H	up to 250	-0.5
	over 250	-1.0
E, EA		-0.5

Keyways and feather keyways (dimensions GA, GC, F and FA) are made in compliance with DIN 6885 Part 1.

■ All dimensions are specified in mm.

More information

SD configurator

SD configurator (on DVD of the interactive catalog CA01 "Products for Automation and Drives")



The interactive Catalog CA 01 contains over 100 000 products with approximately 5 million potential drive system product variants.

The **SD configurator** has been developed to facilitate selection of the correct motor and/or converter from the wide spectrum of A&D SD products. It is integrated as a "selection aid" in this catalog.

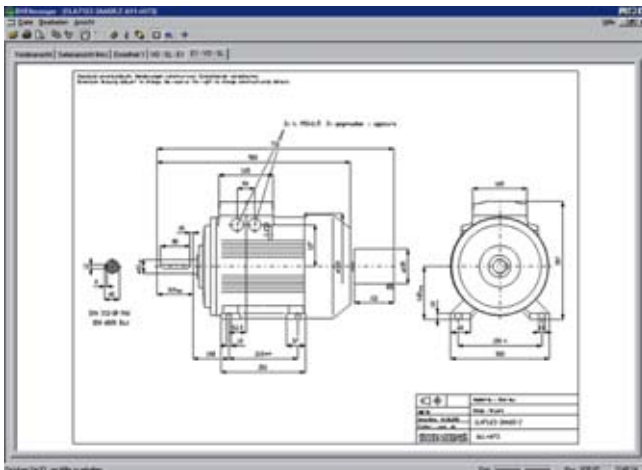
The **SD configurator** makes it easier to find the right drive solution. It supplies the correct order number as well as the corresponding documentation.

It can display operating instructions, factory test certificate, terminal box documentation, etc. and generates data sheets, dimension drawings and a start-up calculation for the relevant products.

Dimension sheet generator

(part of the SD configurator)

A dimension drawing can be created in the SD configurator for every configurable motor. A dimension drawing can be requested for every other motor.



It is also easy to assign a suitable converter to the selected motor.

The extensive help function not only explains the program functions, it also contains extensive technical background material.

SD configurator product range:

Low-voltage motors (energy-saving motors) with corresponding documentation and dimension drawings, low-voltage converters of the MICROMASTER 4 product series, SINAMICS G110 and SINAMICS G120 inverter chassis units as well as SINAMICS G120D distributed frequency inverters, and SIMATIC ET 200S FC and SIMATIC ET 200pro FC frequency converters for distributed I/O.

The interactive CA 01 catalog can be ordered from your local Siemens sales representative or on the Internet at <http://www.siemens.com/automation/CA01>

Links to tips, tricks and downloads for functional or content updates can be found at this address.

Order No. for CA 01, English International:
DVD: **E86060-D4001-A510-C7-7600**

Note: The SD configurator offline tool within CA 01 can be updated for the new 1LE1 motor series online over the Internet.

When a complete Order No. is entered with or without order codes, a dimension drawing can be called up under the "Documentation" tab.

These dimension drawings can be presented in different views and sections and printed.

The corresponding dimension sheets can be exported, saved and processed further in DXF format (interchange/import format for CAD systems) or as bitmap graphics.

The SD configurator has been integrated into the CA 01 electronic catalog as a selection aid (for further information, see above).

The interactive CA 01 catalog can be ordered from your local Siemens sales representative or on the Internet at <http://www.siemens.com/automation/CA01>.

At this address, you will also find links to Tips & Tricks and to downloads for function or content updates.

Order No. for CA 01, English International
DVD: **E86060-D4001-A510-C7-7600**

Note:

The SD configurator offline tool within CA01 can be updated for the new 1LE1 motor series online over the Internet.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

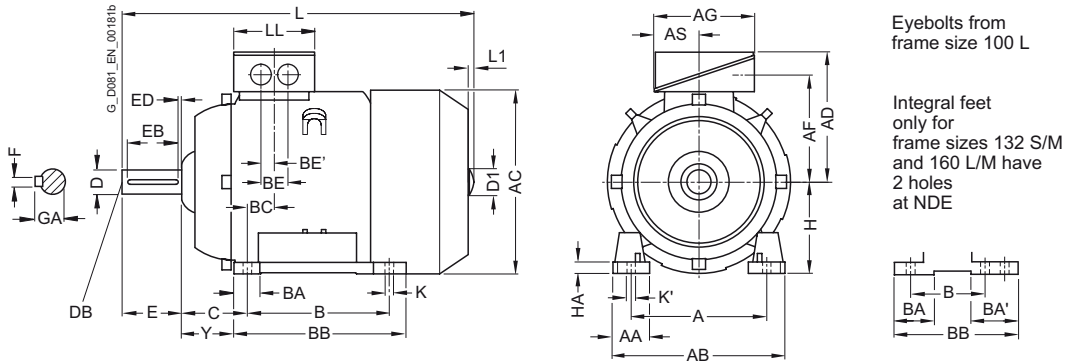
Dimensions

Dimensional drawings

Aluminum series 1LE1, frame sizes 100 to 160 – General Line motors with shorter delivery time

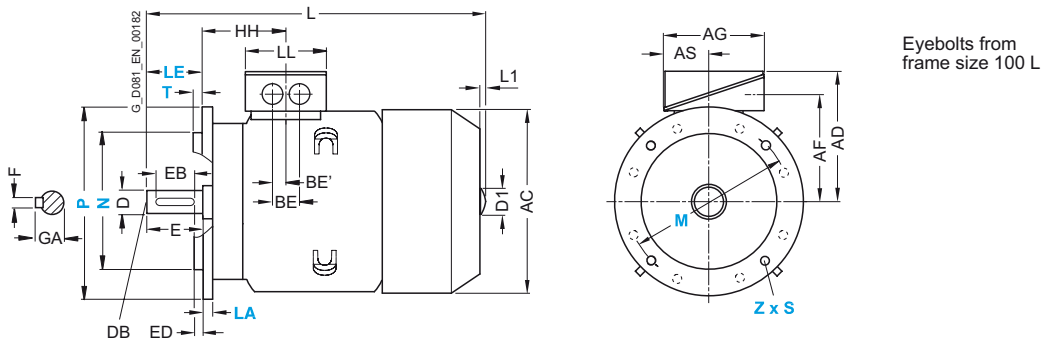
Type of construction IM B3

1



Types of construction IM B5 and IM V1

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																		
Frame size	Number of poles	A	AA	AB	AC	AD	AF	AG	AS	B*	BA	BA'	BB	BC	BE	BE'	C	H	HA	Y ¹⁾
100 L	2, 4, 6, 8	160	42	196	198	166	125.5	135	63.5	140	37.5	-	176	33.5	50	25	63	100	12	45
112 M	2, 4, 6, 8	190	46	226	222	177	136.5	135	63.5	140	35.4	-	176	26	50	25	70	112	12	52
132 S	2, 4, 6, 8	216	53	256	262	202	159.5	155	70.5	140	38	76	218	26.5	48	24	89	132	15	69
132 M	2, 4, 6, 8	216	53	256	262	202	159.5	155	70.5	178	38	76	218	26.5	48	24	89	132	15	69
160 M	2, 4, 6, 8	254	60	300	314	236.5	190	175	77.5	210	44	89	300	47	57	28.5	108	160	18	85
160 L	2, 4, 6, 8	254	60	300	314	236.5	190	175	77.5	254	44	89	300	47	57	28.5	108	160	18	85

* This dimension is assigned in DIN EN 50347 to the frame size listed.

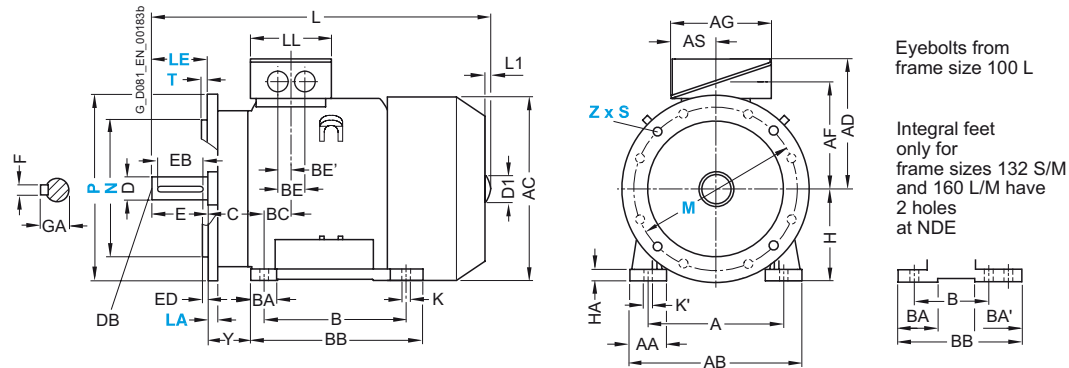
1) Additional information: not a standard dimension acc. to DIN 50347.

Dimensional drawings (continued)

Aluminum series 1LE1, frame sizes 100 to 160 – General Line motors with shorter delivery time

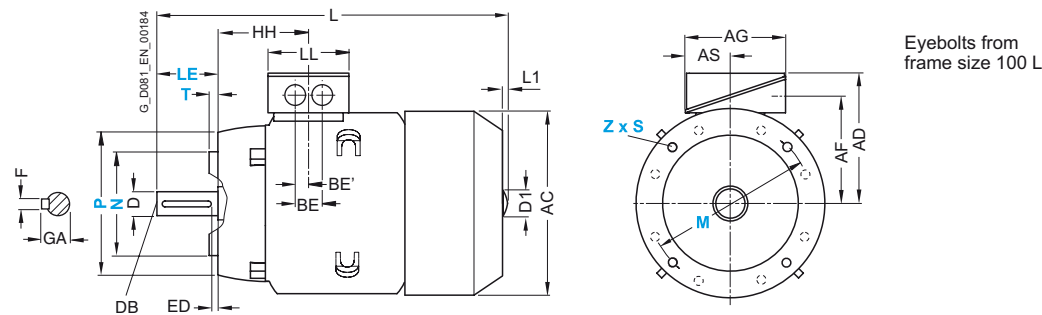
Type of construction IM B35

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



For motor Frame size	Number of poles	Dimension designation acc. to IEC					DE shaft extension									
		HH	K	K'	L ¹⁾	L1	D1	LL	D	DB	E	EB	ED	F	GA	
100 L	2, 4, 6, 8	96.5	12	16	395.5	7	32	112	28	M10	60	50	5	8	31	
112 M	2, 4, 6, 8	96	12	16	389	7	32	112	28	M10	60	50	5	8	31	
132 S	2, 4, 6, 8	115.5	12	16	465	8.5	39	130	38	M12	80	70	5	10	41	
132 M	2, 4, 6, 8	115.5	12	16	465	8.5	39	130	38	M12	80	70	5	10	41	
160 M	2, 4, 6, 8	155	15	19	604	10	45	145	42	M16	110	90	10	12	45	
160 L	2, 4, 6, 8	155	15	19	604	10	45	145	42	M16	110	90	10	12	45	

¹⁾ The length is specified as far as the tip of the fan cover.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

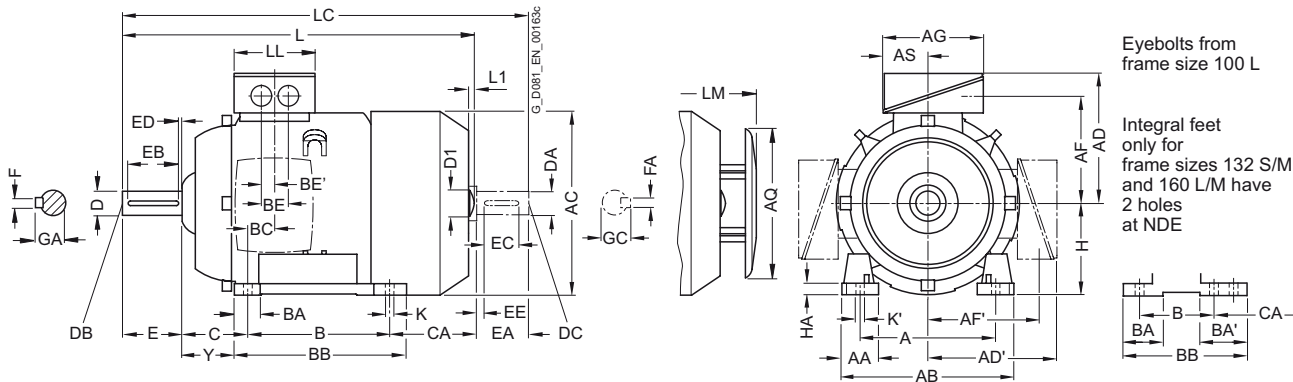
Dimensions

Dimensional drawings (continued)

Aluminum series 1LE1, frame sizes 100 to 160 – self-ventilated motors with improved/high efficiency

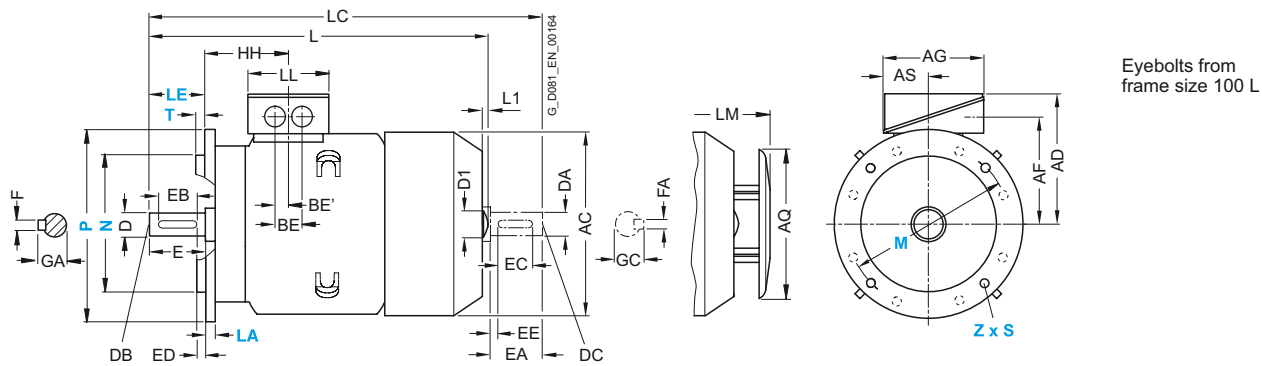
Type of construction IM B3

1



Types of construction IM B5 and IM V1

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																						
Frame size	Number of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AQ	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H	HA	Y ¹⁾
100 L	2, 4, 6, 8	160	42	196	198	166	166	125.5	125.5	135	195	63.5	140	37.5	-	176	33.5	50	25	63	141	100	12	45
112 M	2, 4, 6, 8	190	46	226	222	177	177	136.5	136.5	135	195	63.5	140	35.4	-	176	26	50	25	70	129.7	112	12	52
132 S	2, 4, 6, 8	216	53	256	262	202	202	159.5	159.5	155	260	70.5	140	38	76 ²⁾	218 ³⁾	26.5	48	24	89	128.5 ⁴⁾	132	15	69
132 M	2, 4, 6, 8	216	53	256	262	202	202	159.5	159.5	155	260	70.5	178	38	76	218	26.5	48	24	89	128.5 ⁴⁾	132	15	69
160 M	2, 4, 6, 8	254	60	300	314	236.5	236.5	190	190	175	260	77.5	210	44	89 ⁵⁾	300 ⁶⁾	47	57	28.5	108	148 ⁷⁾	160	18	85
160 L	2, 4, 6, 8	254	60	300	314	236.5	236.5	190	190	175	260	77.5	254	44	89	300	47	57	28.5	108	148 ⁷⁾	160	18	85

* This dimension is assigned in DIN EN 50347 to the frame size listed.
 1) Additional information: not a standard dimension acc. to DIN 50347.
 2) With screwed-on feet, dimension BA' is 38 mm.
 3) With screwed-on feet, dimension BB is 180 mm.

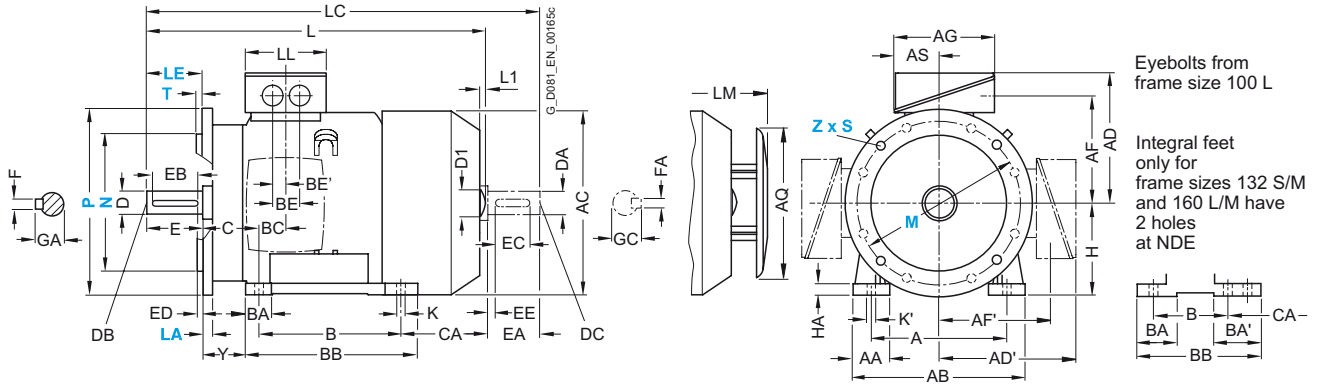
4) With screwed-on feet, dimension CA is 166.5 mm.
 5) With screwed-on feet, dimension BA' is 44 mm.
 6) With screwed-on feet, dimension BB is 256 mm.
 7) With screwed-on feet, dimension CA is 192 mm.

Dimensional drawings (continued)

Aluminum series 1LE1, frame sizes 100 to 160 – self-ventilated motors with improved/high efficiency

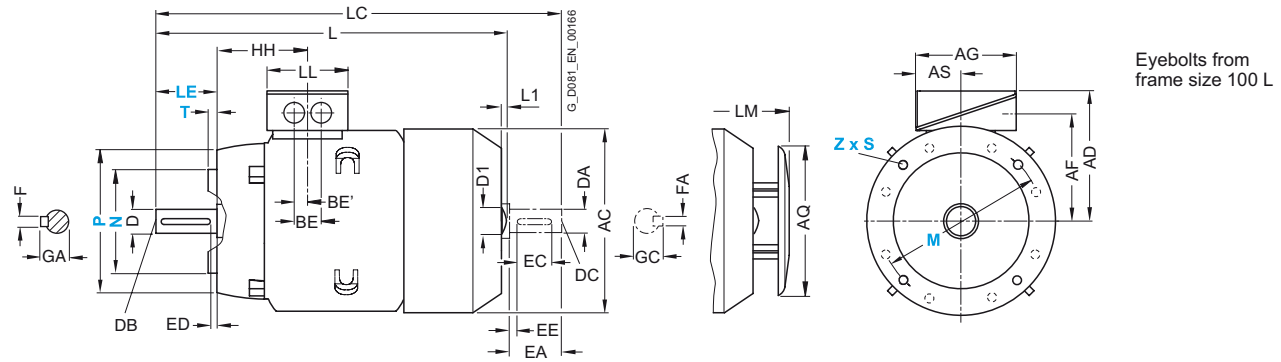
Type of construction IM B35

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



For motor Frame size	Number of poles	Dimension designation acc. to IEC										DE shaft extension					NDE shaft extension							
		HH	K	K'	L ¹⁾	L1	D1	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
100 L	2, 4, 6, 8	96.5	12	16	395.5	7	32	454	112	428.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
112 M	2, 4, 6, 8	96	12	16	389	7	32	450	112	422	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	2, 4, 6, 8	115.5	12	16	465	8.5	39	535.5	130	500.5	38	M12	80	70	5	10	41	28	M10	60	50	5	8	31
132 M	2, 4, 6, 8	115.5	12	16	465	8.5	39	535.5	130	500.5	38	M12	80	70	5	10	41	28	M10	60	50	5	8	31
160 M	2, 4, 6, 8	155	15	19	604	10	45	730	145	638	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
160 L	2, 4, 6, 8	155	15	19	604	10	45	730	145	638	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45

¹⁾ The length is specified as far as the tip of the fan cover.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

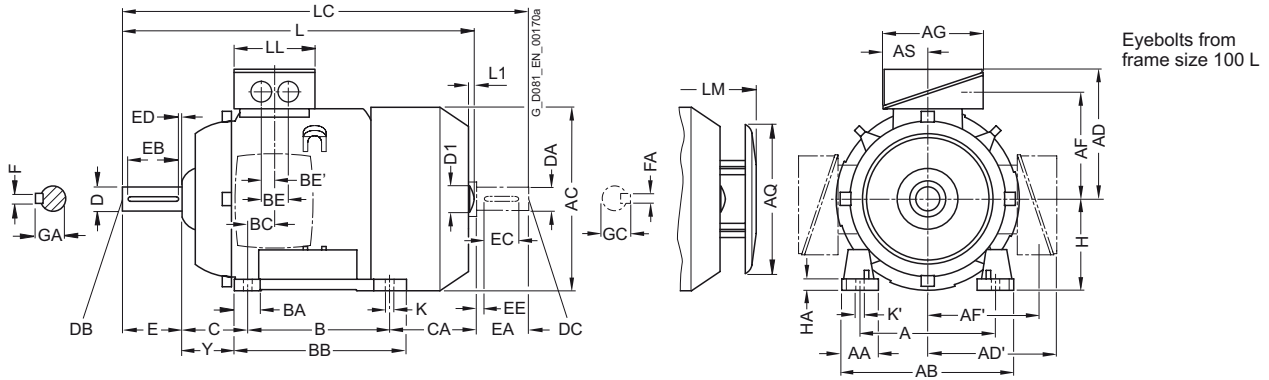
Dimensions

Dimensional drawings (continued)

Aluminum series 1LE1, frame sizes 100 to 160 – self-ventilated motors with increased output and improved/high efficiency

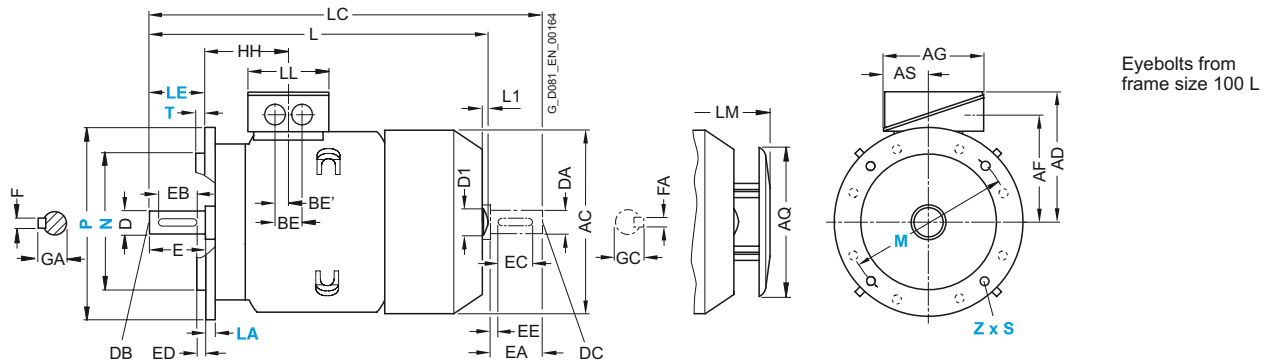
Type of construction IM B3

1



Type of construction IM B5 and IM V1

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



For motor	Dimension designation acc. to IEC	Dimension designation acc. to IEC																						
		A	AA	AB	AC	AD	AD'	AF	AF'	AG	AQ	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H	HA	Y ¹⁾
100 L	2, 4, 6, 8	160	42	196	198	166	166	125.5	125.5	135	195	63.5	140	37.5	-	176	33.5	50	25	63	176	100	12	45
112 M	2, 4, 6, 8	190	46	226	222	177	177	136.5	136.5	135	195	63.5	140	35.4	-	176	26	50	25	70	155	112	12	52
132 M	2, 4, 6, 8	216	53	256	262	202	202	159.5	159.5	155	260	70.5	178	38	-	218	26.5	48	24	89	178.5	132	15	69
160 L	2, 4, 6, 8	254	60	300	314	236.5	236.5	190	190	175	260	77.5	254	44	-	300	47	57	28.5	108	208	160	18	85

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ Additional information: not a standard dimension acc. to DIN 50347.

IEC Squirrel-Cage Motors New Generation 1LE1/1PC1

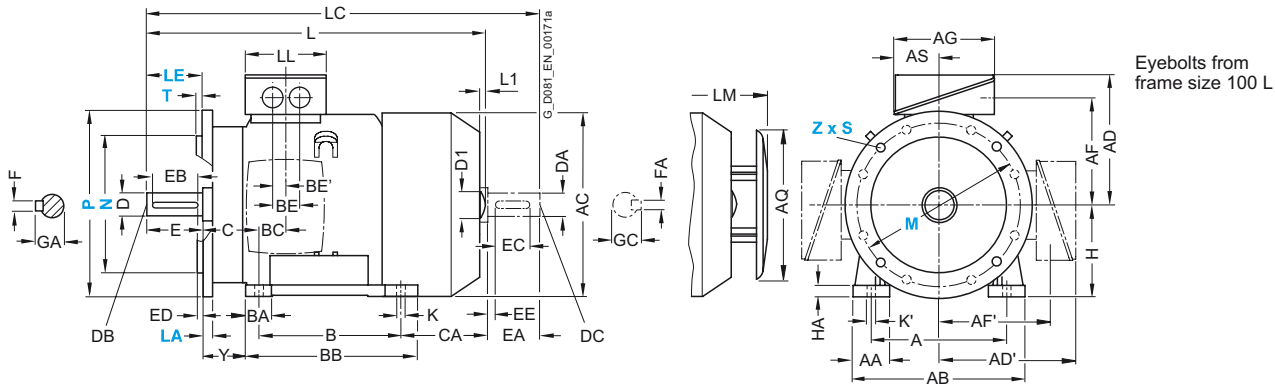
Dimensions

Dimensional drawings (continued)

Aluminum series 1LE1, frame sizes 100 to 160 – self-ventilated motors with increased output and improved/high efficiency

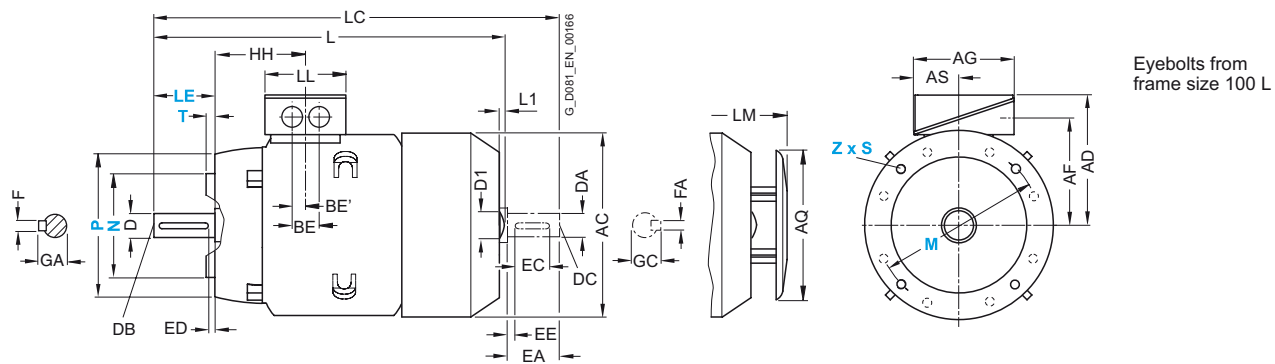
Type of construction IM B35

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



For motor Frame size	Number of poles	Dimension designation acc. to IEC							DE shaft extension					NDE shaft extension										
		HH	K	K'	L ¹⁾	L1	D1	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
100 L	2, 4, 6, 8	96.5	12	16	430.5	7	32	489	112	463.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
112 M	2, 4, 6, 8	96	12	16	414	7	32	475	112	447	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 M	2, 4, 6, 8	115.5	12	16	515	8.5	39	585.5	130	550.5	38	M12	80	70	5	10	41	28	M10	60	50	5	8	31
160 L	2, 4, 6, 8	155	15	19	664	10	45	790	145	698	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45

¹⁾ The length is specified as far as the tip of the fan cover.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

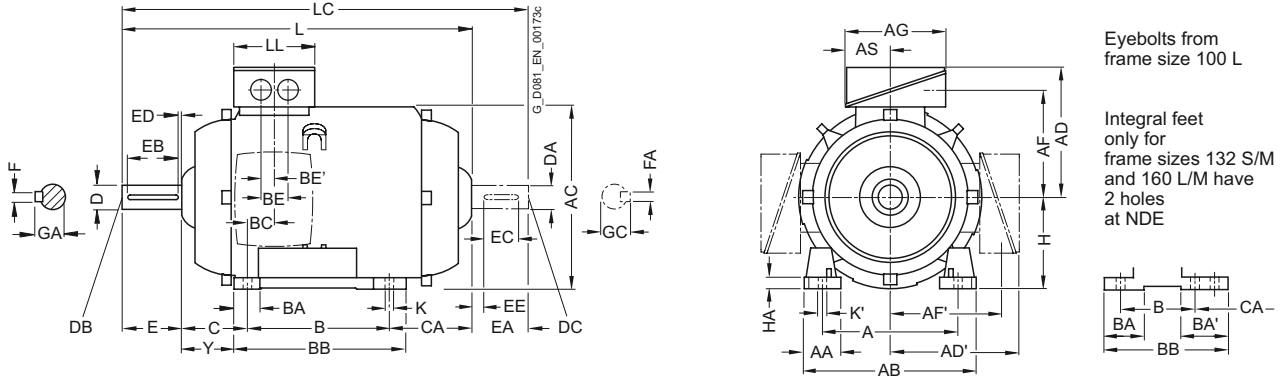
Dimensions

Dimensional drawings (continued)

Aluminum series 1LE1, frame sizes 100 to 160 – forced-air cooled motors with improved/high efficiency
 Aluminum series 1PC1, frame sizes 100 to 160 – self-cooled motors with improved/high efficiency

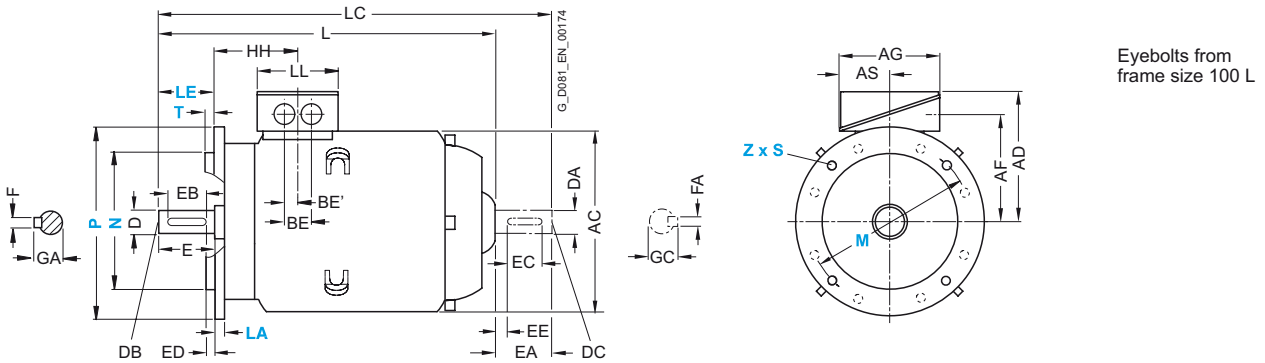
Type of construction IM B3

1



Type of construction IM B5 and IM V1

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



For motor	Frame size	Number of poles	Dimension designation acc. to IEC																					
			A	AA	AB	AC	AD	AD'	AF	AF'	AG	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H	HA	Y ¹⁾
100 L	2, 4, 6, 8		160	42	196	197	166	166	125.5	125.5	135	63.5	140	37.5	–	176	33.5	50	25	63	–	100	12	45
112 M	2, 4, 6, 8		190	46	226	221	177	177	136.5	136.5	135	63.5	140	35.4	–	176	26	50	25	70	–	112	12	52
132 S	2, 4, 6, 8		216	53	256	261	202	202	159.5	159.5	155	70.5	140	38	76 ²⁾	218 ³⁾	26.5	48	24	89	–	132	15	69
132 M	2, 4, 6, 8		216	53	256	261	202	202	159.5	159.5	155	70.5	178	38	76	218	26.5	48	24	89	–	132	15	69
160 M	2, 4, 6, 8		254	60	300	314	236.5	236.5	190	190	175	77.5	210	44	89 ⁴⁾	300 ⁵⁾	47	57	28.5	108	–	160	18	85
160 L	2, 4, 6, 8		254	60	300	314	236.5	236.5	190	190	175	77.5	254	44	89	300	47	57	28.5	108	–	160	18	85

* This dimension is assigned in DIN EN 50347 to the frame size listed.
 1) Additional information: not a standard dimension acc. to DIN 50347.
 2) With screwed-on feet, dimension BA' is 38 mm.

3) With screwed-on feet, dimension BB is 180 mm.
 4) With screwed-on feet, dimension BA' is 44 mm.
 5) With screwed-on feet, dimension BB is 256 mm.

IEC Squirrel-Cage Motors New Generation 1LE1/1PC1

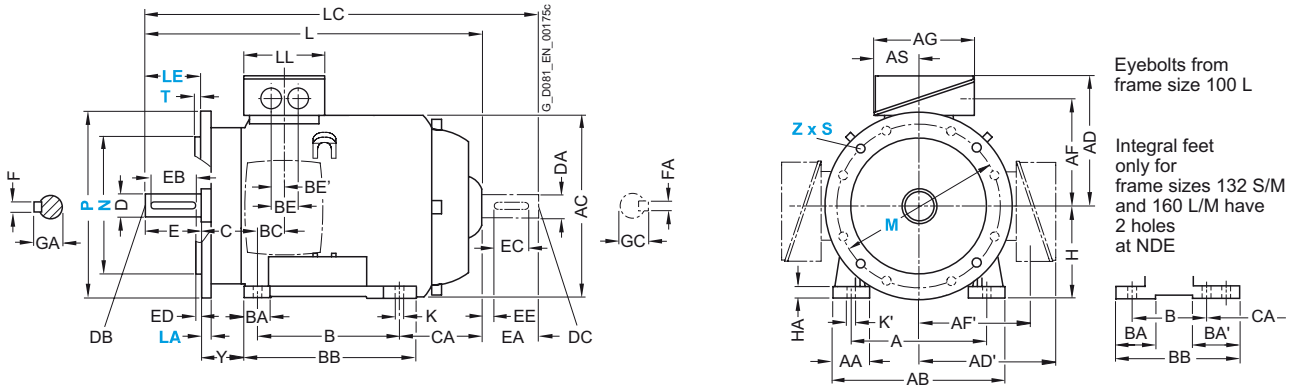
Dimensions

Dimensional drawings (continued)

Aluminum series 1LE1, frame sizes 100 to 160 – forced-air cooled motors with improved/high efficiency
Aluminum series 1PC1, frame sizes 100 to 160 – self-cooled motors with improved/high efficiency

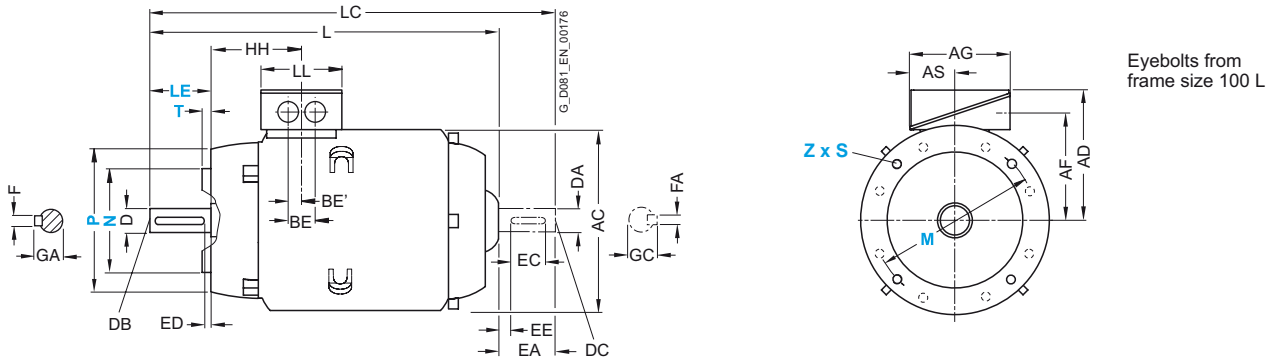
Type of construction IM B35

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



For motor	Frame size	Number of poles	Dimension designation acc. to IEC							DE shaft extension			NDE shaft extension									
			HH	K	K'	L	LC	LL	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
100 L	2, 4, 6, 8		96.5	12	16	321.5	-	112	28	M10	60	50	5	8	31	-	-	-	-	-	-	-
112 M	2, 4, 6, 8		96	12	16	311	-	112	28	M10	60	50	5	8	31	-	-	-	-	-	-	-
132 S	2, 4, 6, 8		115.5	12	16	380.5	-	130	38	M12	80	70	5	10	41	-	-	-	-	-	-	-
132 M	2, 4, 6, 8		115.5	12	16	380.5	-	130	38	M12	80	70	5	10	41	-	-	-	-	-	-	-
160 M	2, 4, 6, 8		155	15	19	510	-	145	42	M16	110	90	10	12	45	-	-	-	-	-	-	-
160 L	2, 4, 6, 8		155	15	19	510	-	145	42	M16	110	90	10	12	45	-	-	-	-	-	-	-

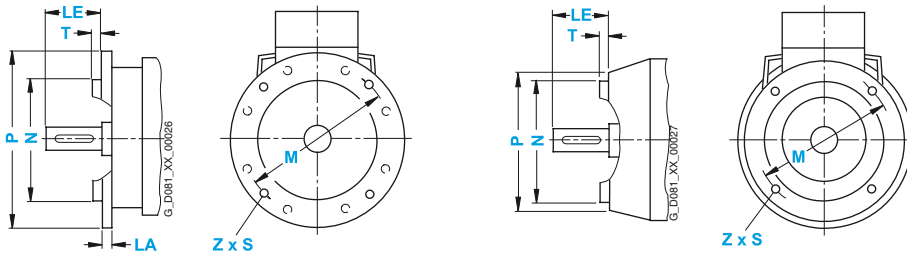
IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Dimensions

Dimensional drawings (continued)

Flange dimensions



In DIN EN 50347, flanges FF with through holes and flanges FT with tapped holes are assigned to frame sizes. The designation of flange A and C according to DIN 42948 (invalid since 09/2003) are also listed for information purposes. See the table below. (Z = the number of retaining holes)

Frame size	Type of construction	Flange type	Flange with		Dimension designation acc. to IEC								
			Through holes (FF/A)	Tapped holes (FT/C)	LA	LE	M	N	P	S	T	Z	
100 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 215	Acc. to DIN EN 50347	A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130	Acc. to DIN 42948	C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange (next larger standard flange)	FT 165		C 200	–	60	165	130	200	M10	3.5	4
112 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 215		A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130		C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange (next larger standard flange)	FT 165		C 200	–	60	165	130	200	M10	3.5	4
132 S, 132 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 265		A 300	12	80	265	230	300	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 165		C 200	–	80	165	130	200	M10	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange (next larger standard flange)	FT 215		C 250	–	80	215	180	250	M12	4	4
160 M, 160 L	IM B5, IM B35, IM V1, IM V3	Flansch	FF 300		A 350	13	110	300	250	350	18.5	5	4
	IM B14, IM B34, IM V18, IM V19	Normflansch	FT 215		C 250	–	110	215	180	250	M12	4	4

Standard motors up to frame size 315 L



2/2	Orientation	2/48	Self-ventilated energy-saving motors with high efficiency, Cast-iron series 1LG6
2/2	Overview	2/48	Selection and ordering data
2/4	Benefits		
2/4	Application		
2/5	Integration		
2/7	Technical specifications		
2/8	Selection and ordering data		
2/9	More information		
2/10	Self-ventilated energy-saving motors with improved efficiency, Aluminum series 1LA7 and 1LA5	2/58	Self-cooled motors without external fan, Aluminum series 1LP7 and 1LP5
2/10	Selection and ordering data	2/58	Selection and ordering data
2/22	Self-ventilated energy-saving motors with high efficiency, Aluminum series 1LA9	2/62	Self-cooled motors without external fan, Cast-iron series 1LP4
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IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Orientation

Overview



Standard motors from Siemens are characterised by their flexibility, ruggedness and energy efficiency. In general, all motors are suitable for converter-fed operation with mains voltages of up to 460 V + 10 %. The motors are designed to fulfill the requirements of the European and International markets with an output range from 0.06 to 200 kW.

Standard motors for use worldwide

IEC motors for the European and International market

The standard motors comply both electrically and mechanically with the applicable IEC/EN standards. For exporting to China, CCC certified motors (China Compulsory Certification) can be supplied.

IEC motors for the North American market

Motors are also available to the NEMA specification (National Electrical Manufacturers Association), with UL approval (Underwriters Laboratories Inc.) and CSA certification (Canadian Standard Association) for exporting to NAFTA states (USA, Canada and Mexico). The mechanical design of all motors is compliant only to IEC/EN, not to NEMA dimensions.

NEMA motors for the North American market

Low-voltage motors are manufactured to the NEMA standard for compliance with the local specifications of the NAFTA markets (USA, Canada and Mexico). This includes motors designed in accordance with the US act, EPACT (specified minimum efficiency levels), as well as motors with NEMA premium efficiency levels. The NEMA motor series provide the highest operating reliability for maximum service life.

Further information regarding NEMA motors is available on the Internet:

<http://www.sea.siemens.com/motors>

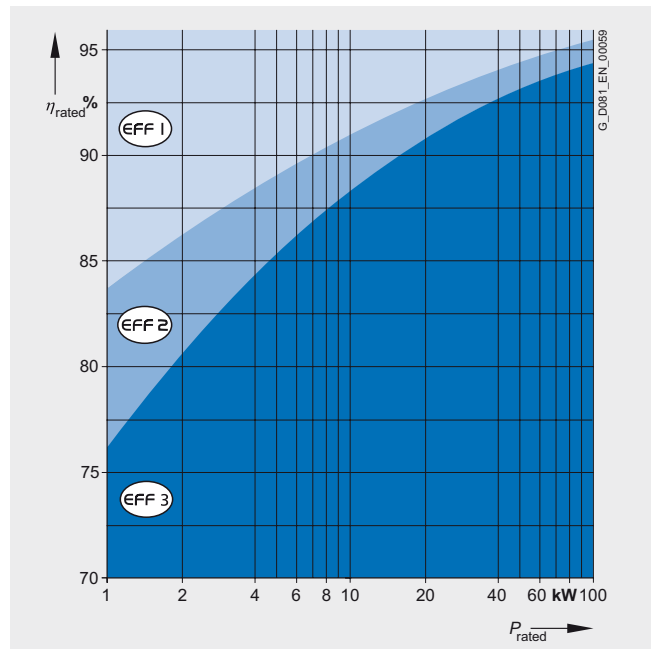
Classified energy-saving motors for an efficient energy balance

Depending on requirements, energy-saving motors are available for an efficient energy balance – for EU requirements in accordance with CEMEP (European Committee of Manufacturers of Electrical Machines and Power Electronics) and for the North American market in accordance with EPACT (US Energy Policy Act).

Efficiency requirements according to CEMEP

CEMEP classifies efficiency levels for 2-pole and 4-pole motors with outputs of 1.1 to 90 kW. Three efficiency classes are defined:

- **EFF1** (High Efficiency motors – referred to below as “Motors with high efficiency”)
- **EFF2** (Improved Efficiency motors – referred to below as “Motors with improved efficiency”)
- **EFF3** (Conventional Efficiency motors)



At a glance: EU/CEMEP for Europe

- Status
Voluntary compliance with efficiency classification
- Covers
2-pole, 4-pole squirrel-cage motors from 1.1 to 90 kW (at 400 V and 50 Hz)
- Required marking
Efficiency class on the motor rating plate
 η_N , $\eta_{3/4}$ load and efficiency class in the documentation

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Orientation

Overview (continued)

Efficiency requirements according to EPACT

In 1997, an act was passed in the US to define minimum efficiencies for low-voltage three-phase motors (EPACT).

An act is in force in Canada that is largely identical, although it is based on different verification methods. The efficiency is verified for these motors for the USA using IEEE 112, Test Method B and for Canada using CSA-C390. Apart from a few exceptions, all three-phase low-voltage motors imported into the USA or Canada must comply with the legal efficiency requirements. The law demands minimum efficiency levels for motors with a voltage of 230 and 460 V at 60 Hz, in the output range of 1 to 200 HP (0.75 to 150 kW) with 2, 4 and 6 poles. Explosion-proof motors must also be included.

The EPACT efficiency requirements exclude, for example:

- Motors whose frame size output classification does not correspond with the standard series according to NEMA MG1-12.
- Flange-mounting motors
- Brake motors
- Converter-fed motors
- Motors with design letter C and higher

EPACT lays down that the nominal efficiency at full load and a "CC" number (Compliance Certification) must be included on the rating plate. The "CC" number is issued by the US Department of Energy (DOE). The following information is stamped on the rating plate of EPACT motors which must be marked by law:

- Nominal efficiency
- Design letter
- Code letter
- CONT
- CC No. CC 032A (Siemens) and NEMA MG1-12.

At a glance: EPACT/CSA for North America

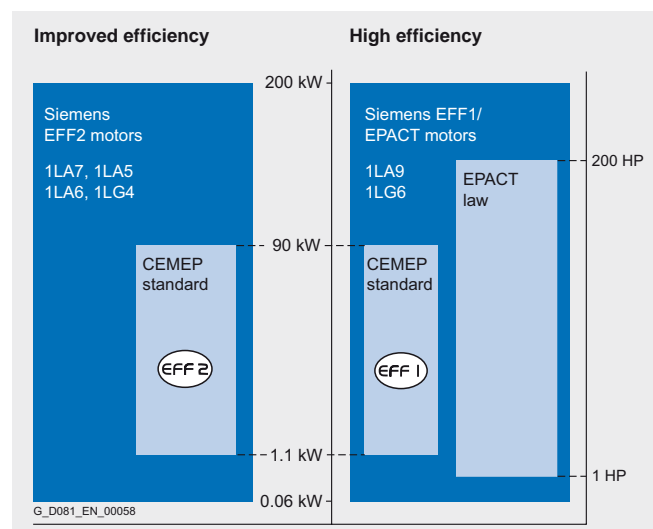
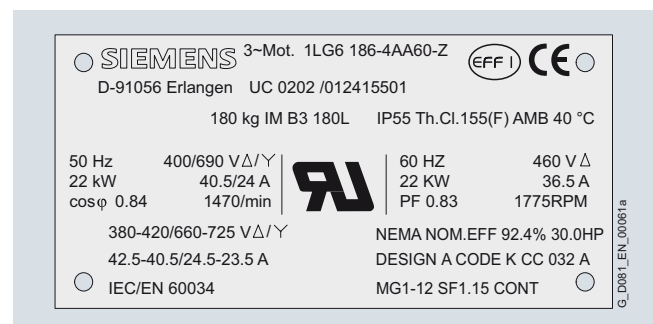
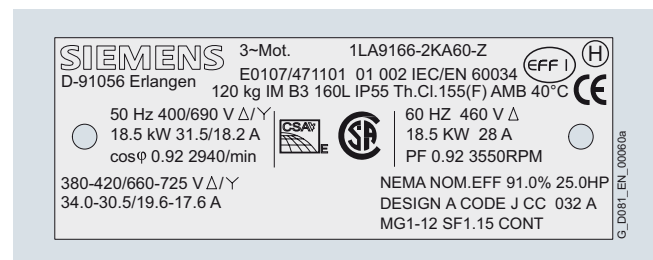
- Status
Minimum efficiencies required by law
- Covers
2-, 4- and 6-pole 60 Hz squirrel-cage motors from 1 to 200 HP (0.75 to 150 kW) for 230 V and/or 460 V 60 Hz
- Required marking
Efficiency η_N on the motor rating plate

Energy-saving motors from Siemens according to CEMEP or EPACT

The product range of standard motors exclusively comprises motors in the EU efficiency classes EFF1 "High Efficiency" or EFF2 "Improved Efficiency". The active parts of the motor have been optimized so that the requirements of the CEMEP efficiency classes EFF1 and EFF2 are fulfilled. The procedure for determining the efficiency is based on the summation of losses in accordance with IEC 60034-2. With these energy-saving motors a significant reduction in energy costs can be achieved as compared to conventional motors according to EFF3.

EPACT motors from Siemens are available CC certified, marked with the number CC032A on the rating plate and optionally also according to UL with the recognition mark. Siemens offers motors with the CSA Energy Efficiency Verification Mark specially for the Canadian market.

At a glance: Energy-saving motors from Siemens according to CEMEP EFF1/EFF2, EPACT and CSA



IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Orientation

Overview (continued)

Standard motors with increased output and compact construction

Standard motors with increased output and compact construction can be used to advantage in confined spaces. For a slightly longer overall length, the output is at least as high as that of the next largest shaft height. These compact motors are also optimised for efficiency and therefore reduce the operating costs.

Standard motors with reduced output without external fan

Self-cooled motors with surface cooling without external fan are suitable for the following operating conditions:

- Types of duty with adequate cooling times (e.g. temporary duty for positioning drives)
- Environmental conditions that demand compact installation space (e.g. in motors with a stopping function)
- Conditions under which an external fan has an adverse effect (e.g. simple cleaning in the food industry, textile industry)

Standard motors that can be supplied from stock with an extremely short delivery time

The most commonly used basic versions of standard motor series 1LA7, 1LA5 and 1LG4 can be supplied from stock – some of these are already marked with “CCC” (China Compulsory Certification) for export to China. Apart from these, a so-called “Sector version” is available for some of the motors available from stock. These include a located bearing at the drive end (DE), PTC thermistor and screwed on feet for the IM B35 type of construction.

The normal delivery time for motors from stock is 1 to 2 days from the time of clarification of the order at the factory until delivery from the factory. To determine the time of arrival at the customer site, the appropriate shipping time must be added.

2

Benefits

Standard motors from Siemens offer the user numerous advantages:

- The motors are approved and certified for worldwide use and meet high quality standards (confirmed, for example, by CSA ¹⁾, UL ²⁾, EXAM ³⁾, PTB ⁴⁾, CQC ⁵⁾)
- The ruggedness and lack of complexity of the components guarantee an extremely long service life
- Complete product spectrum for energy-saving motors according to EU/CEMEP and EPACT
- Extremely easy selection of energy-saving motors due to the efficiency classification (EFF1/EFF2)
- Energy-saving motors in motor series 1LA9 and 1LG6 meet both the EFF1 and EPACT efficiency levels.
- Reduction in operating costs thanks to a high degree of efficiency with EFF1
- Higher motor service life thanks to lower winding temperature in EFF1 and EPACT motors with rated load and supply
- Reduced environmental impact due to CO₂ reduction
- High overload reserves under continuous duty (SF 1.15 for motor series 1LA9/1LG6)
- Suitable for universal applications worldwide
- Standard motors with increased output and extremely compact construction
- Short delivery times for motors from stock
- The module mounting concept supports rapid modification by the customer
- A fast and comprehensive service is provided by factories and modification partners distributed throughout the world

Application

The numerous available options enable standard motors from Siemens to be used in every area of industry and every sector. They are suitable both for special environmental conditions such as those that predominate in the chemical or petrochemical industry as well as for most climatic requirements such as those of offshore applications. Their large range of mains voltages enables them to be used all over the world.

The wide field of implementation includes the following applications:

- Pumps
- Fans
- Compressors
- Conveyor systems such as cranes, belts and lifting gear
- High-bay warehouses
- Packaging machines
- Automation and Drives

¹⁾ Canadian Standard Association

²⁾ Underwriters Laboratories Inc.

³⁾ EXAM BBG Prüf und Zertifier GmbH (previously BVS = Bergbau Versuchsstrecke)

⁴⁾ Physikalisch-Technische Bundesanstalt

⁵⁾ China Quality Certification

Integration

MICROMASTER 411/ COMBIMASTER 411 distributed drive solutions

The MICROMASTER 411/COMBIMASTER 411 series is included in Catalog DA 51.3 which contains the complete product spectrum with ordering data, technical details and explanations.

Application

MICROMASTER 411 and COMBIMASTER 411 are the ideal solution for distributed drive applications that require a high degree of protection. The devices are designed for a wide drive range – for simple individual applications for pumps and fans through to multiple drives for conveyor systems in networked control systems. The ECOFAST versions of the MICROMASTER 411/COMBIMASTER 411 frequency converter series contain plug-in cables for the power supply, communications interface and motor connections. They support fast and problem-free replacement in time-critical applications and are completely compatible with the ECOFAST technology systems. They are based on the universal MICROMASTER 420 converter series and are characterised by customer-oriented performance and ease of use.

Structure

The modular structure allows MICROMASTER 411/COMBIMASTER 411 products and their accessories to be individually selected, e.g. electromechanical brake control module or PROFIBUS module.

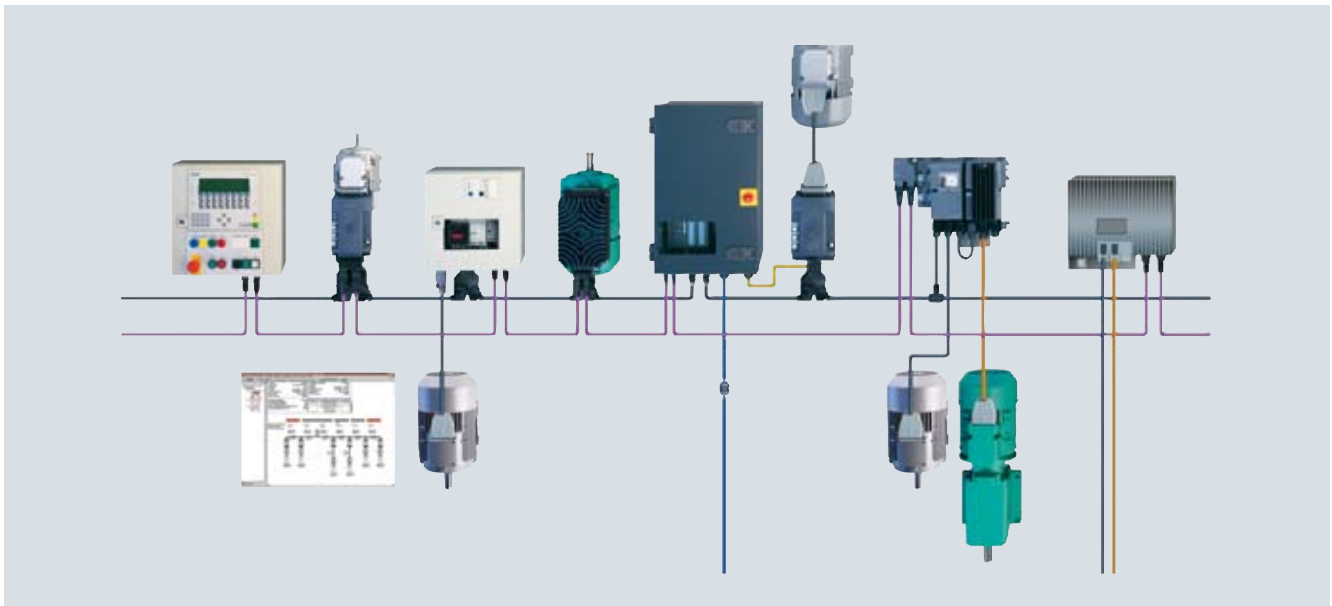
Main features:

- Output range: 0.37 to 3.0 kW, 400 V, 3AC
- IP66 degree of protection (MICROMASTER 411), self-cooling
- Electrical isolation between the electronics and the connection terminals
- Parameter sets for fast startup and cost savings
- Modular structure with numerous accessories
- Operation without operator panel possible (using jumpers and/or control potentiometer)
- Integrated control potentiometer accessible from outside.

Accessories (overview):

- Basic Operator Panel (BOP) for parameterising the converter
- Plain text Advanced Operator Panel (AOP) for MICROMASTER 411 and COMBIMASTER 411 with multiple-language display
- PROFIBUS module
- AS-Interface module
- DeviceNet module
- REM module (dynamic brake and control module for electro-mechanical brake)
- EM module (electromechanical brake control module)
- PC connection kit
- Mounting kits for installing the operator panels
- PC startup programs

ECOFAST system



ECOFAST is a system which permits extensive decentralisation and a modular structure for installation elements on the component level.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Orientation

Integration (continued)

Advantages

The main advantages of the ECOFAST motor connector over a terminal strip are as follows:

- Fast assembly of I/O devices (e.g. motor starters) from the ECOFAST system
- Reduction of assembly and repair times at the end user
- No wiring errors due to connector technology
- Replacement of motor without intervention in the electronics

Main features of the ECOFAST motor connector (with separate MICROMASTER 411 frequency converter)

The motor connector is mounted in the factory and replaces the connection box with terminal board. The connector is mounted towards the non-drive end (NDE). It comprises an angled motor connection casing that can be rotated by 4 x 90°. A 10-pole (+ earth) male insert is used in the housing. In the plug-in connector, the winding connections are connected and optionally the power supply for the brake and the signal leads for the temperature sensors.

The ECOFAST motor connector is compatible with the products of the ECOFAST field device system. Further information can be found in Catalog IK PI.

The mounting dimensions of this casing match those of standard industrial connectors, so it is possible to use a complete series of different standard inserts (such as Han E, ES, ESS from Harting). The motor circuit (star or delta connection) is selected in the mating connector for motor connection. The relevant jumpers are inserted by the customer in the mating connector. As a casing for the mating connector, all standard sleeve casings with lengthwise locking, frame size 10B (e.g. from Harting) can be used.

Only one sensor (temperature sensor or PTC thermistor) can be connected.

Maximum admissible mains voltage on motor connector: ≤500 V

Availability of the ECOFAST motor connector

The ECOFAST motor connector can be supplied for the following motor versions with the exception of the explosion-proof motors:

- Frame sizes 56 M to 132 M
- Output range 0.06 to 5.5 kW (7.5 kW on request)
- Direct on-line starting: Voltage code 1 for 230 VΔ/400 VY, 50 Hz
- Star-delta starting: Voltage code **9** with order code **L1U** 400 VΔ, 50 Hz

More information

Further information is available in the Catalogs IK PI and DA 51.3 "MICROMASTER 411/COMBIMASTER 411 distributed drive solutions" as well as on the Internet at:

<http://www.siemens.com/ecofast>

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Orientation

Technical specifications

The following table lists the most important technical specifications. For further information and details, see catalog part 0 "Introduction".

Technical specifications at a glance

Type of motor	IEC squirrel-cage motor
Connection types	Star connection/delta connection You can establish the connection type used from the Order No. supplements in the selection and ordering data for the required motor.
Number of poles	2, 4, 6, 8, pole-changing for constant load torque (pole-changing for fans, see catalog part 7 "Fan motors")
Rated speed (synchronous speed)	750 ... 3000 rpm
Rated output	0.06 ... 200 kW
Rated torque	0.25 ... 1700 Nm
Insulation of the stator winding to EN 60034-1 (IEC 60034-1)	Temperature class 155 (F), used acc. to temperature class 130 (B) DURIGNIT IR 2000 insulation system
Degree of protection according to EN 60034-5 (IEC 60034-5)	IP55 as standard
Cooling according to EN 60034-6 (IEC 60034-6)	Self-ventilated (motor series 1LA, 1LG) Frame sizes 63 to 315 (IC 411), Frame size 56 (IC 410) Self-cooled (motor series 1LP) Frame sizes 63 to 315 (IC 410)
Admissible coolant temperature and site altitude	-20 °C ... +40 °C as standard, site altitude 1000 mm above sea level. See "Coolant temperature and site altitude" in catalog part 0 "Introduction".
Standard voltages according to EN 60038 (IEC 60038)	50 Hz: 230 V, 400 V, 500 V, 690 V The voltage used can be found in the selection and ordering data for the required motor.
Type of construction according to EN 60034-7 (IEC 60034-7):	Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6, IM V5 with protective cover With flange: IM B5, IM V1 without protective cover, IM V1 with protective cover, IM V3, IM B35 With standard flange: IM B14, IM V19, IM V18 without protective cover, IM V18 with protective cover, IM B34 With special flange: IM B14, IM V19, IM V18 without protective cover, IM V18 with protective cover, IM B34
Paint finish Suitability of paint finish for climate group according to IEC 60721, Part 2-1	Standard: Color RAL 7030 stone gray Climate group "worldwide" with special finish Climate group "moderate" with standard finish See "Paint finish" in catalog part 0 "Introduction".
Vibration quantity level according to EN 60034-14 (IEC 60034-14)	Level A (standard – without special vibration requirements) Level B (with special vibration requirements) See "Balance and vibration quantity" in catalog part 0 "Introduction".
Shaft extension according to DIN 748 (IEC 60072)	Balance type: Half-key balancing See "Balance and vibration quantity" in catalog part 0 "Introduction".
Sound pressure level to DIN EN ISO 1680 (tolerance +3dB)	The sound pressure level is listed in the selection and ordering data for the required motor.
Weights	The weight is listed in the selection and ordering data for the required motor.
Mechanical limit speeds	The limit speed for the required motor can be found on Page 5/6.
Packaging weights and dimensions	See "Packing weights and packing dimensions" in catalog part 0 "Introduction".
Rating plates	Fixed to the motor See "Rating plate" in catalog part 0 "Introduction".
Connection and connection boxes	See "Connection, circuit and connection box" in catalog part 0 "Introduction".
Bearing design	See "Bearings" in catalog part 0 "Introduction".
Cantilever forces	See "Admissible cantilever forces" in catalog part 0 "Introduction".
Options	See the selection and ordering data for "Special versions"

General note

All the data listed in the catalog is applicable for a 50 Hz line supply. With converter-fed operation, the reduction factors for constant torque and drives for fans, pumps and compressors must be observed. Noise values for motors operating with a converter at frequencies other than 50 Hz are available on request.

Mechanical limit speeds

When the motor is operated at its rated frequency, it is important to note that the maximum speeds are limited by the limits for the roller bearings, critical rotor speed and rigidity of the rotating parts.

Ventilation/noise generation (converter-fed operation)

The fan noise can increase at speeds that are higher than the rated speed of self-ventilated motors. To increase motor utilization at low speeds it is recommended that forced-ventilated motors are used.

Mechanical stress and grease lifetime (converter-fed operation)

High speeds that exceed the rated speed and the resulting increased vibrations alter the mechanical running smoothness and the bearings are subjected to increased mechanical stress. This reduces the grease lifetime and the bearing lifetime. More detailed information on request.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Orientation

Selection and ordering data

Preliminary selection of the motor according to motor type/series, speed or number of poles, frame size, rated output, rated torque, rated speed and rated current

Self-ventilated energy-saving motors with improved efficiency

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Aluminum series 1LA7 and 1LA5 (motors with external fan)						
3000, 2-pole	56 M ... 225 M	0.09 ... 45	2830 ... 2960	0.30 ... 145	0.26 ... 78	2/10 ... 2/11
1500, 4-pole	56 M ... 225 M	0.06 ... 45	1350 ... 1470	0.42 ... 292	0.2 ... 80	2/12 ... 2/13
1000, 6-pole	63 M ... 225 M	0.09 ... 30	850 ... 978	1 ... 293	0.44 ... 61	2/14 ... 2/15
750, 8-pole	71 M ... 225 M	0.09 ... 22	630 ... 724	1.4 ... 290	0.36 ... 44.5	2/16 ... 2/17
1500/3000, 4/2-pole	63 M ... 200 L	0.1 ... 26	1330 ... 1465	0.72 ... 169	0.41 ... 48.5	2/18 ... 2/19
750/1500, 8/4-pole	90 S ... 200 L	0.35 ... 17	675 ... 730	5.1 ... 223	1.19 ... 40.5	2/20 ... 2/21
Cast-iron series 1LA6 and 1LG4 (motors with external fan)						
3000, 2-pole	100 L ... 315 L	3 ... 200	2890 ... 2982	9.9 ... 641	6.1 ... 325	2/38 ... 2/39
1500, 4-pole	100 L ... 315 L	2.2 ... 200	1420 ... 1496	15 ... 1285	4.7 ... 340	2/40 ... 2/41
1000, 6-pole	100 L ... 315 L	1.5 ... 160	925 ... 988	15 ... 1547	3.9 ... 285	2/42 ... 2/43
750, 8-pole	100 L ... 315 L	0.75 ... 132	679 ... 738	11 ... 1708	2.15 ... 245	2/44 ... 2/45

Self-ventilated energy-saving motors with high efficiency

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW/HP	rpm	Nm	A	Page
Aluminum series 1LA9 (motors with external fan)						
For use according to CEMEP						
3000, 2-pole	56 M ... 200 L	0.09 ... 37	2830 ... 2950	0.3 ... 120	0.24 ... 64	2/22 ... 2/23
1500, 4-pole	56 M ... 200 L	0.06 ... 30	1380 ... 1465	0.42 ... 196	0.22 ... 53	2/24 ... 2/25
1000, 6-pole	90 S ... 200 L	0.75 ... 22	925 ... 975	7.7 ... 215	2 ... 45	2/26 ... 2/27
For use in the North American market according to EPACT						
3600, 2-pole	56 M ... 200 L	0.12 ... 50	3440 ... 3555	0.25 ... 100	0.23 ... 57	2/28 ... 2/29
1800, 4-pole	56 M ... 200 L	0.08 ... 40	1715 ... 1770	0.33 ... 161	0.18 ... 47	2/30 ... 2/31
1200, 6-pole	90 S ... 200 L	1 ... 30	1140 ... 1175	6.2 ... 182	1.78 ... 40	2/32 ... 2/33
Cast-iron series 1LG6 (motors with external fan)						
For use according to CEMEP						
3000, 2-pole	180 M ... 315 L	22 ... 200	2955 ... 2982	71 ... 641	38.5 ... 320	2/48 ... 2/49
1500, 4-pole	180 M ... 315 L	18.5 ... 200	1470 ... 1490	120 ... 1282	34.5 ... 340	2/48 ... 2/49
1000, 6-pole	180 M ... 315 L	15 ... 160	975 ... 990	147 ... 1543	29.5 ... 280	2/50 ... 2/51
750, 8-pole	180 M ... 315 L	11 ... 132	725 ... 740	145 ... 1704	23.5 ... 240	2/50 ... 2/51
For use in the North American market according to EPACT						
3600, 2-pole	180 M ... 315 L	30 ... 300	3560 ... 3591	60 ... 595	34 ... 320	2/52 ... 2/53
1800, 4-pole	180 M ... 315 L	25 ... 300	1775 ... 1792	100 ... 1193	31 ... 335	2/54 ... 2/55
1200, 6-pole	180 M ... 315 L	20 ... 200	1178 ... 1192	121 ... 1195	25.5 ... 235	2/56 ... 2/57

Self-ventilated motors with increased output

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Aluminum series 1LA9 (motors with external fan)						
3000, 2-pole	56 M ... 200 L	0.2 ... 53	2830 ... 2944	0.67 ... 172	0.51 ... 95	2/34 ... 2/35
1500, 4-pole	56 M ... 200 L	0.14 ... 43	1384 ... 1465	0.97 ... 280	0.44 ... 80	2/36 ... 2/37
Cast-iron series 1LG4 (motors with external fan)						
3000, 2-pole	180 M ... 280 M	30 ... 110	2950 ... 2975	97 ... 353	54 ... 184	2/46 ... 2/47
1500, 4-pole	180 L ... 280 M	30 ... 110	1465 ... 1488	196 ... 706	59 ... 198	2/46 ... 2/47
1000, 6-pole	180 L ... 280 M	18.5 ... 75	970 ... 985	182 ... 727	37.5 ... 136	2/46 ... 2/47
750, 8-pole	180 L ... 280 M	15 ... 55	720 ... 735	199 ... 715	34 ... 106	2/46 ... 2/47

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Orientation

Selection and ordering data (continued)

Self-cooled motors without external fan

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LP7 and 1LP5 (motors without external fan)						
3000, 2-pole	63 M ... 200 L	0.12 ... 16.5	The electrical data can be calculated and supplied on receipt of order.			2/58
1500, 4-pole	63 M ... 200 L	0.07 ... 12				2/59
1000, 6-pole	63 M ... 200 L	0.045 ... 8.5				2/60
750, 8-pole	63 M ... 200 L	0.045 ... 7.5				2/61
Cast-iron series 1LP4 (motors with external fan)						
3000, 2-pole	180 M ... 315 L	7.3 ... 67	2945 ... 2984	24 ... 214	0.068 ... 2.09	2/62
1500, 4-pole	180 M ... 315 L	6.2 ... 67	1465 ... 1488	40 ... 430	0.099 ... 3.46	2/63
1000, 6-pole	180 L ... 315 L	5 ... 44	970 ... 990	49 ... 424	0.175 ... 4.02	2/64
750, 8-pole	180 L ... 315 L	3.7 ... 37	725 ... 740	49 ... 477	0.169 ... 3.95	2/65

More information

For more information, please contact your local Siemens contact – see “Siemens Contacts Worldwide” in the Appendix.

2

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz				For Order No. supplements for voltage and type of construction see table below	IM B3 type of construction approx.
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	Phase-out model	m kg	
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection												
0.09	0.11	56 M	2830	0.3		63	62	0.81	0.26	1LA7 050-2AA□□	3	
0.12	0.14	56 M	2800	0.41		65	64	0.83	0.32	1LA7 053-2AA□□	3	
0.18	0.21	63 M	2820	0.61		64	63	0.79	0.51	1LA7 060-2AA□□	3.5	
0.25	0.29	63 M	2830	0.84		65	65	0.80	0.69	1LA7 063-2AA□□	4.1	
0.37	0.43	71 M	2740	1.3		66	65	0.82	1	1LA7 070-2AA□□	5	
0.55	0.63	71 M	2800	1.9		71	70	0.82	1.36	1LA7 073-2AA□□	6	
0.75	0.86	80 M	2855	2.5		73	72	0.86	1.73	1LA7 080-2AA□□	9	
1.1	1.3	80 M	2845	3.7	EFF2	77	77	0.87	2.4	1LA7 083-2AA□□	11	
1.5	1.75	90 S	2860	5	EFF2	79	80	0.85	3.25	1LA7 090-2AA□□	12.9	
2.2	2.55	90 L	2880	7.3	EFF2	82	82	0.85	4.55	1LA7 096-2AA□□	15.7	
3	3.45	100 L	2890	9.9	EFF2	84	84	0.85	6.1	1LA7 106-2AA□□	22	
4	4.6	112 M	2905	13	EFF2	86	86	0.86	7.8	1LA7 113-2AA□□	29	
5.5	6.3	132 S	2925	18	EFF2	86.5	86.5	0.89	10.4	1LA7 130-2AA□□	39	
7.5	8.6	132 S	2930	24	EFF2	88	88	0.89	13.8	1LA7 131-2AA□□	48	
11	12.6	160 M	2930	36	EFF2	89.5	89.5	0.88	20	1LA7 163-2AA□□	68	
15	17.3	160 M	2930	49	EFF2	90	90.2	0.9	26.5	1LA7 164-2AA□□	77	
18.5	21.3	160 L	2940	60	EFF2	91	91.2	0.91	32	1LA7 166-2AA□□	86	
22	24.5	180 M	2940	71	EFF2	91.7	91.7	0.88	39.5 ¹⁾	1LA5 183-2AA□□	113	
30	33.5	200 L	2945	97	EFF2	92.3	92.3	0.89	53	1LA5 206-2AA□□	159	
37	41.5	200 L	2945	120	EFF2	92.8	92.8	0.89	65 ¹⁾	1LA5 207-2AA□□	179	
45	51	225 M	2960	145	EFF2	93.6	93.6	0.89	78 ¹⁾	1LA5 223-2AA□□	209	

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz			60 Hz			Without flange		With flange			With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover ²⁾	IM V1 with protective cover ²⁾³⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
1	6	3	5	1	6	0	1	4	6	2	7	3		
1LA7 05 □□	○	○	○	–	○	○	□	✓	–	✓	✓	✓		
1LA7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓		
1LA7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓		
1LA7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓		
1LA7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓		
1LA7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓		
1LA7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓		
1LA7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓		
1LA7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓		
1LA5 18 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–		
1LA5 20 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–		
1LA5 22 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–		

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For connection to 230 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").

²⁾ 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting torque	as multiple of rated current	torque			Measuring surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
▶ Phase-out model	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pFA} dB(A)	L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA7 050-2AA□□	2	3.7	2.3	16	0.00015	41	52
1LA7 053-2AA□□	2.1	3.7	2.4	16	0.00015	41	52
1LA7 060-2AA□□	2	3.7	2.2	16	0.00018	49	60
1LA7 063-2AA□□	2	4	2.2	16	0.00022	49	60
1LA7 070-2AA□□	2.3	3.5	2.3	16	0.00029	52	63
1LA7 073-2AA□□	2.5	4.3	2.6	16	0.00041	52	63
1LA7 080-2AA□□	2.3	5.6	2.4	16	0.00079	56	67
1LA7 083-2AA□□	2.6	6.1	2.7	16	0.001	56	67
1LA7 090-2AA□□	2.4	5.5	2.7	16	0.0014	62	74
1LA7 096-2AA□□	2.8	6.3	3.1	16	0.0018	62	74
▶ 1LA7 106-2AA□□	2.8	6.8	3	16	0.0035	62	74
▶ 1LA7 113-2AA□□	2.6	7.2	2.9	16	0.0059	63	75
▶ 1LA7 130-2AA□□	2	5.9	2.8	16	0.015	68	80
▶ 1LA7 131-2AA□□	2.3	6.9	3	16	0.019	68	80
▶ 1LA7 163-2AA□□	2.1	6.5	2.9	16	0.034	70	82
▶ 1LA7 164-2AA□□	2.2	6.6	3	16	0.043	70	82
▶ 1LA7 166-2AA□□	2.4	7	3.1	16	0.051	70	82
1LA5 183-2AA□□	2.5	6.9	3.2	16	0.077	70	83
1LA5 206-2AA□□	2.4	7.2	2.8	16	0.14	71	84
1LA5 207-2AA□□	2.4	7.7	2.8	16	0.16	71	84
1LA5 223-2AA□□	2.8	7.7	3.4	16	0.2	71	84

- ▶ The Order No. for 1LA7 motors marked with this symbol are phase-out models.

1LE1 motors are the successors.

For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Self-ventilated energy-saving motors with improved efficiency" Pages 1/18 to 1/21 or under "General Line motors with shorter delivery time" (defined versions - voltages, types of construction, motor protection and location of the connection boxes) Pages 1/8 to 1/17.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz				For Order No. supplements for voltage and type of construction see table below	IM B3 type of construction approx.
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	► Phase-out model	<i>m</i> kg	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection												
0.06	0.07	56 M	1350	0.42		56	55	0.77	0.2	1LA7 050-4AB□□	3	
0.09	0.11	56 M	1350	0.64		58	57	0.77	0.29	1LA7 053-4AB□□	3	
0.12	0.14	63 M	1350	0.85		55	54	0.75	0.42	1LA7 060-4AB□□	3.5	
0.18	0.21	63 M	1350	1.3		59	60	0.76	0.58	1LA7 063-4AB□□	4.1	
0.25	0.29	71 M	1350	1.8		60	60	0.78	0.77	1LA7 070-4AB□□	4.8	
0.37	0.43	71 M	1370	2.6		65	65	0.78	1.06	1LA7 073-4AB□□	6	
0.55	0.63	80 M	1395	3.8		67	67	0.81	1.46	1LA7 080-4AA□□	9	
0.75	0.86	80 M	1395	5.1		72	72	0.8	1.91	1LA7 083-4AA□□	10	
1.1	1.3	90 S	1415	7.4		77	77	0.81	2.55	1LA7 090-4AA□□	13	
1.5	1.75	90 L	1420	10	EFF2	79	79	0.81	3.4	1LA7 096-4AA□□	15.6	
2.2	2.55	100 L	1420	15	EFF2	82	82.5	0.82	4.7	► 1LA7 106-4AA□□	21	
3	3.45	100 L	1420	20	EFF2	83	83.5	0.82	6.4	► 1LA7 107-4AA□□	24	
4	4.6	112 M	1440	27	EFF2	85	85.5	0.83	8.2	► 1LA7 113-4AA□□	31	
5.5	6.3	132 S	1455	36	EFF2	86	86	0.81	11.4	► 1LA7 130-4AA□□	41	
7.5	8.6	132 M	1455	49	EFF2	87	87.5	0.82	15.2	► 1LA7 133-4AA□□	49	
11	12.6	160 M	1460	72	EFF2	88.5	89	0.84	21.5	► 1LA7 163-4AA□□	73	
15	17.3	160 L	1460	98	EFF2	90	90.2	0.84	28.5	► 1LA7 166-4AA□□	85	
18.5	21.3	180 M	1460	121	EFF2	90.5	90.5	0.83	35.5 ¹⁾	1LA5 183-4AA□□	113	
22	25.3	180 L	1460	144	EFF2	91.2	91.2	0.84	41.5 ¹⁾	1LA5 186-4AA□□	123	
30	34.5	200 L	1465	196	EFF2	91.8	91.8	0.86	55	1LA5 207-4AA□□	157	
37	42.5	225 NO	1470	240	EFF2	92.9	92.9	0.87	66 ¹⁾	1LA5 220-4AA□□	206	
45	52	225 M	1470	292	EFF2	93.4	93.4	0.87	80 ¹⁾	1LA5 223-4AA□□	232	

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz		60 Hz				Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover ²⁾	IM V1 with protective cover ²⁾³⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA7 05 □□	○	○	○	–	○	○	□	✓	–	✓	✓	✓	✓
1LA7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 20 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 22 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For connection to 230 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
²⁾ 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.
⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting as multiple of rated torque	as multiple of rated current	torque	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}				
▶ Phase-out model							
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA7 050-4AB□□	1.9	2.6	1.9	13	0.00027	42	53
1LA7 053-4AB□□	1.9	2.6	1.9	13	0.00027	42	53
1LA7 060-4AB□□	1.9	2.8	2	13	0.00029	42	53
1LA7 063-4AB□□	1.9	3	1.9	13	0.00037	42	53
1LA7 070-4AB□□	1.9	3	1.9	13	0.00052	44	55
1LA7 073-4AB□□	1.9	3.3	2.1	13	0.00077	44	55
1LA7 080-4AA□□	2.2	3.9	2.2	16	0.0014	47	58
1LA7 083-4AA□□	2.3	4.2	2.3	16	0.0017	47	58
1LA7 090-4AA□□	2.3	4.6	2.4	16	0.0024	50	62
1LA7 096-4AA□□	2.4	5.3	2.6	16	0.0033	50	62
▶ 1LA7 106-4AA□□	2.5	5.6	2.8	16	0.0047	56	68
▶ 1LA7 107-4AA□□	2.7	5.6	3	16	0.0055	56	68
▶ 1LA7 113-4AA□□	2.7	6	3	16	0.012	53	65
▶ 1LA7 130-4AA□□	2.5	6.3	3.1	16	0.018	62	74
▶ 1LA7 133-4AA□□	2.7	6.7	3.2	16	0.023	62	74
▶ 1LA7 163-4AA□□	2.2	6.2	2.7	16	0.043	66	78
▶ 1LA7 166-4AA□□	2.6	6.5	3	16	0.055	66	78
1LA5 183-4AA□□	2.3	7.5	3	16	0.13	63	76
1LA5 186-4AA□□	2.3	7.5	3	16	0.15	63	76
1LA5 207-4AA□□	2.6	7	3.2	16	0.24	65	78
1LA5 220-4AA□□	2.8	7	3.2	16	0.32	65	78
1LA5 223-4AA□□	2.8	7.7	3.3	16	0.36	65	78

- ▶ The Order No. for 1LA7 motors marked with this symbol are phase-out models.
1LE1 motors are the successors.
For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Self-ventilated energy-saving motors with improved efficiency" Pages 1/18 to 1/21 or under "General Line motors with shorter delivery time" (defined versions - voltages, types of construction, motor protection and location of the connection boxes) Pages 1/8 to 1/17.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load				Rated current at 400 V, 50 Hz	For Order No. supplements for voltage and type of construction see table below	IM B3 type of construction approx.
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	► Phase-out model	m kg	
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection											
0.09	0.1	63 M	850	1	45	41.5	0.66	0.44	1LA7 063-6AB□□	4.1	
0.18	0.21	71 M	850	2	53	54.5	0.68	0.72	1LA7 070-6AA□□	5	
0.25	0.29	71 M	830	2.8	60	58.5	0.76	0.79	1LA7 073-6AA□□	6.3	
0.37	0.43	80 M	920	3.8	62	60.5	0.72	1.2	1LA7 080-6AA□□	9	
0.55	0.63	80 M	910	5.8	67	66.5	0.74	1.6	1LA7 083-6AA□□	10	
0.75	0.86	90 S	915	7.8	69	69	0.76	2.05	1LA7 090-6AA□□	12.5	
1.1	1.3	90 L	915	11	72	72	0.77	2.85	1LA7 096-6AA□□	15.7	
1.5	1.75	100 L	925	15	74	74	0.75	3.9	► 1LA7 106-6AA□□	21	
2.2	2.55	112 M	940	22	78	78.5	0.78	5.2	► 1LA7 113-6AA□□	26	
3	3.45	132 S	950	30	79	79.5	0.76	7.2	► 1LA7 130-6AA□□	38	
4	4.6	132 M	950	40	80.5	80.5	0.76	9.4	► 1LA7 133-6AA□□	44	
5.5	6.3	132 M	950	55	83	83	0.76	12.6	► 1LA7 134-6AA□□	52	
7.5	8.6	160 M	960	75	86	86	0.74	17	► 1LA7 163-6AA□□	74	
11	12.6	160 L	960	109	87.5	87.5	0.74	24.5	► 1LA7 166-6AA□□	95	
15	18	180 L	970	148	89.5	89.5	0.77	31.5	1LA5 186-6AA□□	126	
18.5	22	200 L	975	181	90.2	90.2	0.77	38.5	1LA5 206-6AA□□	161	
22	26.5	200 L	975	215	90.8	90.8	0.77	45.5	1LA5 207-6AA□□	183	
30	36	225 M	978	293	91.8	91.8	0.77	61 ¹⁾	1LA5 223-6AA□□	214	

Order No. supplements

Motor type	Penultimate position: Voltage code					Final position: Type of construction code							
	50 Hz		60 Hz			Without flange	With flange		With standard flange		With special flange		
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY (see "Introduction" for outputs at 60 Hz)	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover ²⁾	IM V1 with protective cover ²⁾³⁾	IM V3	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA7 05 □□	○	○	○	–	○	○	□	✓	–	✓	✓	✓	✓
1LA7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 20 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 22 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For connection to 230 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
²⁾ 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.
⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting as multiple of rated torque	as multiple of rated current	torque	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}				
▶ Phase-out model							
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA7 063-6AB□□	1.8	2	1.9	13	0.00037	39	50
1LA7 070-6AA□□	2.1	2.3	1.9	16	0.00055	39	50
1LA7 073-6AA□□	2.2	2.7	2	16	0.0008	39	50
1LA7 080-6AA□□	1.9	3.1	2.1	16	0.0014	40	51
1LA7 083-6AA□□	2.1	3.4	2.2	16	0.0017	40	51
1LA7 090-6AA□□	2.2	3.7	2.2	16	0.0024	43	55
1LA7 096-6AA□□	2.3	3.8	2.3	16	0.0033	43	55
▶ 1LA7 106-6AA□□	2.3	4	2.3	16	0.0047	47	59
▶ 1LA7 113-6AA□□	2.2	4.6	2.5	16	0.0091	52	64
▶ 1LA7 130-6AA□□	1.9	4.2	2.2	16	0.015	63	75
▶ 1LA7 133-6AA□□	2.1	4.5	2.4	16	0.019	63	75
▶ 1LA7 134-6AA□□	2.3	5	2.6	16	0.025	63	75
▶ 1LA7 163-6AA□□	2.1	4.6	2.5	16	0.044	66	78
▶ 1LA7 166-6AA□□	2.3	4.8	2.6	16	0.063	66	78
1LA5 186-6AA□□	2	5.2	2.4	16	0.15	66	78
1LA5 206-6AA□□	2.7	5.5	2.8	16	0.24	66	78
1LA5 207-6AA□□	2.8	5.5	2.9	16	0.28	66	78
1LA5 223-6AA□□	2.8	5.7	2.9	16	0.36	66	78

- ▶ The Order No. for 1LA7 motors marked with this symbol are phase-out models.

1LE1 motors are the successors.

For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Self-ventilated energy-saving motors with improved efficiency" Pages 1/18 to 1/21 or under "General Line motors with shorter delivery time" (defined versions - voltages, types of construction, motor protection and location of the connection boxes) Pages 1/8 to 1/17.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Efficiency at 50 Hz 2/4-load						For Order No. supplements for voltage and type of construction see table below	IM B3 type of construction approx.
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	► Phase-out model	m kg		
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection													
0.09	0.1	71 M	630	1.4	53	54.5	0.68	0.36	0.36	1LA7 070-8AB□□	6.3		
0.12	0.14	71 M	645	1.8	53	49.5	0.64	0.51	0.51	1LA7 073-8AB□□	6.3		
0.18	0.21	80 M	675	2.5	51	49.5	0.68	0.75	0.75	1LA7 080-8AB□□	9		
0.25	0.29	80 M	685	3.5	55	50.5	0.64	1.02	1.02	1LA7 083-8AB□□	10		
0.37	0.43	90 S	675	5.2	63	62	0.75	1.14	1.14	1LA7 090-8AB□□	10.5		
0.55	0.63	90 L	675	7.8	66	65	0.76	1.58	1.58	1LA7 096-8AB□□	13.2		
0.75	0.86	100 L	680	11	66	65	0.76	2.15	2.15	► 1LA7 106-8AB□□	19		
1.1	1.3	100 L	680	15	72	72	0.76	2.9	2.9	► 1LA7 107-8AB□□	22		
1.5	1.75	112 M	705	20	74	74	0.76	3.85	3.85	► 1LA7 113-8AB□□	24		
2.2	2.55	132 S	700	30	75	75	0.74	5.7	5.7	► 1LA7 130-8AB□□	38		
3	3.45	132 M	700	41	77	77.5	0.74	7.6	7.6	► 1LA7 133-8AB□□	44		
4	4.6	160 M	715	53	80	80	0.72	10	10	► 1LA7 163-8AB□□	64		
5.5	6.3	160 M	710	74	83.5	83.5	0.73	13	13	► 1LA7 164-8AB□□	74		
7.5	8.6	160 L	715	100	85.5	85.5	0.72	17.6	17.6	► 1LA7 166-8AB□□	94		
11	13.2	180 L	725	145	87	87	0.75	24.5	24.5	1LA5 186-8AB□□	128		
15	18	200 L	725	198	87.5	87.5	0.78	31.5	31.5	1LA5 207-8AB□□	176		
18.5	22	225 NO	725	244	89.2	89.2	0.79	38	38	1LA5 220-8AB□□	184		
22	26.5	225 M	725	290	90.6	90.6	0.79	44.5	44.5	1LA5 223-8AB□□	214		

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz			60 Hz			Without flange		With flange		With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover 1) 2)	IM V1 with protective cover 1) 2)	IM V3	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA7 05 □□	○	○	○	–	○	○	□	✓	–	✓	✓	✓	✓
1LA7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA5 20 □□	○	○	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA5 22 □□	○	○	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

¹⁾ 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

²⁾ The “Second shaft extension” option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting as multiple of rated torque	as multiple of rated current	torque	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}				
▶ Phase-out model							
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA7 070-8AB□□	1.9	2.2	1.7	13	0.0008	36	47
1LA7 073-8AB□□	2.2	2.2	2	13	0.0008	36	47
1LA7 080-8AB□□	1.7	2.3	1.9	13	0.0014	41	52
1LA7 083-8AB□□	2	2.6	2.2	13	0.0017	41	52
1LA7 090-8AB□□	1.6	2.9	1.8	13	0.0023	41	53
1LA7 096-8AB□□	1.7	3	1.9	13	0.0031	41	53
▶ 1LA7 106-8AB□□	1.6	3	1.9	13	0.0051	45	57
▶ 1LA7 107-8AB□□	1.8	3.3	2.1	13	0.0063	45	57
▶ 1LA7 113-8AB□□	1.8	3.7	2.1	13	0.013	49	61
▶ 1LA7 130-8AB□□	1.9	3.9	2.3	13	0.014	53	65
▶ 1LA7 133-8AB□□	2.1	4.1	2.4	13	0.019	53	65
▶ 1LA7 163-8AB□□	2.2	4.5	2.6	13	0.036	63	75
▶ 1LA7 164-8AB□□	2.3	4.7	2.7	13	0.046	63	75
▶ 1LA7 166-8AB□□	2.7	5.3	3	13	0.064	63	75
1LA5 186-8AB□□	2	5	2.2	13	0.21	60	73
1LA5 207-8AB□□	2.1	5	2.2	13	0.37	58	71
1LA5 220-8AB□□	2.1	4.5	2.2	13	0.37	58	71
1LA5 223-8AB□□	2.2	4.8	2.3	13	0.45	58	71

- ▶ The Order No. for 1LA7 motors marked with this symbol are phase-out models.
1LE1 motors are the successors.
For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Self-ventilated energy-saving motors with improved efficiency" Pages 1/18 to 1/21.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Rated output at 50 Hz, 1500 rpm		Frame size		Rated speed at 50 Hz, 1500 rpm		Rated torque at 50 Hz, 1500 rpm		Efficiency at 50 Hz 4/4-load		Power factor at 50 Hz 4/4-load		Rated current at 400 V, 50 Hz		Order No.	Price	Weight motor
1500 rpm	3000 rpm		FS	1500 rpm	3000 rpm	1500 rpm	3000 rpm	1500 rpm	3000 rpm	1500 rpm	3000 rpm	1500 rpm	3000 rpm			
P_{rated} kW	kW		FS	n_{rated} rpm	rpm	T_{rated} Nm	Nm	η_{rated} %	%	$\cos\phi_{rated}$		I_{rated} A	A			m kg
4/2-pole, 1500/3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, double pole-changing for constant load torque with one winding connected in Dahlander circuit																
0.1	0.15	63 M		1330	2650	0.72	0.54	45	52	0.79	0.82	0.41	0.51	1LA7 060-0AAQQ		3.5
0.15	0.2	63 M		1330	2750	1.1	0.7	45	57	0.71	0.73	0.68	0.7	1LA7 063-0AAQQ		4.1
0.21	0.28	71 M		1375	2770	1.5	0.97	59	48	0.73	0.76	0.7	1.1	1LA7 070-0AAQQ		4.8
0.3	0.43	71 M		1390	2780	2.1	1.5	64	58	0.76	0.82	0.89	1.3	1LA7 073-0AAQQ		7
0.48	0.6	80 M		1390	2810	3.3	2	66	64	0.82	0.84	1.25	1.6	1LA7 080-0AAQQ		9
0.7	0.85	80 M		1390	2810	4.8	2.9	69	70	0.84	0.83	1.75	2.1	1LA7 083-0AAQQ		10
1.1	1.4	90 S		1390	2810	7.6	4.8	69	66	0.85	0.85	2.7	3.6	1LA7 090-0AAQQ		13
1.5	1.9	90 L		1410	2860	10	6.4	74	72	0.86	0.85	3.4	4.5	1LA7 096-0AAQQ		15.6
2	2.4	100 L		1410	2870	14	8	81	75	0.84	0.84	4.25	5.5	1LA7 106-0AAQQ		21
2.6	3.1	100 L		1400	2850	18	10	79	74	0.86	0.8	5.5	7.6	1LA7 107-0AAQQ		24
3.7	4.4	112 M		1420	2885	25	15	79	76	0.85	0.8	8	10.5	1LA7 113-0AAQQ		31
4.7	5.9	132 S		1450	2920	31	19	83	80	0.84	0.85	9.7	12.5	1LA7 130-0AAQQ		41
6.5	8	132 M		1450	2930	43	26	82	82.5	0.84	0.84	13.6	16.7	1LA7 133-0AAQQ		50
9.3	11.5	160 M		1455	2930	61	37	86.5	80	0.85	0.89	18.3	23.4	1LA7 163-0AAQQ		74
13	17	160 L		1455	2930	85	55	87.5	87	0.84	0.88	25.6	32	1LA7 166-0AAQQ		92
15	18	180 M		1470	2950	97	58	90	86.5	0.83	0.8	29	37.5	1LA5 183-0AAQQ		113
18	21.5	180 L		1465	2950	117	70	90	87	0.84	0.85	34.5	42	1LA5 186-0AAQQ		123
26	31	200 L		1465	2940	169	101	90.9	86.5	0.86	0.85	48.5	61	1LA5 207-0AAQQ		157

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz, direct online starting				Without flange		With flange		With standard flange		With special flange	
	230 V	400 V	500 V	690 V	IM B3, IM B6/7/8, IM V6/5 without protective cover	IM B5, IM V1 without protective cover ¹⁾	IM V1 with protective cover ¹⁾²⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
1	6	5	0	0	1	4	6	2	7	3		
1LA7 06 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
1LA7 07 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
1LA7 08 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
1LA7 09 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
1LA7 10 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
1LA7 11 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
1LA7 13 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
1LA7 16 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
1LA5 18 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> ³⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1LA5 20 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> ³⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

- Standard version
- Without additional charge
- With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

¹⁾ 1LA5 183-... to 1LA5 207-... motors (motor series 1LA5, frame size 180 M to 200 L) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

²⁾ The “Second shaft extension” option, order code **K16** is not possible.
³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting 1500 rpm T_{LR}/T_{rated}	Locked-rotor torque as multiple of torque 3000 rpm T_{LR}/T_{rated}	Locked-rotor current 1500 rpm I_{LR}/I_{rated}	Locked-rotor current 3000 rpm I_{LR}/I_{rated}	Breakdown torque 1500 rpm T_B/T_{rated}	Breakdown torque 3000 rpm T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²
4/2-pole, 1500/3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, double pole-changing for constant load torque with one winding connected in Dahlander circuit								
1LA7 060-0AA□□	1.8	1.8	2.7	2.9	1.8	1.8	10	0.00029
1LA7 063-0AA□□	2	2	3	3.3	2	2	10	0.0004
1LA7 070-0AA□□	1.6	1.6	3	3.1	1.8	1.8	10	0.00052
1LA7 073-0AA□□	1.8	1.8	3.7	3.8	2	2	10	0.00076
1LA7 080-0AA□□	1.7	1.7	3.9	4	2	2	10	0.0014
1LA7 083-0AA□□	1.8	1.8	4.3	4.3	2.1	2.1	10	0.0017
1LA7 090-0AA□□	1.6	1.8	4.2	4.3	1.9	2	13	0.0024
1LA7 096-0AA□□	1.9	1.9	4.9	5.3	2	2.1	13	0.0033
1LA7 106-0AA□□	1.8	1.8	5	5.5	2	2.1	13	0.0048
1LA7 107-0AA□□	2.3	2.4	5.6	5.6	2.4	2.4	13	0.0055
1LA7 113-0AA□□	2	2.2	5.6	5.8	2.2	2.3	13	0.011
1LA7 130-0AA□□	1.7	1.6	6.3	6.5	2.2	2.2	10	0.018
1LA7 133-0AA□□	2	2.1	6.9	7.5	2.5	2.6	10	0.023
1LA7 163-0AA□□	2	1.8	6.7	7.4	2.6	2.4	10	0.043
1LA7 166-0AA□□	2.5	2.8	7.6	8.5	3	3	10	0.06
1LA5 183-0AA□□	2.1	2.2	6.7	7.5	2.7	3.2	13	0.13
1LA5 186-0AA□□	2	2.2	6.4	7.3	2.6	3.1	13	0.15
1LA5 207-0AA□□	2.6	2.6	6.7	7.5	2.8	3.3	13	0.24

See catalog part "Fan motors" for pole-changing motors for quadratic load torque for driving fans.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Rated output at 50 Hz,		Frame size	Rated speed at 50 Hz,		Rated torque at 50 Hz,		Efficiency at 50 Hz 4/4-load		Power factor at 50 Hz 4/4-load		Rated current at 400 V, 50 Hz		Order No.	Price	Weight motor
750 rpm	1500 rpm		750 rpm	1500 rpm	750 rpm	1500 rpm	750 rpm	1500 rpm	750 rpm	1500 rpm	750 rpm	1500 rpm			
P_{rated}	kW	FS	n_{rated}	rpm	T_{rated}	Nm	η_{rated}	%	$\cos\phi_{\text{rated}}$	I_{rated}	A	A			m
			rpm	rpm	Nm	Nm	%	%		A	A				kg
8/4-pole, 750/1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, double pole-changing for constant load torque with one winding connected in Dahlander circuit															
0.35	0.5	90 S	675	1365	5.1	3.6	60	65	0.71	0.79	1.19	1.41	1LA7 090-0ABQQ		11
0.5	0.7	90 L	675	1380	7.1	4.9	63	62	0.72	0.78	1.6	2.1	1LA7 096-0ABQQ		13.2
0.7	1.1	100 L	690	1380	9.8	7.7	65	61	0.74	0.8	2.1	3.25	1LA7 106-0ABQQ		20
0.9	1.5	100 L	690	1380	13	10	69	67	0.70	0.8	2.7	4.0	1LA7 107-0ABQQ		22
1.4	1.9	112 M	690	1410	19	13	69	70	0.73	0.75	4	5.2	1LA7 113-0ABQQ		25
1.8	3.6	132 S	720	1430	24	24	72	80	0.57	0.9	6.3	7.2	1LA7 130-0ABQQ		41
2.5	5	132 M	720	1430	33	33	73	80	0.6	0.9	8.2	10	1LA7 133-0ABQQ		49
3.5	7	160 M	725	1450	46	46	77	81.5	0.56	0.89	11.7	13.9	1LA7 163-0ABQQ		73
5.6	11	160 L	725	1450	74	72	78	83	0.56	0.89	18.5	21.5	1LA7 166-0ABQQ		91
11	18	180 L	725	1455	144	118	83.5	83.5	0.69	0.87	27.5	35	1LA5 186-0ABQQ		123
17	27	200 L	730	1465	223	177	89	89.5	0.68	0.86	40.5	50.5	1LA5 207-0ABQQ		157

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz, direct online starting				Without flange	With flange			With standard flange		With special flange
	230 V	400 V	500 V	690 V	IM B3, IM B6/7/8, IM V6/5 without protective cover	IM B5, IM V1 without protective cover ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
1	6	5	0	0	1	4	6	2	7	3	
1LA7 06 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 07 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 08 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA5 20 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ 1LA5 183-... to 1LA5 207-... motors (motor series 1LA5, frame size 180 M to 200 L) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting at 750 rpm T_{LR}/T_{rated}	Locked-rotor torque as multiple of current at 1500 rpm T_{LR}/T_{rated}	Locked-rotor current at 750 rpm I_{LR}/I_{rated}	Locked-rotor current at 1500 rpm I_{LR}/I_{rated}	Breakdown torque at 750 rpm T_B/T_{rated}	Breakdown torque at 1500 rpm T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²
8/4-pole, 750/1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, double pole-changing for constant load torque with one winding connected in Dahlander circuit								
1LA7 090-0AB□□	1.3	1.3	2.5	3.2	1.6	1.6	10	0.0023
1LA7 096-0AB□□	1.4	1.5	3	3.5	1.7	1.8	10	0.0031
1LA7 106-0AB□□	1.7	1.6	3.3	3.5	2	1.9	10	0.0051
1LA7 107-0AB□□	1.8	1.6	3.5	3.6	2	1.9	10	0.0063
1LA7 113-0AB□□	1.4	1.5	3.6	4.4	1.7	1.8	10	0.013
1LA7 130-0AB□□	2	1.3	4.3	5.4	2.3	1.8	10	0.018
1LA7 133-0AB□□	2	1.3	4.3	5.4	2.3	1.8	10	0.023
1LA7 163-0AB□□	2	1.4	4	5.4	2.3	1.8	10	0.043
1LA7 166-0AB□□	2.2	1.7	4.2	5.9	2.4	2	10	0.06
1LA5 186-0AB□□	1.9	2	5.2	6.2	2.2	2.2	13	0.21
1LA5 207-0AB□□	2.4	2.3	5.4	6.6	2.5	2.5	13	0.37


See catalog part "Fan motors" for pole-changing motors for quadratic load torque for driving fans.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output							Order No.	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below		
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP											
0.09	56 M	2830	0.3		70	70	0.76	0.24	1LA9 050-2KAQQ	3	
0.12	56 M	2830	0.4		70	70	0.81	0.31	1LA9 053-2KAQQ	3.8	
0.18	63 M	2840	0.61		70	70	0.78	0.48	1LA9 060-2KAQQ	4.1	
0.25	63 M	2840	0.84		72	72	0.8	0.63	1LA9 063-2KAQQ	5.1	
0.37	71 M	2840	1.2		74	74	0.77	0.94	1LA9 070-2KAQQ	6	
0.55	71 M	2835	1.9		75	75	0.75	1.42	1LA9 073-2KAQQ	7.2	
0.75	80 M	2870	2.5		80	80	0.82	1.66	1LA9 080-2KAQQ	9.8	
1.1	80 M	2860	3.7	EFF1	84	84	0.89	2.1	1LA9 083-2KAQQ	12.3	
1.5	90 S	2890	5	EFF1	85	85	0.87	2.95	1LA9 090-2KAQQ	15	
2.2	90 L	2890	7.3	EFF1	86.5	86.5	0.87	4.2	1LA9 096-2KAQQ	18.6	
3	100 L	2890	9.9	EFF1	87	87	0.88	5.7	1LA9 106-2KAQQ	24	
4	112 M	2905	13	EFF1	88.5	88.5	0.89	7.3	1LA9 113-2KAQQ	35	
5.5	132 S	2930	18	EFF1	89.5	89.5	0.9	9.9	1LA9 130-2KAQQ	43	
7.5	132 S	2930	24	EFF1	90.5	90.5	0.92	13	1LA9 131-2KAQQ	56	
11	160 M	2945	36	EFF1	91	91	0.9	19.4	1LA9 163-2KAQQ	73	
15	160 M	2945	49	EFF1	91.5	91.5	0.9	26.5	1LA9 164-2KAQQ	82	
18.5	160 L	2940	60	EFF1	92.3	92.5	0.92	31.5	1LA9 166-2KAQQ	102	
22	180 M	2945	71	EFF1	93	93.2	0.89	38.5 ¹⁾	1LA9 183-2WAQQ	131	
30	200 L	2950	97	EFF1	93.5	93.5	0.89	52	1LA9 206-2WAQQ	185	
37	200 L	2950	120	EFF1	94	94.1	0.89	64 ¹⁾	1LA9 207-2WAQQ	214	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange		With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover	IM V1 with protective cover ²⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	0	1	4	6	2	7	3	
1LA9 05 □□	○	○	○	–	□	✓	–	–	✓	✓	✓	
1LA9 06 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1LA9 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1LA9 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1LA9 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1LA9 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 18 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–	
1LA9 20 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For connection to 230 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP							
1LA9 050-2KA□□	3.6	4.5	3	16	0.00015	41	52
1LA9 053-2KA□□	3.2	4.3	2.8	16	0.0002	41	52
1LA9 060-2KA□□	2.8	4.8	3.1	16	0.00022	49	60
1LA9 063-2KA□□	2.5	4.9	2.5	16	0.00026	49	60
1LA9 070-2KA□□	3.3	6.5	3.1	16	0.00041	52	63
1LA9 073-2KA□□	3.6	6.3	2.9	16	0.0005	52	63
1LA9 080-2KA□□	4.4	8.3	3.2	16	0.001	56	67
1LA9 083-2KA□□	3.8	7	3.2	16	0.0013	56	67
1LA9 090-2KA□□	4.1	7	3.5	16	0.0018	60	72
1LA9 096-2KA□□	4.1	7	3.5	16	0.0022	60	72
1LA9 106-2KA□□	3.4	7	3.2	16	0.0044	62	74
1LA9 113-2KA□□	2.8	7	3.2	16	0.0077	63	75
1LA9 130-2KA□□	2.7	7	3.2	16	0.019	68	80
1LA9 131-2KA□□	2.8	7	3.1	16	0.024	68	80
1LA9 163-2KA□□	2.5	7	3.1	16	0.044	70	82
1LA9 164-2KA□□	2.5	7	3.1	16	0.051	70	82
1LA9 166-2KA□□	2.4	7	3.1	16	0.065	70	82
1LA9 183-2WA□□	2.6	7.2	3.3	16	0.09	70	83
1LA9 206-2WA□□	2.5	7	3.2	16	0.16	71	84
1LA9 207-2WA□□	2.7	7	3.3	16	0.2	71	84


The motors can also be used for 60 Hz according to EPACT, see Pages 2/28 to 2/33.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output							Order No.	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below		
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP											
0.06	56 M	1380	0.42		61	61	0.66	0.22	1LA9 050-4KAQQ	3	
0.09	56 M	1390	0.62		62	62	0.68	0.31	1LA9 053-4KAQQ	3.8	
0.12	63 M	1395	0.82		66	66	0.65	0.41	1LA9 060-4KAQQ	4.1	
0.18	63 M	1395	1.3		65	65	0.68	0.59	1LA9 063-4KAQQ	5.1	
0.25	71 M	1410	1.7		70	70	0.64	0.81	1LA9 070-4KAQQ	6	
0.37	71 M	1385	2.6		71	71	0.73	1.04	1LA9 073-4KAQQ	7.2	
0.55	80 M	1410	3.7		77	77	0.78	1.32	1LA9 080-4KAQQ	9.8	
0.75	80 M	1400	5.1		81	81	0.75	1.78	1LA9 083-4KAQQ	12.3	
1.1	90 S	1440	7.3	EFF1	84	84	0.77	2.45	1LA9 090-4KAQQ	15	
1.5	90 L	1440	9.9	EFF1	85	85	0.77	3.3	1LA9 096-4KAQQ	18	
2.2	100 L	1435	15	EFF1	86.5	86.5	0.82	4.5	1LA9 106-4KAQQ	25	
3	100 L	1435	20	EFF1	87.5	87.7	0.81	6.1	1LA9 107-4KAQQ	30	
4	112 M	1440	27	EFF1	88.5	89	0.81	8.1	1LA9 113-4KAQQ	37	
5.5	132 S	1455	36	EFF1	89.5	89.5	0.84	10.6	1LA9 130-4KAQQ	45	
7.5	132 M	1455	49	EFF1	90.3	90.5	0.84	14.2	1LA9 133-4KAQQ	60	
11	160 M	1460	72	EFF1	91.5	92	0.85	20.5	1LA9 163-4KAQQ	81	
15	160 L	1460	98	EFF1	92	92.3	0.86	27.5	1LA9 166-4KAQQ	107	
18.5	180 M	1465	121	EFF1	92.5	93	0.84	34.5 ¹⁾	1LA9 183-4WAQQ	126	
22	180 L	1465	143	EFF1	93	93.4	0.84	40.5 ¹⁾	1LA9 186-4WAQQ	146	
30	200 L	1465	196	EFF1	93.5	94	0.87	53	1LA9 207-4WAQQ	199	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange			With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover	IM V1 with protective cover ²⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	0	1	4	6	2	7	3	
1LA9 05 QQ	○	○	○	–	□	✓	–	–	✓	✓	✓	
1LA9 06 QQ	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1LA9 07 QQ	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1LA9 08 QQ	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1LA9 09 QQ	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1LA9 10 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 11 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 13 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 16 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 18 QQ	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–	
1LA9 20 QQ	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For connection to 230 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP							
1LA9 050-4KA□□	2.7	3.1	2.8	16	0.00027	42	53
1LA9 053-4KA□□	2.8	3.2	2.8	16	0.00035	42	53
1LA9 060-4KA□□	2.7	3.5	2.6	16	0.00037	42	53
1LA9 063-4KA□□	3	3.6	2.5	16	0.00045	42	53
1LA9 070-4KA□□	3.6	4.3	3.1	16	0.00076	44	55
1LA9 073-4KA□□	3.3	4.2	3	16	0.00095	44	55
1LA9 080-4KA□□	3.4	5.6	2.9	16	0.0017	47	58
1LA9 083-4KA□□	4	5.8	3.5	16	0.0024	47	58
1LA9 090-4KA□□	3.1	6.4	3.2	16	0.0033	48	60
1LA9 096-4KA□□	3.6	6.7	3.4	16	0.004	48	60
1LA9 106-4KA□□	3.4	7	3.6	16	0.0062	53	65
1LA9 107-4KA□□	3.8	7	3.9	16	0.0077	53	65
1LA9 113-4KA□□	3.2	6.9	3.2	16	0.014	53	65
1LA9 130-4KA□□	3.2	7	3.6	16	0.023	62	74
1LA9 133-4KA□□	3.4	7	3.6	16	0.029	62	74
1LA9 163-4KA□□	2.6	6.9	3.2	16	0.055	66	78
1LA9 166-4KA□□	2.8	7	3.3	16	0.072	66	78
1LA9 183-4WA□□	2.8	7	3.2	16	0.15	63	76
1LA9 186-4WA□□	3.1	7.3	3.4	16	0.19	63	76
1LA9 207-4WA□□	3	7	3.2	16	0.32	65	78

The motors can also be used for 60 Hz according to EPACT, see Pages 2/28 to 2/33.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output						Rated current at 400 V, 50 Hz	Order No.	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load				
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below			
6-pole, 1000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP											
0.75	90 S	925	7.7	75.5	75.5	0.72	2	1LA9 090-6KAQQ		15.7	
1.1	90 L	940	11	82	82	0.7	2.75	1LA9 096-6KAQQ		19	
1.5	100 L	935	15	85	85	0.73	3.6	1LA9 106-6KAQQ		25	
2.2	112 M	955	22	84	84	0.7	5.4	1LA9 113-6KAQQ		37	
4	132 M	950	40	84	84	0.81	8.5	1LA9 133-6KAQQ		49	
5.5	132 M	960	55	86	86	0.77	12	1LA9 134-6KAQQ		64	
7.5	160 M	965	74	88	88	0.72	17	1LA9 163-6KAQQ		98	
11	160 L	960	109	88.5	88.5	0.78	23	1LA9 166-6KAQQ		105	
15	180 L	970	148	91	91	0.75	31.5	1LA9 186-6WAQQ		144	
18.5	200 L	975	181	91	91	0.77	38	1LA9 206-6WAQQ		186	
22	200 L	975	215	91.5	91.5	0.77	45	1LA9 207-6WAQQ		217	

Order No. supplements

Motor type	Penultimate position: Voltage code 50 Hz				Final position: Type of construction code						
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	Without flange	With flange			With standard flange		With special flange
					IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover	IM V1 with protective cover ¹⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0	1	4	6	2	7	3
1LA9 05 □□	○	○	○	–	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	○	○	□	✓ ²⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	○	○	□	✓ ²⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP							
1LA9 090-6KA□□	3	4.4	2.5	16	0.0033	43	55
1LA9 096-6KA□□	3.7	5.7	3.2	16	0.005	43	55
1LA9 106-6KA□□	3.5	6.2	3.4	16	0.0065	47	59
1LA9 113-6KA□□	2.9	6.2	3	16	0.014	52	64
1LA9 133-6KA□□	3	6.3	2.7	16	0.025	63	75
1LA9 134-6KA□□	3.7	7.3	3.6	16	0.03	63	75
1LA9 163-6KA□□	2.4	5.5	2.5	16	0.063	66	78
1LA9 166-6KA□□	3.1	6.9	3.2	16	0.072	66	78
1LA9 186-6WA□□	2.2	6.5	2.5	16	0.19	66	78
1LA9 206-6WA□□	2.8	6.2	2.5	16	0.28	66	78
1LA9 207-6WA□□	2.8	6.2	2.5	16	0.36	66	78

The motors can also be used for 60 Hz according to EPACT, see Pages 2/28 to 2/33.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9

Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output					Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 60 Hz	Rated torque at 60 Hz	EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz						
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A				
2-pole, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT											
0.12	56 M	3440	0.25	No	70	0.74	0.23	1LA9 050-2KA00		3	
0.16	56 M	3440	0.33	No	71	0.76	0.28	1LA9 053-2KA00		3.8	
0.25	63 M	3440	0.53	No	71	0.79	0.4	1LA9 060-2KA00		4.1	
0.33	63 M	3460	0.69	No	72	0.76	0.56	1LA9 063-2KA00		5.1	
0.5	71 M	3445	1	No	72	0.75	0.86	1LA9 070-2KA00		6	
0.75	71 M	3445	1.6	No	73	0.73	1.3	1LA9 073-2KA00		7.2	
1	80 M	3485	2	Yes	75.5	0.82	1.52	1LA9 080-2KA00		9.8	
1.5	80 M	3480	3.1	Yes	82.5	0.88	1.9	1LA9 083-2KA00		12.3	
2	90 S	3510	4.1	Yes	84	0.86	2.6	1LA9 090-2KA00		15	
3	90 L	3510	6.1	Yes	85.5	0.85	3.8	1LA9 096-2KA00		18.6	
4	100 L	3510	8.1	No	86.5	0.87	5	1LA9 106-2KA00		24	
5	112 M	3540	10	Yes	87.5	0.88	6	1LA9 113-2KA00		35	
7.5	132 S	3540	15	Yes	88.5	0.9	8.7	1LA9 130-2KA00		43	
10	132 S	3540	20	Yes	89.5	0.92	11.4	1LA9 131-2KA00		56	
15	160 M	3555	30	Yes	90.2	0.9	17	1LA9 163-2KA00		73	
20	160 M	3555	40	Yes	90.2	0.9	23.2	1LA9 164-2KA00		82	
25	160 L	3550	50	Yes	91	0.92	27.7	1LA9 166-2KA00		102	
30	180 M	3545	60	Yes	91	0.86	36	1LA9 183-2WA00		131	
40	200 L	3555	80	Yes	91.7	0.88	46.5	1LA9 206-2WA00		185	
50	200 L	3555	100	Yes	92.4	0.88	57	1LA9 207-2WA00		214	

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code				With standard flange		With special flange
	60 Hz	460 VΔ	Without flange	With flange	IM V1 with protective cover ¹⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	
	(see "Introduction" for outputs at 60 Hz)		IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover IM V3					
	1	6	0	1	4	6	2	7	3
1LA9 05 □□	○	○	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	□	✓ ²⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	□	✓ ²⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 60 Hz L_{pFA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
2-pole, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT							
1LA9 050-2KA□□	3.6	5.5	3.8	16	0.00015	45	56
1LA9 053-2KA□□	3.2	5.4	3.4	16	0.0002	45	56
1LA9 060-2KA□□	2.8	4.9	3.3	16	0.00022	53	64
1LA9 063-2KA□□	2.5	5	2.7	16	0.00026	53	64
1LA9 070-2KA□□	3.3	7.5	3.4	16	0.00041	56	67
1LA9 073-2KA□□	3.4	7.2	3.7	16	0.0005	56	67
1LA9 080-2KA□□	4.4	9.6	4.4	16	0.001	60	71
1LA9 083-2KA□□	3.8	8.6	3.2	16	0.0013	60	71
1LA9 090-2KA□□	4.1	8.6	4.1	16	0.0018	64	76
1LA9 096-2KA□□	4.1	8.5	5.1	16	0.0022	64	76
1LA9 106-2KA□□	3.4	8.6	3.7	16	0.0044	66	78
1LA9 113-2KA□□	2.8	9.2	4	16	0.0077	67	79
1LA9 130-2KA□□	2.7	8.5	3.8	16	0.019	72	84
1LA9 131-2KA□□	2.8	8.3	3.7	16	0.024	72	84
1LA9 163-2KA□□	2.5	8.5	3.7	16	0.044	74	86
1LA9 164-2KA□□	2.5	8.5	3.7	16	0.051	74	86
1LA9 166-2KA□□	2.4	8.5	3.5	16	0.065	74	86
1LA9 183-2WA□□	2.6	8.6	3.5	16	0.09	74	87
1LA9 206-2WA□□	2.5	8.4	3.6	16	0.16	75	88
1LA9 207-2WA□□	2.7	8.4	3.7	16	0.2	75	88

The motors can also be used for 50 Hz according to CEMEP, see Pages 2/22 to 2/27.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9

Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output				Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm	EPACT with CC No. CC 032A	$\cos\phi_{\text{rated}}$							$I_{\text{rated}}$ A
4-pole, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT											
0.08	56 M	1715	0.33	No	63	0.65	0.18	1LA9 050-4KA00		3	
0.12	56 M	1725	0.5	No	64	0.6	0.29	1LA9 053-4KA00		3.8	
0.16	63 M	1710	0.66	No	68	0.6	0.37	1LA9 060-4KA00		4.1	
0.25	63 M	1705	1.1	No	66	0.63	0.54	1LA9 063-4KA00		5.1	
0.33	71 M	1730	1.4	No	69	0.6	0.76	1LA9 070-4KA00		6	
0.5	71 M	1725	2.1	No	70	0.68	0.98	1LA9 073-4KA00		7.2	
0.75	80 M	1725	3.1	No	75.5	0.74	1.24	1LA9 080-4KA00		9.8	
1	80 M	1720	4.1	Yes	82.5	0.75	1.59	1LA9 083-4KA00		12.3	
1.5	90 S	1755	6.1	Yes	84	0.76	2.15	1LA9 090-4KA00		15	
2	90 L	1755	8.1	Yes	84	0.76	2.95	1LA9 096-4KA00		18	
3	100 L	1750	12	No	87.5	0.79	4	1LA9 106-4KA00		25	
4	100 L	1750	16	No	87.5	0.79	5.5	1LA9 107-4KA00		30	
5	112 M	1755	20	Yes	87.5	0.79	6.7	1LA9 113-4KA00		37	
7.5	132 S	1760	30	Yes	89.5	0.81	9.5	1LA9 130-4KA00		45	
10	132 M	1760	40	Yes	89.5	0.82	12.8	1LA9 133-4KA00		60	
15	160 M	1765	61	Yes	91	0.85	17.9	1LA9 163-4KA00		81	
20	160 L	1765	81	Yes	91	0.85	24.5	1LA9 166-4KA00		107	
25	180 M	1770	101	Yes	92.4	0.83	30.5	1LA9 183-4WA00		126	
30	180 L	1770	121	Yes	92.4	0.83	36	1LA9 186-4WA00		146	
40	200 L	1770	161	Yes	93	0.86	47	1LA9 207-4WA00		199	

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code						
	60 Hz	460 VΔ	Without flange	With flange		With standard flange		With special flange	
	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover	IM V1 with protective cover ¹⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	0	1	4	6	2	7	3
1LA9 05 □□	○	○	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	□	✓ ²⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	□	✓ ²⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 60 Hz L_{pFA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
4-pole, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT							
1LA9 050-4KA□□	2.7	3.4	3	16	0.00027	46	57
1LA9 053-4KA□□	2.8	3.5	3	16	0.00035	46	57
1LA9 060-4KA□□	2.7	3.9	2.8	16	0.00037	46	57
1LA9 063-4KA□□	3	3.6	3.1	16	0.00045	46	57
1LA9 070-4KA□□	3.6	4.9	3.4	16	0.00076	48	59
1LA9 073-4KA□□	3.3	4.9	3.4	16	0.00095	48	59
1LA9 080-4KA□□	3.4	6.8	3.6	16	0.0017	51	62
1LA9 083-4KA□□	4	7.3	3.9	16	0.0024	51	62
1LA9 090-4KA□□	3.1	7.7	3.9	16	0.0033	52	64
1LA9 096-4KA□□	3.6	8.1	4.2	16	0.004	52	64
1LA9 106-4KA□□	3.4	8.4	4.3	16	0.0062	57	69
1LA9 107-4KA□□	3.8	8.7	4.6	16	0.0077	57	69
1LA9 113-4KA□□	3.2	8.6	3.9	16	0.014	57	69
1LA9 130-4KA□□	3.2	8.7	4.1	16	0.023	66	78
1LA9 133-4KA□□	3.4	8.7	4.1	16	0.029	66	78
1LA9 163-4KA□□	2.6	8.1	3.2	16	0.055	70	82
1LA9 166-4KA□□	2.8	8.5	3.5	16	0.072	70	82
1LA9 183-4WA□□	2.8	8.4	3.6	16	0.15	67	80
1LA9 186-4WA□□	3.1	8.8	3.9	16	0.19	67	80
1LA9 207-4WA□□	3	8.3	3.6	16	0.32	69	82

The motors can also be used for 50 Hz according to CEMEP, see Pages 2/22 to 2/27.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9

Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output					Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. <i>m</i> kg
		Rated speed at 60 Hz	Rated torque at 60 Hz	EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz						
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A				
6-pole, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT											
1	90 S	1140	6.2	Yes	80	0.66	1.78	1LA9 090-6KA□□		15.7	
1.5	90 L	1150	9.3	Yes	85.5	0.64	2.55	1LA9 096-6KA□□		19	
2	100 L	1150	12	No	86.5	0.70	3.1	1LA9 106-6KA□□		25	
3	112 M	1160	18	Yes	87.5	0.66	4.8	1LA9 113-6KA□□		37	
5	132 M	1160	31	Yes	87.5	0.77	6.9	1LA9 133-6KA□□		49	
7.5	132 M	1160	46	Yes	89.5	0.73	10.6	1LA9 134-6KA□□		64	
10	160 M	1165	61	Yes	89.5	0.7	15	1LA9 163-6KA□□		98	
15	160 L	1165	92	Yes	90.2	0.77	19	1LA9 166-6KA□□		105	
20	180 L	1175	121	Yes	90.2	0.75	28	1LA9 186-6WA□□		144	
25	200 L	1175	152	Yes	91.7	0.75	34	1LA9 206-6WA□□		186	
30	200 L	1175	182	Yes	91.7	0.75	40	1LA9 207-6WA□□		217	

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code								
	60 Hz	460 VΔ	Without flange		With flange		With standard flange		With special flange		
	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover		IM B5, IM V1 without protective cover IM V3		IM V1 with protective cover ¹⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	0	1	4	6	2	7	3		
1LA9 05 □□	○	○	□	✓	–	–	✓	✓	✓		
1LA9 06 □□	○	○	□	✓	✓	✓	✓	✓	✓		
1LA9 07 □□	○	○	□	✓	✓	✓	✓	✓	✓		
1LA9 08 □□	○	○	□	✓	✓	✓	✓	✓	✓		
1LA9 09 □□	○	○	□	✓	✓	✓	✓	✓	✓		
1LA9 10 □□	○	○	□	✓	✓	✓	✓	✓	✓		
1LA9 11 □□	○	○	□	✓	✓	✓	✓	✓	✓		
1LA9 13 □□	○	○	□	✓	✓	✓	✓	✓	✓		
1LA9 16 □□	○	○	□	✓	✓	✓	✓	✓	✓		
1LA9 18 □□	○	○	□	✓ ²⁾	✓	✓	–	–	–		
1LA9 20 □□	○	○	□	✓ ²⁾	✓	✓	–	–	–		

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 60 Hz L_{pFA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
6-pole, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT							
1LA9 090-6KA□□	3	5.6	3	16	0.0033	47	59
1LA9 096-6KA□□	3.7	6.4	3.7	16	0.005	47	59
1LA9 106-6KA□□	3.5	7.2	3.8	16	0.0065	51	63
1LA9 113-6KA□□	2.9	7.5	3.7	16	0.014	56	68
1LA9 133-6KA□□	3	7.9	3.6	16	0.025	67	79
1LA9 134-6KA□□	3.7	8.4	4.3	16	0.03	67	79
1LA9 163-6KA□□	2.4	6.4	2.8	16	0.063	70	82
1LA9 166-6KA□□	3.1	8.3	3.8	16	0.072	70	82
1LA9 186-6WA□□	2.8	7.1	2.8	16	0.19	70	82
1LA9 206-6WA□□	2.8	7.1	2.8	16	0.28	70	82
1LA9 207-6WA□□	2.8	7.2	2.8	16	0.36	70	82

The motors can also be used for 50 Hz according to CEMEP, see Pages 2/22 to 2/27.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated motors with increased output –
Aluminum series 1LA9

Selection and ordering data

Rated output at		Frame size	Operating values at rated output						Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	Order No.	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	$\cos\phi$ rated	I rated					
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi$ rated	I rated					
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used as temperature class 155 (F)													
0.2	0.23	56 M	2830	0.67	69	69	0.82	0.51	1LA9 053-2LAQQ			3.8	
0.33	0.38	63 M	2775	1.1	68	67.5	0.8	0.88	1LA9 060-2LAQQ			4.1	
0.45	0.52	63 M	2720	1.6	68	67.5	0.84	1.14	1LA9 063-2LAQQ			5.1	
0.65	0.75	71 M	2720	2.3	72	72	0.83	1.56	1LA9 070-2LAQQ			6	
0.94	1.08	71 M	2735	3.3	73	73	0.82	2.25	1LA9 073-2LAQQ			7.2	
1.45	1.67	80 M	2820	4.9	76	76	0.83	3.3	1LA9 080-2LAQQ			9.8	
1.75	2.01	80 M	2840	5.9	77	77.5	0.82	4	1LA9 083-2LAQQ			12.3	
2.9	3.34	90 S	2825	9.8	81	81	0.82	6.3	1LA9 090-2LAQQ			15	
3.8	4.37	90 L	2810	13	81	81	0.85	8	1LA9 096-2LAQQ			18.6	
4.4	5.06	100 L	2880	15	82	82	0.83	9.3	1LA9 106-2LAQQ			24	
6.5	7.48	112 M	2900	21	85	85	0.83	13.2	1LA9 113-2LAQQ			35	
9	10.35	132 S	2895	29	87	87	0.9	16.6	1LA9 130-2LAQQ			43	
12	13.8	132 S	2905	39	87	87	0.89	22.5	1LA9 131-2LAQQ			56	
18	20.7	160 M	2910	59	89	89	0.87	33.5	1LA9 163-2LAQQ			73	
21	24.15	160 M	2910	68	90	90	0.91	37	1LA9 164-2LAQQ			82	
26	29.9	160 L	2920	85	91	91	0.91	45.5	1LA9 166-2LAQQ			102	
33	37.95	180 M	2940	107	92	92	0.86	60	1LA9 183-2AAQQ			131	
44	50.6	200 L	2945	143	92	92	0.86	80	1LA9 206-2AAQQ			182	
53	60.95	200 L	2945	172	92.5	92.5	0.87	95	1LA9 207-2AAQQ			211	

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz			60 Hz			Without flange		With flange			With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover IM V3	IM V1 with protective cover ¹⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
1	6	3	5	1	6	0	1	4	6	2	7	3		
1LA9 05 □□	○	○	○	–	○	○	□	✓	–	–	✓	✓	✓	
1LA9 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 18 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	✓	–	–	–	
1LA9 20 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	✓	–	–	–	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

- ¹⁾ The “Second shaft extension” option, order code **K16** is not possible.
- ²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated motors with increased output –
Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used as temperature class 155 (F)							
1LA9 053-2LA□□	2.1	4.5	2.3	16	0.0002	41	52
1LA9 060-2LA□□	2.3	4.4	2.2	16	0.00022	49	60
1LA9 063-2LA□□	2.2	4.2	2.3	16	0.00026	49	60
1LA9 070-2LA□□	2.4	4.5	2.5	16	0.00041	52	63
1LA9 073-2LA□□	2.5	4.8	2.4	16	0.0005	52	63
1LA9 080-2LA□□	3.1	6.7	3.1	16	0.001	56	67
1LA9 083-2LA□□	3.7	7.4	3.5	16	0.0013	56	67
1LA9 090-2LA□□	3.2	6.5	3	16	0.0018	60	72
1LA9 096-2LA□□	3.1	6.5	2.7	16	0.0022	60	72
1LA9 106-2LA□□	3	7.8	3.2	16	0.0044	62	74
1LA9 113-2LA□□	3	8.6	3.8	16	0.0077	63	75
1LA9 130-2LA□□	2	6.4	2.6	16	0.019	68	80
1LA9 131-2LA□□	3	7.4	3.2	16	0.024	68	80
1LA9 163-2LA□□	2.2	7	3.1	16	0.044	70	82
1LA9 164-2LA□□	2	6.9	2.7	16	0.051	70	82
1LA9 166-2LA□□	2.2	7.7	3.2	16	0.065	70	82
1LA9 183-2AA□□	2.5	7.4	3.3	16	0.09	70	83
1LA9 206-2AA□□	2.4	7.8	3.2	16	0.16	71	84
1LA9 207-2AA□□	2.6	8.2	3.3	16	0.2	71	84

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated motors with increased output –
Aluminum series 1LA9

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load					
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A				
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used as temperature class 155 (F)													
0.14	0.16	56 M	1385	0.97	62	60.5	0.74	0.44		1LA9 053-4LA00		3.8	
0.21	0.24	63 M	1335	1.5	60	58.5	0.77	0.66		1LA9 060-4LA00		4.1	
0.29	0.33	63 M	1330	2.1	60	58.5	0.71	0.98		1LA9 063-4LA00		5.1	
0.45	0.52	71 M	1340	3.2	64	63	0.71	1.42		1LA9 070-4LA00		6	
0.6	0.69	71 M	1340	4.3	70	70	0.75	1.64		1LA9 073-4LA00		7.2	
0.9	1.04	80 M	1340	6.4	70	70	0.81	2.3		1LA9 080-4LA00		9.8	
1.25	1.44	80 M	1340	8.9	70	70	0.83	3.1		1LA9 083-4LA00		12.3	
1.8	2.07	90 S	1380	12	77	77.5	0.83	4.05		1LA9 090-4LA00		15	
2.5	2.88	90 L	1390	17	76	76	0.81	5.9		1LA9 096-4LA00		18	
4	4.6	100 L	1410	27	77	77.5	0.81	9.3		1LA9 107-4LA00		25	
5.5	6.33	112 M	1440	36	82	82	0.8	12.2		1LA9 113-4LA00		37	
8.6	9.89	132 S	1440	57	84	84	0.83	17.8		1LA9 130-4LA00		45	
11	12.65	132 M	1450	72	86	86	0.82	22.5		1LA9 133-4LA00		60	
17	19.55	160 M	1455	112	88	88	0.84	33		1LA9 163-4LA00		81	
22	25.3	160 L	1455	144	88	88	0.82	44		1LA9 166-4LA00		107	
26	30	180 M	1460	170	90.5	90.5	0.83	50		1LA9 183-4AA00		126	
32	38	180 L	1465	209	91.3	91.3	0.84	60		1LA9 186-4AA00		146	
43	49.6	200 L	1465	280	91.7	91.7	0.85	80		1LA9 207-4AA00		196	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code									
	50 Hz				60 Hz				Without flange		With flange		With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover 1)	IM V1 with protective cover 1)	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	1	6	0	1	4	6	2	7	3	
1LA9 05 □□	○	○	○	–	○	○	□	✓	–	–	✓	✓	✓	
1LA9 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 18 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	✓	–	–	–	
1LA9 20 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	✓	–	–	–	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated motors with increased output –
Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used as temperature class 155 (F)							
1LA9 053-4LA□□	2.3	3.5	2.2	16	0.00035	42	53
1LA9 060-4LA□□	2.1	2.9	2.1	16	0.00037	42	53
1LA9 063-4LA□□	2.3	2.9	2.3	16	0.00045	42	53
1LA9 070-4LA□□	2.3	3.4	2.3	16	0.00076	44	55
1LA9 073-4LA□□	2.3	3.6	2.3	16	0.00095	44	55
1LA9 080-4LA□□	2.3	4.1	2.4	16	0.0017	47	58
1LA9 083-4LA□□	2.7	4.5	2.4	16	0.0024	47	58
1LA9 090-4LA□□	2.4	5.1	2.4	16	0.0033	48	60
1LA9 096-4LA□□	2.5	5.1	2.3	16	0.004	48	60
1LA9 107-4LA□□	2.7	6	3	16	0.0062	53	65
1LA9 113-4LA□□	3	6.8	3	16	0.014	53	65
1LA9 130-4LA□□	2.3	6.8	2.7	16	0.023	62	74
1LA9 133-4LA□□	2.8	7.4	3.1	16	0.029	62	74
1LA9 163-4LA□□	2.9	7.5	2.8	16	0.055	66	78
1LA9 166-4LA□□	3.1	8.3	3.4	16	0.072	66	78
1LA9 183-4AA□□	2.4	7.5	3.2	16	0.15	63	76
1LA9 186-4AA□□	2.5	7.9	3.4	16	0.19	63	76
1LA9 207-4AA□□	2.7	7.8	3.5	16	0.32	65	78

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Cast-iron series 1LA6/1LG4

Selection and ordering data

Rated output at		Frame size	Operating values at rated output							Rated current at 400 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load					
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A				
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection													
3	3.45	100 L	2890	9.9	EFF2	84	84	0.85	6.1	1LA6 106-2AA□□		34	
4	4.6	112 M	2905	13	EFF2	86	86	0.86	7.8	1LA6 113-2AA□□		43	
5.5	6.3	132 S	2925	18	EFF2	86.5	86.5	0.89	10.4	1LA6 130-2AA□□		53	
7.5	8.6	132 S	2930	24	EFF2	88	88	0.89	13.8	1LA6 131-2AA□□		58	
11	12.6	160 M	2940	36	EFF2	89.5	89.5	0.88	20	1LA6 163-2AA□□		96	
15	17.3	160 M	2940	49	EFF2	90	90.2	0.9	26.5	1LA6 164-2AA□□		105	
18.5	21.3	160 L	2940	60	EFF2	91	91.2	0.91	32	1LA6 166-2AA□□		115	
22	24.5	180 M	2945	71	EFF 2	91.6	91.6	0.86	40.5 ¹⁾	1LG4 183-2AA□□		145	
30	33.5	200 L	2950	97	EFF 2	91.8	91.9	0.88	54 ¹⁾	1LG4 206-2AA□□		205	
37	41.5	200 L	2955	120	EFF 2	92.9	93.2	0.89	65 ¹⁾	1LG4 207-2AA□□		225	
45	51	225 M	2960	145	EFF 2	93.6	93.9	0.88	79 ¹⁾	1LG4 223-2AA□□		285	
55	62	250 M	2970	177	EFF 2	93.6	93.8	0.88	96	1LG4 253-2AB□□		375	
75	84	280 S	2975	241	EFF 2	94.5	94.3	0.88	130 ¹⁾	1LG4 280-2AB□□		500	
90	101	280 M	2975	289	EFF 2	95.1	95.2	0.89	154 ¹⁾	1LG4 283-2AB□□		540	
110	123	315 S	2982	352		94.6	93.8	0.88	190 ¹⁾	1LG4 310-2AB□□		720	
132	148	315 M	2982	423		95.1	94.8	0.9	225 ¹⁾	1LG4 313-2AB□□		775	
160	180	315 L	2982	512		95.5	95.3	0.91	265 ²⁾	1LG4 316-2AB□□		900	
200	224	315 L	2982	641		95.9	95.8	0.92	325 ²⁾	1LG4 317-2AB□□		1015	

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz			60 Hz			Without flange		With flange			With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ³⁾	IM B5, IM V1 without protective cover IM V3 ⁴⁾	IM V1 without protective cover ⁴⁾	IM V1 with protective cover ⁴⁾⁵⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	8	4	6	2	7	3
1LA6 10 □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 11 □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 13 □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 16 □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LG4 18 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 20 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 22 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 25 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 28 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 310 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 313 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 316 □□	–	○	–	○	–	○	□ ⁷⁾	–	✓ ⁸⁾	✓ ⁸⁾	✓	–	–	–
1LG4 317 □□	–	○	–	○	–	○	□ ⁷⁾	–	✓ ⁸⁾	✓ ⁸⁾	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see Page 2/39 bottom.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA6 106-2AA□□	2.8	6.8	3	16	0.0035	62	74
1LA6 113-2AA□□	2.6	7.2	2.9	16	0.0059	63	75
1LA6 130-2AA□□	2	5.9	2.8	16	0.015	68	80
1LA6 131-2AA□□	2.3	6.9	3	16	0.019	68	80
1LA6 163-2AA□□	2.1	6.5	2.9	16	0.034	70	82
1LA6 164-2AA□□	2.2	6.6	3	16	0.043	70	82
1LA6 166-2AA□□	2.4	7	3.1	16	0.051	70	82
1LG4 183-2AA□□	2.5	6.4	3.4	16	0.068	67	80
1LG4 206-2AA□□	2.3	6.5	3	16	0.13	73	86
1LG4 207-2AA□□	2.5	7.2	3.3	16	0.15	73	86
1LG4 223-2AA□□	2.4	6.7	3.1	16	0.22	73	86
1LG4 253-2AB□□	2.1	6.7	3.1	13	0.4	75	88
1LG4 280-2AB□□	2.5	7.5	3.1	13	0.72	74	87
1LG4 283-2AB□□	2.6	7.2	3.1	13	0.83	74	87
1LG4 310-2AB□□	2.4	7.2	3.1	13	1.2	80	94
1LG4 313-2AB□□	2.4	6.9	3	13	1.4	80	94
1LG4 316-2AB□□	2.4	7	3	13	1.6	80	94
1LG4 317-2AB□□	2.3	6.7	2.9	13	2.1	80	94

- For connection to 230 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- For connection to 400 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 1LG4 220-... to 1LG4 318-... motors (motor series 1LG4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- The "Second shaft extension" option, order code **K16** is not possible.
- Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.
- 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz				For Order No. supplements for voltage and type of construction, see table below	IM B3 type of construction approx.
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A		m kg	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection												
2.2	2.55	100 L	1420	15	EFF2	82	82.5	0.82	4.7	1LA6 106-4AA□□	33	
3	3.45	100 L	1420	20	EFF2	83	83.5	0.82	6.4	1LA6 107-4AA□□	36	
4	4.6	112 M	1440	27	EFF2	85	85.5	0.83	8.2	1LA6 113-4AA□□	45	
5.5	6.3	132 S	1455	36	EFF2	86	86	0.81	11.4	1LA6 130-4AA□□	55	
7.5	8.6	132 M	1455	49	EFF2	87	87.5	0.82	15.2	1LA6 133-4AA□□	62	
11	12.6	160 M	1460	72	EFF2	88.5	89	0.84	21.5	1LA6 163-4AA□□	100	
15	17.3	160 L	1460	98	EFF2	90	90.2	0.84	28.5	1LA6 166-4AA□□	114	
18.5	21.3	180 M	1465	121	EFF 2	90.4	90.8	0.84	35 ¹⁾	1LG4 183-4AA□□	140	
22	25.3	180 L	1465	143	EFF 2	91	91.5	0.84	41.5 ¹⁾	1LG4 186-4AA□□	155	
30	34.5	200 L	1465	196	EFF 2	91.6	92	0.85	56 ¹⁾	1LG4 207-4AA□□	205	
37	42.5	225 S	1475	240	EFF 2	92.2	92.6	0.85	68 ¹⁾	1LG4 220-4AA□□	265	
45	52	225 M	1475	291	EFF 2	93.1	93.6	0.86	81 ¹⁾	1LG4 223-4AA□□	300	
55	63	250 M	1480	355	EFF 2	93.5	93.8	0.85	100	1LG4 253-4AA□□	390	
75	86	280 S	1485	482	EFF 2	94.2	94.1	0.85	136 ¹⁾	1LG4 280-4AA□□	535	
90	104	280 M	1485	579	EFF 2	94.6	94.6	0.86	160 ¹⁾	1LG4 283-4AA□□	580	
110	127	315 S	1488	706		94.6	94.6	0.85	198 ¹⁾	1LG4 310-4AA□□	730	
132	152	315 M	1488	847		95.2	95.2	0.85	235 ¹⁾	1LG4 313-4AA□□	810	
160	184	315 L	1486	1028		95.7	95.8	0.86	280 ²⁾	1LG4 316-4AA□□	955	
200	230	315 L	1486	1285		95.9	96.2	0.88	340 ²⁾	1LG4 317-4AA□□	1060	

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz		60 Hz				Without flange	With flange		With standard flange		With special flange		
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover 3)	IM B5, IM V1 without protective cover 4)	IM V1 without protective cover 4)	IM V1 with protective cover 4)5)	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	8	4	6	2	7	3
1LA6 10 □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 11 □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 13 □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 16 □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LG4 18 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 20 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 22 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 25 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 28 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 310 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 313 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 316 □□	–	○	–	○	–	○	□ ⁷⁾	–	✓	✓	✓	–	–	–
1LG4 317 □□	–	○	–	○	–	○	□ ⁷⁾	–	✓	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

For footnotes, see Page 2/41 bottom.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting torque	as multiple of rated current	torque	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}				
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA6 106-4AA□□	2.5	5.6	2.8	16	0.0047	53	65
1LA6 107-4AA□□	2.7	5.6	3	16	0.0055	53	65
1LA6 113-4AA□□	2.7	6	3	16	0.012	53	65
1LA6 130-4AA□□	2.5	6.3	3.1	16	0.018	62	74
1LA6 133-4AA□□	2.7	6.7	3.2	16	0.023	62	74
1LA6 163-4AA□□	2.2	6.2	2.7	16	0.043	66	78
1LA6 166-4AA□□	2.6	6.5	3	16	0.055	66	78
1LG4 183-4AA□□	2.4	6.7	3.1	16	0.099	65	78
1LG4 186-4AA□□	2.5	6.9	3.2	16	0.12	65	78
1LG4 207-4AA□□	2.5	6.7	3.4	16	0.19	66	79
1LG4 220-4AA□□	2.3	6.7	3.1	16	0.37	66	79
1LG4 223-4AA□□	2.6	7.2	3.2	16	0.45	66	79
1LG4 253-4AA□□	2.4	6.1	2.8	16	0.69	65	78
1LG4 280-4AA□□	2.5	7.1	3	16	1.2	70	84
1LG4 283-4AA□□	2.5	7.4	3	16	1.4	70	84
1LG4 310-4AA□□	2.5	6.4	2.8	16	1.9	70	84
1LG4 313-4AA□□	2.7	6.8	2.9	16	2.3	71	85
1LG4 316-4AA□□	2.7	6.8	2.8	16	2.9	71	85
1LG4 317-4AA□□	2.6	6.5	2.8	16	3.5	71	85

- 1) For connection to 230 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 2) For connection to 400 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 3) If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 4) 1LG4 220-... to 1LG4 318-... motors (motor series 1LG4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- 5) The "Second shaft extension" option, order code **K16** is not possible.
- 6) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 7) Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load						
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A					
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection													
1.5	1.75	100 L	925	15	74	74	0.75	3.9	1LA6 106-6AA□□			33	
2.2	2.55	112 M	940	22	78	78.5	0.78	5.2	1LA6 113-6AA□□			40	
3	3.45	132 S	950	30	79	79.5	0.76	7.2	1LA6 130-6AA□□			50	
4	4.6	132 M	950	40	80.5	80.5	0.76	9.4	1LA6 133-6AA□□			57	
5.5	6.3	132 M	950	55	83	83	0.76	12.6	1LA6 134-6AA□□			66	
7.5	8.6	160 M	960	75	86	86	0.74	17	1LA6 163-6AA□□			103	
11	12.6	160 L	960	109	87.5	87.5	0.74	24.5	1LA6 166-6AA□□			122	
15	18	180 L	965	148	88.9	90.3	0.83	29.5	1LG4 186-6AA□□			150	
18.5	22	200 L	975	181	89.8	90.2	0.81	36.5	1LG4 206-6AA□□			195	
22	26.5	200 L	975	215	90.3	91	0.81	43.5	1LG4 207-6AA□□			205	
30	36	225 M	978	293	91.8	92.8	0.83	57 ¹⁾	1LG4 223-6AA□□			280	
37	44.5	250 M	980	361	92.3	93	0.83	70	1LG4 253-6AA□□			370	
45	54	280 S	985	436	92.4	93.1	0.85	83	1LG4 280-6AA□□			475	
55	66	280 M	985	533	92.7	93.3	0.86	100	1LG4 283-6AA□□			510	
75	90	315 S	988	725	93.5	93.7	0.84	138	1LG4 310-6AA□□			685	
90	108	315 M	988	870	93.9	94.2	0.84	164 ¹⁾	1LG4 313-6AA□□			750	
110	132	315 L	988	1063	94.3	94.6	0.86	196	1LG4 316-6AA□□			890	
132	158	315 L	988	1276	94.8	95	0.86	235	1LG4 317-6AA□□			980	
160	192	315 L	988	1547	95	95.1	0.86	285 ²⁾	1LG4 318-6AA□□			1180	

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz			60 Hz			Without flange	With flange			With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ³⁾	IM B5, IM V1 without protective cover ⁴⁾	IM V1 without protective cover ⁴⁾	IM V1 with protective cover ⁴⁾⁵⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	8	4	6	2	7	3
1LA6 10 - ... □□	○	○	○	○	○	○	□	✓	-	✓	✓	✓	✓	✓
1LA6 11 - ... □□	○	○	○	○	○	○	□	✓	-	✓	✓	✓	✓	✓
1LA6 13 - ... □□	○	○	○	○	○	○	□	✓	-	✓	✓	✓	✓	✓
1LA6 16 - ... □□	○	○	○	○	○	○	□	✓	-	✓	✓	✓	✓	✓
1LG4 18 - ... □□	○	○	○	○	○	○	□	✓ ⁶⁾	-	✓	✓	-	-	-
1LG4 20 - ... □□	○	○	○	○	○	○	□	✓ ⁶⁾	-	✓	✓	-	-	-
1LG4 22 - ... □□	○	○	○	○	○	○	□	✓ ⁶⁾	-	✓	✓	-	-	-
1LG4 25 - ... □□	○	○	○	○	○	○	□	✓ ⁶⁾	-	✓	✓	-	-	-
1LG4 28 - ... □□	○	○	○	○	○	○	□	✓ ⁶⁾	-	✓	✓	-	-	-
1LG4 310 - ... □□	○	○	○	○	○	○	□	✓ ⁶⁾	-	✓	✓	-	-	-
1LG4 313 - ... □□														
1LG4 316 - ... □□	-	○	-	○	-	○	□ ⁷⁾	-	✓	✓	✓	-	-	-
1LG4 317 - ... □□														
1LG4 318 - ... □□														

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see Page 2/43 bottom.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting torque	as multiple of rated current	torque			Measuring surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA6 106-6AA□□	2.3	4	2.3	16	0.0047	47	59
1LA6 113-6AA□□	2.2	4.6	2.5	16	0.0091	52	64
1LA6 130-6AA□□	1.9	4.2	2.2	16	0.015	63	75
1LA6 133-6AA□□	2.1	4.5	2.4	16	0.019	63	75
1LA6 134-6AA□□	2.3	5	2.6	16	0.025	63	75
1LA6 163-6AA□□	2.1	4.6	2.5	16	0.044	66	78
1LA6 166-6AA□□	2.3	4.8	2.6	16	0.063	66	78
1LG4 186-6AA□□	2.3	5.3	2.5	16	0.18	57	73
1LG4 206-6AA□□	2.5	5.6	2.5	16	0.24	58	73
1LG4 207-6AA□□	2.6	5.7	2.5	16	0.29	58	73
1LG4 223-6AA□□	2.7	5.6	2.5	16	0.49	59	73
1LG4 253-6AA□□	2.7	6	2.3	16	0.76	60	75
1LG4 280-6AA□□	2.4	6.1	2.4	16	1.1	61	75
1LG4 283-6AA□□	2.5	6.3	2.5	16	1.4	61	75
1LG4 310-6AA□□	2.5	6.5	2.8	16	2.1	63	77
1LG4 313-6AA□□	2.6	6.8	2.9	16	2.5	63	77
1LG4 316-6AA□□	2.5	6.8	2.9	16	3.2	64	78
1LG4 317-6AA□□	3.1	7.3	3	16	4	64	78
1LG4 318-6AA□□	3	7.5	3	16	4.7	65	79

- 1) For connection to 230 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 2) For connection to 400 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 3) If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 4) 1LG4 220-... to 1LG4 318-... motors (motor series 1LG4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- 5) The "Second shaft extension" option, order code **K16** is not possible.
- 6) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 7) Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load				Rated current at 400 V, 50 Hz	For Order No. supplements for voltage and type of construction, see table below
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A		m kg	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection											
0.75	0.86	100 L	680	11	66	65	0.76	2.15	1LA6 106-8AB□□	29	
1.1	1.3	100 L	680	15	72	72	0.76	2.9	1LA6 107-8AB□□	32	
1.5	1.75	112 M	705	20	74	74	0.76	3.85	1LA6 113-8AB□□	39	
2.2	2.55	132 S	700	30	75	75	0.74	5.7	1LA6 130-8AB□□	50	
3	3.45	132 M	700	41	77	77.5	0.74	7.6	1LA6 133-8AB□□	57	
4	4.6	160 M	715	53	80	80	0.72	10	1LA6 163-8AB□□	91	
5.5	6.3	160 M	710	74	83.5	83.5	0.73	13	1LA6 164-8AB□□	102	
7.5	8.6	160 L	715	100	85.5	85.5	0.72	17.6	1LA6 166-8AB□□	122	
11	13.2	180 L	725	145	87.5	88.3	0.73	25	1LG4 186-8AB□□	150	
15	18	200 L	725	198	87.7	88.4	0.76	32.5	1LG4 207-8AB□□	205	
18.5	22	225 S	730	242	89.4	90.4	0.78	38.5	1LG4 220-8AB□□	270	
22	26.5	225 M	730	288	89.7	90.7	0.79	45	1LG4 223-8AB□□	290	
30	36	250 M	730	392	91.4	92.2	0.81	58	1LG4 253-8AB□□	385	
37	44.5	280 S	735	481	92	92.8	0.81	72	1LG4 280-8AB□□	475	
45	54	280 M	735	585	92.4	93.3	0.81	87	1LG4 283-8AB□□	515	
55	66	315 S	740	710	93	93.4	0.81	106	1LG4 310-8AB□□	680	
75	90	315 M	738	971	93.3	94	0.83	140	1LG4 313-8AB□□	745	
90	108	315 L	738	1165	93.4	94	0.83	168	1LG4 316-8AB□□	865	
110	132	315 L	738	1423	94	94.4	0.83	205	1LG4 317-8AB□□	1020	
132	158	315 L	738	1708	94.2	94.6	0.83	245	1LG4 318-8AB□□	1100	

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz		60 Hz				Without flange	With flange			With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover 1)	IM B5, IM V1 without protective cover 2)	IM V1 without protective cover 2)	IM V1 with protective cover 2)3)	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	8	4	6	2	7	3
1LA6 10 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	✓	✓	✓	✓
1LA6 11 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	✓	✓	✓	✓
1LA6 13 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	✓	✓	✓	✓
1LA6 16 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	✓	✓	✓	✓
1LG4 18 - . . . □□	○	○	○	○	○	○	□	✓ ⁴⁾	-	✓	✓	-	-	-
1LG4 20 - . . . □□	○	○	○	○	○	○	□	✓ ⁴⁾	-	✓	✓	-	-	-
1LG4 22 - . . . □□	○	○	○	○	○	○	□	✓ ⁴⁾	-	✓	✓	-	-	-
1LG4 25 - . . . □□	○	○	○	○	○	○	□	✓ ⁴⁾	-	✓	✓	-	-	-
1LG4 28 - . . . □□	○	○	○	○	○	○	□	✓ ⁴⁾	-	✓	✓	-	-	-
1LG4 310 - . . . □□	○	○	○	○	○	○	□	✓ ⁴⁾	-	✓	✓	-	-	-
1LG4 313 - . . . □□														
1LG4 316 - . . . □□	-	○	-	○	-	○	□ ⁵⁾	-	✓	✓	✓	-	-	-
1LG4 317 - . . . □□														
1LG4 318 - . . . □□														

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see Page 2/45 bottom.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting torque	as multiple of rated current	torque	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}				
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA6 106-8AB□□	1.6	3	1.9	13	0.0051	45	57
1LA6 107-8AB□□	1.8	3.3	2.1	13	0.0063	45	57
1LA6 113-8AB□□	1.8	3.7	2.1	13	0.013	49	61
1LA6 130-8AB□□	1.9	3.9	2.3	13	0.014	53	65
1LA6 133-8AB□□	2.1	4.1	2.4	13	0.019	53	65
1LA6 163-8AB□□	2.2	4.5	2.6	13	0.036	63	75
1LA6 164-8AB□□	2.3	4.7	2.7	13	0.046	63	75
1LA6 166-8AB□□	2.7	5.3	3	13	0.064	63	75
1LG4 186-8AB□□	1.7	4.2	2.1	13	0.17	66	79
1LG4 207-8AB□□	2.2	4.9	2.6	13	0.29	67	70
1LG4 220-8AB□□	2.3	5.5	2.7	13	0.48	57	70
1LG4 223-8AB□□	2.3	5.6	2.8	13	0.55	54	73
1LG4 253-8AB□□	2.3	5.5	2.6	13	0.84	55	73
1LG4 280-8AB□□	2.2	5	2.1	13	1.1	56	74
1LG4 283-8AB□□	2.2	5.1	2.1	13	1.4	58	74
1LG4 310-8AB□□	2.2	5.8	2.6	13	2.1	64	78
1LG4 313-8AB□□	2.2	5.7	2.6	13	2.5	64	78
1LG4 316-8AB□□	2.2	5.8	2.7	13	3.1	64	78
1LG4 317-8AB□□	2.4	6.1	2.8	13	3.9	64	78
1LG4 318-8AB□□	2.5	6.5	2.9	13	4.5	64	78

2

- 1) If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 2) 1LG4 220-... to 1LG4 318-... motors (motor series 1LG4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 3) The "Second shaft extension" option, order code **K16** is not possible.
- 4) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 5) Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated motors with increased output –
Cast-iron series 1LG4

Selection and ordering data

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below		
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)											
30	33.5	180 L	2950	97	92.8	92.9	0.86	54 ¹⁾	1LG4 188-2AA□□	175	
45	51	200 L	2955	145	93.6	93.7	0.89	78 ¹⁾	1LG4 208-2AA□□	255	
55	62	225 M	2960	177	94.8	95	0.89	94 ¹⁾	1LG4 228-2AA□□	335	
75	84	250 M	2970	241	94.5	94.5	0.88	130 ¹⁾	1LG4 258-2AA□□	420	
110	123	280 M	2975	353	95.5	95.6	0.9	184 ¹⁾	1LG4 288-2AB□□	630	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)											
30	34.5	180 L	1465	196	91.7	91.9	0.8	59 ¹⁾	1LG4 188-4AA□□	180	
37	42.5	200 L	1465	241	92.5	92.8	0.83	70 ¹⁾	1LG4 208-4AA□□	230	
55	63	225 M	1475	356	93.4	93.9	0.86	99 ¹⁾	1LG4 228-4AA□□	330	
75	86	250 M	1482	483	94.3	94.4	0.85	136 ¹⁾	1LG4 258-4AA□□	460	
110	127	280 M	1488	706	95.2	94.9	0.84	198 ¹⁾	1LG4 288-4AA□□	680	
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)											
18.5	22	180 L	970	182	89.6	90.3	0.8	37.5 ¹⁾	1LG4 188-6AA□□	175	
30	36	200 L	975	294	90.9	91.3	0.8	60 ¹⁾	1LG4 208-6AA□□	245	
37	44.5	225 M	978	361	92.2	93	0.83	70 ¹⁾	1LG4 228-6AA□□	325	
45	54	250 M	982	438	93.3	93.8	0.83	84	1LG4 258-6AA□□	405	
75	90	280 M	985	727	93.8	94.3	0.85	136 ¹⁾	1LG4 288-6AA□□	570	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)											
15	18	180 L	720	199	87.8	88.5	0.73	34 ¹⁾	1LG4 188-8AB□□	165	
18.5	22	200 L	725	244	88.3	89.2	0.78	39	1LG4 208-8AB□□	230	
30	36	225 M	730	392	90.4	91.2	0.79	61 ¹⁾	1LG4 228-8AB□□	340	
37	44.5	250 M	730	484	91.9	92.8	0.82	71	1LG4 258-8AB□□	430	
55	66	280 M	735	715	92.9	93.7	0.81	106	1LG4 288-8AB□□	565	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code								
	50 Hz		60 Hz		Without flange	With flange		With standard flange		With special flange			
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ²⁾	IM B5, IM V1 without protective cover ³⁾	IM V1 with protective cover ³⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LG4 18 - . . . □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	-	-	-
1LG4 20 - . . . □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	-	-	-
1LG4 22 - . . . □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	-	-	-
1LG4 25 - . . . □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	-	-	-
1LG4 28 - . . . □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	-	-	-

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) For connection to 230 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 2) If motors 1LG4 188-... to 1LG4 288-... (motor series 1LG4 frame sizes 180 L to 280 M) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

- 3) 1LG4 220-... to 1LG4 288-... motors (motor series 1LG4 frame sizes 225 M to 280 M) are supplied with two screw-in eyebolts in accordance with IM B 5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- 4) The "Second shaft extension" option, order code **K16** is not possible.
- 5) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated motors with increased output –
Cast-iron series 1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)							
1LG4 188-2AA□□	2.4	7.1	3.4	16	0.09	71	84
1LG4 208-2AA□□	2.5	6.9	3.2	16	0.18	73	86
1LG4 228-2AA□□	2.6	7.3	3.2	16	0.27	73	86
1LG4 258-2AA□□	2.4	7.1	3.1	16	0.48	74	87
1LG4 288-2AB□□	2.5	7	3	13	1	74	87
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)							
1LG4 188-4AA□□	2.6	6.3	2.9	16	0.14	65	78
1LG4 208-4AA□□	2.6	6.5	3	16	0.23	66	79
1LG4 228-4AA□□	2.5	6.5	2.7	16	0.49	66	79
1LG4 258-4AA□□	2.5	7	3	16	0.86	68	81
1LG4 288-4AA□□	2.8	7.9	3.3	16	1.71	70	84
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)							
1LG4 188-6AA□□	2.3	4.9	2.4	16	0.2	60	73
1LG4 208-6AA□□	2.6	5.8	2.6	16	0.36	61	74
1LG4 228-6AA□□	2.5	5.9	2.8	16	0.62	61	74
1LG4 258-6AA□□	2.7	6.3	2.3	16	0.93	61	74
1LG4 288-6AA□□	3	6.8	2.8	16	1.65	61	74
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)							
1LG4 188-8AB□□	2	4.5	2.4	13	0.21	69	82
1LG4 208-8AB□□	2.4	5.2	2.6	13	0.37	58	71
1LG4 228-8AB□□	2.6	5.6	2.8	13	0.66	61	74
1LG4 258-8AB□□	2.4	5.6	2.6	13	1.06	55	68
1LG4 288-8AB□□	2.4	5.6	2.3	13	1.63	58	71

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output							Order No.	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF I	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below		
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP											
22	180 M	2955	71	EFF 1	94.1	94.5	0.88	38.5 ¹⁾	1LG6 183-2AA00	180	
30	200 L	2960	97	EFF 1	93.5	93.4	0.88	53 ¹⁾	1LG6 206-2AA00	225	
37	200 L	2960	119	EFF 1	94.1	94	0.89	64 ¹⁾	1LG6 207-2AA00	255	
45	225 M	2965	145	EFF 1	94.9	95.1	0.89	77 ¹⁾	1LG6 223-2AA00	330	
55	250 M	2975	177	EFF 1	95.3	95.3	0.9	93	1LG6 253-2AA00	420	
75	280 S	2975	241	EFF 1	95.2	95.2	0.89	128 ¹⁾	1LG6 280-2AB00	530	
90	280 M	2978	289	EFF 1	95.6	95.7	0.9	150 ¹⁾	1LG6 283-2AB00	615	
110	315 S	2982	352	EFF 1	95.8	95.7	0.91	182 ¹⁾	1LG6 310-2AB00	790	
132	315 M	2982	423	EFF 1	96	95.9	0.91	220 ¹⁾	1LG6 313-2AB00	915	
160	315 L	2982	512	EFF 1	96.4	96.4	0.92	260	1LG6 316-2AB00	1055	
200	315 L	2982	641	EFF 1	96.5	96.5	0.93	320	1LG6 317-2AB00	1245	
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP											
18.5	180 M	1470	120	EFF 1	92.6	93.2	0.83	34.5 ¹⁾	1LG6 183-4AA00	155	
22	180 L	1470	143	EFF 1	93.2	93.5	0.84	40.5 ¹⁾	1LG6 186-4AA00	180	
30	200 L	1470	195	EFF 1	93.3	93.4	0.85	55 ¹⁾	1LG6 207-4AA00	225	
37	225 S	1480	239	EFF 1	94	94.4	0.85	67 ¹⁾	1LG6 220-4AA00	290	
45	225 M	1480	290	EFF 1	94.5	94.7	0.85	81 ¹⁾	1LG6 223-4AA00	330	
55	250 M	1485	354	EFF 1	95.1	95.3	0.87	96	1LG6 253-4AA00	460	
75	280 S	1485	482	EFF 1	95.1	95.2	0.87	130 ¹⁾	1LG6 280-4AA00	575	
90	280 M	1486	578	EFF 1	95.4	95.5	0.86	158 ¹⁾	1LG6 283-4AA00	675	
110	315 S	1488	706	EFF 1	95.9	96	0.87	190 ¹⁾	1LG6 310-4AA00	810	
132	315 M	1488	847	EFF 1	96.1	96.2	0.88	225 ¹⁾	1LG6 313-4AA00	965	
160	315 L	1490	1026	EFF 1	96.3	96.4	0.88	275 ²⁾	1LG6 316-4AA00	1105	
200	315 L	1490	1282	EFF 1	96.4	96.5	0.88	340 ²⁾	1LG6 317-4AA00	1305	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange			With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ³⁾	IM B5, IM V1 without protective cover ⁴⁾ IM V3 ⁴⁾⁵⁾	IM V1 without protective cover ⁴⁾	IM V1 with protective cover ⁴⁾⁶⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0	1	8	4	6	2	7	3
1LG6 18 - . . . □□	○	○	○	○	□	✓	-	✓	✓	-	-	-
1LG6 20 - . . . □□	○	○	○	○	□	✓	-	✓	✓	-	-	-
1LG6 22 - . . . □□	○	○	○	○	□	✓	-	✓	✓	-	-	-
1LG6 25 - . . . □□	○	○	○	○	□	✓	-	✓	✓	-	-	-
1LG6 28 - . . . □□	○	○	○	○	□	✓	-	✓	✓	-	-	-
1LG6 310 - . . . □□	○	○	○	○	□	✓	-	✓	✓	-	-	-
1LG6 313 - . . . □□	○	○	○	○	□	✓	-	✓	✓	-	-	-
1LG6 316 - . . . □□	-	○	-	○	□ ⁷⁾	-	✓ ⁸⁾	✓ ⁸⁾	✓	-	-	-
1LG6 317 - . . . □□	-	-	-	-	-	-	-	-	-	-	-	-

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see Page 2/49 bottom.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP							
1LG6 183-2AA□□	2.5	7.2	3.4	16	0.086	67	80
1LG6 206-2AA□□	2.4	7	3.3	16	0.15	71	84
1LG6 207-2AA□□	2.5	7.2	3.3	16	0.18	71	84
1LG6 223-2AA□□	2.5	7.3	3.2	16	0.27	71	84
1LG6 253-2AA□□	2.4	6.8	3	16	0.47	71	84
1LG6 280-2AB□□	2.5	7	3	13	0.83	73	86
1LG6 283-2AB□□	2.6	7.6	3.1	13	1	73	86
1LG6 310-2AB□□	2.4	6.9	2.8	13	1.4	76	89
1LG6 313-2AB□□	2.6	7.1	2.9	13	1.6	76	89
1LG6 316-2AB□□	2.5	7.1	2.9	13	2.1	76	89
1LG6 317-2AB□□	2.5	6.9	2.8	13	2.5	76	89
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP							
1LG6 183-4AA□□	2.5	6.4	3	16	0.12	60	73
1LG6 186-4AA□□	2.5	6.7	3.1	16	0.14	60	73
1LG6 207-4AA□□	2.6	6.7	3.3	16	0.23	62	75
1LG6 220-4AA□□	2.7	6.8	3	16	0.4	60	73
1LG6 223-4AA□□	2.8	6.9	3	16	0.49	60	73
1LG6 253-4AA□□	2.6	7.5	3	16	0.86	65	78
1LG6 280-4AA□□	2.5	6.8	2.9	16	1.4	67	80
1LG6 283-4AA□□	2.7	7.5	3.1	16	1.7	68	82
1LG6 310-4AA□□	2.7	7.1	2.9	16	2.3	68	82
1LG6 313-4AA□□	2.7	7.3	2.9	16	2.9	69	83
1LG6 316-4AA□□	3	7.4	3	16	3.5	69	83
1LG6 317-4AA□□	3.2	7.6	3	16	4.2	69	83

The motors can also be used for 60 Hz according to EPACT, see Pages 2/52 to 2/57.

- 1) For connection to 230 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 2) For connection to 400 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 3) If motors 1LG6 183-... to 1LG6 317-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 4) 1LG6 220-... to 1LG6 317-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- 5) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 6) The "Second shaft extension" option, order code **K16** is not possible.
- 7) Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.
- 8) 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output						Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	Order No.	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Efficiency at 50 Hz 2/4-load					
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below			
6-pole, 1000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP												
15	180 L	975	147		90.9	91.7	0.81	29.5	1LG6 186-6AA□□		175	
18.5	200 L	978	181		91.2	91.8	0.81	36	1LG6 206-6AA□□		210	
22	200 L	978	215		91.9	92.5	0.82	42	1LG6 207-6AA□□		240	
30	225 M	980	292		93.2	93.7	0.83	56 ¹⁾	1LG6 223-6AA□□		325	
37	250 M	985	359		93.7	94.1	0.83	69	1LG6 253-6AA□□		405	
45	280 S	988	435		94.4	94.6	0.85	81	1LG6 280-6AA□□		520	
55	280 M	988	532		94.6	94.8	0.85	99	1LG6 283-6AA□□		570	
75	315 S	990	723		95	95	0.83	138	1LG6 310-6AA□□		760	
90	315 M	990	868		95.3	95.4	0.85	160 ¹⁾	1LG6 313-6AA□□		935	
110	315 L	990	1061		95.6	95.7	0.85	196	1LG6 316-6AA□□		1010	
132	315 L	990	1273		95.8	95.8	0.85	235	1LG6 317-6AA□□		1180	
160	315 L	990	1543		95.8	95.9	0.86	280 ²⁾	1LG6 318-6AA□□		1245	
8-pole, 750 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP												
11	180 L	725	145		88.7	89.6	0.76	23.5	1LG6 186-8AB□□		165	
15	200 L	725	198		89.3	89.8	0.8	30.5	1LG6 207-8AB□□		235	
18.5	225 S	730	242		91.1	91.8	0.81	36	1LG6 220-8AB□□		295	
22	225 M	730	288		91.6	92.1	0.81	43	1LG6 223-8AB□□		335	
30	250 M	735	390		92.8	93.3	0.82	57	1LG6 253-8AB□□		435	
37	280 S	738	479		93.1	93.3	0.81	71	1LG6 280-8AB□□		510	
45	280 M	738	582		93.7	94	0.81	86	1LG6 283-8AB□□		560	
55	315 S	740	710		94.3	94.4	0.82	102	1LG6 310-8AB□□		750	
75	315 M	740	968		94.5	94.7	0.83	138	1LG6 313-8AB□□		840	
90	315 L	740	1161		94.7	95.1	0.84	164	1LG6 316-8AB□□		1005	
110	315 L	740	1420		94.8	95.1	0.84	200	1LG6 317-8AB□□		1100	
132	315 L	740	1704		94.9	95.2	0.84	240	1LG6 318-8AB□□		1270	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange			With standard flange	With special flange		
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ³⁾	IM B5, IM V1 without protective cover IM V3 ^{4) 5)}	IM V1 without protective cover ⁴⁾	IM V1 with protective cover ^{4) 6)}	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0	1	8	4	6	2	7	3
1LG6 18 - . . . □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 20 - . . . □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 22 - . . . □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 25 - . . . □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 28 - . . . □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 310 - . . . □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 313 - . . . □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 316 - . . . □□	–	○	–	○	□ ⁷⁾	–	✓	✓	✓	–	–	–
1LG6 317 - . . . □□	–	○	–	○	□ ⁷⁾	–	✓	✓	✓	–	–	–
1LG6 318 - . . . □□	–	○	–	○	□ ⁷⁾	–	✓	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see Page 2/51 bottom.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP							
1LG6 186-6AA□□	2.4	5.5	2.5	16	0.2	56	69
1LG6 206-6AA□□	2.4	5.6	2.4	16	0.29	59	72
1LG6 207-6AA□□	2.4	5.6	2.4	16	0.36	59	72
1LG6 223-6AA□□	2.8	6.5	2.9	16	0.63	59	72
1LG6 253-6AA□□	2.9	6.8	2.5	16	0.93	59	72
1LG6 280-6AA□□	3	6.8	2.7	16	1.4	58	71
1LG6 283-6AA□□	3.3	7.3	2.9	16	1.6	58	71
1LG6 310-6AA□□	2.8	7.3	3	16	2.5	61	74
1LG6 313-6AA□□	2.7	7.3	2.9	16	3.2	61	74
1LG6 316-6AA□□	2.9	7.4	2.9	16	4	61	74
1LG6 317-6AA□□	3.1	7.8	3.1	16	4.7	61	74
1LG6 318-6AA□□	3.2	7.8	3.1	16	5.4	64	77
8-pole, 750 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP							
1LG6 186-8AB□□	1.7	4.6	2.2	13	0.21	62	75
1LG6 207-8AB□□	2.3	5.3	2.6	13	0.37	62	75
1LG6 220-8AB□□	2.3	5.6	2.6	13	0.55	54	67
1LG6 223-8AB□□	2.4	5.8	2.8	13	0.66	58	71
1LG6 253-8AB□□	2.5	6	2.8	13	1.1	57	70
1LG6 280-8AB□□	2.3	5.7	2.3	13	1.4	58	71
1LG6 283-8AB□□	2.6	6.1	2.5	13	1.6	58	71
1LG6 310-8AB□□	2.5	6.3	2.9	13	2.5	61	75
1LG6 313-8AB□□	2.5	6.7	2.9	13	3.1	60	74
1LG6 316-8AB□□	2.4	6.3	2.8	13	3.9	64	77
1LG6 317-8AB□□	2.4	6.4	2.6	13	4.5	64	77
1LG6 318-8AB□□	2.5	6.7	2.9	13	5.3	64	77

The motors can also be used for 60 Hz according to EPACT, see Pages 2/52 to 2/57.

- 1) For connection to 230 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 2) For connection to 400 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 3) If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 4) 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- 5) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 6) The "Second shaft extension" option, order code **K16** is not possible.
- 7) Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output						Order No.	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 60 Hz	Rated torque at 60 Hz	EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz			
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below		
2-pole, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT										
30	180 M	3560	60	Yes	93	0.88	34	1LG6 183-2AAQQ		180
40	200 L	3565	80	Yes	91.7	0.88	46	1LG6 206-2AAQQ		225
50	200 L	3565	100	Yes	92.4	0.89	57	1LG6 207-2AAQQ		255
60	225 M	3570	120	Yes	93.6	0.89	67	1LG6 223-2AAQQ		330
75	225 M	3570	150	Yes	94.5	0.9	83	1LG6 228-2AAQQ ¹⁾		390
75	250 M	3578	149	No	93.6	0.89	84	1LG6 253-2AAQQ		420
100	250 M	3580	199	Yes	94.1	0.89	112	1LG6 258-2AAQQ ¹⁾		470
100	280 S	3580	199	No	95	0.89	110	1LG6 280-2ABQQ		530
125	280 M	3580	249	Yes	95	0.9	136	1LG6 283-2ABQQ		615
150	280 M	3580	299	Yes	95	0.9	164	1LG6 288-2AAQQ ¹⁾		660
150	315 S	3585	298	Yes	94.5	0.91	164	1LG6 310-2ABQQ		790
175	315 M	3586	348	Yes	95	0.91	190	1LG6 313-2ABQQ		915
200	315 L	3588	397	Yes	95.4	0.91	215	1LG6 316-2ABQQ		1055
250	315 L	3588	496	No	95.4	0.93	265	1LG6 317-2ABQQ		1245
300	315 L	3591	595	No	95.4	0.92	320	1LG6 318-2AAQQ ¹⁾		1330

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction						With standard flange		With special flange
	60 Hz		Without flange	With flange				IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	460 VY	460 VA (see "Introduction" for outputs at 60 Hz)	IM B3/6/7/8, IM V6, IM V5 without protective cover ²⁾	IM B5, IM V1 without protective cover ³⁾⁴⁾	IM V1 without protective cover ³⁾⁵⁾	IM V1 with protective cover ³⁾⁵⁾					
	1	6	0	1	8	4	6	2	7	3	
1LG6 18 - . . . QQ	○	○	□	✓	–	✓	✓	–	–	–	
1LG6 20 - . . . QQ	○	○	□	✓	–	✓	✓	–	–	–	
1LG6 22 - . . . QQ	○	○	□	✓	–	✓	✓	–	–	–	
1LG6 25 - . . . QQ	○	○	□	✓	–	✓	✓	–	–	–	
1LG6 28 - . . . QQ	○	○	□	✓	–	✓	✓	–	–	–	
1LG6 310 - . . . QQ	○	○	□	✓	–	✓	✓	–	–	–	
1LG6 313 - . . . QQ	○	○	□	✓	–	✓	✓	–	–	–	
1LG6 316 - . . . QQ	–	○	□ ⁶⁾	–	✓ ⁷⁾	✓ ⁷⁾	✓	–	–	–	
1LG6 317 - . . . QQ	–	○	□ ⁶⁾	–	✓ ⁷⁾	✓ ⁷⁾	✓	–	–	–	
1LG6 318 - . . . QQ	–	○	□ ⁶⁾	–	✓ ⁷⁾	✓ ⁷⁾	✓	–	–	–	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) Only 60 Hz data according to EPACT on the rating plate.
- 2) If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 3) 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 4) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 5) The "Second shaft extension" option, order code **K16** is not possible.
- 6) Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.
- 7) 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 60 Hz L_{pFA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
2-pole, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT							
1LG6 183-2AA□□	2.7	7.9	3.7	16	0.086	72	85
1LG6 206-2AA□□	2.7	7.8	3.7	16	0.15	75	88
1LG6 207-2AA□□	2.8	7.8	3.7	16	0.18	75	88
1LG6 223-2AA□□	2.8	8.3	3.6	16	0.27	74	87
1LG6 228-2AA□□	3.3	8.7	3.7	16	0.32	74	87
1LG6 253-2AA□□	2.7	7.5	3.2	16	0.47	75	88
1LG6 258-2AA□□	2.8	8.4	3.5	16	0.57	79	92
1LG6 280-2AB□□	2.8	7.9	3.4	13	0.83	77	90
1LG6 283-2AB□□	2.9	8.3	3.4	13	1	77	90
1LG6 288-2AA□□	3.1	8.5	3.6	16	1.16	77	90
1LG6 310-2AB□□	2.6	7.5	3.1	13	1.4	81	94
1LG6 313-2AB□□	3	8.3	3.3	13	1.6	81	94
1LG6 316-2AB□□	3	8.4	3.5	13	2.1	81	94
1LG6 317-2AB□□	3.2	8.6	3.4	13	2.5	81	94
1LG6 318-2AA□□	4.1	10	3.9	16	2.74	83	96

The motors can also be used for 50 Hz according to CEMEP, see Pages 2/48 to 2/51.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output					Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 60 Hz	Rated torque at 60 Hz	EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz	EPACT with CC No. CC 032A					
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A					
4-pole, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT											
25	180 M	1775	100	Yes	92.4	0.82	31	1LG6 183-4AA□□		155	
30	180 L	1775	120	Yes	92.4	0.83	36.5	1LG6 186-4AA□□		180	
40	200 L	1775	160	Yes	93	0.84	48	1LG6 207-4AA□□		225	
50	225 S	1785	199	No	93.6	0.84	60	1LG6 220-4AA□□		290	
60	225 M	1785	239	Yes	94.1	0.85	70	1LG6 223-4AA□□		330	
75	225 M	1785	299	Yes	94.1	0.85	88	1LG6 228-4AA□□¹⁾		355	
75	250 M	1790	298	No	94.5	0.86	86	1LG6 253-4AA□□		460	
100	250 M	1788	398	Yes	94.5	0.86	116	1LG6 258-4AA□□¹⁾		495	
100	280 S	1788	398	No	94.5	0.86	114	1LG6 280-4AA□□		575	
125	280 M	1790	497	Yes	95	0.86	144	1LG6 283-4AA□□		675	
150	280 M	1788	598	Yes	95	0.86	172	1LG6 288-4AA□□¹⁾		710	
150	315 S	1791	596	Yes	95	0.87	170	1LG6 310-4AA□□		810	
175	315 M	1791	696	Yes	95.4	0.87	198	1LG6 313-4AA□□		965	
200	315 L	1792	795	Yes	95.4	0.87	225	1LG6 316-4AA□□		1105	
250	315 L	1792	994	No	95.8	0.87	280	1LG6 317-4AA□□		1305	
300	315 L	1792	1193	No	95.8	0.87	335	1LG6 318-4AA□□¹⁾		1345	

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code							
	60 Hz	460 VΔ (see "Introduction" for outputs at 60 Hz)	Without flange	With flange			With standard flange		With special flange	
			IM B3/6/7/8, IM V6, IM V5 without protective cover ²⁾	IM B5, IM V1 without protective cover ³⁾⁴⁾	IM V1 without protective cover ³⁾	IM V1 with protective cover ³⁾⁵⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	0	1	8	4	6	2	7	3
1LG6 18-...□□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 20-...□□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 22-...□□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 25-...□□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 28-...□□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 310-...□□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 313-...□□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 316-...□□	–	○	□ ⁶⁾	–	✓	✓	✓	–	–	–
1LG6 317-...□□	–	○	□	–	–	–	–	–	–	–
1LG6 318-...□□	–	○	□	–	–	–	–	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) Only 60 Hz data according to EPACT on the rating plate.
- 2) If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 3) 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 4) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 5) The "Second shaft extension" option, order code **K16** is not possible.
- 6) Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 60 Hz L_{pFA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
4-pole, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT							
1LG6 183-4AA□□	2.9	7.1	3.3	16	0.12	65	78
1LG6 186-4AA□□	2.8	7.4	3.4	16	0.14	65	78
1LG6 207-4AA□□	3	7.7	3.7	16	0.23	66	79
1LG6 220-4AA□□	3.1	7.5	3.4	16	0.4	65	78
1LG6 223-4AA□□	3.3	7.9	3.5	16	0.49	65	78
1LG6 228-4AA□□	3	7.8	3.3	16	0.66	64	78
1LG6 253-4AA□□	2.9	8.2	3.4	16	0.86	68	81
1LG6 258-4AA□□	3	8.1	3.3	16	0.99	72	86
1LG6 280-4AA□□	2.9	7.6	3.2	16	1.4	71	84
1LG6 283-4AA□□	3	8.2	3.4	16	1.7	71	84
1LG6 288-4AA□□	3.1	8.4	3.5	16	1.88	71	85
1LG6 310-4AA□□	3.1	7.8	3.2	16	2.3	75	88
1LG6 313-4AA□□	3.2	8.4	3.3	16	2.9	75	88
1LG6 316-4AA□□	3.7	9	3.6	16	3.5	75	88
1LG6 317-4AA□□	4	9.1	3.7	16	4.2	75	88
1LG6 318-4AA□□	4	9.3	3.7	16	4.5	81	94

The motors can also be used for 50 Hz according to CEMEP, see Pages 2/48 to 2/51.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output				Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	Order No.	Price	Weight
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm	EPACT with CC No. CC 032A	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below		IM B3 type of construction approx. m kg	
6-pole, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT											
20	180 L	1178	121	Yes	91	0.8	25.5	1LG6 186-6AA□□		175	
25	200 L	1180	151	Yes	91.7	0.79	32.5	1LG6 206-6AA□□		210	
30	200 L	1180	181	Yes	91.7	0.8	38.5	1LG6 207-6AA□□		240	
40	225 M	1184	241	Yes	93	0.82	49	1LG6 223-6AA□□		325	
50	225 M	1184	301	Yes	93	0.83	61	1LG6 228-6AA□□ ¹⁾		355	
50	250 M	1186	300	No	93	0.82	61	1LG6 253-6AA□□		405	
60	250 M	1186	361	Yes	93.6	0.82	73	1LG6 258-6AA□□ ¹⁾		435	
60	280 S	1190	359	No	94.1	0.83	72	1LG6 280-6AA□□		520	
75	280 M	1190	449	No	94.5	0.83	89	1LG6 283-6AA□□		570	
100	280 M	1190	599	Yes	94.5	0.84	118	1LG6 288-6AA□□ ¹⁾		615	
100	315 S	1191	598	Yes	94.5	0.82	120	1LG6 310-6AA□□		760	
125	315 M	1191	747	Yes	94.5	0.84	148	1LG6 313-6AA□□		935	
150	315 L	1192	896	Yes	95	0.84	176	1LG6 316-6AA□□		1010	
175	315 L	1192	1046	Yes	95	0.84	205	1LG6 317-6AA□□		1180	
200	315 L	1192	1195	Yes	95.4	0.84	235	1LG6 318-6AA□□		1245	

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code							
	60 Hz		Without flange	With flange			With standard flange		With special flange	
	460 VY (see "Introduction" for outputs at 60 Hz)	460 VA	IM B3/6/7/8, IM V6, IM V5 without protective cover ²⁾	IM B5, IM V1 without protective cover ^{3) 4)}	IM V1 without protective cover ^{3) 5)}	IM V1 with protective cover ^{3) 5)}	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	0	1	8	4	6	2	7	3
1LG6 18 - . . . □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 20 - . . . □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 22 - . . . □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 25 - . . . □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 28 - . . . □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 310 - . . . □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 313 - . . . □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 316 - . . . □□	–	○	□ ⁶⁾	–	✓	✓	✓	–	–	–
1LG6 317 - . . . □□	–	○	□ ⁶⁾	–	✓	✓	✓	–	–	–
1LG6 318 - . . . □□	–	○	□ ⁶⁾	–	✓	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) Only 60 Hz data according to EPACT on the rating plate.
- 2) If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 3) 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 4) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 5) The "Second shaft extension" option, order code **K16** is not possible.
- 6) Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 60 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
6-pole, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT							
1LG6 186-6AA□□	2.9	6.5	3	16	0.2	57	70
1LG6 206-6AA□□	2.9	6.5	2.7	16	0.29	65	78
1LG6 207-6AA□□	2.9	6.4	2.7	16	0.36	65	78
1LG6 223-6AA□□	3.4	7.2	3.4	16	0.63	62	75
1LG6 228-6AA□□	3.2	7.6	3.4	16	0.76	61	74
1LG6 253-6AA□□	3.4	7.4	2.9	16	0.93	63	76
1LG6 258-6AA□□	3.4	7.4	2.9	16	1.07	65	79
1LG6 280-6AA□□	3.6	7.7	3.1	16	1.4	62	75
1LG6 283-6AA□□	3.9	8.3	3.3	16	1.6	62	75
1LG6 288-6AA□□	4	8.4	3.3	16	1.94	64	78
1LG6 310-6AA□□	3.3	8.4	3.4	16	2.5	66	79
1LG6 313-6AA□□	3	7.9	3.1	16	3.2	66	79
1LG6 316-6AA□□	3.3	8.5	3.3	16	4	66	79
1LG6 317-6AA□□	3.6	8.9	3.6	16	4.7	66	79
1LG6 318-6AA□□	4	9.4	4	16	5.4	69	82

The motors can also be used for 50 Hz according to CEMEP, see Pages 2/48 to 2/51.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-cooled motors without external fan
Aluminum series 1LP7/1LP5

Selection and ordering data

Rated output with		Frame size	Order No.	Price	Weight
			For Order No. supplements for voltage and type of construction, see table below		For IM B3 type of construction approx.
50 Hz P_{rated} kW	60 Hz P_{rated} kW	FS			m kg
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP55 degree of protection, with reduced output					
0.12	0.14	63 M	1LP7 060-2AA□□		3.4
0.16	0.18	63 M	1LP7 063-2AA□□		3.9
0.19	0.22	71 M	1LP7 070-2AA□□		4.9
0.27	0.3	71 M	1LP7 073-2AA□□		6.4
0.35	0.40	80 M	1LP7 080-2AA□□		8.0
0.55	0.6	80 M	1LP7 083-2AA□□		9.6
0.82	0.95	90 S	1LP7 090-2AA□□		12.5
1.1	1.25	90 L	1LP7 096-2AA□□		15.2
1.3	1.5	100 L	▶ 1LP7 106-2AA□□		22.3
1.8	2.1	112 M	▶ 1LP7 113-2AA□□		29.0
2.5	2.9	132 S	▶ 1LP7 130-2AA□□		42.0
3.4	3.9	132 S	▶ 1LP7 131-2AA□□		51.0
5	5.7	160 M	▶ 1LP7 163-2AA□□		70.0
6	6.9	160 M	▶ 1LP7 164-2AA□□		82.0
7	8	160 L	▶ 1LP7 166-2AA□□		99.0
10	11.5	180 M	1LP5 183-2AA□□		112.0
13.5	15.5	200 L	1LP5 206-2AA□□		160.0
16.5	19	200 L	1LP5 207-2AA□□		182.0

The rated outputs and weights may change slightly after they have been checked.

Further electrical data can be calculated and supplied on receipt of order.

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz		60 Hz		Without flange	With flange		With standard flange		With special flange		
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover ¹⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	6	2	7	3
1LP7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP5 18 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	–	–	–
1LP5 20 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

▶ The Order No. for 1LP7 motors marked with this symbol are phase-out models.
1PC1 motors are the successors.
For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Self-cooled motors without external fan and fan cover with improved efficiency" Pages 1/46 to 1/49.

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

1) 1LP5 183-... to 1LP5 207-... motors (motor series 1LA5, frame sizes 180 M to 200 L) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

2) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-cooled motors without external fan
Aluminum series 1LP7/1LP5

Selection and ordering data (continued)

Rated output with		Frame size	Order No.	Price	Weight
50 Hz P_{rated} kW	60 Hz P_{rated} kW	FS	For Order No. supplements for voltage and type of construction, see table below		For IM B3 type of construction approx. m kg
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, with reduced output					
0.07	0.08	63 M	1LP7 060-4AB□□		3.4
0.12	0.14	63 M	1LP7 063-4AB□□		3.9
0.13	0.15	71 M	1LP7 070-4AB□□		4.7
0.19	0.22	71 M	1LP7 073-4AB□□		5.8
0.22	0.25	80 M	1LP7 080-4AA□□		7.8
0.38	0.45	80 M	1LP7 083-4AA□□		9.1
0.55	0.63	90 S	1LP7 090-4AA□□		11.9
0.65	0.75	90 L	1LP7 096-4AA□□		15.1
0.88	1.00	100 L	▶ 1LP7 106-4AA□□		23.0
1.2	1.4	100 L	▶ 1LP7 107-4AA□□		25.0
1.6	1.85	112 M	▶ 1LP7 113-4AA□□		30.0
2.5	2.9	132 S	▶ 1LP7 130-4AA□□		44.0
3.1	3.6	132 M	▶ 1LP7 133-4AA□□		54.0
4.8	5.5	160 M	▶ 1LP7 163-4AA□□		74.0
5.4	6.2	160 L	▶ 1LP7 166-4AA□□		90.0
7.5	8.5	180 M	1LP5 183-4AA□□		109.0
9	10.5	180 L	1LP5 186-4AA□□		122.0
12	14	200 L	1LP5 207-4AA□□		165.0

The rated outputs and weights may change slightly after they have been checked.

Further electrical data can be calculated and supplied on receipt of order.

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz		60 Hz		Without flange	With flange	With standard flange	With special flange				
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover ¹⁾ IM V3	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	6	2	7	3
1LP7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP5 18 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	–	–	–
1LP5 20 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

▶ The Order No. for 1LP7 motors marked with this symbol are phase-out models.
1PC1 motors are the successors.
For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Self-cooled motors without external fan and fan cover with improved efficiency" Pages 1/46 to 1/49.

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

1) 1LP5 183-... to 1LP5 207-... motors (motor series 1LA5, frame sizes 180 M to 200 L) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

2) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-cooled motors without external fan
Aluminum series 1LP7/1LP5

Selection and ordering data (continued)

Rated output with		Frame size	Order No.	Price	Weight
50 Hz P_{rated} kW	60 Hz P_{rated} kW	FS	For Order No. supplements for voltage and type of construction, see table below ▶ Phase-out model		For IM B3 type of construction approx. m kg
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, with reduced output					
0.045	0.05	63 M	1LP7 063-6AA□□		4.0
0.09	0.105	71 M	1LP7 070-6AA□□		6.1
0.13	0.15	71 M	1LP7 073-6AA□□		6.1
0.18	0.2	80 M	1LP7 080-6AA□□		7.3
0.27	0.3	80 M	1LP7 083-6AA□□		9.1
0.37	0.4	90 S	1LP7 090-6AA□□		12.1
0.5	0.57	90 L	1LP7 096-6AA□□		15.2
0.7	0.8	100 L	▶ 1LP7 106-6AA□□		23.3
1.0	1.15	112 M	▶ 1LP7 113-6AA□□		26.0
1.7	1.9	132 S	▶ 1LP7 130-6AA□□		40.0
2	2.3	132 M	▶ 1LP7 133-6AA□□		45.0
2.3	2.65	132 M	▶ 1LP7 134-6AA□□		52.0
3.3	3.8	160 M	▶ 1LP7 163-6AA□□		74.0
4	4.6	160 L	▶ 1LP7 166-6AA□□		99.0
6.5	7.5	180 L	1LP5 186-6AA□□		122.0
8.5	10	200 L	1LP5 207-6AA□□		165.0

The rated outputs and weights may change slightly after they have been checked.

Further electrical data can be calculated and supplied on receipt of order.

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code					
	50 Hz			60 Hz			Without flange	With flange	With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ (see "Introduction" for outputs at 60 Hz)	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover ¹⁾ IM V3	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	6	2	7	3
1LP7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP5 18 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	–	–	–
1LP5 20 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

▶ The Order No. for 1LP7 motors marked with this symbol are phase-out models.

1PC1 motors are the successors.

For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Self-cooled motors without external fan and fan cover with improved efficiency" Pages 1/46 to 1/49.

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ 1LP5 183-... to 1LP5 207-... motors (motor series 1LA5, frame sizes 180 M to 200 L) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-cooled motors without external fan
Aluminum series 1LP7/1LP5

Selection and ordering data (continued)

Rated output with		Frame size	Order No.	Price	Weight
50 Hz P_{rated} kW	60 Hz P_{rated} kW	FS	For Order No. supplements for voltage and type of construction, see table below		For IM B3 type of construction approx. m kg
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, with reduced output					
0.045	0.05	71 M	1LP7 070-8AB□□		6.1
0.06	0.07	71 M	1LP7 073-8AB□□		6.1
0.09	0.105	80 M	1LP7 080-8AB□□		7.3
0.13	0.15	80 M	1LP7 083-8AB□□		9.1
0.25	0.29	90 S	1LP7 090-8AB□□		10.2
0.35	0.4	90 L	1LP7 096-8AB□□		12.8
0.45	0.5	100 L	▶ 1LP7 106-8AB□□		19.4
0.65	0.75	100 L	▶ 1LP7 107-8AB□□		21.3
0.8	0.9	112 M	▶ 1LP7 113-8AB□□		23.3
1.2	1.4	132 S	▶ 1LP7 130-8AB□□		40.0
1.45	1.7	132 M	▶ 1LP7 133-8AB□□		48.0
1.8	2.1	160 M	▶ 1LP7 163-8AB□□		59.0
2.4	2.8	160 L	▶ 1LP7 164-8AB□□		68.0
3	3.45	160 L	▶ 1LP7 166-8AB□□		88.0
5.5	6.5	180 L	1LP5 186-8AB□□		122.0
7.5	9	200 L	1LP5 207-8AB□□		180.0

The rated outputs and weights may change slightly after they have been checked.

Further electrical data can be calculated and supplied on receipt of order.

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code					
	50 Hz		60 Hz				Without flange	With flange		With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover ¹⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	6	2	7	3
1LP7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP5 18 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	–	–	–
1LP5 20 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

▶ The Order No. for 1LP7 motors marked with this symbol are phase-out models.

1PC1 motors are the successors.

For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Self-cooled motors without external fan and fan cover with improved efficiency" Pages 1/46 to 1/49.

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ 1LP5 183-... to 1LP5 207-... motors (motor series 1LA5, frame sizes 180 M to 200 L) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-cooled motors without external fan
Cast-iron series 1LP4

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output					Rated current at 50 Hz 400 V	Locked-rotor torque with direct starting torque	Locked-rotor current starting as multiple current	Break-down torque	Torque class	Moment of inertia	Order No.	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V									
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	$T_{\text{LR}}/T_{\text{rated}}$	$I_{\text{LR}}/I_{\text{rated}}$	$T_{\text{B}}/T_{\text{rated}}$	CL	J kg m ²	For Order No. supplements for voltage and type of construction, see table below		IM B3 type of construction approx. m kg	
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP55 degree of protection, with reduced output															
7.3	180 M	2945	24	91.0	0.89	13	2.4	6.5	3.4	16	0.068	1LP4 183-2FA□□		140	
10	200 L	2950	32	90.9	0.89	17.8	2.3	6.4	2.9	16	0.129	1LP4 206-2FA□□		195	
12.5	200 L	2955	40	91.9	0.90	22	2.5	7.1	3.2	16	0.153	1LP4 207-2FA□□		215	
15	225 M	2960	48	93.2	0.90	26	2.3	6.7	3.0	16	0.217	1LP4 223-2FA□□		275	
18.5	250 M	2970	59	92.6	0.89	32.5	2.0	6.6	3.0	13	0.403	1LP4 253-2FB□□		360	
25	280 S	2975	80	93.8	0.90	42.5	2.5	7.6	3.0	13	0.715	1LP4 280-2FB□□		480	
30	280 M	2975	96	94.4	0.90	51	2.6	7.2	2.9	13	0.832	1LP4 283-2FB□□		520	
37	315 S	2984	118	94.5	0.90	63	2.3	7.3	3.0	13	1.19	1LP4 310-2FB□□		700	
44	315 M	2982	141	94.0	0.91	74	2.3	6.8	2.8	13	1.39	1LP4 313-2FB□□		755	
53	315 L	2982	170	94.6	0.91	89	2.3	6.9	2.9	13	1.62	1LP4 316-2FB□□		880	
67	315 L	2984	214	95.1	0.92	110	2.1	6.5	2.8	13	2.09	1LP4 317-2FB□□		995	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code								
	50 Hz				60 Hz		Without flange		With flange		With standard flange		With special flange
	230 V Δ /400 VY	400 V Δ /690 VY	500 VY	500 V Δ	460 VY	460 V Δ	IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾	IM V1 without protective cover ²⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	8	6	2	7	3
1LP4 18 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 20 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 22 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 25 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 28 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 310 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 313 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 316 - . . . □□	-	○	-	○	-	○	□ ³⁾	-	✓ ⁴⁾	✓	-	-	-
1LP4 317 - . . . □□	-	○	-	○	-	○	□ ³⁾	-	✓ ⁴⁾	✓	-	-	-

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) If motors 1LP4 183-... to 1LP4 317-... (motor series 1LP4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 2) 1LP4 220-... to 1LP4 317-... motors (motor series 1LP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 3) Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.
- 4) 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-cooled motors without external fan
Cast-iron series 1LP4

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque with direct starting torque	Locked-rotor current starting as multiple current	Break-down torque	Torque class	Moment of inertia	Order No.	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V								
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²		m kg	
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP55 degree of protection, with reduced output														
6.2	180 M	1465	40	90.6	0.87	11.4	2.1	6.6	3.0	16	0.099	1LP4 183-4FA□□	135	
7.3	180 L	1470	47	91.2	0.87	13.2	2.1	6.9	3.1	16	0.117	1LP4 186-4FA□□	150	
10	200 L	1465	65	90.5	0.88	18.2	2.3	6.6	3.2	16	0.191	1LP4 207-4FA□□	195	
12.5	225 S	1475	81	92.2	0.86	23	2.3	6.6	3.0	16	0.374	1LP4 220-4FA□□	255	
15	225 M	1475	97	93.1	0.87	26.5	2.4	7.1	3.1	16	0.447	1LP4 223-4FA□□	290	
18.5	250 M	1480	119	93.5	0.87	33	2.2	6.0	2.6	16	0.688	1LP4 253-4FA□□	375	
25	280 S	1485	161	93.9	0.87	44	2.4	7.0	2.9	16	1.19	1LP4 280-4FA□□	515	
30	280 M	1485	193	94.4	0.88	52	2.4	7.2	2.9	16	1.39	1LP4 283-4FA□□	560	
37	315 S	1488	237	94.4	0.87	65	2.2	6.2	2.6	16	1.94	1LP4 310-4FA□□	710	
44	315 M	1488	282	95.2	0.87	77	2.4	6.7	2.7	16	2.31	1LP4 313-4FA□□	790	
53	315 L	1488	340	95.5	0.87	92	2.5	6.7	2.7	16	2.88	1LP4 316-4FA□□	935	
67	315 L	1488	430	95.7	0.88	114	2.3	6.2	2.6	16	3.46	1LP4 317-4FA□□	1040	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code									
	50 Hz				60 Hz		Without flange	With flange		With standard flange		With special flange		
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾	IM V1 without protective cover ²⁾	IM V3	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	8	6	2	7	3	
1LP4 18 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-	
1LP4 20 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-	
1LP4 22 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-	
1LP4 25 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-	
1LP4 28 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-	
1LP4 310 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-	
1LP4 313 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-	
1LP4 316 - . . . □□	-	○	-	○	-	○	□ ³⁾	-	✓	✓	-	-	-	
1LP4 317 - . . . □□	-	○	-	○	-	○	□ ³⁾	-	✓	✓	-	-	-	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) If motors 1LP4 183... to 1LP4 317... (motor series 1LP4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 2) 1LP4 220... to 1LP4 317... motors (motor series 1LP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 3) Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-cooled motors without external fan
Cast-iron series 1LP4

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Rated current at 50 Hz 400 V	Locked-rotor torque with direct starting torque	Locked-rotor current starting as multiple of rated current	Break-down torque	Torque class	Moment of inertia	Order No.	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	$\cos\phi$ rated									
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²	For Order No. supplements for voltage and type of construction, see table below		IM B3 type of construction approx. m kg	
6-pole, 1000 rpm at 50 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP55 degree of protection, with reduced output															
5	180 L	970	49	89.4	0.83	10	2.1	5.3	2.4	16	0.175	1LP4 186-6FA□□		145	
6.2	200 L	975	61	90.4	0.83	12	2.2	5.7	2.4	16	0.238	1LP4 206-6FA□□		185	
7.3	200 L	975	71	90.8	0.82	14.2	2.3	5.8	2.4	16	0.287	1LP4 207-6FA□□		195	
10	225 M	980	97	92.1	0.84	18.6	2.3	5.5	2.4	16	0.492	1LP4 223-6FA□□		270	
12.5	250 M	982	122	92.5	0.84	23	2.3	5.8	2.2	16	0.762	1LP4 253-6FA□□		355	
15	280 S	986	145	92.5	0.86	27	2.1	6.0	2.3	16	1.12	1LP4 280-6FA□□		455	
18.5	280 M	986	179	92.9	0.86	33.5	2.1	6.0	2.4	16	1.37	1LP4 283-6FA□□		490	
25	315 S	990	241	93.9	0.87	44	2.2	6.6	2.7	16	2.10	1LP4 310-6FA□□		665	
30	315 M	988	290	94.2	0.86	53	2.3	6.8	2.8	16	2.50	1LP4 313-6FA□□		730	
37	315 L	988	358	94.5	0.87	65	2.2	6.6	2.7	16	3.20	1LP4 316-6FA□□		870	
44	315 L	990	424	94.9	0.87	77	2.7	7.2	2.9	16	4.02	1LP4 317-6FA□□		960	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code								
	50 Hz				60 Hz		Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾	IM V1 without protective cover ²⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	8	6	2	7	3
1LP4 18 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 20 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 22 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 25 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 28 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 310 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 313 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 316 - . . . □□	-	○	-	○	-	○	□ ³⁾	-	✓	✓	-	-	-
1LP4 317 - . . . □□	-	○	-	○	-	○	□ ³⁾	-	✓	✓	-	-	-

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1LP4 183-... to 1LP4 317-... (motor series 1LP4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1LP4 220-... to 1LP4 317-... motors (motor series 1LP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-cooled motors without external fan
Cast-iron series 1LP4

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Rated current at 50 Hz 400 V	Locked-rotor torque with direct starting torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No.	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V									
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²	For Order No. supplements for voltage and type of construction, see table below		IM B3 type of construction approx. m kg	
8-pole, 750 rpm at 50 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP55 degree of protection, with reduced output															
3.7	180 L	725	49	88.4	0.76	10	1.5	4.4	2.0	13	0.169	1LP4 186-8FB□□		145	
5	200 L	730	65	88.3	0.78	10.4	2.0	5.1	2.5	13	0.290	1LP4 207-8FB□□		195	
6.2	225 S	735	81	89.8	0.80	12.4	2.1	5.6	2.6	13	0.482	1LP4 220-8FB□□		260	
7.3	225 M	735	95	90.2	0.81	14.4	2.1	5.7	2.7	13	0.551	1LP4 223-8FB□□		280	
10	250 M	735	130	91.6	0.82	19.2	2.0	5.4	2.5	13	0.837	1LP4 253-8FB□□		370	
12.5	280 S	735	162	92.3	0.82	24	1.9	4.9	2.1	13	1.11	1LP4 280-8FB□□		455	
15	280 M	735	195	92.6	0.81	29	1.9	5.0	2.0	13	1.35	1LP4 283-8FB□□		495	
18.5	315 S	740	239	93.2	0.83	34.5	2.0	5.8	2.5	13	2.08	1LP4 310-8FB□□		660	
25	315 M	738	323	93.5	0.84	46	2.0	5.7	2.5	13	2.48	1LP4 313-8FB□□		725	
30	315 L	740	387	93.6	0.84	55	2.0	5.8	2.6	13	3.14	1LP4 316-8FB□□		845	
37	315 L	740	477	94.1	0.84	68	2.2	6.0	2.7	13	3.95	1LP4 317-8FB□□		1000	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code								
	50 Hz				60 Hz		Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾	IM V1 without protective cover ²⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	8	6	2	7	3
1LP4 18 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 20 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 22 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 25 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 28 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 310 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 313 - . . . □□	○	○	○	○	○	○	□	✓	-	✓	-	-	-
1LP4 316 - . . . □□	-	○	-	○	-	○	□ ³⁾	-	✓	✓	-	-	-
1LP4 317 - . . . □□	-	○	-	○	-	○	□ ³⁾	-	✓	✓	-	-	-

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1LP4 183-... to 1LP4 317-... (motor series 1LP4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1LP4 220-... to 1LP4 317-... motors (motor series 1LP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Overview

Category	Explanation
Voltages	For standard voltages, see the corresponding Order No. supplements in the selection and ordering data. For other voltages with voltage code 9 and the required order code, see "Special versions", "Selection and ordering data". For further information and details, see catalog part 0 "Introduction".
Types of construction	For standard construction types, see the corresponding Order No. supplements in the selection and ordering data. For other types of construction using type of construction code 9 and the required order code, see "Special versions", "Selection and ordering data". For further information and details, see catalog part 0 "Introduction".
Motor protection	For an overview of the relevant order codes, see "Special versions", "Selection and ordering data".
Motor connection and connection box	For further information and details, see catalog part 0 "Introduction".
Windings and insulation	
Colors and paint finish	
Modular technology – Basic versions	
Modular technology – Combinations of basic versions	
Modular technology – Additional versions	
Special technology	
Mechanical design and degrees of protection	
Coolant temperature and site altitude	
Designs in accordance with standards and specifications	
Bearings and lubrication	
Balance and vibration quantity	
Shaft and rotor	
Heating and ventilation	
Rating plate and extra rating plates	
Packaging, safety notes, documentation and test certificates	
Design for Zones 1, 2, 21 and 22 according to ATEX	See catalog part 4 "Explosion-proof motors"
Ship version	See catalog part 10 "Marine motors"

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Selection and ordering data

Voltages

Additional order codes for other voltages or voltage codes
(without **-Z** supplement)

For some non-standard voltages at 50 or 60 Hz, order codes are specified. They are ordered by specifying the code digit **9** for voltage in the 11th position of the Order No. and the appropriate order code.

Special versions	Voltage code 11th position of the Order No.	Additional identifica- tion code with order code and plain text if required	Motor type frame size													
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7 and 1LA5																
			1LA7 (aluminum)								1LA5 (aluminum)					
Voltage at 50 Hz																
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E	○	○	○	○	○	○	○	○	○	○	○	○	○	○
380 VΔ/660 VY (440 VΔ at 60 Hz) (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1B	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Voltage at 60 Hz																
220 VΔ/380 VY; 50 Hz output	9	L2A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
220 VΔ/380 VY; 60 Hz output	9	L2B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 50 Hz output	9	L2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 60 Hz output	9	L2W	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 50 Hz output	9	L2R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 60 Hz output	9	L2E	○	○	○	○	○	○	○	○	○	○	○	○	○	○
460 VΔ; 50 Hz output	9	L2T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9	L2F	○	○	○	○	○	○	○	○	○	○	○	○	○	○
575 VY; 50 Hz output	9	L2U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VY; 60 Hz output	9	L2L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 50 Hz output	9	L2V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Voltage changeover at 60 Hz																
230 VYY/460 VY 60 Hz; 50 Hz output, 9 main terminals and electrical design to NEMA ³⁾	9	L3E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
230 VYY/460 VY 60 Hz; 60 Hz output, 9 main terminals and electrical design to NEMA ³⁾	9	L3F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
230 VΔΔ/460 VΔ 60 Hz; 50 Hz output, 12 main terminals and electrical design to NEMA	9	L3G	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	-	-
230 VΔΔ/460 VΔ 60 Hz; 60 Hz output, 12 main terminals and electrical design to NEMA	9	L3H	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	-	-
Non-standard voltages and/or frequencies																
Non-standard winding for vol- tages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 2/68.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identifica- tion code with order code and plain text if required	Motor type frame size													
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with improved efficiency in pole-changing version – Aluminum series 1LA7 and 1LA5																
			1LA7 (aluminum)								1LA5 (alu- minum)					
Voltage 60 Hz																
220 V; 50 Hz output	9	L4A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
220 V; 60 Hz output	9	L4B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 V; 50 Hz output	9	L4C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 V; 60 Hz output	9	L4D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 V; 50 Hz output	9	L4G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 V; 60 Hz output	9	L4E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 V; 50 Hz output	9	L4J	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 V; 60 Hz output	9	L4H	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 V; 50 Hz output	9	L4N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 V; 60 Hz output	9	L4M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard voltage and/or frequencies																
Non-standard winding for vol- tages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard winding for Y/Δ starting at low speed ²⁾	9	L3Y •	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓

- Without additional charge
- ✓ With additional charge
- Not possible
- This order code only determines the price of the version –
Additional plain text is required.

¹⁾ With order codes **L1A, L1B, L1C, L1D, L1E, L1L, L1R** and **L1U**, a rated voltage range is also specified on the rating plate.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

³⁾ When ordered with option brake (order code **G26**) only 6 motor connection terminals are possible for frame size 56 to 90.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Voltage code	Additional identification code with order code and plain text if required	Motor type frame size													
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9																
1LA9 (aluminum)																
Voltage at 50 Hz																
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E	○	○	○	○	○	○	○	○	○	○	○	○	○	○
380 VΔ/660 VY (440 VΔ at 60 Hz) (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1B	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Voltage at 60 Hz																
220 VΔ/380 VY; 50 Hz output	9	L2A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
220 VΔ/380 VY; 60 Hz output	9	L2B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 50 Hz output	9	L2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 60 Hz output	9	L2W	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 50 Hz output	9	L2R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 60 Hz output	9	L2E	○	○	○	○	○	○	○	○	○	○	○	○	○	○
460 VΔ; 50 Hz output	9	L2T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9	L2F	○	○	○	○	○	○	○	○	○	○	○	○	○	○
575 VY; 50 Hz output	9	L2U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VY; 60 Hz output	9	L2L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 50 Hz output	9	L2V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Voltage changeover at 60 Hz																
230 VYY/460 VY 60 Hz; 50 Hz output, 9 main terminals and electrical design to NEMA	9	L3E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VYY/460 VY 60 Hz; 60 Hz output, 9 main terminals and electrical design to NEMA	9	L3F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔΔ/460 VΔ 60 Hz; 50 Hz output, 12 main terminals and electrical design to NEMA	9	L3G	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔΔ/460 VΔ 60 Hz; 60 Hz output, 12 main terminals and electrical design to NEMA	9	L3H	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard voltage and/or frequencies																
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Voltage code	11th position of the Order No.	Additional identification code with order code and plain text if required	Motor type frame size												
				56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with increased output – Aluminum series 1LA9																
				1LA9 (aluminum)												
Voltage at 50 Hz																
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9		L1R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9		L1E	○	○	○	○	○	○	○	○	○	○	○	○	○
380 VΔ/660 VY (440 VΔ at 60 Hz) (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9		L1L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9		L1C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9		L1D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9		L1A	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ (380 ... 420 VΔ); 50 Hz output ¹⁾	9		L1B	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9		L1U	○	○	○	○	○	○	○	○	○	○	○	○	○
Voltage at 60 Hz																
220 VΔ/380 VY; 50 Hz output	9		L2A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
220 VΔ/380 VY; 60 Hz output	9		L2B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 50 Hz output	9		L2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9		L2D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9		L2Q	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 60 Hz output	9		L2W	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 50 Hz output	9		L2R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9		L2X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9		L2S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 60 Hz output	9		L2E	○	○	○	○	○	○	○	○	○	○	○	○	○
460 VΔ; 50 Hz output	9		L2T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9		L2F	○	○	○	○	○	○	○	○	○	○	○	○	○
575 VY; 50 Hz output	9		L2U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VY; 60 Hz output	9		L2L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 50 Hz output	9		L2V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9		L2M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Voltage changeover at 60 Hz																
230 VYY/460 VY 60 Hz; 50 Hz output, 9 main terminals and electrical design to NEMA	9		L3E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VYY/460 VY 60 Hz; 60 Hz output, 9 main terminals and electrical design to NEMA	9		L3F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔΔ/460 VΔ 60 Hz; 50 Hz output, 12 main terminals and electrical design to NEMA	9		L3G	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔΔ/460 VΔ 60 Hz; 60 Hz output, 12 main terminals and electrical design to NEMA	9		L3H	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard voltage and/or frequencies																
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9		L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- Without additional charge
- ✓ With additional charge
- Not possible
- This order code only determines the price of the version – Additional plain text is required.

¹⁾ With order codes **L1A, L1B, L1C, L1D, L1E, L1L, L1R** and **L1U**, a rated voltage range is also specified on the rating plate.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identification code with order code and plain text if required	Motor type frame size													
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L
Self-ventilated motors with improved efficiency – Cast-iron series 1LA6 and 1LG4																
			1LA6 (cast-iron)						1LG4 (cast-iron)							
Voltage at 50 Hz																
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E	○	○	○	○	○	○	○	○	○	○	○	○	○	–
380 VΔ/660 VY (440 VΔ at 60 Hz) (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A	○	○	○	○	○	○	○	○	○	○	○	○	○	–
400 VΔ (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1B	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Voltage at 60 Hz																
220 VΔ/380 VY; 50 Hz output	9	L2A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
220 VΔ/380 VY; 60 Hz output	9	L2B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
380 VΔ/660 VY; 50 Hz output	9	L2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
440 VY; 60 Hz output	9	L2W	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
440 VΔ; 50 Hz output	9	L2R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
460 VY; 60 Hz output	9	L2E	○	○	○	○	○	○	○	○	○	○	○	○	○	–
460 VΔ; 50 Hz output	9	L2T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9	L2F	○	○	○	○	○	○	○	○	○	○	○	○	○	○
575 VY; 50 Hz output	9	L2U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
575 VY; 60 Hz output	9	L2L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
575 VΔ; 50 Hz output	9	L2V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Non-standard voltage and/or frequencies																
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- Without additional charge
- ✓ With additional charge
- Not possible
- This order code only determines the price of the version – Additional plain text is required.

¹⁾ With order codes **L1A**, **L1B**, **L1C**, **L1D**, **L1E**, **L1L**, **L1R** and **L1U**, a rated voltage range is also specified on the rating plate.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Voltage code code 11th position of the Order No.	Additional identifica- tion code with order code and plain text if required	Motor type frame size																	
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L		
Self-ventilated motors with increased output – Cast-iron series 1LG4																				
1LG4 (cast-iron)																				
Voltage at 50 Hz																				
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R														✓	✓	✓	✓	✓
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E														○	○	○	○	○
380 VΔ/660 VY (440 VΔ at 60 Hz) (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L														✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C														✓	✓	✓	✓	✓
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D														✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A														○	○	○	○	○
400 VΔ (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1B														○	○	○	○	○
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U														○	○	○	○	○
Voltage at 60 Hz																				
220 VΔ/380 VY; 50 Hz output	9	L2A														✓	✓	✓	✓	✓
220 VΔ/380 VY; 60 Hz output	9	L2B														✓	✓	✓	✓	✓
380 VΔ/660 VY; 50 Hz output	9	L2C														✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D														✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q														✓	✓	✓	✓	✓
440 VY; 60 Hz output	9	L2W														✓	✓	✓	✓	✓
440 VΔ; 50 Hz output	9	L2R														✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X														✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S														✓	✓	✓	✓	✓
460 VY; 60 Hz output	9	L2E														○	○	○	○	○
460 VΔ; 50 Hz output	9	L2T														✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9	L2F														○	○	○	○	○
575 VY; 50 Hz output	9	L2U														✓	✓	✓	✓	✓
575 VY; 60 Hz output	9	L2L														✓	✓	✓	✓	✓
575 VΔ; 50 Hz output	9	L2V														✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M														○	○	○	○	○
Non-standard voltage and/or frequencies																				
Non-standard winding for vol- tages between 200 and 690 V (other voltages are available on request) ²⁾	9	L1Y														✓	✓	✓	✓	✓

- Without additional charge
 ✓ With additional charge
 – Not possible

¹⁾ With order codes **L1A, L1B, L1C, L1D, L1E, L1L, L1R** and **L1U**, a rated voltage range is also specified on the rating plate.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identification code with order code and plain text if required	Motor type frame size														
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L
Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6																	
1LG6 (cast-iron)																	
Voltage at 50 Hz																	
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R														✓	–
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E														○	–
380 VΔ/660 VY (440 VΔ at 60 Hz) (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L														✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C														✓	–
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D														✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A														○	–
400 VΔ (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1B														○	○
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U														○	○
Voltage at 60 Hz																	
220 VΔ/380 VY; 50 Hz output	9	L2A														✓	–
220 VΔ/380 VY; 60 Hz output	9	L2B														✓	–
380 VΔ/660 VY; 50 Hz output	9	L2C														✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D														✓	✓
440 VY; 50 Hz output	9	L2Q														✓	–
440 VY; 60 Hz output	9	L2W														✓	–
440 VΔ; 50 Hz output	9	L2R														✓	✓
440 VΔ; 60 Hz output	9	L2X														✓	✓
460 VY; 50 Hz output	9	L2S														✓	–
460 VY; 60 Hz output	9	L2E														○	–
460 VΔ; 50 Hz output	9	L2T														✓	✓
460 VΔ; 60 Hz output	9	L2F														○	○
575 VY; 50 Hz output	9	L2U														✓	–
575 VY; 60 Hz output	9	L2L														✓	–
575 VΔ; 50 Hz output	9	L2V														✓	✓
575 VΔ; 60 Hz output	9	L2M														○	○
Non-standard voltage and/or frequencies																	
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y														✓	✓

- Without additional charge
 ✓ With additional charge
 – Not possible

¹⁾ With order codes **L1A, L1B, L1C, L1D, L1E, L1L, L1R** and **L1U**, a rated voltage range is also specified on the rating plate.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identifica- tion code with order code and plain text if required	Motor type frame size													
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L
Self-cooled motors without external fan – Aluminum series 1LP7 and 1LP5																
			1LP7 (aluminum)										1LP5 (alu- minum)			
Voltage at 50 Hz																
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E	○	○	○	○	○	○	○	○	○	○	○	○	○	○
380 VΔ/660 VY (440 VΔ at 60 Hz) (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1B	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Voltage at 60 Hz																
220 VΔ/380 VY; 50 Hz output	9	L2A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
220 VΔ/380 VY; 60 Hz output	9	L2B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 50 Hz output	9	L2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 60 Hz output	9	L2W	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 50 Hz output	9	L2R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 60 Hz output	9	L2E	○	○	○	○	○	○	○	○	○	○	○	○	○	○
460 VΔ; 50 Hz output	9	L2T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9	L2F	○	○	○	○	○	○	○	○	○	○	○	○	○	○
575 VY; 50 Hz output	9	L2U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VY; 60 Hz output	9	L2L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 50 Hz output	9	L2V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Voltage changeover at 60 Hz																
230 VYY/460 VY 60 Hz; 50 Hz output, 9 main terminals and electrical design to NEMA	9	L3E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VYY/460 VY 60 Hz; 60 Hz output, 9 main terminals and electrical design to NEMA	9	L3F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔΔ/460 VΔ 60 Hz; 50 Hz output, 12 main terminals and electrical design to NEMA	9	L3G	○	○	○	○	○	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔΔ/460 VΔ 60 Hz; 60 Hz output, 12 main terminals and electrical design to NEMA	9	L3H	○	○	○	○	○	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard voltage and/or frequencies																
Non-standard winding for vol- tages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 2/75.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Voltage code code 11th position of the Order No.	Additional identifica- tion code with order code and plain text if required	Motor type frame size														
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L
Self-cooled motors without external fan – Cast-iron series 1LP4																	
1LP4 (cast-iron)																	
Voltage at 50 Hz																	
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R														✓	✓
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E														○	○
380 VΔ/660 VY (440 VΔ at 60 Hz) (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L														✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C														✓	✓
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D														✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A														○	○
400 VΔ (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1B														○	○
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U														○	○
Voltage at 60 Hz																	
220 VΔ/380 VY; 50 Hz output	9	L2A														✓	✓
220 VΔ/380 VY; 60 Hz output	9	L2B														✓	✓
380 VΔ/660 VY; 50 Hz output	9	L2C														✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D														✓	✓
440 VY; 50 Hz output	9	L2Q														✓	✓
440 VY; 60 Hz output	9	L2W														✓	✓
440 VΔ; 50 Hz output	9	L2R														✓	✓
440 VΔ; 60 Hz output	9	L2X														✓	✓
460 VY; 50 Hz output	9	L2S														✓	✓
460 VY; 60 Hz output	9	L2E														○	○
460 VΔ; 50 Hz output	9	L2T														✓	✓
460 VΔ; 60 Hz output	9	L2F														○	○
575 VY; 50 Hz output	9	L2U														✓	✓
575 VY; 60 Hz output	9	L2L														✓	✓
575 VΔ; 50 Hz output	9	L2V														✓	✓
575 VΔ; 60 Hz output	9	L2M														○	○
Non-standard voltage and/or frequencies																	
Non-standard winding for vol- tages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •														✓	✓

- Without additional charge
- ✓ With additional charge
- Not possible
- This order code only determines the price of the version –
Additional plain text is required.

¹⁾ With order codes **L1A, L1B, L1C, L1D, L1E, L1L, L1R** and **L1U**, a rated voltage range is also specified on the rating plate.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Types of construction

Additional order codes for other types of construction or type of construction codes (without **-Z** supplement)

Order codes have been defined for some special types of construction. They are ordered by specifying the code digit **9** for the type of construction in the 12th position of the Order No. and the appropriate order code.

Special versions	Type of construction code 12th position of the Order No.	Additional identification code with order code and plain text if required	Motor type frame size														
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7 and 1LA5																	
			1LA7 (aluminum)									1LA5 (aluminum)					
Without flange																	
IM V5 with protective cover ¹⁾	9	M1F	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With flange																	
IM V3 ²⁾	9	M1G	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	-	
With standard flange																	
IM V18 with protective cover ¹⁾	9	M2A	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	
With special flange																	
IM V18 with protective cover ¹⁾	9	M2B	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	
IM B34	9	M2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	
Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9																	
Self-ventilated motors with increased output – Aluminum series 1LA9																	
			1LA9 (aluminum)														
Without flange																	
IM V5 with protective cover ¹⁾	9	M1F	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With flange																	
IM V3	9	M1G	-	-	-	-	-	-	-	-	-	-	✓	✓	-	-	
With standard flange																	
IM V18 with protective cover ¹⁾	9	M2A	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	
With special flange																	
IM V18 with protective cover ¹⁾	9	M2B	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	
IM B34	9	M2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	

- ✓ With additional charge
- Not possible

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.

²⁾ For frame sizes 180 M to 225 M, the 1LA5 motors can be supplied with two additional eyebolts; state identification code **-Z** and order code **K32**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

	Type of construction code 12th position of the Order No.	Additional identification code with order code and plain text if required	Motor type frame size																
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L 2-pole	4-, 6-, 8-pole
Self-ventilated energy-saving motors with improved efficiency – Cast-iron series 1LA6 and 1LG4																			
													1LA6 (cast-iron)			1LG4 (cast-iron)			
Without flange																			
IM V5 without protective cover ¹⁾	9	M1D	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓ ²⁾	○
IM V6 ¹⁾	9	M1E	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓ ²⁾	○
IM V5 with protective cover ^{1) 3)}	9	M1F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ ²⁾	✓
With flange																			
IM V3 ⁴⁾	9	M1G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
With standard flange																			
IM V18 with protective cover ³⁾	9	M2A	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–
With special flange																			
IM V18 with protective cover ³⁾	9	M2B	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–
IM B34	9	M2C	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–
Self-ventilated motors with increased output – Cast-iron series 1LG4																			
													1LG4 (cast-iron)						
Without flange																			
IM V5 with protective cover ^{1) 3)}	9	M1F	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
With flange																			
IM V3 ⁴⁾	9	M1G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6																			
													1LG6 (cast-iron)						
Without flange																			
IM V5 without protective cover ¹⁾	9	M1D	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓ ²⁾	○
IM V6 ¹⁾	9	M1E	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓ ²⁾	○
IM V5 with protective cover ^{1) 3)}	9	M1F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ ²⁾	✓
With flange																			
IM V3 ⁴⁾	9	M1G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Self-cooled motors without external fan – Aluminum series 1LP7 and 1LP5																			
													1LP7 (aluminum)			1LP5 (aluminum)			
With flange																			
IM V3 ⁵⁾	9	M1G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Special flange																			
IM B34	9	M2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–
Self-cooled motors without external fan – Cast-iron series 1LP4																			
													1LP4 (cast-iron)						
Without flange																			
IM V5 without protective cover ¹⁾	9	M1D	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓ ²⁾	○
IM V6 ¹⁾	9	M1E	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓ ²⁾	○
With flange																			
IM V3 ⁴⁾	9	M1G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

- Without additional charge
- ✓ With additional charge
- Not possible

¹⁾ If motors of frame sizes 180 M to 315 L are mounted on the wall, it is recommended that the motor feet are supported.

²⁾ 60 Hz version is possible on request.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁴⁾ 1LG4/1LG6/1LP4 motors of frame sizes 225 S to 315 L are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

⁵⁾ For frame sizes 180 M to 200 L, the 1LA5 motors can be supplied with two additional eyebolts; state identification code **-Z** and order code **K32**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Options

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7 and 1LA5																
		1LA7 (aluminum)						1LA5 (aluminum)								
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature detectors for tripping ¹⁾	A31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor connection and connection box																
ECOFAST motor plug Han-Drive 10e for 230 VΔ/400 VY ²⁾	G55	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–
ECOFAST motor plug EMC Han-Drive 10e for 230 VΔ/400 VY ³⁾	G56	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–
Connection box on RHS	K09	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on LHS	K10	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
One cable gland, metal	K54	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cable gland, maximum configuration	K55	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85	✓	✓	✓	✓	✓	○	○	○	○	✓	✓	✓	✓	✓	✓
Next larger connection box	L00	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓
External earthing	L13	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3 cables protruding, 0.5 m long ⁴⁾⁵⁾	L44	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	O. R.
3 cables protruding, 1.5 m long ⁴⁾⁵⁾	L45	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	O. R.
6 cables protruding, 0.5 m long ⁴⁾	L47	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	O. R.
6 cables protruding, 1.5 m long ⁴⁾	L48	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6 cables protruding, 3 m long ⁴⁾	L49	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on NDE	M64	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Terminal strip for main and auxiliary terminals	M69	–	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–

For legend, see Page 2/82, for footnotes, see Page 2/83.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7 and 1LA5																
		1LA7 (aluminum)						1LA5 (aluminum)								
Windings and insulation																
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	C11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output	C12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 180 (H) at rated output and max. CT 60 °C ⁶⁾	C18	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 % ⁷⁾	C22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 % ⁷⁾	C23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 % ⁷⁾	C24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	C25	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	Y50 • and specified output, CT .. °C or SA m above sea level	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and specified output, CT .. °C or SA m above sea level	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Colors and paint finish																
Special finish in RAL 7030 stone gray		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sea air resistant special finish	M94	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

For legend, see Page 2/82, for footnotes, see Page 2/83.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7 and 1LA5																
		1LA7 (aluminum)							1LA5 (aluminum)							
Colors and paint finish (continued)																
Unpainted (only cast iron parts primed)	K23	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Modular technology – Basic versions ⁸⁾																
Mounting of separately driven fan	G17	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake ⁹⁾	G26	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	H57	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	H58	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Modular technology – Combinations of basic versions ⁸⁾																
Mounting of separately driven fan and 1XP8 001-1 rotary pulse encoder	H61	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-1 rotary pulse encoder ⁹⁾	H62	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake and separately driven fan ⁹⁾	H63	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake, separately driven fan and 1XP8 001-1 rotary pulse encoder ⁹⁾	H64	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of separately driven fan and 1XP8 001-2 rotary pulse encoder	H97	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-2 rotary pulse encoder ⁹⁾	H98	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake, separately driven fan and 1XP8 001-2 rotary pulse encoder ⁹⁾	H99	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Modular technology – Additional versions																
Brake supply voltage 24 V DC	C00	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Brake supply voltage 400 V AC	C01	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Brake supply voltage 180 V DC, for operation on MICROMASTER 411-ECOFAS ¹⁰⁾	C02	–	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–
Mechanical manual brake release with lever (no locking)	K82	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special technology ⁸⁾																
Prepared for mounting MMI ¹¹⁾	H15	O. R.	O. R.	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–
Mounting of LL 861 900 220 rotary pulse encoder	H70	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Prepared for mounting LL 861 900 220	H78	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Prepared for mounting HOG 9 D 1024 I	H79	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Prepared for mounting HOG 10 D 1024 I	H80	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend, see Page 2/82, for footnotes, see Page 2/83.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7 and 1LA5																
		1LA7 (aluminum)						1LA5 (aluminum)								
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors, oil resistant to 0.1 bar ¹²⁾	K17	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With two additional eyebolts for IM V1/IM V3	K32	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Low-noise version for 2-pole motors with clockwise direction of rotation ¹⁰⁾	K37	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Low-noise version for 2-pole motors with counter-clockwise direction of rotation ¹⁰⁾	K38	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IP65 degree of protection ¹³⁾	K50	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea) ¹⁴⁾	K52	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration-proof version	L03	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Condensation drainage holes ¹⁵⁾	L12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-rusting screws (externally)	M27	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mechanical protection for encoder ¹⁶⁾	M68	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Coolant temperature and site altitude																
Coolant temperature –40 to +40 °C	D03	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Coolant temperature –30 to +40 °C	D04	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																
CCC China Compulsory Certification ¹⁷⁾	D01	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–
Electrical according to NEMA MG1-12	D30	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Design according to UL with "Recognition Mark" ¹⁸⁾	D31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Canadian regulations (CSA) ¹⁹⁾	D40	✓	✓	✓	✓	✓	○	○	○	○	○	○	○	○	○	○
PSE Mark Japan ²⁰⁾	D46	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–
VIK version (includes Zone 2 for mains-fed operation, without Ex nA II on rating plate) ²¹⁾	K30	–	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection ²²⁾	G50	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Bearing design for increased cantilever forces	K20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Regreasing device ²²⁾	K40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Located bearing DE	K94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing NDE	L04	✓	✓	✓	✓	✓	✓	✓	✓	✓	□	□	□	□	□	□
Balance and vibration quantity																
Vibration quantity A		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Vibration quantity B	K02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Full key balancing	L68	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Balancing without key	M37	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7 and 1LA5																	
		1LA7 (aluminum)						1LA5 (aluminum)									
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ²³⁾	K04	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Second standard shaft extension	K16	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Shaft extension with standard dimensions without featherkey way	K42	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Standard shaft made of non-rusting steel	M65	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Non-standard cylindrical shaft extension ²⁴⁾	Y55 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Heating and ventilation																	
Fan cover for textile industry	H17	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Metal external fan ²⁵⁾	K35	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Anti-condensation heaters for 230 V	K45	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Anti-condensation heaters for 115 V	K46	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Rating plate and extra rating plates																	
Second lubricating plate, supplied loose	B06	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Second rating plate, loose	K31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Extra rating plate with identification codes	Y82 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Packaging, safety notes and test certificates																	
Without safety and commissioning note. Customer's declaration of renouncement required.	B00	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
With one safety and startup guide per box pallet	B01	○	○	○	○	○	○	○	○	○	○	○	○	–	–	–	
Acceptance test certificate 3.1 according to EN 10204	B02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Operating instructions German/English in print	B23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Type test with heat run for vertical motors, with acceptance	F83	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Wire-lattice pallet	L99	○	○	○	○	○	○	○	○	○	○	○	○	–	–	–	
Connected in star for dispatch	M32	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Connected in delta for dispatch	M33	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- . R. On request
- ✓ With additional charge
- Not possible

For footnotes, see Page 2/83.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions
2

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 2) Not possible for pole-changing motors. Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 V Δ /400 VY and special voltage with voltage code **9** and order code **L1U** (400 V Δ). The following order codes cannot be used in combination with the ECOFAST plugs, order code **G55**: **A12, C02, C18, D31, D40, G50, H15, H17, H62, H63, H64, H98, H99, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52.**
- 3) Not possible for pole-changing motors. Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 V Δ /400 VY and special voltage with voltage code **9** and order code **L1U** (400 V Δ). The following order codes cannot be used in combination with the ECOFAST plugs, order code **G56**: **A12, A23, A31, C00, C18, D31, D40, G50, H15, H17, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52.** The following order codes can only be used in combination with the ECOFAST plugs, order code **G56** only with order code **C01** (AC 400 V) or **C02** (DC 180 V): **G26, H62, H63, H64, H98, H99.**
- 4) In combination with the PTC thermistor option or anti-condensation heating option, please inquire before ordering.
- 5) Not possible for pole-changing motors and/or for voltage codes **1** or **6**.
- 6) Cannot be used for motors in UL version (order code **D31**). Cannot be used for motors according to CSA approval (order code **D40**) for motor series 1LA5 frame size 180 to 225. The grease lifetime specified in catalog part 0 "Introduction" refers to CT 40 °C. When the coolant temperature rises by 10 K, the grease lifetime or relubrication interval is halved.
- 7) No derating in combination with the following order codes: **L2A, L2C, L2Q, L2R, L2S, L2T, L2U, L2V, L3E** and **L3G.**)
- 8) A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various technologies nor with each other within the same technology system. This applies for:
 - Modular technology
 - Basic versions of "Modular technology"
 - Combination of special versions "Special technology"
- 9) The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00, C01** and **C02**.
- 10) Not possible in motors in a pole-changing version.
- 11) Converter mounting is possible, if the MICROMASTER DA 51.3 type is specified for 230 V Δ /400 VY.
- 12) Not possible for type of construction IM V3.
- 13) Not possible in combination with rotary pulse encoder HOG 9 D 10241 (order code **H72, H79**) and/or brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 14) Not possible in combination with brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 15) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 16) Not necessary when a rotary pulse encoder is combined with a separately driven fan, because in this case the rotary pulse encoder is installed under the fan cowl.
- 17) CCC certification is required for
 - 2-pole motors ≤ 2.2 kW
 - 4-pole motors ≤ 1.1 kW
 - 6-pole motors ≤ 0.75 kW
 - 8-pole motors ≤ 0.55 kW
 The order code **D01** for frame sizes 100 and 112 is only valid for pole-changing motors 1LA7.
- 18) Possible up to 600 V max. The rated voltage is indicated on the rating plate without voltage range.
- 19) The rated voltage is indicated on the rating plate without voltage range.
- 20) "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking.
- 21) Not possible for pole-changing motors.
- 22) Not possible when brake is mounted.
- 23) Can be combined with deep-groove bearings of series 60.., 62.. and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**), brake mounting or encoder mounting.
- 24) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **K16**:
 - Dimensions D and DA \leq internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA $\leq 2 \times$ length E (normal) of the shaft extension
 For an explanation of the order codes, see catalog part 0 "Introduction".
- 25) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external fan is not possible in combination with the low-noise version – order code **K37** or **K38**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9																
1LA9 (aluminum)																
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature detectors for tripping ¹⁾	A31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor connection and connection box																
ECOFAST motor plug Han-Drive 10e for 230 VΔ/400 VY ²⁾	G55	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-
ECOFAST motor plug EMC Han-Drive 10e for 230 VΔ/400VY ³⁾	G56	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-
Connection box on RHS	K09	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on LHS	K10	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
One cable gland, metal	K54	-	-	-	-	-	✓	✓	✓	✓	-	-	-	-	-	-
Cable gland, maximum configuration	K55	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85	✓	✓	✓	✓	✓	○	○	○	○	○	○	○	○	○	○
Next larger connection box	L00	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	✓
External earthing	L13	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3 cables protruding, 0.5 m long ⁴⁾⁵⁾	L44	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.
3 cables protruding, 1.5 m long ⁴⁾⁵⁾	L45	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.
6 cables protruding, 0.5 m long ⁴⁾	L47	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.
6 cables protruding, 1.5 m long ⁴⁾	L48	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6 cables protruding, 3 m long ⁴⁾	L49	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on NDE	M64	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windings and insulation																
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	C11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output	C12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 % ⁶⁾	C22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 2/87.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9																
1LA9 (aluminum)																
Windings and insulation (continued)																
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 % ⁶⁾	C23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 % ⁶⁾	C24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	C25	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	Y50 • and specified output, CT... °C or SA m above sea level	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and specified output, CT... °C or SA m above sea level	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Colors and paint finish																
Special finish in RAL 7030 stone gray		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sea air resistant special finish	M94	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors, oil-resistant to 0,1 bar Not possible for IM V3 type of construction.	K17	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation	K37	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓
Low-noise version for 2-pole motors with counter-clockwise direction of rotation	K38	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓
IP65 degree of protection	K50	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea)	K52	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration-proof version	L03	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Condensation drainage holes ⁷⁾	L12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-rusting screws (externally)	M27	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 2/87.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9																
1LA9 (aluminum)																
Coolant temperature and site altitude																
Coolant temperature –40 to +40 °C	D03	–	–	–	✓	✓	✓	✓	✓	✓	–	–				
Coolant temperature –30 to +40 °C	D04	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																
CCC China Compulsory Certification ⁸⁾	D01	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–
Electrical according to NEMA MG1-12 ⁹⁾	D30	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Design according to UL with "Recognition Mark" ¹⁰⁾	D31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Certified for Korea according to KS C4202 ¹¹⁾	D33	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Canadian regulations (CSA) ¹²⁾	D40	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PSE Mark Japan ¹³⁾	D46	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–
VIK version (includes Zone 2 for mains-fed operation, without Ex nA II on rating plate)	K30	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces	K20	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regreasing device	K40	–	–	–	–	–	✓	✓	✓ ¹⁴⁾	✓	✓	✓	✓	✓	✓	✓
Located bearing DE	K94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing NDE	L04	✓	✓	✓	✓	✓	✓	✓	✓	✓	□	□	□	□	□	□
Balance and vibration quantity																
Vibration quantity A		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Vibration quantity B	K02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Full key balancing	L68	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Balancing without key	M37	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁵⁾	K04	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second standard shaft extension	K16	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft extension with normal dimensions without featherkey way	K42	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ¹⁶⁾	Y55 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heating and ventilation																
Fan cover for textile industry	H17	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–
Metal external fan ¹⁷⁾	K35	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rating plate and extra rating plates																
Second lubricating plate, supplied loose	B06	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second rating plate, loose	K31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification codes	Y82 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 2/87.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LA9																
		1LA9 (aluminum)														
Packaging, safety notes, documentation and test certificates																
Without safety and commissioning note. Customer's declaration of renouncement required.	B00	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
With one safety and startup guide per box pallet	B01	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–
Acceptance test certificate 3.1 according to EN 10204	B02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Operating instructions German/English in print	B23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F83	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wire-lattice pallet	L99	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–
Connected in star for dispatch	M32	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connected in delta for dispatch	M33	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- . R. Possible on request
- ✓ With additional charge
- Not possible

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 2) Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 VΔ/400 VY and special voltage with voltage code **9** and order code **L1U** (400 VΔ). The following order codes cannot be used in combination with the ECOFAST plugs, order code **G55: A12, C02, C18, D31, D40, G26, G50, H15, H17, H62, H63, H64, H98, H99, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52.**
- 3) Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 VΔ/400 VY and special voltage with voltage code **9** and order code **L1U** (400 VΔ). The following order codes cannot be used in combination with the ECOFAST plugs, order codes **G56: A12, A23, A31, D31, D40, G50, H17, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, L03, L44, L45, L47, L48, L49, L51, L52.**
- 4) In combination with the PTC thermistor option or anti-condensation heating option, please inquire before ordering.
- 5) Not possible for voltage code **1** or **6**.
- 6) No derating in combination with the following order codes: **L2A, L2C, L2Q, L2R, L2S, L2T, L2U, L2V, L3E** and **L3G**.
- 7) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 8) CCC certification is required for
 - 2-pole motors ≤2.2 kW
 - 4-pole motors ≤1.1 kW
 - 6-pole motors ≤0.75 kW
 - 8-pole motors ≤0.55 kW
- 9) Possible up to 600 V max. For EPACT version or UL standard version (no order code necessary). The rated voltage is indicated on the rating plate without voltage range.
- 10) Possible up to 600 V max. The rated voltage is indicated on the rating plate without voltage range.
- 11) For Korea are certified:
 - 2-pole motors ≤0.75 kW
 - 4-pole motors ≤0.75 kW
 - 6-pole motors ≤0.75 kW
- 12) The rated voltage is indicated on the rating plate without voltage range.
- 13) "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking.
- 14) Not possible for 1LA9 134-6. □□.
- 15) Can be combined with deep-groove bearings of series 60... 62... and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**), brake mounting or encoder mounting.
- 16) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤2 x length E (normal) of the shaft extension (for an explanation of the order codes, see catalog part 0 "Introduction").
- 17) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external fan is already included (standard version) in combination with the low-noise version.



IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with increased output – Aluminum series 1LA9																
1LA9 (aluminum)																
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature detectors for tripping ¹⁾	A31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor connection and connection box																
ECOFAST motor plug Han-Drive 10e for 230 VΔ/400 VY ²⁾	G55	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–
Connection box on RHS	K09	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on LHS	K10	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
One cable gland, metal	K54	–	–	–	–	–	✓	✓	✓	✓	✓	–	–	–	–	–
Cable gland, maximum configuration	K55	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85	✓	✓	✓	✓	✓	○	○	○	○	○	✓	✓	✓	✓	✓
Next larger connection box	L00	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓
External earthing	L13	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3 cables protruding, 0.5 m long ³⁾⁴⁾	L44	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	–
3 cables protruding, 1.5 m long ³⁾⁴⁾	L45	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	–
6 cables protruding, 0.5 m long ³⁾	L47	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	–
6 cables protruding, 1.5 m long ³⁾	L48	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6 cables protruding, 3 m long ³⁾	L49	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on NDE	M64	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windings and insulation																
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend, see Page 2/90, for footnotes, see Page 2/91.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with increased output – Aluminum series 1LA9																
1LA9 (aluminum)																
Colors and paint finish																
Special finish in RAL 7030 stone gray		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sea air resistant special finish	M94	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar Not possible for IM V3 type of construction.	K17	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation	K37	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	
Low-noise version for 2-pole motors with counter-clockwise direction of rotation	K38	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	
IP65 degree of protection	K50	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea)	K52	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration-proof version	L03	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Condensation drainage holes	L12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-rusting screws (externally)	M27	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Coolant temperature and site altitude																
Coolant temperature -40 to +40 °C	D03	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Coolant temperature -30 to +40 °C	D04	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																
CCC China Compulsory Certification ⁵⁾	D01	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	-	-
Electrical according to NEMA MG1-12 ⁶⁾	D30	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Design according to UL with "Recognition Mark" ⁷⁾	D31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Canadian regulations (CSA) ⁸⁾	D40	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PSE Mark Japan ⁹⁾	D46	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces	K20	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regreasing device	K40	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing DE	K94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing NDE	L04	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	□	□	□	□	□
Balance and vibration quantity																
Vibration quantity A		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Full key balancing	L68	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Balancing without key	M37	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend, see Page 2/90, for footnotes, see Page 2/91.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with increased output – Aluminum series 1LA9																
1LA9 (aluminum)																
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁰⁾	K04	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second standard shaft extension	K16	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft extension with normal dimensions without featherkey way	K42	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ¹¹⁾	Y55 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heating and ventilation																
Fan cover for textile industry	H17	–	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–
Metal external fan ¹²⁾	K35	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rating plate and extra rating plates																
Second lubricating plate, supplied loose	B06	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓
Second rating plate, loose	K31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification codes	Y82 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates																
Without safety and commissioning note. Customer's declaration of renouncement required.	B00	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
With one safety and startup guide per box pallet	B01	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–
Acceptance test certificate 3.1 according to EN 10204	B02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Operating instructions German/English in print	B23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F83	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wire-lattice pallet	L99	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–
Connected in star for dispatch	M32	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connected in delta for dispatch	M33	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- . R. Possible on request
- ✓ With additional charge
- Not possible

For footnotes, see Page 2/91.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions
2

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 2) Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 VΔ/400 VY and special voltage with voltage code and order code **L1U** (400 VΔ). The following order codes cannot be used in combination with the ECOFAST plugs, order code **G55: A12, C02, C18, D31, D40, G26, G50, H15, H17, H62, H63, H64, H98, H99, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52.**
- 3) In combination with the PTC thermistor option or anti-condensation heating option, please inquire before ordering.
- 4) Not possible for voltage codes **1** or **6**.
- 5) CCC certification is required for
 - 2-pole motors ≤ 2.2 kW
 - 4-pole motors ≤ 1.1 kW
 - 6-pole motors ≤ 0.75 kW
 - 8-pole motors ≤ 0.55 kW
- 6) Possible up to 600 V max. For EPACT version or UL standard version (no order code necessary).
- 7) Possible up to 600 V max. The rated voltage is indicated on the rating plate without voltage range.
- 8) The rated voltage is indicated on the rating plate without voltage range.
- 9) "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking.
- 10) Can be combined with deep-groove bearings of series 60... 62... and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**), brake mounting or encoder mounting.
- 11) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **K16**:
 - Dimensions D and DA \leq internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA $\leq 2 \times$ length E (normal) of the shaft extension
 For an explanation of the order codes, see catalog part 0 "Introduction".
- 12) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external fan is not possible in combination with the low-noise version – order code **K37** or **K38**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Options or order codes (supplement -Z is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with improved efficiency – Cast-iron series 1LA6 and 1LG4																
								1LA6 (cast-iron)			1LG4 (cast-iron)					
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature detectors for tripping ¹⁾	A31						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Installation of 6 PT 100 resistance thermometers in stator winding ¹⁾	A61						-	-	-	-	✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ¹⁾	A72						-	-	-	-	✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A78						-	-	-	-	✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A80						-	-	-	-	✓	✓	✓	✓	✓	✓
Motor connection and connection box																
Two-part plate on connection box	K06						-	-	-	-	-	✓	✓	✓	✓	✓
Connection box on RHS	K09						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on LHS	K10						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on top, feet screwed on	K11						-	-	-	-	✓	✓	✓	✓	✓	✓
Connection box in cast-iron version	K15						□	□	□	□	✓	✓	✓	□	□	□
One cable gland, metal	K54						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cable gland, maximum configuration	K55						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Next larger connection box	L00						-	-	-	-	✓	✓	✓	✓	✓	✓
External earthing	L13						✓	✓	✓	✓	□	□	□	□	□	□

For legend, see Page 2/97, for footnotes, see Page 2/98.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with improved efficiency – Cast-iron series 1LA6 and 1LG4																
Motor connection and connection box (continued)																
Undrilled entry plate	L01											○	○	○	○	○
6 cables protruding, 1.5 m long ²⁾	L48											✓	✓	✓	O. R.	O. R.
6 cables protruding, 3 m long ²⁾	L49											✓	✓	✓	O. R.	O. R.
Protruding cable ends – right side ³⁾	L51											O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends – left side ³⁾	L52											O. R.	O. R.	O. R.	O. R.	O. R.
Auxiliary connection box 1XB3 020	L97											✓	✓	✓	✓	✓
Stud terminal for cable connection, accessories pack (3 items)	M46														✓	✓
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47														✓	✓
Windings and insulation																
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	C11											✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output	C12											✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13											✓	✓	✓	✓	✓
Temperature class 180 (H) at rated output and max. CT 60 °C ⁵⁾	C18											✓	✓	✓	✓	✓
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19											✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	C22											✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	C23											✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	C24											✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	C25											✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26											✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	Y50 • and specified output, CT... °C or SA m above sea level											✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and specified output, CT... °C or SA m above sea level											✓	✓	✓	✓	✓

For legend, see Page 2/97, for footnotes, see Page 2/98.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with improved efficiency – Cast-iron series 1LA6 and 1LG4																
Colors and paint finish																
Standard finish in RAL 7030 stone gray												□	□	□	□	□
Standard finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y53 • and standard finish RAL											✓	✓	✓	✓	✓
Special finish in RAL 7030 stone gray ⁹⁾	K26											□	□	□	□	□
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9002, 9005 Page 0/18	Y54 • and special finish RAL											✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL											✓	✓	✓	✓	✓
Offshore special finish	M91											O. R.	O. R.	O. R.	O. R.	O. R.
Sea air resistant special finish	M94											O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23											○	○	○	○	○
Unpainted, only primed	K24											✓	✓	✓	✓	✓
Modular technology – Basic versions⁷⁾																
Mounting of separately driven fan ⁸⁾	G17											✓	✓	✓	✓	✓
Mounting of brake ^{8) 9)}	G26											✓	✓	✓	✓	✓
Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	H57											✓	✓	✓	✓	✓
Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	H58											✓	✓	✓	✓	✓
Modular technology – Combinations of basic versions⁷⁾																
Mounting of separately driven fan and 1XP8 001-1 rotary pulse encoder	H61											✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-1 rotary pulse encoder ⁹⁾	H62											✓	✓	✓	✓	✓
Mounting of brake and separately driven fan ^{8) 9)}	H63											✓	✓	✓	✓	✓
Mounting of brake, separately driven fan and 1XP8 001-1 rotary pulse encoder ⁹⁾	H64											✓	✓	✓	✓	✓
Mounting of separately driven fan and 1XP8 001-2 rotary pulse encoder	H97											✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-2 rotary pulse encoder ⁹⁾	H98											✓	✓	✓	✓	✓
Mounting of brake, separately driven fan and 1XP8 001-2 rotary pulse encoder ⁹⁾	H99											✓	✓	✓	✓	✓

For legend, see Page 2/97, for footnotes, see Page 2/98.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with improved efficiency – Cast-iron series 1LA6 and 1LG4																
Modular technology – Additional versions																
Brake supply voltage 24 V DC	C00											✓	✓	✓	✓	✓
Brake supply voltage 400 V AC	C01											✓	✓	✓	✓	✓
Mechanical manual brake release with lever (no locking)	K82											✓	✓	✓	✓	✓
Special technology ⁷⁾																
Mounting of LL 861 900 220 rotary pulse encoder	H70											✓	✓	✓	✓	✓
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72											O. R.	O. R.	O. R.	O. R.	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73											–	–	–	–	✓
Prepared for mounting LL 861 900 220	H78											✓	✓	✓	✓	✓
Prepared for mounting HOG 9 D 1024 I	H79											O. R.	O. R.	O. R.	O. R.	✓
Prepared for mounting HOG 10 D 1024 I	H80											–	–	–	–	✓
Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against moisture	J15											✓	✓	✓	✓	✓
Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against dust	J16											✓	✓	✓	✓	✓
Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against moisture	Y74 • and specified speed rpm											–	–	–	–	✓
Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against dust	Y76 • and specified speed rpm											–	–	–	–	✓
Mounting of rotary pulse encoder HOG 10 DN 1024 I + ESL 93, (speed rpm), connection box protection against dust	Y79 • and specified speed (max. 3) rpm											–	–	–	–	✓
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar Not possible for IM V3 type of construction ¹⁰⁾	K17											✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation ¹¹⁾	K37											–	–	✓	✓	✓
Low-noise version for 2-pole motors with counter-clockwise direction of rotation ¹¹⁾	K38											–	–	✓	✓	✓
IP65 degree of protection ¹²⁾	K50											✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea) ¹³⁾	K52											✓	✓	✓	✓	✓
Vibration-proof version	L03											✓	✓	✓	✓	–
Condensation drainage holes ¹⁴⁾	L12											✓	✓	✓	✓	–
Non-rusting screws (externally)	M27											✓	✓	✓	✓	✓
Earth brushes for converter-fed operation	M44											–	–	–	–	O. R.
Mechanical protection for encoder ¹⁵⁾	M68											✓	✓	✓	✓	✓

For legend, see Page 2/97, for footnotes, see Page 2/98.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with improved efficiency – Cast-iron series 1LA6 and 1LG4																
Coolant temperature and site altitude																
Coolant temperature –50 to +40 °C	D02											✓	✓	✓	✓	✓
Coolant temperature –40 to +40 °C	D03											✓	✓	✓	✓	✓
Coolant temperature –30 to +40 °C	D04											✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																
Electrical according to NEMA MG1-12	D30											✓	✓	✓	✓	✓
Design according to UL with "Recognition Mark" ¹⁶⁾	D31											✓	✓	✓	✓	✓
Canadian regulations (CSA) ¹⁷⁾	D40											✓	✓	✓	✓	✓
PSE Mark Japan ¹⁸⁾	D46											✓	✓	✓	–	–
VIK version (includes Zone 2 for mains-fed operation, without Ex nA II on rating plate)	K30											✓	✓	✓	✓	✓
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50											✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ¹⁹⁾	K20											✓	✓	✓	✓	✓
Special bearing for DE and NDE, bearing size	K36											–	–	–	–	–
Regreasing device	K40											✓	✓	✓	✓	□
Located bearing DE	K94											✓	✓	✓	✓	✓
Located bearing NDE	L04											✓	✓	✓	□	□
Insulated bearing cartridge	L27											–	–	–	–	–
Balance and vibration quantity																
Vibration quantity A												□	□	□	□	□
Vibration quantity B	K02											✓	✓	✓	✓	✓
Full key balancing	L68											✓	✓	✓	✓	✓
Balancing without key	M37											✓	✓	✓	✓	✓
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ²¹⁾	K04											✓	✓	✓	✓	✓
Second standard shaft extension ²²⁾	K16											✓	✓	✓	✓	✓
Shaft extension with normal dimensions without featherkey way	K42											✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39											✓	✓	✓	✓	✓
Standard shaft made of non-rusting steel	M65											✓	✓	✓	✓	–
Non-standard cylindrical shaft extension ²³⁾	Y55 • and identification code											✓	✓	✓	✓	✓
Heating and ventilation																
Fan cover for textile industry	H17											✓	✓	✓	✓	–
Metal external fan ²⁴⁾	K35											✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45											✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46											✓	✓	✓	✓	✓
Sheet metal fan cover	L36											–	–	–	–	–
Separately driven fan with non-standard voltage and/or frequency	Y81 • and identification code											–	–	–	–	–

For legend, see Page 2/97, for footnotes, see Page 2/98.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with improved efficiency – Cast-iron series 1LA6 and 1LG4																
							1LA6 (cast-iron)					1LG4 (cast-iron)				
Rating plate and extra rating plates																
Second lubricating plate, supplied loose	B06						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second rating plate, loose	K31						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification codes	Y82 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates																
Without safety and commissioning note. Customer's declaration of renouncement required.	B00						○	○	○	○	–	–	–	–	–	–
With one safety and startup guide per box pallet	B01						○	○	○	○	–	–	–	–	–	–
Acceptance test certificate 3.1 according to EN 10204	B02						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Operating instructions German/English in print	B23						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F83						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wire-lattice pallet	L99						○	○	○	○	–	–	–	–	–	–
Connected in star for dispatch	M32						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connected in delta for dispatch	M33						✓	✓	✓	✓	✓	✓	□	□	□	□

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- . R. Possible on request
- ✓ With additional charge
- Not possible

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 2) In combination with the PTC thermistor option or anti-condensation heating option, please inquire before ordering.
- 3) Possible in combination with order code **L44** to **L49** or length specification in plain text.
- 4) Only the 50 Hz data are indicated on the rating plate.
- 5) Cannot be used for motors in UL version (order code **D31**). Cannot be used for motors according to CSA approval (order code **D40**) for motor serie 1LG4. The grease lifetime specified in catalog part 0 "Introduction" refers to CT 40 °C. When the coolant temperature rises by 10 K, the grease lifetime or relubrication interval is halved.
- 6) For frame sizes 100 to 160, do not specify an order code. Order code is only necessary for frame sizes 180 to 315.
- 7) A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various technologies nor with each other within the same technology system. This applies for:
 - Modular technology
 - Basic versions of "Modular technology"
 - Combination of special versions "Special technology"
- 8) For 1LG4/1LG6 motors, order codes **G17**, **G26** and **H63** frame size 225 and above can also be combined with all rotary pulse encoders in the "Special technology" range.
- 9) The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00** and **C01**.
- 10) Not possible for motor series 1LG4 for 2-pole motors.
- 11) For 1LG4 motors in low-noise version a second shaft extension and/or mounting of an encoder are not possible.)
- 12) Not possible in combination with rotary pulse encoder HOG 9 D 10241 (order code **H72**, **H79**) and/or brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 13) Not possible in combination with brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 14) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 15) Not necessary when a rotary pulse encoder is combined with a separately driven fan, because in this case the rotary pulse encoder is installed under the fan cowl.
- 16) Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 17) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 18) "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking.
- 19) Not possible for 2-pole 1LG4 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration quantity level A available on request for 1LG4 motors. Not possible for 1LG4 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – order code **K04**.
- 20) Additional charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- 21) Can be combined with deep-groove bearings of series 60... 62... and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**), brake mounting or encoder mounting.
- 22) Possible for motors of frame size 315 and above in vertical types of construction or 2-pole for version with second shaft extension on request. Version with protective cover not possible.
- 23) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see catalog part 0 "Introduction".
- 24) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external fan is not possible in combination with the low-noise version – order code **K37** or **K38**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions
Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size																
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315		
Self-ventilated motors with increased output – Cast-iron series 1LG4																		
1LG4 (cast-iron)																		
Motor protection																		
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11										✓	✓	✓	✓	✓			
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12										✓	✓	✓	✓	✓			
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23										✓	✓	✓	✓	✓			
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25										✓	✓	✓	✓	✓			
Temperature detectors for tripping ¹⁾	A31										✓	✓	✓	✓	✓			
Installation of 3 PT 100 resistance thermometers ¹⁾	A60										✓	✓	✓	✓	✓			
Installation of 6 PT 100 resistance thermometers in stator winding ¹⁾	A61										✓	✓	✓	✓	✓			
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ¹⁾	A72										✓	✓	✓	✓	✓			
Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A78										✓	✓	✓	✓	✓			
Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A80										✓	✓	✓	✓	✓			
Motor connection and connection box																		
Two-part plate on connection box	K06										–	✓	✓	✓	✓			
Connection box on RHS	K09										✓	✓	✓	✓	✓			
Connection box on LHS	K10										✓	✓	✓	✓	✓			
Connection box on top, feet screwed on	K11										✓	✓	✓	✓	✓			
Connection box in cast-iron version	K15										✓	✓	✓	□	□			
One cable gland, metal	K54										✓	✓	✓	✓	✓			
Cable gland, maximum configuration	K55										✓	✓	✓	✓	✓			
Rotation of the connection box through 90°, entry from DE	K83										✓	✓	✓	✓	✓			
Rotation of the connection box through 90°, entry from NDE	K84										✓	✓	✓	✓	✓			
Rotation of connection box through 180°	K85										✓	✓	✓	✓	✓			
Next larger connection box	L00										✓	✓	✓	✓	✓			
Undrilled entry plate	L01										○	○	○	○	○			
External earthing	L13										□	□	□	□	□			
6 cables protruding, 1.5 m long ²⁾	L48										✓	✓	✓	○	R.	○	R.	
6 cables protruding, 3 m long ²⁾	L49										✓	✓	✓	○	R.	○	R.	
Protruding cable ends – right side ³⁾	L51										○	R.	○	R.	○	R.	○	R.
Protruding cable ends – left side ³⁾	L52										○	R.	○	R.	○	R.	○	R.
Auxiliary connection box 1XB3 020	L97										✓	✓	✓	✓	✓			

For legend, see Page 2/103, for footnotes, see Page 2/104.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size													
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with increased output – Cast-iron series 1LG4															
1LG4 (cast-iron)															
Motor connection and connection box (continued)															
Stud terminal for cable connection, accessories pack (3 items)	M46													✓	✓
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47													✓	✓
Windings and insulation															
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	C11										✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output ⁵⁾	C12										✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13										✓	✓	✓	✓	✓
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19										✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 % ⁴⁾	C22										✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 % ⁴⁾	C23										✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 % ⁴⁾	C24										✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 % ⁴⁾	C25										✓	✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26										✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	Y50 • and specified output, CT... °C or SA m above sea level										✓	✓	✓	✓	✓
Colors and paint finish															
Standard finish in RAL 7030 stone gray											□	□	□	□	□
Standard finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y53 • and standard finish RAL										✓	✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26										✓	✓	✓	✓	✓
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL										✓	✓	✓	✓	✓

For legend, see Page 2/103, for footnotes, see Page 2/104.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size													
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with increased output – Cast-iron series 1LG4															
1LG4 (cast-iron)															
Colors and paint finish (continued)															
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL										✓	✓	✓	✓	✓
Offshore special finish	M91										✓	✓	✓	✓	✓
Sea air resistant special finish	M94										O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23										○	○	○	○	○
Unpainted, only primed	K24										✓	✓	✓	✓	✓
Modular technology – Basic versions ⁵⁾															
Mounting of separately driven fan ⁶⁾	G17										✓	✓	✓	✓	✓
Mounting of brake ^{6) 7)}	G26										✓	✓	✓	✓	✓
Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	H57										✓	✓	✓	✓	✓
Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	H58										✓	✓	✓	✓	✓
Modular technology – Combinations of basic versions ⁶⁾															
Mounting of separately driven fan and 1XP8 001-1 rotary pulse encoder	H61										✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-1 rotary pulse encoder ⁷⁾	H62										✓	✓	✓	✓	✓
Mounting of brake and separately driven fan ^{6) 7)}	H63										✓	✓	✓	✓	✓
Mounting of brake, separately driven fan and 1XP8 001-1 rotary pulse encoder ⁷⁾	H64										✓	✓	✓	✓	✓
Mounting of separately driven fan and 1XP8 001-2 rotary pulse encoder	H97										✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-2 rotary pulse encoder ⁷⁾	H98										✓	✓	✓	✓	✓
Mounting of brake, separately driven fan and 1XP8 001-2 rotary pulse encoder ⁷⁾	H99										✓	✓	✓	✓	✓
Modular technology – Additional versions															
Brake supply voltage 24 V DC	C00										✓	✓	✓	✓	✓
Brake supply voltage 400 V AC	C01										✓	✓	✓	✓	✓
Mechanical manual brake release with lever (no locking)	K82										✓	✓	✓	✓	✓
Special technology ⁵⁾															
Mounting of LL 861 900 220 rotary pulse encoder	H70										✓	✓	✓	✓	✓
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72										✓	✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73										✓	✓	✓	✓	✓
Prepared for mounting LL 861 900 220	H78										✓	✓	✓	✓	✓
Prepared for mounting HOG 9 D 1024 I	H79										✓	✓	✓	✓	✓
Prepared for mounting HOG 10 D 1024 I	H80										✓	✓	✓	✓	✓
Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against moisture	J15										✓	✓	✓	✓	✓
Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against dust	J16										✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size													
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with increased output – Cast-iron series 1LG4															
1LG4 (cast-iron)															
Special technology ⁵⁾ (continued)															
Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against moisture	Y74 • and specified speed rpm										✓	✓	✓	✓	✓
Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against dust	Y76 • and specified speed rpm										✓	✓	✓	✓	✓
Mounting of rotary pulse encoder HOG 10 DN 1024 I + ESL 93, (speed rpm), connection box protection against dust	Y79 • and specified speed (max. 3) rpm										✓	✓	✓	✓	✓
Mechanical design and degrees of protection															
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar Not possible for IM V3 type of construction ⁸⁾	K17										✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation ⁹⁾	K37										✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with counter-clockwise direction of rotation ⁹⁾	K38										✓	✓	✓	✓	✓
IP65 degree of protection ¹⁰⁾	K50										✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea) ¹¹⁾	K52										✓	✓	✓	✓	✓
Condensation drainage holes ¹²⁾	L12										□	□	□	□	□
Non-rusting screws (externally)	M27										✓	✓	✓	✓	✓
Earth brushes for converter-fed operation	M44										–	–	–	–	O. R.
Mechanical protection for encoder ¹³⁾	M68										✓	✓	✓	✓	✓
Coolant temperature and site altitude															
Coolant temperature –50 to +40 °C	D02										✓	✓	✓	✓	✓
Coolant temperature –40 to +40 °C	D03										✓	✓	✓	✓	✓
Coolant temperature –30 to +40 °C	D04										✓	✓	✓	✓	✓
Designs in accordance with standards and specifications															
Electrical according to NEMA MG1-12	D30										✓	✓	✓	✓	✓
Design according to UL with "Recognition Mark" ¹⁴⁾	D31										✓	✓	✓	✓	✓
Canadian regulations (CSA) ¹⁵⁾	D40										✓	✓	✓	✓	✓
Bearings and lubrication															
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50										✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ¹⁶⁾	K20										✓	✓	✓	✓	✓
Special bearing for DE and NDE, bearing size	K36										✓	✓	✓	✓	✓ ¹⁷⁾
Regreasing device	K40										✓	✓	✓	✓	□
Located bearing DE	K94										✓	✓	✓	✓	✓
Located bearing NDE	L04										□	□	□	□	□
Insulated bearing cartridge	L27										–	–	✓	✓	✓
Balance and vibration quantity															
Vibration quantity A											□	□	□	□	□
Vibration quantity B	K02										✓	✓	✓	✓	✓
Full key balancing	L68										✓	✓	✓	✓	✓
Balancing without key	M37										✓	✓	✓	✓	✓

For legend, see Page 2/103, for footnotes, see Page 2/104.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size													
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with increased output – Cast-iron series 1LG4															
1LG4 (cast-iron)															
Shaft and rotor															
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁸⁾	K04										✓	✓	✓	✓	✓
Second standard shaft extension ¹⁹⁾	K16										✓	✓	✓	✓	✓
Shaft extension with normal dimensions without featherkey way	K42										✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39										✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ²⁰⁾	Y55 • and identification code										✓	✓	✓	✓	✓
Heating and ventilation															
Metal external fan ²¹⁾	K35										✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45										✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46										✓	✓	✓	✓	✓
Sheet metal fan cover	L36										✓	✓	✓	✓	✓
Separately driven fan with non-standard voltage and/or frequency	Y81 • and identification code										–	–	✓	✓	✓
Rating plate and extra rating plates															
Second lubricating plate, supplied loose	B06										✓	✓	✓	✓	✓
Second rating plate, loose	K31										✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code										✓	✓	✓	✓	✓
Extra rating plate with identification codes	Y82 • and identification code										✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code										✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates															
Acceptance test certificate 3.1 according to EN 10204	B02										✓	✓	✓	✓	✓
Operating instructions German/English enclosed in print	B23										✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83										✓	✓	✓	✓	✓
Connected in star for dispatch	M32										✓	✓	✓	✓	✓
Connected in delta for dispatch	M33										✓	✓	□	□	□

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Possible on request
- ✓ With additional charge
- Not possible

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 2) In combination with the PTC thermistor option or anti-condensation heating option, please inquire before ordering.
- 3) Possible in combination with order code **L44** to **L49** or length specification in plain text.
- 4) Only the 50 Hz data are indicated on the rating plate.
- 5) A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various technologies nor with each other within the same technology system. This applies for:
 - Modular technology
 - Basic versions of "Modular technology"
 - Combination of special versions "Special technology"
- 6) For 1LG4/1LG6 motors, order codes **G17**, **G26** and **H63** frame size 225 and above can also be combined with all rotary pulse encoders in the "Special technology" range.
- 7) The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00** and **C01**.
- 8) Not possible for motor series 1LG4 for 2-pole motors.
- 9) For 1LG4 motors in low-noise version a second shaft extension and/or mounting of an encoder are not possible.)
- 10) Not possible in combination with rotary pulse encoder HOG 9 D 10241 (order code **H72**, **H79**) and/or brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 11) Not possible in combination with brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 12) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 13) Not necessary when a rotary pulse encoder is combined with a separately driven fan, because in this case the rotary pulse encoder is installed under the fan cowl.
- 14) Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 15) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 16) Not possible for 2-pole 1LG4 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration quantity level A available on request for 1LG4 motors. Not possible for 1LG4 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – order code **K04**.
- 17) Extra charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- 18) Can be combined with deep-groove bearings of series 60.., 62.. and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**), brake mounting or encoder mounting.
- 19) Possible for motors of frame size 315 and above in vertical types of construction or 2-pole for version with second shaft extension on request. Version with protective cover not possible.
- 20) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **K16**:
 - Dimensions D and DA \leq internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA \leq x length E (normal) of the shaft extension
 For an explanation of the order codes, see catalog part 0 "Introduction".
- 21) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external fan is not possible in combination with the low-noise version – order code **K37** or **K38**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions
Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6																
1LG6 (cast-iron)																
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11										✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12										✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23										✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25										✓	✓	✓	✓	✓	✓
Temperature detectors for tripping ¹⁾	A31										✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60										✓	✓	✓	✓	✓	✓
Installation of 6 PT 100 resistance thermometers in stator winding ¹⁾	A61										✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ¹⁾	A72										✓	✓	✓	✓	✓	✓
Installation of 2 PT100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A78										✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A80										✓	✓	✓	✓	✓	✓
Motor connection and connection box																
Two-part plate on connection box	K06										–	✓	✓	✓	✓	✓
Connection box on RHS	K09										✓	✓	✓	✓	✓	✓
Connection box on LHS	K10										✓	✓	✓	✓	✓	✓
Connection box on top, feet screwed on	K11										✓	✓	✓	✓	✓	✓
Connection box in cast-iron version	K15										✓	✓	✓	□	□	□
One cable gland, metal	K54										✓	✓	✓	✓	✓	✓
Cable gland, maximum configuration	K55										✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83										✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84										✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85										✓	✓	✓	✓	✓	✓
Next larger connection box	L00										✓	✓	✓	✓	✓	✓
Undrilled entry plate	L01										○	○	○	○	○	○
External earthing	L13										□	□	□	□	□	□

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For legend, see Page 2/110, for footnotes, see Page 2/111.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6																
											1LG6 (cast-iron)					
Motor connection and connection box (continued)																
6 cables protruding, 1.5 m long ²⁾	L48										✓	✓	✓	O. R.	O. R.	O. R.
6 cables protruding, 3 m long ²⁾	L49										✓	✓	✓	O. R.	O. R.	O. R.
Protruding cable ends – right side ³⁾	L51										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends – left side ³⁾	L52										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Auxiliary connection box 1XB3 020	L97										✓	✓	✓	✓	✓	✓
Stud terminal for cable connection, accessories pack (3 items)	M46										–	–	–	✓	✓	✓
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47										–	–	–	✓	✓	✓
Windings and insulation																
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	C11										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output ⁴⁾	C12										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13										✓	✓	✓	✓	✓	✓
Increased air humidity/temperature, with 30 to 60 g water per m ³ of air	C19										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 % ⁴⁾	C22										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 % ⁴⁾	C23										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 % ⁴⁾	C24										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 % ⁴⁾	C25										✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	Y50 • and specified output, CT .. °C or SA m above sea level										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and specified output, CT .. °C or SA m above sea level										✓	✓	✓	✓	✓	✓

For legend, see Page 2/110, for footnotes, see Page 2/111.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6																
1LG6 (cast-iron)																
Colors and paint finish																
Standard finish in RAL 7030 stone gray											□	□	□	□	□	□
Standard finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y53 • and standard finish RAL										✓	✓	✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26										✓	✓	✓	✓	✓	✓
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL										✓	✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL										✓	✓	✓	✓	✓	✓
Offshore special finish	M91										✓	✓	✓	✓	✓	✓
Sea air resistant special finish	M94										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23										○	○	○	○	○	○
Unpainted, only primed	K24										✓	✓	✓	✓	✓	✓
Modular technology – Basic versions ⁵⁾																
Mounting of separately driven fan ⁶⁾	G17										✓	✓	✓	✓	✓	✓
Mounting of brake ^{6) 7)}	G26										✓	✓	✓	✓	✓	✓
Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	H57										✓	✓	✓	✓	✓	✓
Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	H58										✓	✓	✓	✓	✓	✓
Modular technology – Combinations of basic versions ⁵⁾																
Mounting of separately driven fan and 1XP8 001-1 rotary pulse encoder	H61										✓	✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-1 rotary pulse encoder ⁷⁾	H62										✓	✓	✓	✓	✓	✓
Mounting of brake and separately driven fan ^{6) 7)}	H63										✓	✓	✓	✓	✓	✓
Mounting of brake, separately driven fan and 1XP8 001-1 rotary pulse encoder ⁷⁾	H64										✓	✓	✓	✓	✓	✓
Mounting of separately driven fan and 1XP8 001-2 rotary pulse encoder	H97										✓	✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-2 rotary pulse encoder ⁷⁾	H98										✓	✓	✓	✓	✓	✓
Mounting of brake, separately driven fan and 1XP8 001-2 rotary pulse encoder ⁷⁾	H99										✓	✓	✓	✓	✓	✓

For legend, see Page 2/110, for footnotes, see Page 2/111.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6																
											1LG6 (cast-iron)					
Modular technology – Additional versions																
Brake supply voltage 24 V DC	C00										✓	✓	✓	✓	✓	✓
Brake supply voltage 400 V AC	C01										✓	✓	✓	✓	✓	✓
Mechanical manual brake release with lever (no locking)	K82										✓	✓	✓	✓	✓	✓
Special technology ⁵⁾																
Mounting of LL 861 900 220 rotary pulse encoder	H70										✓	✓	✓	✓	✓	✓
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72										✓	✓	✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73										✓	✓	✓	✓	✓	✓
Prepared for mounting LL 861 900 220	H78										✓	✓	✓	✓	✓	✓
Prepared for mounting HOG 9 D 1024 I	H79										✓	✓	✓	✓	✓	✓
Prepared for mounting HOG 10 D 1024 I	H80										✓	✓	✓	✓	✓	✓
Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against moisture	J15										✓	✓	✓	✓	✓	✓
Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against dust	J16										✓	✓	✓	✓	✓	✓
Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against moisture	Y74 • and specified speed rpm										✓	✓	✓	✓	✓	✓
Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against dust	Y76 • and specified speed rpm										✓	✓	✓	✓	✓	✓
Mounting of rotary pulse encoder HOG 10 DN 1024 I + ESL 93, (speed rpm), connection box protection against dust	Y79 • and specified speed (max. 3) rpm										✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar. Not possible for IM V3 type of construction and 2-pole motors ⁸⁾	K17										✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation ⁹⁾	K37										–	–	–	–	–	–
Low-noise version for 2-pole motors with clockwise direction of rotation ⁹⁾	K38										–	–	–	–	–	–
IP65 degree of protection ¹⁰⁾	K50										✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea) ¹¹⁾	K52										✓	✓	✓	✓	✓	✓
Condensation drainage holes ¹²⁾	L12										□	□	□	□	□	□
Non-rusting screws (externally)	M27										✓	✓	✓	✓	✓	✓
Earth brushes for converter-fed operation	M44										–	–	–	–	O. R.	O. R.
Mechanical protection for encoder ¹³⁾	M68										✓	✓	✓	✓	✓	✓

For legend, see Page 2/110, for footnotes, see Page 2/111.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6																
1LG6 (cast-iron)																
Coolant temperature and site altitude																
Coolant temperature –50 to +40 °C	D02										✓	✓	✓	✓	✓	✓
Coolant temperature –40 to +40 °C	D03										✓	✓	✓	✓	✓	✓
Coolant temperature –30 to +40 °C	D04										✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																
Electrical according to NEMA MG1-12 ¹⁴⁾	D30										□	□	□	□	□	□
Design according to UL with "Recognition Mark" ¹⁵⁾	D31										✓	✓	✓	✓	✓	✓
Certified for Korea according to KS C4202 ¹⁶⁾	D33										✓	✓	✓	✓	✓	✓
Canadian regulations (CSA) ¹⁷⁾	D40										✓	✓	✓	✓	✓	✓
VIK version (includes Zone 2 for mains-fed operation, without Ex nA II on rating plate)	K30										✓	✓	✓	✓	✓	✓
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50										✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ¹⁸⁾	K20										✓	✓	✓	✓	✓	✓
Special bearing for DE and NDE, bearing size 63	K36										✓	✓	✓	✓	✓ ¹⁹⁾	✓ ¹⁹⁾
Regreasing device	K40										✓	✓	✓	✓	□	□
Located bearing DE	K94										✓	✓	✓	✓	✓	✓
Located bearing NDE	L04										□	□	□	□	□	□
Insulated bearing cartridge	L27										–	–	✓	✓	✓	✓
Balance and vibration quantity																
Vibration quantity A											□	□	□	□	□	□
Vibration quantity B	K02										✓	✓	✓	✓	✓	✓
Full key balancing	L68										✓	✓	✓	✓	✓	✓
Balancing without key	M37										✓	✓	✓	✓	✓	✓
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ²⁰⁾	K04										✓	✓	✓	✓	✓	✓
Second standard shaft extension ²¹⁾	K16										✓	✓	✓	✓	✓	✓
Shaft extension with normal dimensions without featherkey way	K42										✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39										✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ²²⁾	Y55 • and identification code										✓	✓	✓	✓	✓	✓
Heating and ventilation																
Metal external fan ²³⁾	K35										✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45										✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46										✓	✓	✓	✓	✓	✓
Sheet metal fan cover	L36										✓	✓	✓	✓	✓	✓
Separately driven fan with non-standard voltage and/or frequency	Y81 • and identification code										–	–	✓	✓	✓	✓

For legend, see Page 2/110, for footnotes, see Page 2/111.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6																
Rating plate and extra rating plates																
Second lubricating plate, supplied loose	B06											✓	✓	✓	✓	✓
Second rating plate, loose	K31											✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification codes											✓	✓	✓	✓	✓
Extra rating plate with identification codes	Y82 • and identification code											✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code											✓	✓	✓	✓	✓
Packaging, safety notes and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02											✓	✓	✓	✓	✓
Operating instructions German/English enclosed in print	B23											✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F83											✓	✓	✓	✓	✓
Connected in star for dispatch	M32											✓	✓	✓	✓	✓
Connected in delta for dispatch	M33											✓	✓	□	□	□

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Possible on request
- ✓ With additional charge
- Not possible

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions
2

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 2) In combination with the PTC thermistor option or anti-condensation heating option, please inquire before ordering.
- 3) Possible in combination with order code **L44** to **L49** or length specification in plain text.
- 4) Only the 50 Hz data are indicated on the rating plate.
- 5) A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various technologies nor with each other within the same technology system. This applies for:
 - Modular technology
 - Basic versions of "Modular technology"
 - Combination of special versions
 Exception: For frame size 225 and above, the options for mounting a brake (order code **G26**), separately driven fan (order code **G17**) or brake and separately driven fan (order code **H63**) can be combined with the options or rotary pulse encoders of the "Special technology" range.
- 6) For 1LG4/1LG6 motors, order codes **G17**, **G26** and **H63** frame size 225 and above can also be combined with all rotary pulse encoders in the "Special technology" range.
- 7) The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00** and **C01**.
- 8) Not possible for motor series 1LG6 for 2-pole motors.
- 9) Not necessary for 1LG6 motors because these motors are already noise optimized.
- 10) Not possible in combination with rotary pulse encoder HOG 9 D 10241 (order code **H72**, **H79**) and/or brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 11) Not possible in combination with brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 12) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 13) Not necessary when a rotary pulse encoder is combined with a separately driven fan, because in this case the rotary pulse encoder is installed under the fan cowl.
- 14) For the EPACT standard version (no order code required).
- 15) Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 16) For Korea are certified:
 - 2-pole motors ≤ 0.75 kW
 - 4-pole motors ≤ 0.75 kW
 - 6-pole motors ≤ 0.75 kW
- 17) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 18) Not possible for 2-pole 1LG6 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration quantity level B available on request for 1LG6 motors. Not possible for 1LG6 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – order code **K04**.
- 19) Extra charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- 20) Can be combined with deep-groove bearings of series 60.., 62.. and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**), brake mounting or encoder mounting.
- 21) Possible for motors of frame size 315 and above in vertical types of construction or 2-pole for version with second shaft extension on request. Version with protective cover not possible.
- 22) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **K16**:
 - Dimensions D and DA \leq internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA $\leq 2 \times$ length E (normal) of the shaft extension
 For an explanation of the order codes, see catalog part 0 "Introduction".
- 23) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external fan is not possible in combination with the low-noise version – order code **K37** or **K38**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-cooled motors without external fan – Aluminum series 1LP7 and 1LP5																
			1LP7 (aluminum)								1LP5 (aluminum)					
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature detectors for tripping ¹⁾	A31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor connection and connection box																
ECOFAST motor plug Han-Drive 10e for 230 VΔ/400 VY ²⁾	G55		✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–
ECOFAST motor plug EMC Han-Drive 10e for 230 VΔ/400 VY ³⁾	G56		✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–
Connection box on RHS	K09		–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on LHS	K10		–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
One cable gland, metal	K54		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cable gland, maximum configuration	K55		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85		✓	✓	✓	✓	✓	○	○	○	○	✓	✓	✓	✓	✓
Next larger connection box	L00		–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓
External earthing	L13		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3 cables protruding, 0.5 m long ⁴⁾	L44		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	–	–
3 cables protruding, 1.5 m long ⁴⁾	L45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	–	–
6 cables protruding, 0.5 m long ⁴⁾	L47		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	–	–
6 cables protruding, 1.5 m long ⁴⁾	L48		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6 cables protruding, 3 m long ⁵⁾	L49		–	–	–	–	–	–	–	–	–	–	–	–	–	–
Connection box on NDE	M64		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Terminal strip for main and auxiliary terminals	M69		✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–
Windings and insulation																
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend, see Page 2/114, for footnotes, see Page 2/115.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-cooled motors without external fan – Aluminum series 1LP7 and 1LP5																
			1LP7 (aluminum)								1LP5 (aluminum)					
Colors and paint finish																
Special finish in RAL 7030 stone gray			□	□	□	□	□	□	□	□	□	□	□	□	□	□
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Standard finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y53 • and standard finish RAL		–	–	–	–	–	–	–	–	–	–	–	–	–	–
Sea air resistant special finish	M94		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar ⁵⁾	K17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With two additional eyebolts for IM V1/IM V3	K32		–	–	–	–	–	–	–	–	–	–	–	–	–	–
IP65 degree of protection	K50		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea)	K52		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration-proof version	L03		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Condensation drainage holes ⁶⁾	L12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-rusting screws (externally)	M27		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Coolant temperature and site altitude																
Coolant temperature –40 to +40 °C	D03		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Coolant temperature –30 to +40 °C	D04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																
Design according to UL with "Recognition Mark" ⁷⁾	D31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Canadian regulations (CSA) ⁸⁾	D40		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PSE Mark Japan ⁹⁾	D46		✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces	K20		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regreasing device	K40		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing DE	K94		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing NDE	L04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	□	□	□	□

For legend, see Page 2/114, for footnotes, see Page 2/115.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-cooled motors without external fan – Aluminum series 1LP7 and 1LP5																	
			1LP7 (aluminum)								1LP5 (aluminum)						
Balance and vibration quantity																	
Vibration quantity A			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Vibration quantity B	K02		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Full key balancing	L68		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Balancing without key	M37		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁰⁾	K04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second standard shaft extension	K16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft extension with normal dimensions without featherkey way	K42		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Standard shaft made of non-rusting steel	M65		–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ¹¹⁾	Y55 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heating and ventilation																	
Anti-condensation heaters for 230 V	K45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rating plate and extra rating plates																	
Second lubricating plate, supplied loose	B06		–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second rating plate, loose	K31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification codes	Y82 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Packaging, safety notes and test certificates																	
Without safety and commissioning note. Customer's declaration of renouncement required.	B00		–	○	○	○	○	○	○	○	○	○	○	○	○	○	○
With one safety and startup guide per box pallet	B01		–	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Acceptance test certificate 3.1 according to EN 10204	B02		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Operating instructions German/English in print	B23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F83		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wire-lattice pallet	L99		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Connected in star for dispatch	M32		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connected in delta for dispatch	M33		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- ☐ Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Possible on request
- ✓ With additional charge
- Not possible

For footnotes, see Page 2/115.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions
2

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 2) Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 VΔ/400 VY and special voltage with voltage code **9** and order code **L1U** (400 VΔ). The following order codes cannot be used in combination with the ECOFAST plugs, order code **G55: A12, C18, D31, D40, G50, H15, H17, H62, H63, H64, H98, H99, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52.**
- 3) Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 VΔ/400 VY and special voltage with voltage code **9** and order code **L1U** (400 VΔ). The following order codes cannot be used in combination with the ECOFAST plugs, order code **G56: A12, A23, A31, C00, C18, D31, D40, G50, H15, H17, H90, H91, H92, H93, H94, H95, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52.**
- 4) In combination with the PTC thermistor option or anti-condensation heating option, please inquire before ordering.
- 5) Not possible for type of construction IM V3.
- 6) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 7) Possible up to 600 V max. The rated voltage is indicated on the rating plate without voltage range.
- 8) The rated voltage is indicated on the rating plate without voltage range.
- 9) "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking.
- 10) Can be combined with deep-groove bearings of series 60... 62... and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 11) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see catalog part 0 "Introduction".

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-cooled motors without external fan – Cast-iron series 1LP4																
1LP4 (cast-iron)																
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11										✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12										✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23										✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25										✓	✓	✓	✓	✓	✓
Temperature detectors for tripping ¹⁾	A31										✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60										✓	✓	✓	✓	✓	✓
Installation of 6 PT 100 resistance thermometers in stator winding ¹⁾	A61										✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ¹⁾	A72										✓	✓	✓	✓	✓	✓
Installation of 2 PT100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A78										✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A80										✓	✓	✓	✓	✓	✓
Motor connection and connection box																
Two-part plate on connection box	K06										–	✓	✓	✓	✓	✓
Connection box on RHS	K09										✓	✓	✓	✓	✓	✓
Connection box on LHS	K10										✓	✓	✓	✓	✓	✓
Connection box on top, feet screwed on	K11										✓	✓	✓	✓	✓	✓
One cable gland, metal	K54										✓	✓	✓	✓	✓	✓
Cable gland, maximum configuration	K55										✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83										✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84										✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85										✓	✓	✓	✓	✓	✓
Next larger connection box	L00										✓	✓	✓	✓	✓	✓
External earthing	L13										☐	☐	☐	☐	☐	☐
6 cables protruding, 1.5 m long ²⁾	L48										✓	✓	✓	O. R.	O. R.	O. R.
6 cables protruding, 3 m long ²⁾	L49										✓	✓	✓	O. R.	O. R.	O. R.
Protruding cable ends – right side ³⁾	L51										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends – left side ³⁾	L52										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Auxiliary connection box 1XB3 020	L97										✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 2/119.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-cooled motors without external fan – Cast-iron series 1LP4																
											1LP4 (cast-iron)					
Motor connection and connection box (continued)																
Stud terminal for cable connection, accessories pack (3 items)	M46										–	–	–	✓	✓	✓
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47										–	–	–	✓	✓	✓
Windings and insulation																
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	C11										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output ⁴⁾	C12										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13										✓	✓	✓	✓	✓	✓
Increased air humidity/temperature, with 30 to 60 g water per m ³ of air	C19										✓	✓	✓	✓	✓	✓
Increased air humidity/temperature, with 60 to 100 g water per m ³ of air	C26										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	Y50 • and specified output, CT .. °C or SA m above sea level										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and specified output, CT .. °C or SA m above sea level										✓	✓	✓	✓	✓	✓
Colors and paint finish																
Standard finish in RAL 7030 stone gray											□	□	□	□	□	□
Standard finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y53 • and standard finish RAL										✓	✓	✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26										✓	✓	✓	✓	✓	✓
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL										✓	✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL										✓	✓	✓	✓	✓	✓
Offshore special finish	M91										✓	✓	✓	✓	✓	✓
Sea air resistant special finish	M94										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23										○	○	○	○	○	○
Unpainted, only primed	K24										✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 2/119.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-cooled motors without external fan – Cast-iron series 1LP4																
1LP4 (cast-iron)																
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar Not possible for IM V3 type of construction ⁵⁾	K17										✓	✓	✓	✓	✓	✓
IP65 degree of protection	K50										✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea)	K52										✓	✓	✓	✓	✓	✓
Condensation drainage holes ⁶⁾	L12										□	□	□	□	□	□
Non-rusting screws (externally)	M27										✓	✓	✓	✓	✓	✓
Coolant temperature and site altitude																
Coolant temperature -50 to +40 °C	D02										✓	✓	✓	✓	✓	✓
Coolant temperature -40 to +40 °C	D03										✓	✓	✓	✓	✓	✓
Coolant temperature -30 to +40 °C	D04										✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																
Design according to UL with "Recognition Mark" ⁷⁾	D31										✓	✓	✓	✓	✓	✓
Canadian regulations (CSA) ⁸⁾	D40										✓	✓	✓	✓	✓	✓
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50										✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ⁹⁾	K20										✓	✓	✓	✓	✓	✓
Special bearing for DE and NDE, bearing size	K36										✓	✓	✓	✓	✓ ¹⁰⁾	✓ ¹⁰⁾
Regreasing device	K40										✓	✓	✓	✓	□	□
Located bearing DE	K94										✓	✓	✓	✓	✓	✓
Located bearing NDE	L04										□	□	□	□	□	□
Insulated bearing cartridge	L27										-	-	✓	✓	✓	✓
Balance and vibration quantity																
Vibration quantity A											□	□	□	□	□	□
Vibration quantity B	K02										✓	✓	✓	✓	✓	✓
Full key balancing	L68										✓	✓	✓	✓	✓	✓
Balancing without key	M37										✓	✓	✓	✓	✓	✓
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹¹⁾	K04										✓	✓	✓	✓	✓	✓
Second standard shaft extension ¹²⁾	K16										✓	✓	✓	✓	✓	✓
Shaft extension with normal dimensions without featherkey way	K42										✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39										✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ¹³⁾	Y55 • and identification code										✓	✓	✓	✓	✓	✓
Heating and ventilation																
Anti-condensation heaters for 230 V	K45										✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46										✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 2/119.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-cooled motors without external fan – Cast-iron series 1LP4																	
Rating plate and extra rating plates																	
Second lubricating plate, supplied loose	B06											✓	✓	✓	✓	✓	✓
Second rating plate, loose	K31											✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code											✓	✓	✓	✓	✓	✓
Extra rating plate with identification codes	Y82 • and identification code											✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code											✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates																	
Acceptance test certificate 3.1 according to EN 10204	B02											✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F83											✓	✓	✓	✓	✓	✓
Connected in star for dispatch	M32											✓	✓	✓	✓	✓	✓
Connected in delta for dispatch	M33											✓	✓	□	□	□	□

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Possible on request
- ✓ With additional charge
- Not possible

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 2) In combination with the PTC thermistor option or anti-condensation heating option, please inquire before ordering.
- 3) Possible in combination with order code **L44** to **L49** or length specification in plain text.
- 4) Only the 50 Hz data are indicated on the rating plate.
- 5) Not possible for motor series 1LP4 for 2-pole motors.
- 6) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 7) Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 8) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 9) Not possible for 2-pole 1LP4 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration quantity level B available on request for 1LP4 motors. Not possible for 1LP4 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – order code **K04**.

- 10) Extra charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- 11) Can be combined with deep-groove bearings of series 60... 62... and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 12) Possible for motors of frame size 315 and above in vertical types of construction or 2-pole for version with second shaft extension on request. Version with protective cover not possible.
- 13) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **K16**: – Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions") – Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension For an explanation of the order codes, see catalog part 0 "Introduction".

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Accessories

Overview

Modular technology

The components of modular technology can be ordered as accessories. The brake, as a safety-related module, must not be retrofitted.

Cables for rotary pulse encoders can be ordered from Catalog DA 65.10.

Mounting of rotary pulse encoder and separately driven fan for 1LA5, 1LA6, 1LA7 and 1LG motors

Version	Frame size	Number of poles	Order No.
Rotary pulse encoder ¹⁾	HTL version	71 ... 225	1XP8 001-1
	TTL version	71 ... 225	1XP8 001-2
Separately driven fan incl. mounting parts ²⁾	100	all	2CW2 180-8RF54-1AB0
	112	all	2CW2 210-8RF54-1AB1
	132	all	2CW2 250-8RF54-1AB2
	160	all	2CW2 300-8RF54-1AB3
	180	all	2CW2 300-8RF54-1AB4
	200	all	2CW2 300-8RF54-1AB5
	225 ³⁾	all	2CW2 300-8RF54-1AB6
	250	all	1PP9 063-2LA12-Z A11+K50⁴⁾
	280	all	1PP9 063-2LA12-Z A11+K50⁴⁾
	315	2	1PP9 070-2LA12-Z A11+K50⁴⁾
315	4 to 8	1PP9 063-2LA12-Z A11+K50⁴⁾	
Separately driven fan and rotary pulse encoder 1XP8 001-1 incl. mounting parts ²⁾	100	all	2CW2 180-8RF54-2AB0
	112	all	2CW2 210-8RF54-2AB1
	132	all	2CW2 250-8RF54-2AB2
	160	all	2CW2 300-8RF54-2AB3
	180	all	2CW2 300-8RF54-2AB4
	200	all	2CW2 300-8RF54-2AB5
225 ³⁾	all	2CW2 300-8RF54-2AB6	

Slide rails with fixing bolts and tensioning screws acc. to DIN 42923

Slide rails are used to tension the belt of a machine easily and conveniently when a belt tightener is not available. They are fixed to the base using stone bolts or foundation blocks.

The assignment of slide rails to motor size can be found in DIN 42923. For motors of frame sizes 335 to 450, there are no standardised slide rails (please inquire).

Available from:
Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Foundation block acc. to DIN 799

The foundation blocks are inserted into the stone foundation and embedded in concrete. They are used for fixing machines of medium size, slide rails, pedestal bearings, baseframes, etc. After the fixing bolts have been unscrewed, the machine can be dragged without it having to be lifted.

When the machine is initially installed, the foundation block that is bolted to the machine (without washers) and fitted with tapered pins is not embedded with concrete until the machine has been fully aligned. In this case, the machine is positioned 2 to 3 mm lower. The difference in shaft height is compensated by inserting shims on final installation. The tapered pins safeguard the exact position of the machine when it is repeatedly removed and replaced without the need for realignment.

Available from:
Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

¹⁾ For motor series 1LG, the rotary pulse encoders are available on request. They are only available for motor series 1LA7 as accessories for spare parts.

²⁾ The separately driven fan 2CW2 ... comprises a complete fan unit with impeller, the separately driven fan 1PP9 ... only comprises the fan motor without mounting components and impeller.

³⁾ For 1LG motors with separately driven fan with Order No. 1PP9 063-2LA12-Z A11+K50 (weight 4.37 kg).

⁴⁾ Only for replacement purposes.

Overview (continued)

Taper pins acc. to DIN 258 with threaded ends and constant taper lengths

Taper pins are used for components that are repeatedly removed. The drilled hole is ground conical using a conical reamer until the pin can be pushed in by hand until the cone shoulder lies 3 to 4 mm above the rim of the hole.

It can then be driven in using a hammer until it is correctly seated. The pin is removed from the drilled hole by screwing on the nut and tightening it.

Standardised taper pins are available from general engineering suppliers.

Available from:
Otto Roth GmbH & Co. KG
Rutesheimer Straße 22
70499 Stuttgart, Germany
Tel. +49 (0)711-13 88-0
Fax +49 (0)711-13 88-233

<http://www.ottoroth.de>
e-mail: info@ottoroth.de

Couplings

The motor from Siemens is connected to the machine or gear unit through a coupling. Flender is an important coupling manufacturer with a wide range of products. For standard applications, Siemens recommends that elastic couplings of Flender types N-Eupex and Rupex or torsionally rigid couplings of types Arpex and Zapex are used. For special applications, Fludex and Elpex couplings are recommended.

Source of supply:
Siemens contact partner – ordering from Catalog
Siemens MD 10.1 "FLENDER Standard Couplings"

or

A. Friedr. Flender AG
Kupplungswerk Mussum
Industriepark Bocholt
Schlavenhorst 100
46395 Bocholt, Germany
Tel. +49 (0)2871-92 2185
Fax +49 (0)2871-92 2579

<http://www.flender.com>
e-mail: couplings@flender.com

More information

Spare motors and repair parts

- Supply commitment for spare motors and repair parts following delivery of the motor
 - For up to 5 years, in the event of total motor failure, Siemens will supply a comparable motor with regard to the mounting dimensions and functions (the type series may vary).
 - Repair parts will be supplied for up to 5 years.
 - For up to 10 years, Siemens will provide information and will, if necessary, supply documentation for repair parts.
- When repair parts are ordered, the following details must be provided:
 - Designation and part number
 - Order No. and factory number of the motor

Example for ordering a fan cowl 1LA7,
frame size 160 M, 4-pole:

**Fan cowl No. 7.40,
1LA7 163-4AA60, factory number J783298901018**

Mounting of encoder

In the case of mounting by the customer.

Options H79, H80

Baumer Hübner GmbH
Planufer 92b
10967 Berlin, Germany
Tel. +49 (0)30-690 03-0
Fax +49 (0)30-690 03-104

<http://www.baumerhuebner.com>
e-mail: info@baumerhuebner.com

Options H78

Leine & Linde (Deutschland) GmbH
Bahnhofstraße 36
73430 Aalen, Germany
Tel. +49 (0)7361-78 093-0
Fax +49 (0)7361-78 093-11

<http://www.leinelinde.com>
e-mail: info@leinelinde.se

- For bearing types, see the "Introduction".
- Repair parts for 1MJ6, 1MJ7, 1MJ8, 1MJ1, 1ME8, 1ML8, 1LG8 motors and smoke-extraction motors are available on request.
- For standard components, a supply commitment does not apply.
- Support – Hotline
In Germany
Tel.: 01 80/5 05 04 48

National telephone numbers can be found on the Internet page:
<http://www.siemens.com/automation/service&support>

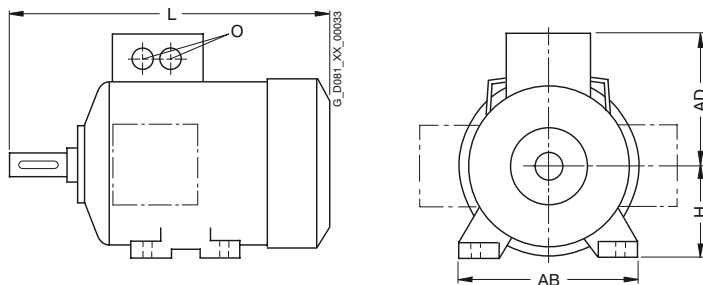
IEC Squirrel-Cage Motors

Standard motors frame size 315L and above

Dimensions

Overview

Overall dimensions



Frame size	Type	Number of poles	Dimensions							
			L	AD	H	AB	O			
56 M	1LA7		169	101	56	110	1 x M16 x 1.5			
	1LA9 050		169	101	56	110	1 x M25 x 1.5			
	1LA9 053		195	101	56	110	1 x M16 x 1.5 1 x M25 x 1.5			
63 M	1LA7		202.5	101	63	120	1 x M16 x 1.5			
	1LA9 063		202.5	101	63	120	1 x M25 x 1.5			
	1LA9 061		228.5	101	63	120	1 x M16 x 1.5 1 x M25 x 1.5			
71 M	1LA7		240	111	71	132	1 x M16 x 1.5			
	1LA9		240	111	71	132	1 x M16 x 1.5 1 x M25 x 1.5			
	1LP7		207	111	71	132	1 x M16 x 1.5 1 x M25 x 1.5			
80 M	1LA7		273.5	120	80	150	1 x M16 x 1.5			
	1LA9 080		273.5	120	80	150	1 x M25 x 1.5			
	1LA9 083		308.5	120	80	150	1 x M16 x 1.5 1 x M25 x 1.5			
	1LP7		237	120	80	150	1 x M16 x 1.5 1 x M25 x 1.5			
	1LA9 096-6K.		376	128	90	165	1 x M16 x 1.5 1 x M25 x 1.5			
90 S/ 90 L	1LA7		331	128	90	165	1 x M16 x 1.5			
	1LA9		331	128	90	165	1 x M16 x 1.5 1 x M25 x 1.5			
	1LA9 096-2..		358	128	90	165	1 x M16 x 1.5 1 x M25 x 1.5			
	1LA9 096-4..		358	128	90	165	1 x M16 x 1.5 1 x M25 x 1.5			
	1LP7		286	128	90	165	1 x M16 x 1.5 1 x M25 x 1.5			
	1LA9 107-4KA.		442	135	100	196	2 x M32 x 1.5			
	1LP7		331	135	100	196	2 x M32 x 1.5			
100 L	1LA6		372	164	100	196	2 x M32 x 1.5			
	1LA7		372	135	100	196	2 x M32 x 1.5			
	1LA9		407	135	100	196	2 x M32 x 1.5			
	1LA9 107-4KA.		442	135	100	196	2 x M32 x 1.5			
	1LP7		331	135	100	196	2 x M32 x 1.5			
112 M	1LA6		393	178	112	226	2 x M32 x 1.5			
	1LA7		393	148	112	226	2 x M32 x 1.5			
	1LA9		431	148	112	226	2 x M32 x 1.5			
	1LP7		349	148	112	226	2 x M32 x 1.5			
	1LA9 131		490.5	167	132	256	2 x M32 x 1.5			
132 S/ 132 M	1LA6	4	453	194	132	256	2 x M32 x 1.5			
	1LA7		452.5	167	132	256	2 x M32 x 1.5			
	1LA9		452.5	167	132	256	2 x M32 x 1.5			
	1LA9 131		490.5	167	132	256	2 x M32 x 1.5			
	1LA9 133		490.5	167	132	256	2 x M32 x 1.5			
	1LA9 134		490.5	167	132	256	2 x M32 x 1.5			
	1LP7		397	167	132	256	2 x M32 x 1.5			
160 M/ 160 L	1LA6		588	226	160	300	2 x M40 x 1.5			
	1LA7		588	197	160	300	2 x M40 x 1.5			
	1LA9		588	197	160	300	2 x M40 x 1.5			
	1LA9 166		628	197	160	300	2 x M40 x 1.5			
	1LP7		529	197	160	300	2 x M40 x 1.5			
	180 M/ 180 L		1LA5		712	258	180	339	2 x M40 x 1.5	
			1LA9		712	258	180	339	2 x M40 x 1.5	
			1LG4		669	262	180	339	2 x M40 x 1.5	
			1LG4 188		720	262	180	339	2 x M40 x 1.5	
			1LG6 183		2	720	262	180	339	2 x M40 x 1.5
			1LG6 183		4	669	262	180	339	2 x M40 x 1.5
			1LG6 186		4, 6, 8	720	262	180	339	2 x M40 x 1.5
			1LP4 183		2, 4	562	262	180	339	2 x M40 x 1.5
			1LP4 186		4, 6, 8	562	262	180	339	2 x M40 x 1.5
			1LP5		611	258	180	339	2 x M40 x 1.5	
200 L	1LA5		769.5	305	200	388	2 x M50 x 1.5			
	1LA9		768.5	305	200	388	2 x M50 x 1.5			
	1LG4		720	300	200	378	2 x M50 x 1.5			
	1LG4 208		2, 6	777	300	200	378	2 x M50 x 1.5		
	1LG6 206		720	300	200	378	2 x M50 x 1.5			
	1LG6 207		2, 6	777	300	200	378	2 x M50 x 1.5		
	1LG6 207		4, 8	720	300	200	378	2 x M50 x 1.5		
	1LP4 206		2, 6	617	300	200	378	2 x M50 x 1.5		
	1LP4 207		2, 4, 6, 8	617	300	200	378	2 x M50 x 1.5		
	1LP5		675	305	200	388	2 x M50 x 1.5			
225 S/ 225 M	1LA5		806	305	225	426	2 x M50 x 1.5			
	1LA5		2	776	305	225	426	2 x M50 x 1.5		
	1LG4		789	325	225	436	2 x M50 x 1.5			
	1LG4 223		2	759	325	225	436	2 x M50 x 1.5		
	1LG4 228		2	819	325	225	436	2 x M50 x 1.5		
	1LG4 228		4, 6, 8	849	325	225	436	2 x M50 x 1.5		
	1LG6 220		4, 8	789	325	225	436	2 x M50 x 1.5		
	1LG6 223		2	819	325	225	436	2 x M50 x 1.5		
	1LG6 223		4, 6, 8	849	325	225	436	2 x M50 x 1.5		
	1LG6 228		2	869	325	225	436	2 x M50 x 1.5		
1LG6 228	4, 6	899	325	225	436	2 x M50 x 1.5				
250 M	1LP4 220	4, 8	670	325	225	436	2 x M50 x 1.5			
	1LP4 223	2	640	325	225	436	2 x M50 x 1.5			
	1LP4 223	4, 6, 8	670	325	225	436	2 x M50 x 1.5			
	1LG4	887	392	250	490	2 x M63 x 1.5				
	1LG4 258	4	957	392	250	490	2 x M63 x 1.5			
	1LG6 253	2, 6, 8	887	392	250	490	2 x M63 x 1.5			
	1LG6 253	4	957	392	250	490	2 x M63 x 1.5			
	1LG6 258	2, 4, 6	957	392	250	490	2 x M63 x 1.5			
1LP4 253	2	764	392	250	490	2 x M63 x 1.5				
1LP4 253	4, 6, 8	764	392	250	490	2 x M63 x 1.5				

IEC Squirrel-Cage Motors

Standard motors frame size 315L and above

Dimensions

Overview (continued)

Frame size	Type	Number of poles	Dimensions				
			L	AD	H	AB	O
280 S/	1LG4		960	432	280	540	2 x M63 x 1.5
280 M	1LG4 288	2, 4	1070	432	280	540	2 x M63 x 1.5
	1LG6 280	2, 4, 6, 8	960	432	280	540	2 x M63 x 1.5
	1LG6 283	2, 4	1070	432	280	540	2 x M63 x 1.5
	1LG6 283	6, 8	960	432	280	540	2 x M63 x 1.5
	1LG6 288	2, 4, 6	1070	432	280	540	2 x M63 x 1.5
	1LP4 280	2, 4, 6, 8	830	432	280	540	2 x M63 x 1.5
	1LP4 283	2, 4, 6, 8	830	432	280	540	2 x M63 x 1.5
315 S/	1LG4		1072	500	315	610	2 x M63 x 1.5
315 M/	1LG4 310	4, 6, 8	1102	500	315	610	2 x M63 x 1.5
315 L	1LG4 313	4, 6, 8	1102	500	315	610	2 x M63 x 1.5
	1LG4 316	2	1232	500	315	610	2 x M63 x 1.5
	1LG4 316	4, 6, 8	1262	500	315	610	2 x M63 x 1.5
	1LG4 317	2	1232	500	315	610	2 x M63 x 1.5
	1LG4 317	4, 6, 8	1262	500	315	610	2 x M63 x 1.5
	1LG4 318	8	1262	500	315	610	2 x M63 x 1.5
	1LG4 318	6	1402	500	315	610	2 x M63 x 1.5

Frame size	Type	Number of poles	Dimensions				
			L	AD	H	AB	O
315 S/	1LG6 310	2	1072	500	315	610	2 x M63 x 1.5
315 M/	1LG6 310	4, 6, 8	1102	500	315	610	2 x M63 x 1.5
315 L	1LG6 313	2	1232	500	315	610	2 x M63 x 1.5
	1LG6 313	4, 6	1262	500	315	610	2 x M63 x 1.5
	1LG6 313	8	1102	500	315	610	2 x M63 x 1.5
	1LG6 316	2	1232	500	315	610	2 x M63 x 1.5
	1LG6 316	4, 6, 8	1262	500	315	610	2 x M63 x 1.5
	1LG6 317	8	1262	500	315	610	2 x M63 x 1.5
	1LG6 317	2	1372	500	315	610	2 x M63 x 1.5
	1LG6 317	4, 6	1402	500	315	610	2 x M63 x 1.5
	1LG6 318	2	1372	651	315	610	2 x M63 x 1.5
	1LG6 318	4	1402	651	315	610	2 x M63 x 1.5
	1LG6 318	6, 8	1402	500	315	610	2 x M63 x 1.5
	1LP4 310	2	925	500	315	610	2 x M63 x 1.5
	1LP4 310	4, 6, 8	955	500	315	610	2 x M63 x 1.5
	1LP4 313	2	925	500	315	610	2 x M63 x 1.5
	1LP4 313	4, 6, 8	955	500	315	610	2 x M63 x 1.5
	1LP4 316	2	1085	500	315	610	2 x M63 x 1.5
	1LP4 316	4, 6, 8	1115	500	315	610	2 x M63 x 1.5
	1LP4 317	2	1085	500	315	610	2 x M63 x 1.5
	1LP4 317	4, 6, 8	1115	500	315	610	2 x M63 x 1.5

Notes on the dimensions

■ Dimension drawings according to DIN EN 50347 and IEC 60072.

■ Fits

The shaft extensions specified in the dimension tables (DIN 748) and centering spigot diameters (DIN EN 50347) are machined with the following fits:

Dimension designation	ISO fit	DIN ISO 286-2
D, DA	to 30	j6
	over 31 to 50	k6
	over 50	m6
N	to 250	j6
	over 250	h6
F, FA		h9
K		H17
S	flange (FF)	H17

The drilled holes of couplings and belt pulleys should have an ISO fit of at least H7.

■ Dimension tolerances

For the following dimensions, the admissible deviations are given below:

Dimension designation	Dimension	Permitted deviation
H	to 250	- 0.5
	over 250	- 1.0
E, EA		- 0.5

Keyways and feather keyways (dimensions GA, GC, F and FA) are made in compliance with DIN 6885 Part 1.

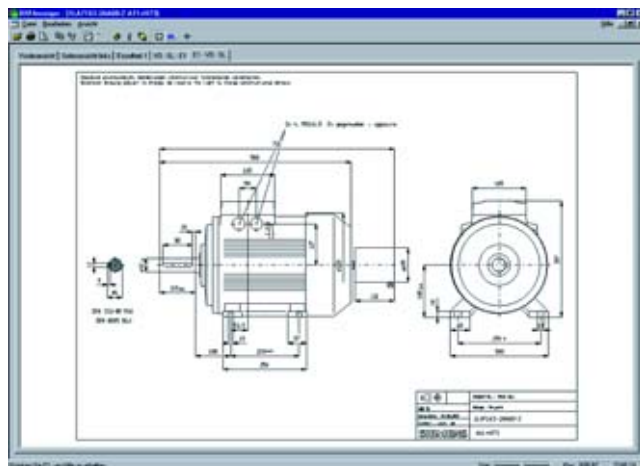
■ All dimensions are specified in mm.

More information

Dimension sheet generator

(part of the SD configurator)

A dimension drawing can be created in the SD configurator for every configurable motor. A dimension drawing can be requested for every other motor.



When a complete Order No. is entered with or without order codes, a dimension drawing can be called up under the "Documentation" tab.

These dimension drawings can be presented in different views and sections and printed.

The corresponding dimension sheets can be exported, saved and processed further in DXF format (interchange/import format for CAD systems) or as bitmap graphics.

The SD configurator has been integrated into the electronic Catalog CA 01 as a selection aid (for further information, catalog part 11 "Appendix", "SD configurator selection tool").

The interactive Catalog CA 01 can be ordered from your local Siemens sales representative or on the Internet at

<http://www.siemens.com/automation/CA01>

At this address, you will also find links to Tips & Tricks and to downloads for function or content updates.

Order number for CA 01 10/2008, English international:
DVD: E86060-D4001-A510-C7-7600

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

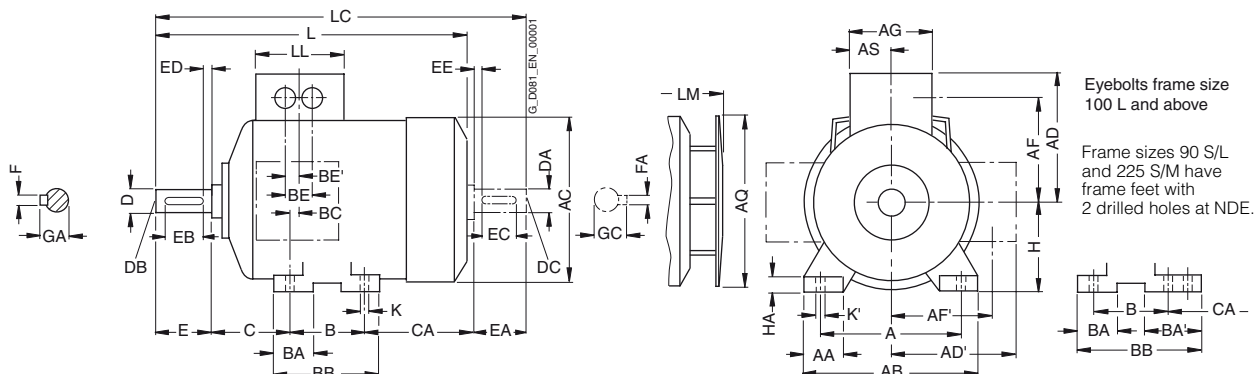
Dimensions

2

Dimensional drawings

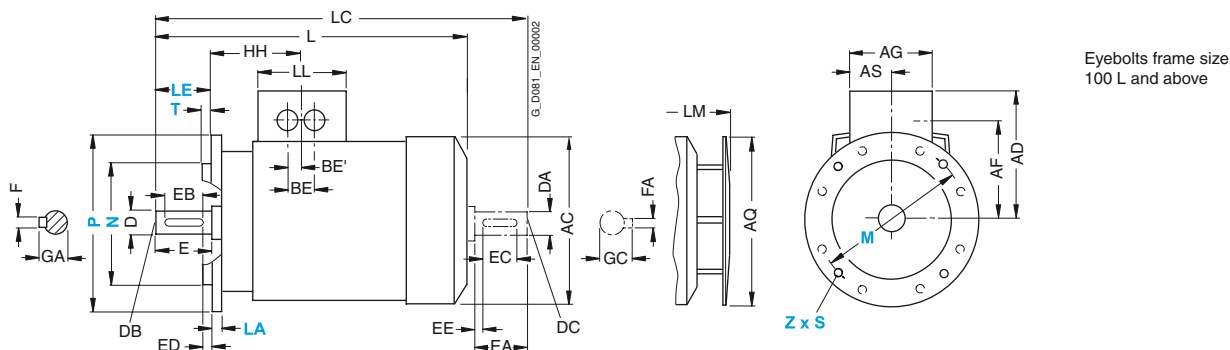
Aluminum series 1LA7 and 1LA5, frame sizes 56 M to 225 M

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																						
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD ²⁾	AD'	AF ²⁾	AF'	AG ²⁾	AQ	AS	B*	BA	BA'	BB	BC	BE ²⁾	BE' ²⁾	C	CA*	H	HA
56 M ³⁾	1LA7 050 1LA7 053	2, 4	90	25	110	116	101	101	78	78	75	-	37.5	71	28	-	87	34	32	18	36	53	56	6
63 M	1LA7 060 1LA7 063	2, 4, 6	100	27	120	124	101	101	78	78	75	124	37.5	80	28	-	96	30	32	18	40	66	63	7
71 M	1LA7 070 1LA7 073	2, 4, 6, 8	112	27	132	145	111	111	88	88	75	124	37.5	90	27	-	106	18	32	18	45	83	71	7
80 M	1LA7 080 1LA7 083	2, 4, 6, 8	125	30.5	150	163	120	120	97	97	75	124	37.5	100	32	-	118	14	32	18	50	94	80	8
90 S 90 L	1LA7 090 1LA7 096	2, 4, 6, 8	140	30.5	165	180	128	128	105	105	75	170	37.5	100	33	54	143	23	32	18	56	143	90	10
100 L	1LA7 106 1LA7 107	2, 4, 6, 8 4, 8	160	42	196	203	135	163	78	123	120	170	60	140	47	-	176	39	42	21	63	125	100	12
112 M	1LA7 113	2, 4, 6, 8	190	46	226	227	148	176	91	136	120	170	60	140	47	-	176	32	42	21	70	141	112	12
132 S	1LA7 130 1LA7 131	2, 4, 6, 8 2	216	53	256	267	167	194	107	154	140	250	70	140	49	-	180	39	42	21	89	162.5	132	15
132 M	1LA7 133 1LA7 134	4, 6, 8 6	216	53	256	267	167	194	107	154	140	250	70	178	49	-	218	39	42	21	89	124.5	132	15
160 M	1LA7 163 1LA7 164	2, 4, 6, 8 2, 8	254	60	300	320	197	226	127	183	165	250	82.5	210	57	-	256	52.5	54	27	108	183	160	18
160 L	1LA7 166	2, 4, 6, 8	254	60	300	320	197	226	127	183	165	250	82.5	254	57	-	300	52.5	54	27	108	139	160	18
180 M	1LA5 183	2, 4	279	69.5	339	363	258	258	216	216	152	340	71	241	50	-	287	38	54	27	121	259	180	18
180 L	1LA5 186	4, 6, 8	279	69.5	339	363	258	258	216	216	152	340	71	279	50	-	325	38	54	27	121	221	180	18
200 L	1LA5 206 1LA5 207	2, 6 2, 4, 6, 8	318	83	388	402	305	305	252	252	260	340	96	305	58.5	-	355	45	85	42.5	133	239	200	24
225 S	1LA5 220	4, 8	356	103	426	402	305	305	252	252	260	340	96	286	58	83	361	36	85	42.5	149	248.5	225	24
225 M	1LA5 223	2 4, 6, 8	356	103	426	402	305	305	252	252	260	340	96	311	58	83	361	36	85	42.5	149	223.5	225	24

■ For 1LA7 and 1LA5 standard motors in pole-changing version (6 or 9 terminals), the dimensions of the basic version apply.

* This dimension is assigned in DIN EN 50347 to the frame size listed.

1) Measured across the bolt heads.

2) The values increase if the connection box is rotated or if a brake is mounted. Further information is provided by the dimension sheet generator in SD configurator.

3) The motors of frame size 56 M are not ventilated.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

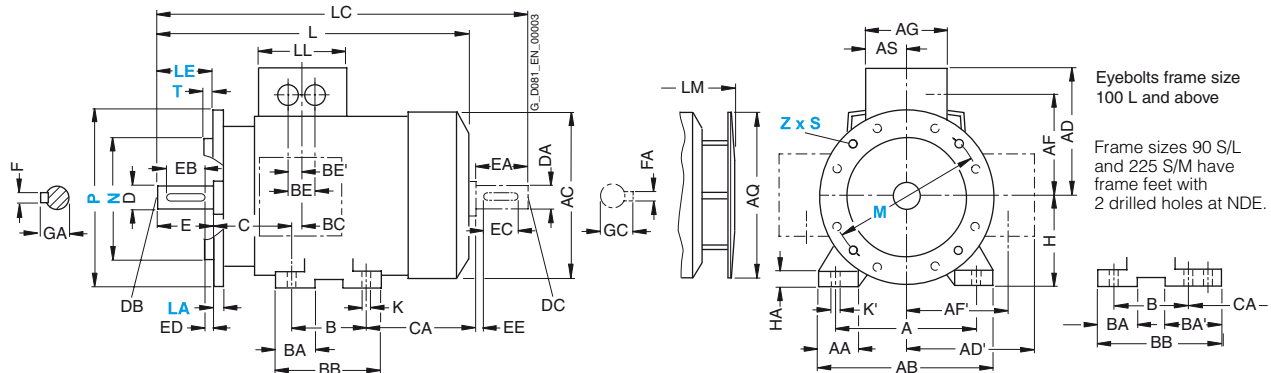
Dimensions

Dimensional drawings

Aluminum series 1LA7 and 1LA5, frame sizes 56 M to 225 M

Type of construction IM B35

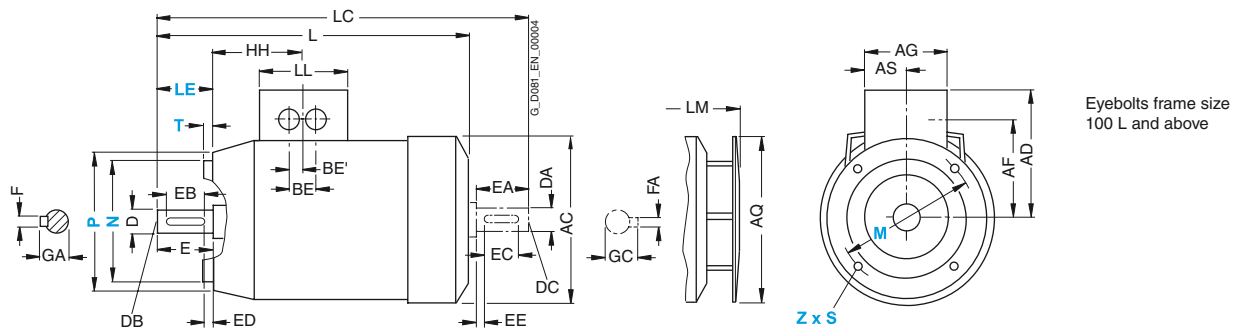
For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



Type of construction IM B14

Type of construction IM B14 not possible for 1LA5 motors, frame sizes 180 M to 225 M

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



For motor Frame size	Type	Number of poles	Dimension designation acc. to IEC							DE shaft extension					NDE shaft extension								
			HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
56 M ¹⁾	1LA7 050 1LA7 053	2, 4	69.5	5.8	9	169	200	75	-	9	M3	20	14	3	3	10.2	9	M3	20	14	3	3	10.2
63 M	1LA7 060 1LA7 063	2, 4, 6	69.5	7	10	202.5 ³⁾	232 ³⁾	75	231.5 ³⁾	11	M4	23	16	3.5	4	12.5	11	M4	23	16	3.5	4	12.5
71 M	1LA7 070 1LA7 073	2, 4, 6, 8	63.5	7	10	240	278	75	268	14	M5	30	22	4	5	16	14	M5	30	22	4	5	16
80 M	1LA7 080 1LA7 083	2, 4, 6, 8	63.5	9.5	13.5	273.5	324 364	75	299.5	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5
90 S 90 L	1LA7 090 1LA7 096	2, 4, 6, 8	79	10	14	331	389	75	382.5	24	M8	50	40	5	8	27	19	M6	40	32	4	6	21.5
100 L	1LA7 106 1LA7 107	2, 4, 6, 8 4, 8	102	12	16	372	438	120	423.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
112 M	1LA7 113	2, 4, 6, 8	102	12	16	393	461	120	444.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1LA7 130 1LA7 131	2, 4, 6, 8 2	128	12	16	452.5 ²⁾	551.5	140	505 ²⁾	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
132 M	1LA7 133 1LA7 134	4, 6, 8 6	128	12	16	452.5 ²⁾	551.5	140	505 ²⁾	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
160 M	1LA7 163 1LA7 164 2, 8	2, 4, 6, 8	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
160 L	1LA7 166	2, 4, 6, 8	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
180 M	1LA5 183	2, 4	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1LA5 186	4, 6, 8	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LA5 206 1LA5 207	2, 6 2, 4, 6, 8	178	19	25	769.5	897	192	850	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
225 S	1LA5 220	4, 8	184.5	19	25	806	933.5	192	887.5	60	M20	140	125	7.5	18	64	55	M20	110	100	5	16	59
225 M	1LA5 223	2 4, 6, 8	184.5	19	25	776 806	903.5 933.5	192	857.5 887.5	55 60	M20	110 140	100 125	5 7.5	16 18	59 64	55	M20	110	100	5	16	59

¹⁾ The motors of frame size 56 M are not ventilated.

²⁾ In a low-noise version, the dimension L is 8 mm greater and the dimension LM is 11.5 mm greater.

³⁾ For 1LA7 063 with type of construction code 1 (B5, IM V1 without protective cover, IM V3) the dimensions L, LC and LM are 26 mm longer.

IEC Squirrel-Cage Motors

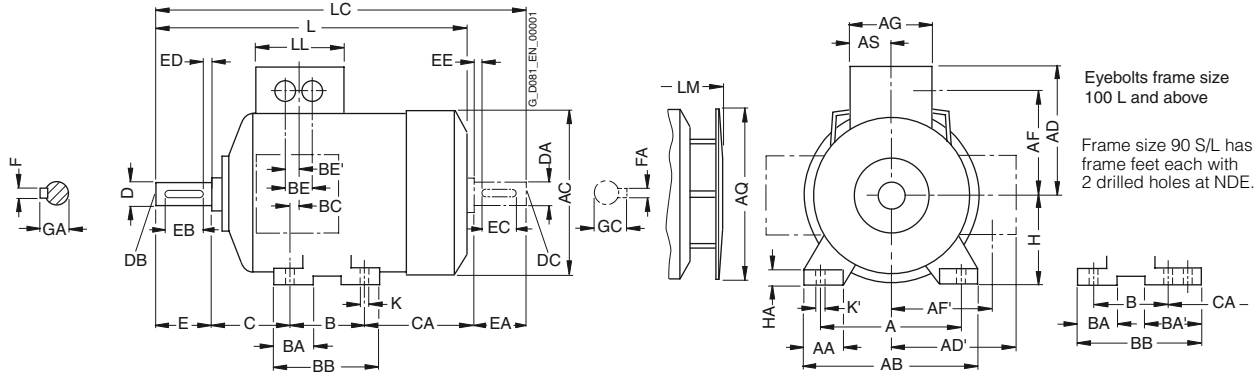
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

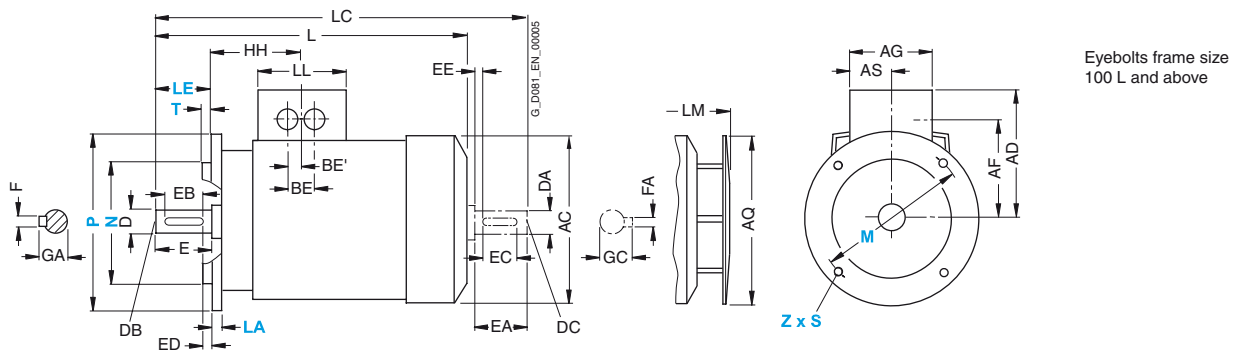
Aluminum series 1LA9, frame sizes 56 M to 200 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																						
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AQ	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H	HA
56 M ²⁾	1LA9 050 1LA9 053	2, 4	90	25	110	116	101	101	78	78	75	-	37.5	71	28	-	87	34	32	18	36	53	56	6
63 M	1LA9 060 1LA9 063	2, 4	100	27	120	124	101	101	78	78	75	124	37.5	80	28	-	96	30	32	18	40	66 92	63	7
71 M	1LA9 070 1LA9 073	2, 4	112	30.5	132	145	111	111	88	88	75	124	37.5	90	27	-	106	18	32	18	45	83	71	7
80 M	1LA9 080 1LA9 083	2, 4	125	30.5	150	163	120	120	97	97	75	124	37.5	100	32	-	118	14	32	18	50	94 134	80	8
90 S 90 L	1LA9 090 1LA9 096	2, 4, 6	140	30.5	165	180	128	128	105	105	75	170	37.5	100 125	33	54	143	23	32	18	56	143 118	90	10
100 L	1LA9 106 1LA9 107	2, 4, 6	160	42	196	203	135	163	78	123	120	170	60	140	47	-	176	39	42	21	63	160 195 ³⁾	100	12
112 M	1LA9 113	2, 4, 6	190	46	226	227	148	176	91	136	120	170	60	140	47	-	176	32	42	21	70	179	112	12
132 S	1LA9 130	2, 4	216	53	256	267	167	194	107	154	140	250	70	140	49	-	180	39	42	21	89	162.5 200.5	132	15
132 M	1LA9 133 1LA9 133 1LA9 134	6 4 6	216	53	256	267	167	194	107	154	140	250	70	178	49	-	218	39	42	21	89	124.5 162.5	132	15
160 M	1LA9 163 1LA9 164	2, 4, 6 2	254	60	300	320	197	226	127	183	165	250	82.5	210	57	-	256	52.5	54	27	108	183	160	18
160 L	1LA9 166	2, 4, 6	254	60	300	320	197	226	127	183	165	250	82.5	254	57	-	300	52.5	54	27	108	179	160	18
180 M	1LA9 183	2, 4	279	69.5	339	363	258	258	216	216	152	340	71	241	50	-	287	38	54	27	121	259	180	18
180 L	1LA9 186	4, 6	279	69.5	339	363	258	258	216	216	152	340	71	279	50	-	325	38	54	27	121	221	180	18
200 L	1LA9 206 1LA9 207	2, 6 2, 4, 6	318	83	388	402	305	305	252	252	260	340	96	305	58.5	-	355	45	85	42.5	133	239	200	24

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ Measured across the bolt heads.

²⁾ The motors of frame size 56 M are not ventilated. Frame size 56 M is not available in IM B35.

³⁾ For 1LA9 107-4KA.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

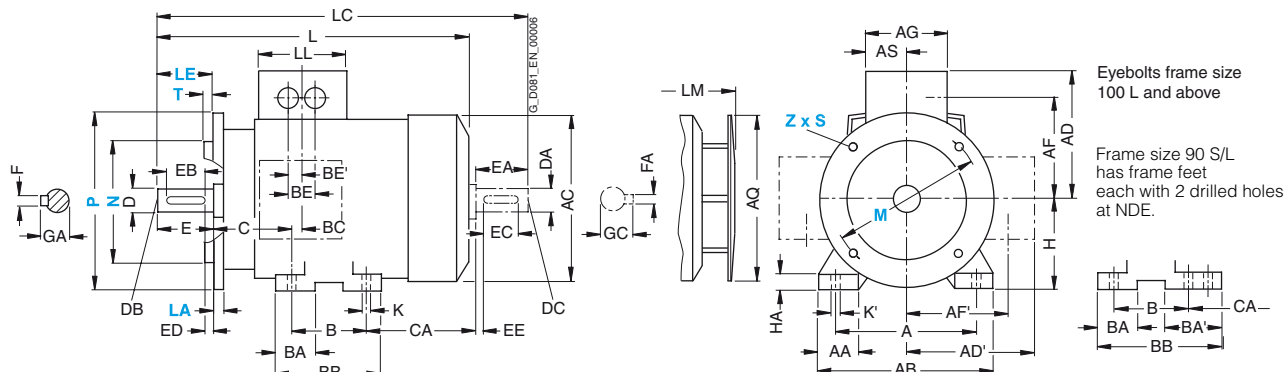
Dimensions

Dimensional drawings

Aluminum series 1LA9, frame sizes 56 M to 200 L

Type of construction IM B35

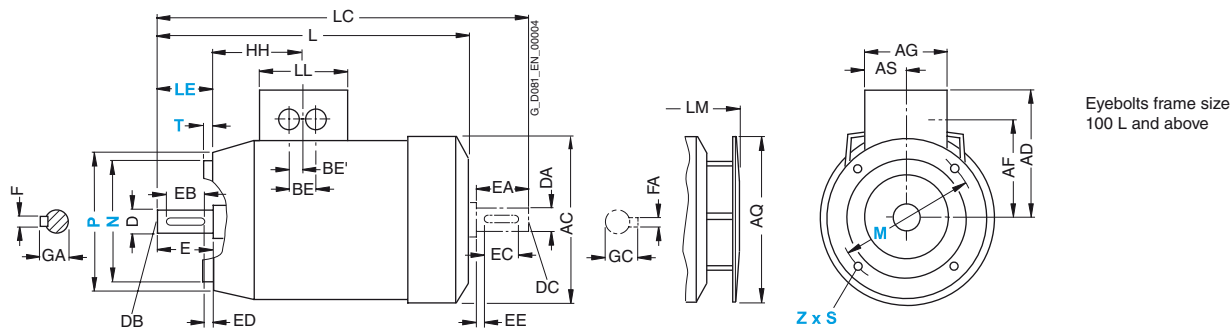
For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



Type of construction IM B14

Type of construction IM B14 not possible for 1LA9 motors, frame sizes 180 M to 200 L

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC										DE shaft extension				NDE shaft extension							
Frame size	Type	Number of poles	HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
56 M ¹⁾	1LA9 050 1LA9 053	2, 4	69.5	5.8	9	169 ²⁾ 195	200 ²⁾ 226	75	-	9	M3	20	14	3	3	10.2	9	M3	20	14	3	3	10.2
63 M	1LA9 060 1LA9 063	2, 4	69.5	7	10	202.5 ³⁾ 228.5	232 ³⁾ 258	75	231.5 257.5	11	M4	23	16	3.5	4	12.5	11	M4	23	16	3.5	4	12.5
71 M	1LA9 070 1LA9 073	2, 4	63.5	7	10	240	278	75	268	14	M5	30	22	4	5	16	14	M5	30	22	4	5	16
80 M	1LA9 080 1LA9 083	2, 4	63.5	9.5	13.5	273.5 308.5	324 364	75	299.5 334.5	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5
90 S 90 L	1LA9 090 1LA9 096	2, 4, 6	79	10	14	331 376 ⁴⁾ 358 ⁵⁾	389 434 ⁴⁾ 414 ⁵⁾	75	382.5 427.5 ⁴⁾ 409.5 ⁵⁾	24	M8	50	40	5	8	27	19	M6	40	32	4	6	21.5
100 L	1LA9 106 1LA9 107	2, 4, 6	102	12	16	407 442 ⁶⁾	473 508 ⁶⁾	120	458.5 493 ⁶⁾	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
112 M	1LA9 113	2, 4, 6	102	12	16	431	499	120	482.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1LA9 130 1LA9 131	2, 4	128	12	16	452.5 490.5	551.5 589.5	140	505 543	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
132 M	1LA9 133 1LA9 133 1LA9 134	6 4 6	128	12	16	452.5 490.5	551.5 589.5	140	505 543	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
160 M	1LA9 163 1LA9 164	2, 4, 6 2	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
160 L	1LA9 166	2, 4, 6	160.5	15	19	628	761	165	680.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
180 M	1LA9 183	2, 4	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1LA9 186	4, 6	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LA9 206 1LA9 207	2, 6 2, 4, 6	178	19	25	768.5	897	192	850	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59

1) The motors of frame size 56 M are not ventilated. Frame size 56 M is not available in IM B35.
 2) For 1LA9 frame size 56 M with type of construction code 1 (B5, IM V1 without protective cover, IM V3) the dimensions L and LC are 26 mm longer.

3) For 1LA9 060 with type of construction code 1 (B5, IM V1 without protective cover, IM V3) the dimensions L, LC and LM are 26 mm longer.
 4) For 1LA9 096-6KA.
 5) For 1LA9 096-2 and 1LA9 096-4.
 6) For 1LA9 107-4KA.

IEC Squirrel-Cage Motors

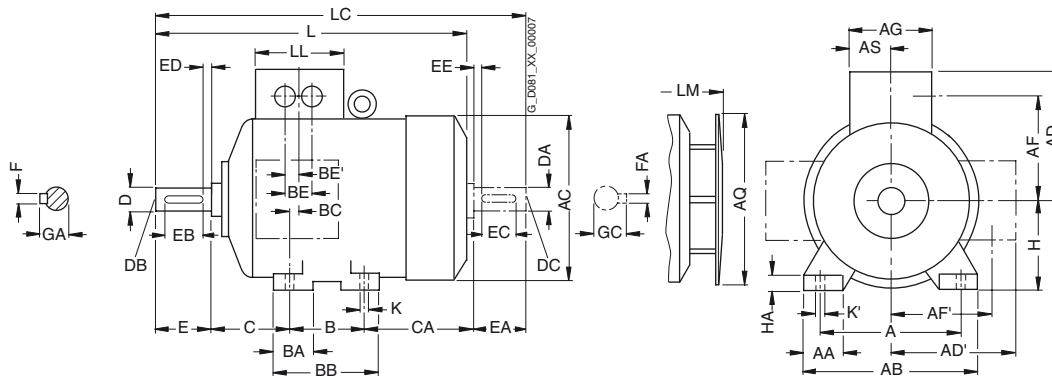
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

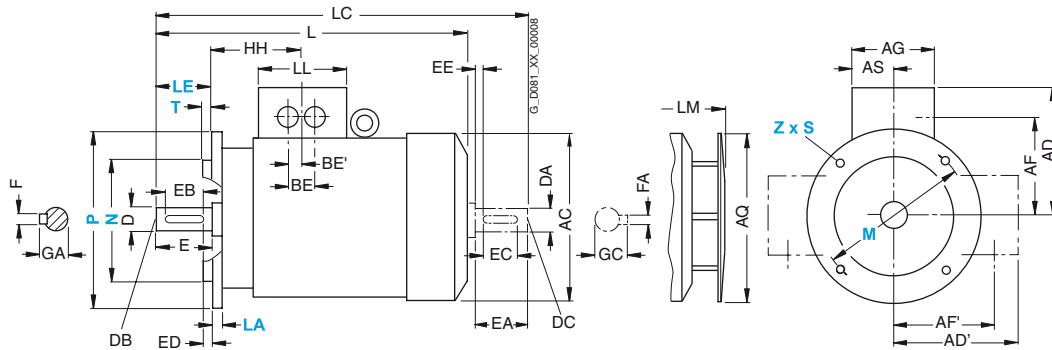
Cast-iron series 1LA6, frame sizes 100 L to 160 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																				
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AQ	AS	B	BA	BB	BC	BE	BE'	C	CA	H	HA
100 L	1LA6 106	2, 4, 6, 8	160	40	196	201	164	164	124	124	121	170	60.5	140	46	180	42	44	22	63	125	100	12
	1LA6 107	4, 8																					
112 M	1LA6 113	2, 4, 6, 8	190	42.5	226	225.5	178	178	138	138	121	170	60.5	140	46	180	34	44	22	70	141	112	15
132 S	1LA6 130	2, 4, 6, 8	216	50	256	265	194	194	154	154	141	250	70.5	140	47	180	42	44	22	89	162.5	132	17
	1LA6 131	2																					
132 M	1LA6 133	4, 6, 8	216	50	256	265	194	194	154	154	141	250	70.5	178	49	218	42	44	22	89	124.5	132	17
	1LA6 134	6																					
160 M	1LA6 163	2, 4, 6, 8	254	60	300	320	226	226	183	183	166	250	83	210	63	256	52	54	27	108	183	160	18
	1LA6 164	2, 8																					
160 L	1LA6 166	2, 4, 6, 8	254	60	300	320	226	226	183	183	166	250	83	254	63	300	52	54	27	108	139	160	18

¹⁾ Measured across the bolt heads.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

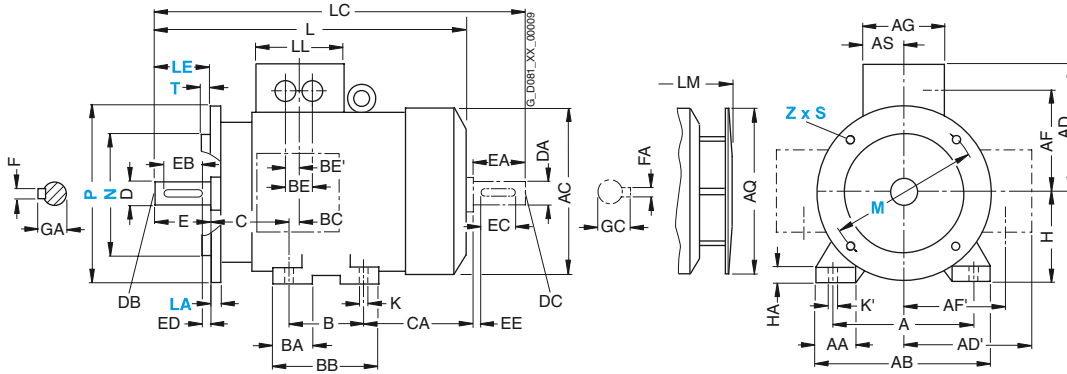
Dimensions

Dimensional drawings

Cast-iron series 1LA6, frame sizes 100 L to 160 L

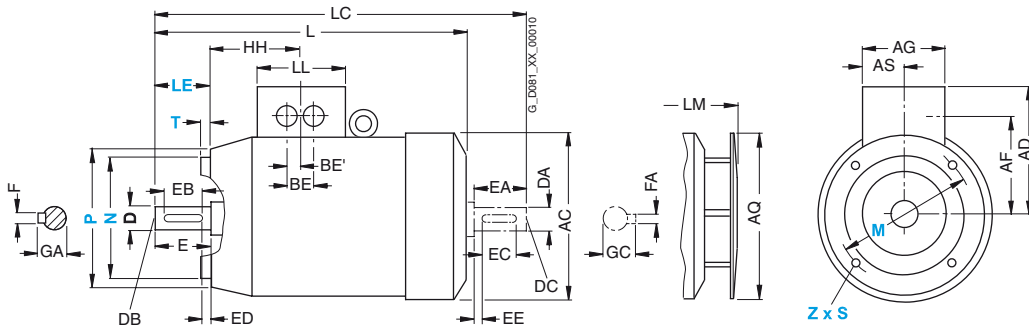
Type of construction IM B35

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



Types of construction IM B14

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



For motor		Number of poles	Dimension designation acc. to IEC							DE shaft extension					NDE shaft extension								
Frame size	Type		HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
100 L	1LA6 106 1LA6 107	2, 4, 6, 8 4, 8	104.5	12	16	372	438	121	423.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
112 M	1LA6 113	2, 4, 6, 8	104.5	12	16	393	461	121	444.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1LA6 130 1LA6 131	2, 4, 6, 8 2	130.5	12	16	453.5	551.5	141	506	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
132 M	1LA6 133 1LA6 134	4, 6, 8 6	130.5	12	16	453.5	551.5	141	506	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
160 M	1LA6 163 1LA6 164	2, 4, 6, 8 2, 8	160	14.5	18	588	721	166	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
160 L	1LA6 166	2, 4, 6, 8	160	14.5	18	588	721	166	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

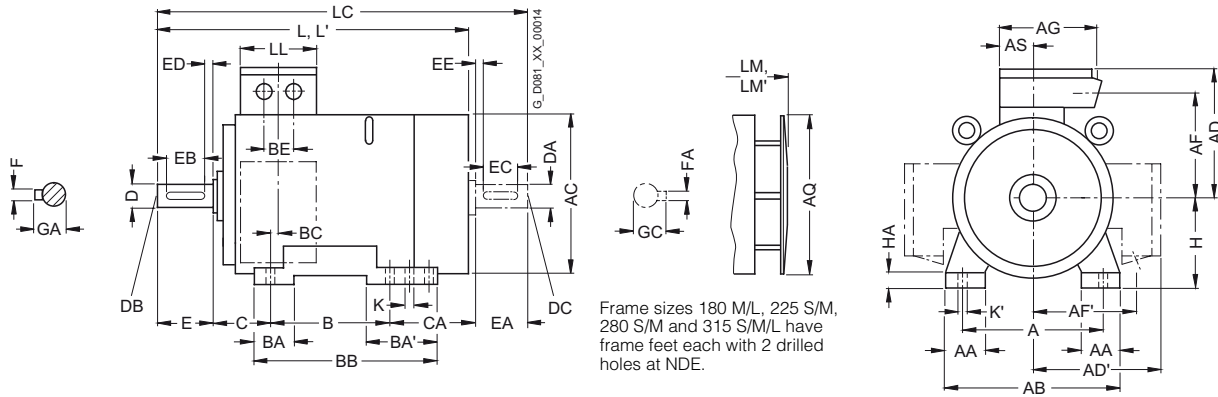
Dimensions

2

Dimensional drawings

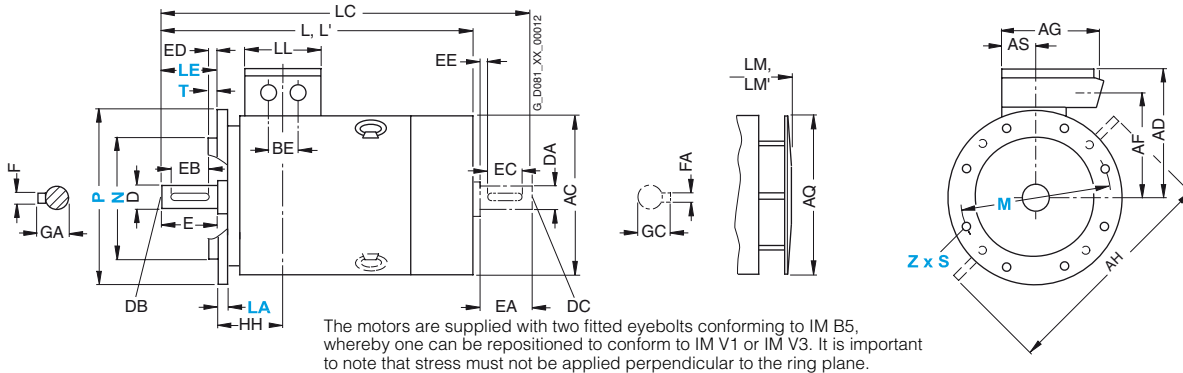
Cast-iron series 1LG4, frame sizes 180 M to 315 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																						
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA
180 M	1LG4 183	2, 4	279	65	339	363	262	262	220	220	152	452	340	71	241	70	111	328	36	54	121	202	180	20
180 L	1LG4 186	4, 6, 8	279	65	339	363	262	262	220	220	152	452	340	71	279	70	111	328	36	54	121	164	180	20
	1LG4 188	2, 4, 6, 8	279	65	339	363	262	262	220	220	152	452	340	71	279	70	111	328	36	54	121	215	180	20
200 L	1LG4 206	2, 6	318	70	378	402	300	300	247	247	260	512	340	96	305	80	80	355	63	85	133	177	200	25
	1LG4 207	2, 4, 6, 8	318	70	378	402	300	300	247	247	260	512	340	96	305	80	80	355	63	85	133	177	200	25
	1LG4 208	2, 6	318	70	378	402	300	300	247	247	260	512	340	96	305	80	80	355	63	85	133	234	200	25
		4, 8																				177		
225 S	1LG4 220	4, 8	356	80	436	442	325	325	272	272	260	556	425	96	286	85	110	361	47	85	149	218	225	34
225 M	1LG4 223	2	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	193	225	34
	1LG4 228	2	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	253	225	34
		4, 6, 8																						
250 M	1LG4 253	2	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	235	250	40
	1LG4 258	2	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	305	250	40
		4																				235		
		6, 8																						
280 S	1LG4 280	2	457	100	540	555	432	432	348	348	300	672	525	118	368	100	151	479	62	110	190	267	280	40
		4, 6, 8																						
280 M	1LG4 283	2	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	216	280	40
	1LG4 288	2	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40
		4																						
		6, 8																						216
315 S	1LG4 310	2	508	120	610	610	500	500	400	400	380	780	590	154	406	125	176	527	69	110	216	315	315	50
	1LG4 310	4, 6, 8																						
315 M ²⁾	1LG4 313	2	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	527	69	110	216	264	315	50
	1LG4 313	4, 6, 8																						
315 L ²⁾	1LG4 316/317	2	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50
	1LG4 316/317	4, 6, 8																						
	1LG4 318	8																						
	1LG4 318	6	508	120	610	610	500	500	400	400	380	780	590	154	508	155	206	648	69	110	216	513	315	50

* This dimension is assigned in DIN EN 50347 to the frame size listed.

1) Measured across the bolt heads.

2) With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

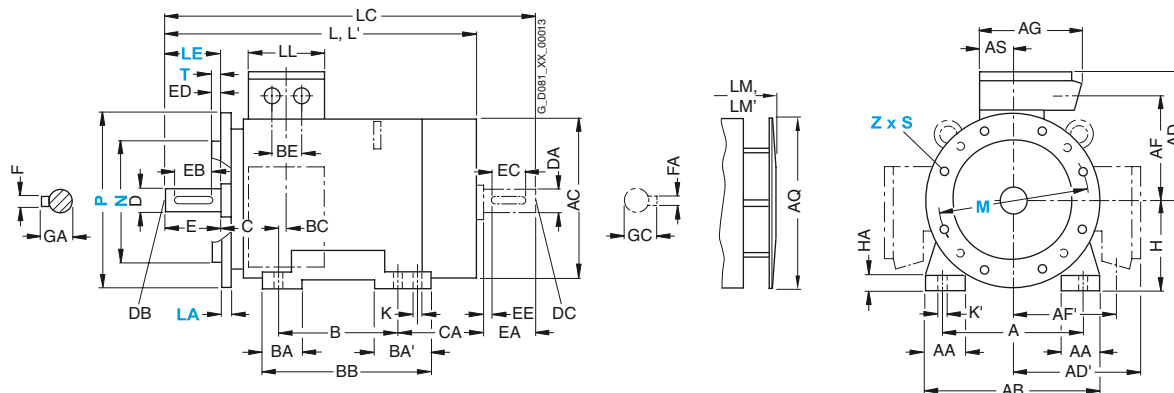
Dimensions

Dimensional drawings

Cast-iron series 1LG4, frame sizes 180 M to 315 L

Type of construction IM B35

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



For motor Frame size	Type	Number of poles	Dimension designation acc. to IEC										DE shaft extension				NDE shaft extension								
			HH	K	K'	L	L ⁽¹⁾	LC ⁽²⁾	LL	LM	LM ⁽¹⁾	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
180 M	1LG4 183	2, 4	157	15	19	669	669	784	132	759	759	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1LG4 186	4, 6, 8	157	15	19	669	-	784	132	759	-	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
	1LG4 188	2, 4, 6, 8	157	15	19	720	720	835	132	810	810	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LG4 206	2, 6	196	19	25	720	754	835	192	810	844	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
	1LG4 207	2, 4, 6, 8	196	19	25	720	754	835	192	810	844	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
	1LG4 208	2, 6	196	19	25	777	811	892	192	867	901	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
		4, 8	-	-	-	720	-	835	-	810	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
225 S	1LG4 220	4, 8	196	19	25	789	-	903	192	889	-	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
225 M	1LG4 223	2	196	19	25	759	793	873	192	859	893	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		4, 6, 8	-	-	-	789	-	903	-	889	-	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
	1LG4 228	2	196	19	25	819	853	933	192	919	953	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		4, 6, 8	-	-	-	849	-	963	-	949	-	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
250 M	1LG4 253	2	237	24	30	887	924	1002	236	987	1024	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
		4, 6, 8	-	-	-	-	-	1032	-	-	-	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG4 258	2	237	24	30	887	924	1002	236	987	1024	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
		4	-	-	-	957	-	1102	-	1057	-	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		6, 8	-	-	-	887	-	1032	-	987	-	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
280 S	1LG4 280	2	252	24	30	960	998	1105	236	1070	1108	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8	-	-	-	-	-	-	-	-	-	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
280 M	1LG4 283	2	252	24	30	960	998	1105	236	1070	1108	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8	-	-	-	-	-	-	-	-	-	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
	1LG4 288	2	252	24	30	1070	1108	1215	236	1180	1218	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4	-	-	-	-	-	-	-	-	-	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
		6, 8	-	-	-	960	-	1105	-	1070	-	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
315 S	1LG4 310	2	285	28	35	1072	1142	1217	307	1182	1252	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG4 310	4, 6, 8	-	-	-	1102	-	1247	-	1212	-	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 M ³⁾	1LG4 313	2	285	28	35	1072	1142	1217	307	1182	1252	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG4 313	4, 6, 8	-	-	-	1102	-	1247	-	1212	-	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 L ³⁾	1LG4 316/317	2	285	28	35	1232	1302	1377	307	1342	1412	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG4 316/317	4, 6, 8	-	-	-	1262	-	1407	-	1372	-	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG4 318	8	-	-	-	-	-	-	-	-	-	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG4 318	6	285	28	35	1402	-	1547	307	1512	-	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5

1) For version with low-noise fan for 2-pole motors.
 2) In the low-noise version, a second shaft extension and/or mounted encoder is not possible.

3) With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

IEC Squirrel-Cage Motors

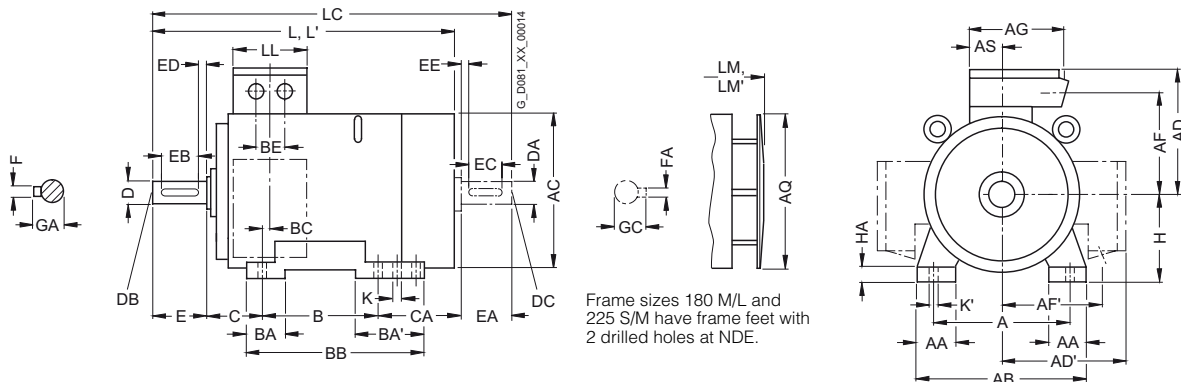
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

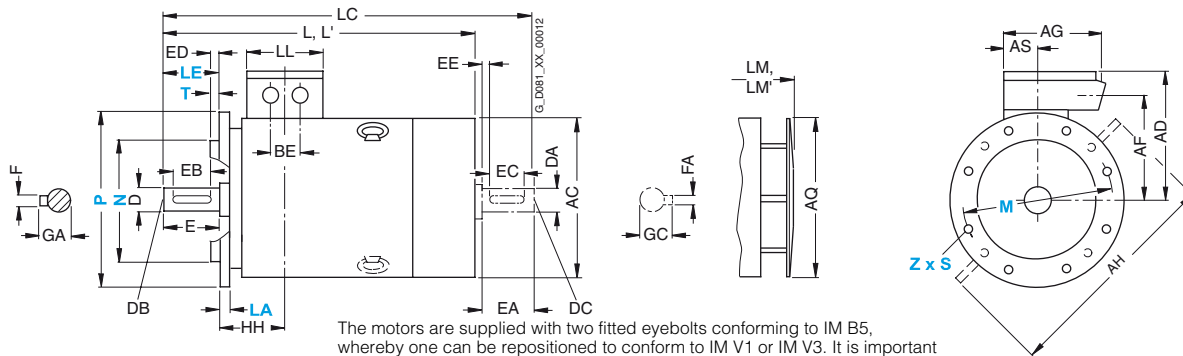
Cast-iron series 1LG6, frame sizes 180 M to 250 M

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



For motor		Number of poles	Dimension designation acc. to IEC																					
Frame size	Type		A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA
180 M	1LG6 183	2	279	65	339	363	262	262	220	220	152	452	340	71	241	70	111	328	36	54	121	253	180	20
		4																				202	180	20
180 L	1LG6 186	4, 6, 8	279	65	339	363	262	262	220	220	152	452	340	71	279	70	111	328	36	54	121	215	180	20
		2, 6	318	70	378	402	300	300	247	247	260	512	340	96	305	80	80	355	63	85	133	177	200	25
200 L	1LG6 206	2, 6	318	70	378	402	300	300	247	247	260	512	340	96	305	80	80	355	63	85	133	234	200	25
		4, 8	318	70	378	402	300	300	247	247	260	512	340	96	305	80	80	355	63	85	133	177	200	25
225 S	1LG6 220	4, 8	356	80	436	442	325	325	272	272	260	556	425	96	286	85	110	361	47	85	149	218	225	34
		2	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	253	225	34
225 M	1LG6 223	4, 6, 8	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	303	225	34
		2	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	303	225	34
250 M	1LG6 253	2	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	235	250	40
		4																				305	250	40
250 M	1LG6 258	6, 8	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	235	250	40
		2	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	305	250	40

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ Measured across the bolt heads.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

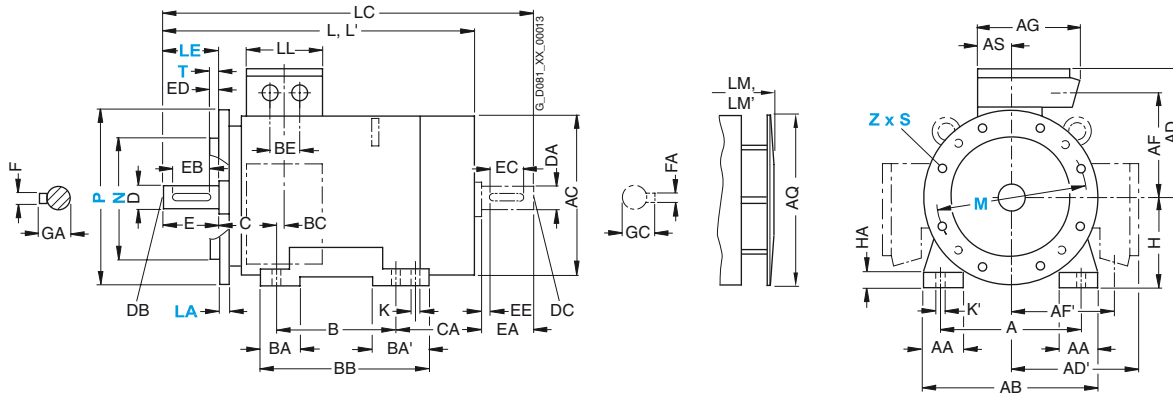
Dimensions

Dimensional drawings

Cast-iron series 1LG6, frame sizes 180 M to 250 M

Type of construction IM B35

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



For motor		Number of poles	Dimension designation acc. to IEC							DE shaft extension					NDE shaft extension								
Frame size	Type		HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
180 M	1LG6 183	2	157	15	19	720	835	132	810	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
		4				669	784		759														
		4, 6, 8				720	835	132	810	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LG6 206	2, 6	196	19	25	720	835	192	810	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
		2, 6	196	19	25	777	892	192	867	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
		4, 8				720	835		810														
225 S	1LG6 220	4, 8	196	19	25	789	903	192	889	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
		2	196	19	25	819	933	192	919	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		4, 6, 8				849	963		949	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
225 M	1LG6 223	2	196	19	25	869	983	192	969	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		4, 6				899	1013		999	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
		2	196	19	25	869	983	192	969	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
250 M	1LG6 253	2	237	24	30	887	1002	236	987	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
		4				957	1102		1057	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		6, 8				887	1032		987	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 258	2	237	24	30	957	1102	236	1057	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
		4, 6								65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		2	237	24	30	957	1102	236	1057	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59

IEC Squirrel-Cage Motors

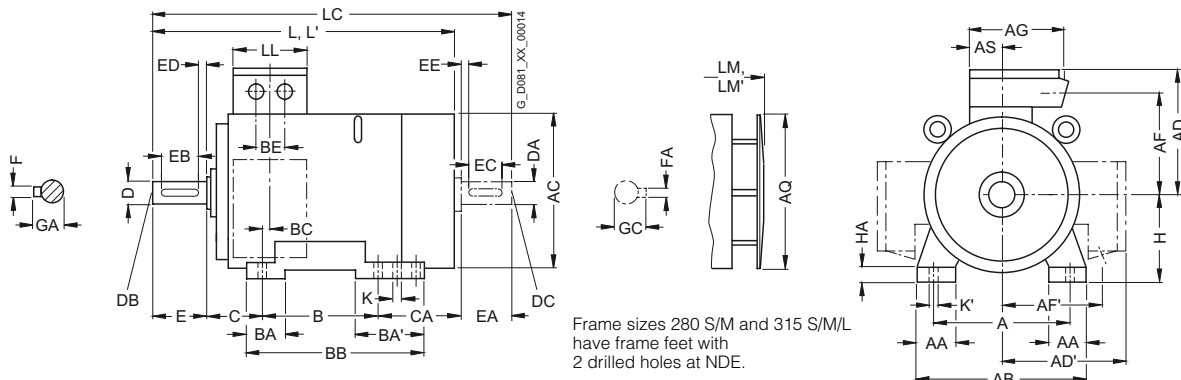
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

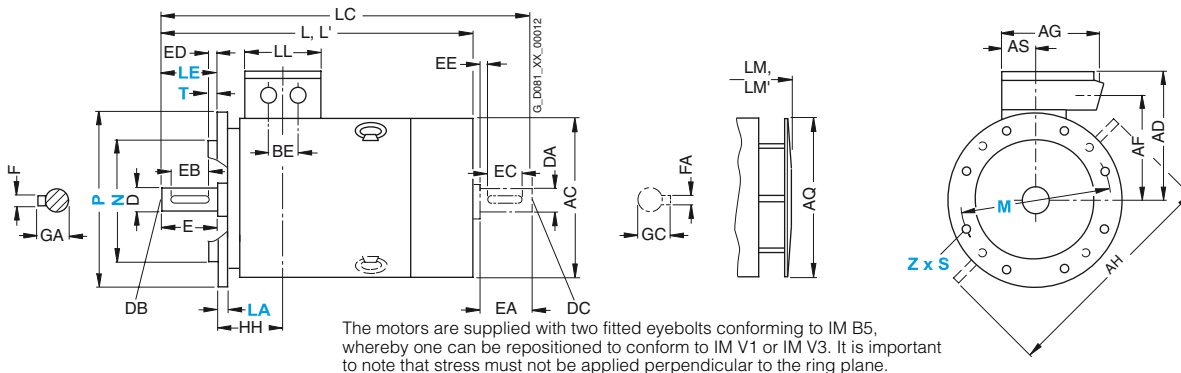
Cast-iron series 1LG6, frame sizes 280 S to 315 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



For motor	Frame size	Type	Number of poles	Dimension designation acc. to IEC																					
				A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA
	280 S	1LG6 280	2	457	100	540	555	432	432	348	348	300	672	525	118	368	100	151	479	62	110	190	267	280	40
	280 M	1LG6 283	2	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40
			4	6, 8	2	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40
		1LG6 288	2	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40
			4																			216			
	315 S	1LG6 310	2	508	120	610	610	500	500	400	400	380	780	590	154	406	125	176	527	69	110	216	315	315	50
		1LG6 310	4, 6, 8																						
	315 M ²⁾	1LG6 313	8	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	527	69	110	216	264	315	50
			2	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	578	69	110	216	424	315	50
	315 L ²⁾	1LG6 313	4, 6																						
			2	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50
		1LG6 316	4, 6																						
		1LG6 316	8																						
		1LG6 317	2	508	120	610	610	500	500	400	400	380	780	590	154	508	155	206	648	69	110	216	513	315	50
		1LG6 317	4, 6																						
		1LG6 317	8																						
		1LG6 318	2	508	120	610	610	651	651	524	524	470	780	590	165	508	155	206	648	69	135	216	513	315	50
		1LG6 318	4																						
		1LG6 318	6, 8					500	500	400	400	380													

* This dimension is assigned in DIN EN 50347 to the frame size listed.

1) Measured across the bolt heads.

2) With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

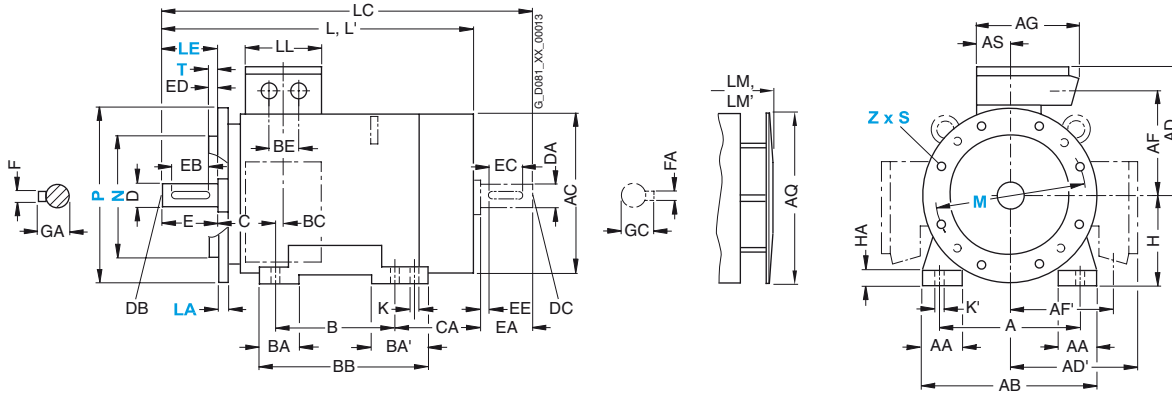
Dimensions

Dimensional drawings

Cast-iron series 1LG6, frame sizes 280 S to 315 L

Type of construction IM B35

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



For motor Frame size	Type	Number of poles	Dimension designation acc. to IEC								DE shaft extension					NDE shaft extension							
			HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
280 S	1LG6 280	2	252	24	30	960	1105	236	1070	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8								75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
280 M	1LG6 283	2	252	24	30	1070	1215	236	1180	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4								75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
	1LG6 288	6, 8				960	1105		1070	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
		2	252	24	30	1070	1215	236	1180	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6								75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
315 S	1LG6 310	2	285	28	35	1072	1217	307	1182	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 310	4, 6, 8				1102	1247		1212	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 M	1LG6 313	8	285	28	35	1102	1247	307	1212	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 313	2	285	28	35	1232	1377	307	1342	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
315 L	1LG6 313	4, 6				1262	1407		1372	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 316	2	285	28	35	1232	1377	307	1342	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 316	4, 6				1262	1407		1372	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 316	8							80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	
	1LG6 317	2	285	28	35	1372	1517	307	1482	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 317	4, 6				1402	1547		1512	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 317	8				1262	1407		1372	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 318	2	285	28	35	1372	1517	330	1482	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 318	4				1402	1547		1512	80 ¹⁾	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 318	6, 8						307		80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5

¹⁾ Diameters up to 90 mm are possible.

IEC Squirrel-Cage Motors

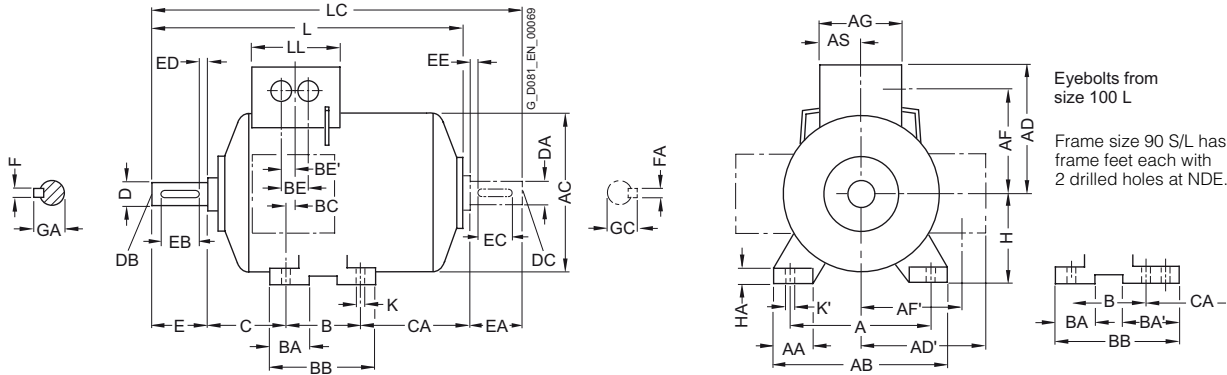
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

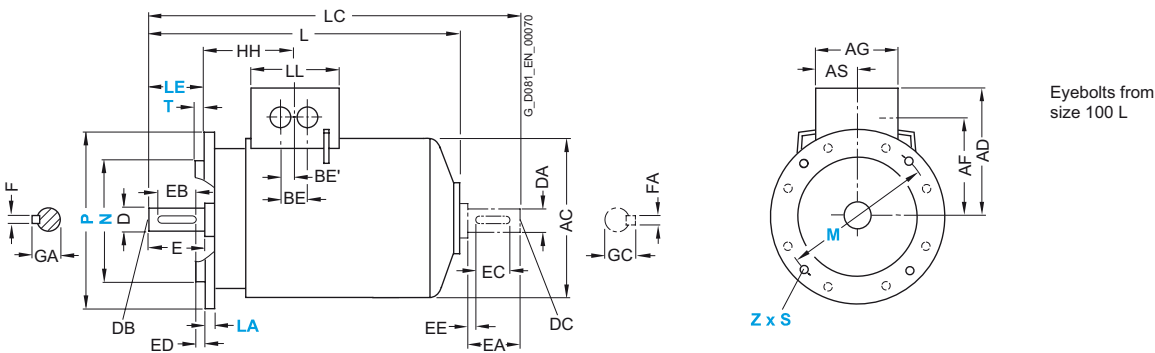
Aluminum series 1LP7 and 1LP5, frame sizes 63 M to 200 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																				
Frame size	Type	Number of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H	HA
63 M	1LP7 060 1LP7 063	2, 4, 6	100	27	120	124	101	101	78	78	75	37.5	80	28	-	96	30	32	18	40	40	63	7
71 M	1LP7 070 1LP7 073	2, 4, 6, 8	112	27	132	145	111	111	88	88	75	37.5	90	27	-	106	18	32	18	45	42	71	7
80 M	1LP7 080 1LP7 083	2, 4, 6, 8	125	30.5	150	163	120	120	97	97	75	37.5	100	32	-	118	14	32	18	50	47	80	8
90 S 90 L	1LP7 090 1LP7 096	2, 4, 6, 8	140	30.5	165	180	128	128	105	105	75	37.5	100 125	33	54	143	23	32	18	56	80 55	90	10
100 L	1LP7 106 1LP7 107	2, 4, 6, 8 4, 8	160	42	196	203	135	163	78	123	120	60	140	47	-	176	39	42	21	63	68	100	12
112 M	1LP7 113	2, 4, 6, 8	190	46	226	227	148	176	91	136	120	60	140	47	-	176	32	42	21	70	79	112	12
132 S	1LP7 130 1LP7 131	2, 4, 6, 8 2	216	53	256	267	167	194	107	154	140	70	140	49	-	180	39	42	21	89	96	132	15
132 M	1LP7 133 1LP7 134	4, 6, 8 6	216	53	256	267	167	194	107	154	140	70	178	49	-	218	39	42	21	89	58	132	15
160 M	1LP7 163 1LP7 164	2, 4, 6, 8 2, 8	254	60	300	320	197	226	127	183	165	82.5	210	57	-	256	52.5	54	27	108	107	160	18
160 L	1LP7 166	2, 4, 6, 8	254	60	300	320	197	226	127	183	165	82.5	254	57	-	300	52.5	54	27	108	63	160	18
180 M	1LP5 183	2, 4	279	69.5	339	363	258	258	216	216	152	71	241	50	-	287	38	54	27	121	145	180	18
180 L	1LP5 186	4, 6, 8	279	69.5	339	363	258	258	216	216	152	71	279	50	-	325	38	54	27	121	107	180	18
200 L	1LP5 206 1LP5 207	2, 6 2, 4, 6, 8	318	83	388	402	305	305	252	252	260	96	305	58.5	-	355	45	85	42.5	133	133	200	24

* This dimension is assigned in DIN EN 50347 to the frame size listed.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

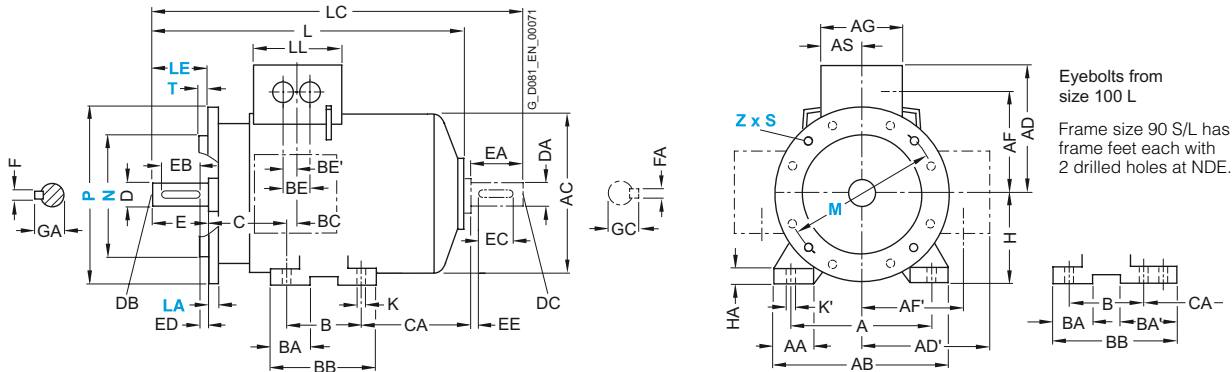
Dimensions

Dimensional drawings

Aluminum series 1LP7 and 1LP5, frame sizes 63 M to 200 L

Types of construction IM B35

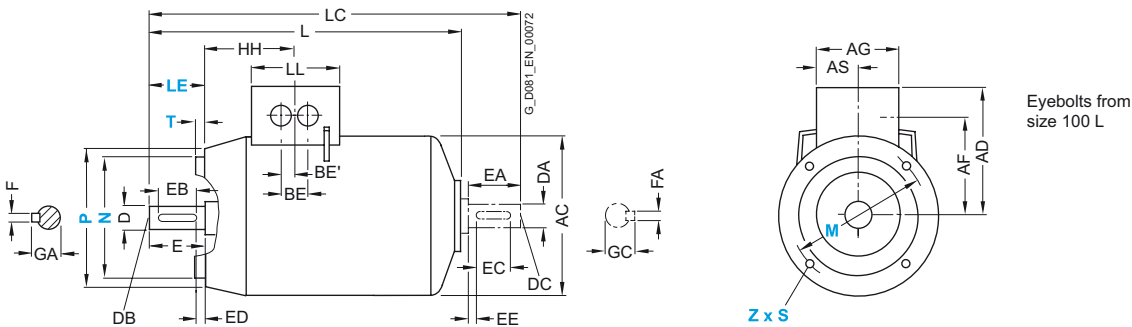
For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



Type of construction IM B14

Type of construction IM B14 not possible for 1LP5 motors, frame sizes 180 M to 200 L

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



For motor		Number of poles	Dimension designation acc. to IEC						DE shaft extension					NDE shaft extension								
Frame size	Type		HH	K	K'	L	LC	LL	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
63 M	1LP7 060 1LP7 063	2, 4, 6	69.5	7	10	172 ¹⁾	206 ¹⁾	75	11	M4	23	16	3.5	4	12.5	11	M4	23	16	3.5	4	12.5
71 M	1LP7 070 1LP7 073	2, 4, 6, 8	63.5	7	10	207	240	75	14	M5	30	22	4	5	16	14	M5	30	22	4	5	16
80 M	1LP7 080 1LP7 083	2, 4, 6, 8	63.5	9.5	13.5	237	280	75	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5
90 S 90 L	1LP7 090 1LP7 096	2, 4, 6, 8	79	10	14	286 286	333 333	75	24	M8	50	40	5	8	27	19	M6	40	32	4	6	21.5
100 L	1LP7 106 1LP7 107	2, 4, 6, 8 4, 8	102	12	16	331	385 ²⁾	120	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
112 M	1LP7 113	2, 4, 6, 8	102	12	16	349 ³⁾	403 ⁴⁾	120	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1LP7 130 1LP7 131	2, 4, 6, 8 2	128	12	16	397	485	140	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
132 M	1LP7 133 1LP7 134	4, 6, 8 6	128	12	16	397	485	140	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
160 M	1LP7 163 1LP7 164	2, 4, 6, 8 2, 8	160.5	15	19	529	645	165	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
160 L	1LP7 166	2, 4, 6, 8	160.5	15	19	529	645	165	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
180 M	1LP5 183	2, 4	159	15	19	611	727	132	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1LP5 186	4, 6, 8	159	15	19	611	727	132	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LP5 206 1LP5 207	2, 6 2, 4, 6, 8	178	19	25	675	791	192	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59

¹⁾ For 1LP7 063 with type of construction code 1 (B5, IM V1 without protective cover, IM V3) the dimensions L and LC are 26 mm longer.

²⁾ For IM B14, 381 mm.

³⁾ For IM B5, 345 mm.

⁴⁾ For IM B5, 399 mm.

IEC Squirrel-Cage Motors

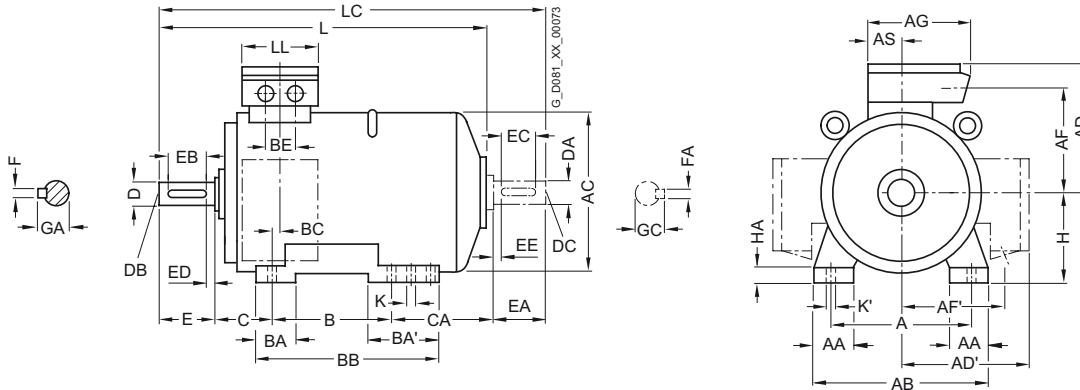
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

Cast-iron series 1LP4, frame sizes 180 M to 315 L

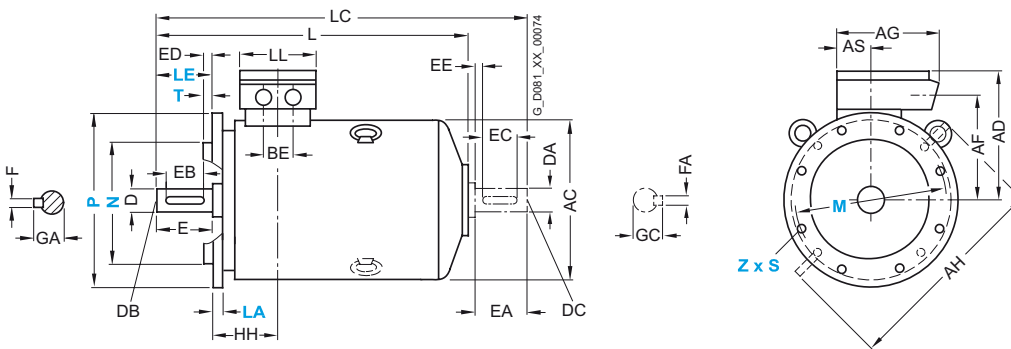
Type of construction IM B3



Frame sizes 180 M/L, 225 S/M, 280 S/M and 315 S/M/L have frame feet each with 2 drilled holes at NDE.

Types of construction IM B5 and IM V1 (IM B5 only up to frame size 315 M)

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



The motors are supplied with two fitted eyebolts conforming to IM B5, whereby one can be repositioned to conform to IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

For motor			Dimension designation acc. to IEC																				
Frame size	Type	Number of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AH	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA
180 M	1LP4 183	2, 4	279	65	339	363	262	262	220	220	152	452	71	241	70	111	328	36	54	121	94	180	20
180 L	1LP4 186	4, 6, 8	279	65	339	363	262	262	220	220	152	452	71	279	70	111	328	36	54	121	56	180	20
200 L	1LP4 206	2, 6	318	70	378	402	300	300	247	247	260	512	96	305	80	80	355	63	85	133	76	200	25
	1LP4 207	2, 4, 6, 8	318	70	378	402	300	300	247	247	260	512	96	305	80	80	355	63	85	133	76	200	25
225 S	1LP4 220	4, 8	356	80	436	442	325	325	272	272	260	556	96	286	85	110	361	47	85	149	99	225	34
225 M	1LP4 223	2	356	80	436	442	325	325	272	272	260	556	96	311	85	110	361	47	85	149	74	225	34
		4, 6, 8																					
250 M	1LP4 253	2	406	100	490	495	392	392	308	308	300	620	118	349	100	100	409	69	110	168	111	250	40
		4, 6, 8																					
280 S	1LP4 280	2	457	100	540	555	432	432	348	348	300	672	118	368	100	151	479	62	110	190	137	280	40
		4, 6, 8																					
280 M	1LP4 283	2	457	100	540	555	432	432	348	348	300	672	118	414	100	151	479	62	110	190	86	280	40
		4, 6, 8																					
315 S	1LP4 310	2	508	120	610	610	500	500	400	400	380	780	154	406	125	176	527	69	110	216	168	315	50
	1LP4 310	4, 6, 8																					
315 M ¹⁾	1LP4 313	2	508	120	610	610	500	500	400	400	380	780	154	457	125	176	527	69	110	216	117	315	50
	1LP4 313	4, 6, 8																					
315 L ¹⁾	1LP4 316/317	2	508	120	610	610	500	500	400	400	380	780	154	508	125	176	578	69	110	216	226	315	50
	1LP4 316/317	4, 6, 8																					

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

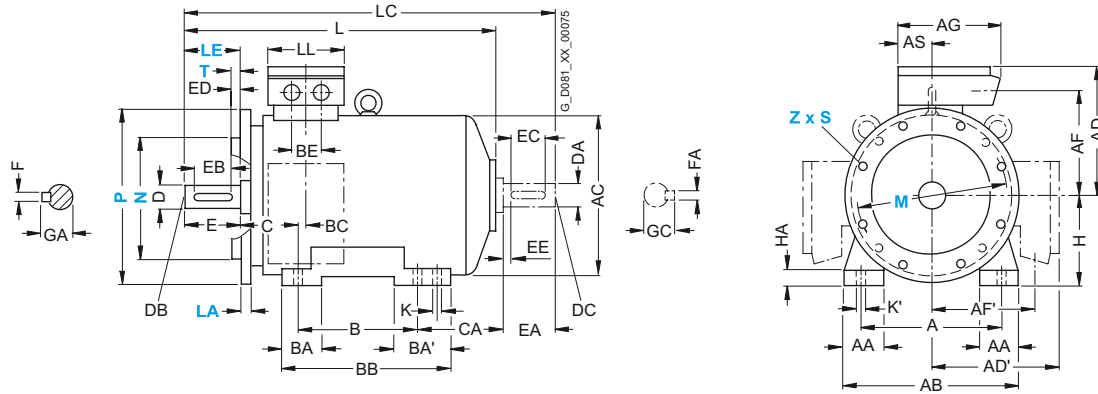
Dimensions

Dimensional drawings

Cast-iron series 1LP4, frame sizes 180 M to 315 L

Type of construction IM B35

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



For motor		Number of poles	Dimension designation acc. to IEC						DE shaft extension					NDE shaft extension								
Frame size	Type		HH	K	K'	L	LC	LL	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
180 M	1LP4 183	2, 4	157	15	19	562	676	132	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1LP4 186	4, 6, 8	157	15	19	562	676	132	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LP4 206	2, 6	196	19	25	617	734	192	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
	1LP4 207	2, 4, 6, 8	196	19	25	617	734	192	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
225 S	1LP4 220	4, 8	196	19	25	670	784	192	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
225 M	1LP4 223	2	196	19	25	640	754	192	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		4, 6, 8				670	784		60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
250 M	1LP4 253	2	237	24	30	764	878	236	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
		4, 6, 8					908		65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
280 S	1LP4 280	2	252	24	30	830	975	236	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8							75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
280 M	1LP4 283	2	252	24	30	830	975	236	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8							75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
315 S	1LP4 310	2	285	28	35	925	1070	307	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LP4 310	4, 6, 8				955	1100		80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 M ¹⁾	1LP4 313	2	285	28	35	925	1070	307	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LP4 313	4, 6, 8				955	1100		80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 L ¹⁾	1LP4 316/317	2	285	28	35	1085	1230	307	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LP4 316/317	4, 6, 8				1115	1260		80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5

¹⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

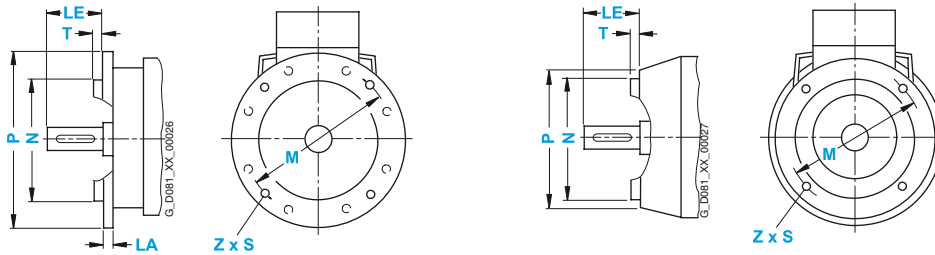
IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

Flange dimensions



In DIN EN 50347, the frame sizes are allocated flange FF with through holes and flange FT with tapped holes. The designation of flange A and C according to DIN 42948 (invalid since 09/2003) are also listed for information purposes. See the table below. (Z = the number of retaining holes)

Frame size	Type of construction	Flange type	Flange with		Dimension designation acc. to IEC								
			through holes (FF/A)	Tapped holes (FT/C)	LA	LE	M	N	P	S	T	Z	
56 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 100	Acc. to DIN EN 50347	A 120	8	20	100	80	120	7	3	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 65	Acc. to DIN 42948	C 80	–	20	65	50	80	M5	2.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 85	Acc. to DIN 42948	C 105	–	20	85	70	105	M6	2.5	4
63 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 115	Acc. to DIN EN 50347	A 140	8	23	115	95	140	10	3	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 75	Acc. to DIN 42948	C 90	–	23	75	60	90	M5	2.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 100	Acc. to DIN 42948	C 120	–	23	100	80	120	M6	3	4
71 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 130	Acc. to DIN EN 50347	A 160	9	30	130	110	160	10	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 85	Acc. to DIN 42948	C 105	–	30	85	70	105	M6	2.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 115	Acc. to DIN 42948	C 140	–	30	115	95	140	M8	3	4
80 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 165	Acc. to DIN EN 50347	A 200	10	40	165	130	200	12	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 100	Acc. to DIN 42948	C 120	–	40	100	80	120	M6	3	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 130	Acc. to DIN 42948	C 160	–	40	130	110	160	M8	3.5	4
90 S, 90 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 165	Acc. to DIN EN 50347	A 200	10	50	165	130	200	12	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 115	Acc. to DIN 42948	C 140	–	50	115	95	140	M8	3	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 130	Acc. to DIN 42948	C 160	–	50	130	110	160	M8	3.5	4
100 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 215	Acc. to DIN EN 50347	A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130	Acc. to DIN 42948	C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 165	Acc. to DIN 42948	C 200	–	60	165	130	200	M10	3.5	4
112 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 215	Acc. to DIN EN 50347	A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130	Acc. to DIN 42948	C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 165	Acc. to DIN 42948	C 200	–	60	165	130	200	M10	3.5	4
132 S, 132 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 265	Acc. to DIN EN 50347	A 300	12	80	265	230	300	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 165	Acc. to DIN 42948	C 200	–	80	165	130	200	M10	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 215	Acc. to DIN 42948	C 250	–	80	215	180	250	M12	4	4
160 M, 160 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 300	Acc. to DIN EN 50347	A 350	13	110	300	250	350	18.5	5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 215	Acc. to DIN 42948	C 250	–	110	215	180	250	M12	4	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 265	Acc. to DIN 42948	C 300	–	110	265	230	300	M12	4	4
180 M, 180 L	IM B5, IM V1, IM V3	Flange	FF 300	Acc. to DIN EN 50347	A 350	13	110	300	250	350	18.5	5	4
200 L	IM B5	Flange	FF 350	Acc. to DIN EN 50347	A 400	15	110	350	300	400	18.5	5	4
225 S, 225 M 2-pole 4-pole to 8-pole	IM B5, IM V1, IM V3	Flange	FF 400	Acc. to DIN EN 50347	A 450	16	110 140	400	350	450	18.5	5	8
250 M	IM B5, IM V1, IM V3	Flange	FF 500	Acc. to DIN EN 50347	A 550	18	140	500	450	550	18.5	5	8
280 S, 280 M	IM B5, IM V1, IM V3	Flange	FF 500	Acc. to DIN EN 50347	A 550	18	140	500	450	550	18.5	5	8
315 S, 315 M, 315 L 2-pole 4-pole to 8-pole	IM B5, IM V1, IM V3	Flange	FF 600	Acc. to DIN EN 50347	A 660	22	140 170	600	550	660	24	6	8

Non-standard motors frame size 315 and above



3/2	Orientation	3/34	Self-ventilated motors with through ventilation for mains-fed operation Cast-iron series 1LL8
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IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

Overview



N compact three-phase asynchronous motors: Series 1LA8, 1PQ8, 1LL8

The three-phase motor series N compact covers outputs up to 1250 kW (at 50 Hz) in the non-standard range. A number of technical features provide this motor series with its ruggedness and long service life and ensure the highest level of availability.

N compact motors are also characterised by their high output for small frame size. The consequence of this is an extremely compact design that can be used to save space in a number of industrial applications.

N compact motors are not only optimised in terms of their construction, but also in terms of their efficiency, so they also contribute towards lower energy consumption.

Apart from mains-fed operation, the motors of the series N compact are also specially designed for converter-fed operation. In combination with frequency converters from the SINAMICS and SIMOVERT MASTERDRIVES product series, they build up perfectly interacting drive systems for variable-speed drive applications.

Versions in the N compact series

Series 1LA8

The motors are asynchronous squirrel-cage motors with compact dimensions in fin-cooled design. They are designed for direct connection to the three-phase supply and for converter-fed operation.

- *1LA8 for mains-fed operation*
 - Designed for operation on the three-phase supply
 - Degree of protection: IP55
 - Cooling method: IC411, self-ventilated
 - Housing: Cast iron

- *1LA8 for converter-fed operation*
 - Converter-fed operation, optimised for the SINAMICS and SIMOVERT MASTERDRIVES drive systems
 - Degree of protection: IP55
 - Cooling method: IC411, self-ventilated
 - Housing: Cast iron
 - With standard insulation for voltages ≤ 500 V or with special insulation for 690 V

Series 1PQ8

The motors are asynchronous squirrel-cage motors with compact dimensions in fin-cooled design with forced ventilation. As these motors are forced-ventilated, no derating or only relatively minor derating (depending on their speed range) is required for operation at constant load torque and with wide speed ranges. The motors are designed for converter-fed operation with the SINAMICS and SIMOVERT MASTERDRIVES drive system.

- Converter-fed operation
- Degree of protection: IP55
- Cooling method: IC416, forced-ventilated
- Housing: Cast iron
- With standard insulation for voltages ≤ 500 V or with special insulation for 690 V

Series 1LL8

The motors of series 1LL8 are asynchronous squirrel-cage motors with compact dimensions in an open fin-cooled design with self-cooling. They are similar in construction to 1LA8 motors. IP23 degree of protection is achieved by opening the internal cooling circuit and supplying it with external cooling air. This can increase the performance by up to 25 % as compared to the 1LA8. They are designed for direct connection to the three-phase supply and for converter-fed operation.

Motors of the 1LL8 type series are intended for installation indoors. They must not be subjected to humid, salty or corrosive atmospheres.

- *1LL8 for mains-fed operation*
 - Mains-fed operation
 - Degree of protection: IP23
 - Cooling method: IC01, self-ventilated
 - Housing: Cast iron
- *1LL8 for converter-fed operation*
 - Converter-fed operation
 - Degree of protection: IP23
 - Cooling method: IC01, self-ventilated
 - Housing: Cast iron

Versions with special insulation for >500 V and operation without an output filter on the frequency converter are only possible on request.

Benefits

Non-standard motors from Siemens offer the user numerous advantages:

- The optimised efficiency results in lower operating costs.
- The high output/size ratio ensures low space requirements combined with low weight.
- The cast-iron housing and bearing plates are extremely rigid and rugged and can therefore be subjected to considerable stress and have excellent vibration damping properties and are resistant to corrosion.
- The bearings are designed for maximum reliability, which results in good vibration characteristics, a long service life and low maintenance costs.
- The DURIGNIT IR 2000 insulation system with VPI or current-UV impregnation results in high reliability, a long service life and high resistance to stress, for example, during starting or under overload conditions.
- Due to the low noise emission level, the stringent requirements of worker protection are fulfilled without the need for additional measures.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

Application

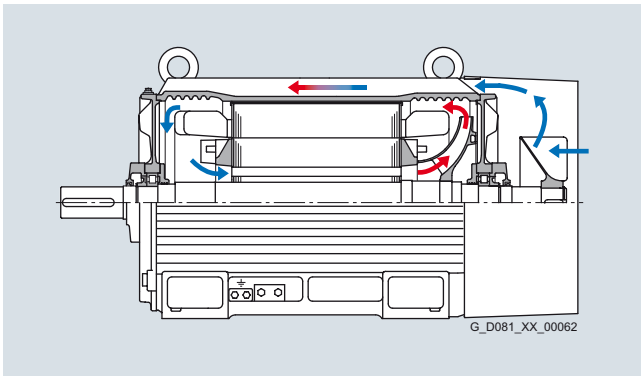
Thanks to the many options, the three-phase motor series N compact covers applications in a wide range of different sectors: Chemicals, paper, water/waste water, steel and shipbuilding are just a few examples. The available types of construction are IM B3, IM B35 and IM V1 according to DIN EN 60034-7. The degree of protection is IP55 as standard, but IP23 for motor series 1LL8.

The 1PQ8 motors are specially designed for variable-speed applications with constant torque. The mounted separately driven fan provides a constantly high cooling air flow at any speed. These motors can therefore be continuously operated at low speed and high torque simultaneously.

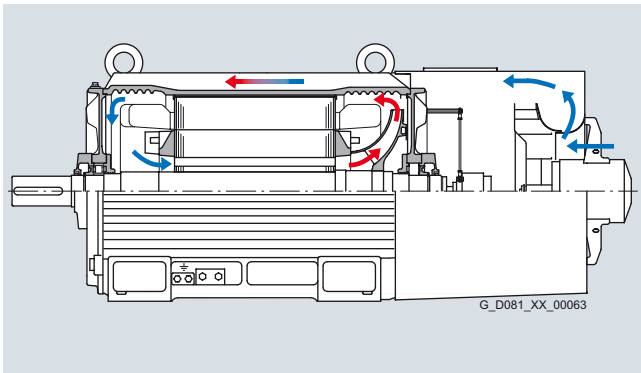
The low-voltage motor series N compact is also available in a through-ventilated version to IP23 degree of protection. This 1LL8 motor series boasts an output 25 % higher than that of the closed 1LA8 motor series for the same frame size. The 1LL8 motor is therefore useful for applications in which a closed 1LA8 motor is not essential and when the ambient conditions permit the use of a through-ventilated machine (IC 01 cooling method, IP23 degree of protection). Motors of the 1LL8 type series are only intended for installation indoors. They must not be subjected to humid, salty or corrosive atmospheres.

Design

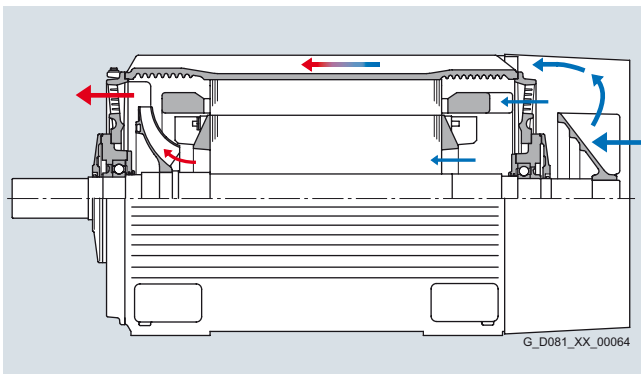
The basic structure of the non-standard motors is shown in the following sectional diagram.



Sectional diagram of 1LA8



Sectional diagram of 1PQ8



Sectional diagram of 1LL8

In conventional fin-cooled motors, the one-sided external ventilation naturally results in an uneven temperature distribution – this is however not the case with N compact motors with their additional internal air-flow channels. This cools, in particular, the stator winding heads, the rotor winding and the drive-end bearings. The resulting reduction in thermal loading increases the operating reliability and lengthens the service life. The internal air-flow channels increase the efficiency of the ventilation which means that the external air-flow can be reduced. The lower volumetric flow and air-flow optimisation of all guide channels results in a low level of fan noise.

3

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

Technical specifications

The following table lists the most important technical specifications. For further information and details, see catalog part 0 "Introduction".

Technical specifications at a glance

Type of motor	Squirrel-cage induction motor
Connection types	Star/delta connection You can establish the connection type used from the Order No. supplements in the selection and ordering data for the required motor.
Number of poles	2, 4, 6, 8
Rated output	160 ... 1250 kW (at 50 Hz)
Rated speed (synchronous speed)	750 ... 3600 rpm
Rated torques	800 ... 10,300 Nm
Insulation of the stator winding according to EN 60034-1 (IEC 60034-1)	Temperature class 155 (F) Used in mains-fed operation (at rated output) as: temperature class 130 (B) Used in converter-fed operation (at rated output): temperature class 155 (F) For coolant temperatures of up to 40 °C as standard DURIGNIT IR 2000 insulation system with impregnation by VPI or current-UV technique
Degree of protection according to EN 60034-5 (IEC 60034-5)	Motor series 1LA8 and 1PQ8: IP55 Motor series 1LL8: IP23
Cooling according to EN 60034-6 (IEC 60034-6)	Self-ventilated (motor series 1LA8) Motor frame sizes 315 to 450 (IC 411) Forced-air cooled (motor series 1PQ8) Motor frame sizes 315 to 450 (IC 416) Self-ventilated (motor series 1LL8) Motor frame sizes 315 to 450 (IC 01)
Admissible coolant temperature	See "Coolant temperature and site altitude" in catalog part 0 "Introduction"
Standard voltages according to EN 60038 (IEC 60038)	50 Hz: 400 V, 500 V, 690 V The voltage used can be found in the selection and ordering data for the required motor.
Type of construction according to EN 60034-7 (IEC 60034-7)	<u>Without flange:</u> IM B3 <u>With flange:</u> IM V1 without protective cover, IM V1 with protective cover, IM B35
Frame design	Cast-iron with cast frame feet for IM B3 and IM B35 types of construction
Paint finish Suitability of paint finish for climate group in accordance with IEC 60721, Part 2-1	<u>Standard:</u> Standard paint finish (moderate = expanded) RAL 7030 stone gray
Vibration quantity level according to EN 60034-14 (IEC 60034-14)	Level A (standard- without special vibration requirements) optional: Level B (with special vibration requirements)
Shaft extension according to DIN 748 (IEC 60072)	With featherkey, half-key balancing
Shaft and flange accuracy according to DIN 42955 (IEC 60072-1)	Tolerance N (normal) <u>Optional:</u> Tolerance R (reduced)
Sound pressure level to DIN EN ISO 1680 (tolerance +3 dB)	The sound pressure level is listed in the selection and ordering data for the required motor.
Weights	The weight is listed in the selection and ordering data for the required motor.
Mechanical limit speeds	The limit speed is listed in the selection and ordering data for the required motor.
Packing weights and dimensions	See "Packing weights and packing dimensions" in catalog part 0 "Introduction".
Rating plates	Fixed to the motor (optionally: 1 additional set of rating plates, loose), labeled as standard in English/German, can be supplied in French/Spanish, Italian or Portuguese without additional charge See "Rating plate" in catalog part 0 "Introduction".
Connection and connection boxes	See "Connection, circuit and connection box" in catalog part 0 "Introduction".
Bearing design	See "Bearings" in catalog part 0 "Introduction".
Cantilever forces	See "Admissible cantilever forces" in catalog part 0 "Introduction"
Pulse encoder	See "Special technology" in catalog part 0 "Introduction"
Options	See the selection and ordering data for "Special versions"

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

Technical specifications (continued)

Rating plate

According to DIN EN 60034-1, the approximate overall weight is specified on the rating plate for all motors of frame size 90 and above (from approx. 30 kg).

For all motors, an additional rating plate can be supplied loose, order code **K31**. An extra rating plate for identification codes is also possible, order code **Y82**. In the standard version, the rating plate is available in English and German.

SIEMENS											
15	3-MOT. 1LA8 317-4AB60-Z NoN- R41124661010001/2003 IMB3 Th.CI.155(F)									8	
1	V	Hz	A	kW	cosφ	1/min	I _A /I _N	T _E s	Certif.No	IP	10
4	400 Δ	50	540	315	0.87	1488				55	3
12	690 Y		315								11
7	Rotor SQU.CAGE KL 13 EN/IEC 60034-1									9	
5	Gew/Wt 1.5 t									6	
16	380..420VΔ, 560..530A 660..725V Y, 325..305A 50Hz									13	
17	N _{MAX} =3000 1/MIN									14	
18	S.F. 1.10									15	
MADE IN GERMANY D-90441 Nürnberg										16	
CE										17	

G_D081_EN_00065a

1 Motor type: 3-phase LV motor	9 Motor weight [kg]
2 Type of construction	10 Temperature class
3 Degree of protection	11 Rated speed [rpm]
4 Rated voltage [V] and circuit	12 Rated frequency [Hz]
5 Rated current [A]	13 Power factor [cos φ]
6 Rated output [kW]	14 Maximum speed [rpm]
7 Standards and regulations e.g. explosion-proof motors	15 Motor type
8 Serial number	16 Rotor class
	17 Additional details (optional)
	18 Service factor

Example of rating plate for 1LA8

Converter-fed operation

The motors are equipped with standard rotors and are suitable for mains-fed or converter-fed operation.

All motors can therefore be operated with a converter, in principle. Special measures are necessary in the case of some motors, especially when separately driven fans are used.

All data are applicable for a 50 Hz sinusoidal supply.

Rated voltage

The tolerance for the rated voltage is in accordance with DIN EN 60034-1 in all cases, a rated voltage range is not specified.

Motor protection

A motor protection function can be implemented using the I^2t detection present in the converter software.

If required, more precise motor protection can be afforded by direct temperature measurement using KTY84 sensors, PT 100 resistance thermometers or PTC thermistors in the motor winding. Some converters from Siemens determine the motor temperature using the resistance of the temperature sensor. They can be set to a required temperature for alarm and tripping.

If PT 100 resistance thermometers are ordered for cooling temperature monitoring (order code **A61**) or KTY84 temperature sensors (order code **A23**), the standard thermistors are omitted. A combination of **A12** and **A61** or **A12** and **A23** is possible; additional charge on request.

Insulation

The standard insulation of the motors is designed such that converter-fed operation is possible without limitation at voltages ≤ 500 V. This also applies for operation with a pulse-controlled AC converter with voltage rise times $t_s > 0.1 \mu\text{s}$ at the motor terminals.

All motors with voltage codes 4, 5 and 8 must be operated under these preconditions on a converter.

This does not apply to motors with voltages > 500 up to 690 V, which must have special insulation for operation on a pulse-controlled AC converter (SINAMICS, SIMOVERT MASTERDRIVES) without a converter circuit (du/dt filter or sinusoidal filter), i.e. when 10th position of the Order No. = "M".

For converter-fed operation with the outputs specified in the catalog, the motors are used according to temperature class 155 (F), i.e. in this case neither a service factor > 1 nor an increased coolant temperature is possible (order codes C11, C12 and C13 cannot be ordered).

Motor connection

When connecting the motors, it is important to consider the restrictions for mains-fed machines as well as the maximum conductor cross-sections permitted for the converter.

Ventilation/noise generation

The fan noise can increase at speeds that are higher than the rated speed of self-ventilated motors (this is not the case for forced ventilated motors 1PQ8). To increase motor utilization at low speeds it is recommended that forced ventilated motors are used, e.g. those of series 1PQ8.

In general, for converter-fed operation, the noise level is higher than that specified in the catalog (exception: 1PQ8). The increase depends on the converter type and can lie between 5 and 10 dB(A) depending on the frame size and number of poles for the motor.

Mechanical stress and grease lifetime

When motors are operated at speeds above the rated speed, the running smoothness and the bearings are subjected to greater mechanical stress. This reduces the grease lifetime and the bearing lifetime. More detailed information on request.

Bearings

To prevent damage being caused as a result of bearing currents, insulated bearings are used at the non-drive-end of 1LA8, 1LL8 and 1PQ8 motors for converter-fed operation in the standard version (this can be recognized when 9th position of Order No. = "P").

When operating multiphase induction machines on a converter, an electrical bearing stress results from a capacitive induced voltage via the bearing lubricating film, depending on the principle being used. The physical cause of this is the common-mode voltage at the converter output that is inherent in the control method for a converter: the sum of the three-phase voltages is – in contrast to straightforward mains-fed operation – not equal to zero at every point in time. The high-frequency, pulse-shaped common-mode voltage brings about a residual current, which closes back to the converter's DC link via the machine's internal capacitances, the machine housing and the earthing circuit. The machine's internal capacitances include the main insulation winding capacitance, the geometric capacitance between the rotor and stator, the lubricating film capacitance and the capacitance of any bearing insulation that may be present. The level of the currents due to the internal capacitances is proportional to the gradients, i.e. the voltage variation of the DC voltage ($i_{(t)} = C \cdot du/dt$).

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

Technical specifications (continued)

In order to apply currents to the motor which are sinusoidal as far as possible (smooth running, oscillation torques, stray losses), a high clock frequency is required for the converter's output voltage. The related (very steep) switching edges of the converter output voltage (and also, therefore, of the common-mode voltage) cause correspondingly high capacitive currents and voltages on the machine's internal capacitances.

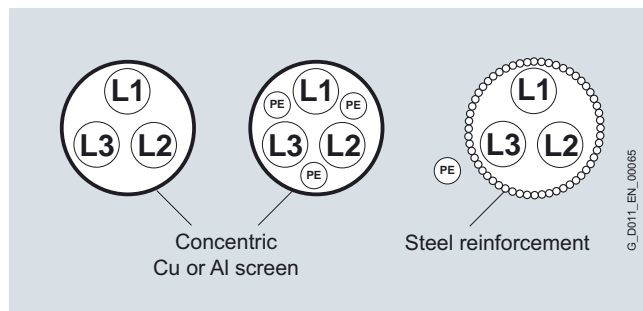
The voltage that is injected capacitively across the bearing can result, in the worst case, in stochastic arcing through the lubrication film of the bearing and prematurely age or damage the bearing. (The current pulses caused by arcing in the lubrication film are known as EDM currents (Electrostatic Discharge Machining) in the technical literature.)

This physical effect, which occurs in isolated cases, has mostly been observed in connection with larger motors.

EMC-compliant installation of the drive system is a basic prerequisite for preventing premature bearing damage as a result of bearing currents.

The most important measures for reducing bearing currents:

- Insulated motor bearings at the non-drive-end NDE (BS) (standard for 1LA8, 1LL8 and 1PQ8 for converter-fed operation)
- Use of cables with a symmetrical cable cross-section:



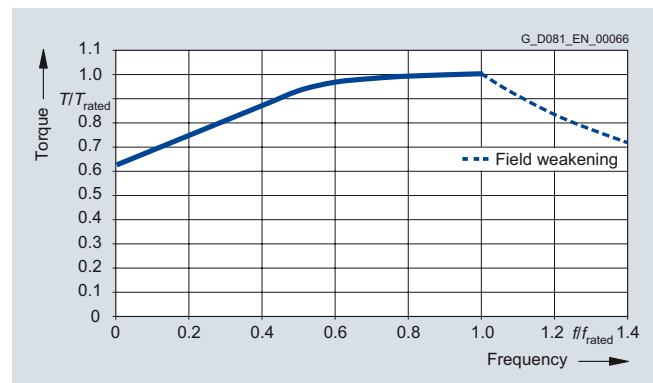
- Preference given to a supply with insulated neutral point (IT system)
- Use of earthing cables with low impedance in a large frequency range (DC up to approximately 70 MHz): for example, plaited copper ribbon cables, HF litz wires
- Separate HF equipotential-bonding cable between motor frame and driven machine
- Separate HF equipotential-bonding cable between motor housing and converter PE busbar
- 360° HF contacting of the cable shield on the motor frame and the converter PE busbar. This can be achieved using EMC screwed glands on the motor end and EMC shield clips on the converter end, for example.
- Using motor reactors at the converter
- Common-mode filters at the converter output

Thermal torque limits

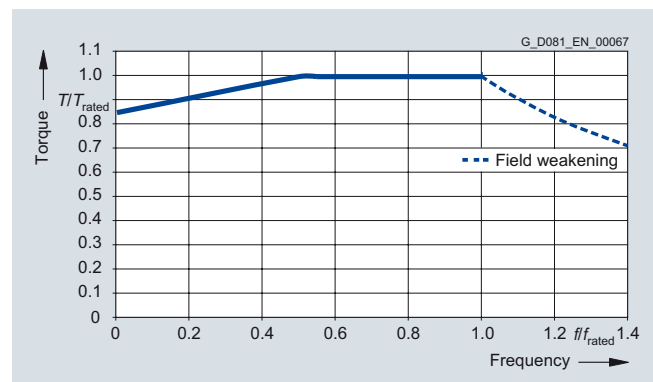
Guide values for the maximum load torques at various speeds can be obtained from the diagrams below.

In the case of self-ventilated motors, such as series 1LA8 and 1LL8, the thermally permissible load torques are reduced for continuous operation for speeds below the rated speed. This must be taken into account in those applications in particular that are not subjected to a load torque that is dependent on the square of the speed. Also in the case of forced-air cooled motors of series 1PQ8, the maximum load torques are reduced slightly for high speed ranges.

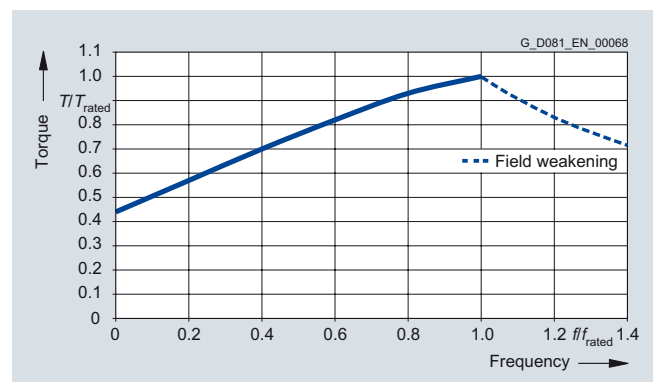
When motors are operated at speeds above their rated speed (operation in the field-weakening range), the maximum load torque is also reduced.



Thermal torque limit characteristic 1LA8



Thermal torque limit characteristic 1PQ8



Thermal torque limit characteristic 1LL8

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

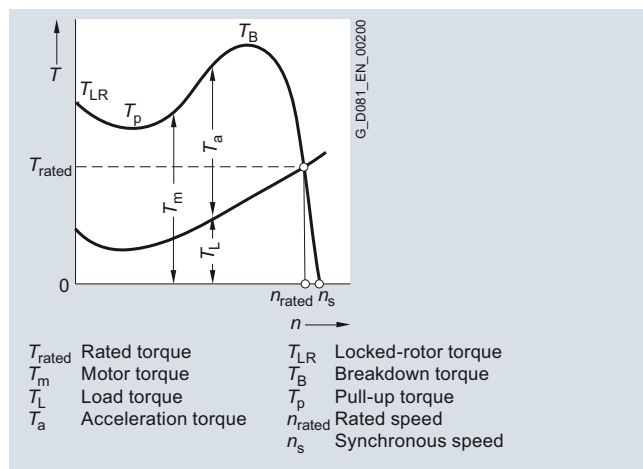
Technical specifications (continued)

Technical explanations regarding torque and determination of the start-up time for mains-fed operation

Torque characteristics – Torque characteristics for special drives

Torque characteristics

The torque generated on the shaft of a three-phase motor in the torque range of $n = 0$ to $n = n_s$ has a very varying magnitude. The characteristic curve of the torque as a function of the speed of a three-phase motor with torque class (CL) of a squirrel-cage rotor shows the following diagram.



The values for locked-rotor torque and breakdown torque as well as for locked-rotor current of a specific motor can be taken from the selection and ordering data.

The limit for the mechanical overload capability is the breakdown torque. According to IEC/EN 60034-1, asynchronous motors at rated voltage and rated frequency must withstand up to 1.6 times the rated torque for 15 s. The pull-up torque of asynchronous motors at rated voltage must - if not specified otherwise - have at least the values stated in the following rated torque.

For three-phase motors without pole-change with a rated output equal to or greater than 100 kW:

0.3 times rated torque and at least 0.5 times locked-rotor torque

According to IEC/EN 60034-1, the following tolerances are permitted:

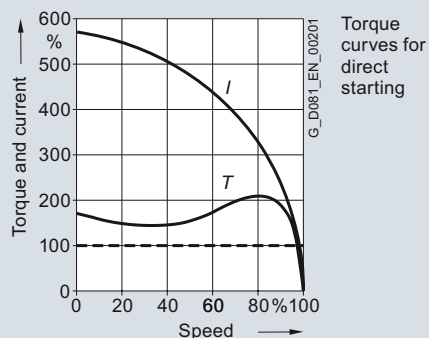
- for the locked-rotor torque of -15 to 25 % of the total locked-rotor torque
- for the locked-rotor current up to 20 % of the stated locked-rotor current without lower limit
- for the breakdown torque up to -10 % of the stated breakdown torque
- for the pull-up torque -15 % of the guaranteed value.

Under observance of these tolerances, the locked-rotor torque must be sufficiently higher than the the break loose torque of the driven machine and the motor torque during start-up up to reaching the operating speed must always be higher than the load torque.

In the case of squirrel-cage motors, the locked-rotor torque and breakdown torque are listed in the selection and ordering data as multiples of the rated torque. The normal practice is to start squirrel-cage motors directly online. The torque class indicates that with direct online starting, even if there is a 5 % undervoltage, it is possible to start up the motor against a load torque of:

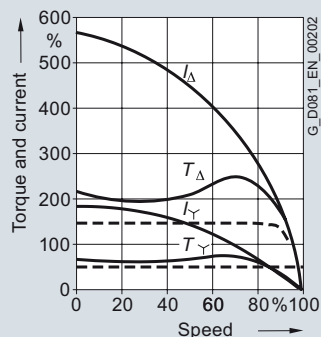
- 130 % (for CL 13),
- 100 % (for CL 10),
- 70 % (for CL 7),
- 50 % (for CL 5)

of the rated torque.



Motors with CL 10 torque class

----- maximum load torque during the starting



Motors with CL 13 torque class

----- maximum load torque during starting

The rated torque can be calculated as follows:

$$T_{rated} = 9.55 \cdot P_{rated} \cdot \frac{1000}{n_{rated}}$$

T_{rated} Rated torque in Nm
 n_{rated} Rated speed in rpm
 P_{rated} Rated output in kW

The rated speed of the motor differentiates itself from the synchronous speed by the slip s_{rated} :

It is:

$$s_{rated} = \frac{n_s - n_{rated}}{n_s} \cdot 100$$

s_{rated} Slip in %
 n_s Synchronous speed in rpm
 n_{rated} Rated speed in rpm

Determination of the start-up time

Calculation of the start-up time for direct online starting

The start-up time from $n = 0$ to $n = n_{op}$ can be approximately determined using the average acceleration torque.

$$t_{st} = \frac{\sum J \cdot n_{op}}{9.55 \cdot T_{aav}}$$

t_{st} Start-up time in s
 J Total moment of inertia in kgm^2
 n_{op} Operating speed in rpm
 T_{aav} Average acceleration torque in Nm

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

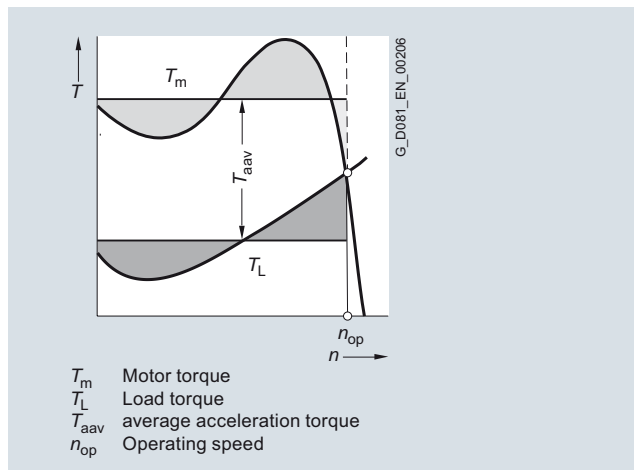
Technical specifications (continued)

The total moment of inertia is made up of the motor moment of inertia plus the moment of inertia of the driven machine and the coupling or pulleys and is converted to the speed of the motor shaft.

Limit values for the start-up curve of three-phase motors with squirrel-cage rotor for voltages up to and including 690 V are defined in EC/EN 60034.

If no sound start-up is possible due to a high moment of inertia and/or a high load torque, a larger motor or a three-phase motor with SINAMICS frequency converter can be selected for N-compact motors.

A mechanical solution for coping with the heavy starting is the employment of a starting coupling, whose application is limited by its capability to absorb heat.



Determination of the average acceleration torque

Start-up for three-phase motors with squirrel-cage rotor

The normal practice is to start squirrel-cage motors directly on-line.

- It must be observed that the torque and speed characteristics for a specific motor are predetermined - independently of the heaviness of the start-up. Star delta start-up must be realized for motors with squirrel-cage rotor if small locked-rotor currents (e.g. in the supply conditions of the electric power company) or a particularly low start-up torque (soft starting) are required. Locked-rotor torque, breakdown torque and all other torque values as well as the locked-rotor current are 25 to 30 % of the values at direct online starting.
- The motor torque must be sufficiently higher than the load torque during the start-up in the Y-stage. The change from star to delta must not occur before approximating the operating speed.

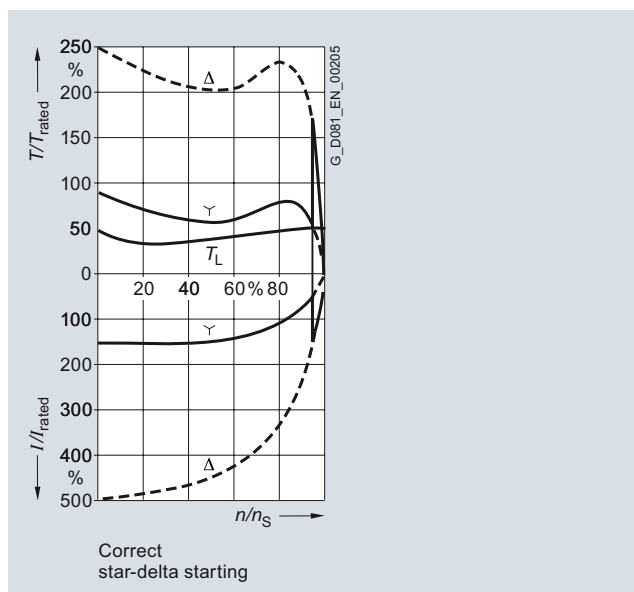
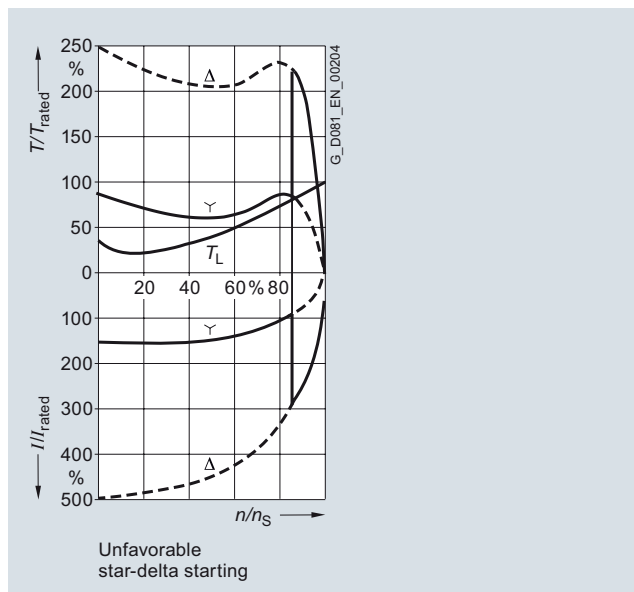
The adjoining diagram shows a case in which the star delta start-up is not appropriate because the too elevated load torque causes the early change which in turn causes a high torque and current surge that renders the star-delta starting ineffective.

The torque characteristics can be approximately reduced by the square of the voltage and the current characteristics linearly with the voltage by reducing the voltage at the motor terminals with the help of a starting transformer or starting resistors.

A starting with rated current is possible on the converter.

Soft starting for motors with squirrel-cage rotor can also be realized using the stator-resistance starting circuit (a resistor is engaged in one phase during the start-up). The locked-rotor torque can be arbitrarily reduced with the help of this circuit. The locked-rotor current without a resistor or reactor is a bit higher in both phases than for direct online starting.

The starting can be facilitated using the electrical motor starter "SIKOSTART", that limits the torque and the current during starting.



IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

Technical specifications (continued)

The following has to be provided in case of requests regarding start-ups:

- 1st Required output and rated speed of the driven machine
- 2nd Planned motor speed
- 3rd Load torque of the driven machine, depending on the speed of the driven machine or the motor speed
- 4th Total external moments of inertia and rated speed of the driven machine or with regard to the motor speed
- 5th Number of starts within a particular time frame and duty cycle or
- 6th Characteristics and number of operating cycles within a particular time frame (method of braking)

Start-up times and moments of inertia for 1LA8 motors for mains-fed operation

Default values

The values in the following table are only valid for 1LA8 motors for mains-fed operation (Pages 3/14 to 3/17) and apply for a continuous heating of 90 % of the rated output at 50 Hz ($0.9 \times P_{\text{rated}}$). The admissible moments of inertia must be reduced again by 20 % at 60 Hz. The moment of inertia J_{adm} in the tables is the moment of inertia which the driven machine is allowed to have as a maximum in order to start the motor. For this purpose has the moment of inertia already been considered in the selection and ordering data, Pages 3/15 to 3/17.

Frame size	Order No.	Locking of brake		Admissible moment of inertia and start-up times when starting the motor			
		cold	warm	1x cold		1x warm	
		Braking time	Braking time	Moment of inertia	Start-up time	Moment of inertia	Start-up time
FS		t_{Br} s	t_{Br} s	J_{adm} kgm ²	t_{st} s	J_{adm} kgm ²	t_{st} s
Self-ventilated motors for mains-fed operation cast-iron series 1LA8 – 2-pole, 3000 rpm at 50 Hz							
315	1LA8 315-2AC□□	18	10	125	33.9	48	13.0
315	1LA8 317-2AC□□	17.5	10	140	33.2	58	13.4
355	1LA8 353-2AC□□	18	9	175	41.4	33	7.8
355	1LA8 355-2AC□□	20	10	190	45.8	40	9.7
355	1LA8 357-2AC□□	15	7.5	180	30.0	40	6.7
400	1LA8 403-2AC□□	22	13	245	40.2	95	15.7
400	1LA8 405-2AC□□	19	11	255	37.2	90	13.1
400	1LA8 407-2AC□□	17	9.5	300	34.9	85	9.9
450	1LA8 453-2AE□□	21.5	15	178	31.3	83	14.6
450	1LA8 455-2AE□□	20.5	14	190	30.2	90	14.3
450	1LA8 457-2AE□□	19	13	200	28.2	95	13.4
Self-ventilated motors for mains-fed operation cast-iron series 1LA8 – 4-pole, 1500 rpm at 50 Hz							
315	1LA8 315-4AB□□	22	13	590	36.9	350	21.9
315	1LA8 317-4AB□□	19	11	730	32.3	425	18.8
355	1LA8 353-4AB□□	20	11	1000	45.7	270	12.4
355	1LA8 355-4AB□□	18	10	1020	39.6	280	10.9
355	1LA8 357-4AB□□	19	10.5	1370	41.9	370	11.3
400	1LA8 403-4AB□□	20.5	11.5	1420	46.2	430	14.0
400	1LA8 405-4AB□□	20	11	1600	44.5	480	13.3
400	1LA8 407-4AB□□	19	10.5	1750	43.6	525	13.1
450	1LA8 453-4CE□□	17.5	10	950	23.7	300	7.5
450	1LA8 455-4AC□□	18.5	10.5	1200	26.8	370	8.3
450	1LA8 457-4AC□□	17	9	1160	22.3	380	7.3

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

Technical specifications (continued)

Frame size	Order No.	Locking of brake		Admissible moment of inertia and start-up times when starting the motor			
		cold	warm	1x cold		1x warm	
		Braking time	Braking time	Moment of inertia	Start-up time	Moment of inertia	Start-up time
FS		t_{Br} s	t_{Br} s	J_{adm} kgm ²	t_{st} s	J_{adm} kgm ²	t_{st} s
Self-ventilated motors for mains-fed operation cast-iron series 1LA8 – 6-pole, 1000 rpm at 50 Hz							
315	1LA8 315-6ABQQ	33	18	1900	57.4	830	25.1
315	1LA8 317-6ABQQ	31	15.5	2300	55.6	1000	24.2
355	1LA8 355-6ABQQ	40	22	2950	62.2	1350	28.5
355	1LA8 357-6ABQQ	40	22	3950	62.5	1800	28.5
400	1LA8 403-6ABQQ	34	18.4	3450	51.1	850	12.6
400	1LA8 405-6ABQQ	32	17.5	3500	43.3	900	11.1
400	1LA8 407-6ABQQ	24	12	2200	25.6	740	8.6
450	1LA8 453-6ABQQ	16	7	1400	15.5	560	6.2
450	1LA8 455-6ABQQ	19	8.5	1700	18.1	670	7.1
450	1LA8 457-6ABQQ	16	7	1800	15.9	720	6.4
Self-ventilated motors for mains-fed operation cast-iron series 1LA8 – 8-pole, 750 rpm at 50 Hz							
315	1LA8 315-8ABQQ	40	22	4800	109.5	1950	44.5
315	1LA8 317-8ABQQ	42	23	6800	125.9	2500	46.3
355	1LA8 355-8ABQQ	41	22.5	6200	89.6	3100	44.8
355	1LA8 357-8ABQQ	40	22	7600	88.7	3800	44.3
400	1LA8 403-8ABQQ	55	30	9700	107.5	4400	48.8
400	1LA8 405-8ABQQ	54	29.5	11000	102.9	5400	50.5
400	1LA8 407-8ABQQ	52	28.5	11200	95.4	5400	46.0
450	1LA8 453-8ABQQ	44	25	9800	78.8	2900	23.3
450	1LA8 455-8ABQQ	42	23	10500	71.4	3000	20.4
450	1LA8 457-8ABQQ	44	25	12400	78.1	3700	23.3

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

Selection and ordering data

Preliminary selection of the motor according to motor type/series, speed or number of poles, frame size, rated output, rated torque, rated speed and rated current

Self-ventilated motors for mains-fed operation (IP55 degree of protection)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Cast-iron series 1LA8						
3000, 2-pole	315 ... 450	250 ... 1000	2979 ... 2986	801 ... 3200	415 ... 1020	3/14 ... 3/15
1500, 4-pole	315 ... 450	250 ... 1000	1488 ... 1492	1600 ... 6400	430 ... 1060	3/14 ... 3/15
1000, 6-pole	315 ... 450	200 ... 800	988 ... 993	1930 ... 7690	345 ... 1100	3/16 ... 3/17
750, 8-pole	315 ... 450	160 ... 630	739 ... 744	2070 ... 8090	295 ... 1160	3/16 ... 3/17

Self-ventilated motors for converter-fed operation (IP55 degree of protection)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Cast-iron series 1LA8 with standard insulation ≤500 V						
3000, 2-pole	315 ... 450	250 ... 1000	2979 ... 2986	801 ... 3200	415 ... 1020	3/18 ... 3/19
1500, 4-pole	315 ... 450	250 ... 1000	1488 ... 1492	1600 ... 6400	430 ... 1060	3/18 ... 3/19
1000, 6-pole	315 ... 450	200 ... 800	988 ... 993	1930 ... 7690	345 ... 1100	3/20 ... 3/21
750, 8-pole	315 ... 450	160 ... 630	739 ... 744	2070 ... 8090	295 ... 1160	3/20 ... 3/21

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 690 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Cast-iron series 1LA8 with special insulation >500 to 690 V						
3000, 2-pole	315 ... 450	240 ... 970	2978 ... 2987	770 ... 3101	730 ... 900	3/22 ... 3/23
1500, 4-pole	315 ... 450	235 ... 980	1485 ... 1492	1511 ... 6273	235 ... 950	3/22 ... 3/23
1000, 6-pole	315 ... 450	190 ... 780	990 ... 993	1833 ... 7502	196 ... 790	3/24 ... 3/25
750, 8-pole	315 ... 450	145 ... 600	740 ... 745	1871 ... 7691	162 ... 660	3/24 ... 3/25

Forced-air cooled motors with mounted separately driven fan for converter-fed operation (IP55 degree of protection)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Cast-iron series 1PQ8 with standard insulation ≤500 V						
3000, 2-pole	315 ... 450	250 ... 1000	2979 ... 2986	801 ... 3200	415 ... 1020	3/26 ... 3/27
1500, 4-pole	315 ... 450	250 ... 1000	1488 ... 1492	1600 ... 6400	430 ... 1060	3/26 ... 3/27
1000, 6-pole	315 ... 450	200 ... 800	988 ... 993	1930 ... 7690	345 ... 1100	3/28 ... 3/29
750, 8-pole	315 ... 450	160 ... 630	739 ... 744	2070 ... 8090	295 ... 1160	3/28 ... 3/29

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 690 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Cast-iron series 1PQ8 with special insulation >500 to 690 V						
3000, 2-pole	315 ... 450	240 ... 970	2978 ... 2987	770 ... 3101	730 ... 900	3/30 ... 3/31
1500, 4-pole	315 ... 450	235 ... 980	1485 ... 1492	1511 ... 6273	235 ... 950	3/30 ... 3/31
1000, 6-pole	315 ... 450	190 ... 780	990 ... 993	1833 ... 7502	196 ... 790	3/32 ... 3/33
750, 8-pole	315 ... 450	145 ... 600	740 ... 745	1871 ... 7691	162 ... 660	3/32 ... 3/33

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

Selection and ordering data (continued)

Self-ventilated motors with through-ventilation for mains-fed operation (IP23 degree of protection)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Cast-iron series 1LL8						
3000, 2-pole	315 ... 450	315 ... 1250	2974 ... 2986	1010 ... 4000	510 ... 1300	3/34 ... 3/35
1500, 4-pole	315 ... 450	315 ... 1250	1483 ... 1490	2030 ... 8010	540 ... 1360	3/34 ... 3/35
1000, 6-pole	315 ... 450	250 ... 1000	988 ... 993	2420 ... 9620	430 ... 1380	3/36 ... 3/37
750, 8-pole	315 ... 450	200 ... 800	738 ... 743	2590 ... 10300	370 ... 1440	3/36 ... 3/37

Self-ventilated motors with through-ventilation for converter-fed operation (IP23 degree of protection)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Cast-iron series 1LL8 with standard insulation ≤500 V						
3000, 2-pole	315 ... 450	315 ... 1250	2974 ... 2986	1010 ... 4000	510 ... 1300	3/38 ... 3/39
1500, 4-pole	315 ... 450	315 ... 1250	1483 ... 1490	2030 ... 8010	540 ... 1360	3/38 ... 3/39
1000, 6-pole	315 ... 450	250 ... 1000	988 ... 993	2420 ... 9620	430 ... 1380	3/40 ... 3/41
750, 8-pole	315 ... 450	200 ... 800	738 ... 743	2590 ... 10300	370 ... 1440	3/40 ... 3/41

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 690 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Cast-iron series 1LL8 with special insulation >500 to 690 V						
3000, 2-pole	315 ... 450	300 ... 1210	2977 ... 2988	962 ... 3871	290 ... 800	3/42 ... 3/43
1500, 4-pole	315 ... 450	295 ... 1225	1485 ... 1493	1897 ... 7846	300 ... 880	3/42 ... 3/43
1000, 6-pole	315 ... 450	235 ... 975	990 ... 994	2267 ... 9377	240 ... 850	3/44 ... 3/45
750, 8-pole	315 ... 450	180 ... 760	738 ... 742	2329 ... 9782	198 ... 800	3/44 ... 3/45

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

More information

Standardline

4-pole 1LA8 motors are available with a reduced range of options up to an output of 500 kW in the *Standardline*.

The benefit to the customer:

- Much shorter delivery time
- Products in the *Standardline* can be configured with a variety of options so as to ensure a high degree of flexibility.

Application:

Standardline low-voltage motors are optimised for applications in pump, fan and compressor drives.

For the low-voltage motors, this is particularly true for complete, coordinated drive systems comprising the motor and a SINAMICS G150 frequency converter.

Standardline motors can be ordered with the order code **B20**.

Scope of the *Standardline*:

- 4-pole version
- Power range 250 to 500 kW
- Types 1LA8 315, 1LA8 317, 1LA8 353, 1LA8 355 and 1LA8 357
- Type of construction code **0** (IM B3)
- For mains-fed operation: Voltage code **6** (400 V Δ /690 VY) or **5** (500 V Δ)
- For converter-fed operation: Voltage code **4** (400 V Δ), **8** (400 V Δ /690 VY) or **5** (500 V Δ)
- Can be ordered for converter-fed operation, but not in the 690 V version
- Possible order codes: **A23, A61, A72, G50, H70, H73, K09, K10, K45, K46, K57, K83, K84, K85, L00, L97, M58** (only frame size 315), **M88** and **Y53**

For more information, see Catalog D 86.1 *Standardline*.

For more information, please contact your local Siemens contact – see “Siemens contacts worldwide” in the Appendix.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for mains-fed operation
Cast-iron series 1LA8

Selection and ordering data

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight of IM B3 type of construction, approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V				For Order No. supplements for voltage and type of construction, see table below
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	I_{rated} A		m kg	
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP55 degree of protection												
250	280	315	2979	801	96.2	96.2	0.90	415	240	1LA8 315-2AC□□	1300	
315	353	315	2979	1010	96.5	96.5	0.91	520	300	1LA8 317-2AC□□	1500	
355	398	355	2980	1140	96.5	96.5	0.90	590	340	1LA8 353-2AC□□	1900	
400	448	355	2980	1280	96.7	96.7	0.91	660	380	1LA8 355-2AC□□	2000	
500	560	355	2982	1600	97.1	97.1	0.91	820	475	1LA8 357-2AC□□	2200	
560	616	400	2985	1790	97.1	97.1	0.91	910	530	1LA8 403-2AC□□	2800	
630	693	400	2985	2020	97.1	97.1	0.91	1020	600	1LA8 405-2AC□□	3000	
710	781	400	2985	2270	97.3	97.3	0.91	–	670 ¹⁾	1LA8 407-2AC□□	3200	
800	–	450	2986	2560	97.2	97.2	0.91	–	760	1LA8 453-2AE□□	4000	
900	–	450	2986	2880	97.3	97.3	0.92	–	840	1LA8 455-2AE□□	4200	
1000	–	450	2986	3200	97.4	97.4	0.93	–	920	1LA8 457-2AE□□	4400	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP55 degree of protection												
250	288	315	1488	1600	96.0	96.0	0.87	430	250 ²⁾	1LA8 315-4AB□□	1300	
315	362	315	1488	2020	96.2	96.2	0.87	540	315 ²⁾	1LA8 317-4AB□□	1500	
355	408	355	1488	2280	96.3	96.3	0.87	610	355 ²⁾	1LA8 353-4AB□□	1900	
400	460	355	1488	2570	96.4	96.4	0.87	690	400 ²⁾	1LA8 355-4AB□□	2000	
500	575	355	1488	3210	96.7	96.7	0.88	850	490 ²⁾	1LA8 357-4AB□□	2200	
560	644	400	1492	3580	96.7	96.7	0.88	950	550	1LA8 403-4AB□□	2800	
630	725	400	1492	4030	96.9	96.9	0.88	1060	620	1LA8 405-4AB□□	3000	
710	817	400	1492	4540	97.0	97.0	0.89	–	690 ¹⁾	1LA8 407-4AB□□	3200	
800	920	450	1492	5120	97.0	97.0	0.88	–	780 ¹⁾	1LA8 453-4AC□□	4000	
900	1040	450	1492	5760	97.1	97.1	0.88	–	880	1LA8 455-4AC□□	4200	
1000	1150	450	1492	6400	97.1	97.1	0.89	–	970	1LA8 457-4AC□□	4400	

Up to frame size 355, a service factor of 1.1 is stamped, above this 1.05.

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ/690 VY	500 VΔ	690 VΔ	60 Hz 460 VΔ (for rated output at 60 Hz, see above)	Without flange IM B3	With flange IM V1 without protective cover ³⁾	IM V1 with protective cover ⁴⁾	IM B35
	6	5	0	9 L2F	0	8	4	6
1LA8 315-... □□ to 1LA8 405-... □□	□	○	– ⁵⁾	○	□	✓ ⁶⁾	✓ ⁶⁾	✓
1LA8 407-... □□ to 1LA8 457-... □□	–	○	□	O. R.	□	✓ ⁶⁾	✓ ⁶⁾	✓ ⁷⁾

- Standard version
- Without additional charge
- ✓ With additional charge
- O. R. Possible on request
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ Can also be supplied for 400 VΔ 50 Hz with voltage code “9” and order code **L1Y** (specify output, voltage and frequency).

²⁾ **Standardline** for 1LA8 motors is a standardized range in specific versions which can be ordered with the order code **B20**. The delivery time is 4 weeks. Scope of the **Standardline**: 4-pole, types **1LA8 315**, **1LA8 317**, **1LA8 353**, **1LA8 355**, type of construction code **0** (IM B3), voltage code **6** (400 VΔ/690 VY) or **5** (500 VΔ); can be ordered for converter-fed operation, but not in 690 V version; possible order codes: **A23**, **A61**, **A72**, **G50**, **H70**, **H73**, **K09**, **K10**, **K45**, **K46**, **K57**, **K83**, **K84**, **K85**, **L00**, **L97**, **M58** (for frame size 315 only), **M88**, **Y53**.

³⁾ For explosion-proof motors, the type of construction IM V1 without protective cover is not possible.

⁴⁾ The “Second shaft extension” option, order code **K16** is not possible.

⁵⁾ As special version with voltage code “9” and order code **L1Y** (specify output, voltage and frequency).

⁶⁾ For 2-pole motors 60 Hz version, not possible for 1LA8 353 to 1LA8 457.

⁷⁾ For 2-pole motors 60 Hz version, not possible for 1LA8 453 to 1LA8 457.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for mains-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output		Mech. limit speed ¹⁾	Parallel feeders required		
	At 50 Hz and for direct online starting as multiple of rated torque					Measuring surface sound pressure level at 50 Hz	Sound power level at 50 Hz		400 V	500 V	690 V
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pFA} dB(A)	L_{WA} dB(A)	$n_{max.}$ rpm			
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP55 degree of protection											
1LA8 315-2AC□□	1.8	7.0	2.8	10	2.7	82 (75) ²⁾	97 (90) ²⁾	3600			Yes
1LA8 317-2AC□□	1.8	7.0	2.8	10	3.3	82 (75) ²⁾	97 (90) ²⁾	3600			Yes
1LA8 353-2AC□□	1.7	6.5	2.5	10	4.8	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	Yes	Yes	
1LA8 355-2AC□□	1.7	6.5	2.5	10	5.3	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	Yes	Yes	
1LA8 357-2AC□□	1.8	6.5	2.6	10	6.4	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	Yes		
1LA8 403-2AC□□	1.6	7.0	2.8	10	8.6	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	Yes		
1LA8 405-2AC□□	1.6	7.0	2.8	10	9.6	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	Yes	Yes	
1LA8 407-2AC□□	1.7	7.0	2.8	10	11	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	Yes	Yes	
1LA8 453-2AE□□	0.9	7.0	3.0	5	19	81 ³⁾	96 ³⁾	3000			Yes
1LA8 455-2AE□□	0.9	7.0	2.8	5	21	81 ³⁾	96 ³⁾	3000			Yes Yes
1LA8 457-2AE□□	0.9	7.0	2.7	5	23	81 ³⁾	96 ³⁾	3000			Yes Yes
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP55 degree of protection											
1LA8 315-4AB□□	1.9	6.5	2.8	13	3.6	73	87	3000 (2650)			Yes
1LA8 317-4AB□□	2.0	6.8	2.8	13	4.4	73	87	3000 (2650)			Yes
1LA8 353-4AB□□	2.1	6.5	2.6	13	6.1	75	90	2500 (2350)	Yes	Yes	
1LA8 355-4AB□□	2.1	6.5	2.6	13	6.8	75	90	2500 (2350)	Yes	Yes	
1LA8 357-4AB□□	2.1	6.5	2.4	13	8.5	75	90	2500 (2350)	Yes		
1LA8 403-4AB□□	1.9	6.5	2.7	13	13	78	93	2200 (2100)/2100 ⁴⁾	Yes		
1LA8 405-4AB□□	1.9	6.8	2.7	13	14	78	93	2200 (2100)/2100 ⁴⁾	Yes	Yes	
1LA8 407-4AB□□	1.9	6.8	2.7	13	16	78	93	2200 (2100)/2100 ⁴⁾	Yes	Yes	
1LA8 453-4AC□□	1.6	7.0	2.6	10	23	81	96	2100 (1900)/1800 ⁴⁾	Yes		
1LA8 455-4AC□□	1.6	7.0	2.6	10	26	81	96	2100 (1900)/1800 ⁴⁾	Yes	Yes	
1LA8 457-4AC□□	1.7	7.0	2.6	10	28	81	96	2100 (1900)/1800 ⁴⁾	Yes	Yes	

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ Limit speeds for reinforced bearings (order code **K20**) for 4-pole motors on request.
²⁾ Low-noise version, 2-pole, in brackets. To reduce noise, 2-pole motors can be equipped with an axial fan that is only suitable for one direction of rotation. Clockwise rotation order code **K37**, counter-clockwise rotation **K38**.

³⁾ In the standard version, the motors already have an axial fan for clockwise rotation. Order code **K37** is not necessary. For counter-clockwise rotation, order code **K38** is necessary.

⁴⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for mains-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight of IM B3 type of construction, approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	$\cos\phi_{rated}$	I_{rated}							$I_{rated}$
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %		A	A					
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP55 degree of protection														
200	230	315	988	1930	95.7	95.8	0.86	345	200		1LA8 315-6AB□□		1300	
250	288	315	988	2410	95.9	96.0	0.86	430	250		1LA8 317-6AB□□		1500	
315	362	355	993	3040	96.2	96.2	0.86	540	315		1LA8 355-6AB□□		2000	
400	460	355	993	3850	96.5	96.5	0.86	690	400		1LA8 357-6AB□□		2200	
450	518	400	991	4330	96.5	96.5	0.86	780	455		1LA8 403-6AB□□		2800	
500	575	400	991	4810	96.5	96.5	0.86	860	500		1LA8 405-6AB□□		3000	
560	644	400	991	5390	96.7	96.7	0.86	960	560		1LA8 407-6AB□□		3200	
630	725	450	993	6060	96.8	96.8	0.86	1100	630		1LA8 453-6AB□□		4000	
710	817	450	993	6830	96.8	96.8	0.86	–	710 ¹⁾		1LA8 455-6AB□□		4200	
800	920	450	993	7690	97.0	97.1	0.86	–	790		1LA8 457-6AB□□		4500	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP55 degree of protection														
160	184	315	739	2070	94.9	94.9	0.82	295	172		1LA8 315-8AB□□		1300	
200	230	315	739	2580	95.2	95.2	0.82	370	215		1LA8 317-8AB□□		1500	
250	288	355	741	3220	95.7	95.7	0.82	460	265		1LA8 355-8AB□□		2000	
315	362	355	741	4060	96.0	96.0	0.82	580	335		1LA8 357-8AB□□		2200	
355	408	400	742	4570	96.1	96.1	0.82	650	375		1LA8 403-8AB□□		2800	
400	460	400	742	5150	96.2	96.2	0.82	730	425		1LA8 405-8AB□□		3000	
450	518	400	742	5790	96.3	96.3	0.82	820	475		1LA8 407-8AB□□		3200	
500	575	450	744	6420	96.4	96.4	0.81	920	540		1LA8 453-8AB□□		4000	
560	644	450	744	7190	96.5	96.5	0.81	1040	600		1LA8 455-8AB□□		4200	
630	725	450	744	8090	96.6	96.6	0.81	1160	670		1LA8 457-8AB□□		4500	

Up to frame size 355, a service factor of 1.1 is stamped, above this 1.05.

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ/690 VY	500 VΔ	690 VΔ	60 Hz 460 VΔ (for rated output at 60 Hz, see above)	Without flange IM B3	With flange IM V1 without protective cover ²⁾	IM V1 with protective cover ³⁾	IM B35
	6	5	0	9 L2F	0	8	4	6
6-pole								
1LA8 315-...□□ to 1LA8 453-...□□	□	○	– ⁴⁾	○	□	✓	✓	✓
1LA8 455-...□□ to 1LA8 457-...□□	–	○	□	O. R.	□	✓	✓	✓
8-pole								
1LA8 315-...□□ to 1LA8 457-...□□	□	○	– ⁴⁾	○	□	✓	✓	✓

- Standard version
- Without additional charge
- ✓ With additional charge
- O. R. Possible on request
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ Can also be supplied for 400 VΔ 50 Hz with voltage code "9" and order code **L1Y** (specify output, voltage and frequency).
²⁾ For explosion-proof motors, the type of construction IM V1 without protective cover is not possible.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.
⁴⁾ As special version with voltage code "9" and order code **L1Y** (specify output, voltage and frequency).

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for mains-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output		Mech. limit speed ¹⁾	Parallel feeders required		
	At 50 Hz and for direct online starting as multiple of rated torque					Measuring surface sound pressure level at 50 Hz	Sound power level at 50 Hz		400 V	500 V	690 V
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pFA} dB(A)	L_{WA} dB(A)	$n_{max.}$ rpm			
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP55 degree of protection											
1LA8 315-6AB□□	2.0	6.3	2.5	13	6.0	68	82	2950 (2350)			
1LA8 317-6AB□□	2.0	6.3	2.5	13	7.3	68	82	2950 (2350)	Yes		
1LA8 355-6AB□□	2.2	6.5	2.8	13	13	71	86	2500 (2100)	Yes		
1LA8 357-6AB□□	2.2	6.5	2.8	13	16	71	86	2500 (2100)	Yes	Yes	Yes
1LA8 403-6AB□□	2.2	6.5	2.8	13	21	73	88	2200 (1900)/2100 ²⁾			
1LA8 405-6AB□□	2.3	6.5	2.8	13	24	73	88	2200 (1900)/2100 ²⁾	Yes		
1LA8 407-6AB□□	2.3	6.5	2.8	13	27	73	88	2200 (1900)/2100 ²⁾	Yes		
1LA8 453-6AB□□	2.0	6.5	2.6	13	35	75	90	2100 (1700)/1800 ²⁾	Yes	Yes	
1LA8 455-6AB□□	2.0	6.5	2.5	13	39	75	90	2100 (1700)/1800 ²⁾	Yes	Yes	
1LA8 457-6AB□□	2.0	6.5	2.5	13	44	75	90	2100 (1700)/1800 ²⁾	Yes	Yes	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP55 degree of protection											
1LA8 315-8AB□□	2.1	6.0	2.3	13	6.0	65	79	2950 (2350)			
1LA8 317-8AB□□	2.1	6.0	2.3	13	7.3	65	79	2950 (2350)			
1LA8 355-8AB□□	2.1	6.1	2.4	13	13	67	82	2500 (2100)			
1LA8 357-8AB□□	2.1	6.1	2.4	13	16	67	82	2500 (2100)	Yes		
1LA8 403-8AB□□	2.0	6.5	2.6	13	21	69	84	2200 (1900)/2100 ²⁾			
1LA8 405-8AB□□	2.1	6.5	2.6	13	24	69	84	2200 (1900)/2100 ²⁾			
1LA8 407-8AB□□	2.1	6.5	2.6	13	27	69	84	2200 (1900)/2100 ²⁾	Yes		
1LA8 453-8AB□□	2.0	6.6	2.4	13	35	71	86	2100 (1700)/1800 ²⁾	Yes		
1LA8 455-8AB□□	2.0	6.6	2.4	13	39	71	86	2100 (1700)/1800 ²⁾	Yes	Yes	
1LA8 457-8AB□□	2.0	6.6	2.4	13	44	71	86	2100 (1700)/1800 ²⁾	Yes	Yes	

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ Limit speeds for reinforced bearings (order code **K20**) for 6- and 8-pole motors on request.

²⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for converter-fed operation
Cast-iron series 1LA8

Selection and ordering data

Rated output at		Frame size	Operating values at rated output and sinusoidal supply							Order No.	Price	Weight of IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below	m kg	
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V												
250	280	315	2979	801	96.2	96.2	0.90	415	240	1LA8 315-2PC□□	1300	
315	353	315	2979	1010	96.5	96.5	0.91	520	300	1LA8 317-2PC□□	1500	
355	398	355	2980	1140	96.5	96.5	0.90	590	340	1LA8 353-2PC□□	1900	
400	448	355	2980	1280	96.7	96.7	0.91	660	380	1LA8 355-2PC□□	2000	
500	560	355	2982	1600	97.1	97.1	0.91	820	475	1LA8 357-2PC□□	2200	
560	616	400	2985	1790	97.1	97.1	0.91	910	530	1LA8 403-2PC□□	2800	
630	693	400	2985	2020	97.1	97.1	0.91	1020	600	1LA8 405-2PC□□	3000	
710	781	400	2985	2270	97.3	97.3	0.91	–	670 ¹⁾	1LA8 407-2PC□□	3200	
800	–	450	2986	2560	97.2	97.2	0.91	–	760	1LA8 453-2PE□□	4000	
900	–	450	2986	2880	97.3	97.3	0.92	–	840	1LA8 455-2PE□□	4200	
1000	–	450	2986	3200	97.4	97.4	0.93	–	920	1LA8 457-2PE□□	4400	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V												
250	288	315	1488	1600	96.0	96.0	0.87	430	250 ²⁾	1LA8 315-4PB□□	1300	
315	362	315	1488	2020	96.2	96.2	0.87	540	315 ²⁾	1LA8 317-4PB□□	1500	
355	408	355	1488	2280	96.3	96.3	0.87	610	355 ²⁾	1LA8 353-4PB□□	1900	
400	460	355	1488	2570	96.4	96.4	0.87	690	400 ²⁾	1LA8 355-4PB□□	2000	
500	575	355	1488	3210	96.7	96.7	0.88	850	490 ²⁾	1LA8 357-4PB□□	2200	
560	644	400	1492	3580	96.7	96.7	0.88	950	550	1LA8 403-4PB□□	2800	
630	725	400	1492	4030	96.9	96.9	0.88	1060	620	1LA8 405-4PB□□	3000	
710	817	400	1492	4540	97.0	97.0	0.89	–	690 ¹⁾	1LA8 407-4PB□□	3200	
800	920	450	1492	5120	97.0	97.0	0.88	–	780 ¹⁾	1LA8 453-4PC□□	4000	
900	1040	450	1492	5760	97.1	97.1	0.88	–	880	1LA8 455-4PC□□	4200	
1000	1150	450	1492	6400	97.1	97.1	0.89	–	970	1LA8 457-4PC□□	4400	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ	400 VΔ/690 VY ³⁾	500 VΔ	690 VΔ ³⁾	Without flange IM B3	With flange IM V1 without protective cover ⁴⁾	IM V1 with protective cover ⁵⁾	IM B35
	4	8	5	7	0	8	4	6
1LA8 315-... □□ to 1LA8 405-... □□	○	□	○	–	□	✓ ⁶⁾	✓ ⁶⁾	✓
1LA8 407-... □□ to 1LA8 457-... □□	–	–	○	□	□	✓ ⁶⁾	✓ ⁶⁾	✓ ⁷⁾

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ Can also be supplied for 400 VΔ 50 Hz with voltage code "9" and order code **L1Y** (specify output, voltage and frequency).
²⁾ **Standardline** for 1LA8 motors is a standardized range in specific versions which can be ordered with the order code **B20**. The delivery time is 4 weeks. Scope of the **Standardline**: 4-pole, types **1LA8 315**, **1LA8 317**, **1LA8 353**, **1LA8 355**, type of construction code **0** (IM B3), voltage code **4** (400 VΔ), **8** (400 VΔ/690 VY) or **5** (500 VΔ); can be ordered for converter-fed operation, but not in 690 V version. Possible order codes: **A23**, **A61**, **A72**, **G50**, **H70**, **H73**, **K09**, **K10**, **K45**, **K46**, **K57**, **K83**, **K84**, **K85**, **L00**, **L97**, **M58** (for frame size 315 only), **M88**, **Y53**.

³⁾ Motors with standard insulation can only be operated with converter circuit (du/dt or sinusoidal filter).
⁴⁾ For explosion-proof motors, the type of construction IM V1 without protective cover is not possible.
⁵⁾ The "Second shaft extension" option, order code **K16** is not possible.
⁶⁾ In 2-pole motors 60 Hz version, not possible for 1LA8 353 to 1LA8 457.
⁷⁾ In 2-pole motors 60 Hz version, not possible for 1LA8 453 to 1LA8 457.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for converter-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Order No.	At 50 Hz as multiple of rated torque	Torque class	Moment of inertia	Noise	Sound power level	Mech. limit speed ¹⁾		Parallel feeders required		
	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz For rated output and sinusoidal supply, 50 Hz, tolerance +3 dB(A) L_{pFA} dB(A)	at 50 Hz L_{WA} dB(A)	n_{max} rpm	f_{max} Hz	400 V	500 V	690 V
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V										
1LA8 315-2PC□□	2.8	10	2.7	82 (75) ²⁾	97 (90) ²⁾	3600	60	Yes		
1LA8 317-2PC□□	2.8	10	3.3	82 (75) ²⁾	97 (90) ²⁾	3600	60	Yes		
1LA8 353-2PC□□	2.5	10	4.8	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes	Yes	
1LA8 355-2PC□□	2.5	10	5.3	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes	Yes	
1LA8 357-2PC□□	2.6	10	6.4	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes		
1LA8 403-2PC□□	2.8	10	8.6	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes		
1LA8 405-2PC□□	2.8	10	9.6	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes	Yes	
1LA8 407-2PC□□	2.8	10	11	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes		
1LA8 453-2PE□□	3.0	5	19	81 ³⁾	96 ³⁾	3000	50	Yes		
1LA8 455-2PE□□	2.8	5	21	81 ³⁾	96 ³⁾	3000	50	Yes	Yes	
1LA8 457-2PE□□	2.7	5	23	81 ³⁾	96 ³⁾	3000	50	Yes	Yes	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V										
1LA8 315-4PB□□	2.8	13	3.6	73	87	3000 (2650)	100 (88)	Yes		
1LA8 317-4PB□□	2.8	13	4.4	73	87	3000 (2650)	100 (88)	Yes		
1LA8 353-4PB□□	2.6	13	6.1	75	90	2500 (2350)	83 (78)	Yes	Yes	
1LA8 355-4PB□□	2.6	13	6.8	75	90	2500 (2350)	83 (78)	Yes	Yes	
1LA8 357-4PB□□	2.4	13	8.5	75	90	2500 (2350)	83 (78)	Yes		
1LA8 403-4PB□□	2.7	13	13	78	93	2200 (2100)/2100 ⁴⁾	73 (70)/70 ⁴⁾	Yes		
1LA8 405-4PB□□	2.7	13	14	78	93	2200 (2100)/2100 ⁴⁾	73 (70)/70 ⁴⁾	Yes	Yes	
1LA8 407-4PB□□	2.7	13	16	78	93	2200 (2100)/2100 ⁴⁾	73 (70)/70 ⁴⁾	Yes		
1LA8 453-4PC□□	2.6	10	23	81	96	2100 (1900)/1800 ⁴⁾	70 (63)/60 ⁴⁾	Yes		
1LA8 455-4PC□□	2.6	10	26	81	96	2100 (1900)/1800 ⁴⁾	70 (63)/60 ⁴⁾	Yes	Yes	
1LA8 457-4PC□□	2.6	10	28	81	96	2100 (1900)/1800 ⁴⁾	70 (63)/60 ⁴⁾	Yes	Yes	

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ Limit speeds for reinforced bearings (order code **K20**) for 4-pole motors on request.

²⁾ Low-noise version, 2-pole, in brackets. To reduce noise, 2-pole motors can be equipped with an axial fan that is only suitable for one direction of rotation. Clockwise rotation order code **K37**, counter-clockwise rotation **K38**.

³⁾ In the standard version, the motors already have an axial fan for clockwise rotation. Order code **K37** is not necessary. For counter-clockwise rotation, order code **K38** is necessary.

⁴⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for converter-fed operation Cast-iron series 1LA8

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output and sinusoidal supply							Order No.	Price	Weight of IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below	m kg	
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V												
200	230	315	988	1930	95.7	95.8	0.86	345	200	1LA8 315-6PBQQ	1300	
250	288	315	988	2410	95.9	96.0	0.86	430	250	1LA8 317-6PBQQ	1500	
315	362	355	993	3040	96.2	96.2	0.86	540	315	1LA8 355-6PBQQ	2000	
400	460	355	993	3850	96.5	96.5	0.86	690	400	1LA8 357-6PBQQ	2200	
450	518	400	991	4330	96.5	96.5	0.86	780	455	1LA8 403-6PBQQ	2800	
500	575	400	991	4810	96.5	96.5	0.86	860	500	1LA8 405-6PBQQ	3000	
560	644	400	991	5390	96.7	96.7	0.86	960	560	1LA8 407-6PBQQ	3200	
630	725	450	993	6060	96.8	96.8	0.86	1100	630	1LA8 453-6PBQQ	4000	
710	817	450	993	6830	96.8	96.8	0.86	–	710 ¹⁾	1LA8 455-6PBQQ	4200	
800	920	450	993	7690	97.0	97.1	0.86	–	790 ¹⁾	1LA8 457-6PBQQ	4500	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V												
160	184	315	739	2070	94.9	94.9	0.82	295	172	1LA8 315-8PBQQ	1300	
200	230	315	739	2580	95.2	95.2	0.82	370	215	1LA8 317-8PBQQ	1500	
250	288	355	741	3220	95.7	95.7	0.82	460	265	1LA8 355-8PBQQ	2000	
315	362	355	741	4060	96.0	96.0	0.82	580	335	1LA8 357-8PBQQ	2200	
355	408	400	742	4570	96.1	96.1	0.82	650	375	1LA8 403-8PBQQ	2800	
400	460	400	742	5150	96.2	96.2	0.82	730	425	1LA8 405-8PBQQ	3000	
450	518	400	742	5790	96.3	96.3	0.82	820	475	1LA8 407-8PBQQ	3200	
500	575	450	744	6420	96.4	96.4	0.81	920	540	1LA8 453-8PBQQ	4000	
560	644	450	744	7190	96.5	96.5	0.81	1040	600	1LA8 455-8PBQQ	4200	
630	725	450	744	8090	96.6	96.6	0.81	1160	670	1LA8 457-8PBQQ	4500	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VA	400 VA/690 VY ²⁾	500 VA	690 VA ²⁾	Without flange IM B3	With flange IM V1 without protective cover ³⁾	IM V1 with protective cover ⁴⁾	IM B35
	4	8	5	7	0	8	4	6
6-pole								
1LA8 315-... QQ to 1LA8 453-... QQ	○	□	○	–	□	✓	✓	✓
1LA8 455-... QQ to 1LA8 457-... QQ	–	–	○	□	□	✓	✓	✓
8-pole								
1LA8 315-... QQ to 1LA8 457-... QQ	○	□	○	– ⁵⁾	□	✓	✓	✓

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ Can also be supplied for 400 VA 50 Hz with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).
²⁾ Motors with standard insulation can only be operated with converter circuit (du/dt or sinusoidal filter).

³⁾ For explosion-proof motors, the type of construction IM V1 without protective cover is not possible.
⁴⁾ The "Second shaft extension" option, order code **K16** is not possible.
⁵⁾ As special version with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for converter-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Order No.	At 50 Hz as multiple of rated torque	Torque class	Moment of inertia	Noise		Mech. limit speed ¹⁾		Parallel feeders required		
				Measuring surface sound pressure level at 50 Hz For rated output and sinusoidal supply, 50 Hz, tolerance +3 dB(A)	Sound power level at 50 Hz	n_{max} rpm	f_{max} Hz	400 V	500 V	690 V
	T_B/T_{rated}	CL	J kgm ²	L_{pFA} dB(A)	L_{WA} dB(A)					
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V										
1LA8 315-6PB□□	2.5	13	6.0	68	82	2950 (2350)	147 (117)			
1LA8 317-6PB□□	2.5	13	7.3	68	82	2950 (2350)	147 (117)	Yes		
1LA8 355-6PB□□	2.8	13	13	71	86	2500 (2100)	125 (105)	Yes		
1LA8 357-6PB□□	2.8	13	16	71	86	2500 (2100)	125 (105)	Yes	Yes	
1LA8 403-6PB□□	2.8	13	21	73	88	2200 (1900)/2100 ²⁾	110 (95)/105 ²⁾			
1LA8 405-6PB□□	2.8	13	24	73	88	2200 (1900)/2100 ²⁾	110 (95)/105 ²⁾	Yes		
1LA8 407-6PB□□	2.8	13	27	73	88	2200 (1900)/2100 ²⁾	110 (95)/105 ²⁾	Yes		
1LA8 453-6PB□□	2.6	13	35	75	90	2100 (1700)/1800 ²⁾	105 (85)/90 ²⁾	Yes	Yes	
1LA8 455-6PB□□	2.5	13	39	75	90	2100 (1700)/1800 ²⁾	105 (85)/90 ²⁾			Yes
1LA8 457-6PB□□	2.5	13	44	75	90	2100 (1700)/1800 ²⁾	105 (85)/90 ²⁾	Yes		Yes
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V										
1LA8 315-8PB□□	2.3	13	6.0	65	79	2950 (2350)	196 (156)			
1LA8 317-8PB□□	2.3	13	7.3	65	79	2950 (2350)	196 (156)			
1LA8 355-8PB□□	2.4	13	13	67	82	2500 (2100)	166 (140)			
1LA8 357-8PB□□	2.4	13	16	67	82	2500 (2100)	166 (140)	Yes		
1LA8 403-8PB□□	2.6	13	21	69	84	2200 (1900)/2100 ²⁾	146 (126)/140 ²⁾			
1LA8 405-8PB□□	2.6	13	24	69	84	2200 (1900)/2100 ²⁾	146 (126)/140 ²⁾			
1LA8 407-8PB□□	2.6	13	27	69	84	2200 (1900)/2100 ²⁾	146 (126)/140 ²⁾	Yes		
1LA8 453-8PB□□	2.4	13	35	71	86	2100 (1700)/1800 ²⁾	140 (113)/120 ²⁾	Yes		
1LA8 455-8PB□□	2.4	13	39	71	86	2100 (1700)/1800 ²⁾	140 (113)/120 ²⁾	Yes	Yes	
1LA8 457-8PB□□	2.4	13	44	71	86	2100 (1700)/1800 ²⁾	140 (113)/120 ²⁾	Yes	Yes	Yes

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ Limit speeds for reinforced bearings (order code **K20**) for 6- and 8-pole motors on request.

²⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for converter-fed operation Cast-iron series 1LA8

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output and sinusoidal supply						Order No.	Price	Weight of IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 690 V			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A		m kg	
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V											
240	270	315	2978	770	96.0	96.0	0.90	230	1LA8 315-2PM8□	1300	
300	335	315	2978	962	96.4	96.4	0.91	285	1LA8 317-2PM8□	1500	
345	385	355	2981	1105	96.4	96.4	0.90	335	1LA8 353-2PM8□	1900	
390	435	355	2981	1249	96.6	96.6	0.91	370	1LA8 355-2PM8□	2000	
485	545	355	2982	1553	97.0	97.0	0.91	460	1LA8 357-2PM8□	2200	
545	600	400	2986	1743	97.1	97.1	0.91	520	1LA8 403-2PM7□	2800	
610	670	400	2986	1951	97.1	97.1	0.91	580	1LA8 405-2PM7□	3000	
680	750	400	2986	2175	97.2	97.2	0.92	640	1LA8 407-2PM7□	3200	
775	-	450	2987	2478	97.2	97.2	0.92	730	1LA8 453-2PM7□	4000	
875	-	450	2987	2798	97.3	97.3	0.92	820	1LA8 455-2PM7□	4200	
970	-	450	2987	3101	97.4	97.4	0.93	900	1LA8 457-2PM7□	4400	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V											
235	270	315	1485	1511	95.8	95.8	0.87	235	1LA8 315-4PM8□	1300	
290	335	315	1485	1865	95.9	95.9	0.87	285	1LA8 317-4PM8□	1500	
340	390	355	1488	2182	96.0	96.0	0.87	340	1LA8 353-4PM8□	1900	
385	445	355	1488	2471	96.2	96.2	0.87	385	1LA8 355-4PM8□	2000	
480	550	355	1488	3081	96.4	96.4	0.87	480	1LA8 357-4PM8□	2200	
545	625	400	1491	3491	96.5	96.5	0.88	540	1LA8 403-4PM8□	2800	
615	710	400	1491	3939	96.7	96.7	0.88	600	1LA8 405-4PM8□	3000	
690	795	400	1491	4420	96.9	96.9	0.89	670	1LA8 407-4PM7□	3200	
785	905	450	1492	5025	96.8	96.8	0.88	770	1LA8 453-4PM7□	4000	
880	1010	450	1492	5633	97.0	97.0	0.87	870	1LA8 455-4PM7□	4200	
980	1125	450	1492	6273	97.1	97.1	0.89	950	1LA8 457-4PM7□	4400	

Order No. supplements

Motor type	Final position: Type of construction code			
	Without flange IM B3	With flange IM V1 without protective cover	IM V1 with protective cover	IM B35
1LA8 315-... □□ to 1LA8 457-... □□	0	8	4	6
	□	✓	✓	✓

- Standard version
- ✓ With additional charge

The voltage code is already in the Order No. as the penultimate position.

Assignment:

7 = 690 VΔ

8 = 400 VΔ/690 VY

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for converter-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz as multiple of rated torque	Torque class	Moment of inertia	Noise		Mech. limit speed ¹⁾		Parallel feeders required		
	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz For rated output and sinusoidal supply, 50 Hz, tolerance +3 dB(A) L_{pFA} dB(A)	Sound power level at 50 Hz L_{WA} dB(A)	n_{max} rpm	f_{max} Hz	400 V	500 V	690 V
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V										
1LA8 315-2PM8□	3.0	10	2.7	82 (75) ²⁾	97 (90) ²⁾	3600	60	Yes		
1LA8 317-2PM8□	3.0	10	3.3	82 (75) ²⁾	97 (90) ²⁾	3600	60	Yes		
1LA8 353-2PM8□	2.6	10	4.8	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes	Yes	
1LA8 355-2PM8□	2.6	10	5.3	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes	Yes	
1LA8 357-2PM8□	2.6	10	6.4	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes		
1LA8 403-2PM7□	3.0	10	8.6	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes		
1LA8 405-2PM7□	3.1	10	9.6	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes	Yes	
1LA8 407-2PM7□	3.0	10	11	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes		
1LA8 453-2PM7□	2.8	5	19	81 ³⁾	96 ³⁾	3000	50	Yes		
1LA8 455-2PM7□	2.8	5	21	81 ³⁾	96 ³⁾	3000	50	Yes	Yes	
1LA8 457-2PM7□	2.8	5	23	81 ³⁾	96 ³⁾	3000	50	Yes	Yes	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V										
1LA8 315-4PM8□	2.8	13	3.6	73	87	3000 (2650)	100 (88)	Yes		
1LA8 317-4PM8□	2.8	13	4.4	73	87	3000 (2650)	100 (88)	Yes		
1LA8 353-4PM8□	2.6	13	6.1	75	90	2500 (2350)	83 (78)	Yes	Yes	
1LA8 355-4PM8□	2.6	13	6.8	75	90	2500 (2350)	83 (78)	Yes	Yes	
1LA8 357-4PM8□	2.5	13	8.5	75	90	2500 (2350)	83 (78)	Yes		
1LA8 403-4PM8□	2.6	13	13	78	93	2200 (2100)/2100 ⁴⁾	73 (70)/70 ⁴⁾	Yes		
1LA8 405-4PM8□	2.7	13	14	78	93	2200 (2100)/2100 ⁴⁾	73 (70)/70 ⁴⁾	Yes	Yes	
1LA8 407-4PM7□	2.6	13	16	78	93	2200 (2100)/2100 ⁴⁾	73 (70)/70 ⁴⁾	Yes		
1LA8 453-4PM7□	2.5	10	23	81	96	2100 (1900)/1800 ⁴⁾	70 (63)/60 ⁴⁾	Yes		
1LA8 455-4PM7□	2.6	10	26	81	96	2100 (1900)/1800 ⁴⁾	70 (63)/60 ⁴⁾	Yes	Yes	
1LA8 457-4PM7□	2.6	10	28	81	96	2100 (1900)/1800 ⁴⁾	70 (63)/60 ⁴⁾	Yes	Yes	

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ Limit speeds for reinforced bearings (order code **K20**) for 4-pole motors on request.

²⁾ Low-noise version, 2-pole, in brackets. To reduce noise, 2-pole motors can be equipped with an axial fan that is only suitable for one direction of rotation. Clockwise rotation order code **K37**, counter-clockwise rotation **K38**.

³⁾ In the standard version, the motors already have an axial fan for clockwise rotation. Order code **K37** is not necessary. For counter-clockwise rotation, order code **K38** is necessary.

⁴⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for converter-fed operation Cast-iron series 1LA8

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output and sinusoidal supply						Order No.	Price	Weight of IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 690 V			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A		m kg	
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V											
190	220	315	990	1833	95.5	95.6	0.85	196	1LA8 315-6PM8□	1300	
235	270	315	990	2267	95.7	95.8	0.86	240	1LA8 317-6PM8□	1500	
300	345	355	992	2888	96.2	96.2	0.86	305	1LA8 355-6PM8□	2000	
380	435	355	992	3658	96.4	96.4	0.86	385	1LA8 357-6PM8□	2200	
435	500	400	993	4184	96.4	96.4	0.85	445	1LA8 403-6PM8□	2800	
485	560	400	993	4664	96.5	96.5	0.86	490	1LA8 405-6PM8□	3000	
545	625	400	993	5241	96.6	96.6	0.86	550	1LA8 407-6PM8□	3200	
615	705	450	993	5915	96.8	96.8	0.84	630	1LA8 453-6PM8□	4000	
690	795	450	993	6636	96.8	96.8	0.85	700	1LA8 455-6PM7□	4200	
780	895	450	993	7502	96.9	97.0	0.85	790	1LA8 457-6PM7□	4500	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V											
145	165	315	740	1871	94.6	94.6	0.79	162	1LA8 315-8PM8□	1300	
180	205	315	740	2323	94.9	94.9	0.80	198	1LA8 317-8PM8□	1500	
230	265	355	743	2956	95.5	95.5	0.80	250	1LA8 355-8PM8□	2000	
290	335	355	743	3727	95.7	95.7	0.81	315	1LA8 357-8PM8□	2200	
335	385	400	743	4306	96.0	96.0	0.80	365	1LA8 403-8PM8□	2800	
375	430	400	743	4820	96.1	96.1	0.80	410	1LA8 405-8PM8□	3000	
425	490	400	743	5463	96.2	96.2	0.79	470	1LA8 407-8PM8□	3200	
485	560	450	745	6217	96.5	96.5	0.78	540	1LA8 453-8PM8□	4000	
545	625	450	745	6986	96.6	96.6	0.78	610	1LA8 455-8PM8□	4200	
600	690	450	745	7691	96.7	96.7	0.79	660	1LA8 457-8PM8□	4500	

Order No. supplements

Motor type	Final position: Type of construction code			
	Without flange		With flange	
	IM B3	IM V1 without protective cover	IM V1 with protective cover	IM B35
	0	8	4	6
1LA8 315-... □□ to 1LA8 457-... □□	□	✓	✓	✓

- Standard version
- ✓ With additional charge

The voltage code is already in the Order No. as the penultimate position.

Assignment:

7 = 690 VΔ

8 = 400 VΔ/690 VY

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for converter-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz as multiple of rated torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise		Mech. limit speed ¹⁾		Parallel feeders required		
				Measuring surface sound pressure level at 50 Hz For rated output and sinusoidal supply, 50 Hz, tolerance +3 dB(A) L_{pFA} dB(A)	Sound power level at 50 Hz L_{WA} dB(A)	n_{max} rpm	f_{max} Hz	400 V	500 V	690 V
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V										
1LA8 315-6PM8□	2.7	13	6.0	68	82	2950 (2350)	147 (117)			
1LA8 317-6PM8□	2.7	13	7.3	68	82	2950 (2350)	147 (117)	Yes		
1LA8 355-6PM8□	2.8	13	13	71	86	2500 (2100)	125 (105)	Yes		
1LA8 357-6PM8□	2.9	13	16	71	86	2500 (2100)	125 (105)	Yes	Yes	
1LA8 403-6PM8□	2.8	13	21	73	88	2200 (1900)/2100 ²⁾	110 (95)/105 ²⁾			
1LA8 405-6PM8□	2.8	13	24	73	88	2200 (1900)/2100 ²⁾	110 (95)/105 ²⁾	Yes		
1LA8 407-6PM8□	2.7	13	27	73	88	2200 (1900)/2100 ²⁾	110 (95)/105 ²⁾	Yes		
1LA8 453-6PM8□	2.7	13	35	75	90	2100 (1700)/1800 ²⁾	105 (85)/90 ²⁾	Yes	Yes	
1LA8 455-6PM7□	2.5	13	39	75	90	2100 (1700)/1800 ²⁾	105 (85)/90 ²⁾		Yes	
1LA8 457-6PM7□	2.6	13	44	75	90	2100 (1700)/1800 ²⁾	105 (85)/90 ²⁾		Yes	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V										
1LA8 315-8PM8□	2.5	13	6.0	65	79	2950 (2350)	196 (156)			
1LA8 317-8PM8□	2.5	13	7.3	65	79	2950 (2350)	196 (156)			
1LA8 355-8PM8□	2.4	13	13	67	82	2500 (2100)	166 (140)			
1LA8 357-8PM8□	2.4	13	16	67	82	2500 (2100)	166 (140)	Yes		
1LA8 403-8PM8□	2.6	13	21	69	84	2200 (1900)/2100 ²⁾	146 (126)/140 ²⁾			
1LA8 405-8PM8□	2.7	13	24	69	84	2200 (1900)/2100 ²⁾	146 (126)/140 ²⁾			
1LA8 407-8PM8□	2.7	13	27	69	84	2200 (1900)/2100 ²⁾	146 (126)/140 ²⁾	Yes		
1LA8 453-8PM8□	2.5	13	35	71	86	2100 (1700)/1800 ²⁾	140 (113)/120 ²⁾	Yes		
1LA8 455-8PM8□	2.5	13	39	71	86	2100 (1700)/1800 ²⁾	140 (113)/120 ²⁾	Yes	Yes	
1LA8 457-8PM8□	2.5	13	44	71	86	2100 (1700)/1800 ²⁾	140 (113)/120 ²⁾	Yes	Yes	

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ Limit speeds for reinforced bearings (order code **K20**) for 6- and 8-pole motors on request.

²⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Forced-air cooled motors with separately driven fan for converter-fed operation – Cast-iron series 1PQ8

Selection and ordering data

Rated output at		Frame size	Operating values at rated output and sinusoidal supply							Order No.	Price	Weight of IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos \varphi_{rated}$	I_{rated} A	I_{rated} A		m kg	
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V												
250	280	315	2979	801	96.2	96.2	0.90	415	240	1PQ8 315-2PC□□	1400	
315	353	315	2979	1010	96.5	96.5	0.91	520	300	1PQ8 317-2PC□□	1600	
355	398	355	2980	1140	96.5	96.5	0.90	590	340	1PQ8 353-2PC□□	2000	
400	448	355	2980	1280	96.7	96.7	0.91	660	380	1PQ8 355-2PC□□	2100	
500	560	355	2982	1600	97.1	97.1	0.91	820	475	1PQ8 357-2PC□□	2300	
560	616	400	2985	1790	97.1	97.1	0.91	910	530	1PQ8 403-2PC□□	2900	
630	693	400	2985	2020	97.1	97.1	0.91	1020	600	1PQ8 405-2PC□□	3100	
710	781	400	2985	2270	97.3	97.3	0.91	–	670 ¹⁾	1PQ8 407-2PC□□	3300	
800	–	450	2986	2560	97.2	97.2	0.91	–	760	1PQ8 453-2PE□□	4100	
900	–	450	2986	2880	97.3	97.3	0.92	–	840	1PQ8 455-2PE□□	4300	
1000	–	450	2986	3200	97.4	97.4	0.93	–	920	1PQ8 457-2PE□□	4500	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V												
250	288	315	1488	1600	96.0	96.0	0.87	430	250	1PQ8 315-4PB□□	1400	
315	362	315	1488	2020	96.2	96.2	0.87	540	315	1PQ8 317-4PB□□	1600	
355	408	355	1488	2280	96.3	96.3	0.87	610	355	1PQ8 353-4PB□□	2000	
400	460	355	1488	2570	96.4	96.4	0.87	690	400	1PQ8 355-4PB□□	2100	
500	575	355	1488	3210	96.7	96.7	0.88	850	490	1PQ8 357-4PB□□	2300	
560	644	400	1492	3580	96.7	96.7	0.88	950	550	1PQ8 403-4PB□□	2900	
630	725	400	1492	4030	96.9	96.9	0.88	1060	620	1PQ8 405-4PB□□	3100	
710	817	400	1492	4540	97.0	97.0	0.89	–	690 ¹⁾	1PQ8 407-4PB□□	3300	
800	920	450	1492	5120	97.0	97.0	0.88	–	780 ¹⁾	1PQ8 453-4PC□□	4100	
900	1040	450	1492	5760	97.1	97.1	0.88	–	880	1PQ8 455-4PC□□	4300	
1000	1150	450	1492	6400	97.1	97.1	0.89	–	970	1PQ8 457-4PC□□	4500	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ	400 VΔ/690 VY ²⁾	500 VΔ	690 VΔ ²⁾	Without flange IM B3	With flange IM V1 without protective cover ³⁾	IM V1 with protective cover ⁴⁾	IM B35
	4	8	5	7	0	8	4	6
1PQ8 315-...□□ to 1PQ8 405-...□□	○	□	○	–	□	✓	✓	✓
1PQ8 407-...□□ to 1PQ8 457-...□□	–	–	○	□	□	✓	✓	✓

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ Can also be supplied for 400 VΔ 50 Hz with voltage code "9" and order code **L1Y** (specify output, voltage and frequency).
²⁾ Motors with standard insulation can only be operated with converter circuit (du/dt or sinusoidal filter).

³⁾ For explosion-proof motors, the type of construction IM V1 without protective cover is not possible.
⁴⁾ The "Second shaft extension" option, order code **K16** is not possible.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Forced-air cooled motors with separately driven fan
for converter-fed operation – Cast-iron series 1PQ8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz as multiple of rated torque	Torque class	Moment of inertia	Technical data of the separately driven fan				Measuring surface sound pressure level at 50 Hz	Sound power level at 50 Hz	Mech. limit speed ¹⁾	Parallel feeders required			
				Power consumption with	Rated current at	50 Hz	60 Hz				400 V	460 V	50 Hz	60 Hz	For rated output, 50 Hz, tolerance +3 dB(A)	L_{WA} dB(A)	n_{max.} rpm	f_{max.} Hz	400 V	500 V	690 V
	T _B /T _{rated}	CL	J kgm ²	P kW	P kW	I A	I A	L _{pfA} dB(A)	L _{WA} dB(A)	n _{max.} rpm	f _{max.} Hz	400 V	500 V	690 V
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V														
1PQ8 315-2PC□□	2.8	10	2.7	0.75	1.23	3.4	3.3	79	94	3600	60	Yes		
1PQ8 317-2PC□□	2.8	10	3.3	0.75	1.23	3.4	3.3	79	94	3600	60	Yes		
1PQ8 353-2PC□□	2.5	10	4.8	1.3	2.2	6.4	6.2	81	96	3600/3100 ²⁾	60/52 ²⁾	Yes	Yes	
1PQ8 355-2PC□□	2.5	10	5.3	1.3	2.2	6.4	6.2	81	96	3600/3100 ²⁾	60/52 ²⁾	Yes	Yes	
1PQ8 357-2PC□□	2.6	10	6.4	1.3	2.2	6.4	6.2	81	96	3600/3100 ²⁾	60/52 ²⁾	Yes		
1PQ8 403-2PC□□	2.8	10	8.6	1.6	2.8	6.4	6.2	83	98	3600/3100 ²⁾	60/52 ²⁾	Yes		
1PQ8 405-2PC□□	2.8	10	9.6	1.6	2.8	6.4	6.2	83	98	3600/3100 ²⁾	60/52 ²⁾	Yes	Yes	
1PQ8 407-2PC□□	2.8	10	11	1.6	2.8	6.4	6.2	83	98	3600/3100 ²⁾	60/52 ²⁾	Yes		
1PQ8 453-2PE□□	3.0	5	19	3.0	4.2	8.2	7.7	86	101	3000	50	Yes		
1PQ8 455-2PE□□	2.8	5	21	3.0	4.2	8.2	7.7	86	101	3000	50	Yes	Yes	
1PQ8 457-2PE□□	2.7	5	23	3.0	4.2	8.2	7.7	86	101	3000	50	Yes	Yes	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V														
1PQ8 315-4PB□□	2.8	13	3.6	0.75	1.23	3.4	3.3	79	93	3000 (2650)	100 (88)	Yes		
1PQ8 317-4PB□□	2.8	13	4.4	0.75	1.23	3.4	3.3	79	93	3000 (2650)	100 (88)	Yes		
1PQ8 353-4PB□□	2.6	13	6.1	1.3	2.2	6.4	6.2	81	96	2500 (2350)	83 (78)	Yes	Yes	
1PQ8 355-4PB□□	2.6	13	6.8	1.3	2.2	6.4	6.2	81	96	2500 (2350)	83 (78)	Yes	Yes	
1PQ8 357-4PB□□	2.4	13	8.5	1.3	2.2	6.4	6.2	81	96	2500 (2350)	83 (78)	Yes		
1PQ8 403-4PB□□	2.7	13	13	1.6	2.8	6.4	6.2	83	98	2200 (2100)/2100 ²⁾	73 (70)/70 ²⁾	Yes		
1PQ8 405-4PB□□	2.7	13	14	1.6	2.8	6.4	6.2	83	98	2200 (2100)/2100 ²⁾	73 (70)/70 ²⁾	Yes	Yes	
1PQ8 407-4PB□□	2.7	13	16	1.6	2.8	6.4	6.2	83	98	2200 (2100)/2100 ²⁾	73 (70)/70 ²⁾	Yes		
1PQ8 453-4PC□□	2.6	10	23	3.0	4.2	8.2	7.7	86	101	2100 (1900)/1800 ²⁾	70 (63)/60 ²⁾	Yes		
1PQ8 455-4PC□□	2.6	10	26	3.0	4.2	8.2	7.7	86	101	2100 (1900)/1800 ²⁾	70 (63)/60 ²⁾	Yes	Yes	
1PQ8 457-4PC□□	2.6	10	28	3.0	4.2	8.2	7.7	86	101	2100 (1900)/1800 ²⁾	70 (63)/60 ²⁾	Yes	Yes	

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ Limit speeds for reinforced bearings (order code **K20**) for 4-pole motors on request.

²⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Forced-air cooled motors with separately driven fan for converter-fed operation – Cast-iron series 1PQ8

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output and sinusoidal supply							Order No.	Price	Weight of IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos \varphi_{\text{rated}}$	I_{rated} A	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below	m kg	
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V												
200	230	315	988	1930	95.7	95.8	0.86	345	200	1PQ8 315-6PB□□	1400	
250	288	315	988	2410	95.9	96.0	0.86	430	250	1PQ8 317-6PB□□	1600	
315	362	355	993	3040	96.2	96.2	0.86	540	315	1PQ8 355-6PB□□	2100	
400	460	355	993	3850	96.5	96.5	0.86	690	400	1PQ8 357-6PB□□	2300	
450	518	400	991	4330	96.5	96.5	0.86	780	455	1PQ8 403-6PB□□	2900	
500	575	400	991	4810	96.5	96.5	0.86	860	500	1PQ8 405-6PB□□	3100	
560	644	400	991	5390	96.7	96.7	0.86	960	460	1PQ8 407-6PB□□	3300	
630	725	450	993	6060	96.8	96.8	0.86	1100	630	1PQ8 453-6PB□□	4100	
710	817	450	993	6830	96.8	96.8	0.86	–	710 ¹⁾	1PQ8 455-6PB□□	4300	
800	920	450	993	7690	97.0	97.1	0.86	–	790 ¹⁾	1PQ8 457-6PB□□	4600	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V												
160	184	315	739	2070	94.9	94.9	0.82	295	172	1PQ8 315-8PB□□	1400	
200	230	315	739	2580	95.2	95.2	0.82	370	215	1PQ8 317-8PB□□	1600	
250	288	355	741	3220	95.7	95.7	0.82	460	265	1PQ8 355-8PB□□	2100	
315	362	355	741	4060	96.0	96.0	0.82	580	335	1PQ8 357-8PB□□	2300	
355	408	400	742	4570	96.1	96.1	0.82	650	375	1PQ8 403-8PB□□	2900	
400	460	400	742	5150	96.2	96.2	0.82	730	425	1PQ8 405-8PB□□	3100	
450	518	400	742	5790	96.3	96.3	0.82	820	475	1PQ8 407-8PB□□	3300	
500	575	450	744	6420	96.4	96.4	0.81	920	540	1PQ8 453-8PB□□	4100	
560	644	450	744	7190	96.5	96.5	0.81	1040	600	1PQ8 455-8PB□□	4300	
630	725	450	744	8090	96.6	96.6	0.81	1160	670	1PQ8 457-8PB□□	4600	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ	400 VΔ/690 VY ²⁾	500 VΔ	690 VΔ ²⁾	Without flange IM B3	With flange IM V1 without protective cover ³⁾	IM V1 with protective cover ⁴⁾	IM B35
	4	8	5	7	0	8	4	6
6-pole								
1PQ8 315-... □□ to 1PQ8 453-... □□	○	□	○	–	□	✓	✓	✓
1PQ8 455-... □□ to 1PQ8 457-... □□	–	–	○	□	□	✓	✓	✓
8-pole								
1PQ8 315-... □□ to 1PQ8 457-... □□	○	□	○	– ⁵⁾	□	✓	✓	✓

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

- 1) Can also be supplied for 400 VΔ 50 Hz with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).
- 2) Motors with standard insulation can only be operated with converter circuit (du/dt or sinusoidal filter).
- 3) For explosion-proof motors, the type of construction IM V1 without protective cover is not possible.

- 4) The "Second shaft extension" option, order code **K16** is not possible.
- 5) As special version with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Forced-air cooled motors with separately driven fan
for converter-fed operation – Cast-iron series 1PQ8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz as multiple of rated torque	Torque class	Moment of inertia	Technical data of the separately driven fan				Measuring surface sound pressure level at 50 Hz	Sound power level at 50 Hz	Mech. limit speed ¹⁾	Parallel feeders required			
				Power consumption with		Rated current at								
	T_B/T_{rated}	CL	J kgm ²	P kW	P kW	I A	I A	$L_{p(A)}$ dB(A)	L_{WA} dB(A)	$n_{max.}$ rpm	$f_{max.}$ Hz	400 V	500 V	690 V
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V														
1PQ8 315-6PB□□	2.5	13	6.0	0.75	1.23	3.4	3.3	80	94	2950 (2350)	147 (117)			
1PQ8 317-6PB□□	2.5	13	7.3	0.75	1.23	3.4	3.3	80	94	2950 (2350)	147 (117)	Yes		
1PQ8 355-6PB□□	2.8	13	13	1.3	2.2	6.4	6.2	82	97	2500 (2100)	125 (105)	Yes		
1PQ8 357-6PB□□	2.8	13	16	1.3	2.2	6.4	6.2	82	97	2500 (2100)	125 (105)	Yes	Yes	
1PQ8 403-6PB□□	2.8	13	21	1.3	2.2	6.4	6.2	84	99	2200 (1900)/2100 ²⁾	110 (95)/105 ²⁾			
1PQ8 405-6PB□□	2.8	13	24	1.6	2.8	6.4	6.2	84	99	2200 (1900)/2100 ²⁾	110 (95)/105 ²⁾	Yes		
1PQ8 407-6PB□□	2.8	13	27	1.6	2.8	6.4	6.2	84	99	2200 (1900)/2100 ²⁾	110 (95)/105 ²⁾	Yes		
1PQ8 453-6PB□□	2.6	13	35	3.0	4.2	8.2	7.7	87	102	2100 (1700)/1800 ²⁾	105 (85)/90 ²⁾	Yes	Yes	
1PQ8 455-6PB□□	2.5	13	39	3.0	4.2	8.2	7.7	87	102	2100 (1700)/1800 ²⁾	105 (85)/90 ²⁾		Yes	
1PQ8 457-6PB□□	2.5	13	44	3.0	4.2	8.2	7.7	87	102	2100 (1700)/1800 ²⁾	105 (85)/90 ²⁾		Yes	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V														
1PQ8 315-8PB□□	2.3	13	6.0	0.75	1.23	3.4	3.3	79	93	2950 (2350)	196 (156)			
1PQ8 317-8PB□□	2.3	13	7.3	0.75	1.23	3.4	3.3	79	93	2950 (2350)	196 (156)			
1PQ8 355-8PB□□	2.4	13	13	1.3	2.2	6.4	6.2	81	96	2500 (2100)	166 (140)			
1PQ8 357-8PB□□	2.4	13	16	1.3	2.2	6.4	6.2	81	96	2500 (2100)	166 (140)		Yes	
1PQ8 403-8PB□□	2.6	13	21	1.3	2.2	6.4	6.2	83	98	2200 (1900)/2100 ²⁾	146 (126)/140 ²⁾			
1PQ8 405-8PB□□	2.6	13	24	1.6	2.8	6.4	6.2	83	98	2200 (1900)/2100 ²⁾	146 (126)/140 ²⁾			
1PQ8 407-8PB□□	2.6	13	27	1.6	2.8	6.4	6.2	83	98	2200 (1900)/2100 ²⁾	146 (126)/140 ²⁾	Yes		
1PQ8 453-8PB□□	2.4	13	35	3.0	4.2	8.2	7.7	86	101	2100 (1700)/1800 ²⁾	140 (113)/120 ²⁾	Yes		
1PQ8 455-8PB□□	2.4	13	39	3.0	4.2	8.2	7.7	86	101	2100 (1700)/1800 ²⁾	141 (113)/120 ²⁾	Yes	Yes	
1PQ8 457-8PB□□	2.4	13	44	3.0	4.2	8.2	7.7	86	101	2100 (1700)/1800 ²⁾	142 (113)/120 ²⁾	Yes	Yes	

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ Limit speeds for reinforced bearings (order code **K20**) for 6- and 8-pole motors on request.

²⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Forced-air cooled motors with separately driven fan for converter-fed operation – Cast-iron series 1PQ8

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output and sinusoidal supply						Order No.	Price	Weight of IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 690 V			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A		m kg	
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V											
240	270	315	2978	770	96.0	96.0	0.90	230	1PQ8 315-2PM8□	1400	
300	335	315	2978	962	96.4	96.4	0.91	285	1PQ8 317-2PM8□	1600	
345	385	355	2981	1105	96.4	96.4	0.90	335	1PQ8 353-2PM8□	2000	
390	435	355	2981	1249	96.6	96.6	0.91	370	1PQ8 355-2PM8□	2100	
485	545	355	2982	1553	97.0	97.0	0.91	460	1PQ8 357-2PM8□	2300	
545	600	400	2986	1743	97.1	97.1	0.91	520	1PQ8 403-2PM7□	2900	
610	670	400	2986	1951	97.1	97.1	0.91	580	1PQ8 405-2PM7□	3100	
680	750	400	2986	2175	97.2	97.2	0.92	640	1PQ8 407-2PM7□	3300	
775	-	450	2987	2478	97.2	97.2	0.92	730	1PQ8 453-2PM7□	4100	
875	-	450	2987	2798	97.3	97.3	0.92	820	1PQ8 455-2PM7□	4300	
970	-	450	2987	3101	97.4	97.4	0.93	900	1PQ8 457-2PM7□	4500	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V											
235	270	315	1485	1511	95.8	95.8	0.87	235	1PQ8 315-4PM8□	1400	
290	335	315	1485	1865	95.9	95.9	0.87	285	1PQ8 317-4PM8□	1600	
340	390	355	1488	2182	96.0	96.0	0.87	340	1PQ8 353-4PM8□	2000	
385	445	355	1488	2471	96.2	96.2	0.87	385	1PQ8 355-4PM8□	2100	
480	550	355	1488	3081	96.4	96.4	0.87	480	1PQ8 357-4PM8□	2300	
545	625	400	1491	3491	96.5	96.5	0.88	540	1PQ8 403-4PM8□	2900	
615	710	400	1491	3939	96.7	96.7	0.88	600	1PQ8 405-4PM8□	3100	
690	795	400	1491	4420	96.9	96.9	0.89	670	1PQ8 407-4PM7□	3300	
785	905	450	1492	5025	96.8	96.8	0.88	770	1PQ8 453-4PM7□	4100	
880	1010	450	1492	5633	97.0	97.0	0.87	870	1PQ8 455-4PM7□	4300	
980	1125	450	1492	6273	97.1	97.1	0.89	950	1PQ8 457-4PM7□	4500	

Order No. supplements

Motor type	Final position: Type of construction code			
	Without flange IM B3	With flange		
		IM V1 without protective cover	IM V1 with protective cover	IM B35
	0	8	4	6
1PQ8 315- . . . □□ to 1PQ8 457- . . . □□	□	✓	✓	✓

- Standard version
- ✓ With additional charge

The voltage code is already in the Order No. as the penultimate position.

Assignment:

7 = 690 VΔ

8 = 400 VΔ/690 VY

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Forced-air cooled motors with separately driven fan
for converter-fed operation – Cast-iron series 1PQ8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz as multiple of rated torque	Torque class	Moment of inertia	Technical data of the separately driven fan				Measuring surface sound pressure level at 50 Hz	Sound power level at 50 Hz	Mech. limit speed ¹⁾	Parallel feeders required			
				Power consumption with	Rated current at	50 Hz	60 Hz						400 V	460 V
	T_B/T_{rated}	CL	J kgm ²	P kW	P kW	I A	I A	$L_{p(A)}$ dB(A)	L_{WA} dB(A)	$n_{max.}$ rpm	$f_{max.}$ Hz	400 V	500 V	690 V
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V														
1PQ8 315-2PM8□	3.0	10	2.7	0.75	1.23	3.4	3.3	79	94	3600	60	Yes	Yes	
1PQ8 317-2PM8□	3.0	10	3.3	0.75	1.23	3.4	3.3	79		3600	60	Yes	Yes	
1PQ8 353-2PM8□	2.6	10	4.8	1.3	2.2	6.4	6.2	81	96	3600/3100 ²⁾	60/52 ²⁾	Yes	Yes	
1PQ8 355-2PM8□	2.6	10	5.3	1.3	2.2	6.4	6.2	81		3600/3100 ²⁾	60/52 ²⁾	Yes	Yes	
1PQ8 357-2PM8□	2.6	10	6.4	1.3	2.2	6.4	6.2	81		3600/3100 ²⁾	60/52 ²⁾	Yes		
1PQ8 403-2PM7□	3.0	10	8.6	1.6	2.8	6.4	6.2	83	98	3600/3100 ²⁾	60/52 ²⁾	Yes		
1PQ8 405-2PM7□	3.1	10	9.6	1.6	2.8	6.4	6.2	83		3600/3100 ²⁾	60/52 ²⁾	Yes	Yes	
1PQ8 407-2PM7□	3.0	10	11	1.6	2.8	6.4	6.2	83		3600/3100 ²⁾	60/52 ²⁾	Yes		
1PQ8 453-2PM7□	2.8	5	19	3.0	4.2	8.2	7.7	86	101	3000	50	Yes		
1PQ8 455-2PM7□	2.8	5	21	3.0	4.2	8.2	7.7	86		3000	50	Yes	Yes	
1PQ8 457-2PM7□	2.8	5	23	3.0	4.2	8.2	7.7	86		3000	50	Yes	Yes	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V														
1PQ8 315-4PM8□	2.8	13	3.6	0.75	1.23	3.4	3.3	79	93	3000 (2650)	100 (88)	Yes		
1PQ8 317-4PM8□	2.8	13	4.4	0.75	1.23	3.4	3.3	79		3000 (2650)	100 (88)	Yes		
1PQ8 353-4PM8□	2.6	13	6.1	1.3	2.2	6.4	6.2	81	96	2500 (2350)	83 (78)	Yes	Yes	
1PQ8 355-4PM8□	2.6	13	6.8	1.3	2.2	6.4	6.2	81		2500 (2350)	83 (78)	Yes	Yes	
1PQ8 357-4PM8□	2.5	13	8.5	1.3	2.2	6.4	6.2	81		2500 (2350)	83 (78)	Yes		
1PQ8 403-4PM8□	2.6	13	13	1.6	2.8	6.4	6.2	83	98	2200 (2100)/2100 ²⁾	73 (70)/70 ²⁾	Yes		
1PQ8 405-4PM8□	2.7	13	14	1.6	2.8	6.4	6.2	83		2200 (2100)/2100 ²⁾	73 (70)/70 ²⁾	Yes	Yes	
1PQ8 407-4PM7□	2.6	13	16	1.6	2.8	6.4	6.2	83		2200 (2100)/2100 ²⁾	73 (70)/70 ²⁾	Yes		
1PQ8 453-4PM7□	2.5	10	23	3.0	4.2	8.2	7.7	86	101	2100 (1900)/1800 ²⁾	70 (61)/60 ²⁾	Yes		
1PQ8 455-4PM7□	2.6	10	26	3.0	4.2	8.2	7.7	86		2100 (1900)/1800 ²⁾	70 (61)/60 ²⁾	Yes	Yes	
1PQ8 457-4PM7□	2.6	10	28	3.0	4.2	8.2	7.7	86		2100 (1900)/1800 ²⁾	70 (61)/60 ²⁾	Yes	Yes	

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ Limit speeds for reinforced bearings (order code **K20**) for 4-pole motors on request.

²⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Forced-air cooled motors with separately driven fan for converter-fed operation – Cast-iron series 1PQ8

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output and sinusoidal supply						Order No.	Price	Weight of IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 690 V			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A		m kg	
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V											
190	220	315	990	1833	95.5	95.6	0.85	196	1PQ8 315-6PM8□	1400	
235	270	315	990	2267	95.7	95.8	0.86	240	1PQ8 317-6PM8□	1600	
300	345	355	992	2888	96.2	96.2	0.86	305	1PQ8 355-6PM8□	2100	
380	435	355	992	3658	96.4	96.4	0.86	385	1PQ8 357-6PM8□	2300	
435	500	400	993	4184	96.4	96.4	0.85	445	1PQ8 403-6PM8□	2900	
485	560	400	993	4664	96.5	96.5	0.86	490	1PQ8 405-6PM8□	3100	
545	625	400	993	5241	96.6	96.6	0.86	550	1PQ8 407-6PM8□	3300	
615	705	450	993	5915	96.8	96.8	0.84	630	1PQ8 453-6PM8□	4100	
690	795	450	993	6636	96.8	96.8	0.85	700	1PQ8 455-6PM7□	4300	
780	895	450	993	7502	96.9	97.0	0.85	790	1PQ8 457-6PM7□	4600	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V											
145	165	315	740	1871	94.6	94.6	0.79	162	1PQ8 315-8PM8□	1400	
180	205	315	740	2323	94.9	94.9	0.80	198	1PQ8 317-8PM8□	1600	
230	265	355	743	2956	95.5	95.5	0.80	250	1PQ8 355-8PM8□	2100	
290	335	355	743	3727	95.7	95.7	0.81	315	1PQ8 357-8PM8□	2300	
335	385	400	743	4306	96.0	96.0	0.80	365	1PQ8 403-8PM8□	2900	
375	430	400	743	4820	96.1	96.1	0.80	410	1PQ8 405-8PM8□	3100	
425	490	400	743	5463	96.2	96.2	0.79	470	1PQ8 407-8PM8□	3300	
485	560	450	745	6217	96.5	96.5	0.78	540	1PQ8 453-8PM8□	4100	
545	625	450	745	6986	96.6	96.6	0.78	610	1PQ8 455-8PM8□	4300	
600	690	450	745	7691	96.7	96.7	0.79	660	1PQ8 457-8PM8□	4600	

Order No. supplements

Motor type	Final position: Type of construction code			
	Without flange	With flange		
	IM B3	IM V1 without protective cover	IM V1 with protective cover	IM B35
	0	8	4	6
1PQ8 315-...□□	□	✓	✓	✓
to 1PQ8 457-...□□				

- Standard version
- ✓ With additional charge

The voltage code is already in the Order No. as the penultimate position.

Assignment:

7 = 690 VΔ

8 = 400 VΔ/690 VY

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Forced-air cooled motors with separately driven fan
for converter-fed operation – Cast-iron series 1PQ8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz as multiple of rated torque	Torque class	Moment of inertia	Technical data of the separately driven fan				Measuring surface sound pressure level at 50 Hz	Sound power level at 50 Hz	Mech. limit speed ¹⁾	Parallel feeders required			
				Power consumption with	Rated current at		For rated output, 50 Hz, tolerance +3 dB(A)				400 V	500 V	690 V	
	T_B/T_{rated}	CL	J kgm ²	P kW	P kW	I A	I A	L_{pfA} dB(A)	L_{WA} dB(A)	$n_{max.}$ rpm	$f_{max.}$ Hz	400 V	500 V	690 V
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V														
1PQ8 315-6PM8□	2.7	13	6	0.75	1.23	3.4	3.3	80	94	2950 (2350)	147 (117)			
1PQ8 317-6PM8□	2.7	13	7.3	0.75	1.23	3.4	3.3	80	94	2950 (2350)	147 (117)	Yes		
1PQ8 355-6PM8□	2.8	13	13	1.3	2.2	6.4	6.2	82	97	2500 (2100)	125 (105)	Yes		
1PQ8 357-6PM8□	2.9	13	16	1.3	2.2	6.4	6.2	82	97	2500 (2100)	125 (105)	Yes	Yes	
1PQ8 403-6PM8□	2.8	13	21	1.3	2.2	6.4	6.2	84	99	2200 (1900)/2100 ²⁾	110 (95)/105 ²⁾			
1PQ8 405-6PM8□	2.8	13	24	1.6	2.8	6.4	6.2	84	99	2200 (1900)/2100 ²⁾	110 (95)/105 ²⁾	Yes		
1PQ8 407-6PM8□	2.7	13	27	1.6	2.8	6.4	6.2	84	99	2200 (1900)/2100 ²⁾	110 (95)/105 ²⁾	Yes		
1PQ8 453-6PM8□	2.7	13	35	1.6	2.8	6.4	6.2	87	102	2100 (1700)/1800 ²⁾	105 (85)/90 ²⁾	Yes	Yes	
1PQ8 455-6PM7□	2.5	13	39	3	4.2	8.2	7.7	87	102	2100 (1700)/1800 ²⁾	105 (85)/90 ²⁾			Yes
1PQ8 457-6PM7□	2.6	13	44	3	4.2	8.2	7.7	87	102	2100 (1700)/1800 ²⁾	105 (85)/90 ²⁾			Yes
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V														
1PQ8 315-8PM8□	2.5	13	6	0.75	1.23	3.4	3.3	79	93	2950 (2350)	196 (156)			
1PQ8 317-8PM8□	2.5	13	7.3	0.75	1.23	3.4	3.3	79	93	2950 (2350)	196 (156)			
1PQ8 355-8PM8□	2.4	13	13	1.3	2.2	6.4	6.2	81	96	2500 (2100)	166 (140)			
1PQ8 357-8PM8□	2.4	13	16	1.3	2.2	6.4	6.2	81	96	2500 (2100)	166 (140)			Yes
1PQ8 403-8PM8□	2.6	13	21	1.3	2.2	6.4	6.2	83	98	2200 (1900)/2100 ²⁾	146 (126)/140 ²⁾			
1PQ8 405-8PM8□	2.7	13	24	1.6	2.8	6.4	6.2	83	98	2200 (1900)/2100 ²⁾	146 (126)/140 ²⁾			
1PQ8 407-8PM8□	2.7	13	27	1.6	2.8	6.4	6.2	83	98	2200 (1900)/2100 ²⁾	146 (126)/140 ²⁾	Yes		
1PQ8 453-8PM8□	2.5	13	35	1.6	2.8	6.4	6.2	86	101	2100 (1700)/1800 ²⁾	140 (113)/120 ²⁾	Yes		
1PQ8 455-8PM8□	2.5	13	39	3	4.2	8.2	7.7	86	101	2100 (1700)/1800 ²⁾	140 (113)/120 ²⁾	Yes	Yes	
1PQ8 457-8PM8□	2.5	13	44	3	4.2	8.2	7.7	86	101	2100 (1700)/1800 ²⁾	140 (113)/120 ²⁾	Yes	Yes	

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ Limit speeds for reinforced bearings (order code **K20**) for 6- and 8-pole motors on request.

²⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through ventilation
for mains-fed operation – Cast-iron series 1LL8

Selection and ordering data

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight of IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V				For Order No. supplements for voltage and type of construction, see table below
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	I_{rated} A		m kg	
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP23 degree of protection											
315	345	315	2974	1010	96.1	0.92	510	300	1LL8 315-2AC□□	1300	
400	440	315	2974	1280	96.4	0.92	650	375	1LL8 317-2AC□□	1500	
450	–	355	2978	1440	96.4	0.91	740	430	1LL8 353-2AD□□	1900	
500	–	355	2979	1600	96.6	0.92	810	470	1LL8 355-2AD□□	2000	
630	–	355	2980	2020	96.9	0.93	1000	580	1LL8 357-2AD□□	2200	
710	–	400	2984	2270	97.0	0.91	1160	670	1LL8 403-2AD□□	2800	
800	–	400	2984	2560	97.1	0.92	1300	750	1LL8 405-2AD□□	3000	
900	–	400	2985	2880	97.3	0.92	–	840	1LL8 407-2AD□□	3200	
1000	–	450	2987	3200	97.3	0.93	–	920	1LL8 453-2AE□□	4000	
1120	–	450	2986	3580	97.3	0.94	–	1020	1LL8 455-2AE□□	4200	
1250	–	450	2986	4000	97.4	0.94	–	1140	1LL8 457-2AE□□	4400	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP23 degree of protection											
315	360	315	1483	2030	96.0	0.87	540	315	1LL8 315-4AC□□	1300	
400	460	315	1484	2570	96.2	0.88	680	395	1LL8 317-4AC□□	1500	
450	515	355	1487	2890	96.5	0.87	770	450	1LL8 353-4AC□□	1900	
500	575	355	1487	3210	96.6	0.88	850	490	1LL8 355-4AC□□	2000	
630	725	355	1488	4040	96.9	0.88	1060	620	1LL8 357-4AC□□	2200	
710	815	400	1489	4550	96.9	0.88	1200	700	1LL8 403-4AC□□	2800	
800	920	400	1490	5130	97.0	0.88	–	780	1LL8 405-4AC□□	3000	
900	1035	400	1491	5760	97.2	0.87	–	890	1LL8 407-4AC□□	3200	
1000	1150	450	1492	6400	97.2	0.86	–	1000	1LL8 453-4AD□□	4000	
1120	1280	450	1491	7170	97.2	0.89	–	1080	1LL8 455-4AD□□	4200	
1250	1430	450	1490	8010	97.2	0.89	–	1200	1LL8 457-4AD□□	4400	

A service factor (SF) of 1.05 is stamped onto all 1LL8 motors for mains-fed operation.

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ/690 VY	500 VΔ	690 VΔ	60 Hz 460 VΔ (see "Introduction" for outputs at 60 Hz)	Without flange IM B3	With flange		IM B35
						IM V1 without protective cover	IM V1 with protective cover ¹⁾	
	6	5	0	9 L2F	0	8	4	6
1LL8 315-...□□ to 1LL8 317-...□□	□	○	– ²⁾	○	□	✓	✓	✓
1LL8 353-...□□ to 1LL8 405-...□□	□	○	– ²⁾	○	□ ³⁾	✓ ³⁾	✓ ³⁾	✓ ³⁾
1LL8 407-...□□ to 1LL8 457-...□□	–	○	□	O. R.	□ ³⁾	✓ ³⁾	✓ ³⁾	✓ ³⁾

- Standard version
- Without additional charge
- ✓ With additional charge
- O. R. Possible on request
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

- 1) The "Second shaft extension" option, order code **K16** is not possible.
- 2) As special version with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).
- 3) Not possible for 2-pole motors in 60 Hz version.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through ventilation
for mains-fed operation – Cast-iron series 1LL8

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Noise at rated output		Mech. limit speed	Parallel feeders required		
	At 50 Hz and for direct online starting as multiple of rated torque	At 50 Hz and for direct online starting as multiple of rated current	At 50 Hz and for direct online starting as multiple of rated torque	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz	Sound power level at 50 Hz	n_{max} rpm	400 V	500 V	690 V
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}			L_{pA} dB(A)	L_{WA} dB(A)				
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP23 degree of protection											
1LL8 315-2AC□□	1.6	7.0	2.8	10	2.7	84 ¹⁾	99	3600	Yes		
1LL8 317-2AC□□	1.7	7.0	2.8	10	3.3	84 ¹⁾	99	3600	Yes		
1LL8 353-2AD□□	1.4	7.0	2.6	7	4.8	86 ¹⁾	101	3600/3100 ²⁾	Yes	Yes	
1LL8 355-2AD□□	1.4	7.0	2.6	7	5.3	86 ¹⁾	101	3600/3100 ²⁾	Yes	Yes	
1LL8 357-2AD□□	1.6	7.0	2.6	7	6.4	86 ¹⁾	101	3600/3100 ²⁾	Yes		
1LL8 403-2AD□□	1.4	6.8	2.6	7	8.6	88 ¹⁾	103	3600/3100 ²⁾	Yes		
1LL8 405-2AD□□	1.5	7.0	2.6	7	9.6	88 ¹⁾	103	3600/3100 ²⁾	Yes	Yes	
1LL8 407-2AD□□	1.5	7.0	2.7	7	11	88 ¹⁾	103	3600/3100 ²⁾	Yes		
1LL8 453-2AE□□	0.9	7.0	2.9	5	19	90 ¹⁾	105	3000	Yes		
1LL8 455-2AE□□	0.9	7.0	2.7	5	21	90 ¹⁾	105	3000	Yes	Yes	
1LL8 457-2AE□□	0.9	7.0	2.6	5	23	90 ¹⁾	105	3000	Yes	Yes	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP23 degree of protection											
1LL8 315-4AC□□	1.6	7.0	2.7	10	3.6	75	90	3000/2600 ²⁾	Yes		
1LL8 317-4AC□□	1.7	7.0	2.7	10	4.4	75	90	3000/2600 ²⁾	Yes		
1LL8 353-4AC□□	1.5	7.0	2.6	10	6.1	77	92	2500/2200 ²⁾	Yes	Yes	
1LL8 355-4AC□□	1.6	7.0	2.6	10	6.8	77	92	2500/2200 ²⁾	Yes	Yes	
1LL8 357-4AC□□	1.6	7.0	2.7	10	8.5	77	92	2500/2200 ²⁾	Yes		
1LL8 403-4AC□□	1.6	7.0	2.4	10	13	81	96	2200/1900 ²⁾	Yes		
1LL8 405-4AC□□	1.7	7.0	2.5	10	14	81	96	2200/1900 ²⁾	Yes	Yes	
1LL8 407-4AC□□	1.7	7.0	2.6	10	16	81	96	2200/1900 ²⁾	Yes		
1LL8 453-4AD□□	1.5	7.0	2.8	7	23	84	99	2100/1800 ²⁾	Yes		
1LL8 455-4AD□□	1.5	7.0	2.6	7	26	84	99	2100/1800 ²⁾	Yes	Yes	
1LL8 457-4AD□□	1.5	7.0	2.5	7	28	84	99	2100/1800 ²⁾	Yes	Yes	

¹⁾ The noise values for **1LL8**, 2-pole are for guidance only.

²⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through ventilation
for mains-fed operation – Cast-iron series 1LL8

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight of IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below	m kg	
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP23 degree of protection											
250	285	315	988	2420	95.4	0.88	430	250	1LL8 315-6AC□□	1300	
315	360	315	988	3040	95.7	0.89	530	310	1LL8 317-6AC□□	1500	
400	460	355	991	3850	96.1	0.88	680	395	1LL8 355-6AC□□	2000	
500	575	355	991	4820	96.4	0.88	850	495	1LL8 357-6AC□□	2200	
560	645	400	993	5390	96.6	0.87	960	560	1LL8 403-6AC□□	2800	
630	725	400	993	6060	96.7	0.88	1060	620	1LL8 405-6AC□□	3000	
710	815	400	993	6830	96.7	0.88	1200	700	1LL8 407-6AC□□	3200	
800	920	450	993	7700	96.8	0.87	–	790	1LL8 453-6AD□□	4000	
900	1035	450	992	8660	96.8	0.88	–	880	1LL8 455-6AD□□	4200	
1000	1150	450	993	9620	96.9	0.88	–	980	1LL8 457-6AD□□	4500	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP23 degree of protection											
200	230	315	738	2590	94.7	0.82	370	215	1LL8 315-8AC□□	1300	
250	285	315	738	3240	95.0	0.82	465	270	1LL8 317-8AC□□	1500	
315	360	355	740	4070	95.5	0.83	570	335	1LL8 355-8AC□□	2000	
400	460	355	740	5160	95.6	0.84	720	415	1LL8 357-8AC□□	2200	
450	515	400	741	5800	95.9	0.84	810	465	1LL8 403-8AD□□	2800	
500	575	400	741	6440	96.1	0.84	890	520	1LL8 405-8AD□□	3000	
560	645	400	742	7210	96.2	0.83	1020	590	1LL8 407-8AD□□	3200	
630	745	450	743	8100	96.3	0.82	1160	670	1LL8 453-8AD□□	4000	
710	815	450	743	9130	96.4	0.83	1280	740	1LL8 455-8AD□□	4200	
800	920	450	743	10300	96.5	0.83	–	840	1LL8 457-8AD□□	4500	

A service factor (SF) of 1.05 is stamped onto all 1LL8 motors for mains-fed operation.

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ/690 VY	500 VΔ	690 VΔ	60 Hz 460 VΔ (see "Introduction" for outputs at 60 Hz)	Without flange IM B3	With flange IM V1 without protective cover	IM V1 with protective cover ¹⁾	IM B35
	6	5	0	9 L2F	0	8	4	6
6-pole								
1LL8 315-...□□ to 1LL8 407-...□□	□	○	– ²⁾	○	□	✓	✓	✓
1LL8 453-...□□ to 1LL8 457-...□□	–	○	□	O. R.	□	✓	✓	✓
8-pole								
1LL8 315-...□□ to 1LL8 455-...□□	□	○	– ²⁾	○	□	✓	✓	✓
1LL8 457-...□□	–	○	□	O. R.	□	✓	✓	✓

- Standard version
- Without additional charge
- ✓ With additional charge
- O. R. Possible on request
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.

²⁾ As special version with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through ventilation
for mains-fed operation – Cast-iron series 1LL8

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Noise at rated output		Mech. limit speed	Parallel feeders required		
	At 50 Hz and for direct online starting as multiple of rated torque			CL	J kgm ²	Measuring surface sound pressure level at 50 Hz	Sound power level at 50 Hz	n_{max} rpm	400 V	500 V	690 V
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}			L_{pA} dB(A)	L_{WA} dB(A)				
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP23 degree of protection											
1LL8 315-6AC□□	1.6	7	2.6	10	6	70	84	2950/2600 ¹⁾			
1LL8 317-6AC□□	1.7	7	2.6	10	7.3	70	84	2950/2600 ¹⁾	Yes		
1LL8 355-6AC□□	1.7	7	2.5	10	13	73	88	2500/2200 ¹⁾	Yes		
1LL8 357-6AC□□	1.8	7	2.6	10	16	73	88	2500/2200 ¹⁾	Yes	Yes	
1LL8 403-6AC□□	1.8	7	2.6	10	21	76	91	2200/1900 ¹⁾			
1LL8 405-6AC□□	1.8	7	2.6	10	24	76	91	2200/1900 ¹⁾	Yes		
1LL8 407-6AC□□	1.8	7	2.5	10	27	76	91	2200/1900 ¹⁾	Yes		
1LL8 453-6AD□□	1.5	7	2.5	7	35	78	93	2100/1800 ¹⁾	Yes	Yes	
1LL8 455-6AD□□	1.5	7	2.4	7	39	78	93	2100/1800 ¹⁾		Yes	
1LL8 457-6AD□□	1.5	7	2.5	7	44	78	93	2100/1800 ¹⁾		Yes	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP23 degree of protection											
1LL8 315-8AC□□	1.6	5.8	2.4	10	6	67	81	2950/2600 ¹⁾			
1LL8 317-8AC□□	1.6	5.8	2.4	10	7.3	67	81	2950/2600 ¹⁾			
1LL8 355-8AC□□	1.6	6	2.4	10	13	69	84	2500/2200 ¹⁾			
1LL8 357-8AC□□	1.6	6	2.3	10	16	69	84	2500/2200 ¹⁾	Yes		
1LL8 403-8AD□□	1.3	5.8	2.3	7	21	72	87	2200/1900 ¹⁾			
1LL8 405-8AD□□	1.4	5.8	2.4	7	24	72	87	2200/1900 ¹⁾			
1LL8 407-8AD□□	1.4	6	2.4	7	27	72	87	2200/1900 ¹⁾	Yes		
1LL8 453-8AD□□	1.3	5.8	2.3	7	35	74	89	2100/1800 ¹⁾	Yes		
1LL8 455-8AD□□	1.3	5.8	2.3	7	39	74	89	2100/1800 ¹⁾	Yes	Yes	
1LL8 457-8AD□□	1.3	5.8	2.3	7	44	74	89	2100/1800 ¹⁾	Yes	Yes	

¹⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through-ventilation
for converter-fed operation – Cast-iron series 1LL8

Selection and ordering data

Rated output at		Frame size	Operating values at rated output and sinusoidal supply						Order No.	Price	Weight of IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	I_{rated} A		kg	
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V											
315	345	315	2974	1010	96.1	0.92	510	300	1LL8 315-2PCQQ	1300	
400	440	315	2974	1280	96.4	0.92	650	375	1LL8 317-2PCQQ	1500	
450	–	355	2978	1440	96.4	0.91	740	430	1LL8 353-2PDQQ	1900	
500	–	355	2979	1600	96.6	0.92	810	470	1LL8 355-2PDQQ	2000	
630	–	355	2980	2020	96.9	0.93	1000	580	1LL8 357-2PDQQ	2200	
710	–	400	2984	2270	97.0	0.91	1160	670	1LL8 403-2PDQQ	2800	
800	–	400	2984	2560	97.1	0.92	1300	750	1LL8 405-2PDQQ	3000	
900	–	400	2985	2880	97.3	0.92	–	840	1LL8 407-2PDQQ	3200	
1000	–	450	2987	3200	97.3	0.93	–	920	1LL8 453-2PEQQ	4000	
1120	–	450	2986	3580	97.3	0.94	–	1020	1LL8 455-2PEQQ	4200	
1250	–	450	2986	4000	97.4	0.94	–	1140	1LL8 457-2PEQQ	4400	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V											
315	360	315	1483	2030	96.0	0.87	540	315	1LL8 315-4PCQQ	1300	
400	460	315	1484	2570	96.2	0.88	680	395	1LL8 317-4PCQQ	1500	
450	515	355	1487	2890	96.5	0.87	770	450	1LL8 353-4PCQQ	1900	
500	575	355	1487	3210	96.6	0.88	850	490	1LL8 355-4PCQQ	2000	
630	725	355	1488	4040	96.9	0.88	1060	620	1LL8 357-4PCQQ	2200	
710	815	400	1489	4550	96.9	0.88	1200	700	1LL8 403-4PCQQ	2800	
800	920	400	1490	5130	97.0	0.88	1360	780	1LL8 405-4PCQQ	3000	
900	1035	400	1491	5760	97.2	0.87	–	890	1LL8 407-4PCQQ	3200	
1000	1150	450	1492	6400	97.2	0.86	–	1000	1LL8 453-4PDQQ	4000	
1120	1280	450	1491	7170	97.2	0.89	–	1080	1LL8 455-4PDQQ	4200	
1250	1430	450	1490	8010	97.2	0.89	–	1200	1LL8 457-4PDQQ	4400	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ	400 VΔ/690 VY ¹⁾	500 VΔ	690 VΔ ¹⁾	Without flange IM B3	With flange		IM B35
						IM V1 without protective cover	IM V1 with protective cover	
	4	8	5	7	0	8	4	6
1LL8 315-... QQ to 1LL8 405-... QQ	○	□	○	–	□	✓	✓	✓
1LL8 407-... QQ to 1LL8 457-... QQ	–	–	○	□	□	✓	✓	✓

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ Motors with standard insulation can only be operated with converter circuit (du/dt or sinusoidal filter).

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through-ventilation
for converter-fed operation – Cast-iron series 1LL8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz as multiple of rated torque	Torque class	Moment of inertia	Measuring surface sound pressure level at 50 Hz	Sound power level at 50 Hz	Mech. limit speed		Parallel feeders required			
						T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)	$n_{max.}$ rpm	$f_{max.}$ Hz	400 V	500 V	690 V
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V											
1LL8 315-2PC□□	2.8	10	2.7	84 ¹⁾	99	3600	60			Yes	
1LL8 317-2PC□□	2.8	10	3.3	84 ¹⁾	99	3600	60			Yes	
1LL8 353-2PD□□	2.6	7	4.8	86 ¹⁾	101	3600/3100 ²⁾	60/52 ²⁾			Yes	Yes
1LL8 355-2PD□□	2.6	7	5.3	86 ¹⁾	101	3600/3100 ²⁾	60/52 ²⁾			Yes	Yes
1LL8 357-2PD□□	2.6	7	6.4	86 ¹⁾	101	3600/3100 ²⁾	60/52 ²⁾			Yes	
1LL8 403-2PD□□	2.6	7	8.6	88 ¹⁾	103	3600/3100 ²⁾	60/52 ²⁾			Yes	
1LL8 405-2PD□□	2.6	7	9.6	88 ¹⁾	103	3600/3100 ²⁾	60/52 ²⁾			Yes	Yes
1LL8 407-2PD□□	2.7	7	11	88 ¹⁾	103	3600/3100 ²⁾	60/52 ²⁾			Yes	
1LL8 453-2PE□□	2.9	5	19	90 ¹⁾	105	3000	50			Yes	
1LL8 455-2PE□□	2.7	5	21	90 ¹⁾	105	3000	50			Yes	Yes
1LL8 457-2PE□□	2.6	5	23	90 ¹⁾	105	3000	50			Yes	Yes
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V											
1LL8 315-4PC□□	2.7	10	3.6	75	90	3000/2600 ²⁾	100/87 ²⁾			Yes	
1LL8 317-4PC□□	2.7	10	4.4	75	90	3000/2600 ²⁾	100/87 ²⁾			Yes	
1LL8 353-4PC□□	2.6	10	6.1	77	92	2500/2200 ²⁾	83/73 ²⁾			Yes	Yes
1LL8 355-4PC□□	2.6	10	6.8	77	92	2500/2200 ²⁾	83/73 ²⁾			Yes	Yes
1LL8 357-4PC□□	2.7	10	8.5	77	92	2500/2200 ²⁾	83/73 ²⁾			Yes	
1LL8 403-4PC□□	2.4	10	13	81	96	2200/1900 ²⁾	73/63 ²⁾			Yes	
1LL8 405-4PC□□	2.5	10	14	81	96	2200/1900 ²⁾	73/63 ²⁾			Yes	Yes
1LL8 407-4PC□□	2.6	10	16	81	96	2200/1900 ²⁾	73/63 ²⁾			Yes	
1LL8 453-4PD□□	2.8	7	23	84	99	2100/1800 ²⁾	70/60 ²⁾			Yes	
1LL8 455-4PD□□	2.6	7	26	84	99	2100/1800 ²⁾	70/60 ²⁾			Yes	Yes
1LL8 457-4PD□□	2.5	7	28	84	99	2100/1800 ²⁾	70/60 ²⁾			Yes	Yes

¹⁾ The noise values for 1LL8, 2-pole are for guidance only.

²⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through-ventilation
for converter-fed operation – Cast-iron series 1LL8

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output and sinusoidal supply						Order No.	Price	Weight of IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below	kg	
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V											
250	285	315	988	2420	95.4	0.88	430	250	1LL8 315-6PC□□	1300	
315	360	315	988	3040	95.7	0.89	530	310	1LL8 317-6PC□□	1500	
400	460	355	991	3850	96.1	0.88	680	395	1LL8 355-6PC□□	2000	
500	575	355	991	4820	96.4	0.88	850	495	1LL8 357-6PC□□	2200	
560	645	400	993	5390	96.6	0.87	960	560	1LL8 403-6PC□□	2800	
630	725	400	993	6060	96.7	0.88	1060	620	1LL8 405-6PC□□	3000	
710	815	400	993	6830	96.7	0.88	1200	700	1LL8 407-6PC□□	3200	
800	920	450	993	7700	96.8	0.87	1380	790	1LL8 453-6PD□□	4000	
900	1035	450	992	8660	96.8	0.88	–	880	1LL8 455-6PD□□	4200	
1000	1150	450	993	9620	96.9	0.88	–	980	1LL8 457-6PD□□	4500	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V											
200	230	315	738	2590	94.7	0.82	370	215	1LL8 315-8PC□□	1300	
250	285	315	738	3240	95.0	0.82	465	270	1LL8 317-8PC□□	1500	
315	360	355	740	4070	95.5	0.83	570	335	1LL8 355-8PC□□	2000	
400	460	355	740	5160	95.6	0.84	720	415	1LL8 357-8PC□□	2200	
450	515	400	741	5800	95.9	0.84	810	465	1LL8 403-8PD□□	2800	
500	575	400	741	6440	96.1	0.84	890	520	1LL8 405-8PD□□	3000	
560	645	400	742	7210	96.2	0.83	1020	590	1LL8 407-8PD□□	3200	
630	745	450	743	8100	96.3	0.82	1160	670	1LL8 453-8PD□□	4000	
710	815	450	743	9130	96.4	0.83	1280	740	1LL8 455-8PD□□	4200	
800	920	450	743	10300	96.5	0.83	–	840	1LL8 457-8PD□□	4500	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ	400 VΔ/690 VY ¹⁾	500 VΔ	690 VΔ ¹⁾	Without flange IM B3	With flange		
	4	8	5	7	0	IM V1 without protective cover	IM V1 with protective cover ²⁾	IM B35
	4	8	5	7	0	8	4	6
6-pole								
1LL8 315-...□□ to 1LL8 453-...□□	○	□	○	–	□	✓	✓	✓
1LL8 455-...□□ to 1LL8 457-...□□	–	–	○	□	□	✓	✓	✓
8-pole								
1LL8 315-...□□ to 1LL8 455-...□□	○	□	○	– ³⁾	□	✓	✓	✓
1LL8 457-...□□	–	–	○	□	□	✓	✓	✓

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ Motors with standard insulation can only be operated with converter circuit (du/dt or sinusoidal filter).

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ As special version with voltage code **"9"** and order code **L1Y** (specify output, voltage and frequency).

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through-ventilation
for converter-fed operation – Cast-iron series 1LL8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz as multiple of rated torque	Torque class	Moment of inertia	Measuring surface sound pressure level at 50 Hz	Sound power level at 50 Hz	Mech. limit speed		Parallel feeders required		
						T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)	$n_{max.}$ rpm	$f_{max.}$ Hz	400 V	500 V	690 V
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V										
1LL8 315-6PC□□	2.6	10	6.0	70	84	2950/2600 ¹⁾	147/130 ¹⁾			
1LL8 317-6PC□□	2.6	10	7.3	70	84	2950/2600 ¹⁾	147/130 ¹⁾	Yes		
1LL8 355-6PC□□	2.5	10	13	73	88	2500/2200 ¹⁾	125/110 ¹⁾	Yes		
1LL8 357-6PC□□	2.6	10	16	73	88	2500/2200 ¹⁾	125/110 ¹⁾	Yes	Yes	
1LL8 403-6PC□□	2.6	10	21	76	91	2200/1900 ¹⁾	110/95 ¹⁾			
1LL8 405-6PC□□	2.6	10	24	76	91	2200/1900 ¹⁾	110/95 ¹⁾	Yes		
1LL8 407-6PC□□	2.5	10	27	76	91	2200/1900 ¹⁾	110/95 ¹⁾	Yes		
1LL8 453-6PD□□	2.5	7	35	78	93	2100/1800 ¹⁾	105/90 ¹⁾	Yes	Yes	
1LL8 455-6PD□□	2.4	7	39	78	93	2100/1800 ¹⁾	105/90 ¹⁾	Yes		
1LL8 457-6PD□□	2.5	7	44	78	93	2100/1800 ¹⁾	105/90 ¹⁾	Yes		
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V										
1LL8 315-8PC□□	2.4	10	6.0	67	81	2950/2600 ¹⁾	196/173 ¹⁾			
1LL8 317-8PC□□	2.4	10	7.3	67	81	2950/2600 ¹⁾	196/173 ¹⁾			
1LL8 355-8PC□□	2.4	10	13	69	84	2500/2200 ¹⁾	166/146 ¹⁾			
1LL8 357-8PC□□	2.3	10	16	69	84	2500/2200 ¹⁾	166/146 ¹⁾	Yes		
1LL8 403-8PD□□	2.3	7	21	72	87	2200/1900 ¹⁾	146/126 ¹⁾			
1LL8 405-8PD□□	2.4	7	24	72	87	2200/1900 ¹⁾	146/126 ¹⁾			
1LL8 407-8PD□□	2.4	7	27	72	87	2200/1900 ¹⁾	146/126 ¹⁾	Yes		
1LL8 453-8PD□□	2.3	7	35	74	89	2100/1800 ¹⁾	140/120 ¹⁾	Yes		
1LL8 455-8PD□□	2.3	7	39	74	89	2100/1800 ¹⁾	140/120 ¹⁾	Yes	Yes	
1LL8 457-8PD□□	2.3	7	44	74	89	2100/1800 ¹⁾	140/120 ¹⁾	Yes	Yes	

¹⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through-ventilation
for converter-fed operation – Cast-iron series 1LL8

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output and sinusoidal supply						Order No.	Price	Weight of IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 690 V			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A		m kg	
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 V to 690 V											
300	330	315	2977	962	95.9		0.91	290	1LL8315-2PM8□	1300	
380	415	315	2977	1219	96.3		0.91	365	1LL8317-2PM8□	1500	
435	475	355	2982	1393	96.2		0.90	420	1LL8353-2PM8□	1900	
485	530	355	2982	1553	96.5		0.90	465	1LL8355-2PM8□	2000	
610	670	355	2983	1953	96.8		0.91	580	1LL8357-2PM8□	2200	
690	755	400	2986	2207	96.9		0.91	650	1LL8403-2PM8□	2800	
770	845	400	2986	2463	96.9		0.91	730	1LL8405-2PM8□	3000	
860	945	400	2988	2749	97.2		0.92	800	1LL8407-2PM7□	3200	
965	1060	450	2988	3084	97.2		0.92	2x450	1LL8453-2PM7□	4000	
1085	1190	450	2987	3469	97.2		0.93	2x500	1LL8455-2PM7□	4200	
1210	1330	450	2985	3871	97.3		0.93	2x560	1LL8457-2PM7□	4400	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 V to 690 V											
295	340	315	1485	1897	95.7		0.86	300	1LL8315-4PM8□	1300	
365	420	315	1487	2344	96.1		0.87	365	1LL8317-4PM8□	1500	
430	495	355	1489	2758	96.3		0.86	435	1LL8353-4PM8□	1900	
480	550	355	1489	3079	96.5		0.87	480	1LL8355-4PM8□	2000	
600	690	355	1490	3846	96.8		0.86	600	1LL8357-4PM8□	2200	
690	790	400	1491	4420	96.7		0.87	690	1LL8403-4PM8□	2800	
780	895	400	1491	4996	96.9		0.88	770	1LL8405-4PM8□	3000	
870	1000	400	1493	5565	97.1		0.85	880	1LL8407-4PM7□	3200	
980	1125	450	1493	6269	97.1		0.85	2x495	1LL8453-4PM7□	4000	
1095	1255	450	1492	7009	97.1		0.88	2x530	1LL8455-4PM7□	4200	
1225	1405	450	1491	7846	97.1		0.88	2x600	1LL8457-4PM7□	4400	

Order No. supplements

Motor type	Final position: Type of construction code			
	Without flange		With flange	
	IM B3	IM V1 without protective cover	IM V1 with protective cover	IM B35
	0	8	4	6
1LL8 315-... □□ to 1LL8 457-... □□	□	✓	✓	✓

- Standard version
- ✓ With additional charge

The voltage code is already in the Order No. as the penultimate position.

Assignment:

7 = 690 VΔ

8 = 400 VΔ/690 VY

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through-ventilation
for converter-fed operation – Cast-iron series 1LL8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz as multiple of rated torque	Parallel feeders required
	T_B/T_{rated}	690 V
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 V to 690 V		
1LL8315-2PM8□	2.9	
1LL8317-2PM8□	2.9	
1LL8353-2PM8□	2.7	
1LL8355-2PM8□	2.7	
1LL8357-2PM8□	2.7	
1LL8403-2PM8□	2.7	
1LL8405-2PM8□	2.7	
1LL8407-2PM7□	2.8	
1LL8453-2PM7□	3.0	Yes
1LL8455-2PM7□	2.8	Yes
1LL8457-2PM7□	2.7	Yes
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 V to 690 V		
1LL8315-4PM8□	2.9	
1LL8317-4PM8□	3.0	
1LL8353-4PM8□	2.7	
1LL8355-4PM8□	2.7	
1LL8357-4PM8□	2.8	
1LL8403-4PM8□	2.5	
1LL8405-4PM8□	2.6	
1LL8407-4PM7□	2.7	
1LL8453-4PM7□	2.9	Yes
1LL8455-4PM7□	2.7	Yes
1LL8457-4PM7□	2.6	Yes

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through-ventilation
for converter-fed operation – Cast-iron series 1LL8

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output and sinusoidal supply						Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight of IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 690 V			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 V to 690 V											
235	270	315	990	2267	95.0		0.87	240	1LL8315-6PM8□	1300	
295	335	315	990	2846	95.3		0.87	295	1LL8317-6PM8□	1500	
380	435	355	992	3658	95.6		0.87	380	1LL8355-6PM8□	2000	
475	545	355	993	4568	96.3		0.87	475	1LL8357-6PM8□	2200	
540	620	400	993	5193	96.4		0.86	550	1LL8403-6PM8□	2800	
610	700	400	994	5861	96.5		0.87	610	1LL8405-6PM8□	3000	
690	790	400	993	6636	96.6		0.87	690	1LL8407-6PM8□	3200	
780	895	450	993	7502	96.7		0.87	780	1LL8453-6PM8□	4000	
870	1000	450	993	8367	96.8		0.88	850	1LL8455-6PM7□	4200	
975	1120	450	993	9377	96.8		0.88	2x480	1LL8457-6PM7□	4500	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 V to 690 V											
180	205	315	738	2329	94.1		0.81	198	1LL8315-8PM8□	1300	
225	255	315	740	2904	94.8		0.80	250	1LL8317-8PM8□	1500	
285	325	355	741	3673	95.1		0.81	310	1LL8355-8PM8□	2000	
365	415	355	741	4704	95.4		0.83	385	1LL8357-8PM8□	2200	
420	480	400	741	5413	95.5		0.83	445	1LL8403-8PM8□	2800	
465	530	400	742	5985	96.0		0.83	490	1LL8405-8PM8□	3000	
525	600	400	742	6757	96.0		0.82	560	1LL8407-8PM8□	3200	
610	700	450	742	7851	95.9		0.82	650	1LL8453-8PM8□	4000	
690	790	450	742	8881	96.0		0.82	730	1LL8455-8PM8□	4200	
760	870	450	742	9782	96.0		0.83	800	1LL8457-8PM8□	4500	

Order No. supplements

Motor type	Final position: Type of construction code			
	Without flange IM B3	With flange IM V1 without protective cover	IM V1 with protective cover	IM B35
1LL8 315-... □□ to 1LL8 457-... □□	0	8	4	6
	□	✓	✓	✓

- Standard version
- ✓ With additional charge

The voltage code is already in the Order No. as the penultimate position.

Assignment:

7 = 690 VΔ

8 = 400 VΔ/690 VY

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through-ventilation
for converter-fed operation – Cast-iron series 1LL8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz as multiple of rated torque	Parallel feeders required
	T_B/T_{rated}	690 V
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 V to 690 V		
1LL8315-6PM8□	2.8	
1LL8317-6PM8□	2.8	
1LL8355-6PM8□	2.6	
1LL8357-6PM8□	2.7	
1LL8403-6PM8□	2.7	
1LL8405-6PM8□	2.7	
1LL8407-6PM8□	2.6	
1LL8453-6PM8□	2.6	
1LL8455-6PM7□	2.5	
1LL8457-6PM7□	2.6	Yes
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 V to 690 V		
1LL8315-8PM8□	2.7	
1LL8317-8PM8□	2.7	
1LL8355-8PM8□	2.7	
1LL8357-8PM8□	2.5	
1LL8403-8PM8□	2.5	
1LL8405-8PM8□	2.6	
1LL8407-8PM8□	2.6	
1LL8453-8PM8□	2.4	
1LL8455-8PM8□	2.4	
1LL8457-8PM8□	2.4	

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Overview

Motor protection

KTY 84 temperature sensor:

Order code **A23**:

1 x KTY 84-130 (+ 1 x KTY 84-130 as spare)

The sensor is a semi-conductor sensor that changes its resistance depending on temperature in accordance with a defined, approximately linear characteristic. The temperature sensor is embedded in the winding head of the motor in the same manner as a PTC thermistor.

PT100 resistance thermometers

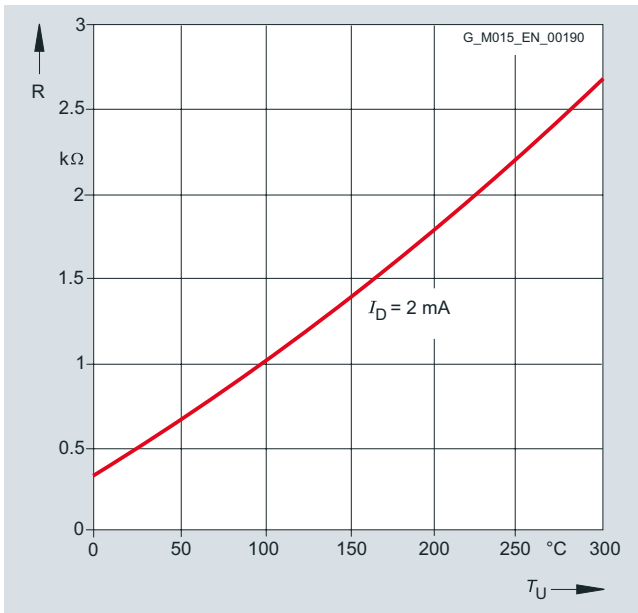
Order code **A61**: 6 PT100 resistance thermometers

The thermometer changes its resistance depending on the temperature in accordance with a defined, almost linear characteristic. The temperature sensor is embedded in the winding head of the motor in the same manner as a PTC thermistor.

Evaluation of the KTY or PT100 sensor is performed, for example, in the converter.

For motors for mains-fed operation, the 3RS10 temperature monitoring device that forms part of the protective equipment must be ordered separately, for further details, see Catalog LV 1.

For all non-standard motors of series 1LA8, 1PQ8 and 1LL8, if order code **A23** or **A61** is used, the standard PTC thermistors will be omitted. A combination of **A12** and **A61** or **A12** and **A23** is possible on request for an additional charge.



IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Selection and ordering data

Voltages

Additional order codes for other voltages or voltage codes
(without **-Z** supplement)

For some non-standard voltages at 50 or 60 Hz, order codes are specified. They are ordered by specifying the code digit **9** for voltage in the 11th position of the Order No. and the appropriate order code.

Special versions	Voltage code 11th position of Order No.	Additional identification code with order code and plain text if required	Motor type frame size			
			315	355	400	450
Self-ventilated motors for mains-fed operation – Cast-iron series 1LA8						
Self-ventilated motors for converter-fed operation – Cast-iron series 1LA8						
			1LA8			
Voltage at 60 Hz						
380 VΔ/660 VY; 50 Hz output ¹⁾	9	L2C	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output ¹⁾	9	L2D	✓	✓	✓	✓
440 VΔ; 50 Hz output ¹⁾	9	L2R	✓	✓	✓	✓
440 VΔ; 60 Hz output ¹⁾	9	L2X	✓	✓	✓	✓
460 VΔ; 50 Hz output ¹⁾	9	L2T	✓	✓	✓	✓
460 VΔ; 60 Hz output ¹⁾	9	L2F	✓	✓	✓	✓
575 VΔ; 50 Hz output	9	L2V	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M	✓	✓	✓	✓
Non-standard voltage and/or frequencies						
Standard winding (winding according to voltage code 0, 4, 5, 6, 7 or 8; rating plate will be stamped in accordance with order) ²⁾	9	L8Y •	✓	✓	✓	✓
Non-standard winding for voltages between 380 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •	✓	✓	✓	✓

- ✓ With additional charge
- This order code only determines the price of the version – Additional plain text is required.

¹⁾ Only possible with rated outputs of up to 630 kW.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Voltage code 11th position of Order No.	Additional identification code with order code and plain text if required	Motor type frame size			
			315	355	400	450
Forced-air cooled motors with mounted separately driven fan for converter-fed operation – Cast-iron series 1PQ8						
1PQ8						
Voltage at 60 Hz						
380 VΔ/660 VY; 50 Hz output ¹⁾	9	L2C	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output ¹⁾	9	L2D	✓	✓	✓	✓
440 VΔ; 50 Hz output ¹⁾	9	L2R	✓	✓	✓	✓
440 VΔ; 60 Hz output ¹⁾	9	L2X	✓	✓	✓	✓
460 VΔ; 50 Hz output ¹⁾	9	L2T	✓	✓	✓	✓
460 VΔ; 60 Hz output ¹⁾	9	L2F	✓	✓	✓	✓
575 VΔ; 50 Hz output	9	L2V	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M	✓	✓	✓	✓
Non-standard voltage and/or frequencies						
Standard winding (winding according to voltage code 4, 5, 7 or 8; rating plate will be stamped in accordance with order) ²⁾	9	L8Y •	✓	✓	✓	✓
Non-standard winding for voltages between 380 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •	✓	✓	✓	✓

- ✓ With additional charge
- This order code only determines the price of the version – Additional plain text is required.

Note:

The order codes listed above are only valid for motor series 1PQ8 with forced-air cooled motor.

The required voltage/frequency according to order code Y81 „Separately driven fan with non-standard voltage/frequency“ must be ordered in plain text with indication of the voltage, frequency and circuit.

¹⁾ Only possible with rated outputs of up to 630 kW.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Voltage code 11th position of Order No.	Additional identification code with order code and plain text if required	Motor type frame size			
			315	355	400	450
Self-ventilated motors with through ventilation for mains-fed and converter-fed operation – Cast-iron series 1LL8						
1LL8						
Voltage at 60 Hz						
380 VΔ/660 VY; 50 Hz output ¹⁾	9	L2C	✓	✓ ³⁾	✓ ³⁾	✓ ³⁾
380 VΔ/660 VY; 60 Hz output ¹⁾	9	L2D	✓	✓	✓	✓
440 VΔ; 50 Hz output ¹⁾	9	L2R	✓	✓	✓	✓
440 VΔ; 60 Hz output ¹⁾	9	L2X	✓	✓	✓	✓
460 VΔ; 50 Hz output ¹⁾	9	L2T	✓	✓	✓	✓
460 VΔ; 60 Hz output ¹⁾	9	L2F	✓	✓	✓	✓
575 VΔ; 50 Hz output	9	L2V	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M	✓	✓	✓	✓
Non-standard voltage and/or frequencies						
Standard winding (winding according to voltage code 0, 5 or 6; rating plate will be stamped in accordance with order) ²⁾	9	L8Y •	✓	✓	✓	✓
Non-standard winding for voltages between 380 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •	✓	✓	✓	✓

- ✓ With additional charge
- This order code only determines the price of the version – Additional plain text is required.

¹⁾ Only possible with rated outputs of up to 630 kW.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

³⁾ Not possible for 2-pole motors in 60 Hz version of frame size 355 and above.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Options

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size							
		315	355	400	450	315	355	400	450
Self-ventilated motors for mains-fed and converter-fed operation 1LA8									
		1LA8 Mains-fed operation				1LA8 Converter-fed operation			
Standardline									
Standardline version ¹⁾	B20	○	○	–	–	○	○	–	–
Motor protection									
Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ²⁾	A12	□	□	□	□	□	□	□	□
Motor temperature detection with embedded temperature sensor KTY 84-130 ³⁾	A23	○	○	○	○	○	○	○	○
Installation of 6 PT 100 resistance thermometers in stator winding ⁵⁾	A61	✓	✓	✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings	A72	✓	✓	✓	✓	✓	✓	✓	✓
Motor connection and connection box									
Two-part plate on connection box	K06	✓ ⁴⁾	✓	✓	✓	O. R.	O. R.	O. R.	O. R.
Undrilled entry plate	L01	○ ⁴⁾	○	○	○	○ ⁴⁾	○	○	○
Connection box on RHS	K09	□	□	□	□	□	□	□	□
Connection box on LHS	K10	○	○	○	○	○	○	○	○
Connection box above (1XB1 634 connection box) ⁵⁾	K11	✓	✓	✓	✓	✓	✓	✓	✓
Cable gland DIN 89280, maximum configuration	K57	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83	○	○	○	○	○	○	○	○
Rotation of the connection box through 90°, entry from NDE	K84	○	○	○	○	○	○	○	○
Rotation of connection box through 180°	K85	○	○	○	○	○	○	○	○
Larger connection box (1XB1 621 connection box)	M58	✓	□ ⁶⁾	–	–	✓	□ ⁶⁾	–	–
Larger connection box (1XB1 631 connection box)	L00	✓	✓ ⁶⁾	□	□	✓	✓ ⁶⁾	□	□
6 cables protruding, 1.5 m long	L48	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
6 cables protruding, 3 m long	L49	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Auxiliary connection box 1XB9 016 (cast-iron)	M50	✓	✓	✓	✓	✓	✓	✓	✓
Auxiliary connection box 1XB3 020 ⁷⁾	L97	✓	✓	✓	✓	✓	✓	✓	✓
Auxiliary connection box 1XB9 014 (aluminum)	M88	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on NDE	M64	✓	✓	✓	✓	✓	✓	✓	✓
Windings and insulation									
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF 1.1, SF 1.05 from frame size 400) ⁸⁾	C11	✓	✓	✓	✓	–	–	–	–
Temperature class 155 (F), used acc. to 155 (F), with increased output (10 %, 5 % from frame size 400) ⁸⁾	C12	✓	✓	✓	✓	–	–	–	–
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature (55 °C, 50 °C from frame size 400) ⁸⁾	C13	✓	✓	✓	✓	–	–	–	–
Temperature class 180 (H), used acc. to 155 (F), with service factor (SF 1.1) ⁸⁾	C14	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 3/53.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size							
		315	355	400	450	315	355	400	450
Self-ventilated motors for mains-fed and converter-fed operation 1LA8									
		1LA8 Mains-fed operation				1LA8 Converter-fed operation			
Colors and paint finish									
Standard finish in RAL 7030 stone gray		☐	☐	☐	☐	☐	☐	☐	☐
Standard paint finish in other colors	Y53 • and standard finish RAL	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in other colors	Y54 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓
Unpainted (only cast iron parts primed)	K23	○	○	○	○	○	○	○	○
Special technology									
Mounting of brake (incl. brake of Stromag)	H47	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Mounting of LL 861 900 220 rotary pulse encoder	H70	–	–	–	–	✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73	–	–	–	–	✓	✓	✓	✓
Prepared for mounting LL 861 900 220	H78	–	–	–	–	✓	✓	✓	✓
Prepared for mounting HOG 10 D 1024 I	H80	–	–	–	–	✓	✓	✓	✓
Mounting a special type of rotary pulse encoder	Y70 • and encoder designation	–	–	–	–	O. R.	O. R.	O. R.	O. R.
Mechanical design and degrees of protection									
Low-noise version for 2-pole motors with clockwise direction of rotation	K37	✓	☐	☐	☐	✓	☐	☐	☐
Low-noise version for 2-pole motors with counter-clockwise direction of rotation	K38	✓	○	○	○	✓	○	○	○
IP56 degree of protection (non-heavy-sea)	K52	✓	✓	✓	✓	✓	✓	✓	✓
Non-rusting screws (externally)	M27	✓	✓	✓	✓	✓	✓	✓	✓
Coolant temperature and site altitude									
Coolant temperature –40 to +40 °C	D03	✓	✓	✓	✓	✓	✓	✓	✓
Coolant temperature –30 to +40 °C	D04	✓	✓	✓	✓	✓	✓	✓	✓
Coolant temperature 45 °C, derating 4 % ⁹⁾	D11	○	○	○	○	○	○	○	○
Coolant temperature 50 °C, derating 8 % ⁹⁾	D12	○	○	○	○	○	○	○	○
Coolant temperature 55 °C, derating 13 % ⁹⁾	D13	○	○	○	○	○	○	○	○
Coolant temperature 60 °C, derating 18 % ⁹⁾	D14	○	○	○	○	○	○	○	○
Designs in accordance with standards and specifications									
Electrical according to NEMA MG1-12	D30	✓	✓	✓	✓	✓	✓	✓	✓
Design according to UL with "Recognition Mark"	D31	✓	✓	✓	✓	✓	✓	✓	✓
Canadian regulations (CSA)	D40	✓	✓	✓	✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		315	355	400	450	315	355	400	450	
Self-ventilated motors for mains-fed and converter-fed operation 1LA8										
			1LA8 Mains-fed operation				1LA8 Converter-fed operation			
Design for Zones 1, 2 and 22 according to ATEX ¹⁰⁾										
Design for Zone 2 for mains-fed operation Ex nA II T3 to IEC/EN 60079-15 ^{11) 12) 13)}	M72	✓	✓	✓	✓	–	–	–	–	
Design for Zone 2 for converter-fed operation, reduced output Ex nA II T3 to IEC/EN 60079-15 ^{11) 12) 13) 14)}	M73	–	–	–	–	O. R.	O. R.	O. R.	O. R.	
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation ¹³⁾	M35	✓	✓	✓	✓	–	–	–	–	
Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation ^{12) 13)}	M39	–	–	–	–	✓	✓	✓	✓	
VIK version ^{13) 15)}	K30	✓	✓	–	–	O. R.	O. R.	–	–	
Stamping of Ex nA II on VIK rating plate	C27	✓	✓	–	–	O. R.	O. R.	–	–	
Bearings and lubrication										
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50	✓	✓	✓	✓	✓	✓	✓	✓	
Bearing design for increased cantilever forces ¹⁶⁾	K20	✓	✓	–	–	✓	✓	–	–	
Balance and vibration quantity										
Vibration quantity level B	K02	✓	✓	✓	✓	✓	✓	✓	✓	
Full key balancing	L68	✓	✓	✓	✓	✓	✓	✓	✓	
Shaft and rotor										
Second standard shaft extension ¹⁷⁾	K16	✓	✓	✓	✓	✓	✓	✓	✓	
Shaft extension with standard dimensions, without featherkey way	K42	✓	✓	✓	✓	✓	✓	✓	✓	
Non-standard cylindrical shaft extension	Y55 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	
Heating and ventilation										
Metal external fan	K35	✓	✓	✓	✓	✓	✓	✓	✓	
Anti-condensation heaters for 230 V	K45	✓	✓	✓	✓	✓	✓	✓	✓	
Anti-condensation heaters for 115 V	K46	✓	✓	✓	✓	✓	✓	✓	✓	
Rating plate and extra rating plates										
Second rating plate, loose	K31	✓	✓	✓	✓	✓	✓	✓	✓	
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	
Extra rating plate with identification code	Y82 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	
Packaging, safety notes, documentation and test certificates¹⁸⁾										
Document – Electrical data sheet	B31	✓	✓	✓	✓	✓	✓	✓	✓	
Document – Order dimension drawing	B32	✓	✓	✓	✓	✓	✓	✓	✓	
Document – Load characteristics	B37	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	
Standard test (routine test) with acceptance	F01	✓	✓	✓	✓	✓	✓	✓	✓	
Visual acceptance and report handover with acceptance	F03	✓	✓	✓	✓	✓	✓	✓	✓	

For legend and footnotes, see Page 3/53.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size							
		315	355	400	450	315	355	400	450
Self-ventilated motors for mains-fed and converter-fed operation 1LA8									
		1LA8 Mains-fed operation				1LA8 Converter-fed operation			
Packaging, safety notes, documentation and test certificates ¹⁸⁾ (continued)									
Temperature-rise test, without acceptance	F04	✓	✓	✓	✓	✓	✓	✓	✓
Temperature-rise test, with acceptance	F05	✓	✓	✓	✓	✓	✓	✓	✓
Noise measurement in no-load operation, no noise analysis, no acceptance	F28	✓	✓	✓	✓	✓	✓	✓	✓
Noise measurement in no-load operation, no noise analysis, with acceptance	F29	✓	✓	✓	✓	✓	✓	✓	✓
Noise measurement in no-load operation, with noise analysis, without acceptance	F62	✓	✓	✓	✓	✓	✓	✓	✓
Noise measurement in no-load operation, with noise analysis, with acceptance	F63	✓	✓	✓	✓	✓	✓	✓	✓
Recording of current and torque curves with torque metering shaft during starting, without acceptance	F34	✓	✓	✓	✓	–	–	–	–
Recording of current and torque curves with torque metering shaft during starting, with acceptance	F35	✓	✓	✓	✓	–	–	–	–
Measurement of locked-rotor torque and current, without acceptance	F52	✓	✓	✓	✓	–	–	–	–
Measurement of locked-rotor torque and current, with acceptance	F53	✓	✓	✓	✓	–	–	–	–
Type test with heat run for horizontal motors, without acceptance	F82	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, without acceptance	F92	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F93	✓	✓	✓	✓	✓	✓	✓	✓

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Possible on request
- ✓ With additional charge
- Not possible

¹⁾ For 4-pole version only, type of construction IM B3, 400 V Δ /690 VY or 500 VA voltage (no special insulation). Only the following short codes can be ordered in combination with the *Standardline*: **A23, A61, A72, G50, H70, H73, K09, K10, K45, K46, K83, K84, K85, L00, L97, M58** (only frame size 315), **M88, Y53**.

²⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.

³⁾ The standard thermistors are omitted. If PTC thermistors are required as well as KTYs or PT100s, this must be specified in the order in plain text. A combination of **A12** and **A61** or **A12** and **A23** is possible on request for an additional charge.

⁴⁾ Only possible in combination with the larger connection boxes 1XB1 621 or 1XB1 631 (order codes **M58** or **L00**).

⁵⁾ A combination with the order codes **M88** and **M50** is not possible. Connection box 1XP1 634 can be rotated through 4 x 90°. Cable entry is from NDE or the delivery position. Dimension drawings available on request.

⁶⁾ With 1LA8 357-2 and 1LA8 357-4, connection box 1XB1 631 is supplied in the standard version.

⁷⁾ VIK version is not possible.

⁸⁾ Use according to temperature class 180 (H) is not possible. All 400 V version are available on request. Due to the rated current, a larger connection box of type 1XB9 600, which is part of order code **C14**, is generally provided for frame sizes 400 (2- and 4-pole) and 450 (all no. of poles).

⁹⁾ Site altitude up to 1000 m above sea level.

¹⁰⁾ Explosion-protected encoders are available on request.

¹¹⁾ Only admissible for use in accordance with temperature class 130 (B). PTC thermistors for temperature class 130 (B) are included. For compliance with temperature class 130 (B), derating is necessary in the case of converter-fed operation in Zones 2 and 22. Derating data are available on request.

¹²⁾ These motors do not have a rated voltage range stamped on the rating plate.

¹³⁾ For options **K30, M35, M39, M72, M73** an additional metal external fan order code **K35** must be ordered.

¹⁴⁾ In the order, the "Speed range and torque characteristic" must be specified in plain text. A system test is necessary for $M = \text{constant}$.

¹⁵⁾ The VIK version comprises Zone 2 for mains-fed operation – without Ex nA II marking on rating plate. For 2-pole motors of frame size 315, the low-noise version is also required. Order code **K37** or **K38** and additionally the metal external fan order code **K35**. Note the specified output and dimensions. For 1LA8 353 to 1LA8 357 motors, the connection box cannot be rotated by 4 x 90°.

¹⁶⁾ Not possible for 2-pole motors and motors of vertical type of construction.

¹⁷⁾ Please inquire in the case of 2-pole motors and motors in vertical type of construction.

¹⁸⁾ Type testing is also performed for converter-fed operation.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size			
		315	355	400	450
Forced-air cooled motors with mounted separately driven fan for converter-fed operation 1PQ8					
1PQ8					
Converter-fed operation					
Standardline					
Standardline version	B20	–	–	–	–
Motor protection					
Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	A12	☐	☐	☐	☐
Motor temperature detection with embedded temperature sensor KTY 84-130 ²⁾	A23	○	○	○	○
Installation of 6 PT 100 resistance thermometers in stator winding ²⁾	A61	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings	A72	✓	✓	✓	✓
Motor connection and connection box					
Two-part plate on connection box	K06	O. R.	O. R.	O. R.	O. R.
Undrilled entry plate	L01	○ ³⁾	○	○	○
Connection box on RHS	K09	☐	☐	☐	☐
Connection box on LHS	K10	○	○	○	○
Connection box above (1XB1 634 connection box) ⁴⁾	K11	✓	✓	✓	✓
Cable gland, maximum configuration	K57	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83	○	○	○	○
Rotation of the connection box through 90°, entry from NDE	K84	○	○	○	○
Rotation of connection box through 180°	K85	○	○	○	○
Larger connection box (1XB1 621 connection box)	M58	✓	☐ ⁵⁾	–	–
Larger connection box (1XB1 631 connection box)	L00	✓	✓ ⁵⁾	☐	☐
6 cables protruding, 1.5 m long	L48	O. R.	O. R.	O. R.	O. R.
6 cables protruding, 3 m long	L49	O. R.	O. R.	O. R.	O. R.
Auxiliary connection box 1XB9 016 (cast-iron)	M50	✓	✓	✓	✓
Auxiliary connection box 1XB3 020	L97	✓	✓	✓	✓
Auxiliary connection box 1XB9 014 (aluminum)	M88	✓	✓	✓	✓
Connection box on NDE	M64	✓	✓	✓	✓

For legend and footnotes, see Page 3/57.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size			
		315	355	400	450
Forced-air cooled motors with mounted separately driven fan for converter-fed operation 1PQ8					
1PQ8 Converter-fed operation					
Windings and insulation					
Temperature class 180 (H), used acc. to 155 (F), with service factor (SF 1.1) ⁶⁾	C14	✓	✓	✓	✓
Colors and paint finish					
Standard finish in RAL 7030 stone gray		□	□	□	□
Standard paint finish in other colors	Y53 • and standard finish RAL	✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26	✓	✓	✓	✓
Special finish in other colors	Y54 • and special finish RAL	✓	✓	✓	✓
Unpainted (only cast-iron parts primed)	K23	○	○	○	○
Special technology					
Mounting of brake (incl. brake of Stromag)	H47	O. R.	O. R.	O. R.	O. R.
Mounting of LL 861 900 220 rotary pulse encoder	H70	✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73	✓	✓	✓	✓
Prepared for mounting LL 861 900 220	H78	✓	✓	✓	✓
Prepared for mounting HOG 10 D 1024 I	H80	✓	✓	✓	✓
Mounting a special type of rotary pulse encoder	Y70 • and encoder designation	O. R.	O. R.	O. R.	O. R.
Mechanical design and degrees of protection					
Low-noise version for 2-pole motors with clockwise direction of rotation	K37	–	–	–	–
Low-noise version for 2-pole motors with counter-clockwise direction of rotation	K38	–	–	–	–
IP56 degree of protection (non-heavy-sea)	K52	O. R.	O. R.	O. R.	O. R.
Non-rusting screws (externally) ⁷⁾	M27	✓	✓	✓	✓
Coolant temperature and site altitude					
Coolant temperature –40 to +40 °C	D03	O. R.	O. R.	O. R.	O. R.
Coolant temperature –30 to +40 °C	D04	O. R.	O. R.	O. R.	O. R.
Coolant temperature 45 °C, derating 4 % ⁸⁾	D11	○	○	○	○
Coolant temperature 50 °C, derating 8 % ⁸⁾	D12	○	○	○	○
Coolant temperature 55 °C, derating 13 % ⁸⁾	D13	○	○	○	○
Coolant temperature 60 °C, derating 18 % ⁸⁾	D14	○	○	○	○

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size			
		315	355	400	450
Forced-air cooled motors with mounted separately driven fan for converter-fed operation 1PQ8					
		1PQ8			
		Converter-fed operation			
Designs in accordance with standards and specifications					
Electrical according to NEMA MG1-12 ⁹⁾	D30	✓	✓	✓	✓
Design according to UL with "Recognition Mark"	D31	✓	✓	✓	✓
Canadian regulations (CSA)	D40	✓	✓	✓	✓
Design for Zones 2 and 22 according to ATEX¹⁰⁾					
Design for Zone 2 for mains-fed operation Ex nA II T3 to IEC/EN 60079-15	M72	–	–	–	–
Design for Zone 2 for converter-fed operation, reduced output Ex nA II T3 to IEC/EN 60079-15 ^{11) 12) 13)}	M73	O. R.	O. R.	O. R.	O. R.
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	M35	–	–	–	–
Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation	M39	–	–	–	–
VIK version	K30	–	–	–	–
Stamping of Ex nA II on VIK rating plate	C27	–	–	–	–
Bearings and lubrication					
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50	✓	✓	✓	✓
Bearing design for increased cantilever forces ¹⁴⁾	K20	✓	✓	–	–
Balance and vibration quantity					
Vibration quantity level B	K02	✓	✓	✓	✓
Full key balancing	L68	✓	✓	✓	✓
Shaft and rotor					
Second standard shaft extension	K16	–	–	–	–
Shaft extension with standard dimensions, without featherkey way	K42	✓	✓	✓	✓
Non-standard cylindrical shaft extension	Y55 • and identification code	✓	✓	✓	✓
Heating and ventilation					
Anti-condensation heaters for 230 V	K45	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46	✓	✓	✓	✓
Separately driven fan with non-standard voltage and/or frequency ¹⁵⁾	Y81 • and identification code	✓	✓	✓	✓
Rating plate and extra rating plates					
Second rating plate, loose	K31	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates¹⁶⁾					
Document – Electrical data sheet	B31	✓	✓	✓	✓
Document – Order dimension drawing	B32	✓	✓	✓	✓

For legend and footnotes, see Page 3/57.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size			
		315	355	400	450
Forced-air cooled motors with mounted separately driven fan for converter-fed operation 1PQ8					
		1PQ8 Converter-fed operation			
Packaging, safety notes, documentation and test certificates ¹⁶⁾ (continued)					
Document – Load characteristics	B37	O. R.	O. R.	O. R.	O. R.
Normal inspection (routine inspection) with acceptance	F01	✓	✓	✓	✓
Visual acceptance and report handover with acceptance	F03	✓	✓	✓	✓
Temperature-rise test, without acceptance	F04	✓	✓	✓	✓
Temperature-rise test, with acceptance	F05	✓	✓	✓	✓
Noise measurement in no-load operation, no noise analysis, no acceptance	F28	✓	✓	✓	✓
Noise measurement in no-load operation, no noise analysis, with acceptance	F29	✓	✓	✓	✓
Noise measurement in no-load operation, with noise analysis, without acceptance	F62	✓	✓	✓	✓
Noise measurement in no-load operation, with noise analysis, with acceptance	F63	✓	✓	✓	✓
Recording of current and torque curves with torque metering shaft during starting, without acceptance	F34	–	–	–	–
Recording of current and torque curves with torque metering shaft during starting, with acceptance	F35	–	–	–	–
Measurement of locked-rotor torque and current, without acceptance	F52	–	–	–	–
Measurement of locked-rotor torque and current, with acceptance	F53	–	–	–	–
Type test with heat run for horizontal motors, without acceptance	F82	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83	✓	✓	✓	✓
Type test with heat run for vertical motors, without acceptance	F92	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F93	✓	✓	✓	✓

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- O. R. Possible on request
- ✓ With additional charge
- Not possible

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.

²⁾ The standard thermistors are omitted. If PTC thermistors are required as well as KTYs or PT100s, this must be specified in the order in plain text. A combination of **A12** and **A61** or **A12** and **A23** is possible on request for an additional charge.

³⁾ Only possible in combination with the larger connection boxes 1XB1 621 or 1XB1 631 (order codes **M58** or **L00**).

⁴⁾ A combination with the order codes **M88** and **M50** is not possible. Connection box 1XP1 634 can be rotated through 4 x 90°. Cable entry is from NDE or the delivery position. Dimension drawings available on request.

⁵⁾ With 1PQ8 357-2 and 1PQ8 357-4, connection box 1XB1 631 is supplied in the standard version.

⁶⁾ Use according to temperature class 180 (H) is not possible. All 400 V version are available on request. Due to the rated current, a larger connection box of type 1XB9 600, which is part of order code **C14**, is generally provided for frame sizes 400 (2- and 4-pole) and 450 (all no. of poles).

⁷⁾ Only possible for main motor – Not possible for separately driven fan.

⁸⁾ Site altitude up to 1000 m above sea level.

⁹⁾ Only possible for main motor – Not possible for separately driven fan motor.

¹⁰⁾ Explosion-protected encoders are available on request.

¹¹⁾ Only admissible for use in accordance with temperature class 130 (B). PTC thermistors for temperature class 130 (B) are included. For compliance with temperature class 130 (B), derating is necessary in the case of converter-fed operation in Zones 2 and 22. Derating data are available on request.

¹²⁾ These motors do not have a rated voltage range stamped on the rating plate.

¹³⁾ In the order, the "Speed range and torque characteristic" must be specified in plain text. A system test is necessary for $M = \text{constant}$.

¹⁴⁾ Not possible for 2-pole motors and motors of vertical type of construction.

¹⁵⁾ When ordering, specify in plain text: Voltage, frequency and circuit.

¹⁶⁾ Type testing is also performed for converter-fed operation.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size							
		315	355	400	450	315	355	400	450
Self-ventilated motors with through ventilation for mains-fed and converter-fed operation									
		1LL8 Mains-fed operation				1LL8 Converter-fed operation			
Standardline									
Standardline version	B20	–	–	–	–	–	–	–	–
Motor protection									
Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	A12	☐	☐	☐	☐	☐	☐	☐	☐
Motor temperature detection with embedded temperature sensor KTY 84-130 ²⁾	A23	○	○	○	○	○	○	○	○
Installation of 6 PT 100 resistance thermometers in stator winding ²⁾	A61	✓	✓	✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings	A72	✓	✓	✓	✓	✓	✓	✓	✓
Motor connection and connection box									
Two-part plate on connection box	K06	✓	✓	✓	✓	O. R.	O. R.	O. R.	O. R.
Undrilled entry plate	L01	○	○	○	○	○	○	○	○
Connection box on RHS	K09	☐	☐	☐	☐	☐	☐	☐	☐
Connection box on LHS	K10	○	○	○	○	○	○	○	○
Connection box above (1XB1 634 connection box) ³⁾	K11	✓	✓	✓	✓	✓	✓	✓	✓
Cable gland, maximum configuration	K57	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83	○	○	○	○	○	○	○	○
Rotation of the connection box through 90°, entry from NDE	K84	○	○	○	○	○	○	○	○
Rotation of connection box through 180°	K85	○	○	○	○	○	○	○	○
Larger connection box (1XB1 621 connection box)	M58	✓	–	–	–	☐	–	–	–
Larger connection box (1XB1 631 connection box)	L00	✓	☐	☐	☐	✓	☐	☐	☐
6 cables protruding, 1.5 m long	L48	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
6 cables protruding, 3 m long	L49	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Auxiliary connection box 1XB9 016 (cast-iron)	M50	✓	✓	✓	✓	✓	✓	✓	✓
Auxiliary connection box 1XB3 020	L97	✓	✓	✓	✓	✓	✓	✓	✓
Auxiliary connection box 1XB9 014 (aluminum)	M88	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on NDE	M64	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 3/61.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		315	355	400	450	315	355	400	450	
Self-ventilated motors with through ventilation for mains-fed and converter-fed operation										
			1LL8 Mains-fed operation				1LL8 Converter-fed operation			
Windings and insulation										
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF 1.1, SF 1.05 from frame size 400) ⁴⁾	C11	✓	✓	✓	✓	–	–	–	–	
Temperature class 155 (F), used acc. to 155 (F), with increased output (10 %, 5 % from frame size 400) ⁴⁾	C12	✓	✓	✓	✓	–	–	–	–	
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature (55 °C, 50 °C from frame size 400) ⁴⁾	C13	✓	✓	✓	✓	–	–	–	–	
Temperature class 180 (H), used acc. to 155 (F), with service factor (SF 1.1)	C14	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	
Colors and paint finish										
Standard finish in RAL 7030 stone gray		□	□	□	□	□	□	□	□	
Standard paint finish in other colors	Y53 • and standard finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	
Special finish in RAL 7030 stone gray	K26	✓	✓	✓	✓	✓	✓	✓	✓	
Special finish in other colors	Y54 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	
Unpainted (only cast iron parts primed)	K23	○	○	○	○	○	○	○	○	
Special technology										
Mounting of brake (incl. brake of Stromag)	H47	–	–	–	–	–	–	–	–	
Mounting of LL 861 900 220 rotary pulse encoder	H70	–	–	–	–	✓	✓	✓	✓	
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73	–	–	–	–	✓	✓	✓	✓	
Prepared for mounting LL 861 900 220	H78	–	–	–	–	✓	✓	✓	✓	
Prepared for mounting HOG 10 D 1024 I	H80	–	–	–	–	✓	✓	✓	✓	
Mounting a special type of rotary pulse encoder	Y70 • and encoder designation	–	–	–	–	O. R.	O. R.	O. R.	O. R.	
Mechanical design and degrees of protection										
Low-noise version for 2-pole motors with clockwise direction of rotation	K37	✓	○	○	○	✓	○	○	○	
Low-noise version for 2-pole motors with counter-clockwise direction of rotation	K38	✓	○	○	○	✓	○	○	○	
IP56 degree of protection (non-heavy-sea)	K52	–	–	–	–	–	–	–	–	
Non-rusting screws (externally)	M27	✓	✓	✓	✓	✓	✓	✓	✓	
Coolant temperature and site altitude										
Coolant temperature –40 to +40 °C	D03	–	–	–	–	–	–	–	–	
Coolant temperature –30 to +40 °C	D04	–	–	–	–	–	–	–	–	
Coolant temperature 45 °C, derating 4 % ⁵⁾	D11	○	○	○	○	○	○	○	○	
Coolant temperature 50 °C, derating 8 % ⁵⁾	D12	○	○	○	○	○	○	○	○	
Coolant temperature 55 °C, derating 13 % ⁵⁾	D13	○	○	○	○	○	○	○	○	
Coolant temperature 60 °C, derating 18 % ⁵⁾	D14	○	○	○	○	○	○	○	○	

For legend and footnotes, see Page 3/61.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size							
		315	355	400	450	315	355	400	450
Self-ventilated motors with through ventilation for mains-fed and converter-fed operation									
		1LL8 Mains-fed operation				1LL8 Converter-fed operation			
Design in accordance with standards and specifications									
Electrical according to NEMA MG1-12	D30	✓	✓	✓	✓	✓	✓	✓	✓
Design according to UL with "Recognition Mark"	D31	✓	✓	✓	✓	✓	✓	✓	✓
VIK version	K30	–	–	–	–	–	–	–	–
Canadian regulations (CSA)	D40	✓	✓	✓	✓	✓	✓	✓	✓
Designs for Zones 2 and 22 according to ATEX									
Design for Zone 2 for mains-fed operation Ex nA II T3 to IEC/EN 60079-15	M72	–	–	–	–	–	–	–	–
Design for Zone 2 for converter-fed operation, derating Ex nA II T3 to IEC/EN 60079-15	M73	–	–	–	–	–	–	–	–
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	M35	–	–	–	–	–	–	–	–
Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation	M39	–	–	–	–	–	–	–	–
Stamping of Ex nA II on VIK rating plate	C27	–	–	–	–	–	–	–	–
Bearings and lubrication									
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50	✓	✓	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces	K20	–	–	–	–	–	–	–	–
Balance and vibration quantity									
Vibration quantity level B	K02	✓	✓	✓	✓	✓	✓	✓	✓
Full key balancing	L68	✓	✓	✓	✓	✓	✓	✓	✓
Shaft and rotor									
Second standard shaft extension ^{b)}	K16	✓	✓	✓	✓	✓	✓	✓	✓
Shaft extension with standard dimensions, without featherkey way	K42	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension	Y55 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓
Heating and ventilation									
Metal external fan	K35	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46	✓	✓	✓	✓	✓	✓	✓	✓
Sheet metal fan cover	L36	□	□	□	□	□	□	□	□
Rating plate and extra rating plates									
Second rating plate, loose	K31	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates ⁷⁾									
Document – Electrical data sheet	B31	✓	✓	✓	✓	✓	✓	✓	✓
Document – Order dimension drawing	B32	✓	✓	✓	✓	✓	✓	✓	✓
Document – Load characteristics	B37	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

For legend and footnotes, see Page 3/61.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size							
		315	355	400	450	315	355	400	450
Self-ventilated motors with through ventilation for mains-fed and converter-fed operation									
		1LL8 Mains-fed operation				1LL8 Converter-fed operation			
Packaging, safety notes, documentation and test certificates ⁷⁾ (continued)									
Standard test (routine test) with acceptance	F01	✓	✓	✓	✓	✓	✓	✓	✓
Visual acceptance and report handover with acceptance	F03	✓	✓	✓	✓	✓	✓	✓	✓
Temperature-rise test, without acceptance	F04	✓	✓	✓	✓	✓	✓	✓	✓
Temperature-rise test, with acceptance	F05	✓	✓	✓	✓	✓	✓	✓	✓
Noise measurement in no-load operation, no noise analysis, no acceptance	F28	✓	✓	✓	✓	✓	✓	✓	✓
Noise measurement in no-load operation, no noise analysis, with acceptance	F29	✓	✓	✓	✓	✓	✓	✓	✓
Noise measurement in no-load operation, with noise analysis, without acceptance	F62	✓	✓	✓	✓	✓	✓	✓	✓
Noise measurement in no-load operation, with noise analysis, with acceptance	F63	✓	✓	✓	✓	✓	✓	✓	✓
Recording of current and torque curves with torque metering shaft during starting, without acceptance	F34	✓	✓	✓	✓	–	–	–	–
Recording of current and torque curves with torque metering shaft during starting, with acceptance	F35	✓	✓	✓	✓	–	–	–	–
Measurement of locked-rotor torque and current, without acceptance	F52	✓	✓	✓	✓	–	–	–	–
Measurement of locked-rotor torque and current, with acceptance	F53	✓	✓	✓	✓	–	–	–	–
Type test with heat run for horizontal motors, without acceptance	F82	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, without acceptance	F92	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F93	✓	✓	✓	✓	✓	✓	✓	✓

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Possible on request
- ✓ With additional charge
- Not possible

1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.

2) The standard thermistors are omitted. If PTC thermistors are required as well as KTYs or PT100s, this must be specified in the order in plain text. A combination of **A12** and **A61** or **A12** and **A23** is possible on request for an additional charge.

3) A combination with the order codes **M88** and **M50** is not possible. Connection box 1XP1 634 can be rotated through 4 x 90°. Cable entry is from NDE or the delivery position. Dimension drawings available on request.

4) Use according to temperature class 180 (H) is not possible. All 400 V version are available on request. Due to the rated current, a larger connection box of type 1XB9 600, which is part of order code **C14**, is generally provided for frame sizes 400 (2- and 4-pole) and 450 (all no. of poles).

5) Site altitude 1000 m above sea level

6) Please inquire in the case of 2-pole motors and motors in vertical type of construction.

7) Type testing is also performed for converter-fed operation.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Accessories

Overview

Slide rails with fixing bolts and tensioning screws to DIN 42923

Slide rails are used to tension the belt of a machine easily and conveniently when a belt tightener is not available. They are fixed to the base using stone bolts or foundation blocks.

The assignment of slide rails to motor size can be found in DIN 42923. For motors of frame sizes 335 to 450, there are no standardized slide rails (please inquire).

Available from:

Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Foundation block acc. to DIN 799

The foundation blocks are inserted into the stone foundation and embedded in concrete. They are used for fixing machines of medium size, slide rails, pedestal bearings, baseframes, etc. After the fixing bolts have been unscrewed, the machine can be dragged without it having to be lifted.

When the machine is initially installed, the foundation block that is bolted to the machine (without washers) and fitted with tapered pins is not embedded with concrete until the machine has been fully aligned. In this case, the machine is positioned 2 to 3 mm lower. The difference in shaft height is compensated by inserting shims on final installation. The tapered pins safeguard the exact position of the machine when it is repeatedly removed and replaced without the need for realignment.

Available from:

Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Taper pins to DIN 258 with threaded ends and constant taper lengths

Taper pins are used for components that are repeatedly removed. The drilled hole is ground conical using a conical reamer until the pin can be pushed in by hand until the cone shoulder lies 3 to 4 mm above the rim of the hole.

It can then be driven in using a hammer until it is correctly seated. The pin is removed from the drilled hole by screwing on the nut and tightening it.

Standardized taper pins are available from general engineering suppliers.

Available from:

Otto Roth GmbH & Co. KG
Rutesheimer Straße 22
70499 Stuttgart, Germany
Tel. +49 (0)711-13 88-0
Fax +49 (0)711-13 88-233

<http://www.ottoroth.de>
e-mail: info@ottoroth.de

Couplings

The motor from Siemens is connected to the machine or gear unit through a coupling. Flender is an important coupling manufacturer with a wide range of products. For standard applications, Siemens recommends that elastic couplings of Flender types N-Eupex and Rupex or torsionally rigid couplings of types Arpex and Zapex are used. For special applications, Fludex and Elpex-S couplings are recommended. These coupling types are suitable for use in areas subject to explosion hazards and are offered with declaration of conformity and type test certificate according to directive 94/9/EU.

Source of supply:

Siemens contact partner – ordering from Catalog
Siemens MD 10.1 „FLENDER Standard Couplings“

or

A. Friedr. Flender AG
Kupplungswerk Mussum
Industriepark Bocholt
Schlavenhorst 100
46395 Bocholt, Germany
Tel. +49 (0)2871-92 2185
Fax +49 (0)2871-92 2579

<http://www.flender.com>
e-mail: couplings@flender.com

More information

Spare motors and repair parts

- Supply commitment for spare motors and repair parts following delivery of the motor
 - For up to 5 years, in the event of total motor failure, Siemens will supply a comparable motor with regard to the mounting dimensions and functions (the type series may vary).
 - Repair parts will be supplied for up to 5 years.
 - For up to 10 years, Siemens will provide information and will, if necessary, supply documentation for repair parts.
- When repair parts are ordered, the following details must be provided:
 - Designation and part number
 - Order No. and factory number of the motor

Example for an order for a fan cowl 1LA8, frame size 315, 4-pole:

**Fan cowl No. 12.01,
1LA8 315-4AB60, factory No. J1172515010001**

- For bearing types, see the “Introduction”.
- For standard components, a supply commitment does not apply.
- Support – Hotline
In Germany
Tel.: 01 80/5 05 04 48

You will find telephone numbers for other countries on our Internet site:

<http://www.siemens.com/automation/service&support>

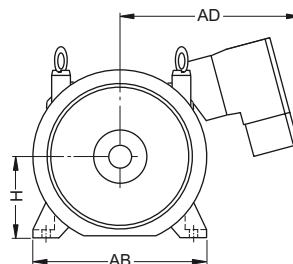
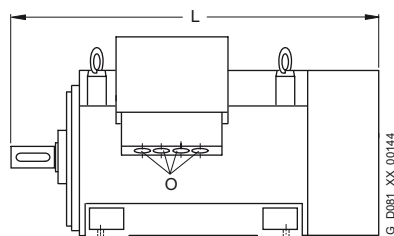
IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Dimensions

Overview

Overall dimensions



Frame size	Type	Number of poles	Dimensions			
			L	AD	H	AB
315	1LA8	2	1380	570	315	680
	1LA8	4, 6, 8	1410	570	315	680
	1LA8	4, 6, 8 ¹⁾	1430	570	315	680
	1PQ8	2	1742	570	315	680
	1PQ8	4, 6, 8	1772	570	315	680
	1PQ8	4 ¹⁾	1792	570	315	680
	1LL8	2	1380	662	315	680
	1LL8	4, 6, 8	1410	662	315	680
355	1LA8	2	1605	710	355	780
	1LA8	4, 6, 8	1635	710	355	780
	1LA8	4, 6, 8 ¹⁾	1699	710	355	780
	1PQ8	2	1971	690	355	780
	1PQ8	4, 6, 8	2001	690	355	780
	1PQ8	4, 6, 8 ¹⁾	2065	690	355	780
	1LL8	2	1635	840	355	780
	1LL8	4, 6, 8	1675	840	355	780

Frame size	Type	Number of poles	Dimensions			
			L	AD	H	AB
400	1LA8	2	1793	865	400	860
	1LA8	4, 6, 8	1833	865	400	860
	1PQ8	2	2148	865	400	860
	1PQ8	4, 6, 8	2188	865	400	860
	1LL8	2	1793	865	400	860
	1LL8	4, 6, 8	1833	865	400	860
450	1LA8	2	1953	900	450	980
	1LA8	4, 6, 8	1993	900	450	980
	1PQ8	2	2308	900	450	980
	1PQ8	4, 6, 8	2348	900	450	980
	1LL8	2	1953	900	450	980
	1LL8	4, 6, 8	2033	900	450	980

For dimension "O", see "Introduction" under "Connection boxes".

Notes on the dimensions

■ Dimension drawings according to DIN EN 50347 and IEC 60072.

■ Fits

The shaft extensions specified in the dimension tables (DIN 748) and centering spigot diameters (DIN EN 50347) are machined with the following fits:

Dimension designation	ISO fit	DIN ISO 286-2
D, DA	over 50	m6
N	over 250	h6
F, FA		h9
K		H17
S	Flange (FF)	H17

The drilled holes of couplings and belt pulleys should have an ISO fit of at least H7.

■ Dimension tolerances

For the following dimensions, the permissible deviations are given below:

Dimension designation	Dimension	Permitted deviation
H	over 250	- 1.0
E, EA		- 0.5

Keyways and feather keyways (dimensions GA, GC, F and FA) are made in compliance with DIN 6885 Part 1.

■ All dimensions are specified in mm.

¹⁾ With bearings for increased cantilever forces: Dimensions available on request.

IEC Squirrel-Cage Motors

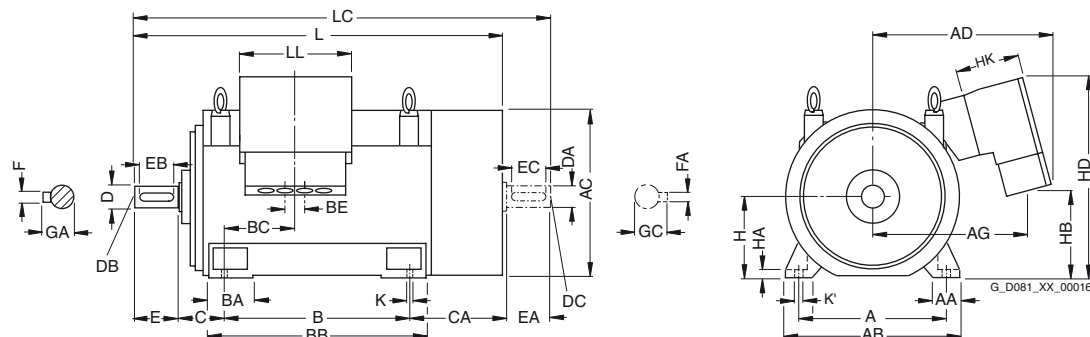
Non-standard motors frame size 315 and above

Dimensions

Dimensional drawings

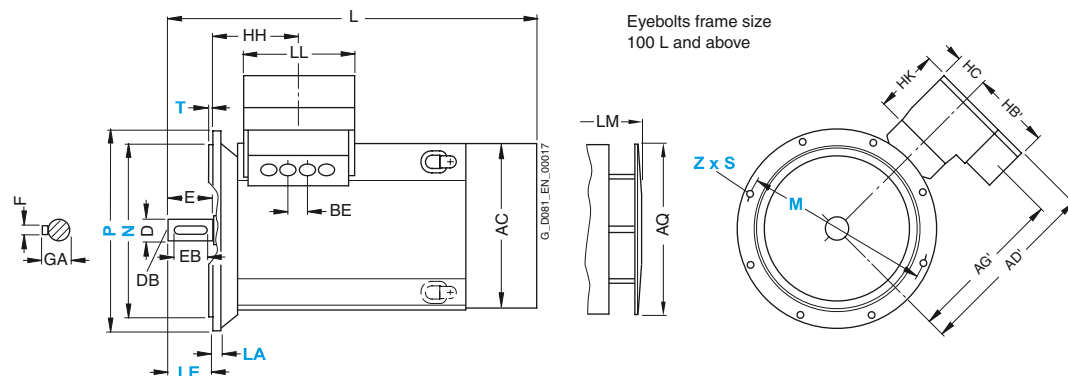
Cast-iron series 1LA8, frame sizes 315 to 450

Type of construction IM B3



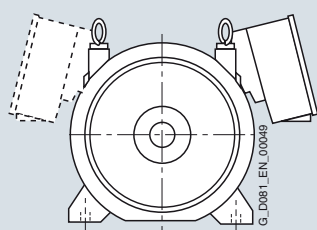
Type of construction IM V1

For flange dimensions, see Page 3/70 (Z = the number of retaining holes)



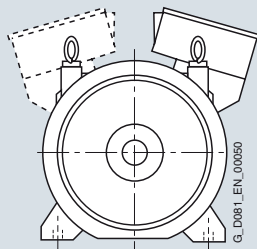
Connection box position

Basic version

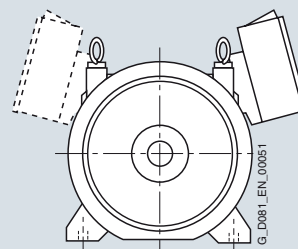


Cable entry: bottom
Console: 0 degrees
Order code: -

Special versions



Cable entry: top
Console: 180 degrees
Order code: K85



Cable entry: top
Console: 0 degrees
Order code: plain text

With cable entry from above, protection against rain and other adverse weather conditions must be provided.

For motor		Dimension designation acc. to IEC																														
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AG	AG'	AQ	B	BA	BB	BC	BE	C	CA	H	HA	HB	HB'	HC									
315	1LA8 31	2 4, 6, 8 4, 6, 8 ²⁾	560	120	680	710	570	582	474	481	670	630	180	780	195	140	180 180 200	435	315	28	404	217	162									
355	1LA8 35	2 4, 6, 8	630	150	780	790	690	697	597	593	750	800	220	980	185	135	200 200	470	355	35	431	290	165									
	1LA8 357	2, 4																						829	875	739	745	100	200	359	395	175
	1LA8 35..	4, 6, 8 ²⁾																						690	697	597	593	135	224	431	290	165
400	1LA8 40	2 4, 6, 8	710	150	860	880	865	925	775	795	850	900	220	1080	186	100	224	506	400	35	439	395	175									
450	1LA8 45	2 ³⁾ 4, 6, 8	800	180	980	970	900	975	810	845	950	1000	260	1220	170	100	250	540	450	42	525	395	175									

¹⁾ Measured across the bolt heads (not in the flattened area of the fan cowl).

²⁾ With bearings for increased cantilever forces. – No second shaft extension possible.

³⁾ Only at 50 Hz.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

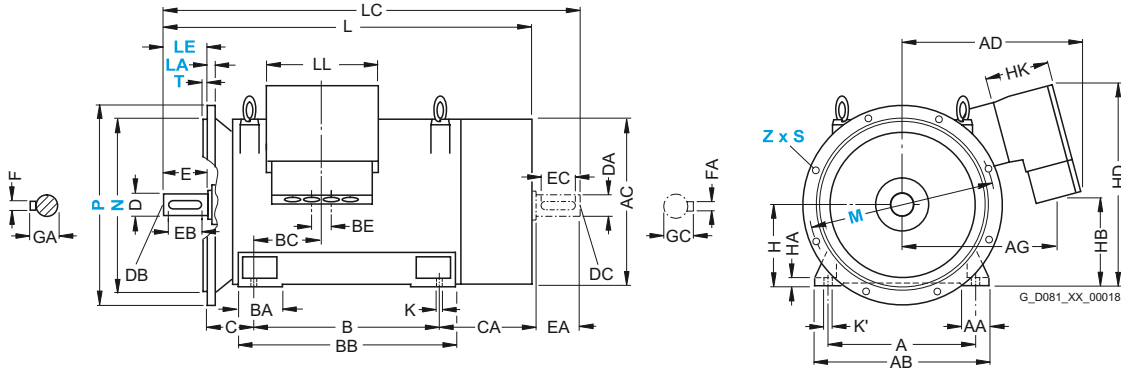
Dimensions

Dimensional drawings

Cast-iron series 1LA8, frame sizes 315 to 450

Type of construction IM B35

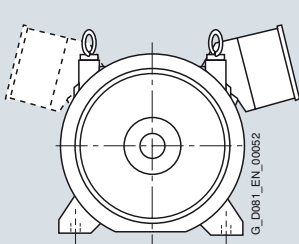
For flange dimensions, see Page 3/70 (Z = the number of retaining holes)



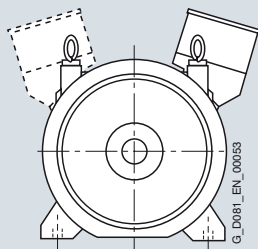
3

Connection box position

Special versions



Cable entry: DE / NDE
Console: 0 degrees
Order code: K83/K84



Cable entry: DE / NDE
Console: 180 degrees
Order code: plain text

For motor Frame size	Type	Number of poles	Dimension designation acc. to IEC										DE shaft extension				NDE shaft extension					
			HD	HK	K	K'	L	LC	LL	LM	D	DB	E	EB	F	GA	DA	DC	EA	EC	FA	GC
315	1LA8 31 .	2	783	170	26	33	1380	1495	308	1510	65	M20	140	125	18	69	50	M16	110	100	14	53.5
		4, 6, 8					1410	1555	1540	85	M20	170	140	22	90	70	M20	140	125	20	74.5	
		4, 6, 8 ¹⁾					1430	1575	95	M24	170	140	25	100	-	-	-	-	-	-		
355	1LA8 35 .	2	896	229	33	40	1605	1750	330	1745	75	M20	140	125	20	79.5	60	M20	140	125	18	64
		4, 6, 8					1635	1810	1775	95	M24	170	140	25	100	80	170	140	22	85		
		2, 4					945	320	554	-	-	-	-	-	-	-	-	-	-			
	1LA8 357	2, 4	945	320			1699	-			100	M24	210	180	28	106	-	-	-	-	-	-
400	1LA8 40 .	2	1025	320	33	40	1793	1940	554	1943	80	M20	170	140	22	85	70	M20	140	125	20	74.5
		4, 6, 8					1833	2010	1983	110	M24	210	180	28	116	90	M24	170	140	25	95	
450	1LA8 45 .	2 ²⁾	1111	320	39	47	1953	2100	554	2103	90	M24	170	140	25	95	75	M20	140	125	20	79.5
		4, 6, 8					1993	2210	2143	120	210	180	32	127	100	M24	210	180	28	106		

¹⁾ With bearings for increased cantilever forces. – No second shaft extension possible.

²⁾ Only at 50 Hz.

IEC Squirrel-Cage Motors

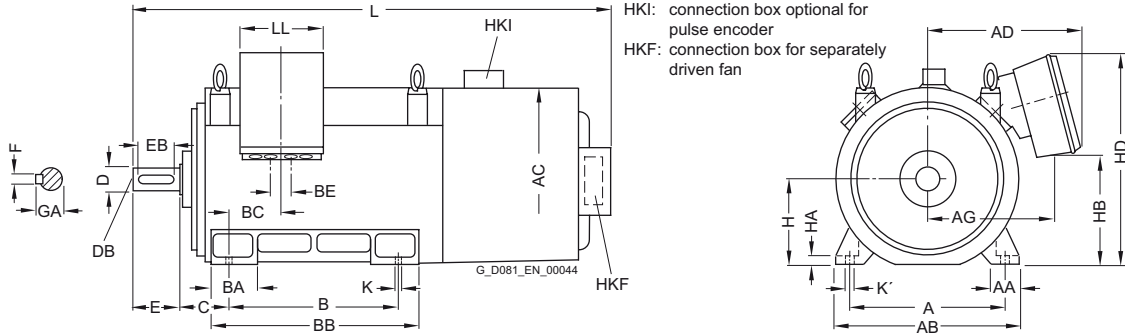
Non-standard motors frame size 315 and above

Dimensions

Dimensional drawings

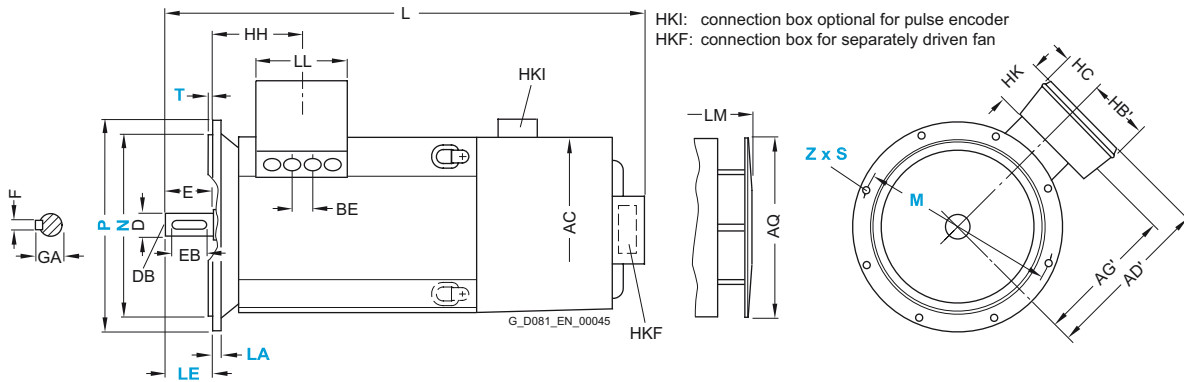
Cast-iron series 1PQ8, frame sizes 315 to 450

Type of construction IM B3

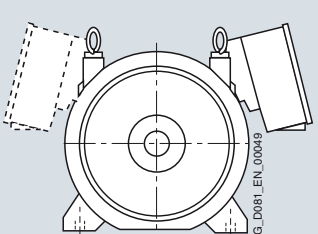
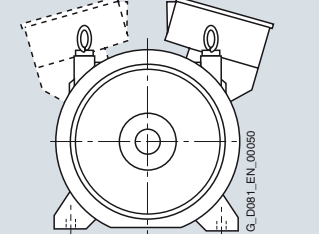
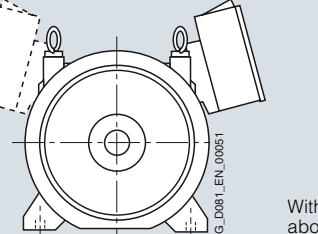


Type of construction IM V1

For flange dimensions, see Page 3/70 (Z = the number of retaining holes)



Connection box position

Basic version	Special versions	
 <p>Cable entry: bottom Console: 0 degrees Order code: -</p>	 <p>Cable entry: top Console: 180 degrees Order code: K85</p>	 <p>Cable entry: top Console: 0 degrees Order code: plain text</p>
<p>With cable entry from above, protection against rain and other adverse weather conditions must be provided.</p>		

For motor	Dimension designation acc. to IEC																	
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AG	AG'	AQ	B	BA	BB	BC	BE	C	
315	1PQ8 31.	2	560	120	680	710	570	582	474	481	750	630	180	780	195	140	180	
		4, 6, 8															180	
		4, 6, 8 ²⁾															200	
355	1PQ835. 35.	2	630	150	780	790	690	697	597	593	850	800	220	980	185	135	200	
		4, 6, 8															200	
		2, 4															100	
	1PQ8357	2, 4					829	875	739	745						100	200	
	1PQ835	4, 6, 8 ²⁾					670	697	597	593							135	224
400	1PQ8 40.	2	710	150	860	880	865	925	775	795	950	900	220	1080	186	100	224	
	4, 6, 8	224																
450	1PQ8 45.	2 ³⁾	800	180	980	970	900	980	810	845	950	1000	260	1220	170	100	250	
		4, 6, 8															250	

¹⁾ Measured across the bolt heads (not in the flattened area of the fan cowl).

²⁾ With bearings for increased cantilever forces.

³⁾ Only at 50 Hz.

3

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

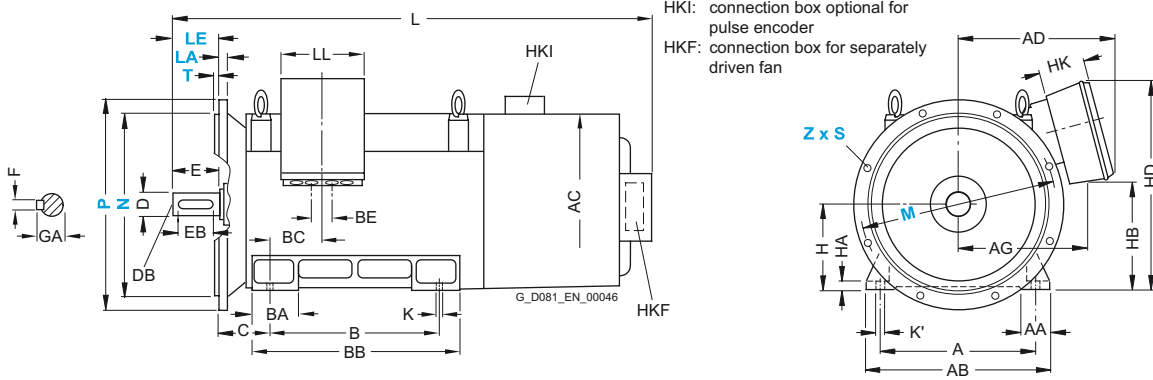
Dimensions

Dimensional drawings

Cast-iron series 1PQ8, frame sizes 315 to 450

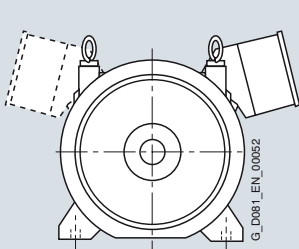
Type of construction IM B35

For flange dimensions, see Page 3/70 (Z = the number of retaining holes)

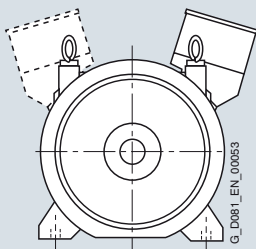


Connection box position

Special versions



Cable entry: DE / NDE
Console: 0 degrees
Order code: K83/K84



Cable entry: DE / NDE
Console: 180 degrees
Order code: plain text

For motor		Dimension designation acc. to IEC													DE shaft extension					
Frame size	Type	Number of poles	H	HA	HB	HB'	HC	HD	HK	K	K'	L	LL	LM	D	DB	E	EB	F	GA
315	1PQ8 31.	2	315	28	404	217	162	783	170	26	33	1742	308	1765	65	M20	140	125	18	69
		4, 6, 8													85	M20	170	140	22	90
		4, 6, 8 ¹⁾													95	M24	170	140	25	100
355	1PQ8 35.	2	355	35	431	290	165	896	229	33	40	1971	330	2005	75	M20	140	125	20	79.5
		4, 6, 8													95	M24	170	140	25	100
		2, 4													554					
	1PQ8 357	2, 4			359	395	175	945	320											
	1PQ8 35.	4, 6, 8 ¹⁾										2065	2099	100	M24	210	180	28	106	
400	1PQ8 40.	2	400	35	440	400	175	1025	320	33	40	2148	554	2182	80	M20	170	140	22	85
		4, 6, 8													110	M24	210	180	28	116
450	1PQ8 45.	2 ²⁾	450	42	525	400	175	1111	320	39	47	2308	554	2340	90	M24	170	140	25	95
		4, 6, 8													120		210	180	32	127

1) With bearings for increased cantilever forces.

2) Only at 50 Hz.

IEC Squirrel-Cage Motors

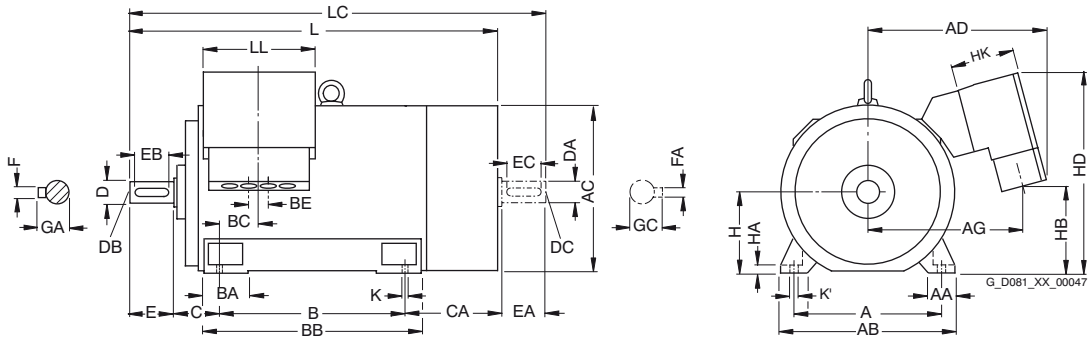
Non-standard motors frame size 315 and above

Dimensions

Dimensional drawings

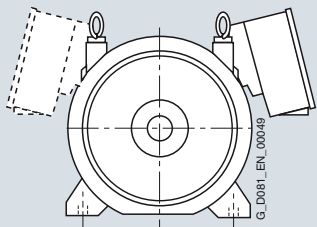
Cast-iron series 1LL8, frame sizes 315 to 450

Type of construction IM B3



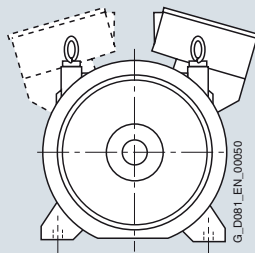
Connection box position

Basic version

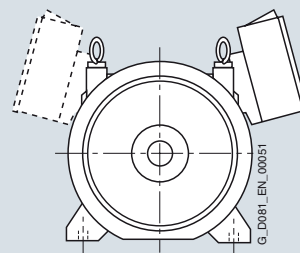


Cable entry: bottom
Console: 0 degrees
Order code: -

Special versions



Cable entry: top
Console: 180 degrees
Order code: K85



Cable entry: top
Console: 0 degrees
Order code: plain text

For motor		Dimension designation acc. to IEC																	
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AG	AG'	AQ	B	BA	BB	BC	BE	C	CA	
315	1LL8 31.	2 4, 6, 8	560	120	680	710	662	- 660	569	- 560	670	630	180	780	195	110	180	435	
355	1LL8 35.	2 4, 6, 8	630	150	780	790	829	- 880	739	- 745	750	800	220	980	185	135	200	470	
400	1LL8 40.	2 4, 6, 8	710	150	860	880	865	- 930	775	- 795	850	900	220	1080	186	100	224	506	
450	1LL8 45.	2 ²⁾ 4, 6, 8	800	180	980	970	900	- 980	810	- 845	950	1000	260	1220	170	100	250	540	

¹⁾ Measured across the bolt heads.

²⁾ Only at 50 Hz.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

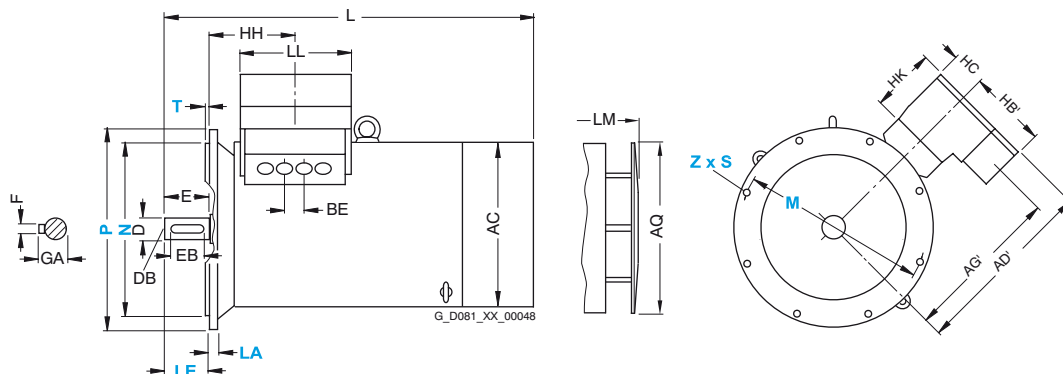
Dimensions

Dimensional drawings

Cast-iron series 1LL8, frame sizes 315 to 450

Type of construction IM V1

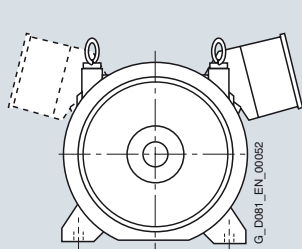
For flange dimensions, see Page 3/70 (Z = the number of retaining holes)



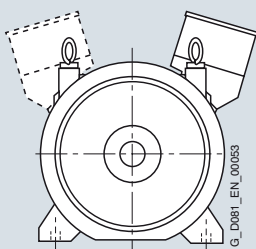
3

Connection box position

Special versions



Cable entry: DE / NDE
Console: 0 degrees
Order code: K83/K84



Cable entry: DE / NDE
Console: 180 degrees
Order code: plain text

For motor		Dimension designation acc. to IEC														DE shaft extension				
Frame size	Type	Number of poles	H	HA	HB	HB'	HD	HK	K	K'	L	LC	LL	LM	D	DB	E	EB	F	GA
315	1LL8 31.	2	315	28	363	-	828	229	26	33	1380	1495	330	1510	70	M20	140	125	20	74.5
		4, 6, 8				290									90	M24	170	140	25	95
355	1LL8 35.	2	355	35	359	-	945	320	33	40	1605	1750	554	1775	80	M20	170	140	22	85
		4, 6, 8				400									110	M24	210	180	28	116
400	1LL8 40.	2	400	35	439	-	1025	320	33	40	1793	1940	554	1943	85	M20	170	140	22	90
		4, 6, 8				400									120	M24	210	180	32	127
450	1LL8 45.	2 ¹⁾	450	42	525	-	1111	320	39	47	1953	2100	554	2143	90	M24	170	140	25	95
		4, 6, 8				400									130	M24	250	220	32	137

¹⁾ Only at 50 Hz.

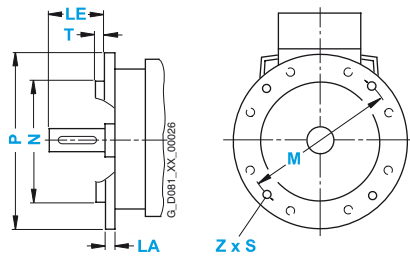
IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Dimensions

Dimensional drawings

Flange dimensions



Frame size	Type of construction	Flange type	Flange with through holes (FF/A)		Dimension designation acc. to IEC							
			According to DIN EN 50347	Acc. to DIN 42948	LA	LE	M	N	P	S	T	Z
315 2-pole 4-pole to 8-pole	IM B35, IM V1	Flange	–	–	25	140 170	740	680	800	22	6	8
355 2-pole 4-pole to 8-pole	IM B35, IM V1	Flange	–	–	25	140 170	840	780	900	22	6	8
400 2-pole 4-pole to 8-pole	IM B35, IM V1	Flange	–	–	28	170 210	940	880	1000	22	6	8
450 2-pole 4-pole to 8-pole	IM B35, IM V1	Flange	–	–	30	170 210	1080	1000	1150	26	6	8

Explosion-proof motors



4/2	Orientation	4/70	Self-ventilated motors in Zones 2, 21, 22 with type of protection “n” or protection against dust explosions
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4/3	Benefits	4/70	Selection and ordering data
4/3	Application	4/80	Self-ventilated motors in Zones 2, 22 with type of protection “n” or protection against dust explosions
4/3	Technical specifications	4/80	Cast-iron series 1LA8
4/11	Selection and ordering data	4/80	Selection and ordering data
4/13	More information	4/80	Forced-air cooled motors in Zones 2, 22 with type of protection “n” or protection against dust explosions
4/18	Self-ventilated motors in Zone 1 with type of protection “e”	4/80	Cast-iron series 1PQ8
	Aluminum series 1MA7	4/81	Special versions
4/18	Selection and ordering data	4/81	Overview
4/22	Self-ventilated motors in Zone 1 with type of protection “e”	4/84	Selection and ordering data
	Cast-iron series 1MA6	4/84	• Voltages
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	Cast-iron series 1MJ6 and 1MJ7	4/125	Accessories
4/34	Selection and ordering data	4/125	Overview
4/42	Self-ventilated motors in Zones 2, 21, 22 with type of protection “n” or protection against dust explosions	4/126	More information
	Aluminum series 1LA7 and 1LA5	4/127	Dimensions
4/42	Selection and ordering data	4/127	Overview
4/50	Self-ventilated motors in Zones 2, 21, 22 with type of protection “n” or protection against dust explosions	4/129	More information
	Aluminum series 1LA9	4/130	Dimensional drawings
4/50	Selection and ordering data		
4/62	Self-ventilated motors in Zones 2, 21, 22 with type of protection “n” or protection against dust explosions		
	Cast-iron series 1LA6 and 1LG4		
4/62	Selection and ordering data		

IEC Squirrel-Cage Motors

Explosion-proof motors

Orientation

Overview



Explosion-protected equipment are designed such that an explosion can be prevented when they are used properly.

The explosion-protected equipment can be designed in accordance with various types of protection.

The **local** conditions must be subdivided into specified zones by the user with the assistance of the responsible authorities in accordance with the frequency of occurrence of an explosion hazard. Device (equipment) categories are assigned to these zones. The zones are then subdivided into possible types of protection and therefore into possible equipment (product) types.

Our product range contains motors in the following types of protection:

- “Increased safety” Ex e II
- “Explosion-proof enclosure” Ex de IIC/Ex d IIC
- “Non-sparking” Ex nA II
- “Areas protected against dust explosions in Zones 21 and 22”

The table below “Overview of explosion-proof motors” contains a complete overview of our products, their types of protection and the assignment of motor types to categories. It is important to note that depending on whether the motor is used for converter-fed operation or mains-fed operation, different order codes are required for unique selection of the required product.

In many industrial sectors as well as in domestic life, explosion protection or explosion hazards are ever-present, e.g. in the chemicals industry, in refineries, on drilling platforms, at petrol stations, in feed manufacturing and in sewage treatment plants.

The risk of explosion is always present when gases, fumes, mist or dust are mixed with oxygen in the air in an explosive ratio close to sources of ignition that are able to release the so-called minimum ignition energy.

Overview of explosion-proof motors

Section	Category	Zone	Frequency of occurrence of the Ex atmosphere	Degree of protection	Temperature class	Degree of protection	Standard	Motor type (Pos. 1-4 of Order No.)	Operation	Order code	Utilization according to temperature class
Gas and Fumes (G)	1G	0	Continuously or long-term	Not common practice with low-voltage motors							
	2G	1	Infrequently	Ex de IIC ¹⁾ (explosion-proof enclosure)	T1 – T4	IP55	IEC/EN 60 079-0 IEC/EN 60 079-1	1MJ6/7	Mains	–	130 (B)
				Ex e II (increased safety)	T1 – T3	IP55	IEC/EN 60 079-0 IEC/EN 60 079-7	1MA6 1MA7	Mains	–	130 (B)/ 155 (F)
	3G	2	Rarely or briefly	Ex nA II (non sparking)	T1 – T3	IP55	IEC/EN 60079-15	1LA6	Mains	M72	130 (B)
1LA7 1LA8, 1PQ8 ²⁾ 1LA9 1LG4/6								Converter	M73		
Dust (D)	1D	20	Continuously or long-term	Not common practice with low-voltage motors							
	2D	21	Infrequently	Conductive and non-conductive dust	Max. housing temperature T 125 °C	IP65	IEC/EN 61241	1LA5	Mains	M34	130 (B)
								1LA6 1LA7	Converter	M38	
3D	22	Rarely or briefly	Non-conductive dust		IP55		1LA8 ³⁾ , 1PQ8 ²⁾ 1LA9 1LG4/6	Mains	M35		
									Converter	M39	

¹⁾ Highest explosion group IIC includes IIB and IIA.

²⁾ 1PQ8 is not possible for Zones 21 and 22; Zone 2 for 1PQ8 available on request. Utilization according to temperature class 155 (F).

³⁾ 1LA8 only available for Zone 22 (order codes M35, M39). Utilization according to temperature class 155 (F).

Benefits

The explosion-proof motors from Siemens offer the user numerous advantages:

- The motors are designed in accordance with Directive 94/9/EU (ATEX 95 previously ATEX 100a). As product supplier, Siemens accepts responsibility for compliance with the applicable product standards for the selected equipment.
- By using this product, the plant operating company satisfies Directive 1999/92/EU in accordance with Appendix II B (ATEX 137 previously ATEX 118a). The plant manufacturer or plant operating company is responsible for correct selection and proper usage of the equipment.

- Comprehensive series of explosion-proof motors for protection against gas and dust.
- Individual versions of motors are possible thanks to the numerous catalog options.
- Further special versions are possible on request.
- Certificates are available for a defined spectrum of Siemens motors/converters.

Application

The explosion-proof motors are used in the following sectors to prevent explosion hazards that result in serious injury to persons and severe damage to property.

- Chemical and petrochemical industry
- Production of mineral oil and gas
- Gas works
- Gas supply companies
- Petrol stations
- Coking plants
- Mills (e.g. corn, solids)
- Sewage treatment plants
- Wood processing (e.g. sawdust, tree resin)
- Other industries subject to explosion hazards

Technical specifications

Zone 1 with type of protection Ex e II Increased Safety "e"

All 1MA motors are certified in type of protection Ex e II for temperature classes T1 to T3 at an ambient temperature from -20 to +40 °C and have an EU type test certificate according to Directive 94/9/EG (ATEX 95). Higher temperature classes are available on request.

Explosion protection is achieved when the certified motor versions interact with a similarly certified motor protection switch. The motor protection switch is selected in accordance with the values certified for the motor for the starting current ratio I_{LR}/I_{rated} and the t_E times, so that in the case of a locked rotor fault, the motor is isolated from the supply within the t_E time. The t_E times assigned to the separate temperature classes and the starting current ratio are marked on the rating plate.

Explosion protection can be achieved exclusively by the PTC thermistors embedded in the winding provided that the motor has been specially approved and certified for this. This type of protection is not technically possible for every motor, so it is essential to inquire before ordering.

With the exception of 2-pole motors of frame size 225 M and above, all motors are of an identical version, i.e. the motors can be operated at T1/T2 or T3 at the appropriate rated output. For special versions (different frequency, output, coolant temperature, site altitude, etc.) a new certificate is necessary (please inquire). The temperature class must be specified in the order, otherwise the universal version T1/T2 and T3 will be certified (doubling the certification costs).

Identification on the rating plate:

 II 2G Ex e II T1 – T3

Zone 1 with type of protection Ex de IIC explosion-proof enclosure "d"

All 1MJ motors are certified for the highest explosion group IIC, temperature classes T1 to T4 at ambient temperatures from -20 to +60 °C and have an EC type test certificate according to Directive 94/9/EG (ATEX 95).

These motors are designed such that an explosion within the housing cannot result in an explosion in the environment. The energy that is generated internally by an explosion is dissipated in the so-called "flameproof chamber" so far that the energy is no longer sufficient for ignition outside the casing. The housing temperature is below the ignition temperature of the gases to which temperature class T4 applies.



The 1MJ6 motors (frame sizes 71 to 200) generally have a located bearing on the non-drive-end (NDE) of the motor.

The following variations are possible on request:

- Coolant temperature >40 °C or site altitude >1000 m (for 1MJ6, the reduction factors listed in catalog part 0 "Introduction" under "General technical data", "Coolant temperature and site altitude" are applicable).
- Frequency and rated duty
- Pole-changing motors
- Insulated bearing at the non-drive-end (NDE)
- Use according to temperature class 155 (F) in mains-fed operation

On the frequency converter, motors in type of protection "explosion-proof enclosure" can be used thermally acc. to temperature class 155 (F). Converter-fed operation can be ordered with order code **A15** (PTC thermistors for tripping) or **A16** (PTC thermistors for alarm and tripping), whereby an additional PTC thermistor is fitted to 1MJ6/1MJ7 motors in the connection box.

Identification on the rating plate:

 II 2G Ex de IIC T1 – T4
or
 II 2G Ex d IIC T1 – T4

IEC Squirrel-Cage Motors

Explosion-proof motors

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Technical specifications (continued)

Zone 2 with type of protection Ex nA (non-sparking)

- Zone 2 acc. to IEC/EN 60079-15
The duty types are:
 - Design for Zone 2 for mains-fed operation (order code **M72**)
 - Design for Zone 2 for mains-fed operation, with derating (order code **M73**)

1LA/1LG motors are modified for this purpose in the "Non-sparking" design and are suitable for use in hazardous areas of Zone 2 for temperature classes T1 to T3. The maximum surface temperature that can occur during operation must lie below the limit temperature of the respective temperature class. The ventilation system must be in accordance with IEC/EN 60079-0. An external earthing terminal is fitted to the motors. The connection box is similar to the ExEx design.


Please inquire in the case of

- Use in accordance with temperature class 155 (F)
- For pole-changing versions

For motors in the "Non-sparking" version, a conformity declaration is available from a recognized testing authority.

Ambient temperature -20 to $+60$ °C, whereby derating applies from 40 °C upwards. Other temperatures are available on request.

The rating plate or the extra rating plate contains the text:

 II 3G Ex nA II T3

IEC/EN 60079-15 and number of the "Conformity declaration"

The motors do not have a rated voltage range stamped on the rating plate.

Protection against dust explosions in Zones 21 and 22

The distinction between Zones 21 and 22 is as follows:

- Zone 21 according to IEC 61241, EN 50281 ¹⁾
 - Design for Zone 21 ²⁾, as well as Zone 22 for conducting dust (IP65) for mains-fed operation (order code **M34**)
 - Design for Zone 21 ²⁾, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating (order code **M38**)

- Zone 22 according to IEC 61241, EN 50281
 - Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation (order code **M35**)
 - Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating (order code **M39**)

The 1LA/1LG motors are modified for this purpose for use in zones subject to dust explosion hazards. The surface temperature is ≤ 125 °C at rated duty.

An external earthing terminal and a metal external fan are fitted to the motors. In the design for Zone 21, the connection box is similar to the ExEx design.

Pole-changing versions are not possible for Zone 21 – they are possible for Zone 22 on request.

Certification:

- Zone 21: EC type-test certificate (ATEX), issued by the DMT testing authority (Deutsche Montan-Technologie) and EC declaration of conformity.
- Zone 22: EC declaration of conformity

Identification on the rating plate:

Zone 21:  II 2D Ex tD A21 IP65 T125 °C

Zone 22:  II 3D Ex tD A22 IP55 T125 °C

Ambient temperature -20 °C to $+60$ °C, whereby derating applies from 40 °C upwards. Other temperatures are available on request.

Generally, the following is valid:

All Ex motors in vertical type of construction with shaft extension pointing down must have a protective cover.

Ex motors cannot be designed in accordance with UL and CSA.

The certificates for the motors for hazardous areas are stored with the documentation in the SD configurator tool for low-voltage motors.

For converter-fed operation, Ex motors must always be monitored using PTC thermistors. Certified tripping units are required for this purpose, see Catalog LV1.

Comprehensive operating instructions and the declaration of conformity are supplied with Ex motors.

In the case of non-standard 1LA8 and 1PQ8 motors, the bearing temperature must be monitored (order code **A72**).

Overview of the technical specifications

Explosion-proof motors - The technology at a glance

Motors	Type of protection "e"	Type of protection "d"	Type of protection "n"	Dust explosion protection
Frame size	63 M ... 315 L	71 M ... 315 M	63 M ... 450	56 M ... 450 L
Output range	0.12 to 160 kW	0.25 ... 132 kW	0.09 to 1000 kW	0.06 to 1000 kW
Number of poles	2/4/6	2/4/6/8	2/4/6/8	2/4/6/8
Temperature class	T1 - T3	T1 - T4	T3	-
Degree of protection	II 2 G Ex e II acc. to IEC/EN 60079-0 IEC/EN 60079-7	II 2 G Ex de II acc. to IEC/EN 60079-0 IEC/EN 60079-1	II 3 G Ex nA acc. to IEC/EN 60079-15	Zone 21: II 2D Ex td A21 IP65 T125 °C ³⁾ Zone 22: II 3D Ex td A22 IP55 T125 °C acc. to EN 50281/IEC 61241
Directive	94/9/EG, ATEX 95	94/9/EG, ATEX 95	94/9/EG, ATEX 95	94/9/EG, ATEX 95
Protection class	IP55	IP55	IP55	Zone 21: IP65 Zone 22: IP55
Voltages	All commonly used voltages	All commonly used voltages	All commonly used voltages	All commonly used voltages
Frequency	50 and 60 Hz	50 and 60 Hz	50 and 60 Hz	50 and 60 Hz
Type of construction	All common types of construction	All common types of construction	All common types of construction	All common types of construction
Housing	FS 63 M ... 160 L aluminum FS 100 L ... 315 L cast-iron	FS 71 M ... 315 M cast-iron	FS 63 M ... 160 L aluminum FS 100 L ... 450 cast-iron	FS 56 M ... 225 M aluminum FS 100 L ... 450 ¹⁾ cast-iron
Cooling method	Surface-cooled	Surface-cooled	Surface-cooled	Surface-cooled
Temperature class	155 (F) used acc. to 130 (B)	155 (F) used acc. to 130 (B) ⁴⁾	155 (F) used acc. to 130 (B)	155 (F) used acc. to 130 (B) ⁵⁾
Insulation system	DURIGNIT IR 2000	DURIGNIT IR 2000, converter-compatible up to 500 V, 690 V on request	DURIGNIT IR 2000, converter-compatible up to 500 V, 690 V on request	DURIGNIT IR 2000, converter-compatible up to 500 V, 690 V on request

¹⁾ Zone 21 only up to frame size 315 L

²⁾ Zone 21 takes into account conducting and non-conducting dust

³⁾ Zone 21 for "Non-standard motors frame size 315 and above" only up to frame size 315 possible.

⁴⁾ For converter-fed operation used 155 (F)

⁵⁾ For "Non-standard motors frame size 315 and above" temperature class 155 (F) used according to 155 (F).

Technical specifications (continued)

Coolant temperature and site altitude

Coolant temperature -40 °C to $+40\text{ °C}$ for Ex motor

For all 1LA5, 1LA6, 1LA7, 1LA9 motors (with the exception of 1LA9 with increased output), 1LG4, 1LG6, 1MA6, 1MA7 frame sizes 56 to 315 with the respective types of protection Ex e, Ex nA or dust-Ex (Zone 21/22), the operating ambient temperature can optionally be expanded up to -40 °C . Technical measures are required for this purpose (e.g. metal external fan).
Order **D19**

The order code **D19** is not possible in combination with order code **L03** "Vibration-proof version".

The mechanical limit speed of the 2-pole motors 1LA5/1LA9 in design for Zone 21/22 is reduced from frame size 180 as compared to the values in catalog part 5 "Motors operating with frequency converters":

Frame size	Motor type	2-pole	
		n_{\max} rpm	f_{\max} Hz
180	1LA5/1LA9	3300	55
200		3100	51
225		3000	50

With converter-fed operation and operation on 60 Hz supplies, particular attention has to be paid to the mechanical limit speeds – 60 Hz data are not stamped on the rating plate.
Alternative: 1LG4/1LG6 motors in design for Zone 21/22.

Special technology

The "Special technology" comprises Ex-mountings on explosion-proof motors.

The field of application of explosion-proof motors is considerably expanded by mounting Ex rotary pulse encoders or Ex separately driven fans.

The use of a separately driven fan is recommended to increase motor utilization at low speeds and to limit noise generation at speeds significantly higher than the synchronous speed.

Both of these results can only be achieved with converter-fed operation.

For explosion-proof motor versions with Ex rotary pulse encoder or Ex separately driven fan, see tables below.

The following explosion-proof motor versions are available with an Ex rotary pulse encoder:

Type of protection	Order No. + order code	Frame size	Order code of the Ex rotary pulse encoder
Ex nA	1LA6/7/9... + M73	100 L ... 160 L	H86: Mounting of explosion-proof rotary pulse encoder – LL841 900 006 – for use in Zones 2, 21, 22.
	1LG4/6... + M73	180 M ... 315 L	
Dust-Ex (Zone 21)	1LA6/7... + M38	100 L ... 160 L	
	1LA5... + M38	180 M ... 225 M	
	1LA9... + M38	100 L ... 200 L	
	1LG4/6... + M38	180 M ... 315 L	
Dust-Ex (Zone 22)	1LA6/7... + M39	100 L ... 160 L	
	1LA5... + M39	180 M ... 225 M	
	1LA9... + M39	100 L ... 200 L	
	1LG4/6... + M39	180 M ... 315 L	
Ex nA or dust-Ex (Zone 22)	1LA6/7/9... + M75	100 L ... 160 L	
	1LG4/6... + M75	180 M ... 315 L	
Ex de	1MJ6... + A15/A16	90 L ... 200 L	H87: Mounting of explosion-proof rotary pulse encoder on motors Ex d/de in Zone 1. • Ex OG 9 DN 1024 I (BG 90L – 160L) • Ex HOG 161 DN 1024I (BG 180M – 315L)
	1MJ7... + A15/A16	225 M ... 315 M	

The following explosion-proof motor versions are available with an Ex separately driven fan:

Type of protection	Order No. + order code	Frame size	Order code of the Ex separately driven fan
Ex nA	1LG4/6 + M73	225 M ... 315 L	M95: "Mounting of explosion-proof separately driven fan Ex nA for use in Zone 2".
Dust-Ex (Zone 21)	1LG4/6 + M38	225 M ... 315 L	M96: "Mounting of explosion-proof separately driven fan II 2D for use in Zone 21".
Dust-Ex (Zone 22)	1LG4/6 + M39	180 M ... 315 L	M97: "Mounting of explosion-proof separately driven fan II 3D for use in Zone 22".
	1LA6/7 + M39	100 L ... 160 L	
	1LA5 + M39	180 M ... 225 M	
	1LA9 + M39	100 L ... 200 L	
Ex de	1MJ7 + A15/A16	225 M ... 315 M	M98: "Mounting of explosion-proof separately driven fan Ex de for use in Zone 1".

Note: Notwithstanding, Ex separately driven fans can also be used for mains-fed operation in special applications.

IEC Squirrel-Cage Motors

Explosion-proof motors

Orientation

Technical specifications (continued)

Ex rotary pulse encoder

The rotary pulse encoder can only be mounted on a standard non-drive end (NDE), i.e. a second shaft extension or protective cover cannot be supplied. Therefore, the user must implement a suitable cover for vertical mounting positions to prevent small parts from falling into the fan cover (see also standard IEC//EN 60079-0).

Ex rotary pulse encoders do not have insulated bearings due to their construction (request required!).

The degree of protection of the rotary pulse encoder must be observed. The relevant data are stamped on the rating plate of the rotary pulse encoder.

When an Ex rotary pulse encoder is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Dimensions and weights".

LL 841 900 006 rotary pulse encoder

With its rugged construction, this rotary pulse encoder is also suitable for difficult operating environments. It is resistant to shock and vibration.

The LL 841 900 006 rotary pulse encoder for use in Zones 2, 21, 22 can be supplied with the already mounted ADS diagnostic system for an early error detection in the encoder.

Order code **H86**

Manufacturer:

Leine und Linde (Germany) GmbH

Bahnhofstraße 36

73430 Aalen

Tel. +49 (0)73 61-78093-0

Fax +49 (0)73 61-78093-11

<http://www.leinelinde.com>

e-Mail: info@leinelinde.se

Technical data for LL 841 900 006 (HTL version)

Mounting of encoder for use below -20 °C and higher than $+40\text{ °C}$ on request.

Supply voltage U_B	+9 V to +30 V
Current input without load	max. 80 mA
Admissible load current per output	40 mA
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, A', B, B', 0, 0' High Current HTL Isolated switching output for ADS signal
Pulse offset between the two outputs	$90^\circ \pm 25^\circ \text{ el.}$
Output amplitude	$U_{\text{High}} > U_B - 4\text{ V}$ $U_{\text{Low}} < 2.5\text{ V}$
Mark space ratio	$1:1 \pm 10\%$
Edge steepness	50 V/ μs (without load)
Maximum frequency	100 kHz for 350 m cable
Maximum speed	4200 rpm
Temperature range	$-40\text{ to }+70\text{ °C}$
Degree of protection	IP65
Max. adm. radial cantilever force	150 N
Max. adm. axial force	100 N
Termination system	Terminal strips in encoder, Cable connection M20 x 1.5 radial

Ex OG9 DN 1024 I rotary pulse encoder

The Ex OG9 DN 1024 I rotary pulse encoder for use on Ex d/de motors in Zone 1 (frame sizes 90 to 160) can be supplied already mounted.

Order code **H87**

Manufacturer:

Baumer Hübner GmbH

Planufer 92b

10967 Berlin

Tel. +49 (0)30-6 90 03-0

Fax +49 (0)30-6 90 03-1 04

<http://www.baumerhuebner.com>

e-Mail: info@baumerhuebner.com

Technical data for Ex OG9 DN 1024 I rotary pulse encoder (HTL version)

Mounting of encoder for use below -20 °C and higher than $+40\text{ °C}$ on request.

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 90 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, B and A', B' and R, R'
Pulse offset between the two outputs	$90^\circ \pm 20\%$
Output amplitude	$U_{\text{High}} \geq U_B - 3.5\text{ V}$ $U_{\text{Low}} \leq 1.5\text{ V}$
Mark space ratio	$1:1 \pm 20\%$
Edge steepness	10 V/ μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	$-20\text{ to }+55\text{ °C}$
Degree of protection	IP56
Max. adm. radial cantilever force	350 N
Max. adm. axial force	200 N
Termination system	Terminals with increased safety e, Cable connection M20 x 1.5
Mech. design acc. to Hübner Ident. No.	73 775 B
Weight	Approx. 3.5 kg

Technical specifications (continued)

Ex HOG 161 DN 1024 I rotary pulse encoder

With its rugged construction, this rotary pulse encoder is also suitable for difficult operating environments.

The HOG10 DN 1024 I rotary pulse encoder for use on Ex d/de motors in Zone 1 (frame sizes 180 to 315) can be supplied already mounted.

Order code **H87**

Manufacturer:
Baumer Hübner GmbH
Planufer 92b
10967 Berlin
Tel. +49 (0)30-6 90 03-0
Fax +49 (0)30-6 90 03-1 04

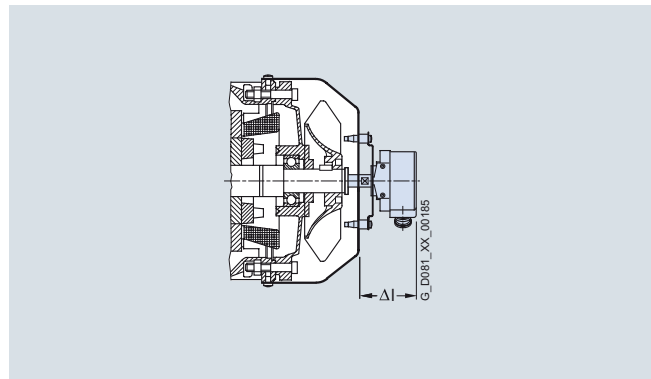
<http://www.baumerhuebner.com>
e-Mail: info@baumerhuebner.com

Technical data for HOG10 DN 1024 I (HTL version)

Mounting of encoder for use below -20 °C and higher than +40 °C on request.

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	64 short-circuit proof square-wave pulses A, B and A', B' and R, R'
Pulse offset between the two outputs	90° ±20 %
Output amplitude	$U_{High} = U_B - 3.5 V$ $U_{Low} = 1.5 V$
Mark space ratio	1:1 ±20 %
Edge steepness	10 V/μs
Maximum frequency	120 kHz
Maximum speed	5600 rpm
Temperature range	-20 to +65 °C
Degree of protection	IP56
Max. adm. radial cantilever force	650 N
Max. admissible axial force	450 N
Termination system	Terminals with increased safety e, Cable connection M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 140 A
Weight	Approx. 8.8 kg

Dimensions and weights of the rotary pulse encoders



Ex rotary pulse encoder (on cover), order codes **H86, H87**

Frame size	Ex d/de (Zone 1)		Ex nA (Zone 2) and dust-Ex (Zone 21/22)			
	1MJ6/7	1LA5/6/7/9	1LG4/6	Weight approx.	ΔI	Weight approx.
	mm	kg	mm	kg	mm	kg
90	184	14.0	–	–	–	–
100	188	14.5	110	2.0	–	–
112	190	14.5	110	2.0	–	–
132	186	16.5	110	2.0	–	–
160	183	17.5	110	2.0	–	–
180	164	9.0	110	2.0	100	3
200	164	9.0	110	2.0	100	3
225	160	12	110	2.0	100	3
250	160	12	–	–	100	3
280	160	12	–	–	100	3
315	160	12	–	–	100	3

The 1MJ6 motors of frame sizes 90 to 160 feature the rugged, flanged Ex OG9 rotary pulse encoder, which provides a high mechanical protection itself.

A protective cover of non-corrosive sheet steel is available for Ex rotary pulse encoders from the "Special technology" section, see "Mechanical protection for encoder" under "Mechanical design and degrees of protection".

Order code **M68**

Consequently, the motor length also increases:

- 1LA up to 146 mm
- 1MJ6 up to 175 mm
- 1LG/1MJ7 up to 25 mm

IEC Squirrel-Cage Motors

Explosion-proof motors

Orientation

Technical specifications (continued)

Ex separately driven fan

The use of a separately driven fan is recommended to increase motor utilization at low speeds and to limit noise generation at speeds significantly higher than the synchronous speed. Both of these results can only be achieved with converter-fed operation. Please inquire about traction and vibratory operation.

The separately driven fan can be supplied already mounted for the following zones:

- Mounting of explosion-proof separately driven fan Ex de for use in Zone 1
Order code **M98**
- Mounting of explosion-proof separately driven fan Ex nA for use in Zone 2
Order code **M95**
- Mounting of explosion-proof separately driven fan II 2D for use in Zone 21
Order code **M96**
- Mounting of explosion-proof separately driven fan II 3D for use in Zone 22
Order code **M97**

The supply voltage of the Ex separately driven fan motors is defined as follows:

Type 2CW2 has voltage windings for wide range voltages (see subsequently "Technical data of separately driven fan for Ex motors 1LA5/6/7/9, 1LG4/6 (frame sizes 180 and 200) in design for Zone 22").

The separately driven fan motors 1LA/1MJ have a rated voltage (rated voltage range) with tolerances in accordance with EC/EN 60034-1, Categories A and B.

A rating plate with the operating data is applied to the Ex separately driven fan motors.

The type of protection of the Ex separately driven fan motor corresponds with the type of protection of the assigned Ex basic motor (note order codes for the appropriate zone).

Please note the direction of rotation of the separately driven fan (axial-flow fan) when connecting it.

Coolant temperatures deviating from -20 to $+40$ °C on request.

The Ex separately driven fan has degree of protection IP55 as standard (higher degrees of protection on request).

Motors with separately driven fans must use a PTC thermistor as motor protection. The Ex motor versions for converter-fed operation (order codes: M73, M38, M39, M75, M77, A15, A16) already have PTC thermistors for tripping. The PTC thermistor must safely shut down the motor if the separately driven fan is defective.

For selection information and order numbers, see the tables "Technical data of separately driven fan for Ex motors ..." on the following pages. A rating plate listing all the important data is fitted to the separately driven fan. For supply voltages outside the rated voltage range for 1LA motors, order code **Y81** and plain text required. Please note the direction of rotation of the separately driven fan (axial-flow fan) when connecting it. Admissible coolant temperatures are $CT_{min} -20$ °C or $CT_{max} +40$ °C. Lower coolant temperatures on request.

When the separately driven fan is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights".

Technical data of separately driven fan for Ex motors 1LA5/6/7/9, 1LG4/6 (frame sizes 180 and 200) in design for Zone 22

Frame size	Designation on rating plate of separately driven fan	Rated voltage range		Frequency	Rated speed	Power consumption	Rated current
			V	Hz	rpm	kW	A
100	2CW2 180-8RF54-1AC0	1 AC	230 to 277	50	2790	0.075	0.29
		3 AC	220 to 290 Δ	50	2830	0.086	0.27
		3 AC	380 to 500 Y	50	2830	0.086	0.16
		1 AC	230 to 277	60	3280	0.094	0.28
		3 AC	220 to 332 Δ	60	3490	0.093	0.27
		3 AC	380 to 575 Y	60	3490	0.093	0.16
112	2CW2 180-8RF54-1AC1	1 AC	230 to 277	50	2720	0.073	0.26
		3 AC	220 to 290 Δ	50	2770	0.085	0.27
		3 AC	380 to 500 Y	50	2770	0.085	0.15
		1 AC	230 to 277	60	3000	0.107	0.31
		3 AC	220 to 332 Δ	60	3280	0.094	0.28
		3 AC	380 to 575 Y	60	3280	0.094	0.16
132	2CW2 180-8RF54-1AC2	1 AC	230 to 277	50	2860	0.115	0.40
		3 AC	220 to 290 Δ	50	2880	0.138	0.45
		3 AC	380 to 500 Y	50	2880	0.138	0.24
		1 AC	230 to 277	60	3380	0.185	0.59
		3 AC	220 to 332 Δ	60	3470	0.148	0.41
		3 AC	380 to 575 Y	60	3470	0.148	0.24
160 to 225 ¹⁾	2CW2 180-8RF54-1AC3	1 AC	230 to 277	50	2780	0.236	0.96
		3 AC	220 to 290 Δ	50	2840	0.220	0.76
		3 AC	380 to 500 Y	50	2830	0.220	0.43
		3 AC	220 to 332 Δ	60	3400	0.284	0.94
		3 AC	380 to 575 Y	60	3400	0.284	0.56

¹⁾ Separately driven fans with Order No. **1LA. ...** are used for 1LG motors of frame size 225 and above.

Technical specifications (continued)

Technical data of separately driven fan for Ex motors 1LG4/6 (frame sizes 225 to 315) n design for Zones 2¹⁾, 21, 22

Frame size	Designation on rating plate of separately driven fan	Rated voltage range		Frequency	Rated speed	Power consumption	Rated current at rated voltage ²⁾
			V	Hz	rpm	kW	A
225 M to 280 M	1LA7 073-2AA62-Z	3 AC	220 to 240 Δ	50	2800	0.550	1.36
		3 AC	380 to 420 Y	50	2800	0.550	0.79
		3 AC	440 to 480 Y	60	3400	0.630	1.32
315 – 2-pole	1LA9 073-2LA92-Z	3 AC	220 to 240 Δ	50	2780	0.700	1.73
		3 AC	380 to 420 Y	50	2780	0.700	1.00
		3 AC	440 to 480 Y	60	3385	0.700	1.64
315 – 4, 6, 8 -pole	1LA7 073-2AA62-Z	3 AC	220 to 240 Δ	50	2800	0.550	1.36
		3 AC	380 to 420 Y	50	2800	0.550	0.79
		3 AC	440 to 480 Y	60	3400	0.630	1.32

Technical data of separately driven fan for Ex motors 1MJ7 (frame sizes 225 bis 315) in design for Zone 1

Frame size	Designation on rating plate of separately driven fan	Rated voltage range		Frequency	Rated speed	Power consumption	Rated current at rated voltage
			V	Hz	rpm	kW	A
225 M to 280 M	1MJ6 073-2CA92-Z: Data for 50/60 Hz	3 AC	220 to 240 Δ	50	2790	0.550	1.38
		3 AC	380 to 420 Y	50	2790	0.550	0.8
		3 AC	440 to 480 Y	60	3390	0.630	1.38
315 – 2-pole	1MJ6 073-2CA92-Z: Data for 50/60 Hz	3 AC	220 to 240 Δ	50	2790	0.550	1.38
		3 AC	380 to 420 Y	50	2790	0.550	0.8
		3 AC	440 to 480 Y	60	3390	0.630	1.38
315 – 4-, 6-, 8-pole	1MJ6 073-2CA92-Z: Data for 50/60 Hz	3 AC	220 to 240 Δ	50	2790	0.550	1.38
		3 AC	380 to 420 Y	50	2790	0.550	0.8
		3 AC	440 to 480 Y	60	3390	0.630	1.38

¹⁾ There is no rated voltage range for motors for Zone 2.

²⁾ The values are only valid for the medium voltage of the rated voltage; therefore, there is no valid rated voltage range.

IEC Squirrel-Cage Motors

Explosion-proof motors

Orientation

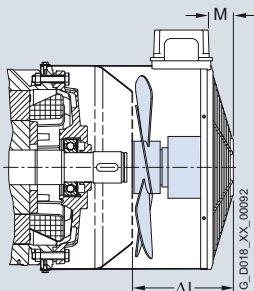
Technical specifications (continued)

Dimensions and weights of the Ex separately driven fans

Ex rotary pulse encoder (on cover) order codes **H86, H87**

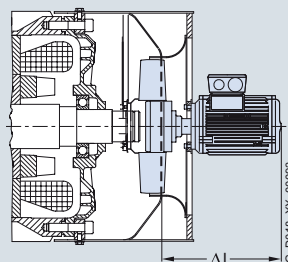
**1LA frame sizes 100 ... 225,
1LG frame sizes 180 and 200**

Ex separately driven fan
Order code **M97**



**1LG from frame size 225
1MJ7 from frame size 225**

Separately driven fan
Order codes **M95, M96, M98**



4

Frame size	Zone 22 1LA5/6/7/9		1LG4/6		Zones 2, 21 1LG4/6		Zone 1 (Ex d/de) 1MJ6/7	
	Δl mm	Weight approx. kg	Δl mm	Weight approx. kg	Δl mm	Weight approx. kg	Δl mm	Weight approx. kg
100	141	4	–	–	–	–	–	–
112	158	4.5	–	–	–	–	–	–
132	177	5.5	–	–	–	–	–	–
160	227	7	–	–	–	–	–	–
180	269	10	269	10	–	–	–	–
200	272	11	272	11	–	–	–	–
225	272	11	235	22	235	22	372	27
250	–	–	235	25	235	25	370	32
280	–	–	235	28	235	28	370	34
315	–	–	247	36	247	36	385	40

Selection and ordering data

Preliminary selection of the motor according to motor type/series, speed or number of poles, frame size, rated output, rated torque, rated speed and rated current

Self-ventilated motors in Zone 1 with type of protection "e" (Ex e II Increased safety)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1MA7 50 Hz						
3000, 2-pole	63 M ... 160 L	0.18 ... 16	2810 ... 2910	0.61 ... 53	0.55 ... 30.0	4/18 ... 4/19
1500, 4-pole	63 M ... 160 L	0.12 ... 13.5	1375 ... 1465	0.83 ... 88	0.52 ... 27	4/20 ... 4/21
1000, 6-pole	71 M ... 160 L	0.25 ... 9.7	850 ... 965	2.8 ... 96	0.81 ... 21	4/20 ... 4/21
Cast-iron series 1MA6 50 Hz						
3000, 2-pole	100 L ... 315 L	2.5 ... 165	2865 ... 2986	8.3 ... 528	5.3 ... 280	4/22 ... 4/25
1500, 4-pole	100 L ... 315 L	2 ... 165	1420 ... 1492	14 ... 1061	4.5 ... 305	4/26 ... 4/29
1000, 6-pole	100 L ... 315 L	1.3 ... 135	935 ... 991	13 ... 1300	3.35 ... 240	4/30 ... 4/33

Self-ventilated motors in Zone 1 with type of protection "de" (Ex de IIC explosion-proof enclosure)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Cast-iron series 1MJ6 50 Hz						
3000, 2-pole	71 M ... 200 L	0.37 ... 37	2750 ... 2945	1 ... 120	0.98 ... 64	4/34 ... 4/35
1500, 4-pole	71 M ... 200 L	0.25 ... 30	1325 ... 1465	1 ... 196	0.78 ... 55	4/36 ... 4/37
1000, 6-pole	71 M ... 200 L	0.25 ... 22	870 ... 975	2 ... 215	0.82 ... 42.5	4/38 ... 4/39
750, 8-pole	90 L ... 200 L	0.37 ... 15	655 ... 725	5 ... 198	1.16 ... 32	4/40 ... 4/41
Cast-iron series 1MJ7 50 Hz						
3000, 2-pole	225 M ... 315 M	45 ... 132	2955 ... 2980	145 ... 423	77 ... 225	4/34 ... 4/35
1500, 4-pole	225 S ... 315 M	37 ... 132	1475 ... 1486	240 ... 848	67 ... 232	4/36 ... 4/37
1000, 6-pole	225 M ... 315 M	30 ... 90	978 ... 988	293 ... 870	56 ... 162	4/38 ... 4/39
750, 8-pole	225 S ... 315 M	18.5 ... 75	725 ... 738	244 ... 970	37.5 ... 140	4/40 ... 4/41

IEC Squirrel-Cage Motors

Explosion-proof motors

Orientation

Selection and ordering data (continued)

Self-ventilated motors in Zones 2, 21 and 22 with type of protection “n” or protection against dust explosions

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V, 50 Hz at 460 V, 60 Hz	Detailed selection and ordering data Page
rpm		kW at 50 Hz HP at 60 Hz	rpm	Nm	A	
Aluminum series 1LA7 and 1LA5¹⁾ 50 Hz						
3000, 2-pole	56 M²⁾ ... 225 M	0.09 ... 45	2830 ... 2959	0.3 ... 145	0.26 ... 78	4/42 ... 4/43
1500, 4-pole	56 M²⁾ ... 225 M	0.06 ... 45	1350 ... 1470	0.42 ... 292	0.2 ... 80	4/44 ... 4/45
1000, 6-pole	63 M ... 225 M	0.09 ... 30	850 ... 978	1 ... 293	0.44 ... 61	4/46 ... 4/47
750, 8-pole	71 M ... 225 M	0.09 ... 22	630 ... 724	1.4 ... 290	0.36 ... 44.5	4/48 ... 4/49
Aluminum series 1LA9						
“High Efficiency” 50 Hz						
3000, 2-pole	56 M ... 200 L	0.09 ... 37	2830 ... 2950	0.3 ... 120	0.24 ... 64	4/50 ... 4/51
1500, 4-pole	56 M ... 200 L	0.06 ... 30	1380 ... 1465	0.42 ... 196	0.22 ... 53	4/52 ... 4/53
1000, 6-pole	90 S ... 200 L	0.75 ... 22	925 ... 975	7.7 ... 215	2 ... 45	4/54 ... 4/55
For use in the North American market according to EPACT 60 Hz						
3600, 2-pole	56 M ... 200 L	0.12 ... 50	3440 ... 3555	0.25 ... 100	0.23 ... 57	4/56 ... 4/57
1800, 4-pole	56 M ... 200 L	0.08 ... 40	1715 ... 1770	0.33 ... 161	0.18 ... 47	4/58 ... 4/59
1200, 6-pole	90 S ... 200 L	1 ... 30	1140 ... 1175	6.2 ... 182	1.78 ... 40	4/60 ... 4/61
Cast-iron series 1LA6 and 1LG4 50 Hz						
3000, 2-pole	100 L ... 315 L	3 ... 200	2890 ... 2982	9.9 ... 641	6.1 ... 325	4/62 ... 4/63
1500, 4-pole	100 L ... 315 L	2.2 ... 200	1420 ... 1486	15 ... 1285	4.7 ... 340	4/64 ... 4/65
1000, 6-pole	100 L ... 315 L	1.5 ... 160	925 ... 988	15 ... 1547	3.9 ... 285	4/66 ... 4/67
750, 8-pole	100 L ... 315 L	0.75 ... 132	679 ... 738	11 ... 1708	2.15 ... 245	4/68 ... 4/69
Cast-iron series 1LG6						
“High Efficiency” 50 Hz						
3000, 2-pole	180 M ... 315 L	22 ... 200	2955 ... 2982	71 ... 641	38.5 ... 320	4/70 ... 4/71
1500, 4-pole	180 M ... 315 L	18.5 ... 200	1470 ... 1490	120 ... 1282	34.5 ... 340	4/70 ... 4/71
1000, 6-pole	180 M ... 315 L	15 ... 160	975 ... 990	147 ... 1543	29.5 ... 280	4/72 ... 4/73
750, 8-pole	180 M ... 315 L	11 ... 132	725 ... 740	145 ... 1704	23.5 ... 240	4/72 ... 4/73
For use in the North American market according to EPACT 60 Hz						
3600, 2-pole	180 M ... 315 L	30 ... 300	3560 ... 3591	60 ... 595	34 ... 320	4/74 ... 4/75
1800, 4-pole	180 M ... 315 L	25 ... 300	1775 ... 1792	100 ... 1193	31 ... 335	4/76 ... 4/77
1200, 6-pole	180 M ... 315 L	20 ... 200	1178 ... 1192	121 ... 1195	25.5 ... 235	4/78 ... 4/79
Cast-iron series 1LA8 50 Hz for mains-fed operation³⁾						
3000, 2-pole	315 ... 450	250 ... 1000	2979 ... 2986	801 ... 3200	415 ... 1020	3/14 ... 3/15
1500, 4-pole	315 ... 450	250 ... 1000	1488 ... 1492	1600 ... 6400	430 ... 1060	3/14 ... 3/15
1000, 6-pole	315 ... 450	200 ... 800	988 ... 993	1930 ... 7690	345 ... 1100	3/16 ... 3/17
750, 8-pole	315 ... 450	160 ... 630	739 ... 744	2070 ... 8090	295 ... 1160	3/16 ... 3/17
Cast-iron series 1PQ8 50 Hz with standard insulation ≤500 V³⁾						
3000, 2-pole	315 ... 450	250 ... 1000	2979 ... 2986	801 ... 3200	415 ... 1020	3/26 ... 3/27
1500, 4-pole	315 ... 450	250 ... 1000	1488 ... 1492	1600 ... 6400	430 ... 1060	3/26 ... 3/27
1000, 6-pole	315 ... 450	200 ... 800	988 ... 993	1930 ... 7690	345 ... 1100	3/28 ... 3/29
750, 8-pole	315 ... 450	160 ... 630	739 ... 744	2070 ... 8090	295 ... 1160	3/28 ... 3/29

Motors for converter-fed operation 1LA8³⁾ with normal and special insulation or 1PQ8³⁾ with special insulation, see overview on Page 3/11.

¹⁾ Motor series 1LA5 is not possible for Zone 2.

²⁾ Motor series 1LA7 is only possible for Zone 2 in frame size 63 M and above.

³⁾ Motor series 1LA8 and 1PQ8 are not possible for Zone 21, 1PQ8 for Zones 2 and 22 on request.

More information

Fundamental physical principles and definitions

Explosion

An explosion is the sudden chemical reaction of a combustible substance with oxygen, involving the release of high energy. Combustible substances can be gases, vapors, fumes or dust. An explosion can only take place if the following three factors coincide:

1. Combustible substance (in the relevant distribution and concentration)
2. Oxygen (in the air)
3. Source of ignition (e.g. electrical spark)

Primary and secondary explosion protection

Integrated explosion protection

1. Prevention of dangerous potentially explosive atmospheres
2. Prevention of the ignition of dangerous potentially explosive atmospheres
3. Limiting the explosion to a negligible degree

The principle of integrated explosion protection requires all explosion protection measures to be carried out in a defined order. A distinction is made here between primary and secondary protective measures.

Primary explosion protection covers all measures that prevent the formation of a potentially explosive atmosphere.

What are the protective measures that can be taken to minimize the risk of an explosion?

- Avoidance of combustible substances
- Inerting (addition of nitrogen, carbon dioxide, etc.)
- Limiting of the concentration
- Improved ventilation

Secondary explosion protection is required if the explosion hazard cannot be removed or can only be partially removed using primary explosion protection measures.

When considering safety-related factors, it is necessary to know certain characteristic quantities of combustible materials.

Flash point

The flash point for flammable liquids specifies the lowest temperature at which a vapor-air mixture forms over the surface of the liquid that can be ignited by a separate source.

If the flash point of such a flammable liquid is significantly above the maximum occurring temperatures, a potentially explosive atmosphere cannot form there. However, the flash point of a mixture of different liquids can also be lower than the flash point of the individual components.

In technical regulations, flammable liquids are divided into four hazard classes:

Hazard class	Flash point
AI	<21 °C
AII	21 ... 55 °C
AIII	>55 ... 100 °C
B	<21 °C, at 15 °C soluble in water


Explosion limits

Combustible substances form a potentially explosive atmosphere when they are present within a certain range of concentration (see "Area subject to explosion hazard").

If the concentration is too low (lean mixture) and if the concentration is too high (rich mixture) an explosion does not take place. Instead slow burning takes place, or no burning at all. Only in the area between the upper and the lower explosion limits does the mixture react explosively if ignited. The explosion limits depend on the surrounding pressure and the proportion of oxygen in the air (see the table below).

We refer to a deflagration, explosion, or detonation, depending on the speed of combustion. A potentially explosive atmosphere is present if ignition represents a hazard for personnel or materials. A potentially explosive atmosphere, even one of low volume, can result in hazardous explosions in an enclosed space.

Area subject to explosion hazard

100 % vol	Air concentration	0 % vol
Mixture too weak	Area subject to explosion hazard	Mixture too rich
No combustion		Partial combustion, no explosion
← Lower explosion limit upper →		
0 % vol		100 % vol
Concentration of combustible substance		

Dusts

In industrial environments, e.g. in chemical plants or in flour mills, solid matter is often present in small particles and also in the form of dust.

The term "dust" is defined in DIN EN 50281-1-2 as small solid particles in the atmosphere that are deposited due to their own weight but which remain in the atmosphere for some time in the form of a dust/air mixture". Dust deposits are comparable to a porous body and have an air component of up to 90 %. If the temperature of dust deposits is increased, this can result in self-ignition of the combustible substance in the form of dust.

When deposits of dust with a small particle size are disturbed, there is a risk of explosion. This risk increases as the particle size decreases, because the surface area of the hollow space increases. Dust explosions are often the result of disturbed glowing dust deposits that carry the initial spark within them.

Explosions of gas/air or vapor/air mixtures can also disturb dust, in which case the gas explosion can become a dust explosion.

IEC Squirrel-Cage Motors

Explosion-proof motors

Orientation

More information (continued)

In coal mines, methane gas explosions often caused coal dust explosions which surpassed the gas explosions in their effects.

The risk of an explosion is prevented by using explosion-proof equipment in accordance with its protection capability. The identification of the equipment categories mirrors the effectiveness of the explosion protection and therefore its use in the corresponding areas subject to explosion hazard.

The potential risk of explosive dust atmospheres and the selection of appropriate protective measures are assessed on the basis of safety characteristics for the materials involved. Dusts are subdivided here in accordance with two of their material-specific characteristics:

- **Conductivity**
Dusts that have a specific electrical resistance of up to $10^3 \Omega\text{m}$ are classed as conductive.
- **Combustibility**
Combustible dusts, however, are characterized by the fact that they can burn or glow in air and that they can form explosive mixtures at atmospheric pressure and at temperature from -20 to $+60$ °C in combination with air.

Examples of safety characteristics in the case of disturbed dust include the minimum ignition energy and the ignition temperature, whereas in the case of dust deposits, the glowing temperature is a characteristic feature.

Minimum ignition energy

The application of a certain amount of energy is required to ignite a potentially explosive atmosphere.

The minimum energy is taken to be the lowest possible converted energy, for example, the discharge of a capacitor, that will ignite the relevant flammable mixture.

The minimum energy lies between approximately 10^{-5} J for hydrogen, and several Joules for certain dusts.

What can cause ignition?

- Hot surfaces
- Adiabatic compression
- Ultrasound
- Ionized radiation
- Open flames
- Chemical reaction
- Optical radiation
- Electromagnetic radiation
- Electrostatic discharge
- Sparks caused mechanically by friction or impact
- Electrical sparks and arcing
- Ionized radiation

Legislative basis and standards

Legislative basis of explosion protection

Globally, explosion protection is regulated by the legislatures of the individual countries. At the international level, the IEC is attempting to get closer to the aim of "a single global test and certificate" by introducing the IECEx Scheme.

EU directives

In the European Union, explosion protection is regulated by directives and laws.

Electrical equipment for use in potentially explosive atmospheres must therefore possess test certification or approval. The relevant systems and equipment are graded as systems requiring monitoring and must only use devices approved for this purpose. In addition, commissioning, modification, and regular safety inspections must only be accepted or carried out by approved institutions or societies. The EU directives are binding for all member states and form the legal framework.

Selection of important EU directives

Short designation	Full text	Directive no.	Valid as of:	End of transition period
EX Directive (ATEX 95)	Directive of the European Parliament and Council of March 23, 1994 on the harmonization of laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres	94/9/EG	03/01/96	06/30/03
ATEX 137	Minimum regulations for improving the health protection and safety of employees that could be endangered by potentially explosive atmospheres	1999/92/EG	12/16/99	06/30/03

More information (continued)

National laws and regulations

In general, the EU directives are European laws that must be incorporated by the individual member states unmodified by ratification. Directive 94/9/EU was adopted completely into the German explosion protection regulation ExVO. The underlying legislation for technical equipment is the Equipment Safety Law (GSG) to which ExVO is appended as a separate regulation (11th GSGV).

In contrast, ATEX 137 (Directive - 1999/92/EC) contains only "Minimum regulations for improving the health protection and safety of employees that could be endangered by potentially explosive atmospheres", so that each EU member state can pass its own regulations beyond the minimum requirements. In the German Federal Republic, the contents of the directive have been implemented in factory safety legislation. In order to simplify the legislation, the contents of several earlier regulations have been simultaneously integrated into the factory safety legislation ('BetrSichVO'). From the area of explosion protection, these are:

- The regulation concerning electrical installations in potentially explosive atmospheres (EllexV)
- The acetylene regulation
- The regulation concerning flammable liquids

These regulations became defunct when the factory safety legislation came into force on 01/01/2003.

Explosion protection guidelines (EX-RL) of the professional associations

In the "Guidelines for the prevention of hazards from potentially explosive atmospheres with listed examples" of the *German Chemicals Professional Association*, specific information is given on the hazards of potentially explosive atmospheres and measures for their prevention or limitation are listed. Of special use are the examples of individual potentially explosive process plants in the most diverse industrial sectors in which these measures are listed in detail. Valuable suggestions and risk evaluations are available for planners and operators of such plants or similar process plants. While the EX Directives have no legal status, they are nevertheless to be regarded as important recommendations that can also be called upon for support in deciding legal questions in the event of damage.

Standards

There are a host of technical standards worldwide for the area of explosion protection. The standards environment is subject to constant modification. This is the result of both adaptation to technical progress and increased safety demands in society. International efforts towards harmonization also contribute to the aim of achieving the most uniform global standards possible and the resulting removal of barriers to trade.

EU standards

The standards for explosion protection valid in the European Union are created on the basis of the EU Directives under the leadership of CENELEC (European Committee for Electrotechnical Standardization). CENELEC comprises the national committees of the member states. Since, in the meantime, standardization at international level gained greatly in importance through the dynamism of the IEC (International Electrotechnical Commission), CENELEC has decided only to pass standards in parallel with the IEC. In practice, this means European standards in the area of electrical/electronic systems will now be created or redefined almost exclusively on the basis of IEC standards as harmonized EN standards. For the area of explosion protection, these are mainly the standards of the EN 60079 series. The numbers of harmonized European standards are built up according to the following system:

IEC/EN	60079-0	:	1997	Meaning
				Year of issue
				Number of standard
				Harmonized European Standard

IEC

At the international level, the IEC (International Electrotechnical Commission) issues standards for explosion protection. The Technical Committee TC31 is responsible. Standards for explosion protection are found in the IEC 60079-x series (previously IEC 79-x). The x represents the numbers of the individual technical standards, e.g. IEC 60079-7 for intrinsic safety.

Classification of explosion-protected equipment

Identification

The identification of electrical equipment for areas protected against explosion hazards should include:

- The manufacturer who supplied the equipment
- A designation that identifies it
- The implementation range
 - In underground mines I
 - Other areas II
 - Gases and vapors – G -, dusts – D – or mines – M -,
- The categories that specify whether the device can be used for specific zones
- The type(s) of protection to which the equipment complies
- The testing authority that issued the test certificate, the standard or version of the standard to which the equipment complies – including the registration number of the certificate from the testing authority, and if necessary, the special conditions to be observed.
- The data that is normally required for an identical item of equipment in industrial design should also be provided.

Example for identification according to 94/9/EU

CE	0158	⊕ Ex	II 2D	IP65	T125 °C	Meaning
						Temperature range
						Enclosure protection class
						Ex protection zone
						Nominated authority for certification of the QA system in accordance with 94/9/EU
						Conformity mark

Equipment identification code	Meaning
SAMPLE_COMPANY	Manufacturer and type designation
Type 07-5103-.../...	
Ex II 2D IP65 T 125 °C	Acc. to EN 50281-1-1. Protection afforded by housing, IP65 protection class, Max. surface temperature +125 °C
PTB	Symbol of test authority
00	ATEX generation
ATEX	Certified 2000
1081	Serial No. of test authority

IEC Squirrel-Cage Motors

Explosion-proof motors

Orientation

More information (continued)

Device groups/categories

Devices are classified into device groups:

- Device group I
 - in underground operations
 - in mines
 - as well as open-cast operations
- Device group II
 - Devices for use in the other areas

Each device group contains equipment that is in turn assigned to different categories (Directive 94/9/EC).

The category specifies the zone in which the equipment may be used.

Comparison of device groups and categories

Device group I (mining)		
Category	M1: Extremely high level of safety	M2: High level of safety
Sufficient safety	Through 2 protective measures/in the event of 2 faults	Must be switched off in the presence of an Ex atmosphere.




Device group II (other areas subject to explosion hazard)						
Category	1: Extremely high level of safety		2: High level of safety		3: Normal level of safety	
Sufficient safety	Through 2 protective measures/in the event of 2 faults		In the event of frequent device faults/in the event of one fault		In the case of fault-free operation	
Use	Zone 0	Zone 20	Zone 1	Zone 21	Zone 2	Zone 22
Atmosphere	G (gas)	D (dust)	G	D	G	D

Zones

Potentially explosive atmospheres are divided into zones. Division into zones depends on the chronological and geographical probability of the presence of a hazardous, potentially explosive atmosphere.

Information and specifications for zone subdivision can be found in EN/IEC 60079-10.

Equipment in areas where a constant explosion hazard exists (Zone 0/20) are subject to stricter requirements, and by contrast, equipment in less hazardous areas (Zone 1/21, Zone 2/22) is subject to less stringent requirements. In general, 95 % of systems are installed in Zone 1 and only 5 % of equipment is in Zone 0.

Types of protection for gases							Use in Zone		
Degree of protection	Coding	Schematic diagram	Basic principle	Standard	Examples	0	1	2	
General requirements			General requirements for the type and testing of electrical equipment intended for the Ex area	IEC/EN 60079-0					
Increased safety	e		Applies only to equipment, or its component parts, that normally does not create sparks or arcs, does not attain hazardous temperatures, and whose mains voltage does not exceed 1 kV	IEC/EN 60079-7	Squirrel-cage motors, terminals, connection boxes		•	•	
Flameproof enclosure	d		If an explosion occurs inside the enclosure, the housing will withstand the pressure and the explosion will not be propagated outside the enclosure	IEC/EN 60079-1	Squirrel-cage motors, switchgear, transformers		•	•	
Types of protection	n	Zone 2 Several protection types are included under this type	Slightly simplified application of the other Zone 2 protection types – "n" stands for "non-igniting"	EN 50021 ¹⁾ IEC/EN 60079-15	Squirrel-cage motors, programmable controllers			•	

¹⁾ From 2007 IEC/EN 60079-15

Subdivision of combustible dusts into different zones

Flammable gases, vapors, and mist		
Zone	Equipment category	Description
0	1G	Hazardous, potentially explosive atmosphere present continuously and over extended periods .
1	2G 1G	It is to be expected that a hazardous, potentially explosive atmosphere will only occur occasionally .
2	3G 2G 1G	It is to be expected that a hazardous, potentially explosive atmosphere will occur only rarely and then only for a short period .

Flammable dusts		
Zone	Equipment category	Description
20	1D	Areas where a potentially explosive atmosphere comprising dust-air mixtures is present continuously, over extended periods or frequently .
21	2D 1D	Areas where it is expected that a hazardous, potentially explosive atmosphere comprising dust-air mixtures will occur occasionally and for short periods .
22	3D 2D 1D	Areas in which it is not to be expected that a potentially explosive atmosphere will be caused by stirred-up dust. If this does occur, then in all probability only rarely and for a short period .

Types of protection

The protection types are design measures and electrical measures carried out on the equipment to achieve explosion protection in the areas subject to explosion hazard.

Protection types are secondary explosion protection measures. The scope of the secondary explosion protection measures depends on the probability of the occurrence of a hazardous, potentially explosive atmosphere.

Electrical equipment for areas subject to explosion hazard must comply with the general requirements of IEC/EN 60079-0 and the specific requirements for the relevant type of protection in which the equipment is listed.

The types of protection listed on the pages below are significant in accordance with IEC/EN 60079-0. All types of protection are based on different principles.

More information (continued)

Types of protection for dusts		Basic principle	Standard	Examples	Use in Zone		
Type of protection	Coding				20	21	22
Pressurized enclosure	pD	Penetration of a surrounding atmosphere into the housing of electrical equipment is prevented by retaining an ignition protection gas (air, inert gas or other suitable gas) internally at a higher pressure than the surrounding atmosphere.	EN 50281 IEC 61241	Equipment in which sparks, arcs or hot components occur during operation	•	•	•
Encapsulation	mD	Components that can ignite a potentially explosive atmosphere through sparks or heating are embedded in a potting compound such that the explosive atmosphere cannot ignite. This is achieved by completely covering the components with a potting compound that is resistant to physical (particularly electrical, thermal and mechanical) as well as chemical influences.	EN 50281 IEC 61241	Switchgear and control cabinets	•	•	•
Protection by housing	tD	The housing is so thick that ingress of combustible dust is not possible. The external surface temperature of the housing is limited.	EN 50281 IEC 61241	Measuring and monitoring equipment	•	•	•
Intrinsic safety	iaD, ibD	Current and voltage are limited so that intrinsic safety is guaranteed. Sparks or thermal effects cannot ignite a dust/air mixture.	EN 50281 IEC 61241	Sensors and actuators	•	•	•

Temperature classes

The ignition temperature of flammable gases or a flammable liquid is the lowest temperature of a heated surface at which the gas/air or vapor/air mixture just ignites.

Thus the highest surface temperature of any equipment must always be less than the ignition temperature of the surrounding atmosphere.

Temperature classes T1 to T6 have been introduced for electrical equipment of Explosion group II. Equipment is assigned to each temperature class according to its maximum surface temperature.

Equipment that corresponds to a higher temperature class can also be used for applications with a lower temperature class.

Flammable gases and vapors are assigned to the relevant temperature class according to ignition temperature.

Definition of the temperature classes

Temperature class	Maximum surface temperature of the equipment	Ignition temperatures of combustible substances
T1	450 °C	>450 °C
T2	300 °C	>300 °C
T3	200 °C	>200 °C
T4	135 °C	>135 °C
T5	100 °C	>100 °C
T6	85 °C	>85 °C

Classification of gases and vapors into explosion groups and temperature classes

Explosion group	Temperature classes					
	T1	T2	T3	T4	T5	T6
I	Methane					
II A	Acetone Ethane Ethyl acetate Ammonia Benzene (pure) Acetic acid Carbon monoxide Carbon dioxide Methane Methanol Propane Toluene	Ethyl alcohol i-amyl acetate n-butane n-butyl alcohol	Petrol Diesel fuel Aviation gasoline Fuel oil n-hexane	Acetyl aldehyde Ethyl ether		
II B	Town gas (Illuminating gas)	Ethylene				
II C	Hydrogen	Acetylene				Carbon disulfide

For further information, please contact your local Siemens contact – see “Siemens Contacts Worldwide” in the Appendix.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Aluminum series 1MA7

Selection and ordering data

Rated output at		Temperature class	Frame size	Operating values at rated output					Order No.	Price	Weight
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz			
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below	IM B3 type of construction approx. m kg	
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T3											
0.18	0.18	T1,T2,T3	63 M	2810	0.61	66	0.74	0.55	1MA7 060-2BAQQ	3.9	
0.25	0.25	T1,T2,T3	63 M	2800	0.85	68	0.81	0.7	1MA7 063-2BAQQ	4.5	
0.37	0.37	T1,T2,T3	71 M	2825	1.3	73	0.8	0.93	1MA7 070-2BAQQ	5.4	
0.55	0.55	T1,T2,T3	71 M	2785	1.9	72	0.80	1.4	1MA7 073-2BAQQ	7	
0.75	0.75	T1,T2,T3	80 M	2845	2.5	73	0.85	1.81	1MA7 080-2BAQQ	8.6	
1.1	1.1	T1,T2,T3	80 M	2855	3.7	79	0.85	2.5	1MA7 083-2BAQQ	10.3	
1.3	1.3	T1,T2,T3	90 S	2850	4.4	78	0.88	2.9	1MA7 090-2BAQQ	13.3	
1.85	1.85	T1,T2,T3	90 L	2860	6.2	81	0.88	3.95	1MA7 096-2BAQQ	16.1	
2.5	2.5	T1,T2,T3	100 L	2865	8.3	82	0.87	5.3	1MA7 106-2BAQQ	21	
3.3	3.3	T1,T2,T3	112 M	2875	11	84	0.89	6.7	1MA7 113-2BBQQ	27	
4.6	4.6	T1,T2,T3	132 S	2920	15	83	0.9	9.2	1MA7 130-2BBQQ	38	
5.5	5.5	T3	132 S	2925	18	86	0.92	10.6	1MA7 131-2BBQQ¹⁾	44	
7.5	7.5	T3	160 M	2945	24	87.5	0.9	14.3	1MA7 163-2BBQQ¹⁾	67	
10	10	T3	160 M	2940	33	88.5	0.92	18.6	1MA7 164-2BBQQ¹⁾	72	
12.5	12.5	T3	160 L	2940	41	89	0.93	23	1MA7 166-2BBQQ¹⁾	82	

Rated output at		Temperature class	Frame size	Operating values at rated output					Order No.	Price	Weight
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz			
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below	IM B3 type of construction approx. m kg	
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 and T2, with double rating plate (T1/T2 and T3)											
6.5	6.5	T1,T2	132 S	2900	21	85	0.93	12.5	1MA7 131-2BBQQ¹⁾	44	
9.5	9.5	T1,T2	160 M	2920	31	87	0.91	18.1	1MA7 163-2BBQQ¹⁾	67	
13	13	T1,T2	160 M	2910	43	87.5	0.92	24.5	1MA7 164-2BBQQ¹⁾²⁾	72	
16	16	T1,T2	160 L	2910	53	87	0.93	30	1MA7 166-2BBQQ¹⁾²⁾	82	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz	230 V Δ /400 VY	400 V Δ /690 VY	500 VY	500 V Δ	Without flange	With flange		With standard flange		With special flange	
						IM B3/6/7/8, IM V6 ³⁾	IM B5, IM V3 ³⁾	IM V1 with protective cover ³⁾⁴⁾	IM B35	IM B14, ³⁾ IM V19 ³⁾	IM B34	IM B14 IM V19 ³⁾
	1	6	3	5	0	1	4	6	2	7	3	
1MA7 06 QQ	○	–	○	–	□	✓	✓	✓	✓	✓	✓	
1MA7 07 QQ	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1MA7 08 QQ	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1MA7 09 QQ	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1MA7 10 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1MA7 11 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1MA7 13 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1MA7 16 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see Page 4/19.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Aluminum series 1MA7

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output		t_E time	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)	for temperature class T1/T2 t_E s	for temperature class T3 t_E s
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T3									
1MA7 060-2BAQQ	2.3	4.4	2.3	16	0.00018	49	60	30	27
1MA7 063-2BAQQ	2.2	4.4	2.3	16	0.00023	49	60	19	16
1MA7 070-2BAQQ	2.3	5.6	2.1	16	0.00035	52	63	28	25
1MA7 073-2BAQQ	3	5.2	2.6	16	0.00045	52	63	18	13
1MA7 080-2BAQQ	2.5	6.2	2.7	16	0.00085	56	67	13	11
1MA7 083-2BAQQ	2.8	6.4	3	16	0.0011	56	67	12	10
1MA7 090-2BAQQ	2.6	6.2	2.8	16	0.0015	60	72	12	11
1MA7 096-2BAQQ	2.8	7.2	2.8	16	0.002	60	72	9	8
1MA7 106-2BAQQ	2.6	7.4	2.8	16	0.0038	62	74	9	8
1MA7 113-2BBQQ	2.1	6.6	2.3	13	0.0055	63	75	10	9
1MA7 130-2BBQQ	1.9	6.8	2.5	13	0.016	68	80	15	13
1MA7 131-2BBQQ	2.2	7.7	2.7	13	0.021	68	80	15	13
1MA7 163-2BBQQ	2.2	7.6	3.1	13	0.034	70	82	29	18
1MA7 164-2BBQQ	2.1	7.6	2.9	13	0.04	70	82	23	12
1MA7 166-2BBQQ	2.3	7.6	3	13	0.052	70	82	21	9

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output		t_E time for temperature class T1/T2	t_E time for temperature class T3
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)	t_E s	t_E s
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 and T2, with double rating plate (T1/T2 and T3)									
1MA7 131-2BBQQ	1.9	6.5	2.3	13	0.021	68	80	12	7
1MA7 163-2BBQQ	1.7	6	2.4	13	0.034	70	82	24	–
1MA7 164-2BBQQ	1.6	5.8	2.2	13	0.04	70	82	16	–
1MA7 166-2BBQQ	1.8	5.8	2.3	13	0.052	70	82	15	–

- 1) For the following versions T3-output is stamped as standard:
– order code **A11/A12**
– voltage code "9"
Alternative: order code **C30** "T1/T2-output on the rating plate"
- 2) Utilization according to temperature class 155 (F).

- 3) The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- 4) The "Second shaft extension" option, order code **K16** is not possible.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Aluminum series 1MA7

Selection and ordering data (continued)

Rated output at		Temperature class	Frame size	Operating values at rated output					Rated current at 380 ... 420 V, 50 Hz	Order No.	Price	Weight
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz				
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below		IM B3 type of construction approx. m kg	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T3												
0.12	0.12	T1,T2,T3	63 M	1375	0.83	55	0.66	0.52	1MA7 060-4BBQQ		3.9	
0.18	0.18	T1,T2,T3	63 M	1330	1.3	57	0.75	0.62	1MA7 063-4BBQQ		4.5	
0.25	0.25	T1,T2,T3	71 M	1310	1.8	60	0.77	0.8	1MA7 070-4BBQQ		6	
0.37	0.37	T3	71 M	1355	2.6	67	0.74	1.1	1MA7 073-4BBQQ		6.4	
0.55	0.55	T1,T2,T3	80 M	1390	3.8	73	0.73	1.59	1MA7 080-4BAQQ		8.4	
0.75	0.75	T1,T2,T3	80 M	1395	5.1	73	0.75	2.05	1MA7 083-4BAQQ		11	
1	1	T1,T2,T3	90 S	1420	6.7	77	0.78	2.5	1MA7 090-4BAQQ		12.7	
1.35	1.35	T1,T2,T3	90 L	1415	9.1	78	0.82	3.1	1MA7 096-4BAQQ		16	
2	2	T1,T2,T3	100 L	1420	14	80	0.82	4.5	1MA7 106-4BAQQ		20	
2.5	2.5	T1,T2,T3	100 L	1415	17	81	0.83	5.5	1MA7 107-4BAQQ		23	
3.6	3.6	T1,T2,T3	112 M	1435	24	85	0.83	7.5	1MA7 113-4BAQQ		29	
5	5	T1,T2,T3	132 S	1445	33	86	0.82	10.4	1MA7 130-4BAQQ		42	
6.8	6.8	T1,T2,T3	132 M	1465	44	87	0.82	14	1MA7 133-4BAQQ		61	
10	10	T1,T2,T3	160 M	1455	66	88	0.87	19.7	1MA7 163-4BBQQ		67	
13.5	13.5	T1,T2,T3	160 L	1465	88	89	0.84	27	1MA7 166-4BBQQ		107	
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T3												
0.25	0.25	T1,T2,T3	71 M	850	2.8	63	0.72	0.81	1MA7 073-6BAQQ		6.7	
0.37	0.37	T1,T2,T3	80 M	920	3.6	68	0.7	1.14	1MA7 080-6BAQQ		8.3	
0.55	0.55	T1,T2,T3	80 M	930	5.6	69	0.67	1.75	1MA7 083-6BAQQ		12.5	
0.65	0.65	T1,T2,T3	90 S	915	6.8	70	0.75	1.8	1MA7 090-6BAQQ		14	
0.95	0.95	T1,T2,T3	90 L	915	9.9	72	0.75	2.6	1MA7 096-6BAQQ		15.7	
1.3	1.3	T1,T2,T3	100 L	935	13	77	0.73	3.35	1MA7 106-6BAQQ		20	
1.9	1.9	T1,T2,T3	112 M	940	19	79	0.76	4.7	1MA7 113-6BBQQ		24	
2.6	2.6	T1,T2,T3	132 S	945	26	79	0.75	6.5	1MA7 130-6BBQQ		36	
3.5	3.5	T1,T2,T3	132 M	955	35	81	0.72	9	1MA7 133-6BBQQ		41	
4.8	4.8	T1,T2,T3	132 M	950	48	83	0.76	11.4	1MA7 134-6BBQQ		50	
6.6	6.6	T1,T2,T3	160 M	960	65	85	0.75	14.9	1MA7 163-6BBQQ		70	
9.7	9.7	T1,T2,T3	160 L	965	96	88	0.76	21	1MA7 166-6BBQQ		105	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ¹⁾	IM B5, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14 IM V19 ¹⁾
	1	6	3	5	0	1	4	6	2	7	3
1MA7 06 □□	○	–	○ ³⁾	–	□	✓	✓	✓	✓	✓	✓
1MA7 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MA7 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MA7 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MA7 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA7 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA7 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA7 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see Page 4/21.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Aluminum series 1MA7

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output		t_E time	
	with direct starting torque	as multiple of rated current	torque			Measuring surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz	for temperature class T1/T2	for temperature class T3
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pFA} dB(A)	L_{WA} dB(A)	t_E s	t_E s
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T3									
1MA7 060-4BBQQ	1.9	2.6	1.9	13	0.0003	42	53	35	30
1MA7 063-4BBQQ	1.9	2.7	1.9	13	0.0004	42	53	30	25
1MA7 070-4BBQQ	1.9	3.1	1.9	13	0.0006	44	55	50	40
1MA7 073-4BBQQ	1.9	3.7	2.1	13	0.00083	44	55	35	29
1MA7 080-4BAQQ	2.4	4.6	2.5	16	0.0015	47	58	24	21
1MA7 083-4BAQQ	2.6	4.8	2.6	16	0.0018	47	58	19	16
1MA7 090-4BAQQ	2.2	5.4	2.5	16	0.0028	48	60	16	14
1MA7 096-4BAQQ	2.3	5.9	2.5	16	0.0035	48	60	15	13
1MA7 106-4BAQQ	2.5	6.4	2.7	16	0.0048	53	65	13	11
1MA7 107-4BAQQ	2.6	6.4	2.7	16	0.0058	53	65	12	10
1MA7 113-4BAQQ	2.6	7.2	2.9	16	0.011	53	65	10	9
1MA7 130-4BAQQ	2.7	6.6	3.2	16	0.021	62	74	10	9
1MA7 133-4BAQQ	3	7.7	3.6	16	0.027	62	74	11	9
1MA7 163-4BBQQ	2.3	6.5	2.7	13	0.052	66	78	17	10
1MA7 166-4BBQQ	2.4	6.9	3	13	0.057	66	78	18	9
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T3									
1MA7 073-6BAQQ	2.2	3	2.1	16	0.0009	39	50	130	70
1MA7 080-6BAQQ	2.3	3.6	2.4	16	0.0015	40	51	60	55
1MA7 083-6BAQQ	2.4	4	2.4	16	0.0025	40	51	30	27
1MA7 090-6BAQQ	2.3	3.9	2.4	16	0.0028	43	55	35	30
1MA7 096-6BAQQ	2.3	4.1	2.4	16	0.0038	43	55	22	19
1MA7 106-6BAQQ	2.4	4.8	2.5	16	0.0063	47	59	26	26
1MA7 113-6BBQQ	2.3	5	2.5	13	0.011	52	64	19	16
1MA7 130-6BBQQ	1.8	4.4	2.4	13	0.015	63	75	21	18
1MA7 133-6BBQQ	2.3	5.1	2.8	13	0.019	63	75	16	13
1MA7 134-6BBQQ	2.4	5.6	2.8	13	0.025	63	75	13	11
1MA7 163-6BBQQ	2.7	6.4	3.1	13	0.041	66	78	18	9
1MA7 166-6BBQQ	2.8	7.7	2.2	13	0.055	66	78	15	8

- 1) The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- 2) The "Second shaft extension" option, order code **K16** is not possible.
- 3) For motors 1MA7 06.-4. (motor series 1MA7 frame size 63, 4-pole) not possible.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data

Rated output at		Temperature class	Frame size	Operating values at rated output					Rated current at 380 ... 420 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. <i>m</i> kg
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz				
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A				
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T3												
2.5	2.5	T1,T2,T3	100 L	2865	8.3	82	0.87	5.3	1MA6 106-2BA□□		34	
3.3	3.3	T1,T2,T3	112 M	2875	11	84	0.89	6.7	1MA6 113-2BB□□		43	
4.6	4.6	T1,T2,T3	132 S	2920	15	83	0.9	9.3	1MA6 130-2BB□□		53	
5.5	5.5	T3	132 S	2925	18	86	0.92	10.7	1MA6 131-2BB□□¹⁾		58	
7.5	7.5	T3	160 M	2945	24	87.5	0.9	15.3	1MA6 163-2BB□□¹⁾		96	
10	10	T3	160 M	2940	33	88.5	0.92	19.1	1MA6 164-2BB□□¹⁾		105	
12.5	12.5	T3	160 L	2940	41	89	0.93	23	1MA6 166-2BB□□¹⁾		115	
15	15	T3	180 M	2955	49	92	0.87	29	1MA6 183-2BC□□		170	
20	20	T3	200 L	2950	64	91.2	0.87	49	1MA6 206-2BC□□		245	
24	24	T3	200 L	2965	77	92	0.87	46	1MA6 207-2BC□□		246	
28	28	T3	225 M	2970	90	93.6	0.9	51	1MA6 223-2BC□□		310	
38	38	T1,T2	225 M	2970	122	93.9	0.89	69 ²⁾	1MA6 223-2AC□□		310	
36	36	T3	250 M	2975	116	93.5	0.91	64	1MA6 253-2BC□□		415	
47	47	T1,T2	250 M	2975	151	93.9	0.9	85	1MA6 253-2AC□□		415	
47	47	T3	280 S	2983	150	94.5	0.9	84	1MA6 280-2BD□□		570	
64	64	T1,T2	280 S	2980	205	94.3	0.89	115	1MA6 280-2AD□□		570	
58	58	T3	280 M	2982	186	94.7	0.91	104	1MA6 283-2BD□□		610	
76	76	T1,T2	280 M	2978	244	94.8	0.9	134	1MA6 283-2AD□□		610	
68	68	T3	315 S	2985	218	94	0.91	120	1MA6 310-2BD□□		790	
95	95	T1,T2	315 S	2985	304	94.6	0.9	169	1MA6 310-2AD□□		790	
80	80	T3	315 M	2985	256	94.8	0.91	142	1MA6 313-2BD□□		850	
112	112	T1,T2	315 M	2985	358	94.8	0.91	198 ²⁾	1MA6 313-2AD□□		850	
100	100	T3	315 L	2984	320	94.9	0.92	174	1MA6 316-2BD□□		990	
135	135	T1,T2	315 L	2984	432	95.2	0.91	234	1MA6 316-2AD□□		990	
125	125	T3	315 L	2985	400	95.5	0.91	214	1MA6 317-2BD□□³⁾		1100	
165	165	T1,T2	315 L	2986	528	95.7	0.91	280	1MA6 317-2AD□□³⁾		1100	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ⁴⁾⁵⁾	IM B5, IM V3 ⁴⁾⁶⁾	IM V1 with protective cover ⁴⁾⁶⁾⁷⁾	IM B35	IM B14, IM V19 ⁴⁾	IM B34	IM B14 IM V19 ⁴⁾
	1	6	3	5	0	1	4	6	2	7	3
1MA6 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA6 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA6 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA6 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA6 18 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 20 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 22 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 25 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 28 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 310 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 313 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 316 □□	–	○	○	○	□ ⁹⁾	–	✓ ¹⁰⁾	✓	–	–	–
1MA6 317 □□	–	○	○	○	□ ⁹⁾	–	✓ ¹⁰⁾	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see Page 4/23.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output		t_E time	
	with direct starting torque	as multiple of rated current	torque			Measuring surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz	for temperature class T1/T2	for temperature class T3
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	$L_{p(A)}$ dB(A)	L_{WA} dB(A)	t_E s	t_E s
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T3									
1MA6 106-2BA□□	2.6	7.4	2.8	16	0.0038	62	74	9	8
1MA6 113-2BB□□	2.1	6.6	2.3	13	0.0055	63	75	10	9
1MA6 130-2BB□□	1.9	6.8	2.5	13	0.016	68	80	15	13
1MA6 131-2BB□□	2.2	7.7	2.7	13	0.021	68	80	15	13
1MA6 163-2BB□□	2.2	7.6	3.1	13	0.034	70	82	29	18
1MA6 164-2BB□□	2.1	7.6	2.9	13	0.04	70	82	23	12
1MA6 166-2BB□□	2.3	7.6	3	13	0.052	70	82	23	9
1MA6 183-2BC□□	2	6.9	3.3	10	0.077	70	83	30	14
1MA6 206-2BC□□	1.9	6	2.9	10	0.14	71	84	35	14
1MA6 207-2BC□□	2	6.4	3	10	0.16	71	84	35	10
1MA6 223-2BC□□	1.8	6.4	2.7	10	0.24	71	84	30	13
1MA6 223-2AC□□	1.8	7	2.7	10	0.24	71	84	16	–
1MA6 253-2BC□□	1.5	6.6	2.7	10	0.45	75	89	30	11
1MA6 253-2AC□□	1.5	6.5	2.7	10	0.45	75	89	18	–
1MA6 280-2BD□□	1.5	7.1	2.9	7	0.79	77	91	30	23
1MA6 280-2AD□□	1.5	7.8	2.9	7	0.79	77	91	19	–
1MA6 283-2BD□□	1.5	7.2	2.8	7	0.92	77	91	27	11
1MA6 283-2AD□□	1.5	7.5	2.8	7	0.92	77	91	15	–
1MA6 310-2BD□□	1.4	7.1	2.8	7	1.3	79	93	50	21
1MA6 310-2AD□□	1.5	7.3	2.9	7	1.3	79	93	30	–
1MA6 313-2BD□□	1.6	7	2.8	7	1.5	79	93	40	19
1MA6 313-2AD□□	1.4	7.5	2.7	7	1.5	79	93	21	–
1MA6 316-2BD□□	1.4	6.8	2.7	7	1.8	79	93	40	11
1MA6 316-2AD□□	1.6	7.4	2.9	7	1.8	79	93	17	–
1MA6 317-2BD□□	1.5	7.3	2.5	7	2.3	79	93	30	7
1MA6 317-2AD□□	1.8	9.3	2.9	7	2.3	79	93	7	–

1) For the following versions T3-output is stamped as standard:
– order code **A11/A12**
– voltage code "9"
Alternative: order code **C30** "T1/T2-output on the rating plate"

2) For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection box").

3) Technical data and dimensions are available for VIK version (order code **K30**) on request (additional charge).

4) The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

5) If motors 1MA6 183-... to 1MA6 318-... (motor series 1MA6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

6) 1MA6 220-... to 1MA6 318-... motors (motor series 1MA6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

7) The "Second shaft extension" option, order code **K16** is not possible.

8) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

9) Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

10) 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Rated output at		Temperature class	Frame size	Operating values at rated output					Order No.	Price	Weight
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz			
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage and type of construction, see table below	<i>m</i> kg	
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 and T2, with double rating plate (T1/T2 and T3)											
6.5	6.5	T1,T2	132 S	2900	21	85	0.91	12.6	1MA6 131-2BB□□²⁾	58	
9.5	9.5	T1,T2	160 M	2920	31	87	0.88	18.6	1MA6 163-2BB□□²⁾	96	
13	13	T1,T2	160 M	2910	43	87.5	0.92	24.5	1MA6 164-2BB□□^{1) 2)}	105	
16	16	T1,T2	160 L	2910	53	87	0.93	30	1MA6 166-2BB□□^{1) 2)}	115	
19	19	T1,T2	180 M	2935	62	91.1	0.88	36.5	1MA6 183-2BC□□¹⁾	170	
25	25	T1,T2	200 L	2960	81	90.6	0.86	39	1MA6 206-2BC□□¹⁾	245	
31	31	T1,T2	200 L	2950	100	91.4	0.88	60	1MA6 207-2BC□□¹⁾	246	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3(6/7/8), IM V6 ^{3) 4)}	IM B5 ^{3) 5)} IM V3 ^{3) 5)}	IM V1 with protective cover ^{3) 5) 6)}	IM B35	IM B14, ³⁾ IM V19 ³⁾	IM B34	IM B14 IM V19 ³⁾
	1	6	3	5	0	1	4	6	2	7	3
1MA6 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA6 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA6 18 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–
1MA6 20 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ Utilization according to temperature class 155 (F).

²⁾ For the following versions T3-output is stamped as standard:
– order code **A11/A12**
– voltage code "9"
Alternative: order code **C30** "T1/T2-output on the rating plate"

³⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

⁴⁾ If motors 1MA6 183-... to 1MA6 318-... (motor series 1MA6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

⁵⁾ 1MA6 220-... to 1MA6 318-... motors (motor series 1MA6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

⁶⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁷⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	t_E time	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	for temperature class T1/T2 t_E s	for temperature class T3 t_E s
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 and T2, with double rating plate (T1/T2 and T3)							
1MA6 131-2BB□□	1.9	6.5	2.3	13	0.021	12	7
1MA6 163-2BB□□	1.7	6	2.4	13	0.034	24	–
1MA6 164-2BB□□	1.6	5.8	2.2	13	0.04	16	–
1MA6 166-2BB□□	1.8	5.8	2.3	13	0.052	5	–
1MA6 183-2BC□□	1.6	5.5	2.6	10	0.077	24	–
1MA6 206-2BC□□	1.5	4.8	2.3	10	0.14	28	–
1MA6 207-2BC□□	1.5	4.9	2.3	10	0.16	26	–

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Rated output at		Temperature class	Frame size	Operating values at rated output					Rated current at 380 ... 420 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz				
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A				
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T3												
2	2	T1,T2,T3	100 L	1420	14	80	0.82	4.5	1MA6 106-4BAQQ		33	
2.5	2.5	T1,T2,T3	100 L	1415	17	81	0.83	5.5	1MA6 107-4BAQQ		36	
3.6	3.6	T1,T2,T3	112 M	1435	24	85	0.83	7.5	1MA6 113-4BAQQ		45	
5	5	T1,T2,T3	132 S	1445	33	86	0.82	10.4	1MA6 130-4BAQQ		55	
6.8	6.8	T1,T2,T3	132 M	1460	44	87	0.82	14	1MA6 133-4BAQQ		62	
10	10	T1,T2,T3	160 M	1455	66	88	0.87	19.7	1MA6 163-4BBQQ		100	
13.5	13.5	T1,T2,T3	160 L	1465	88	89	0.84	27	1MA6 166-4BBQQ		114	
15	15	T3	180 M	1470	97	90.7	0.8	31	1MA6 183-4BCQQ		165	
17.5	17.5	T3	180 L	1470	114	91.6	0.8	36	1MA6 186-4BCQQ		177	
24	24	T3	200 L	1475	155	92.5	0.82	47.5	1MA6 207-4BCQQ		280	
30	30	T3	225 S	1481	193	93.3	0.83	59	1MA6 220-4BCQQ		300	
36	36	T3	225 M	1484	232	93.8	0.84	70 ¹⁾	1MA6 223-4BCQQ		330	
44	44	T3	250 M	1485	283	94	0.85	83	1MA6 253-4BCQQ		435	
58	58	T3	280 S	1488	372	94.6	0.84	111	1MA6 280-4BCQQ ²⁾		610	
70	70	T3	280 M	1488	449	94.8	0.85	130	1MA6 283-4BCQQ ²⁾		660	
84	84	T3	315 S	1492	538	95.4	0.84	158	1MA6 310-4BDQQ		830	
100	100	T3	315 M	1492	640	95.8	0.85	185	1MA6 313-4BDQQ ²⁾		910	
115	115	T3	315 L	1490	740	95.6	0.86	214	1MA6 316-4BDQQ ²⁾		1060	
135	135	T3	315 L	1492	868	95.8	0.86	245	1MA6 317-4BDQQ		1200	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange			With standard flange		With special flange	
	230 V Δ /400 VY	400 V Δ /690 VY	500 VY	500 V Δ	IM B3(6/7/8), IM V6 ^{3) 4)}	IM B5 ^{3) 5)}	IM V3 ^{3) 5)}	IM V1 with protective cover ^{3) 5) 6)}	IM B35	IM B14 ^{1) 3)}	IM B34	IM B14 IM V19 ³⁾
	1	6	3	5	0	1	4	6	2	7	3	
1MA6 10 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1MA6 11 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1MA6 13 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1MA6 16 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1MA6 18 QQ	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	
1MA6 20 QQ	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	
1MA6 22 QQ	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	
1MA6 25 QQ	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	
1MA6 28 QQ	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	
1MA6 310 QQ	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	
1MA6 313 QQ	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	
1MA6 316 QQ	–	○	○	○	□ ⁸⁾	–	✓	✓	–	–	–	
1MA6 317 QQ	–	○	○	○	□ ⁸⁾	–	✓	✓	–	–	–	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see Page 4/27.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output		t_E time	
	with direct starting torque	as multiple of rated current	torque			Measuring surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz	for temperature class T1/T2	for temperature class T3
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pFA} dB(A)	L_{WA} dB(A)	t_E s	t_E s
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T3									
1MA6 106-4BA□□	2.5	6.4	2.7	16	0.0048	53	65	13	11
1MA6 107-4BA□□	2.6	6.4	2.7	16	0.0058	53	65	12	10
1MA6 113-4BA□□	2.6	7.2	2.9	16	0.011	53	65	10	9
1MA6 130-4BA□□	2.7	6.6	3.2	16	0.021	62	74	10	9
1MA6 133-4BA□□	3	7.7	3.6	16	0.027	62	74	10	9
1MA6 163-4BB□□	2.3	6.5	2.7	13	0.052	66	78	17	10
1MA6 166-4BB□□	2.4	6.9	3	13	0.057	66	78	18	9
1MA6 183-4BC□□	1.8	6.1	2.9	10	0.13	63	76	18	11
1MA6 186-4BC□□	1.8	6.4	3	10	0.15	63	76	16	11
1MA6 207-4BC□□	2.1	7.9	3	10	0.24	65	78	20	11
1MA6 220-4BC□□	1.6	6.7	2.7	10	0.44	65	78	13	13
1MA6 223-4BC□□	1.7	6.9	2.8	10	0.52	65	78	12	12
1MA6 253-4BC□□	1.7	7.3	2.5	10	0.79	65	79	18	11
1MA6 280-4BC□□	1.7	6.3	2.5	10	1.4	67	81	30	7
1MA6 283-4BC□□	1.7	7	2.5	10	1.6	67	81	26	6
1MA6 310-4BD□□	1.7	7.7	2.8	7	2.2	69	83	28	8
1MA6 313-4BD□□	1.6	7.2	2.5	7	2.7	69	83	29	7
1MA6 316-4BD□□	1.7	7.5	2.5	7	3.2	69	83	28	5
1MA6 317-4BD□□	1.7	7.8	2.8	7	4.2	69	83	26	7

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- For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection box").
- Technical data and dimensions are available for VIK version (order code **K30**) on request (additional charge).
- The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- If motors 1MA6 183-... to 1MA6 318-... (motor series 1MA6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.
- 1MA6 220-... to 1MA6 318-... motors (motor series 1MA6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- The "Second shaft extension" option, order code **K16** is not possible.
- Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Rated output at		Temperature class	Frame size	Operating values at rated output					Rated current at 380 ... 420 V, 50 Hz	Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz				
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A				
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 and T2, with double rating plate (T1/T2 and T3)												
17	17	T1,T2	180 M	1460	111	90	0.82	35.5	1MA6 183-4BC□□¹⁾		165	
20	20	T1,T2	180 L	1465	130	90.6	0.82	41 ²⁾	1MA6 186-4BC□□¹⁾		177	
27	27	T1,T2	200 L	1475	175	92.4	0.84	53	1MA6 207-4BC□□		280	
33	33	T1,T2	225 S	1480	213	93.1	0.84	64 ²⁾	1MA6 220-4BC□□		300	
40	40	T1,T2	225 M	1480	258	93.6	0.85	77 ²⁾	1MA6 223-4BC□□		330	
50	50	T1,T2	250 M	1485	322	93.8	0.86	94	1MA6 253-4BC□□		435	
68	68	T1,T2	280 S	1485	437	94.5	0.85	131	1MA6 280-4BC□□³⁾		610	
80	80	T1,T2	280 M	1485	514	94.8	0.87	150 ²⁾	1MA6 283-4BC□□³⁾		660	
100	100	T1,T2	315 S	1490	641	95.3	0.85	188	1MA6 310-4BD□□		830	
120	120	T1,T2	315 M	1488	770	95.7	0.86	222 ²⁾	1MA6 313-4BD□□³⁾		910	
135	135	T1,T2	315 L	1488	868	95.5	0.86	248	1MA6 316-4BD□□³⁾		1060	
165	165	T1,T2	315 L	1485	1061	95.8	0.87	305	1MA6 317-4BD□□		1200	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange			With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ⁴⁾⁵⁾	IM B5, IM V3 ⁴⁾⁶⁾	IM V1 with protective cover ⁴⁾⁶⁾⁷⁾	IM B35	IM B14, IM V19 ⁴⁾	IM B34	IM B14 IM V19 ⁴⁾	
	1	6	3	5	0	1	4	6	2	7	3	
1MA6 18 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	-	-	-	
1MA6 20 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	-	-	-	
1MA6 22 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	-	-	-	
1MA6 25 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	-	-	-	
1MA6 28 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	-	-	-	
1MA6 310 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	-	-	-	
1MA6 313 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	-	-	-	
1MA6 316 □□	-	○	○	○	□ ⁹⁾	-	✓	✓	-	-	-	
1MA6 317 □□	-	○	○	○	□ ⁹⁾	-	✓	✓	-	-	-	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ Utilization according to temperature class 155 (F).

²⁾ For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection box").

³⁾ Technical data and dimensions are available for VIK version (order code **K30**) on request (additional charge).

⁴⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

⁵⁾ If motors 1MA6 183-... to 1MA6 318-... (motor series 1MA6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

⁶⁾ 1MA6 220-... to 1MA6 318-... motors (motor series 1MA6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

⁷⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁸⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

⁹⁾ Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	t_E time	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	for temperature class T1/T2 t_E s	for temperature class T3 t_E s
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 and T2, with double rating plate (T1/T2 and T3)							
1MA6 183-4BC□□	1.6	5.3	2.4	10	0.13	13	–
1MA6 186-4BC□□	1.6	5.6	2.6	10	0.15	13	–
1MA6 207-4BC□□	1.9	7.1	2.7	10	0.24	19	–
1MA6 220-4BC□□	1.4	6.2	2.5	10	0.44	11	–
1MA6 223-4BC□□	1.5	6.2	2.5	10	0.52	10	–
1MA6 253-4BC□□	1.5	6.4	2.1	10	0.79	15	–
1MA6 280-4BC□□	1.5	5.3	2.1	10	1.4	23	–
1MA6 283-4BC□□	1.5	6	2.2	10	1.6	20	–
1MA6 310-4BD□□	1.4	6.5	2.4	7	2.2	24	–
1MA6 313-4BD□□	1.3	6	2.1	7	2.7	24	–
1MA6 316-4BD□□	1.4	6.4	2.1	7	3.2	21	–
1MA6 317-4BD□□	1.5	6.3	2.3	7	4.2	17	–

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Rated output at		Temperature class	Frame size	Operating values at rated output					Rated current at 380 ... 420 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz				
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A				
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T3												
1.3	1.3	T1,T2,T3	100 L	935	13	77	0.73	3.35	1MA6 106-6BA□□		33	
1.9	1.9	T1,T2,T3	112 M	940	19	79	0.76	4.7	1MA6 113-6BB□□		40	
2.6	2.6	T1,T2,T3	132 S	945	26	79	0.75	6.5	1MA6 130-6BB□□		50	
3.5	3.5	T1,T2,T3	132 M	955	35	81	0.72	9	1MA6 133-6BB□□		57	
4.8	4.8	T1,T2,T3	132 M	950	48	83	0.76	11.4	1MA6 134-6BB□□		66	
6.6	6.6	T1,T2,T3	160 M	960	65	85	0.75	14.9	1MA6 163-6BB□□		103	
9.7	9.7	T1,T2,T3	160 L	965	96	88	0.76	21	1MA6 166-6BB□□		122	
13.2	13.2	T1,T2,T3	180 L	975	129	89.6	0.78	28.5	1MA6 186-6BC□□		177	
16.5	16.5	T1,T2,T3	200 L	980	161	90.5	0.81	34.5	1MA6 206-6BC□□		220	
20	20	T1,T2,T3	200 L	980	195	90.8	0.82	41	1MA6 207-6BC□□		235	
27	27	T1,T2,T3	225 M	980	263	92.5	0.82	54	1MA6 223-6BC□□		305	
33	33	T1,T2,T3	250 M	985	320	93	0.83	66	1MA6 253-6BC□□		410	
40	40	T1,T2,T3	280 S	990	386	93.3	0.85	77	1MA6 280-6BC□□		540	
46	46	T3	280 M	988	445	93.5	0.86	86	1MA6 283-6BC□□		580	
64	64	T3	315 S	991	617	94.3	0.84	124	1MA6 310-6BC□□		770	
76	76	T3	315 M	991	732	94.6	0.84	146	1MA6 313-6BC□□		830	
92	92	T3	315 L	991	887	95	0.85	172	1MA6 316-6BC□□		970	
110	110	T3	315 L	991	1060	95.2	0.84	210	1MA6 317-6BC□□ ¹⁾		1060	
125	125	T3	315 L	991	1210	95.2	0.86	220	1MA6 318-6BC□□ ¹⁾²⁾		1100	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange		With standard flange				With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ³⁾⁴⁾	IM B5, IM V3 ³⁾⁵⁾	IM V1 with protective cover ³⁾⁵⁾⁶⁾	IM B35	IM B14, IM V19 ³⁾	IM B34	IM B14, IM V19 ³⁾	
	For delta connection, overload protection with phase-failure protection must be provided.											
	1	6	3	5	0	1	4	6	2	7	3	
1MA6 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1MA6 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1MA6 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1MA6 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1MA6 18 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	-	-	-	
1MA6 20 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	-	-	-	
1MA6 22 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	-	-	-	
1MA6 25 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	-	-	-	
1MA6 28 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	-	-	-	
1MA6 310 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	-	-	-	
1MA6 313 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	-	-	-	
1MA6 316 □□	-	○	○	○	□ ⁸⁾	-	✓	✓	-	-	-	
1MA6 317 □□	-	-	-	-	-	-	-	-	-	-	-	
1MA6 318 □□	-	-	-	-	-	-	-	-	-	-	-	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see Page 4/31.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output		t_E time	
	with direct starting as multiple of rated torque	as multiple of rated current	torque			Measuring surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz	for temperature class T1/T2	for temperature class T3
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{dFA} dB(A)	L_{WA} dB(A)	t_E s	t_E s
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T3									
1MA6 106-6BA□□	2.4	4.8	2.5	16	0.0063	47	59	26	26
1MA6 113-6BB□□	2.3	5	2.5	13	0.011	52	64	19	16
1MA6 130-6BB□□	1.8	4.4	2.4	13	0.015	63	75	21	18
1MA6 133-6BB□□	2.3	5.1	2.8	13	0.019	63	75	16	13
1MA6 134-6BB□□	2.4	5.6	2.8	13	0.025	63	75	13	11
1MA6 163-6BB□□	2.7	6.4	3.1	13	0.041	66	78	18	9
1MA6 166-6BB□□	2.8	7.7	2.2	13	0.055	66	78	15	8
1MA6 186-6BC□□	1.6	5.4	2.5	10	0.2	66	78	22	18
1MA6 206-6BC□□	1.7	5.4	2.6	10	0.29	66	78	23	19
1MA6 207-6BC□□	1.7	5.6	2.6	10	0.33	66	78	22	17
1MA6 223-6BC□□	1.6	5.6	2.5	10	0.57	66	78	15	15
1MA6 253-6BC□□	1.6	5.3	2.4	10	0.89	60	74	16	16
1MA6 280-6BC□□	1.5	6.2	2.6	10	1.3	60	74	13	13
1MA6 283-6BC□□	1.6	6.5	2.5	10	1.5	60	74	0	12
1MA6 310-6BC□□	1.7	6.2	2.5	10	2.4	63	77	0	14
1MA6 313-6BC□□	1.7	6.4	2.5	10	2.9	63	77	0	8
1MA6 316-6BC□□	1.7	6.5	2.5	10	3.5	63	77	0	9
1MA6 317-6BC□□	1.7	6.8	2.5	10	4.3	63	77	0	6
1MA6 318-6BC□□	1.6	7	2.5	10	4.9	63	77	0	6

4

- 1) Technical data and dimensions are available for VIK version (order code **K30**) on request (additional charge).
- 2) Only certified for rated voltage of 400 V.
- 3) The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- 4) If motors 1MA6 183-... to 1MA6 318-... (motor series 1MA6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.
- 5) 1MA6 220-... to 1MA6 318-... motors (motor series 1MA6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- 6) The "Second shaft extension" option, order code **K16** is not possible.
- 7) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 8) Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Rated output at		Temperature class	Frame size	Operating values at rated output					Rated current at 380 ... 420 V, 50 Hz	Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz				
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A				
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 and T2, with double rating plate (T1/T2 and T3)												
50	50	T1,T2	280 M	987	484	93.3	0.86	96	1MA6 283-6BC□□		580	
68	68	T1,T2	315 S	990	656	94.2	0.85	131	1MA6 310-6BC□□		770	
82	82	T1,T2	315 M	990	791	94.5	0.84	158	1MA6 313-6BC□□		830	
98	98	T1,T2	315 L	990	945	94.8	0.85	185	1MA6 316-6BC□□		970	
120	120	T1,T2	315 L	990	1160	95	0.85	230	1MA6 317-6BC□□¹⁾		1060	
135	135	T1,T2	315 L	990	1300	95	0.86	240 ²⁾	1MA6 318-6BC□□¹⁾		1100	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	Without flange	With flange		With standard flange		With special flange	
						IM B3/6/7/8, IM V6 ³⁾⁴⁾	IM B5, IM V3 ³⁾⁵⁾	IM V1 with protective cover ³⁾⁵⁾⁶⁾	IM B35	IM B14, IM V19 ³⁾	IM B34	IM B14 IM V19 ³⁾
	1	6	3	5	0	1	4	6	2	7	3	
1MA6 28 - □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	-	-	-	
1MA6 310 - . . . □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	-	-	-	
1MA6 313 - . . . □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	-	-	-	
1MA6 316 - . . . □□	-	○	○	○	□ ⁸⁾	-	✓	✓	-	-	-	
1MA6 317 - . . . □□	-	-	-	-	-	-	-	-	-	-	-	
1MA6 318 - . . . □□	-	-	-	-	-	-	-	-	-	-	-	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) Technical data and dimensions are available for VIK version (order code **K30**) on request (additional charge).
- 2) Only certified for rated voltage of 400 V.
- 3) The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- 4) If motors 1MA6 183-... to 1MA6 318-... (motor series 1MA6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

- 5) 1MA6 220-... to 1MA6 318-... motors (motor series 1MA6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- 6) The "Second shaft extension" option, order code **K16** is not possible.
- 7) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 8) Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	t_E time	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	for temperature class T1/T2 t_E s	for temperature class T3 t_E s
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 and T2, with double rating plate (T1/T2 and T3)							
1MA6 283-6BC□□	1.5	5.8	2.3	10	1.5	14	–
1MA6 310-6BC□□	1.6	5.9	2.3	10	2.4	22	–
1MA6 313-6BC□□	1.6	5.9	2.3	10	2.9	18	–
1MA6 316-6BC□□	1.6	6.1	2.3	10	3.5	20	–
1MA6 317-6BC□□	1.6	6.2	2.3	10	4.3	16	–
1MA6 318-6BC□□	1.5	6.5	2.3	10	4.9	17	–

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "de"
Cast-iron series 1MJ6 and 1MJ7

Selection and ordering data

Rated output at		Frame size	Operating values at rated output					Power factor at 50 Hz	Rated current at 400 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. <i>m</i> kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz ¹⁾							
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A					
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T4												
0.37	0.43	71 M	2750	1.3	67	0.81	0.98	1MJ6 070-2CA□□			19	
0.55	0.63	71 M	2790	1.9	71	0.81	1.38	1MJ6 073-2CA□□			20	
0.75	0.86	80 M	2840	2.5	72	0.86	1.75	1MJ6 080-2CA□□			24	
1.1	1.3	80 M	2835	3.7	74	0.87	2.45	1MJ6 083-2CA□□			26	
1.5	1.75	90 L	2850	5	78	0.84	3.3	1MJ6 096-2CA□□			32	
2.2	2.55	90 L	2860	7.4	80	0.86	4.6	1MJ6 097-2CA□□			35	
3	3.45	100 L	2885	9.9	82	0.85	6.2	1MJ6 106-2CA□□			44	
4	4.6	112 M	2895	13	84	0.88	7.8	1MJ6 113-2CA□□			57	
5.5	6.3	132 S	2925	18	85	0.89	10.5	1MJ6 130-2CA□□			75	
7.5	8.6	132 S	2930	24	87	0.89	14.5	1MJ6 131-2CA□□			82	
11	12.6	160 M	2940	36	88	0.88	20.5	1MJ6 163-2CA□□			123	
15	17.3	160 M	2940	49	89	0.91	26.5	1MJ6 164-2CA□□			134	
18.5	21.3	160 L	2940	60	91	0.91	32.5	1MJ6 166-2CA□□			161	
22	24.5	180 M	2940	71	92	0.88	39	1MJ6 183-2CA□□			175	
30	33.5	200 L	2940	97	92.3	0.89	53	1MJ6 206-2CA□□			250	
37	41.5	200 L	2945	120	92.8	0.9	64	1MJ6 207-2CA□□			266	
45	51	225 M	2955	145	93.9	0.9	77 ¹⁾	1MJ7 223-2CB□□			335	
55	62	250 M	2965	177	94	0.9	93	1MJ7 253-2CB□□			445	
75	84	280 S	2975	241	94.7	0.9	128 ¹⁾	1MJ7 280-2CC□□			600	
90	101	280 M	2975	289	95.1	0.91	150 ¹⁾	1MJ7 283-2CC□□			640	
110	123	315 S	2980	353	94.8	0.9	186 ¹⁾	1MJ7 310-2CC□□			840	
132	148	315 M	2980	423	95.1	0.9	225 ¹⁾	1MJ7 313-2CC□□			900	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange		With flange			With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3(6/7/8, IM V6 ²⁾³⁾	IM B5 ²⁾⁴⁾ , IM V3 ²⁾⁴⁾	IM V1 with protective cover ²⁾⁴⁾⁵⁾	IM B35	IM B14 ^{1,2)} , IM V19 ²⁾	IM B34	IM B14, IM V19 ²⁾	
1	6	3	5	0	1	4	6	2	7	3		
1MJ6 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1MJ6 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1MJ6 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	–	
1MJ6 10 □□	○	○	○	○	□	✓	✓	✓	–	–	–	
1MJ6 11 □□	○	○	○	○	□	✓	✓	✓	–	–	–	
1MJ6 13 □□	○	○	○	○	□	✓	✓	✓	–	–	–	
1MJ6 16 □□	○	○	○	○	□	✓	✓	✓	–	–	–	
1MJ6 18 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–	
1MJ6 20 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–	
1MJ7 22 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–	
1MJ7 25 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–	
1MJ7 28 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–	
1MJ7 31 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see Page 4/35.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "de"
Cast-iron series 1MJ6 and 1MJ7

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T4							
1MJ6 070-2CA□□	2.3	4.3	2.3	16	0.00035	52	63
1MJ6 073-2CA□□	2.3	5.3	2.3	16	0.00045	52	63
1MJ6 080-2CA□□	2.4	6.3	2.3	16	0.00085	56	67
1MJ6 083-2CA□□	2.6	6.3	2.3	16	0.0011	56	67
1MJ6 096-2CA□□	2.5	6.7	2.5	16	0.0015	60	72
1MJ6 097-2CA□□	2.8	7.1	2.8	16	0.002	60	72
1MJ6 106-2CA□□	2.8	7.7	3	16	0.0038	62	74
1MJ6 113-2CA□□	2.4	7.6	2.8	16	0.0055	63	75
1MJ6 130-2CA□□	2	5.9	2.6	16	0.01	68	80
1MJ6 131-2CA□□	2.3	6.9	2.6	16	0.01	68	80
1MJ6 163-2CA□□	2.1	6.5	2.6	16	0.03	70	82
1MJ6 164-2CA□□	2.2	6.6	3.1	16	0.04	70	82
1MJ6 166-2CA□□	2.4	7	3.3	16	0.05	70	82
1MJ6 183-2CA□□	2.5	6.9	3.2	16	0.07	70	83
1MJ6 206-2CA□□	2.4	6.5	2.8	16	0.14	71	84
1MJ6 207-2CA□□	2.4	7.7	2.8	16	0.16	71	84
1MJ7 223-2CB□□	2.3	6.9	2.7	13	0.24	71	84
1MJ7 253-2CB□□	2.1	6.9	2.8	13	0.45	75	89
1MJ7 280-2CC□□	1.9	7	2.7	10	0.79	77	91
1MJ7 283-2CC□□	2	7	2.7	10	0.92	77	91
1MJ7 310-2CC□□	1.8	7	2.8	10	1.3	79	93
1MJ7 313-2CC□□	1.9	7	2.8	10	1.5	79	93

The 1MJ6/1MJ7 motors can also be ordered for use with type of protection Ex d/de (Zone 1)/dust-Ex Zone 21, as well as for Zone 22 for conducting dust:

Mains-fed operation – order code **M76**

Converter-fed operation with derating – order code **M77**

See "Special versions" in the "Selection and ordering data" under "Options".

Other versions up to 900 kW as 2-pole motors as DN series with Order No. 1PS4 (Ex de IIB), 1PS5 (Ex de IIC) available; also higher outputs and other numbers of poles possible.

Place request with:

Loher GmbH (a Siemens company)

Hans-Loher-Str. 32

94099 Ruhstorf/Rott

<http://www.loher.com>

- For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").
- The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- If motors 1MJ6 183-... to 1MJ7 313-... (motor series 1MJ6 frame size 180 M and above to 1MJ7 frame size 315 M) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.
- 1MJ7 220-... to 1MJ7 313-... motors (motor series 1MJ7 frame sizes 225 S to 315 M) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- The "Second shaft extension" option, order code **K16** is not possible.
- Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "de"
Cast-iron series 1MJ6 and 1MJ7

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output					Power factor at 50 Hz	Rated current at 400 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz ¹⁾							
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A					
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T4												
0.25	0.29	71 M	1325	1.8	60	0.77	0.78	1MJ6 070-4CB□□			20	
0.37	0.43	71 M	1375	2.5	64	0.74	1.13	1MJ6 073-4CB□□			21	
0.55	0.63	80 M	1395	3.7	71	0.79	1.42	1MJ6 080-4CA□□			24	
0.75	0.86	80 M	1395	5.1	73	0.79	1.88	1MJ6 083-4CA□□			26	
1.1	1.3	90 L	1410	7.5	73	0.80	2.7	1MJ6 096-4CA□□			32	
1.5	1.75	90 L	1420	10	77	0.8	3.5	1MJ6 097-4CA□□			35	
2.2	2.55	100 L	1420	15	78	0.8	5.1	1MJ6 106-4CA□□			44	
3	3.45	100 L	1415	20	80	0.82	6.6	1MJ6 107-4CA□□			47	
4	4.6	112 M	1435	27	83	0.82	8	1MJ6 113-4CA□□			58	
5.5	6.3	132 S	1450	36	86	0.83	11.1	1MJ6 130-4CA□□			76	
7.5	8.6	132 M	1450	49	86	0.84	15	1MJ6 133-4CA□□			85	
11	12.6	160 M	1455	72	87	0.85	21.5	1MJ6 163-4CA□□			128	
15	17.3	160 L	1455	98	89	0.85	28.5	1MJ6 166-4CA□□			158	
18.5	21.3	180 M	1460	121	90.5	0.84	35	1MJ6 183-4CA□□			175	
22	25.3	180 L	1460	144	91.2	0.85	41	1MJ6 186-4CA□□			189	
30	34.5	200 L	1465	196	91.8	0.86	55	1MJ6 207-4CA□□			247	
37	42.5	225 S	1475	240	93	0.86	67 ¹⁾	1MJ7 220-4CA□□			325	
45	52	225 M	1475	292	93.4	0.87	80 ¹⁾	1MJ7 223-4CA□□			355	
55	63	250 M	1480	355	94	0.87	97 ¹⁾	1MJ7 253-4CA□□			465	
75	86	280 S	1485	482	94.7	0.86	132 ¹⁾	1MJ7 280-4CA□□			630	
90	104	280 M	1485	579	95	0.86	160 ¹⁾	1MJ7 283-4CA□□			680	
110	127	315 S	1486	707	94.8	0.86	194 ¹⁾	1MJ7 310-4CA□□			870	
132	152	315 M	1486	848	95.5	0.86	232 ¹⁾	1MJ7 313-4CA□□			950	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange		With standard flange				With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ^{2) 3)}	IM B5, IM V3 ^{2) 4)}	IM V1 with protective cover ^{2) 4) 5)}	IM B35	IM B14, IM V19 ²⁾	IM B34	IM B14, IM V19 ²⁾	
1	6	3	5	0	1	4	6	2	7	3		
1MJ6 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1MJ6 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1MJ6 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	–	
1MJ6 10 □□	○	○	○	○	□	✓	✓	✓	–	–	–	
1MJ6 11 □□	○	○	○	○	□	✓	✓	✓	–	–	–	
1MJ6 13 □□	○	○	○	○	□	✓	✓	✓	–	–	–	
1MJ6 16 □□	○	○	○	○	□	✓	✓	✓	–	–	–	
1MJ6 18 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–	
1MJ6 20 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–	
1MJ7 22 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–	
1MJ7 25 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–	
1MJ7 28 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–	
1MJ7 31 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see Page 4/37.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "de"
Cast-iron series 1MJ6 and 1MJ7

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T4							
1MJ6 070-4CB□□	1.8	3.2	1.8	13	0.0006	44	55
1MJ6 073-4CB□□	2	3.6	2	13	0.0008	44	55
1MJ6 080-4CA□□	2.3	4.7	2.4	16	0.0015	47	58
1MJ6 083-4CA□□	2.5	5	2.6	16	0.0018	47	58
1MJ6 096-4CA□□	2.1	4.9	2.5	16	0.0028	48	60
1MJ6 097-4CA□□	2.2	5.8	2.6	16	0.0035	48	60
1MJ6 106-4CA□□	2.2	6	2.6	16	0.0048	53	65
1MJ6 107-4CA□□	2.7	6.4	3	16	0.0058	53	65
1MJ6 113-4CA□□	2.8	7.2	3	16	0.01	53	65
1MJ6 130-4CA□□	2.4	6.9	3.3	16	0.01	62	74
1MJ6 133-4CA□□	2.7	7.7	3.3	16	0.02	62	74
1MJ6 163-4CA□□	2.4	6.6	2.9	16	0.04	66	78
1MJ6 166-4CA□□	2.8	7.4	3.2	16	0.05	66	78
1MJ6 183-4CA□□	2.3	7.1	3	16	0.13	63	76
1MJ6 186-4CA□□	2.3	7.1	3	16	0.15	63	76
1MJ6 207-4CA□□	2.6	7.4	3.2	16	0.24	65	78
1MJ7 220-4CA□□	2.5	7	3.1	16	0.44	65	78
1MJ7 223-4CA□□	2.6	7	3.2	16	0.52	65	78
1MJ7 253-4CA□□	2.6	6.7	2.5	16	0.79	65	79
1MJ7 280-4CA□□	2.5	6.7	2.7	16	1.4	67	81
1MJ7 283-4CA□□	2.5	6.8	2.8	16	1.6	67	81
1MJ7 310-4CA□□	2.5	6.7	2.7	16	2.2	69	83
1MJ7 313-4CA□□	2.7	7.2	3	16	2.7	69	83

The 1MJ6/1MJ7 motors can also be ordered for use with type of protection Ex d/de (Zone 1)/dust-Ex Zone 21, as well as for Zone 22 for conducting dust:

Mains-fed operation – order code **M76**

Converter-fed operation with derating – order code **M77**

See "Special versions" in the "Selection and ordering data" under "Options".

Other versions up to 1400 kW as 4-pole motors as DN series with Order No. 1PS4 (Ex de IIB), 1PS5 (Ex de IIC) available; also higher outputs and other numbers of poles possible.

Place request with:

Loher GmbH (a Siemens company)
Hans-Loher-Str. 32
94099 Ruhstorf/Rott

<http://www.loher.com>

- For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").
- The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- If motors 1MJ6 183-... to 1MJ7 313-... (motor series 1MJ6 frame size 180 M and above to 1MJ7 frame size 315 M) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.
- 1MJ7 220-... to 1MJ7 313-... motors (motor series 1MJ7 frame sizes 225 S to 315 M) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- The "Second shaft extension" option, order code **K16** is not possible.
- Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "de"
Cast-iron series 1MJ6 and 1MJ7

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output					Power factor at 50 Hz	Rated current at 400 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz ¹⁾							
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A					
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection temperature classes T1 to T4												
0.25	0.29	71 M	870	2.7	63	0.7	0.82	1MJ6 073-6CA□□			16	
0.37	0.43	80 M	910	3.9	64	0.71	1.18	1MJ6 080-6CA□□			35	
0.55	0.63	80 M	900	5.8	64	0.74	1.67	1MJ6 083-6CA□□			22.5	
0.75	0.86	90 L	910	8	68	0.74	2.15	1MJ6 096-6CA□□			32	
1.1	1.3	90 L	905	12	72	0.75	2.95	1MJ6 097-6CA□□			32	
1.5	1.75	100 L	930	15	75	0.73	4	1MJ6 106-6CA□□			39	
2.2	2.55	112 M	945	22	76	0.76	5.5	1MJ6 113-6CA□□			52	
3	3.45	132 S	945	30	78	0.75	7.4	1MJ6 130-6CA□□			78	
4	4.6	132 M	945	40	79	0.76	9.6	1MJ6 133-6CA□□			85	
5.5	6.3	132 M	950	55	83	0.76	12.6	1MJ6 134-6CA□□			92	
7.5	8.6	160 M	960	75	86	0.72	17.5	1MJ6 163-6CA□□			134	
11	12.6	160 L	960	109	87	0.74	24.5	1MJ6 166-6CA□□			167	
15	18	180 L	970	148	89	0.83	29.5	1MJ6 186-6CA□□			190	
18.5	22	200 L	975	181	90.2	0.82	36	1MJ6 206-6CA□□			240	
22	26.5	200 L	975	215	90.8	0.83	42.5	1MJ6 207-6CA□□			255	
30	36	225 M	978	293	92	0.84	56	1MJ7 223-6CA□□			330	
37	44.5	250 M	980	361	92.4	0.84	69	1MJ7 253-6CA□□			440	
45	54	280 S	982	438	93	0.86	81	1MJ7 280-6CA□□			560	
55	66	280 M	984	534	93.6	0.86	99 ¹⁾	1MJ7 283-6CA□□			600	
75	90	315 S	988	725	93.8	0.85	136	1MJ7 310-6CA□□			810	
90	108	315 M	988	870	94.2	0.85	162 ¹⁾	1MJ7 313-6CA□□			870	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code								
	50 Hz				Without flange		With flange		With standard flange				With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ^{2) 3)}	IM B5, IM V3 ^{2) 4)}	IM V1 with protective cover ^{2) 4) 5)}	IM B35	IM B14, IM V19 ²⁾	IM B34	IM B14 IM V19 ²⁾		
	1	6	3	5	0	1	4	6	2	7	3		
1MJ6 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓		
1MJ6 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓		
1MJ6 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	–		
1MJ6 10 □□	○	○	○	○	□	✓	✓	✓	–	–	–		
1MJ6 11 □□	○	○	○	○	□	✓	✓	✓	–	–	–		
1MJ6 13 □□	○	○	○	○	□	✓	✓	✓	–	–	–		
1MJ6 16 □□	○	○	○	○	□	✓	✓	✓	–	–	–		
1MJ6 18 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–		
1MJ6 20 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–		
1MJ7 22 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–		
1MJ7 25 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–		
1MJ7 28 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–		
1MJ7 31 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–		

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see Page 4/39.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "de"
Cast-iron series 1MJ6 and 1MJ7

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection temperature classes T1 to T4							
1MJ6 073-6CA□□	2.2	3.1	2.2	16	0.0009	39	50
1MJ6 080-6CA□□	1.9	3.3	2	16	0.0015	40	51
1MJ6 083-6CA□□	2	3.5	2.1	16	0.0018	40	51
1MJ6 096-6CA□□	2.2	3.9	2.3	16	0.0028	43	55
1MJ6 097-6CA□□	2.4	4.3	2.4	16	0.0035	43	55
1MJ6 106-6CA□□	2.3	4.5	2.5	16	0.0063	47	59
1MJ6 113-6CA□□	2.2	4.8	2.5	16	0.01	52	64
1MJ6 130-6CA□□	2	4.8	2.2	16	0.01	63	75
1MJ6 133-6CA□□	2	5	2.4	16	0.01	63	75
1MJ6 134-6CA□□	2.2	5.4	2.5	16	0.02	63	75
1MJ6 163-6CA□□	2.1	5.1	2.5	16	0.04	66	78
1MJ6 166-6CA□□	2.3	5.5	2.5	16	0.04	66	78
1MJ6 186-6CA□□	2.6	6.3	2.4	16	0.2	66	78
1MJ6 206-6CA□□	2.6	6.3	2.3	16	0.29	66	78
1MJ6 207-6CA□□	2.5	5.7	2.3	16	0.33	66	78
1MJ7 223-6CA□□	2.6	5.7	2.2	16	0.57	66	78
1MJ7 253-6CA□□	2.6	6	2.1	16	0.89	60	74
1MJ7 280-6CA□□	2.4	6	2.3	16	1.3	60	74
1MJ7 283-6CA□□	2.5	6.2	2.4	16	1.5	60	74
1MJ7 310-6CA□□	2.4	6.2	2.5	16	2.4	63	77
1MJ7 313-6CA□□	2.4	6.2	2.5	16	2.9	63	77

The 1MJ6/1MJ7 motors can also be ordered for use with type of protection Ex d/de (Zone 1)/dust-Ex Zone 21, as well as for Zone 22 for conducting dust:

Mains-fed operation – order code **M76**

Converter-fed operation with derating – order code **M77**

See "Special versions" in the "Selection and ordering data" under "Options".

Other versions up to 1600 kW as 6-pole motors as DN series with Order No. 1PS4 (Ex de IIB), 1PS5 (Ex de IIC) available; also higher outputs and other numbers of poles possible.

Place request with:

Loher GmbH (a Siemens company)

Hans-Loher-Str. 32

94099 Ruhstorf/Rott

<http://www.loher.com>

- For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").
- The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- If motors 1MJ6 183-... to 1MJ7 313-... (motor series 1MJ6 frame size 180 M and above to 1MJ7 frame size 315 M) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.
- 1MJ7 220-... to 1MJ7 313-... motors (motor series 1MJ7 frame sizes 225 S to 315 M) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- The "Second shaft extension" option, order code **K16** is not possible.
- Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "de"
Cast-iron series 1MJ6 and 1MJ7

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output					Power factor at 50 Hz	Rated current at 400 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz							
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A					
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T4												
0.37	0.43	90 L	655	5.3	61	0.76	1.16	1MJ6 096-8CB□□			27.5	
0.55	0.63	90 L	655	7.9	65	0.76	1.62	1MJ6 097-8CB□□			29.5	
0.75	0.86	100 L	685	10	65	0.72	2.3	1MJ6 106-8CB□□			40	
1.1	1.3	100 L	685	16	74	0.74	2.9	1MJ6 107-8CB□□			48	
1.5	1.75	112 M	700	21	74	0.73	4	1MJ6 113-8CB□□			52	
2.2	2.55	132 S	695	30	74	0.72	6	1MJ6 130-8CB□□			78	
3	3.45	132 M	700	40	76	0.72	7.9	1MJ6 133-8CB□□			85	
4	4.6	160 M	715	54	81	0.72	9.9	1MJ6 163-8CB□□			119	
5.5	6.3	160 M	710	74	83	0.72	13.3	1MJ6 164-8CB□□			134	
7.5	8.6	160 L	715	100	84	0.72	17.9	1MJ6 166-8CB□□			159	
11	13.2	180 L	725	145	87	0.7	26	1MJ6 186-8CB□□			191	
15	18	200 L	725	198	87.5	0.78	32	1MJ6 207-8CB□□			263	
18.5	22	225 S	725	244	88.6	0.8	37.5	1MJ7 220-8CB□□			325	
22	26.5	225 M	725	290	90.1	0.81	43.5	1MJ7 223-8CB□□			350	
30	36	250 M	730	392	91.6	0.81	58	1MJ7 253-8CB□□			465	
37	44.5	280 S	732	483	92.7	0.82	70	1MJ7 280-8CB□□			570	
45	54	280 M	734	585	92.8	0.83	84	1MJ7 283-8CB□□			620	
55	66	315 S	738	712	93.1	0.82	104	1MJ7 310-8CB□□			780	
75	90	315 M	738	970	93.6	0.82	140	1MJ7 313-8CB□□			890	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange		With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3(6/7/8), IM V6 ¹⁾²⁾	IM B5, ³⁾ IM V3 ³⁾	IM V1 with protective cover ¹⁾³⁾⁴⁾	IM B35	IM B14, ¹⁾ IM V19 ¹⁾	IM B34	IM B14 IM V19 ¹⁾	
1	6	3	5	0	1	4	6	2	7	3		
1MJ6 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1MJ6 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓	
1MJ6 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	–	
1MJ6 10 □□	○	○	○	○	□	✓	✓	✓	–	–	–	
1MJ6 11 □□	○	○	○	○	□	✓	✓	✓	–	–	–	
1MJ6 13 □□	○	○	○	○	□	✓	✓	✓	–	–	–	
1MJ6 16 □□	○	○	○	○	□	✓	✓	✓	–	–	–	
1MJ6 18 □□	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–	
1MJ6 20 □□	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–	
1MJ7 22 □□	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–	
1MJ7 25 □□	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–	
1MJ7 28 □□	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–	
1MJ7 31 □□	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see Page 4/41.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "de"
Cast-iron series 1MJ6 and 1MJ7

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, temperature classes T1 to T4							
1MJ6 096-8CB□□	1.4	2.8	1.7	13	0.0025	41	53
1MJ6 097-8CB□□	1.5	2.9	1.7	13	0.0035	41	53
1MJ6 106-8CB□□	1.6	3.5	1.8	13	0.0053	45	57
1MJ6 107-8CB□□	1.8	3.9	2	13	0.007	45	57
1MJ6 113-8CB□□	1.8	4.4	2	13	0.01	49	61
1MJ6 130-8CB□□	1.7	4.2	2.1	13	0.01	53	65
1MJ6 133-8CB□□	1.9	4.4	2.2	13	0.01	53	65
1MJ6 163-8CB□□	2.1	4.8	2.3	13	0.03	63	75
1MJ6 164-8CB□□	2.3	5.1	2.5	13	0.04	63	75
1MJ6 166-8CB□□	2.6	5.8	2.8	13	0.06	63	75
1MJ6 186-8CB□□	2	5	2.2	13	0.21	60	73
1MJ6 207-8CB□□	2.1	5	2.2	13	0.37	58	71
1MJ7 220-8CB□□	2.1	5	2.2	13	0.58	58	71
1MJ7 223-8CB□□	2.1	5	2.2	13	0.66	58	71
1MJ7 253-8CB□□	2.1	5	2.1	13	1.1	57	71
1MJ7 280-8CB□□	2.2	5.5	2.2	13	1.4	58	72
1MJ7 283-8CB□□	2.2	5.5	2.2	13	1.6	58	72
1MJ7 310-8CB□□	2.2	6	2.4	13	2.3	62	76
1MJ7 313-8CB□□	2.3	6.2	2.5	13	3	62	76

The 1MJ6/1MJ7 motors can also be ordered for use with type of protection Ex d/de (Zone 1)/dust-Ex Zone 21, as well as for Zone 22 for conducting dust:

Mains-fed operation – order code **M76**

Converter-fed operation with derating – order code **M77**

See "Special versions" in the "Selection and ordering data" under "Options".

Other versions up to 1350 kW as 8-pole motors as DN series with Order No. 1PS4 (Ex de IIB), 1PS5 (Ex de IIC) available; also higher outputs and other numbers of poles possible.

Place request with:

Loher GmbH (a Siemens company)
Hans-Loher-Str. 32
94099 Ruhstorf/Rott

<http://www.loher.com>

- The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- If motors 1MJ6 183-... to 1MJ7 313-... (motor series 1MJ6 frame size 180 M and above to 1MJ7 frame size 315 M) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.
- 1MJ7 220-... to 1MJ7 313-... motors (motor series 1MJ7 frame sizes 225 S to 315 M) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- The "Second shaft extension" option, order code **K16** is not possible.
- Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA7/1LA5

Selection and ordering data

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection											
0.09	0.11	56 M	2830	0.3	63	62	0.81	0.26	1LA7 050-2AA□□	3	
0.12	0.14	56 M	2800	0.41	65	64	0.83	0.32	1LA7 053-2AA□□	3	
0.18	0.21	63 M	2820	0.61	64	63	0.79	0.51	1LA7 060-2AA□□	3.5	
0.25	0.29	63 M	2830	0.84	65	65	0.80	0.69	1LA7 063-2AA□□	4.1	
0.37	0.43	71 M	2740	1.3	66	65	0.82	1	1LA7 070-2AA□□	5	
0.55	0.63	71 M	2800	1.9	71	70	0.82	1.36	1LA7 073-2AA□□	6	
0.75	0.86	80 M	2855	2.5	73	72	0.86	1.73	1LA7 080-2AA□□	9	
1.1	1.3	80 M	2845	3.7	77	77	0.87	2.4	1LA7 083-2AA□□	11	
1.5	1.75	90 S	2860	5	79	80	0.85	3.25	1LA7 090-2AA□□	12.9	
2.2	2.55	90 L	2880	7.3	82	82	0.85	4.55	1LA7 096-2AA□□	15.7	
3	3.45	100 L	2890	9.9	84	84	0.85	6.1	1LA7 106-2AA□□	22	
4	4.6	112 M	2905	13	86	86	0.86	7.8	1LA7 113-2AA□□	29	
5.5	6.3	132 S	2925	18	86.5	86.5	0.89	10.4	1LA7 130-2AA□□	39	
7.5	8.6	132 S	2930	24	88	88	0.89	13.8	1LA7 131-2AA□□	48	
11	12.6	160 M	2940	36	89.5	89.5	0.88	20	1LA7 163-2AA□□	68	
15	17.3	160 M	2930	49	90	90.2	0.9	26.5	1LA7 164-2AA□□	77	
18.5	21.3	160 L	2940	60	91	91.2	0.91	32	1LA7 166-2AA□□	86	
22	24.5	180 M	2940	71	91.7	91.7	0.88	39.5 ¹⁾	1LA5 183-2AA□□	113	
30	33.5	200 L	2945	97	92.3	92.3	0.89	53	1LA5 206-2AA□□	159	
37	41.5	200 L	2945	120	92.8	92.8	0.89	65 ¹⁾	1LA5 207-2AA□□	179	
45	51	225 M	2960	145	93.6	93.6	0.89	78 ¹⁾	1LA5 223-2AA□□	209	

Special versions according to ATEX

Motor type	Zone 2		VIK (includes Zone 2) ²⁾		Zone 21		Zone 22	
	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)
Frame size	Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA7	56	–	–	–	✓	✓	✓	✓
	63	✓	✓	✓	✓	✓	✓	✓
	71	✓	✓	✓	✓	✓	✓	✓
	80	✓	✓	✓	✓	✓	✓	✓
	90	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓
1LA5	160	✓	✓	✓	✓	✓	✓	✓
	180	–	–	–	–	✓	✓	✓
	200	–	–	–	–	✓	✓	✓
	225	–	–	–	–	✓	✓	✓

✓ With additional charge
– Not possible

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):

Mains-fed operation – order code **M74**

Converter-fed operation with derating – order code **M75**

See "Special versions" in the "Selection and ordering data" under "Options".

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").

²⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA7 050-2AA□□	2	3.7	2.3	16	0.00015	41	52
1LA7 053-2AA□□	2.1	3.7	2.4	16	0.00015	41	52
1LA7 060-2AA□□	2	3.7	2.2	16	0.00018	49	60
1LA7 063-2AA□□	2	4	2.2	16	0.00022	49	60
1LA7 070-2AA□□	2.3	3.5	2.3	16	0.00029	52	63
1LA7 073-2AA□□	2.5	4.3	2.6	16	0.00041	52	63
1LA7 080-2AA□□	2.3	5.6	2.4	16	0.00079	56	67
1LA7 083-2AA□□	2.6	6.1	2.7	16	0.001	56	67
1LA7 090-2AA□□	2.4	5.5	2.7	16	0.0014	62	74
1LA7 096-2AA□□	2.8	6.3	3.1	16	0.0018	62	74
1LA7 106-2AA□□	2.8	6.8	3	16	0.0035	62	74
1LA7 113-2AA□□	2.6	7.2	2.9	16	0.0059	63	75
1LA7 130-2AA□□	2	5.9	2.8	16	0.015	68	80
1LA7 131-2AA□□	2.3	6.9	3	16	0.019	68	80
1LA7 163-2AA□□	2.1	6.5	2.9	16	0.034	70	82
1LA7 164-2AA□□	2.2	6.6	3	16	0.043	70	82
1LA7 166-2AA□□	2.4	7	3.1	16	0.051	70	82
1LA5 183-2AA□□	2.5	6.9	3.2	16	0.077	70	83
1LA5 206-2AA□□	2.4	7.2	2.8	16	0.14	71	84
1LA5 207-2AA□□	2.4	7.7	2.8	16	0.16	71	84
1LA5 223-2AA□□	2.8	7.7	3.4	16	0.2	71	84

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz				60 Hz		Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6 ¹⁾	IM B5, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2) 3)}	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾
1	6	3	5	1	6	0	1	4	6	2	7	3	
1LA7 05 □□	○	○	○	–	○	○	□	✓	–	✓	✓	✓	✓
1LA7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 20 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 22 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement "**Z**" and order code **K32**.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	IM B3 type of construction approx. m kg	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection											
0.06	0.07	56 M	1350	0.42	56	55	0.77	0.2	1LA7 050-4ABQQ	3	
0.09	0.11	56 M	1350	0.64	58	57	0.77	0.29	1LA7 053-4ABQQ	3	
0.12	0.14	63 M	1350	0.85	55	54	0.75	0.42	1LA7 060-4ABQQ	3.5	
0.18	0.21	63 M	1350	1.3	59	60	0.76	0.58	1LA7 063-4ABQQ	4.1	
0.25	0.29	71 M	1350	1.8	60	60	0.78	0.77	1LA7 070-4ABQQ	4.8	
0.37	0.43	71 M	1370	2.6	65	65	0.78	1.06	1LA7 073-4ABQQ	6	
0.55	0.63	80 M	1395	3.8	67	67	0.81	1.46	1LA7 080-4AAQQ	9	
0.75	0.86	80 M	1395	5.1	72	72	0.8	1.91	1LA7 083-4AAQQ	10	
1.1	1.3	90 S	1415	7.4	77	77	0.81	2.55	1LA7 090-4AAQQ	13	
1.5	1.75	90 L	1420	10	79	79	0.81	3.4	1LA7 096-4AAQQ	15.6	
2.2	2.55	100 L	1420	15	82	82.5	0.82	4.7	1LA7 106-4AAQQ	21	
3	3.45	100 L	1420	20	83	83.5	0.82	6.4	1LA7 107-4AAQQ	24	
4	4.6	112 M	1440	27	85	85.5	0.83	8.2	1LA7 113-4AAQQ	31	
5.5	6.3	132 S	1455	36	86	86	0.81	11.4	1LA7 130-4AAQQ	41	
7.5	8.6	132 M	1455	49	87	87.5	0.82	15.2	1LA7 133-4AAQQ	49	
11	12.6	160 M	1460	72	88.5	89	0.84	21.5	1LA7 163-4AAQQ	73	
15	17.3	160 L	1460	98	90	90.2	0.84	28.5	1LA7 166-4AAQQ	85	
18.5	21.3	180 M	1460	121	90.5	90.5	0.83	35.5 ¹⁾	1LA5 183-4AAQQ	113	
22	25.3	180 L	1460	144	91.2	91.2	0.84	41.5 ¹⁾	1LA5 186-4AAQQ	123	
30	34.5	200 L	1465	196	91.8	91.8	0.86	55	1LA5 207-4AAQQ	157	
37	42.5	225 S	1470	240	92.9	92.9	0.87	66 ¹⁾	1LA5 220-4AAQQ	206	
45	52	225 M	1470	292	93.4	93.4	0.87	80 ¹⁾	1LA5 223-4AAQQ	232	

Special versions according to ATEX

Motor type	Zone 2		VIK (includes Zone 2) ²⁾		Zone 21		Zone 22	
	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)
Frame size	Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA7	56	–	–	–	–	–	–	–
	63	✓	✓	✓	✓	✓	✓	✓
	71	✓	✓	✓	✓	✓	✓	✓
	80	✓	✓	✓	✓	✓	✓	✓
	90	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓
	160	✓	✓	✓	✓	✓	✓	✓
1LA5	180	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–
	225	–	–	–	–	–	–	–

✓ With additional charge
– Not possible

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):

Mains-fed operation – order code **M74**

Converter-fed operation with derating – order code **M75**

See "Special versions" in the "Selection and ordering data" under "Options".

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").

²⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA7 050-4AB□□	1.9	2.6	1.9	13	0.00027	42	53
1LA7 053-4AB□□	1.9	2.6	1.9	13	0.00027	42	53
1LA7 060-4AB□□	1.9	2.8	2	13	0.00029	42	53
1LA7 063-4AB□□	1.9	3	1.9	13	0.00037	42	53
1LA7 070-4AB□□	1.9	3	1.9	13	0.00052	44	55
1LA7 073-4AB□□	1.9	3.3	2.1	13	0.00077	44	55
1LA7 080-4AA□□	2.2	3.9	2.2	16	0.0014	47	58
1LA7 083-4AA□□	2.3	4.2	2.3	16	0.0017	47	58
1LA7 090-4AA□□	2.3	4.6	2.4	16	0.0024	50	62
1LA7 096-4AA□□	2.4	5.3	2.6	16	0.0033	50	62
1LA7 106-4AA□□	2.5	5.6	2.8	16	0.0047	56	68
1LA7 107-4AA□□	2.7	5.6	3	16	0.0055	56	68
1LA7 113-4AA□□	2.7	6	3	16	0.012	53	65
1LA7 130-4AA□□	2.5	6.3	3.1	16	0.018	62	74
1LA7 133-4AA□□	2.7	6.7	3.2	16	0.023	62	74
1LA7 163-4AA□□	2.2	6.2	2.7	16	0.043	66	78
1LA7 166-4AA□□	2.6	6.5	3	16	0.055	66	78
1LA5 183-4AA□□	2.3	7.5	3	16	0.13	63	76
1LA5 186-4AA□□	2.3	7.5	3	16	0.15	63	76
1LA5 207-4AA□□	2.6	7	3.2	16	0.24	65	78
1LA5 220-4AA□□	2.8	7	3.2	16	0.32	65	78
1LA5 223-4AA□□	2.8	7.7	3.3	16	0.36	65	78

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code									
	50 Hz				60 Hz		Without flange	With flange			With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6 ¹⁾	IM B5, IM V3	IM V1 with protective cover ^{1) 2) 3)}		IM B35	IM B14, IM V19	IM B34	IM B14, IM V19 ¹⁾
	1	6	3	5	1	6	0	1	4	6	2	7	3	
1LA7 05 □□	○	○	○	–	○	○	□	✓	–	✓	✓	✓	✓	
1LA7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA5 18 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–	
1LA5 20 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–	
1LA5 22 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement "Z" and order code **K32**.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Rated current at 400 V, 50 Hz	Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below				
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			m kg	
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection												
0.09	0.1	63 M	850	1	45	41.5	0.66	0.44	1LA7 063-6AA00		4.1	
0.18	0.21	71 M	850	2	53	54.5	0.68	0.72	1LA7 070-6AA00		5	
0.25	0.29	71 M	830	2.8	60	58.5	0.76	0.79	1LA7 073-6AA00		6.3	
0.37	0.43	80 M	920	3.8	62	60.5	0.72	1.2	1LA7 080-6AA00		9	
0.55	0.63	80 M	910	5.8	67	66.5	0.74	1.6	1LA7 083-6AA00		10	
0.75	0.86	90 S	915	7.8	69	69	0.76	2.05	1LA7 090-6AA00		12.5	
1.1	1.3	90 L	915	11	72	72	0.77	2.85	1LA7 096-6AA00		15.7	
1.5	1.75	100 L	925	15	74	74	0.75	3.9	1LA7 106-6AA00		21	
2.2	2.55	112 M	940	22	78	78.5	0.78	5.2	1LA7 113-6AA00		26	
3	3.45	132 S	950	30	79	79.5	0.76	7.2	1LA7 130-6AA00		38	
4	4.6	132 M	950	40	80.5	80.5	0.76	9.4	1LA7 133-6AA00		44	
5.5	6.3	132 M	950	55	83	83	0.76	12.6	1LA7 134-6AA00		52	
7.5	8.6	160 M	960	75	86	86	0.74	17	1LA7 163-6AA00		74	
11	12.6	160 L	960	109	87.5	87.5	0.74	24.5	1LA7 166-6AA00		95	
15	18	180 L	970	148	89.5	89.5	0.77	31.5	1LA5 186-6AA00		126	
18.5	22	200 L	975	181	90.2	90.2	0.77	38.5	1LA5 206-6AA00		161	
22	26.5	200 L	975	215	90.8	90.8	0.77	45.5	1LA5 207-6AA00		183	
30	36	225 M	978	293	91.8	91.8	0.77	61 ¹⁾	1LA5 223-6AA00		214	

Special versions according to ATEX

Motor type	Zone 2		VIK (includes Zone 2) ²⁾		Zone 21		Zone 22		
	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	
	Frame size	Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA7	63	✓	✓	✓	✓	✓	✓	✓	✓
	71	✓	✓	✓	✓	✓	✓	✓	✓
	80	✓	✓	✓	✓	✓	✓	✓	✓
	90	✓	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓	✓
1LA5	160	✓	✓	✓	✓	✓	✓	✓	✓
	180	–	–	–	–	✓	✓	✓	✓
	200	–	–	–	–	✓	✓	✓	✓
	225	–	–	–	–	✓	✓	✓	✓

- ✓ With additional charge
– Not possible

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):

Mains-fed operation – order code **M74**

Converter-fed operation with derating – order code **M75**

See "Special versions" in the "Selection and ordering data" under "Options".

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").

²⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA7 063-6AB□□	1.8	2	1.9	13	0.00037	39	50
1LA7 070-6AA□□	2.1	2.3	1.9	16	0.00055	39	50
1LA7 073-6AA□□	2.2	2.7	2	16	0.0008	39	50
1LA7 080-6AA□□	1.9	3.1	2.1	16	0.0014	40	51
1LA7 083-6AA□□	2.1	3.4	2.2	16	0.0017	40	51
1LA7 090-6AA□□	2.2	3.7	2.2	16	0.0024	43	55
1LA7 096-6AA□□	2.3	3.8	2.3	16	0.0033	43	55
1LA7 106-6AA□□	2.3	4	2.3	16	0.0047	47	59
1LA7 113-6AA□□	2.2	4.6	2.5	16	0.0091	52	64
1LA7 130-6AA□□	1.9	4.2	2.2	16	0.015	63	75
1LA7 133-6AA□□	2.1	4.5	2.4	16	0.019	63	75
1LA7 134-6AA□□	2.3	5	2.6	16	0.025	63	75
1LA7 163-6AA□□	2.1	4.6	2.5	16	0.044	66	78
1LA7 166-6AA□□	2.3	4.8	2.6	16	0.063	66	78
1LA5 186-6AA□□	2	5.2	2.4	16	0.15	66	78
1LA5 206-6AA□□	2.7	5.5	2.8	16	0.24	66	78
1LA5 207-6AA□□	2.8	5.5	2.9	16	0.28	66	78
1LA5 223-6AA□□	2.8	5.7	2.9	16	0.36	66	78

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz			60 Hz			Without flange	With flange		With standard flange	With special flange		
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6 ¹⁾	IM B5, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2) 3)}	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 20 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 22 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement "Z" and order code **K32**.
³⁾ The "Second shaft extension" option, order code **K16** is not possible.
⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Rated current at 400 V, 50 Hz	Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load					
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	m	kg	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection												
0.09	0.1	71 M	630	1.4	53	54.5	0.68	0.36	1LA7 070-8ABQQ		6.3	
0.12	0.14	71 M	645	1.8	53	49.5	0.64	0.51	1LA7 073-8ABQQ		6.3	
0.18	0.21	80 M	675	2.5	51	49.5	0.68	0.75	1LA7 080-8ABQQ		9	
0.25	0.29	80 M	685	3.5	55	50.5	0.64	1.02	1LA7 083-8ABQQ		10	
0.37	0.43	90 S	675	5.2	63	62	0.75	1.14	1LA7 090-8ABQQ		10.5	
0.55	0.63	90 L	675	7.8	66	65	0.76	1.58	1LA7 096-8ABQQ		13.2	
0.75	0.86	100 L	680	11	66	65	0.76	2.15	1LA7 106-8ABQQ		19	
1.1	1.3	100 L	680	15	72	72	0.76	2.9	1LA7 107-8ABQQ		22	
1.5	1.75	112 M	705	20	74	74	0.76	3.85	1LA7 113-8ABQQ		24	
2.2	2.55	132 S	700	30	75	75	0.74	5.7	1LA7 130-8ABQQ		38	
3	3.45	132 M	700	41	77	77.5	0.74	7.6	1LA7 133-8ABQQ		44	
4	4.6	160 M	715	53	80	80	0.72	10	1LA7 163-8ABQQ		64	
5.5	6.3	160 M	710	74	83.5	83.5	0.73	13	1LA7 164-8ABQQ		74	
7.5	8.6	160 L	715	100	85.5	85.5	0.72	17.6	1LA7 166-8ABQQ		94	
11	13.2	180 L	725	145	87	87	0.75	24.5	1LA5 186-8ABQQ		128	
15	18	200 L	725	198	87.5	87.5	0.78	31.5	1LA5 207-8ABQQ		176	
18.5	22	225 S	725	244	89.2	89.2	0.79	38	1LA5 220-8ABQQ		184	
22	26.5	225 M	725	290	90.6	90.6	0.79	44.5	1LA5 223-8ABQQ		214	

Special versions according to ATEX

Motor type	Zone 2		VIK (includes Zone 2) ¹⁾		Zone 21		Zone 22	
	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)
Frame size	Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA7	71	✓	✓	✓	✓	✓	✓	✓
	80	✓	✓	✓	✓	✓	✓	✓
	90	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓
160	✓	✓	✓	✓	✓	✓	✓	
1LA5	180	-	-	-	✓	✓	✓	✓
	200	-	-	-	✓	✓	✓	✓
	225	-	-	-	✓	✓	✓	✓

- ✓ With additional charge
 - Not possible

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):

Mains-fed operation – order code **M74**

Converter-fed operation with derating – order code **M75**

See "Special versions" in the "Selection and ordering data" under "Options".

¹⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA7 070-8AB□□	1.9	2.2	1.7	13	0.0008	36	47
1LA7 073-8AB□□	2.2	2.2	2	13	0.0008	36	47
1LA7 080-8AB□□	1.7	2.3	1.9	13	0.0014	41	52
1LA7 083-8AB□□	2	2.6	2.2	13	0.0017	41	52
1LA7 090-8AB□□	1.6	2.9	1.8	13	0.0023	41	53
1LA7 096-8AB□□	1.7	3	1.9	13	0.0031	41	53
1LA7 106-8AB□□	1.6	3	1.9	13	0.0051	45	57
1LA7 107-8AB□□	1.8	3.3	2.1	13	0.0063	45	57
1LA7 113-8AB□□	1.8	3.7	2.1	13	0.013	49	61
1LA7 130-8AB□□	1.9	3.9	2.3	13	0.014	53	65
1LA7 133-8AB□□	2.1	4.1	2.4	13	0.019	53	65
1LA7 163-8AB□□	2.2	4.5	2.6	13	0.036	63	75
1LA7 164-8AB□□	2.3	4.7	2.7	13	0.046	63	75
1LA7 166-8AB□□	2.7	5.3	3	13	0.064	63	75
1LA5 186-8AB□□	2	5	2.2	13	0.21	60	73
1LA5 207-8AB□□	2.1	5	2.2	13	0.37	58	71
1LA5 220-8AB□□	2.1	4.5	2.2	13	0.37	58	71
1LA5 223-8AB□□	2.2	4.8	2.3	13	0.45	58	71

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz						60 Hz		Without flange	With flange		With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6 ¹⁾	IM B5, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2) 3)}	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾	
1	6	3	5	1	6	0	1	4	6	2	7	3		
1LA7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA5 18 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–	
1LA5 20 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–	
1LA5 22 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement "Z" and order code **K32**.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA9

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output						Order No.	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	m kg	
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, "High Efficiency"										
0.09	56 M	2830	0.3	70	68	0.76	0.24	1LA9 050-2KA00		3
0.12	56 M	2830	0.4	70	70	0.81	0.31	1LA9 053-2KA00		3.8
0.18	63 M	2840	0.61	70	70	0.78	0.48	1LA9 060-2KA00		4.1
0.25	63 M	2840	0.84	72	70	0.8	0.63	1LA9 063-2KA00		5.1
0.37	71 M	2840	1.2	74	74	0.77	0.94	1LA9 070-2KA00		6
0.55	71 M	2835	1.9	75	75	0.75	1.42	1LA9 073-2KA00		7.2
0.75	80 M	2870	2.5	80	80	0.82	1.66	1LA9 080-2KA00		9.8
1.1	80 M	2860	3.7	84	84	0.89	2.1	1LA9 083-2KA00		12.3
1.5	90 S	2890	5	85	85	0.87	2.95	1LA9 090-2KA00		15
2.2	90 L	2890	7.3	86.5	86.5	0.87	4.2	1LA9 096-2KA00		18.6
3	100 L	2890	9.9	87	87	0.88	5.7	1LA9 106-2KA00		24
4	112 M	2905	13	88.5	88.5	0.89	7.3	1LA9 113-2KA00		35
5.5	132 S	2930	18	89.5	89.5	0.9	9.9	1LA9 130-2KA00		43
7.5	132 S	2930	24	90.5	90.5	0.92	13	1LA9 131-2KA00		56
11	160 M	2945	36	91	91	0.9	19.4	1LA9 163-2KA00		73
15	160 M	2945	49	91.5	91.5	0.9	26.5	1LA9 164-2KA00		82
18.5	160 L	2940	60	92.3	92.5	0.92	31.5	1LA9 166-2KA00		102
22	180 M	2945	71	93	93.2	0.89	38.5 ¹⁾	1LA9 183-2WA00		131
30	200 L	2950	97	93.5	93.5	0.89	52	1LA9 206-2WA00		185
37	200 L	2950	120	94	94.1	0.89	64 ¹⁾	1LA9 207-2WA00		214

Special versions according to ATEX

Motor type	Zone 2	VIK (includes Zone 2) ²⁾				Zone 21		Zone 22	
		Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)
	Frame size	Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA9	56	–	–	–	–	✓	✓	✓	✓
	63	✓	✓	✓	✓	✓	✓	✓	✓
	71	✓	✓	✓	✓	✓	✓	✓	✓
	80	✓	✓	✓	✓	✓	✓	✓	✓
	90	✓	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓	✓
	160	✓	✓	✓	✓	✓	✓	✓	✓
	180	–	–	–	–	✓	✓	✓	✓
	200	–	–	–	–	✓	✓	✓	✓

✓ With additional charge
– Not possible

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):

Mains-fed operation – order code **M74**

Converter-fed operation with derating – order code **M75**

See "Special versions" in the "Selection and ordering data" under "Options".

The motors can also be used for 60 Hz according to EPACT, see Pages 4/56 to 4/61.

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").

²⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, "High Efficiency"							
1LA9 050-2KA□□	3.6	4.5	3	16	0.00015	41	52
1LA9 053-2KA□□	3.2	4.3	2.8	16	0.0002	41	52
1LA9 060-2KA□□	2.8	4.8	3.1	16	0.00022	49	60
1LA9 063-2KA□□	2.5	4.9	2.5	16	0.00026	49	60
1LA9 070-2KA□□	3.3	6.5	3.1	16	0.00041	52	63
1LA9 073-2KA□□	3.6	6.3	2.9	16	0.0005	52	63
1LA9 080-2KA□□	4.4	8.3	3.2	16	0.001	56	67
1LA9 083-2KA□□	3.8	7	3.2	16	0.0013	56	67
1LA9 090-2KA□□	4.1	7	3.5	16	0.0018	60	72
1LA9 096-2KA□□	4.1	7	3.5	16	0.0022	60	72
1LA9 106-2KA□□	3.4	7	3.2	16	0.0044	62	74
1LA9 113-2KA□□	2.8	7	3.2	16	0.0077	63	75
1LA9 130-2KA□□	2.7	7	3.2	16	0.019	68	80
1LA9 131-2KA□□	2.8	7	3.1	16	0.024	68	80
1LA9 163-2KA□□	2.5	7	3.1	16	0.044	70	82
1LA9 164-2KA□□	2.5	7	3.1	16	0.051	70	82
1LA9 166-2KA□□	2.4	7	3.1	16	0.065	70	82
1LA9 183-2WA□□	2.6	7.2	3.3	16	0.09	70	83
1LA9 206-2WA□□	2.5	7	3.2	16	0.16	71	84
1LA9 207-2WA□□	2.7	7	3.3	16	0.2	71	84

Order No. supplements

Motor type	Penultimate position: Voltage code 50 Hz				Final position: Type of construction code						
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	Without flange IM B3/6/7/8, IM V6 ¹⁾	With flange IM B5, ₁₎ IM V3 ₁₎		IM V1 with protective cover ^{1) 2)}	IM B35	With standard flange IM B14, ₁₎ IM V19 ₁₎	
	1	6	3	5	0	1	4	6	2	7	3
1LA9 05 □□	○	○	○	–	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA9

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output						Order No.	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	m	kg
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, "High Efficiency"										
0.06	56 M	1380	0.42	61	61	0.66	0.22	1LA9 050-4KA00		3
0.09	56 M	1390	0.62	62	62	0.68	0.31	1LA9 053-4KA00		3.8
0.12	63 M	1395	0.82	66	66	0.65	0.41	1LA9 060-4KA00		4.1
0.18	63 M	1395	1.3	65	65	0.68	0.59	1LA9 063-4KA00		5.1
0.25	71 M	1410	1.7	70	70	0.64	0.81	1LA9 070-4KA00		6
0.37	71 M	1385	2.6	71	71	0.73	1.04	1LA9 073-4KA00		7.2
0.55	80 M	1410	3.7	77	77	0.78	1.32	1LA9 080-4KA00		9.8
0.75	80 M	1400	5.1	81	81	0.75	1.78	1LA9 083-4KA00		12.3
1.1	90 S	1440	7.3	84	84	0.77	2.45	1LA9 090-4KA00		15
1.5	90 L	1440	9.9	85	85	0.77	3.3	1LA9 096-4KA00		18
2.2	100 L	1435	15	86.5	86.5	0.82	4.5	1LA9 106-4KA00		25
3	100 L	1435	20	87.5	87.7	0.81	6.1	1LA9 107-4KA00		30
4	112 M	1440	27	88.5	89	0.81	8.1	1LA9 113-4KA00		37
5.5	132 S	1455	36	89.5	89.5	0.84	10.6	1LA9 130-4KA00		45
7.5	132 M	1455	49	90.3	90.5	0.84	14.2	1LA9 133-4KA00		60
11	160 M	1460	72	91.5	92	0.85	20.5	1LA9 163-4KA00		81
15	160 L	1460	98	92	92.3	0.86	27.5	1LA9 166-4KA00		107
18.5	180 M	1465	121	92.5	93	0.84	34.5 ¹⁾	1LA9 183-4WA00		126
22	180 L	1465	143	93	93.4	0.84	40.5 ¹⁾	1LA9 186-4WA00		146
30	200 L	1465	196	93.5	94	0.87	53	1LA9 207-4WA00		199

Special versions according to ATEX

Motor type	Zone 2	VIK (includes Zone 2) ²⁾				Zone 21		Zone 22	
		Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)
	Frame size	Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA9	56	–	–	–	–	✓	✓	✓	✓
	63	✓	✓	✓	✓	✓	✓	✓	✓
	71	✓	✓	✓	✓	✓	✓	✓	✓
	80	✓	✓	✓	✓	✓	✓	✓	✓
	90	✓	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓	✓
	160	✓	✓	✓	✓	✓	✓	✓	✓
	180	–	–	–	–	✓	✓	✓	✓
200	–	–	–	–	✓	✓	✓	✓	

- ✓ With additional charge
– Not possible

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):

Mains-fed operation – order code **M74**

Converter-fed operation with derating – order code **M75**

See "Special versions" in the "Selection and ordering data" under "Options".

The motors can also be used for 60 Hz according to EPACT, see Pages 4/56 to 4/61.

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").

²⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, "High Efficiency"							
1LA9 050-4KA□□	2.7	3.1	2.8	16	0.00027	42	53
1LA9 053-4KA□□	2.8	3.2	2.8	16	0.00035	42	53
1LA9 060-4KA□□	2.7	3.5	2.6	16	0.00037	42	53
1LA9 063-4KA□□	3	3.6	2.5	16	0.00045	42	53
1LA9 070-4KA□□	3.6	4.3	3.1	16	0.00076	44	55
1LA9 073-4KA□□	3.3	4.2	3	16	0.00095	44	55
1LA9 080-4KA□□	3.4	5.6	2.9	16	0.0017	47	58
1LA9 083-4KA□□	4	5.8	3.5	16	0.0024	47	58
1LA9 090-4KA□□	3.1	6.4	3.2	16	0.0033	48	60
1LA9 096-4KA□□	3.6	6.7	3.4	16	0.004	48	60
1LA9 106-4KA□□	3.4	7	3.6	16	0.0062	53	65
1LA9 107-4KA□□	3.8	7	3.9	16	0.0077	53	65
1LA9 113-4KA□□	3.2	6.9	3.2	16	0.014	53	65
1LA9 130-4KA□□	3.2	7	3.6	16	0.023	62	74
1LA9 133-4KA□□	3.4	7	3.6	16	0.029	62	74
1LA9 163-4KA□□	2.6	6.9	3.2	16	0.055	66	78
1LA9 166-4KA□□	2.8	7	3.3	16	0.072	66	78
1LA9 183-4WA□□	2.8	7	3.2	16	0.15	63	76
1LA9 186-4WA□□	3.1	7.3	3.4	16	0.19	63	76
1LA9 207-4WA□□	3	7	3.2	16	0.32	65	78

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange			With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ¹⁾	IM B5, ₁₎ IM V3	IM V1 with protective cover ^{1) 2)}	IM B35	IM B14, ₁₎ IM V19 ₁₎	IM B34	IM B14, ₁₎ IM V19 ₁₎
	1	6	3	5	0	1	4	6	2	7	3
1LA9 05 □□	○	○	○	–	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA9

Selection and ordering data (continued)

Rated output at 50 Hz P_{rated} kW	Frame size FS	Operating values at rated output						Order No. For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 50 Hz n_{rated} rpm	Rated torque at 50 Hz T_{rated} Nm	Efficiency at 50 Hz 4/4-load η_{rated} %	Efficiency at 50 Hz 3/4-load η_{rated} %	Power factor at 50 Hz 4/4-load $\cos\phi_{\text{rated}}$	Rated current at 400 V, 50 Hz I_{rated} A			
6-pole, 1000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, "High Efficiency"										
0.75	90 S	925	7.7	75.5	75.5	0.72	2	1LA9 090-6KAQQ		15.7
1.1	90 L	940	11	82	82	0.7	2.75	1LA9 096-6KAQQ		19
1.5	100 L	935	15	85	85	0.73	3.6	1LA9 106-6KAQQ		25
2.2	112 M	955	22	84	84	0.7	5.4	1LA9 113-6KAQQ		37
4	132 M	950	40	84	84	0.81	8.5	1LA9 133-6KAQQ		49
5.5	132 M	960	55	86	86	0.77	12	1LA9 134-6KAQQ		64
7.5	160 M	965	74	88	88	0.72	17	1LA9 163-6KAQQ		98
11	160 L	960	109	88.5	88.5	0.78	23	1LA9 166-6KAQQ		105
15	180 L	970	148	91	91	0.75	31.5	1LA9 186-6WAQQ		144
18.5	200 L	975	181	91	91	0.77	38	1LA9 206-6WAQQ		186
22	200 L	975	215	91.5	91.5	0.77	45	1LA9 207-6WAQQ		217

Special versions according to ATEX

Motor type	Zone 2	VIK (includes Zone 2) ¹⁾				Zone 21		Zone 22	
		Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)
Frame size	Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39	
1LA9	90	✓	✓	✓	✓	✓	✓	✓	
	100	✓	✓	✓	✓	✓	✓	✓	
	112	✓	✓	✓	✓	✓	✓	✓	
	132	✓	✓	✓	✓	✓	✓	✓	
	160	✓	✓	✓	✓	✓	✓	✓	
	180	–	–	–	–	✓	✓	✓	✓
	200	–	–	–	–	✓	✓	✓	✓

- ✓ With additional charge
– Not possible

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):

Mains-fed operation – order code **M74**

Converter-fed operation with derating – order code **M75**

See "Special versions" in the "Selection and ordering data" under "Options".

The motors can also be used for 60 Hz according to EPACT, see Pages 4/56 to 4/61.

¹⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, "High Efficiency"							
1LA9 090-6KA□□	3.	4.4	2.5	16	0.0033	43	55
1LA9 096-6KA□□	3.7	5.7	3.2	16	0.005	43	55
1LA9 106-6KA□□	3.5	6.2	3.4	16	0.0065	47	59
1LA9 113-6KA□□	2.9	6.2	3	16	0.014	52	64
1LA9 133-6KA□□	3	6.3	2.7	16	0.025	63	75
1LA9 134-6KA□□	3.7	7.3	3.6	16	0.03	63	75
1LA9 163-6KA□□	2.4	5.5	2.5	16	0.063	66	78
1LA9 166-6KA□□	3.1	6.9	3.2	16	0.072	66	78
1LA9 186-6WA□□	2.2	6.5	2.5	16	0.19	66	78
1LA9 206-6WA□□	2.8	6.2	2.5	16	0.28	66	78
1LA9 207-6WA□□	2.8	6.2	2.5	16	0.36	66	78

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange			With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ¹⁾	IM B5, ¹⁾ IM V3 ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35	IM B14, ¹⁾ IM V19 ¹⁾	IM B34	IM B14, ¹⁾ IM V19 ¹⁾
	1	6	3	5	0	1	4	6	2	7	3
1LA9 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA9

Selection and ordering data

Rated output at 60 Hz P_{rated} HP	Frame size FS	Operating values at rated output					Power factor at 60 Hz 4/4-load $\cos\phi_{\text{rated}}$	Rated current at 460 V, 60 Hz I_{rated} A	Order No. For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 60 Hz n_{rated} rpm	Rated torque at 60 Hz T_{rated} Nm	EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz η_{rated} %						
2-pole, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT											
0.12	56 M	3440	0.25	No	70	0.74	0.23	1LA9 050-2KA□□		3	
0.16	56 M	3440	0.33	No	71	0.76	0.28	1LA9 053-2KA□□		3.8	
0.25	63 M	3440	0.53	No	71	0.79	0.4	1LA9 060-2KA□□		4.1	
0.33	63 M	3460	0.69	No	72	0.76	0.56	1LA9 063-2KA□□		5.1	
0.5	71 M	3445	1	No	72	0.75	0.86	1LA9 070-2KA□□		6	
0.75	71 M	3445	1.6	No	73	0.73	1.3	1LA9 073-2KA□□		7.2	
1	80 M	3485	2	Yes	75.5	0.82	1.52	1LA9 080-2KA□□		9.8	
1.5	80 M	3480	3.1	Yes	82.5	0.88	1.9	1LA9 083-2KA□□		12.3	
2	90 S	3510	4.1	Yes	84	0.86	2.6	1LA9 090-2KA□□		15	
3	90 L	3510	6.1	Yes	85.5	0.85	3.8	1LA9 096-2KA□□		18.6	
4	100 L	3510	8.1	No	86.5	0.87	5	1LA9 106-2KA□□		24	
5	112 M	3540	10	Yes	87.5	0.88	6	1LA9 113-2KA□□		35	
7.5	132 S	3540	15	Yes	88.5	0.9	8.7	1LA9 130-2KA□□		43	
10	132 S	3540	20	Yes	89.5	0.92	11.4	1LA9 131-2KA□□		56	
15	160 M	3555	30	Yes	90.2	0.9	17	1LA9 163-2KA□□		73	
20	160 M	3555	40	Yes	90.2	0.9	23.2	1LA9 164-2KA□□		82	
25	160 L	3550	50	Yes	91	0.92	27.7	1LA9 166-2KA□□		102	
30	180 M	3545	60	Yes	91	0.86	36	1LA9 183-2WA□□		131	
40	200 L	3555	80	Yes	91.7	0.88	46.5	1LA9 206-2WA□□		185	
50	200 L	3555	100	Yes	92.4	0.88	57	1LA9 207-2WA□□		214	

Special versions according to ATEX

Motor type	Zone 2		VIK (includes Zone 2) ¹⁾		Zone 21		Zone 22	
	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)
Frame size	Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA9	56	–	–	–	–	✓	✓	✓
	63	✓	✓	✓	✓	✓	✓	✓
	71	✓	✓	✓	✓	✓	✓	✓
	80	✓	✓	✓	✓	✓	✓	✓
	90	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓
	160	✓	✓	✓	✓	✓	✓	✓
	180	–	–	–	–	✓	✓	✓
200	–	–	–	–	✓	✓	✓	✓

- ✓ With additional charge
– Not possible

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):
Mains-fed operation – order code **M74**
Converter-fed operation with derating – order code **M75**
See "Special versions" in the "Selection and ordering data" under "Options".

The motors can also be used for 50 Hz "High Efficiency", see Pages 4/50 to 4/55.

¹⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting torque	as multiple of rated current	torque	CL	J kgm ²	Measuring surface sound pressure level at 60 Hz	Sound pressure level at 60 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}			L_{pFA} dB(A)	L_{WA} dB(A)
2-pole, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT							
1LA9 050-2KA□□	3.6	5.5	3.8	16	0.00015	45	56
1LA9 053-2KA□□	3.2	5.4	3.4	16	0.0002	45	56
1LA9 060-2KA□□	2.8	4.9	3.3	16	0.00022	53	64
1LA9 063-2KA□□	2.5	5	2.7	16	0.00026	53	64
1LA9 070-2KA□□	3.3	7.5	3.4	16	0.00041	56	67
1LA9 073-2KA□□	3.6	7.2	3.7	16	0.0005	56	67
1LA9 080-2KA□□	4.4	9.6	4.4	16	0.001	60	71
1LA9 083-2KA□□	3.8	8.6	3.2	16	0.0013	60	71
1LA9 090-2KA□□	4.1	8.6	4.1	16	0.0018	64	76
1LA9 096-2KA□□	4.1	8.5	5.1	16	0.0022	64	76
1LA9 106-2KA□□	3.4	8.6	3.7	16	0.0044	66	78
1LA9 113-2KA□□	2.8	9.2	4	16	0.0077	67	79
1LA9 130-2KA□□	2.7	8.5	3.8	16	0.019	72	84
1LA9 131-2KA□□	2.8	8.3	3.7	16	0.024	72	84
1LA9 163-2KA□□	2.5	8.5	3.7	16	0.044	74	86
1LA9 164-2KA□□	2.5	8.5	3.7	16	0.051	74	86
1LA9 166-2KA□□	2.4	8.5	3.5	16	0.065	74	86
1LA9 183-2WA□□	2.6	8.6	3.5	16	0.09	74	87
1LA9 206-2WA□□	2.5	8.4	3.6	16	0.16	75	88
1LA9 207-2WA□□	2.7	8.4	3.7	16	0.2	75	88

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction				With standard flange		With special flange
	60 Hz 460 VY	460 VA (see "Introduction" for outputs at 60 Hz)	Without flange IM B3/6/7/8, IM V6 ¹⁾	With flange IM B5, IM V3 ¹⁾	IM V1 with protective cover ¹⁾²⁾	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾
	1	6	0	1	4	6	2	7	3
1LA9 05 □□	○	○	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA9

Selection and ordering data (continued)

Rated output at 60 Hz P_{rated} HP	Frame size FS	Operating values at rated output					Power factor at 60 Hz 4/4-load $\cos\phi_{\text{rated}}$	Rated current at 460 V, 60 Hz I_{rated} A	Order No. For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 60 Hz n_{rated} rpm	Rated torque at 60 Hz T_{rated} Nm	EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz η_{rated} %						
4-pole, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT											
0.08	56 M	1715	0.33	No	63	0.65	0.18	1LA9 050-4KA□□		3	
0.12	56 M	1725	0.5	No	64	0.6	0.29	1LA9 053-4KA□□		3.8	
0.16	63 M	1710	0.66	No	68	0.6	0.37	1LA9 060-4KA□□		4.1	
0.25	63 M	1705	1.1	No	66	0.63	0.54	1LA9 063-4KA□□		5.1	
0.33	71 M	1730	1.4	No	69	0.6	0.76	1LA9 070-4KA□□		6	
0.5	71 M	1725	2.1	No	70	0.68	0.98	1LA9 073-4KA□□		7.2	
0.75	80 M	1725	3.1	No	75.5	0.74	1.24	1LA9 080-4KA□□		9.8	
1	80 M	1720	4.1	Yes	82.5	0.75	1.59	1LA9 083-4KA□□		12.3	
1.5	90 S	1755	6.1	Yes	84	0.76	2.15	1LA9 090-4KA□□		15	
2	90 L	1775	14	Yes	84	0.76	2.95	1LA9 096-4KA□□		18	
3	100 L	1750	12	No	87.5	0.79	4	1LA9 106-4KA□□		25	
4	100 L	1750	16	No	87.5	0.79	5.5	1LA9 107-4KA□□		30	
5	112 M	1755	20	Yes	87.5	0.79	6.7	1LA9 113-4KA□□		37	
7.5	132 S	1760	30	Yes	89.5	0.81	9.5	1LA9 130-4KA□□		45	
10	132 M	1760	40	Yes	89.5	0.82	12.8	1LA9 133-4KA□□		60	
15	160 M	1765	61	Yes	91	0.85	17.9	1LA9 163-4KA□□		81	
20	160 L	1765	81	Yes	91	0.85	24.5	1LA9 166-4KA□□		107	
25	180 M	1770	101	Yes	92.4	0.83	30.5	1LA9 183-4WA□□		126	
30	180 L	1770	121	Yes	92.4	0.83	36	1LA9 186-4WA□□		146	
40	200 L	1770	161	Yes	93	0.86	47	1LA9 207-4WA□□		199	

Special versions according to ATEX

Motor type	Zone 2		VIK (includes Zone 2) ¹⁾		Zone 21		Zone 22	
	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)
Frame size	Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA9	56	–	–	–	✓	✓	✓	✓
	63	✓	✓	✓	✓	✓	✓	✓
	71	✓	✓	✓	✓	✓	✓	✓
	80	✓	✓	✓	✓	✓	✓	✓
	90	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓
	160	✓	✓	✓	✓	✓	✓	✓
	180	–	–	–	✓	✓	✓	✓
	200	–	–	–	✓	✓	✓	✓

- ✓ With additional charge
– Not possible

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):
Mains-fed operation – order code **M74**
Converter-fed operation with derating – order code **M75**
See "Special versions" in the "Selection and ordering data" under "Options".

The motors can also be used for 50 Hz "High Efficiency", see Pages 4/50 to 4/55.

¹⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 60 Hz L_{pFA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
4-pole, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT							
1LA9 050-4KA□□	2.7	3.4	3	16	0.00027	46	57
1LA9 053-4KA□□	2.8	3.5	3	16	0.00035	46	57
1LA9 060-4KA□□	2.7	3.9	2.8	16	0.00037	46	57
1LA9 063-4KA□□	3	3.6	3.1	16	0.00045	46	57
1LA9 070-4KA□□	3.6	4.9	3.4	16	0.00076	48	59
1LA9 073-4KA□□	3.3	4.9	3.4	16	0.00095	48	59
1LA9 080-4KA□□	3.4	6.8	3.6	16	0.0017	51	62
1LA9 083-4KA□□	4	7.3	3.9	16	0.0024	51	62
1LA9 090-4KA□□	3.1	7.7	3.9	16	0.0033	52	64
1LA9 096-4KA□□	3.6	8.1	4.2	16	0.004	52	64
1LA9 106-4KA□□	3.4	8.4	4.3	16	0.0062	57	69
1LA9 107-4KA□□	3.8	8.7	4.6	16	0.0077	57	69
1LA9 113-4KA□□	3.2	8.6	3.9	16	0.014	57	69
1LA9 130-4KA□□	3.2	8.7	4.1	16	0.023	66	78
1LA9 133-4KA□□	3.4	8.7	4.1	16	0.029	66	78
1LA9 163-4KA□□	2.6	8.1	3.2	16	0.055	70	82
1LA9 166-4KA□□	2.8	8.5	3.5	16	0.072	70	82
1LA9 183-4WA□□	2.8	8.4	3.6	16	0.15	67	80
1LA9 186-4WA□□	3.1	8.8	3.9	16	0.19	67	80
1LA9 207-4WA□□	3	8.3	3.6	16	0.32	69	82

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code					With standard flange		With special flange
	60 Hz 460 VY 460 VA (see "Introduction") for outputs at 60 Hz)		Without flange IM B3/6/7/8, IM V6 ¹⁾	With flange IM B5, IM V3 ¹⁾	IM V1 with protective cover ¹⁾²⁾	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾	
	1	6	0	1	4	6	2	7	3	
1LA9 05 □□	○	○	□	✓	–	–	✓	✓	✓	
1LA9 06 □□	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 07 □□	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 08 □□	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 09 □□	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 10 □□	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 11 □□	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 13 □□	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 16 □□	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 18 □□	○	○	□	✓ ³⁾	✓	✓	–	–	–	
1LA9 20 □□	○	○	□	✓ ³⁾	✓	✓	–	–	–	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA9

Selection and ordering data (continued)

Rated output at 60 Hz P_{rated} HP	Frame size FS	Operating values at rated output					Power factor at 60 Hz 4/4-load $\cos\phi_{\text{rated}}$	Rated current at 460 V, 60 Hz I_{rated} A	Order No. For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 60 Hz n_{rated} rpm	Rated torque at 60 Hz T_{rated} Nm	EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz η_{rated} %						
6-pole, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT											
1	90 S	1140	6.2	Yes	80	0.66	1.78	1LA9 090-6KA□□		15.7	
1.5	90 L	1150	9.3	Yes	85.5	0.64	2.55	1LA9 096-6KA□□		19	
2	100 L	1150	12	No	86.5	0.7	3.1	1LA9 106-6KA□□		25	
3	112 M	1160	18	Yes	87.5	0.66	4.8	1LA9 113-6KA□□		37	
5	132 M	1160	31	Yes	87.5	0.77	6.9	1LA9 133-6KA□□		49	
7.5	132 M	1160	46	Yes	89.5	0.73	10.6	1LA9 134-6KA□□		64	
10	160 M	1165	61	Yes	89.5	0.7	15	1LA9 163-6KA□□		98	
15	160 L	1165	92	Yes	90.2	0.77	19	1LA9 166-6KA□□		105	
20	180 L	1175	121	Yes	90.2	0.75	28	1LA9 186-6WA□□		144	
25	200 L	1175	152	Yes	91.7	0.75	34	1LA9 206-6WA□□		186	
30	200 L	1175	182	Yes	91.7	0.75	40	1LA9 207-6WA□□		217	

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ¹⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation (FC) Order code M73	Mains-fed operation Order code K30	Converter-fed operation (FC) On request	Mains-fed operation Order code M34	Converter-fed operation (FC) Order code M38	Mains-fed operation Order code M35	Converter-fed operation (FC) Order code M39
1LA9	90	✓	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓	✓
	160	✓	✓	✓	✓	✓	✓	✓	✓
	180	–	–	–	–	✓	✓	✓	✓
	200	–	–	–	–	✓	✓	✓	✓

- ✓ With additional charge
– Not possible

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):

Mains-fed operation – order code **M74**

Converter-fed operation with derating – order code **M75**

See "Special versions" in the "Selection and ordering data" under "Options".

The motors can also be used for 50 Hz "High Efficiency", see Pages 4/50 to 4/55.

¹⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 60 Hz L_{pFA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
6-pole, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT							
1LA9 090-6KA□□	3	5.6	3	16	0.0033	47	59
1LA9 096-6KA□□	3.7	6.4	3.7	16	0.005	47	59
1LA9 106-6KA□□	3.5	7.2	3.8	16	0.0065	51	63
1LA9 113-6KA□□	2.9	7.5	3.7	16	0.014	56	68
1LA9 133-6KA□□	3	7.9	3.6	16	0.025	67	79
1LA9 134-6KA□□	3.7	8.4	4.3	16	0.03	67	79
1LA9 163-6KA□□	2.4	6.4	2.8	16	0.063	70	82
1LA9 166-6KA□□	3.1	8.3	3.8	16	0.072	70	82
1LA9 186-6WA□□	2.8	7.1	2.8	16	0.19	70	82
1LA9 206-6WA□□	2.8	7.1	2.8	16	0.28	70	82
1LA9 207-6WA□□	2.8	7.2	2.8	16	0.36	70	82

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code						
	60 Hz 460 VY	460 VΔ (see "Introduction" for outputs at 60 Hz)	Without flange IM B3/6/7/8, IM V6 ¹⁾	With flange IM B5, IM V3 ¹⁾	IM V1 with protective cover ¹⁾²⁾	IM B35	With standard flange IM B14, ¹⁾ IM V19 ¹⁾	IM B34	With special flange IM B14, IM V19 ¹⁾
	1	6	0	1	4	6	2	7	3
1LA9 09 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LA6/1LG4

Selection and ordering data

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	m kg	
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection											
3	3.45	100 L	2890	9.9	84	84	0.85	6.1	1LA6 106-2AAQQ	34	
4	4.6	112 M	2905	13	86	86	0.86	7.8	1LA6 113-2AAQQ	43	
5.5	6.3	132 S	2925	18	86.5	86.5	0.89	10.4	1LA6 130-2AAQQ	53	
7.5	8.6	132 S	2930	24	88	88	0.89	13.8	1LA6 131-2AAQQ	58	
11	12.6	160 M	2940	36	89.5	89.5	0.88	20	1LA6 163-2AAQQ	96	
15	17.3	160 M	2940	49	90	90.2	0.9	26.5	1LA6 164-2AAQQ	105	
18.5	21.3	160 L	2940	60	91	91.2	0.91	32	1LA6 166-2AAQQ	115	
22	24.5	180 M	2945	71	91.6	91.6	0.86	40.5 ¹⁾	1LG4 183-2AAQQ	145	
30	33.5	200 L	2950	97	91.8	91.9	0.88	54 ¹⁾	1LG4 206-2AAQQ	205	
37	41.5	200 L	2955	120	92.9	93.2	0.89	65 ¹⁾	1LG4 207-2AAQQ	225	
45	51	225 M	2960	145	93.6	93.9	0.88	79 ¹⁾	1LG4 223-2AAQQ	285	
55	62	250 M	2970	177	93.6	93.8	0.88	96	1LG4 253-2ABQQ	375	
75	84	280 S	2975	241	94.5	94.3	0.88	130 ¹⁾	1LG4 280-2ABQQ	500	
90	101	280 M	2975	289	95.1	95.2	0.89	154 ¹⁾	1LG4 283-2ABQQ	540	
110	123	315 S	2982	352	94.6	93.8	0.88	190 ¹⁾	1LG4 310-2ABQQ	720	
132	148	315 M	2982	423	95.1	94.8	0.9	225 ¹⁾	1LG4 313-2ABQQ	775	
160	180	315 L	2982	512	95.5	95.3	0.91	265 ²⁾	1LG4 316-2ABQQ	900	
200	224	315 L	2982	641	95.9	95.8	0.92	325 ²⁾	1LG4 317-2ABQQ	1015	

Special versions according to ATEX

Motor type	Zone 2		VIK (includes Zone 2) ³⁾		Zone 21		Zone 22	
	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)
Frame size	Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA6	100	✓	✓	✓	–	–	✓	✓
	112	✓	✓	✓	✓	–	✓	✓
	132	✓	✓	✓	✓	–	✓	✓
	160	✓	✓	✓	✓	–	✓	✓
1LG4	180	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓

- ✓ With additional charge
– Not possible

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):

Mains-fed operation – order code **M74**

Converter-fed operation with derating – order code **M75**

See "Special versions" in the "Selection and ordering data" under "Options".

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").
²⁾ For connection to 400 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").

³⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA6 106-2AA□□	2.8	6.8	3	16	0.0035	62	74
1LA6 113-2AA□□	2.6	7.2	2.9	16	0.0059	63	75
1LA6 130-2AA□□	2	5.9	2.8	16	0.015	68	80
1LA6 131-2AA□□	2.3	6.9	3	16	0.019	68	80
1LA6 163-2AA□□	2.1	6.5	2.9	16	0.034	70	82
1LA6 164-2AA□□	2.2	6.6	3	16	0.043	70	82
1LA6 166-2AA□□	2.4	7	3.1	16	0.051	70	82
1LG4 183-2AA□□	2.5	6.4	3.4	16	0.068	67	80
1LG4 206-2AA□□	2.3	6.5	3	16	0.13	74	87
1LG4 207-2AA□□	2.5	7.2	3.3	16	0.15	73	86
1LG4 223-2AA□□	2.4	6.7	3.1	16	0.22	73	86
1LG4 253-2AB□□	2.1	6.7	3.1	13	0.4	75	88
1LG4 280-2AB□□	2.5	7.5	3.1	13	0.72	74	87
1LG4 283-2AB□□	2.6	7.2	3.1	13	0.83	74	87
1LG4 310-2AB□□	2.4	7.2	3.1	13	1.2	81	95
1LG4 313-2AB□□	2.4	6.9	3	13	1.4	80	94
1LG4 316-2AB□□	2.4	7	3	13	1.6	79	92
1LG4 317-2AB□□	2.3	6.7	2.9	13	2.1	79	92

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code								
	50 Hz				60 Hz		Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6 ¹⁾²⁾	IM B5, IM V3 ¹⁾³⁾	IM V1	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA6 10 - ... □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 11 - ... □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 13 - ... □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 16 - ... □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LG4 18 - ... □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 20 - ... □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 22 - ... □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 25 - ... □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 28 - ... □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 310 - ... □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 313 - ... □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 316 - ... □□	–	○	–	○	–	○	□ ⁶⁾	–	✓ ⁷⁾	✓	–	–	–
1LG4 317 - ... □□	–	○	–	○	–	○	□ ⁶⁾	–	✓ ⁷⁾	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- 2) If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.
- 3) 1LG4 220-... to 1LG4 318-... motors (motor series 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- 4) The "Second shaft extension" option, order code **K16** is not possible.
- 5) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 6) Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.
- 7) 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Rated current at 400 V, 50 Hz	Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz				
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	m	kg	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection												
2.2	2.55	100 L	1420	15	82	82.5	0.82	4.7	1LA6 106-4AA□□		33	
3	3.45	100 L	1420	20	83	83.5	0.82	6.4	1LA6 107-4AA□□		36	
4	4.6	112 M	1440	27	85	85.5	0.83	8.2	1LA6 113-4AA□□		45	
5.5	6.3	132 S	1455	36	86	86	0.81	11.4	1LA6 130-4AA□□		55	
7.5	8.6	132 M	1455	49	87	87.5	0.82	15.2	1LA6 133-4AA□□		62	
11	12.6	160 M	1460	72	88.5	89	0.84	21.5	1LA6 163-4AA□□		100	
15	17.3	160 L	1460	98	90	90.2	0.84	28.5	1LA6 166-4AA□□		114	
18.5	21.3	180 M	1465	121	90.4	90.8	0.84	35 ¹⁾	1LG4 183-4AA□□		140	
22	25.3	180 L	1465	143	91	91.5	0.84	41.5 ¹⁾	1LG4 186-4AA□□		155	
30	34.5	200 L	1465	196	91.6	92	0.85	56 ¹⁾	1LG4 207-4AA□□		205	
37	42.5	225 S	1475	240	92.2	92.6	0.85	68 ¹⁾	1LG4 220-4AA□□		265	
45	52	225 M	1475	291	93.1	93.6	0.86	81 ¹⁾	1LG4 223-4AA□□		300	
55	63	250 M	1480	355	93.5	93.8	0.85	100	1LG4 253-4AA□□		390	
75	86	280 S	1485	482	94.2	94.1	0.85	136 ¹⁾	1LG4 280-4AA□□		535	
90	104	280 M	1485	579	94.6	94.6	0.86	160 ¹⁾	1LG4 283-4AA□□		580	
110	127	315 S	1488	706	94.6	94.6	0.85	198 ¹⁾	1LG4 310-4AA□□		730	
132	152	315 M	1488	847	95.2	95.2	0.85	235 ¹⁾	1LG4 313-4AA□□		810	
160	184	315 L	1486	1028	95.7	95.8	0.86	280 ²⁾	1LG4 316-4AA□□		955	
200	230	315 L	1486	1285	95.9	96.2	0.88	340 ²⁾	1LG4 317-4AA□□		1060	

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ³⁾		Zone 21		Zone 22	
		Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)	Mains-fed operation	Converter-fed operation (FC)
		Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA6	100	✓	✓	✓	✓	–	–	✓	✓
	112	✓	✓	✓	✓	–	–	✓	✓
	132	✓	✓	✓	✓	–	–	✓	✓
	160	✓	✓	✓	✓	–	–	✓	✓
1LG4	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓	✓

- ✓ With additional charge
– Not possible

The motors can also be orderd in design for Zones 2 and 22 for non-conducting dust (IP55):

Mains-fed operation – order code **M74**

Converter-fed operation with derating – order code **M75**

See "Special versions" in the "Selection and ordering data" under "Options".

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").
²⁾ For connection to 400 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").

³⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA6 106-4AA□□	2.5	5.6	2.8	16	0.0047	53	65
1LA6 107-4AA□□	2.7	5.6	3	16	0.0055	53	65
1LA6 113-4AA□□	2.7	6	3	16	0.012	53	65
1LA6 130-4AA□□	2.5	6.3	3.1	16	0.018	62	74
1LA6 133-4AA□□	2.7	6.7	3.2	16	0.023	62	74
1LA6 163-4AA□□	2.2	6.2	2.7	16	0.043	66	78
1LA6 166-4AA□□	2.6	6.5	3	16	0.055	66	78
1LG4 183-4AA□□	2.4	6.7	3.1	16	0.099	65	78
1LG4 186-4AA□□	2.5	6.9	3.2	16	0.12	65	78
1LG4 207-4AA□□	2.5	6.7	3.4	16	0.19	66	79
1LG4 220-4AA□□	2.3	6.7	3.1	16	0.37	66	79
1LG4 223-4AA□□	2.6	7.2	3.2	16	0.45	66	79
1LG4 253-4AA□□	2.4	6.1	2.8	16	0.69	65	78
1LG4 280-4AA□□	2.5	7.1	3	16	1.2	70	83
1LG4 283-4AA□□	2.5	7.4	3	16	1.4	68	82
1LG4 310-4AA□□	2.5	6.4	2.8	16	1.9	70	83
1LG4 313-4AA□□	2.7	6.8	2.9	16	2.3	70	83
1LG4 316-4AA□□	2.7	6.8	2.8	16	2.9	70	83
1LG4 317-4AA□□	2.6	6.5	2.8	16	3.5	71	86

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz			60 Hz			Without flange	With flange		With standard flange	With special flange		
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6 ¹⁾²⁾	IM B5, IM V3 ¹⁾³⁾	IM V1 With protective cover ¹⁾³⁾⁴⁾	IM B 35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾
1	6	3	5	1	6	0	1	4	6	2	7	3	
1LA6 10 -... □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 11 -... □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 13 -... □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 16 -... □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LG4 18 -... □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 20 -... □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 22 -... □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 25 -... □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 28 -... □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 310 -... □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 313 -... □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 316 -... □□	–	○	–	○	–	○	□ ⁶⁾	–	✓	✓	–	–	–
1LG4 317 -... □□	–	○	–	○	–	○	□ ⁶⁾	–	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- 2) If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

- 3) 1LG4 220-... to 1LG4 318-... motors (motor series 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- 4) The "Second shaft extension" option, order code **K16** is not possible.
- 5) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 6) Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	IM B3 type of construction approx. m kg	
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection											
1.5	1.75	100 L	925	15	74	74	0.75	3.9	1LA6 106-6AA□□	33	
2.2	2.55	112 M	940	22	78	78.5	0.78	5.2	1LA6 113-6AA□□	40	
3	3.45	132 S	950	30	79	79.5	0.76	7.2	1LA6 130-6AA□□	50	
4	4.6	132 M	950	40	80.5	80.5	0.76	9.4	1LA6 133-6AA□□	57	
5.5	6.3	132 M	950	55	83	83	0.76	12.6	1LA6 134-6AA□□	66	
7.5	8.6	160 M	960	75	86	86	0.74	17	1LA6 163-6AA□□	103	
11	12.6	160 L	960	109	87.5	87.5	0.74	24.5	1LA6 166-6AA□□	122	
15	18	180 L	965	148	88.9	90.3	0.83	29.5	1LG4 186-6AA□□	150	
18.5	22	200 L	975	181	89.8	90.2	0.81	36.5	1LG4 206-6AA□□	195	
22	26.5	200 L	975	215	90.3	91	0.81	43.5	1LG4 207-6AA□□	205	
30	36	225 M	978	293	91.8	92.8	0.83	57 ¹⁾	1LG4 223-6AA□□	280	
37	44.5	250 M	980	361	92.3	93	0.83	70	1LG4 253-6AA□□	370	
45	54	280 S	985	436	92.4	93.1	0.85	83	1LG4 280-6AA□□	475	
55	66	280 M	985	533	92.7	93.3	0.86	100	1LG4 283-6AA□□	510	
75	90	315 S	988	725	93.5	93.7	0.84	138	1LG4 310-6AA□□	685	
90	108	315 M	988	870	93.9	94.2	0.84	164 ¹⁾	1LG4 313-6AA□□	750	
110	132	315 L	988	1063	94.3	94.6	0.86	196	1LG4 316-6AA□□	890	
132	158	315 L	988	1276	94.8	95	0.86	235	1LG4 317-6AA□□	980	
160	192	315 L	988	1547	95	95.1	0.86	285 ²⁾	1LG4 318-6AA□□	1180	

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ³⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation (FC) Order code M73	Mains-fed operation Order code K30	Converter-fed operation (FC) On request	Mains-fed operation Order code M34	Converter-fed operation (FC) Order code M38	Mains-fed operation Order code M35	Converter-fed operation (FC) Order code M39
1LA6	100	✓	✓	✓	✓	–	–	✓	✓
	112	✓	✓	✓	✓	–	–	✓	✓
	132	✓	✓	✓	✓	–	–	✓	✓
	160	✓	✓	✓	✓	–	–	✓	✓
1LG4	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓	✓

- ✓ With additional charge
– Not possible

The motors can also be orderd in design for Zones 2 and 22 for non-conducting dust (IP55):

Mains-fed operation – order code **M74**

Converter-fed operation with derating – order code **M75**

See "Special versions" in the "Selection and ordering data" under "Options".

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").
²⁾ For connection to 400 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").

³⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA6 106-6AA□□	2.3	4	2.3	16	0.0047	47	59
1LA6 113-6AA□□	2.2	4.6	2.5	16	0.0091	52	64
1LA6 130-6AA□□	1.9	4.2	2.2	16	0.015	63	75
1LA6 133-6AA□□	2.1	4.5	2.4	16	0.019	63	75
1LA6 134-6AA□□	2.3	5	2.6	16	0.025	63	75
1LA6 163-6AA□□	2.1	4.6	2.5	16	0.044	66	78
1LA6 166-6AA□□	2.3	4.8	2.6	16	0.063	66	78
1LG4 186-6AA□□	2.3	5.3	2.5	16	0.18	57	73
1LG4 206-6AA□□	2.5	5.6	2.5	16	0.24	58	73
1LG4 207-6AA□□	2.6	5.7	2.5	16	0.29	58	73
1LG4 223-6AA□□	2.7	5.6	2.5	16	0.49	59	73
1LG4 253-6AA□□	2.7	6	2.3	16	0.76	60	75
1LG4 280-6AA□□	2.4	6.1	2.4	16	1.1	61	75
1LG4 283-6AA□□	2.5	6.3	2.5	16	1.4	61	75
1LG4 310-6AA□□	2.5	6.5	2.8	16	2.1	63	77
1LG4 313-6AA□□	2.6	6.8	2.9	16	2.5	63	77
1LG4 316-6AA□□	2.5	6.8	2.9	16	3.2	64	78
1LG4 317-6AA□□	3.1	7.3	3	16	4	64	78
1LG4 318-6AA□□	3	7.5	3	16	4.7	65	79

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz		60 Hz				Without flange	With flange		With standard flange	With special flange		
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6 ¹⁾²⁾	IM B5, IM V3 ¹⁾³⁾	IM V1 With protective cover ¹⁾³⁾⁴⁾	IM B 35 IM V19 ¹⁾	IM B14, IM B34	IM B14, IM V19 ¹⁾	
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA6 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LG4 18 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 20 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 22 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 25 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 28 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 310 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 313 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 316 □□	–	○	–	○	–	○	□ ⁶⁾	–	✓	✓	–	–	–
1LG4 317 □□													
1LG4 318 □□													

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- 2) If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

- 3) 1LG4 220-... to 1LG4 318-... motors (motor series 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- 4) The "Second shaft extension" option, order code **K16** is not possible.
- 5) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 6) Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Rated current at 400 V, 50 Hz	Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load					
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	m	kg	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection												
0.75	0.86	100 L	680	11	66	65	0.76	2.15	1LA6 106-8ABQQ		29	
1.1	1.3	100 L	680	15	72	72	0.76	2.9	1LA6 107-8ABQQ		32	
1.5	1.75	112 M	705	20	74	74	0.76	3.85	1LA6 113-8ABQQ		39	
2.2	2.55	132 S	700	30	75	75	0.74	5.7	1LA6 130-8ABQQ		50	
3	3.45	132 M	700	41	77	77.5	0.74	7.6	1LA6 133-8ABQQ		57	
4	4.6	160 M	715	53	80	80	0.72	10	1LA6 163-8ABQQ		91	
5.5	6.3	160 M	710	74	83.5	83.5	0.73	13	1LA6 164-8ABQQ		102	
7.5	8.6	160 L	715	100	85.5	85.5	0.72	17.6	1LA6 166-8ABQQ		122	
11	13.2	180 L	725	145	87.5	88.3	0.73	25	1LG4 186-8ABQQ		150	
15	18	200 L	725	198	87.7	88.4	0.76	32.5	1LG4 207-8ABQQ		205	
18.5	22	225 S	730	242	89.4	90.4	0.78	38.5	1LG4 220-8ABQQ		270	
22	26.5	225 M	730	288	89.7	90.7	0.79	45	1LG4 223-8ABQQ		290	
30	36	250 M	730	392	91.4	92.2	0.81	58	1LG4 253-8ABQQ		385	
37	44.5	280 S	735	481	92	92.8	0.81	72	1LG4 280-8ABQQ		475	
45	54	280 M	735	585	92.4	93.3	0.81	87	1LG4 283-8ABQQ		515	
55	66	315 S	740	710	93	93.4	0.81	106	1LG4 310-8ABQQ		680	
75	90	315 M	738	971	93.3	94	0.83	140	1LG4 313-8ABQQ		745	
90	108	315 L	738	1165	93.4	94	0.83	168	1LG4 316-8ABQQ		865	
110	132	315 L	738	1423	94	94.4	0.83	205	1LG4 317-8ABQQ		1020	
132	158	315 L	738	1708	94.2	94.6	0.83	245	1LG4 318-8ABQQ		1100	

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ¹⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation (FC) Order code M73	Mains-fed operation Order code K30	Converter-fed operation (FC) On request	Mains-fed operation Order code M34	Converter-fed operation (FC) Order code M38	Mains-fed operation Order code M35	Converter-fed operation (FC) Order code M39
1LA6	100	✓	✓	✓	✓	–	–	✓	✓
	112	✓	✓	✓	✓	–	–	✓	✓
	132	✓	✓	✓	✓	–	–	✓	✓
	160	✓	✓	✓	✓	–	–	✓	✓
1LG4	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓	✓

- ✓ With additional charge
– Not possible

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):

Mains-fed operation – order code **M74**

Converter-fed operation with derating – order code **M75**

See "Special versions" in the "Selection and ordering data" under "Options".

¹⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA6 106-8AB□□	1.6	3	1.9	13	0.0051	45	57
1LA6 107-8AB□□	1.8	3.3	2.1	13	0.0063	45	57
1LA6 113-8AB□□	1.8	3.7	2.1	13	0.013	49	61
1LA6 130-8AB□□	1.9	3.9	2.3	13	0.014	53	65
1LA6 133-8AB□□	2.1	4.1	2.4	13	0.019	53	65
1LA6 163-8AB□□	2.2	4.5	2.6	13	0.036	63	75
1LA6 164-8AB□□	2.3	4.7	2.7	13	0.046	63	75
1LA6 166-8AB□□	2.7	5.3	3	13	0.064	63	75
1LG4 186-8AB□□	1.7	4.2	2.1	13	0.17	65	78
1LG4 207-8AB□□	2.2	4.9	2.6	13	0.29	67	70
1LG4 220-8AB□□	2.3	5.5	2.7	13	0.48	57	70
1LG4 223-8AB□□	2.3	5.6	2.8	13	0.55	54	73
1LG4 253-8AB□□	2.3	5.5	2.6	13	0.84	55	73
1LG4 280-8AB□□	2.2	5	2.1	13	1.1	55	74
1LG4 283-8AB□□	2.2	5.1	2.1	13	1.4	58	74
1LG4 310-8AB□□	2.2	5.8	2.6	13	2.1	64	78
1LG4 313-8AB□□	2.2	5.7	2.6	13	2.5	64	78
1LG4 316-8AB□□	2.2	5.8	2.7	13	3.1	64	78
1LG4 317-8AB□□	2.4	6.1	2.8	13	3.9	64	78
1LG4 318-8AB□□	2.5	6.5	2.9	13	4.5	64	78

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz		60 Hz		Without flange	With flange		With standard flange		With special flange			
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6 ¹⁾²⁾	IM B5, IM V3 ¹⁾³⁾	IM V1 With protective cover ¹⁾³⁾⁴⁾	IM B 35 IM V19 ¹⁾	IM B14, IM B34	IM B14, IM V19 ¹⁾	
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA6 10...□□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 11...□□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 13...□□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 16...□□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LG4 18...□□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 20...□□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 22...□□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 25...□□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 28...□□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 310...□□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 313...□□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 316...□□	–	○	–	○	–	○	□ ⁶⁾	–	✓	✓	–	–	–
1LG4 317...□□	–	○	–	○	–	○	□ ⁶⁾	–	✓	✓	–	–	–
1LG4 318...□□	–	○	–	○	–	○	□ ⁶⁾	–	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- 2) If motors 1LG4 183... to 1LG4 318... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.
- 3) 1LG4 220... to 1LG4 318... motors (motor series 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- 4) The "Second shaft extension" option, order code **K16** is not possible.
- 5) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 6) Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LG6

Selection and ordering data

Rated output at 50 Hz P_{rated} kW	Frame size FS	Operating values at rated output						Order No. For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 50 Hz n_{rated} rpm	Rated torque at 50 Hz T_{rated} Nm	Efficiency at 50 Hz 4/4-load η_{rated} %	Efficiency at 50 Hz 3/4-load η_{rated} %	Power factor at 50 Hz 4/4-load $\cos\phi_{\text{rated}}$	Rated current at 400 V, 50 Hz I_{rated} A			
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, "High Efficiency"										
22	180 M	2955	71	94.1	94.5	0.88	38.5 ¹⁾	1LG6 183-2AA□□		180
30	200 L	2960	97	93.5	93.4	0.88	53 ¹⁾	1LG6 206-2AA□□		225
37	200 L	2960	119	94.1	94	0.89	64 ¹⁾	1LG6 207-2AA□□		255
45	225 M	2965	145	94.9	95.1	0.89	77 ¹⁾	1LG6 223-2AA□□		330
55	250 M	2975	177	95.3	95.3	0.9	93	1LG6 253-2AA□□		420
75	280 S	2975	241	95.2	95.2	0.89	128 ¹⁾	1LG6 280-2AB□□		530
90	280 M	2978	289	95.6	95.7	0.9	150 ¹⁾	1LG6 283-2AB□□		615
110	315 S	2982	352	95.8	95.7	0.91	182 ¹⁾	1LG6 310-2AB□□		790
132	315 M	2982	423	96	95.9	0.91	220 ¹⁾	1LG6 313-2AB□□		915
160	315 L	2982	512	96.4	96.4	0.92	260 ²⁾	1LG6 316-2AB□□		1055
200	315 L	2982	641	96.5	96.5	0.93	320 ²⁾	1LG6 317-2AB□□		1245
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, "High Efficiency"										
18.5	180 M	1470	120	92.6	93.2	0.83	34.5 ¹⁾	1LG6 183-4AA□□		155
22	180 L	1470	143	93.2	93.5	0.84	40.5 ¹⁾	1LG6 186-4AA□□		180
30	200 L	1470	195	93.3	93.4	0.85	55 ¹⁾	1LG6 207-4AA□□		225
37	225 S	1480	239	94	94.4	0.85	67 ¹⁾	1LG6 220-4AA□□		290
45	225 M	1480	290	94.5	94.7	0.85	81 ¹⁾	1LG6 223-4AA□□		330
55	250 M	1485	354	95.1	95.3	0.87	96	1LG6 253-4AA□□		460
75	280 S	1485	482	95.1	95.2	0.87	130 ¹⁾	1LG6 280-4AA□□		575
90	280 M	1486	578	95.4	95.5	0.86	158 ¹⁾	1LG6 283-4AA□□		675
110	315 S	1488	706	95.9	96	0.87	190 ¹⁾	1LG6 310-4AA□□		810
132	315 M	1488	847	96.1	96.2	0.88	225 ¹⁾	1LG6 313-4AA□□		965
160	315 L	1490	1026	96.3	96.4	0.88	275 ²⁾	1LG6 316-4AA□□		1105
200	315 L	1490	1282	96.4	96.5	0.88	340 ²⁾	1LG6 317-4AA□□		1305

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ³⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation (FC) Order code M73	Mains-fed operation Order code K30	Converter-fed operation (FC) On request	Mains-fed operation Order code M34	Converter-fed operation (FC) Order code M38	Mains-fed operation Order code M35	Converter-fed operation (FC) Order code M39
1LG6	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓	✓

✓ With additional charge

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):

Mains-fed operation – order code **M74**

Converter-fed operation with derating – order code **M75**

See "Special versions" in the "Selection and ordering data" under "Options".

The motors can also be used for 60 Hz according to EPACT, see Pages 4/74 to 4/79.

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").

²⁾ For connection to 400 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").

³⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, "High Efficiency"							
1LG6 183-2AA□□	2.5	7.2	3.4	16	0.086	67	80
1LG6 206-2AA□□	2.4	7	3.3	16	0.15	71	84
1LG6 207-2AA□□	2.5	7.2	3.3	16	0.18	71	84
1LG6 223-2AA□□	2.5	7.3	3.2	16	0.27	71	84
1LG6 253-2AA□□	2.4	6.8	3	16	0.47	71	84
1LG6 280-2AB□□	2.5	7	3	13	0.83	73	86
1LG6 283-2AB□□	2.6	7.6	3.1	13	1	73	86
1LG6 310-2AB□□	2.4	6.9	2.8	13	1.4	76	89
1LG6 313-2AB□□	2.6	7.1	2.9	13	1.6	76	89
1LG6 316-2AB□□	2.5	7.1	2.9	13	2.1	76	89
1LG6 317-2AB□□	2.5	6.9	2.8	13	2.5	76	89
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, "High Efficiency"							
1LG6 183-4AA□□	2.5	6.4	3	16	0.12	60	73
1LG6 186-4AA□□	2.5	6.7	3.1	16	0.14	60	73
1LG6 207-4AA□□	2.6	6.7	3.3	16	0.23	62	75
1LG6 220-4AA□□	2.7	6.8	3	16	0.4	60	73
1LG6 223-4AA□□	2.8	6.9	3	16	0.49	60	73
1LG6 253-4AA□□	2.6	7.5	3	16	0.86	65	78
1LG6 280-4AA□□	2.5	6.8	2.9	16	1.4	67	80
1LG6 283-4AA□□	2.7	7.5	3.1	16	1.7	67	80
1LG6 310-4AA□□	2.7	7.1	2.9	16	2.3	68	82
1LG6 313-4AA□□	2.7	7.3	2.9	16	2.9	68	82
1LG6 316-4AA□□	3	7.4	3	16	3.5	68	82
1LG6 317-4AA□□	3.2	7.6	3	16	4.2	68	82

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange			With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ¹⁾²⁾	IM B5 ¹⁾³⁾ , IM V3 ⁴⁾	IM V1 with protective cover ¹⁾³⁾⁵⁾	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾
1	6	3	5	0	1	4	6	2	7	3	
1LG6 18 - □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 20 - □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 22 - □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 25 - □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 28 - □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 310 - □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 313 - □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 316 - □□	-	○	-	○	□ ⁶⁾	-	✓ ⁷⁾	✓	-	-	-
1LG6 317 - □□	-	○	-	○	□ ⁶⁾	-	✓ ⁷⁾	✓	-	-	-

□ Standard version
○ Without additional charge

✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

- 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- The "Second shaft extension" option, order code **K16** is not possible.
- Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.
- 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LG6

Selection and ordering data (continued)

Rated output at 50 Hz P_{rated} kW	Frame size FS	Operating values at rated output						Order No. For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 50 Hz n_{rated} rpm	Rated torque at 50 Hz T_{rated} Nm	Efficiency at 50 Hz 4/4-load η_{rated} %	Efficiency at 50 Hz 3/4-load η_{rated} %	Power factor at 50 Hz 4/4-load $\cos\phi_{\text{rated}}$	Rated current at 400 V, 50 Hz I_{rated} A			
6-pole, 1000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, "High Efficiency"										
15	180 L	975	147	90.9	91.7	0.81	29.5	1LG6 186-6AA□□		175
18.5	200 L	978	181	91.2	91.8	0.81	36	1LG6 206-6AA□□		210
22	200 L	978	215	91.9	92.5	0.82	42	1LG6 207-6AA□□		240
30	225 M	980	292	93.2	93.7	0.83	56 ¹⁾	1LG6 223-6AA□□		325
37	250 M	985	359	93.7	94.1	0.83	69	1LG6 253-6AA□□		405
45	280 S	988	435	94.4	94.6	0.85	81	1LG6 280-6AA□□		520
55	280 M	988	532	94.6	94.8	0.85	99	1LG6 283-6AA□□		570
75	315 S	990	723	95	95	0.83	138	1LG6 310-6AA□□		760
90	315 M	990	868	95.3	95.4	0.85	160 ¹⁾	1LG6 313-6AA□□		935
110	315 L	990	1061	95.6	95.7	0.85	196	1LG6 316-6AA□□		1010
132	315 L	990	1273	95.8	95.8	0.85	235	1LG6 317-6AA□□		1180
160	315 L	990	1543	95.8	95.9	0.86	280 ²⁾	1LG6 318-6AA□□		1245
8-pole, 750 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, "High Efficiency"										
11	180 L	725	145	88.7	89.6	0.76	23.5	1LG6 186-8AB□□		165
15	200 L	725	198	89.3	89.8	0.8	30.5	1LG6 207-8AB□□		235
18.5	225 S	730	242	91.1	91.8	0.81	36	1LG6 220-8AB□□		295
22	225 M	730	288	91.6	92.1	0.81	43	1LG6 223-8AB□□		335
30	250 M	735	390	92.8	93.3	0.82	57	1LG6 253-8AB□□		435
37	280 S	738	479	93.1	93.3	0.81	71	1LG6 280-8AB□□		510
45	280 M	738	582	93.7	94	0.81	86	1LG6 283-8AB□□		560
55	315 S	740	710	94.3	94.4	0.82	102	1LG6 310-8AB□□		750
75	315 M	740	968	94.5	94.7	0.83	138	1LG6 313-8AB□□		840
90	315 L	740	1161	94.7	95.1	0.84	164	1LG6 316-8AB□□		1005
110	315 L	740	1420	94.8	95.1	0.84	200	1LG6 317-8AB□□		1100
132	315 L	740	1704	94.9	95.2	0.84	240	1LG6 318-8AB□□		1270

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ³⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation (FC) Order code M73	Mains-fed operation Order code K30	Converter-fed operation (FC) On request	Mains-fed operation Order code M34	Converter-fed operation (FC) Order code M38	Mains-fed operation Order code M35	Converter-fed operation (FC) Order code M39
1LG6	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
315	✓	✓	✓	✓	✓	✓	✓	✓	

✓ With additional charge

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):

Mains-fed operation – order code **M74**

Converter-fed operation with derating – order code **M75**

See "Special versions" in the "Selection and ordering data" under "Options".

The motors can also be used for 60 Hz according to EPACT, see Pages 4/74 to 4/79.

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").

²⁾ For connection to 400 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection box").

³⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, "High Efficiency"							
1LG6 186-6AA□□	2.4	5.5	2.5	16	0.2	56	69
1LG6 206-6AA□□	2.4	5.6	2.4	16	0.29	59	72
1LG6 207-6AA□□	2.4	5.6	2.4	16	0.36	59	72
1LG6 223-6AA□□	2.8	6.5	2.9	16	0.63	59	72
1LG6 253-6AA□□	2.9	6.8	2.5	16	0.93	59	72
1LG6 280-6AA□□	3	6.8	2.7	16	1.4	58	71
1LG6 283-6AA□□	3.3	7.3	2.9	16	1.6	58	71
1LG6 310-6AA□□	2.8	7.3	3	16	2.5	61	74
1LG6 313-6AA□□	2.7	7.3	2.9	16	3.2	61	74
1LG6 316-6AA□□	2.9	7.4	2.9	16	4	61	74
1LG6 317-6AA□□	3.1	7.8	3.1	16	4.7	61	74
1LG6 318-6AA□□	3.2	7.8	3.1	16	5.4	64	77
8-pole, 750 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, "High Efficiency"							
1LG6 186-8AB□□	1.7	4.6	2.2	13	0.21	62	75
1LG6 207-8AB□□	2.3	5.3	2.6	13	0.37	62	75
1LG6 220-8AB□□	2.3	5.6	2.6	13	0.55	54	67
1LG6 223-8AB□□	2.4	5.8	2.8	13	0.66	58	71
1LG6 253-8AB□□	2.5	6	2.8	13	1.1	57	70
1LG6 280-8AB□□	2.3	5.7	2.3	13	1.4	58	71
1LG6 283-8AB□□	2.6	6.1	2.5	13	1.6	58	71
1LG6 310-8AB□□	2.5	6.3	2.9	13	2.5	64	77
1LG6 313-8AB□□	2.5	6.7	2.9	13	3.1	58	72
1LG6 316-8AB□□	2.4	6.3	2.8	13	3.9	64	77
1LG6 317-8AB□□	2.4	6.4	2.6	13	4.5	64	77
1LG6 318-8AB□□	2.5	6.7	2.9	13	5.3	64	77

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange			With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ¹⁾²⁾	IM B5 ¹⁾³⁾ , IM V3 ⁴⁾	IM V1 with protective cover ¹⁾³⁾⁵⁾	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾	
	1	6	3	5	0	1	4	6	2	7	3	
1LG6 18 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-	
1LG6 20 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-	
1LG6 22 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-	
1LG6 25 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-	
1LG6 28 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-	
1LG6 310 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-	
1LG6 313 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-	
1LG6 316 - ... □□	-	○	-	○	□ ⁶⁾	-	✓	✓	-	-	-	
1LG6 317 - ... □□												
1LG6 318 - ... □□												

- Standard version
○ Without additional charge

- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- 2) If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

- 3) 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- 4) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 5) The "Second shaft extension" option, order code **K16** is not possible.
- 6) Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LG6

Selection and ordering data

Rated output at 60 Hz P_{rated} HP	Frame size FS	Operating values at rated output						Order No. For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 60 Hz n_{rated} rpm	Rated torque at 60 Hz T_{rated} Nm	EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz η_{rated} %	Power factor at 60 Hz 4/4-load $\cos\phi_{\text{rated}}$	Rated current at 460 V, 60 Hz I_{rated} A			
2-pole, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT										
30	180 M	3560	60	Yes	93	0.88	34	1LG6 183-2AA□□		180
40	200 L	3565	80	Yes	91.7	0.88	46	1LG6 206-2AA□□		225
50	200 L	3565	100	Yes	92.4	0.89	57	1LG6 207-2AA□□		255
60	225 M	3570	120	Yes	93.6	0.89	67	1LG6 223-2AA□□		330
75	225 M	3570	150	Yes	94.5	0.9	83	1LG6 228-2AA□□¹⁾		390
75	250 M	3578	149	No	93.6	0.89	84	1LG6 253-2AA□□		420
100	250 M	3580	199	Yes	94.1	0.89	112	1LG6 258-2AA□□¹⁾		470
100	280 S	3580	199	No	95	0.89	110	1LG6 280-2AB□□		530
125	280 M	3580	249	Yes	95	0.9	136	1LG6 283-2AB□□		615
150	280 M	3580	299	Yes	95	0.9	164	1LG6 288-2AA□□¹⁾		660
150	315 S	3585	298	Yes	94.5	0.91	164	1LG6 310-2AB□□		790
175	315 M	3586	348	Yes	95	0.91	190	1LG6 313-2AB□□		915
200	315 L	3588	397	Yes	95.4	0.91	215	1LG6 316-2AB□□		1055
250	315 L	3588	496	No	95.4	0.93	265	1LG6 317-2AB□□		1245
300	315 L	3591	595	No	95.4	0.92	320	1LG6 318-2AA□□¹⁾		1330

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ²⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation (FC) Order code M73	Mains-fed operation Order code K30	Converter-fed operation (FC) On request	Mains-fed operation Order code M34	Converter-fed operation (FC) Order code M38	Mains-fed operation Order code M35	Converter-fed operation (FC) Order code M39
1LG6	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓	✓

✓ With additional charge

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):
Mains-fed operation – order code **M74**
Converter-fed operation with derating – order code **M75**
See "Special versions" in the "Selection and ordering data" under "Options".

The motors can also be used for 50 Hz "High Efficiency", see Pages 4/70 to 4/73.

¹⁾ Only 60 Hz data according to EPACT on the rating plate.

²⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 60 Hz L_{pFA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
2-pole, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACK							
1LG6 183-2AA□□	2.7	7.9	3.7	16	0.086	72	85
1LG6 206-2AA□□	2.7	7.8	3.7	16	0.15	75	88
1LG6 207-2AA□□	2.8	7.8	3.7	16	0.18	75	88
1LG6 223-2AA□□	2.8	8.3	3.6	16	0.27	74	87
1LG6 228-2AA□□	3.3	8.7	3.7	16	0.32	74	87
1LG6 253-2AA□□	2.7	7.5	3.2	16	0.47	75	88
1LG6 258-2AA□□	2.8	8.4	3.5	16	0.57	79	92
1LG6 280-2AB□□	2.8	7.9	3.4	13	0.83	77	90
1LG6 283-2AB□□	2.9	8.3	3.4	13	1	77	90
1LG6 288-2AA□□	3.1	8.5	3.6	16	1.16	77	90
1LG6 310-2AB□□	2.6	7.5	3.1	13	1.4	81	94
1LG6 313-2AB□□	3	8.3	3.3	13	1.6	81	94
1LG6 316-2AB□□	3	8.4	3.5	13	2.1	81	94
1LG6 317-2AB□□	3.2	8.6	3.4	13	2.5	81	94
1LG6 318-2AA□□	4.1	10	3.9	16	2.74	83	96

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code				With standard flange		With special flange
	60 Hz 460 VY 460 VΔ (see "Introduction" for outputs at 60 Hz)		Without flange IM B3/6/7/8, IM V6 ¹⁾²⁾	With flange IM B5, IM V3 ¹⁾³⁾⁴⁾	IM V1 with protective cover ¹⁾³⁾⁵⁾	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾
	1	6	0	1	4	6	2	7	3
1LG6 18-...□□	○	○	□	✓	✓	✓	-	-	-
1LG6 20-...□□	○	○	□	✓	✓	✓	-	-	-
1LG6 22-...□□	○	○	□	✓	✓	✓	-	-	-
1LG6 25-...□□	○	○	□	✓	✓	✓	-	-	-
1LG6 28-...□□	○	○	□	✓	✓	✓	-	-	-
1LG6 310-...□□	○	○	□	✓	✓	✓	-	-	-
1LG6 313-...□□	○	○	□	✓	✓	✓	-	-	-
1LG6 316-...□□	-	○	□ ⁶⁾	-	✓ ⁷⁾	✓	-	-	-
1LG6 317-...□□	-	○	□	-	✓	✓	-	-	-
1LG6 318-...□□	-	○	□	-	✓	✓	-	-	-

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- 2) If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

- 3) 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- 4) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 5) The "Second shaft extension" option, order code **K16** is not possible.
- 6) Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.
- 7) 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. “n” or prot. against dust explosions – Cast-iron series 1LG6

Selection and ordering data (continued)

Rated output at 60 Hz P_{rated} HP	Frame size FS	Operating values at rated output				Nominal efficiency at 60 Hz η_{rated} %	Power factor at 60 Hz 4/4-load $\cos\phi_{\text{rated}}$	Rated current at 460 V, 60 Hz I_{rated} A	Order No. For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 60 Hz n_{rated} rpm	Rated torque at 60 Hz T_{rated} Nm	EPACT with CC No. CC 032A							
4-pole, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT											
25	180 M	1775	100	Yes	92.4	0.82	31	1LG6 183-4AA□□		155	
30	180 L	1775	120	Yes	92.4	0.83	36.5	1LG6 186-4AA□□		180	
40	200 L	1775	160	Yes	93	0.84	48	1LG6 207-4AA□□		225	
50	225 S	1785	199	No	93.6	0.84	60	1LG6 220-4AA□□		290	
60	225 M	1785	239	Yes	94.1	0.85	70	1LG6 223-4AA□□		330	
75	225 M	1785	299	Yes	94.1	0.85	88	1LG6 228-4AA□□¹⁾		355	
75	250 M	1790	298	No	94.5	0.86	86	1LG6 253-4AA□□		460	
100	250 M	1788	398	Yes	94.5	0.86	116	1LG6 258-4AA□□¹⁾		495	
100	280 S	1788	398	No	94.5	0.86	114	1LG6 280-4AA□□		575	
125	280 M	1790	497	Yes	95	0.86	144	1LG6 283-4AA□□		675	
150	280 M	1788	598	Yes	95	0.86	172	1LG6 288-4AA□□¹⁾		710	
150	315 S	1791	596	Yes	95	0.87	170	1LG6 310-4AA□□		810	
175	315 M	1791	696	Yes	95.4	0.87	198	1LG6 313-4AA□□		965	
200	315 L	1792	795	Yes	95.4	0.87	225	1LG6 316-4AA□□		1105	
250	315 L	1792	994	No	95.8	0.87	280	1LG6 317-4AA□□		1305	
300	315 L	1792	1193	No	95.8	0.87	335	1LG6 318-4AA□□¹⁾		1345	

Special versions according to ATEX

Motor type	Zone 2		VIK (includes Zone 2) ²⁾		Zone 21		Zone 22		
	Frame size	Mains-fed operation Order code M72	Converter-fed operation (FC) Order code M73	Mains-fed operation Order code K30	Converter-fed operation (FC) On request	Mains-fed operation Order code M34	Converter-fed operation (FC) Order code M38	Mains-fed operation Order code M35	Converter-fed operation (FC) Order code M39
1LG6	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓	✓

✓ With additional charge

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):

Mains-fed operation – order code **M74**

Converter-fed operation with derating – order code **M75**

See “Special versions” in the “Selection and ordering data” under “Options”.

The motors can also be used for 50 Hz “High Efficiency”, see Pages 4/70 to 4/73.

¹⁾ Only 60 Hz data according to EPACT on the rating plate.

²⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 60 Hz L_{pFA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
4-pole, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT							
1LG6 183-4AA□□	2.9	7.1	3.3	16	0.12	65	78
1LG6 186-4AA□□	2.8	7.4	3.4	16	0.14	65	78
1LG6 207-4AA□□	3	7.7	3.7	16	0.23	66	79
1LG6 220-4AA□□	3.1	7.5	3.4	16	0.4	65	78
1LG6 223-4AA□□	3.3	7.9	3.5	16	0.49	65	78
1LG6 228-4AA□□	3	7.8	3.3	16	0.66	64	78
1LG6 253-4AA□□	2.9	8.2	3.4	16	0.86	68	81
1LG6 258-4AA□□	3	8.1	3.3	16	0.99	72	86
1LG6 280-4AA□□	2.9	7.6	3.2	16	1.4	71	84
1LG6 283-4AA□□	3	8.2	3.4	16	1.7	71	84
1LG6 288-4AA□□	3.1	8.4	3.5	16	1.88	71	85
1LG6 310-4AA□□	3.1	7.8	3.2	16	2.3	75	88
1LG6 313-4AA□□	3.2	8.4	3.3	16	2.9	75	88
1LG6 316-4AA□□	3.7	9	3.6	16	3.5	75	88
1LG6 317-4AA□□	4	9.1	3.7	16	4.2	75	88
1LG6 318-4AA□□	4	9.3	3.7	16	4.5	81	94

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code						
	60 Hz 460 VY 460 VΔ (see "Introduction" for outputs at 60 Hz)		Without flange IM B3/6/7/8, IM V6 ¹⁾²⁾	With flange IM B5, IM V3 ¹⁾³⁾⁴⁾	IM V1 with protective cover ¹⁾³⁾⁵⁾	IM B35	With standard flange IM B14, ¹⁾ IM V19 ¹⁾	IM B34	With special flange IM B14, IM V19 ¹⁾
	1	6	0	1	4	6	2	7	3
1LG6 18 - □□	○	○	□	✓	✓	✓	-	-	-
1LG6 20 - □□	○	○	□	✓	✓	✓	-	-	-
1LG6 22 - □□	○	○	□	✓	✓	✓	-	-	-
1LG6 25 - □□	○	○	□	✓	✓	✓	-	-	-
1LG6 28 - □□	○	○	□	✓	✓	✓	-	-	-
1LG6 310 - □□	○	○	□	✓	✓	✓	-	-	-
1LG6 313 - □□	○	○	□	✓	✓	✓	-	-	-
1LG6 316 - □□	-	○	□ ⁶⁾	-	✓	✓	-	-	-
1LG6 317 - □□									
1LG6 318 - □□									

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- ²⁾ If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

- ³⁾ 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- ⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁵⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁶⁾ Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LG6

Selection and ordering data (continued)

Rated output at 60 Hz P_{rated} HP	Frame size FS	Operating values at rated output				Nominal efficiency at 60 Hz η_{rated} %	Power factor at 60 Hz 4/4-load $\cos\phi_{\text{rated}}$	Rated current at 460 V, 60 Hz I_{rated} A	Order No. For Order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below	Price	Weight IM B3 type of construction approx. m kg
		Rated speed at 60 Hz n_{rated} rpm	Rated torque at 60 Hz T_{rated} Nm	EPACT with CC No. CC 032A							
6-pole, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT											
20	180 L	1178	121	Yes	91	0.8	25.5	1LG6 186-6AA□□		175	
25	200 L	1180	151	Yes	91.7	0.79	32.5	1LG6 206-6AA□□		210	
30	200 L	1180	181	Yes	91.7	0.8	38.5	1LG6 207-6AA□□		240	
40	225 M	1184	241	Yes	93	0.82	49	1LG6 223-6AA□□		325	
50	225 M	1184	301	Yes	93	0.83	61	1LG6 228-6AA□□¹⁾		355	
50	250 M	1186	300	No	93	0.82	61	1LG6 253-6AA□□		405	
60	250 M	1186	361	Yes	93.6	0.82	73	1LG6 258-6AA□□¹⁾		435	
60	280 S	1190	359	No	94.1	0.83	72	1LG6 280-6AA□□		520	
75	280 M	1190	449	No	94.5	0.83	89	1LG6 283-6AA□□		570	
100	280 M	1190	599	Yes	94.5	0.84	118	1LG6 288-6AA□□¹⁾		615	
100	315 S	1191	598	Yes	94.5	0.82	120	1LG6 310-6AA□□		760	
125	315 M	1191	747	Yes	94.5	0.84	148	1LG6 313-6AA□□		935	
150	315 L	1192	896	Yes	95	0.84	176	1LG6 316-6AA□□		1010	
175	315 L	1192	1046	Yes	95	0.84	205	1LG6 317-6AA□□		1180	
200	315 L	1192	1195	Yes	95.4	0.84	235	1LG6 318-6AA□□		1245	

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ²⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation (FC) Order code M73	Mains-fed operation Order code K30	Converter-fed operation (FC) On request	Mains-fed operation Order code M34	Converter-fed operation (FC) Order code M38	Mains-fed operation Order code M35	Converter-fed operation (FC) Order code M39
1LG6	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓	✓

✓ With additional charge

The motors can also be ordered in design for Zones 2 and 22 for non-conducting dust (IP55):
Mains-fed operation – order code **M74**
Converter-fed operation with derating – order code **M75**
See "Special versions" in the "Selection and ordering data" under "Options".

The motors can also be used for 50 Hz "High Efficiency", see Pages 4/70 to 4/73.

¹⁾ Only 60 Hz data according to EPACT on the rating plate.

²⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 60 Hz L_{pFA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
6-pole, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT							
1LG6 186-6AA□□	2.9	6.5	3	16	0.2	57	70
1LG6 206-6AA□□	2.9	6.5	2.7	16	0.29	65	78
1LG6 207-6AA□□	2.9	6.4	2.7	16	0.36	65	78
1LG6 223-6AA□□	3.4	7.2	3.4	16	0.63	62	75
1LG6 228-6AA□□	3.2	7.6	3.4	16	0.76	61	74
1LG6 253-6AA□□	3.4	7.4	2.9	16	0.93	63	76
1LG6 258-6AA□□	3.4	7.4	2.9	16	1.07	65	79
1LG6 280-6AA□□	3.6	7.7	3.1	16	1.4	62	75
1LG6 283-6AA□□	3.9	8.3	3.3	16	1.6	62	75
1LG6 288-6AA□□	4	8.4	3.3	16	1.94	64	78
1LG6 310-6AA□□	3.3	8.4	3.4	16	2.5	66	79
1LG6 313-6AA□□	3	7.9	3.1	16	3.2	66	79
1LG6 316-6AA□□	3.3	8.5	3.3	16	4	66	79
1LG6 317-6AA□□	3.6	8.9	3.6	16	4.7	66	79
1LG6 318-6AA□□	4	9.4	4	16	5.4	69	82

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code				With standard flange		With special flange
	60 Hz 460 VY 460 VΔ (see "Introduction" for outputs at 60 Hz)		Without flange IM B3/6/7/8, IM V6 ¹⁾²⁾	With flange IM B5, IM V3 ¹⁾³⁾⁴⁾	IM V1 with protective cover ¹⁾³⁾⁵⁾	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾
	1	6	0	1	4	6	2	7	3
1LG6 18 - . . . □□	○	○	□	✓	✓	✓	-	-	-
1LG6 20 - . . . □□	○	○	□	✓	✓	✓	-	-	-
1LG6 22 - . . . □□	○	○	□	✓	✓	✓	-	-	-
1LG6 25 - . . . □□	○	○	□	✓	✓	✓	-	-	-
1LG6 28 - . . . □□	○	○	□	✓	✓	✓	-	-	-
1LG6 310 - . . . □□	○	○	□	✓	✓	✓	-	-	-
1LG6 313 - . . . □□	○	○	□	✓	✓	✓	-	-	-
1LG6 316 - . . . □□	-	○	□ ⁶⁾	-	✓	✓	-	-	-
1LG6 317 - . . . □□	-	○	□ ⁶⁾	-	✓	✓	-	-	-
1LG6 318 - . . . □□	-	○	□ ⁶⁾	-	✓	✓	-	-	-

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- ²⁾ If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

- ³⁾ 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- ⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁵⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁶⁾ Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2 and 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1LA8

Selection and ordering data

The data for series 1LA8 with type of protection "n" or protection against dust explosions can be found in the selection and ordering data in catalog part 3 "Non-standard motors of frame size 315 and above". The technical specifications are identical to the specifications of the non-explosion-proof versions. They are or-

dered using additional order options (special versions). These special versions for voltages, construction types or options are listed in catalog part 3 "Non-standard motors frame size 315 and above".

Special versions according to ATEX

Motor type	Zone 2		VIK ¹⁾ (includes Zone 2, utilization 155 (F) according to 130 (B))		Zone 21		Zone 22		
	Frame size	Mains-fed operation Order code M72	Converter-fed operation (FC) Order code M73	Mains-fed operation Order code K30	Converter-fed operation (FC) On request	Mains-fed operation Order code M34	Converter-fed operation (FC) Order code M38	Mains-fed operation Order code M35	Converter-fed operation (FC) Order code M39
1LA8	315	✓	O. R.	✓	O. R.	–	–	✓	✓
	355	✓	O. R.	✓	O. R.	–	–	✓	✓
	400	✓	O. R.	–	–	–	–	✓	✓
	450	✓	O. R.	–	–	–	–	✓	✓

O. R. Possible on request

✓ With additional charge

– Not possible

4

Forced-air cooled, in Zones 2 and 22 with type of prot. "n" or prot. against dust explosions – Cast-iron series 1PQ8

Selection and ordering data

The data for series 1PQ8 with type of protection "n" or protection against dust explosions can be found in the selection and ordering data in catalog part 3 "Non-standard motors of frame size 315 and above". The technical specifications are identical to the specifications of the non-explosion-proof versions. They are or-

dered using additional order options (special versions). These special versions for voltages, construction types or options are listed in catalog part 3 "Non-standard motors frame size 315 and above". Motor series 1PQ8 for converter-fed operation in Zone 2 available on request.

¹⁾ If the marking Ex nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

Overview

General information

Ex motors in vertical type of construction with shaft extension pointing down must have a protective cover.

Extensive operating instructions are supplied as standard with explosion-proof motors.

For all explosion-proof motors, designs according to UL (order code **D31**) and CSA (order code **D40**) are not possible.

Motor connection

For motors in Ex version (except for Zone 22, VIK, certified metric cable glands/sealing plugs are included in the scope of supply.

Mains-fed operation

Motors to type of protection

- Ex e are only certified for mains-fed operation. 2-pole motors 1MA frame sizes 132 to 160 are designed with double rating plate (T1/T2 and T3) as standard. For motor versions with order codes A11/A12 or with voltage code "9" T3-output is then stamped on the rating plate as standard. Alternatively, "T1/T2-output on the rating plate" can be stamped – order code **C30**
- Ex de/Ex d are designed in the basic version for mains-fed operation
- Motors 1MJ6/1MJ7 for use in type of protection Ex d/de (Zone 1)/dust-Ex Zone 21, as well as Zone 22 for conducting dust – order code **M76**
- Motors 1LA/1LG can be modified for use in Zones 2, 21 or 22 if they are ordered using order codes:
 - Design for Zone 2 for mains-fed operation – (order code **M72**)
 - Design for Zones 2 and 22 for non-conducting dust (IP55) for mains-fed operation – (order code **M74**)
 - Design for Zone 21¹⁾, as well as Zone 22 for conducting dust (IP65) for mains-fed operation – (order code **M34**)
 - Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation – (order code **M35**)

Certified motor protection switches/tripping units must be used for motor protection, see Catalog LV 1.

¹⁾ Zone 21 takes into account conducting and non-conducting dust.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Converter-fed operation

The motors are suitable for use with converters for voltage rise times $t_s > 0.1 \mu\text{s}$ for $U \leq 460 \text{ V}$ (for motor series 1LA8 up to 500 V).

For converter-fed operation, Ex motors must always be monitored using PTC thermistors. Certified tripping units are required for this purpose, see Catalog LV 1.

For converter-fed operation with frame size 225 and above, it is recommended that an "Insulated bearing cartridge" – order code **L27** is used.

Type of protection "Explosion-proof enclosure" Ex de IIC T4/ Ex d IIC T4

The motors must be ordered with:

- Motor protection with PTC thermistors for converter-fed operation with 4 embedded temperature sensors for tripping – Order code **A15**

or

- Motor protection with PTC thermistors for converter-fed operation with 8 embedded temperature sensors for alarm and tripping – Order code **A16**

or

- Design for Zones 1 and 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating – order code **M77** (incl. order code **A15**)

For motor series 1MJ6 and 1MJ7, a fourth PTC thermistor is installed in the connection box.

Thermal utilization is according to temperature class 155 (F).

The EU type test certificate and factory certificate 2.1 also cover converter-fed operation.

General converters for Zone 2/21/22

1LA and 1LG motors for Zones 2, 21 and 22 for converter-fed operation have 3 PTC thermistors for tripping as standard. 1LG4/1LG6 motors also have an additional PTC thermistor in the connection box.

Optionally available: PTC thermistors for alarm for converter-fed operation in Zones 2, 21, 22 – Order code **A10**

For all motors, "MICROMASTER DUTY S9" is stamped on the rating plate complete with the relevant rating data. (Exception: Motor series 1LA8 and 1PQ8).

These rated operating points apply for both constant torque drives and pump/fan/compressor drives. For a constant torque drive, the resulting thermal motor torques in the positioning range must be taken into account.

On the rating plate, four rated operating points are possible in the following variants:

Possible variants:	Rated operating points in Hz				Additional order information
50 Hz field weakening range	5	25	50	f_{max}	50 Hz voltage: e.g. "9" and L1A
60 Hz field weakening range	6	30	60	f_{max}	60 Hz voltage: e.g. "9" and L2E
87 Hz characteristic	5	25	87	f_{max}	87 Hz at 400 VΔ: "9" and L3A

Alternatively, rated operating points for SIMOVERT MASTERDRIVES, SINAMICS G110, SINAMICS S120 or ET 200S FC on the rating plate can be ordered as follows:

Y68 with plain text (C text): Y68:SIMOVERT MASTERDRIVES

Y68 with plain text (C text): Y68:SINAMICS G110

Y68 with plain text (C text): Y68:ET 200S FC

Y68 with plain text (C text): Y68:SINAMICS S120

- The converter type and the associated rating data are on the rating plate

The reasons for this are the different control levels for the converter with a converter output frequency of 45 Hz and above and the associated derating of the motor.

For compliance with temperature class 130 (B), derating is necessary in the case of converter-fed operation in Zones 2, 21 and 22. Derating information is available in the configuration tool SIZER (see Appendix).

The certificates for the motors and converters for hazardous areas are stored under "Documentation" in the SD configurator tool for low-voltage motors.

Only "one" voltage must be assigned to voltage codes/ order codes:

Voltage code	Order code	Mains voltage
3	-	500 VY 50 Hz
5	-	500 VΔ 50 Hz
9	L1A	400 VY 50 Hz
9	L1B	400 VΔ 50 Hz
9	L1C	415 VY 50 Hz
9	L1D	415 VΔ 50 Hz
9	L2E	460 VY 60 Hz
9	L2F	460 VΔ 60 Hz
9	L2W	440 VY 60 Hz
9	L2X	440 VΔ 60 Hz
9	L1Y (non-standard winding)	Plain text (max. 460 VY 50 or 60 Hz)
9	L3A ¹⁾	For 87 Hz 400 VΔ (4 to 8-pole)

¹⁾ Not technically possible for 1LG, FS 315 L.

Overview (continued)

1LA8, 1PQ8 motors for converter-fed operation

When 1LA8 and 1PQ8 motors are ordered, the speed setting range and the load torque must be specified as well as whether the application is for a "Constant torque drive" or a "Fan/pump/compressor drive".

In some cases, a system test must be performed to ensure that the admissible limit temperature is not exceeded.

- A system test is not generally required for motors for applications with quadratic load torque ($M \sim n^2$).
- A system test is usually required for motors for applications with constant load torque. In individual cases in which the motor type has already been measured once using the same speed setting range, a new system test is not necessary.

Please inquire in such cases.

For all motors, an additional rating plate complete with the rating data for the converter is fitted.

Converters specially for Zone 2, type of protection "n" or Ex nA II T3

The motors must be ordered with

- **Design for Zone 2 for converter-fed operation, derating** Ex nA II T3 acc. to IEC/EN 60079-15 – Order code **M73**.

In the version for order code **M73**, PTC thermistors are included in accordance with temperature class 130 (B).

The IEC/EN 60079-15 standard requires that the converter drive for motors is subjected to the "non-sparking" test. The test is available for Siemens motors Ex nA II on Siemens converters in accordance with Factory Certificate 2.1.

Please inquire in the case of a non-Siemens converter (additional charge).

The test will cost more in the case of non-Siemens converters (especially on commissioning).

Commissioning personnel must be provided by the customer for setting up and operating the non-Siemens converter during the test, if required.

Converters specially for Zone 21/22

The motors must be ordered with:

- Design for Zone 21¹⁾, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating – Order code **M38**
- Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating – Order code **M39**

In order codes **M38/M39**, PTC thermistors are included in accordance with temperature class 130 (B).

Please inquire in the case of a non-Siemens converter (additional charge).

Converters for Zone 2/22

The motors must be ordered with:

- Design for Zones 2 and 22 for non-conducting dust (IP55) for converter-fed operation, derating – Order code **M75**

In order code **M75**, PTC thermistors are included in accordance with temperature class 130 (B).

Please inquire in the case of a non-Siemens converter (additional charge).

VIK version

VIK standard version:

- VIK version – Order code **K30**

VIK version "Non-sparking":

- "Ex nA II T3" marking on VIK rating plate according to Directive 94/9/EU (ATEX) – Order code **C27**

The motors in VIK design (**K30**) contain technology for Zone 2 in Ex nA II T3 type of protection. In accordance with VIK recommendations, "Ex nA II T3" will only be stamped on the rating plate on the express wish of the customer when ordering with order code **C27**.

Note: When ordering, **C27** must be specified in addition to **K30**.

Motors up to frame size 355 can be supplied in accordance with the technical requirements of the VIK (Verband der Industriellen Energie- und Kraftwirtschaft e.V.). Not possible for 1LA5 motors, 1LG4 motors will be supplied.

1LG4, 1LG6, 1MJ6 and 1MJ7 motors in frame size 315 are supplied with special connection boxes with a removable cable entry plate.

Note the output and dimensions in the case of 1LA8 motors. With 1LA8 motors the connection boxes cannot be rotated by $4 \times 90^\circ$. Motors in a vertical type of construction with the shaft extension pointing down must have a protective cover (e.g. type of construction code **4**). Use according to temperature class 130 (B) is mandatory. Frame sizes 400 and 450 are not included in VIK.

Please inquire about converter-fed operation in all cases.

Motors in VIK design with mounted technology (brake, rotary pulse encoder, separately driven fan and anti-condensation heater) are not compatible with Zone 2. Designs for Zone 21/22 are not possible.

Chinese explosion-proof certification

For projects in China in particular, explosion-proof motors are required that have been approved by a named Chinese testing authority.

Ex certification for China – Order code **D32**

The following motor series have Chinese Ex certification:

- Zone 1 type of protection "d" or Ex de IIC T4/Ex d IIC T4: 1MJ6, 1MJ7
- Zone 2 type of protection "n" or Ex nA II T3: 1LA6, 1LA7, 1LA9, 1LG when ordered in:
 - **Design for Zone 2 for mains-fed operation** Ex nA II T3 acc. to IEC/EN 60079-15 – Order code **M72**.
 - **Design for Zone 2 for converter-fed operation, derating** Ex nA II T3 acc. to IEC/EN 60079-15 – Order code **M73**.

In addition, the VIK design for motor series 1MJ6, 1MJ7, 1LA, 1LG can also be ordered with Ex certification for China.

When these motors are ordered in the version

- "Ex certification for China" – Order code **D32**

the "NEPSI²⁾ certificate number" and the "NEPSI" logo are stamped on the rating plate.

For motor series 1LA8, the "CQST³⁾ certificate number" and the logo: "CQST" are then stamped on the rating plate.

¹⁾ Zone 21 takes into account conducting and non-conducting dust.

²⁾ NEPSI = National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation.

³⁾ CQST = China National Quality Supervision and Test Centre for Explosion Protected Electrical Products.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Selection and ordering data

Voltages

Additional order codes for other voltages or voltage codes
(without **-Z** supplement)

For some non-standard voltages at 50 or 60 Hz, order codes are specified. They are ordered by specifying the code digit **9** for voltage in the 11th position of the Order No. and the appropriate order code.

Special versions	Voltage code 11th position of the Order No.	Additional identifica- tion code with order code and plain text if required	Motor type frame size														
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L
Self-ventilated motors in Zone 1 with type of protection "e" – Aluminum series 1MA7																	
1MA7 (aluminum)																	
Voltage at 50 Hz																	
220 VΔ/380 VY (209 ... 231 VΔ/361 ... 399 VY); 50 Hz output ¹⁾	9	L1R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔ (218 ... 242 VΔ); 50 Hz output ¹⁾	9	L1E	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
380 VΔ/660 VY (361 ... 399 VΔ/627 ... 693 VY); 50 Hz output ¹⁾	9	L1L	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VY (394 ... 436 VY); 50 Hz output ¹⁾	9	L1C	✓ ²⁾	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VΔ (394 ... 436 VΔ); 50 Hz output ¹⁾	9	L1D	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Voltage at 60 Hz ³⁾																	
220 VΔ/380 VY; 50 Hz output	9	L2A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 50 Hz output	9	L2C	✓ ⁴⁾	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 50 Hz output	9	L2R	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S	✓ ²⁾	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VΔ; 50 Hz output	9	L2T	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VY; 50 Hz output	9	L2U	✓ ⁴⁾	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 50 Hz output	9	L2V	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard voltage and/or frequencies																	
Non-standard winding for vol- tages between 200 and 690 V (voltages outside this range are available on request) ⁵⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Self-ventilated motors in Zone 1 with type of protection "e" – Cast-iron series 1MA6																	
1MA6 (cast-iron)																	
Voltage at 50 Hz																	
220 VΔ/380 VY (209 ... 231 VΔ/361 ... 399 VY); 50 Hz output ¹⁾	9	L1R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔ (218 ... 242 VΔ); 50 Hz output ¹⁾	9	L1E	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
380 VΔ/660 VY (361 ... 399 VΔ/627 ... 693 VY); 50 Hz output ¹⁾	9	L1L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VY (394 ... 436 VY); 50 Hz output ¹⁾	9	L1C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VΔ (394 ... 436 VΔ); 50 Hz output ¹⁾	9	L1D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Voltage at 60 Hz ³⁾																	
220 VΔ/380 VY; 50 Hz output	9	L2A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 50 Hz output	9	L2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 50 Hz output	9	L2R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S	✓	✓	✓	✓	✓	✓	✓	○	○	○	○	○	○	○	○
460 VΔ; 50 Hz output	9	L2T	✓	✓	✓	✓	✓	✓	✓	○	○	○	○	○	○	○	○
575 VY; 50 Hz output	9	L2U	✓	✓	✓	✓	✓	✓	✓	○	○	○	○	○	○	○	○
575 VΔ; 50 Hz output	9	L2V	✓	✓	✓	✓	✓	✓	✓	○	○	○	○	○	○	○	○
Non-standard voltage and/or frequencies																	
Non-standard winding for vol- tages between 200 and 690 V (voltages outside this range are available on request) ⁵⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- Without additional charge
- ✓ With additional charge
- Not possible

- This order code only determines the price of the version – Additional plain text is required.

Footnotes, see Page 4/85.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identification code with order code and plain text if required	Motor type frame size														
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L
Self-ventilated motors in Zone 1 with type of protection "de" – Cast-iron series 1MJ6 and 1MJ7																	
			1MJ6 (cast-iron)									1MJ7 (cast-iron)					
Voltage at 50 Hz																	
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
Voltage at 60 Hz																	
220 VΔ/380 VY; 50 Hz output	9	L2A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
220 VΔ/380 VY; 60 Hz output	9	L2B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
380 VΔ/660 VY; 50 Hz output	9	L2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
380 VΔ/660 VY; 60 Hz output	9	L2D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
440 VY; 50 Hz output	9	L2Q	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
440 VY; 60 Hz output	9	L2W	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
440 VΔ; 50 Hz output	9	L2R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
440 VΔ; 60 Hz output	9	L2X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
460 VY; 50 Hz output	9	L2S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
460 VY; 60 Hz output	9	L2E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○	○	○	○
460 VΔ; 50 Hz output	9	L2T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
460 VΔ; 60 Hz output	9	L2F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○	○	○	○
575 VY; 50 Hz output	9	L2U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
575 VY; 60 Hz output	9	L2L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
575 VΔ; 50 Hz output	9	L2V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
575 VΔ; 60 Hz output	9	L2M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○	○	○	○
Non-standard voltage and/or frequencies																	
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ³⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- Without additional charge
- ✓ With additional charge
- Not possible
- This order code only determines the price of the version – Additional plain text is required.

¹⁾ For order codes **L1C**, **L1D**, **L1E**, **L1L**, **L1R**, **L1U** and **L1A** a rated voltage range is also marked on the rating plate.

²⁾ For motors 1MA7 060-4 (motor series 1MA7 frame size 63, 4-pole) not possible.

³⁾ Special certification is required for 60 Hz.

⁴⁾ For motors 1MA7 060-2, 1MA7 060-4 and 1MA7 063-4 (motor series 1MA7 frame size 63, 2- and 4-pole) not possible.

⁵⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identifica- tion code with order code and plain text if required	Motor type frame size													
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21 and 22 with type of protection “n” or protection against dust explosions – Aluminum series 1LA7 and 1LA5																
			1LA7 (aluminum) ¹⁾										1LA5 (aluminum) ¹⁾			
Voltage at 50 Hz																
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ²⁾	9	L1R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔ (220 ... 240 VΔ); 50 Hz output ²⁾	9	L1E	○	○	○	○	○	○	○	○	○	○	○	○	○	○
380 VΔ/660 VY (440 VΔ at 60 Hz) (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ²⁾	9	L1L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ²⁾	9	L1C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VΔ (395 ... 435 VΔ); 50 Hz output ²⁾	9	L1D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ²⁾	9	L1A	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ (380 ... 420 VΔ); 50 Hz output ²⁾	9	L1B	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ (460 VΔ bei 60 Hz) (380 ... 420 VΔ); 50 Hz output ²⁾	9	L1U	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ 87 Hz output (4-pole to 8-pole only) ³⁾	9	L3A	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Voltage at 60 Hz																
220 VΔ/380 VY; 50 Hz output	9	L2A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
220 VΔ/380 VY; 60 Hz output	9	L2B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 50 Hz output	9	L2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 60 Hz output	9	L2W	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 50 Hz output	9	L2R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 60 Hz output	9	L2E	○	○	○	○	○	○	○	○	○	○	○	○	○	○
460 VΔ; 50 Hz output	9	L2T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9	L2F	○	○	○	○	○	○	○	○	○	○	○	○	○	○
575 VY; 50 Hz output	9	L2U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VY; 60 Hz output	9	L2L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 50 Hz output	9	L2V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard voltage and/or frequencies																
Non-standard winding for vol- tages between 200 V and 690 V (voltages outside this range are available on request) ⁴⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- Without additional charge
- ✓ With additional charge
- This order code only determines the price of the version – Additional plain text is required.

¹⁾ Zone 2 is not possible for motor series 1LA5 and motor series 1LA7 for frame size 56.

²⁾ For Zones 21 and 22, for order codes **L1C, L1D, L1E, L1L, L1R, L1U, L1B** and **L1A** a rated voltage range is also marked on the rating plate.

³⁾ The rating data for converter-fed operation is also provided in a table on the rating plate.

⁴⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identifica- tion code with order code and plain text if required	Motor type frame size													
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions – Aluminum series 1LA9																
1LA9 (aluminum)																
Voltage at 50 Hz																
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E	○	○	○	○	○	○	○	○	○	○	○	○	○	○
380 VΔ/660 VY (440 VΔ at 60 Hz) (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1B	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ (460 VΔ bei 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ 87 Hz output (4-pole to 8-pole only) ²⁾	9	L3A	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Voltage at 60 Hz																
220 VΔ/380 VY; 50 Hz output	9	L2A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
220 VΔ/380 VY; 60 Hz output	9	L2B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 50 Hz output	9	L2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 60 Hz output	9	L2W	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 50 Hz output	9	L2R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 60 Hz output	9	L2E	○	○	○	○	○	○	○	○	○	○	○	○	○	○
460 VΔ; 50 Hz output	9	L2T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9	L2F	○	○	○	○	○	○	○	○	○	○	○	○	○	○
575 VY; 50 Hz output	9	L2U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VY; 60 Hz output	9	L2L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 50 Hz output	9	L2V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard voltage and/or frequencies																
Non-standard winding for vol- tages between 200 and 690 V (voltages outside this range are available on request) ³⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- Without additional charge
- ✓ With additional charge
- This order code only determines the price of the version – Additional plain text is required.

¹⁾ For Zones 21 and 22, for order codes **L1C, L1D, L1E, L1L, L1R, L1U, L1B** and **L1A** a rated voltage range is also marked on the rating plate.

²⁾ The rating data for converter-fed operation is also provided in a table on the rating plate.

³⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identifica- tion code with order code and plain text if required	Motor type frame size														
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L
Self-ventilated motors in Zones 2, 21, 22 with type of protection "n" or protection against dust explosions – Cast-iron series 1LA6 and 1LG4																	
Voltage at 50 Hz																	
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–
380 VΔ/660 VY (440 VΔ at 60 Hz) (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–
400 VΔ (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1B	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ (460 VΔ bei 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ 87 Hz output (2-pole to 4-pole only) ²⁾	9	L3A	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Voltage at 60 Hz																	
220 VΔ/380 VY; 50 Hz output	9	L2A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
220 VΔ/380 VY; 60 Hz output	9	L2B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
380 VΔ/660 VY; 50 Hz output	9	L2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
440 VY; 60 Hz output	9	L2W	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
440 VΔ; 50 Hz output	9	L2R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
460 VY; 60 Hz output	9	L2E	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–
460 VΔ; 50 Hz output	9	L2T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9	L2F	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
575 VY; 50 Hz output	9	L2U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
575 VY; 60 Hz output	9	L2L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
575 VΔ; 50 Hz output	9	L2V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Non-standard voltage and/or frequencies																	
Non-standard winding for vol- tages between 200 and 690 V (voltages outside this range are available on request) ³⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

○ Without additional charge

✓ With additional charge

○ R. Possible on request

– Not possible

- This order code only determines the price of the version – Additional plain text is required.

¹⁾ For Zones 21 and 22, for order codes **L1C, L1D, L1E, L1L, L1R, L1U, L1B** and **L1A** a rated voltage range is also marked on the rating plate.

²⁾ The rating data for converter-fed operation is also provided in a table on the rating plate.

³⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identifica- tion code with order code and plain text if required	Motor type frame size														
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L
Self-ventilated motors in Zones 2, 21 and 22 with type of protection “n” or protection against dust explosions – Cast-iron series 1LG6																	
													1LG6 (cast-iron)				
Voltage at 50 Hz																	
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R														✓	✓
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E														○	○
380 VΔ/660 VY (440 VΔ at 60 Hz) (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L														✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C														✓	✓
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D														✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A														○	○
400 VΔ (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1B														○	○
400 VΔ (460 VΔ bei 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U														○	○
400 VΔ 87 Hz output (4-pole to 8-pole only) ²⁾	9	L3A														O. R.	O. R.
Voltage at 60 Hz																	
220 VΔ/380 VY; 50 Hz output	9	L2A														✓	✓
220 VΔ/380 VY; 60 Hz output	9	L2B														✓	✓
380 VΔ/660 VY; 50 Hz output	9	L2C														✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D														✓	✓
440 VY; 50 Hz output	9	L2Q														✓	✓
440 VY; 60 Hz output	9	L2W														✓	✓
440 VΔ; 50 Hz output	9	L2R														✓	✓
440 VΔ; 60 Hz output	9	L2X														✓	✓
460 VY; 50 Hz output	9	L2S														✓	✓
460 VY; 60 Hz output	9	L2E														○	○
460 VΔ; 50 Hz output	9	L2T														✓	✓
460 VΔ; 60 Hz output	9	L2F														○	○
575 VY; 50 Hz output	9	L2U														✓	✓
575 VY; 60 Hz output	9	L2L														✓	✓
575 VΔ; 50 Hz output	9	L2V														✓	✓
575 VΔ; 60 Hz output	9	L2M														○	○
Non-standard voltage and/or frequencies																	
Non-standard winding for vol- tages between 200 and 690 V (voltages outside this range are available on request) ³⁾	9	L1Y •														✓	✓

- Without additional charge
- ✓ With additional charge
- O. R. Possible on request
- Not possible
- This order code only determines the price of the version –
Additional plain text is required.

¹⁾ For Zones 21 and 22, for order codes **L1C, L1D, L1E, L1L, L1R, L1U, L1B** and **L1A** a rated voltage range is also marked on the rating plate.

²⁾ The rating data for converter-fed operation is also provided in a table on the rating plate.

³⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Types of construction

Additional order codes for other types of construction or type of construction codes (without **-Z** supplement)

Order codes have been defined for some special types of construction. They are ordered by specifying the code digit **9** for the type of construction in the 12th position of the Order No. and the appropriate order code.

Special versions	Type of construction code 12th position of the Order No.	Additional identification code with order code and plain text if required	Motor type frame size													315 S/M	315 L	2-pole	4-, 6-, 8-pole
			56	63	71	80	90	100	112	132	160	180	200	225	250					280
Self-ventilated motors in Zone 1 with type of protection "e" – Aluminum series 1MA7																			
1MA7 (aluminum)																			
Without flange																			
IM V5 with protective cover ^{1) 2)}	9	M1F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With standard flange																			
IM V18 with protective cover ^{1) 2)}	9	M2A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With special flange																			
IM V18 with protective cover ^{1) 2)}	9	M2B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
IM B34	9	M2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Self-ventilated motors in Zone 1 with type of protection "e" – Cast-iron series 1MA6																			
1MA6 (cast-iron)																			
Without flange																			
IM V6 ^{1) 3)}	9	M1E	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓ ⁴⁾	○
IM V5 with protective cover ^{1) 2) 3)}	9	M1F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ ⁴⁾	✓
With flange																			
IM V3 ^{1) 5)}	9	M1G	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	–	–
With special flange																			
IM V18 with protective cover ^{1) 2)}	9	M2B	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–
IM B34	9	M2C	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–

- Without additional charge
- ✓ With additional charge
- Not possible

4

- 1) The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- 2) The "Second shaft extension" option, order code **K16** is not possible.
- 3) If motors of frame sizes 180 M to 315 L are mounted on the wall, it is recommended that the motor feet are supported.

- 4) 60 Hz version is possible on request.
- 5) 1MA6 motors of frame sizes 225 S to 315 M are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Type of construction code 12th position of the Order No.	Additional identification code with order code and plain text if required	Motor type frame size													
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "de" – Cast-iron series 1MJ6 and 1MJ7																
			1MJ6 (cast-iron)						1MJ7 (cast-iron)							
Without flange																
IM V5 with protective cover ^{1) 2) 3)}	9	M1F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With flange																
IM V3 ^{1) 4)}	9	M1G	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓
With standard flange																
IM V18 with protective cover ^{1) 2)}	9	M2A	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–
With special flange																
IM V18 with protective cover ^{1) 2)}	9	M2B	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–
IM B34	9	M2C	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–

- ✓ With additional charge
 – Not possible

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ If motors of frame sizes 180 M to 315 M are mounted on the wall, it is recommended that the motor feet are supported.

⁴⁾ 1MJ7 motors of frame sizes 225 S to 315 M are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Type of construction code 12th position of the Order No.	Additional identification code with order code and plain text if required	Motor type frame size														315 L S/M	2-pole	4-, 6-, 8-pole
			56	63	71	80	90	100	112	132	160	180	200	225	250	280			
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions – Aluminum series 1LA7 and 1LA5																			
			1LA7 (aluminum) ¹⁾										1LA5 (aluminum) ¹⁾						
Without flange																			
IM V5 with protective cover ^{2) 3)}	9	M1F	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With flange																			
IM V3 ^{2) 4)}	9	M1G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
With standard flange																			
IM V18 with protective cover ^{2) 3)}	9	M2A	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	
With special flange																			
IM V18 with protective cover ^{2) 3)}	9	M2B	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	
IM B34	9	M2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions – Aluminum series 1LA9																			
			1LA9 (aluminum)																
Without flange																			
IM V5 with protective cover ^{2) 3)}	9	M1F	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With flange																			
IM V3	9	M1G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
With standard flange																			
IM V18 with protective cover ^{2) 3)}	9	M2A	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	
With special flange																			
IM V18 with protective cover ^{2) 3)}	9	M2B	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	
IM B34	9	M2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions – Cast-iron series 1LA6 and 1LG4																			
			1LA6 (cast-iron)							1LG4 (cast-iron)									
Without flange																			
IM V6 ^{2) 6)}	9	M1E	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
IM V5 with protective cover ^{2) 3) 6)}	9	M1F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With flange																			
IM V3 ^{2) 7)}	9	M1G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
With standard flange																			
IM V18 with protective cover ^{2) 3)}	9	M2A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
With special flange																			
IM V18 with protective cover ^{2) 3)}	9	M2B	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
IM B34	9	M2C	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions – Cast-iron series 1LG6																			
			1LG6 (cast-iron)																
Without flange																			
IM V6 ⁶⁾	9	M1E	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
IM V5 with protective cover ^{2) 3) 6)}	9	M1F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With flange																			
IM V3 ^{2) 7)}	9	M1G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	

- Without additional charge
 ✓ With additional charge
 – Not possible

- ¹⁾ Zone 2 is not possible for motor series 1LA5 and motor series 1LA7 for frame size 56.
²⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft extension down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
³⁾ The "Second shaft extension" option, order code **K16** is not possible.
⁴⁾ For frame sizes 180 M to 225 M, the 1LA5 motors can be supplied with two additional eyebolts; state identification code "**-Z**" and order code **K32**.

- ⁵⁾ 60 Hz version is possible on request.
⁶⁾ If motors of frame sizes 180 M to 315 L are mounted on the wall, it is recommended that the motor feet are supported.
⁷⁾ 1LG4/1LG6 motors of frame sizes 225 S to 315 M are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Options

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "e" – Aluminum series 1MA7																
1MA7 (aluminum)																
Design for Zones 1, 2, 21 and 22 according to ATEX																
T1/T2 on rating plate ¹⁾	C30		–	–	–	–	–	–	○	○						
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ²⁾	A11		✓	✓	✓	✓	✓	✓	✓	✓						
Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ²⁾	A12		✓	✓	✓	✓	✓	✓	✓	✓						
Motor connection and connection box																
Connection box on RHS	K09		–	–	✓	✓	✓	✓	✓	✓						
Connection box on LHS	K10		–	–	✓	✓	✓	✓	✓	✓						
Rotation of the connection box through 90°, entry from DE	K83		✓	✓	✓	✓	✓	✓	✓	✓						
Rotation of the connection box through 90°, entry from NDE	K84		✓	✓	✓	✓	✓	✓	✓	✓						
Rotation of connection box through 180°	K85		✓	✓	✓	✓	✓	○	○	○	○					
Windings and insulation																
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19		✓	✓	✓	✓	✓	✓	✓	✓						
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 % ³⁾	C22		✓	✓	✓	✓	✓	✓	✓	✓						
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 % ³⁾	C23		✓	✓	✓	✓	✓	✓	✓	✓						
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 % ³⁾	C24		✓	✓	✓	✓	✓	✓	✓	✓						
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 % ³⁾	C25		✓	✓	✓	✓	✓	✓	✓	✓						
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26		✓	✓	✓	✓	✓	✓	✓	✓						
Colors and paint finish																
Special finish in RAL 7030 stone gray			□	□	□	□	□	□	□	□						
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓						
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" Page 0/19	Y51 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓						
Offshore special finish	M91		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.						
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○						
Unpainted, only primed	K24		✓	✓	✓	✓	✓	✓	✓	✓						

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For legend and footnotes, see Page 4/95.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "e" – Aluminum series 1MA7																
1MA7 (aluminum)																
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar Not possible for IM V3 type of construction	K17	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Low-noise version for 2-pole motors with clockwise direction of rotation ⁴⁾	K37	–	–	–	–	–	–	–	✓	✓						
Low-noise version for 2-pole motors with counter-clockwise direction of rotation ⁴⁾	K38	–	–	–	–	–	–	–	✓	✓						
IP65 degree of protection	K50	✓	✓	✓	✓	✓	✓	✓	✓	✓						
IP56 degree of protection (non-heavy-sea)	K52	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Vibration-proof version	L03	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Condensation drainage holes ⁵⁾	L12	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Rust-resistant screws (externally)	M27	–	–	✓	✓	✓	✓	✓	✓	✓						
Coolant temperature and site altitude																
Coolant temperature –40 °C to +40 °C for EX motors ⁶⁾	D19	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Designs in accordance with standards and specifications																
CCC China Compulsory Certification ⁷⁾	D01	✓	✓	✓	✓	–	–	–	–	–						
VIK version	K30	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Bearings and lubrication																
Bearing design for increased cantilever forces	K20	–	–	–	–	✓	✓	✓	✓	✓						
Regreasing device	K40	–	–	–	–	✓	✓	✓	✓	✓						
Located bearing DE	K94	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Located bearing NDE	L04	✓	✓	✓	✓	✓	✓	✓	✓	✓					□	
Balance and vibration quantity																
Vibration quantity A		□	□	□	□	□	□	□	□	□						
Vibration quantity B	K02	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Full key balancing	L68	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Balancing without key	M37	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ⁸⁾	K04	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Second standard shaft extension ⁹⁾	K16	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Shaft extension with standard dimensions without featherkey way	K42	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Non-standard cylindrical shaft extension ¹⁰⁾	Y55 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓						

For legend and footnotes, see Page 4/95.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "e" – Aluminum series 1MA7																
1MA7 (aluminum)																
Heating and ventilation																
Metal external fan	K35		–	–	–	–	✓	✓	✓	✓						
Rating plate and extra rating plates																
Second lubricating plate, supplied loose	B06		–	–	–	–	✓	✓	✓	✓						
Second rating plate, loose	K31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Operating instructions German/English enclosed in print	B23		□	□	□	□	□	□	□	□	□	□	□	□	□	□
Wire-lattice pallet	L99		○	○	○	○	○	○	○	○	○	○	○	○	○	○

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Possible on request
- ✓ With additional charge
- Not possible

- 1) 2-pole motors 1 MA frame sizes 132 to 160 are designed with double rating plate (T1/T2 and T3) as standard. For motor versions with order codes **A11/A12** or with voltage code "9" T3-output is then stamped on the rating plate as standard. Alternatively, "T1/T2-output on the rating plate" can be stamped – order code **C30**
 - 2) Evaluation with associated 3RN1 tripping unit (see Catalog LV 1) is recommended. When used in hazardous areas, a certified tripping unit is required. Motor protection by means of PTC thermistor as sole protection available on request.
 - 3) The maximum certified output will be supplied.
 - 4) 1MA7 motors are up to 80 mm longer than normal. A second shaft extension is not possible.
 - 5) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
 - 6) Not possible in combination with vibration-proof version, order code **L03**.
 - 7) CCC certification is required for
 - 2-pole motors ≤ 2.2 kW
 - 4-pole motors ≤ 1.1 kW
 - 6-pole motors ≤ 0.75 kW
 - 8-pole motors ≤ 0.55 kW
 - 8) Can be combined with deep-groove bearings of series 60... 62... and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
 - 9) Not possible for low-noise version (2-pole) for frame sizes 132 S to 160 L. Version with protective cover not possible.
 - 10) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case.
 - For order codes **Y55** and **K16**:
 - Dimensions D and DA \leq internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA $\leq 2 \times$ length E (normal) of the shaft extension
- For an explanation of the order codes, see catalog part 0 "Introduction".

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "e" – Cast-iron series 1MA6																
Design for Zones 1, 2, 21 and 22 according to ATEX																
T1/T2 on rating plate ¹⁾	C30															
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ²⁾	A11															
Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ²⁾	A12															
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ²⁾	A72												O. R.	O. R.	O. R.	O. R.
Installation of 2 PT100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings	A78												O. R.	O. R.	O. R.	O. R.
Motor connection and connection box																
Connection box on RHS	K09															
Connection box on LHS	K10															
Connection box in cast-iron version	K15															
Rotation of the connection box through 90°, entry from DE	K83															
Rotation of the connection box through 90°, entry from NDE	K84															
Rotation of connection box through 180°	K85															
Next larger connection box	L00															
Auxiliary connection box 1XB3 020	L97															
Windings and insulation																
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19															
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 % ³⁾	C22															
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 % ³⁾	C23															
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 % ³⁾	C24															
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 % ³⁾	C25															
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26															

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For legend, see Page 4/98, for footnotes, see Page 4/99.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "e" – Cast-iron series 1MA6																
1MA6 (cast-iron)																
Colors and paint finish																
Standard finish in RAL 7030 stone gray												□	□	□	□	
Standard finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y53 • and standard finish RAL											✓	✓	✓	✓	
Special finish in RAL 7030 stone gray ⁴⁾	K26						□	□	□	□	□	□	□	□	□	□
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" Page 0/19	Y51 • and special finish RAL						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Offshore special finish	M91						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Sea air resistant special finish	M94						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23						○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar Not possible for type of construction IM V3; with frame size 180 M and above, only possible for 4-pole to 6-pole motors	K17						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation ⁵⁾	K37						–	–	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with counter-clockwise direction of rotation ⁵⁾	K38						–	–	✓	✓	✓	✓	✓	✓	✓	✓
IP65 degree of protection	K50						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea)	K52						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration-proof version	L03						✓	✓	✓	✓	–	–	–	–	–	–
Condensation drainage holes ⁶⁾	L12						✓	✓	✓	✓	✓	–	–	–	–	–
Rust-resistant screws (externally)	M27						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Coolant temperature and site altitude																
Coolant temperature –40 °C to +40 °C for EX motor ⁷⁾	D19						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																
VIK version	K30						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50						–	–	–	–	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ⁸⁾	K20						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regreasing device	K40						✓	✓	✓	✓	✓	✓	✓	✓	□	□
Located bearing DE	K94						✓	✓	✓	✓	✓	–	–	–	–	–
Located bearing NDE	L04						✓	✓	✓	✓	□	–	–	–	–	–

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "e" – Cast-iron series 1MA6																
1MA6 (cast-iron)																
Balance and vibration quantity																
Vibration quantity A							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Vibration quantity B	K02						✓	✓	✓	✓	✓	✓	✓ ⁹⁾	✓ ⁹⁾	✓ ⁹⁾	✓ ⁹⁾
Full key balancing	L68						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Balancing without key	M37						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ⁹⁾	K04						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second standard shaft extension ¹⁰⁾	K16						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft extension with standard dimensions without featherkey way	K42						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ¹¹⁾	Y55 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heating and ventilation																
Cast-iron fan cover	K34						–	–	–	–	–	–	✓	✓	✓	✓
Metal external fan	K35						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45						–	–	–	–	–	–	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46						–	–	–	–	–	–	✓	✓	✓	✓
Rating plate and extra rating plates																
Second lubricating plate, supplied loose	B06						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second rating plate, loose	K31						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Operating instructions German/English enclosed in print	B23						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Wire-lattice pallet	L99						○	○	○	○	○	○	–	–	–	–

- ☐ Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- , R. Possible on request
- ✓ With additional charge
- Not possible

For footnotes, see Page 4/99.

- 1) 2-pole motors 1MA frame sizes 132 to 160 are designed with double rating plate (T1/T2 and T3) as standard. For motor versions with order codes **A11/A12** or with voltage code "9" T3-output is then stamped on the rating plate as standard. Alternatively, "T1/T2-output on the rating plate" can be stamped – order code **C30**
- 2) Evaluation with associated 3RN1 tripping unit (see Catalog LV 1) is recommended. When used in hazardous areas, a certified tripping unit is required. Motor protection with PTC thermistors is available as sole protection up to frame size 160 L on request. With frame size 180 M and above, it is not permitted as sole protection; motor protection switch is required.
- 3) The maximum certified output will be supplied.
- 4) For frame sizes 100 to 200, do not specify an order code. Order code is only necessary for frame sizes 225 to 315.
- 5) 1MA6 motors are up to 80 mm longer than normal. A second shaft extension is not possible.
- 6) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 7) Not possible in combination with vibration-proof version, order code **L03**.
- 8) Not possible for 2-pole 1MA6 motors, frame size 315 L in vertical type of construction; bearings for increased cantilever forces for vibration quantity level B are available on request for 1MA6 motors of frame size 225 M and above. Not possible for 1MA6 motors of frame size 225 M and above in combination with concentricity of shaft extension, coaxiality and linear movement according to DIN 42955 tolerance R for flange-mounting types.
- 9) Can be combined with deep-groove bearings of series 60... 62... and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 10) For motors of frame size 180 M and above in vertical type of construction in version with second shaft extension on request. Not possible for low-noise version (2-pole) for frame sizes 132 S to 160 L. Version with protective cover not possible.
- 11) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not applicable for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case.
 For order codes **Y55** and **K16**:
 – Dimensions D and DA \leq Inner diameter of roller bearing (see tables under "Dimensions")
 – Dimensions E and EA $\leq 2 \times$ Length E (normal) of the shaft extension
 For explanation of the order codes, see catalog part 0 "Introduction".

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in Zone 1 with type of protection "de" – Cast-iron series 1MJ6 and 1MJ7																	
Design for Zones 1, 2, 21 and 22 according to ATEX																	
Design for Zones 1 and 21, as well as for Zone 22 for conducting dust (IP65), for mains-fed operation ¹⁾	M76			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Design for Zones 1 and 21, as well as for Zone 22 for conducting dust (IP65), for converter-fed operation, derating ¹⁾	M77			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Motor protection																	
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ^{2) 3)}	A11			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ^{2) 3) 4)}	A12			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Motor protection with PTC thermistors for converter-fed operation with 4 embedded temperature sensors for tripping ^{2) 3)}	A15			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Motor protection with PTC thermistors for converter-fed operation with 8 embedded temperature sensors for alarm and tripping ^{2) 3) 4)}	A16			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ²⁾	A72			-	-	-	-	-	-	-	-	-	-	O. R.	O. R.	O. R.	O. R.
Installation of 2 PT100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ²⁾	A78			-	-	-	-	-	-	-	-	-	-	O. R.	O. R.	O. R.	O. R.
Motor connection and connection box																	
Connection box on RHS	K09			-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on LHS	K10			-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box in cast-iron version	K15			✓	✓	✓	✓	✓	✓	✓	✓ ⁵⁾	✓	✓	✓	□	□	□
Explosion-proof connection box, Ex d IIC type of protection ⁶⁾	K53			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85			○	○	○	○	○	○	○	○	○	○	○	○	○	○
Auxiliary connection box 1XB3020 ⁷⁾	L97			-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓
Saddle terminal for connection without cable lug, accessories pack (3 items of high saddle terminals)	M47			-	-	-	-	-	-	-	-	-	-	-	✓	✓	✓

For legend and footnotes, see Page 4/103.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "de" – Cast-iron series 1MJ6 and 1MJ7																
		1MJ6 (cast-iron)							1MJ7 (cast-iron)							
Windings and insulation																
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 % ⁸⁾	C22		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 % ⁸⁾	C23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 % ⁸⁾	C24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	C25		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with a higher coolant temperature and/or site altitude	Y50 • and specified output, CT... °C or SA m above sea level		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Colors and paint finish																
Standard finish in RAL 7030 stone gray			–	–	–	–	–	–	–	–	–	–	–	–	–	–
Standard finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y53 • and standard finish RAL		–	–	–	–	–	–	–	–	–	–	–	–	–	–
Special finish in RAL 7030 stone gray ⁹⁾	K26		□	□	□	□	□	□	□	□	□	□	□	□	□	□
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" Page 0/19	Y51 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Offshore special finish	M91		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Sea air resistant special finish	M94		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special technology																
Mounting of the explosion-proof rotary pulse encoder for use on Ex d/de motors in Zone 1 ¹⁰⁾	H87		–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of the explosion-proof Ex de separately driven fan for use in Zone 1 ¹¹⁾	M98		–	–	–	–	–	–	–	–	–	–	–	–	–	–

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size													
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "de" – Cast-iron series 1MJ6 and 1MJ7															
		1MJ6 (cast-iron)							1MJ7 (cast-iron)						
Mechanical design and degrees of protection															
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar Not possible for type of construction IM V3; with frame size 180 M and above, only possible for 4-pole to 8-pole motors	K17	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation ¹²⁾	K37	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with counter-clockwise direction of rotation ¹²⁾	K38	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
IP65 degree of protection ¹³⁾	K50	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea)	K52	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration-proof version	L03	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-
Mechanical protection for encoder ¹⁵⁾	M68	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications															
CCC China Compulsory Certification ¹⁶⁾	D01	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-
VIK version	K30	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ex certification for China	D32	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearings and lubrication															
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ¹⁷⁾	K20	-	-	-	-	-	-	-	✓	✓	✓	✓	-	-	-
Regreasing device	K40	-	-	-	-	-	-	-	✓	✓	✓	✓	□	□	□
Insulated bearing cartridge	L27	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓
Balance and vibration quantity															
Vibration quantity A		□	□	□	□	□	□	□	□	□	□	□	□	□	□
Vibration quantity B	K02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Full key balancing	L68	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Balancing without key	M37	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft and rotor															
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁸⁾	K04	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓
Second standard shaft extension ¹⁹⁾	K16	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ²⁰⁾	Y55 • and identification code	-	-	-	-	-	-	-	-	-	-	O. R.	O. R.	O. R.	O. R.
Heating and ventilation															
Metal external fan	K35	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V ²¹⁾²²⁾	K45	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V ²¹⁾²²⁾	K46	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Separately driven fan with non-standard voltage and/or frequency	Y81 • and identification code	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓

For legend and footnotes, see Page 4/103.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size													
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "de" – Cast-iron series 1MJ6 and 1MJ7															
		1MJ6 (cast-iron)							1MJ7 (cast-iron)						
Rating plate and extra rating plates															
Second lubricating plate, supplied loose	B06										✓	✓	✓	✓	✓
Second rating plate, loose	K31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates															
Acceptance test certificate 3.1 according to EN 10204	B02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Operating instructions German/English enclosed in print	B23	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Wire-lattice pallet	L99	○	○	○	○	○	○	○	○	○	○	○	○	○	○

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- , R. Possible on request
- ✓ With additional charge
- Not possible

- 1) In combination with order codes **K30** and **M98** please inquire. Not possible in combination with order codes **D32**, **K50** and **K52**.
- 2) Evaluation with appropriate 3RN1 tripping unit (see Catalog LV 1) is recommended. When used in hazardous areas, a certified tripping unit is required.
- 3) For 1MJ6 motors, for a version with PTC thermistors, an anti-condensation heater (order code **K45**, **K46**) up to frame size 160 L is not possible.
- 4) For 1MJ6 motors frame sizes 180 to 200 and 1MJ7 motors, for a version with PTC thermistors, an anti-condensation heater (order code **K45**, **K46**) is not possible. Exception: 1MJ7 frame size 315.
- 5) For 1MJ6 motors frame size 160 L standard version.
- 6) Drilled holes for the cable glands are sealed with Exd plugs for 1MJ motors as standard. On request, the Exd cable entries can be supplied for 1MJ7 motors. When ordering, the number of cables and outer diameters must be specified so that the appropriate cable glands can be supplied.
- 7) Not possible in combination with order code **K53**, since the auxiliary connection box has been approved only for Ex de.
- 8) Derating does not apply in combination with order codes **L2A**, **L2C**, **L2Q**, **L2R**, **L2S**, **L2T**, **L2U** and **L2V**.
- 9) For frame sizes 71 to 200, do not specify an order code. Order code is only necessary for frame sizes 225 to 315.
- 10) In combination with order codes **C19**, **C26**, **L27** and **M98** please inquire. Not possible in combination with order codes **C22** to **C25** (frame sizes 90 to 160), **D19**, **K16**, **K50**, **M77**. Furthermore a combination with protective cover is not possible. Therefore a suitable cover must be implemented by the end user in vertical mounting position to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0).
- 11) In combination with order codes **C19**, **C22** to **C26**, **D19**, **H87**, **K50**, **K52**, **M76** and **M77** please inquire. Not possible in combination with order code **K16**.
- 12) The motors are up to 80 mm longer than normal. A second shaft extension is not possible.
- 13) Order code **K50** (protective cover IP65) can be ordered only for Zone 1. For Zone 21, IP65 degree of protection is standard. Not possible for Zone 22, because only IP55 degree of protection is required.
- 14) A combination of order code **K52** degree of protection IP56 (non-heavy-sea) with **M76** or **M77** is not permissible.
- 15) 1MJ6 motors of frame size 90 to 160 have a rugged flanged. Ex OG9 rotary pulse encoder, which offers alone a high mechanical protection. The mechanical protection for the encoder is not necessary when a rotary pulse encoder is combined with a separately driven fan because in this case the rotary pulse encoder is installed under the fan cowl.
- 16) CCC certification is required for
 - 2-pole motors ≤2.2 kW
 - 4-pole motors ≤1.1 kW
 - 6-pole motors ≤0.75 kW
 - 8-pole motors ≤0.55 kW
- 17) Bearings for increased cantilever forces at vibration quantity level B on request.
- 18) Can be combined with deep-groove bearings of series 60.., 62.. and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 19) For 1MJ6/1MJ7 motors of frame size 180 M and above in vertical type of construction in version with second shaft extension on request. Not possible for low-noise version (2-pole). Version with protective cover not possible.
- 20) When motors which have a longer or shorter shaft extension than normal are ordered, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension For an explanation of the order codes, see catalog part 0 "Introduction".
- 21) For 1MJ6 motors, version with 3, 4 PTC thermistors (order codes **A11**, **A15**) is not possible up to frame size 160 L.
- 22) Not possible for version with 6, 8 PTC thermistors (order codes **A12**, **A16**). Exception: 1MJ7 frame size 315.



IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21, 22 with type of protection "n" or protection against dust explosions – Aluminum series 1LA7 and 1LA5																
		1LA7 (aluminum) ¹⁾									1LA5 (aluminum) ²⁾					
Design for Zones 1, 2, 21 and 22 according to ATEX ³⁾																
Design for Zone 2 for mains-fed operation Ex nA II T3 to IEC/EN 60079-15 ⁴⁾	M72	–	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–			
Design for Zone 2 for converter-fed operation, reduced output Ex nA II T3 to IEC/EN 60079-15 ^{4) 5) 6)}	M73	–	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–			
Design for Zones 2 and 22, for non-conducting dust (IP55), for mains-fed operation ⁷⁾	M74	–	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–			
Design for Zones 2 and 22, for non-conducting dust (IP55), for converter-fed operation, derating ^{5) 6) 7)}	M75	–	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–			
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for mains-fed operation ⁸⁾	M34	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating ^{4) 6) 8)}	M38	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	M35	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Design for Zone 22 for conducting dust (IP55) for converter-fed operation, derating ^{4) 6)}	M39	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
VIK design (comprises Zone 2 for mains-fed operation, without Ex nA II marking on rating plate)	K30	–	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–			
Ex nA II on VIK rating plate	C27	–	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–			
Alternative converter (SIMOVERT MASTERDRIVES, SINAMICS G110, SINAMICS S120 or ET 200S FC)	Y68 • and converter type	○	○	○	○	○	○	○	○	○	○	○	○			
Motor protection																
With PTC thermistors for alarm for converter-fed operation in Zones 2, 21, 22 ⁹⁾	A10	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–			
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ⁹⁾	A11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ⁹⁾	A12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Motor temperature detection with embedded temperature sensor KTY 84-130 ⁹⁾	A23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ⁹⁾	A25	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Installation of 3 PT 100 resistance thermometers ⁹⁾	A60	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓			

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For legend, see Page 4/108, for footnotes, see Page 4/109.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21, 22 with type of protection "n" or protection against dust explosions – Aluminum series 1LA7 and 1LA5																
		1LA7 (aluminum) ¹⁾										1LA5 (aluminum) ²⁾				
Motor connection and connection box																
Connection box on RHS	K09	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on LHS	K10	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
One cable gland, metal ¹⁰⁾	K54	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cable gland, maximum configuration	K55	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Rotation of the connection box through 90°, entry from DE	K83	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85	✓	✓	✓	✓	✓	○	○	○	○	✓	✓	✓	✓	✓	✓
Next larger connection box	L00	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓
External earthing	L13	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Windings and insulation																
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 % ¹¹⁾	C22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 % ¹¹⁾	C23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 % ¹¹⁾	C24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	C25	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	Y50 • and specified output, CT ... °C or SA ... m above sea level	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21, 22 with type of protection "n" or protection against dust explosions – Aluminum series 1LA7 and 1LA5																
		1LA7 (aluminum) ¹⁾									1LA5 (aluminum) ²⁾					
Colors and paint finish																
Special finish in RAL 7030 stone gray		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" Page 0/19	Y51 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sea air resistant special finish	M94	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special technology																
Mounting of explosion-proof rotary pulse encoder for use in Zones 2, 21, 22 ¹²⁾	H86	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of explosion-proof separately driven fan II 3D for use in Zone 22 ¹³⁾	M97	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar Not possible for IM V3 type of construction	K17	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With two additional eyebolts for IM V1/IM V3	K32	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation	K37	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓
Low-noise version for 2-pole motors with counter-clockwise direction of rotation	K38	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓
IP65 degree of protection ¹⁴⁾	K50	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea) ¹⁵⁾	K52	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration-proof version	L03	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Condensation drainage holes ¹⁶⁾	L12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rust-resistant screws (externally)	M27	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mechanical protection for encoder ¹⁷⁾	M68	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend, see Page 4/108, for footnotes, see Page 4/109.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21, 22 with type of protection "n" or protection against dust explosions – Aluminum series 1LA7 and 1LA5																
		1LA7 (aluminum) ¹⁾										1LA5 (aluminum) ²⁾				
Coolant temperature and site altitude																
Coolant temperature –40 °C to +40 °C for EX motor ¹⁸⁾	D19	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																
CCC China Compulsory Certification ¹⁹⁾	D01	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–
Electrical according to NEMA MG1-12	D30	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ex-certification for China (only valid for Zone 2)	D32	–	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces	K20	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regreasing device	K40	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing DE	K94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing NDE	L04	✓	✓	✓	✓	✓	✓	✓	✓	✓	□	□	□	□	□	□
Balance and vibration quantity																
Vibration quantity A		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Vibration quantity B	K02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Full key balancing	L68	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Balancing without key	M37	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ²⁰⁾	K04	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second standard shaft extension	K16	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft extension with standard dimensions without featherkey way	K42	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Standard shaft made of rust-resistant steel	M65	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ²¹⁾	Y55 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heating and ventilation																
Fan cover for textile industry	H17	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Metal external fan ²²⁾	K35	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heater, Ex. 230 V	M15	–	–	–	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Anti-condensation heater, Ex. 115 V	M14	–	–	–	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21, 22 with type of protection "n" or protection against dust explosions – Aluminum series 1LA7 and 1LA5																
		1LA7 (aluminum) ¹⁾										1LA5 (aluminum) ²⁾				
Rating plate and extra rating plates																
Second lubricating plate, supplied loose	B06	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second rating plate, loose	K31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Operating instructions German/English enclosed in print	B23	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Type test with heat run for vertical motors, with acceptance	F83	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wire-lattice pallet	L99	○	○	○	○	○	○	○	○	○	○	○	○	–	–	–
Connected in star for dispatch	M32	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connected in delta for dispatch	M33	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- , R. Possible on request
- ✓ With additional charge
- Not possible

- 1) Zone 2 for motor series 1LA7 only frame size 63 and above.
- 2) Zone 2 is not possible for motor series 1LA5. For Zone 2, instead of 1LA5 motors, 1LG4 motors are used.
- 3) Anti-condensation heater up to frame size 71 M not possible.
- 4) These motors do not have a rated voltage range stamped on the rating plate.
- 5) According to the standard, the motor and converter must be tested as a unit. A "Manufacturer test certificate" is available for a defined spectrum of Siemens motors (frame sizes 63 M to 315 L)/converter. Please inquire in the case of a non-Siemens converter (additional charge).
- 6) With this option, PTC thermistors for temperature class 130 (B) are included. For compliance with temperature class 130 (B), derating is necessary in the case of converter-fed operation in Zones 2, 21 and 22. The operating data for the MICROMASTER converter series from Siemens are specified on the rating plate as standard. Derating information is available on request. For converter-fed operation only voltage codes/order codes with only one voltage are permitted, see also Page 4/82.
- 7) In combination with order codes **D19**, **K30** and **M97** please inquire. Not possible in combination with order codes **D32**, **K50** and **K52**.
- 8) Zone 21 takes into account conducting and non-conducting dust.
- 9) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended. When used in hazardous areas, a certified tripping unit is required. KTY 84-130 and PT 100 are not permitted as sole protection. Full motor protection for mains-fed operation implemented only with PTC thermistors, please inquire.
- 10) For 1LA7 and 1LA5 motors additional charge only applies to Zone 22. Designs for Zones 2 and 21 already have a certified metal cable gland in the standard version.
- 11) Derating does not apply in combination with order codes **L2A**, **L2C**, **L2Q**, **L2R**, **L2S**, **L2T**, **L2U** and **L2V**.
- 12) In combination with order codes **C19**, **C26**, **L27** and **M97** please inquire. Not possible in combination with order code **K16**. Furthermore a combination with protective cover is not possible. Therefore a suitable cover must be implemented by the end user in vertical mounting position to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0).
- 13) In combination with order codes **C19**, **C22**, **C23**, **C24**, **C25**, **C26**, **D19**, **H86**, **K50** and **K52** please inquire. Not possible in combination with order codes **C27**, **K16**, **K30**, **M72**, **M73**, **M34**, **M38**, **M74** and **M75**.
- 14) Order code **K50** (IP65 degree of protection) can only be ordered for Zone 2. For Zone 21, IP65 degree of protection is standard. Not possible for Zone 22, because only IP55 degree of protection is required.
- 15) Order code **K52** IP56 degree of protection (non-heavy-sea) is only possible for Zone 2. Not admissible for Zone 21 (IP65 degree of protection) and Zone 22 (IP55 degree of protection).
- 16) When supplied the condensation drainage holes are sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 17) Not necessary when a rotary pulse encoder is combined with a separately driven fan, because in this case the rotary pulse encoder is installed under the fan cover.
- 18) Not possible in combination with order code **L03**. The mechanical limit speed of 1LA5 2-pole motors in the design for Zones 21/22 from frame size 180 has been reduced compared to the values in catalog part 5 "Motors operating with frequency converters" of the catalog:

Frame size	2 pole n_{max} in rpm	f_{max} in Hz
180	3300	55
200	3100	51
225	3000	50

This is particularly important to be observed for converter-fed operation and operation on 60 Hz line supplies. Option: 1LG4 motors in the design for Zones 21/22.
- 19) CCC certification is required for
 - 2-pole motors: ≤ 2.2 kW
 - 4-pole motors: ≤ 1.1 kW
 - 6-pole motors: ≤ 0.75 kW
 - 8-pole motors: ≤ 0.55 kW
- 20) Can be combined with deep-groove bearings of series 60... 62... and 63... Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 21) When motors which have a longer or shorter shaft extension than normal are ordered, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **K16**:
 - Dimensions D and DA \leq internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA $\leq 2 \times$ length E (normal) of the shaft extension
For an explanation of the order codes, see catalog part 0 "Introduction".
- 22) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external fan is standard for these motors in the version for Zone 21/22. The metal external fan is not possible in combination with the low-noise version – order code **K37** or **K38**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions – Aluminum series 1LA9																
1LA9 (aluminum)																
Design for Zones 1, 2, 21 and 22 according to ATEX ¹⁾																
Design for Zone 2 for mains-fed operation Ex nA II T3 to IEC/EN 60079-15 ²⁾	M72	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–			
Design for Zone 2 for converter-fed operation, reduced output Ex nA II T3 to IEC/EN 60079-15 ^{2) 3) 4)}	M73	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–			
Design for Zones 2 and 22, for non-conducting dust (IP55), for mains-fed operation ⁵⁾	M74	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–			
Design for Zones 2 and 22, for non-conducting dust (IP55), for converter-fed operation, derating ^{3) 4) 5)}	M75	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–			
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for mains-fed operation ⁶⁾	M34	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating ^{2) 4) 6)}	M38	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	M35	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating ^{2) 4)}	M39	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
VIK design (comprises Zone 2 for mains-fed operation, without Ex nA II marking on rating plate)	K30	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–			
Ex nA II on VIK rating plate	C27	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–			
Alternative converter (SIMOVERT MASTERDRIVES, SINAMICS G110, SINAMICS S120 or ET 200S FC)	Y68 • and converter type	○	○	○	○	○	○	○	○	○	○	○	○			
Motor protection																
With PTC thermistors for alarm for converter-fed operation in Zones 2, 21, 22 ⁷⁾	A10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ⁷⁾	A11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ⁷⁾	A12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Motor temperature detection with embedded temperature sensor KTY 84-130 ⁷⁾	A23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ⁷⁾	A25	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Installation of 3-PT 100 resistance thermometers ⁷⁾	A60	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓			

For legend, see Page 4/113, for footnotes, see Page 4/114.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions – Aluminum series 1LA9																
1LA9 (aluminum)																
Motor connection and connection box																
Connection box on RHS	K09	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on LHS	K10	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
One cable gland, metal ⁸⁾	K54	–	–	–	–	–	✓	✓	✓	✓	–	–	–	–	–	–
Cable gland, maximum configuration	K55	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Rotation of the connection box through 90°, entry from DE	K83	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85	✓	✓	✓	✓	✓	○	○	○	○	✓	✓	✓	✓	✓	✓
Next larger connection box	L00	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
External earthing	L13	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Windings and insulation																
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 % ⁹⁾	C22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 % ⁹⁾	C23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 % ⁹⁾	C24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	C25	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with a higher coolant temperature and/or site altitude	Y50 • and specified output, CT .. °C or SA m above sea level	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Colors and paint finish																
Special finish in RAL 7030 stone gray		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" Page 0/19	Y51 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sea air resistant special finish	M94	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions – Aluminum series 1LA9																
1LA9 (aluminum)																
Special technology																
Mounting of explosion-proof rotary pulse encoder for use in Zones 2, 21, 22 ¹⁰⁾	H86	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of explosion-proof separately driven fan II 3D for use in Zone 22 ¹¹⁾	M97	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar Not possible for IM V3 type of construction.	K17	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation	K37	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with counter-clockwise direction of rotation	K38	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓
IP65 degree of protection ¹²⁾	K50	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea) ¹³⁾	K52	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration-proof version	L03	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Condensation drainage holes ¹⁴⁾	L12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rust-resistant screws (externally)	M27	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mechanical protection for encoder ¹⁵⁾	M68	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Coolant temperature and site altitude																
Coolant temperature -40 °C to +40 °C for EX motor ¹⁶⁾	D19	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																
CCC China Compulsory Certification ¹⁷⁾	D01	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	-	-
Electrical according to NEMA MG1-12	D30	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ex-certification for China (only valid for Zone 2)	D32	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces	K20	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regreasing device	K40	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing DE	K94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing NDE	L04	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	□	□	□	□	□
Balance and vibration quantity																
Vibration quantity A		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Vibration quantity B	K02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Full key balancing	L68	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Balancing without key	M37	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend, see Page 4/113, for footnotes, see Page 4/114.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions – Aluminum series 1LA9																
1LA9 (aluminum)																
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁸⁾	K04	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second standard shaft extension	K16	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft extension with standard dimensions without featherkey way	K42	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ¹⁹⁾	Y55 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heating and ventilation																
Fan cover for textile industry	H17	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–
Metal external fan ²⁰⁾	K35	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heater, Ex. 230 V	M15	–	–	–	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Anti-condensation heater, Ex. 115 V	M14	–	–	–	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Rating plate and extra rating plates																
Second lubricating plate, supplied loose	B06	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second rating plate, loose	K31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Operating instructions German/English enclosed in print	B23	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Type test with heat run for vertical motors, with acceptance	F83	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wire-lattice pallet	L99	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–
Connected in star for dispatch	M32	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connected in delta for dispatch	M33	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- O. R. Possible on request
- ✓ With additional charge
- Not possible

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Explosion-proof motors

Special versions

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- 1) Anti-condensation heater up to frame size 71 M not possible.
- 2) These motors do not have a rated voltage range stamped on the rating plate.
- 3) According to the standard, the motor and converter must be tested as a unit. A "Manufacturer test certificate" is available for a defined spectrum of Siemens motors (frame sizes 63 M to 315 L)/converter. Please inquire in the case of a non-Siemens converter (additional charge).
- 4) With this option, PTC thermistors for temperature class 130 (B) are included. For compliance with temperature class 130 (B), derating is necessary in the case of converter-fed operation in Zones 2, 21 and 22. The operating data for the MICROMASTER converter series from Siemens are specified on the rating plate as standard. Derating information is available on request. For converter-fed operation only voltage codes/order codes with only one voltage are permitted, see also Page 4/82.
- 5) In combination with order codes **D19**, **K30** and **M97** please inquire. Not possible in combination with order codes **D32**, **K50** and **K52**.
- 6) Zone 21 takes into account conducting and non-conducting dust.
- 7) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended. When used in hazardous areas, a certified tripping unit is required. KTY 84-130 and PT 100 are not permitted as sole protection. Full motor protection for mains-fed operation implemented only with PTC thermistors, please inquire.
- 8) For 1LA9 motors additional charge only applies to Zone 22. Designs for Zones 2 and 21 already have a certified metal cable gland in the standard version.
- 9) Derating does not apply in combination with order codes **L2A**, **L2C**, **L2Q**, **L2R**, **L2S**, **L2T**, **L2U** and **L2V**.
- 10) In combination with order codes **C19**, **C26**, **L27** and **M97** please inquire. Not possible in combination with order code **K16**. Furthermore a combination with protective cover is not possible. Therefore a suitable cover must be implemented by the end user in vertical mounting position to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0).
- 11) In combination with order codes **C19**, **C22**, **C23**, **C24**, **C25**, **C26**, **C27**, **D19**, **H86**, **K30**, **K50** and **K52** please inquire. Not possible in combination with order codes **C27**, **K16**, **K30**, **M72**, **M73**, **M34**, **M38**, **M74** and **M75**.
- 12) Order code **K50** (IP65 degree of protection) can only be ordered for Zone 2. For Zone 21, IP65 degree of protection is standard. Not possible for Zone 22, because only IP55 degree of protection is required.
- 13) Order code **K52** IP56 degree of protection (non-heavy-sea) is only possible for Zone 2. Not admissible for Zone 21 (IP65 degree of protection) and Zone 22 (IP55 degree of protection).
- 14) When supplied the condensation drainage holes are sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 15) Not necessary when a rotary pulse encoder is combined with a separately driven fan, because in this case the rotary pulse encoder is installed under the fan cover.
- 16) Not possible in combination with order code **L03**. The mechanical limit speed of 1LA9 2-pole motors in the design for Zones 21/22 from frame size 180 has been reduced compared to the values in catalog part 5 "Motors operating with frequency converters" of the catalog:

Frame size	2 pole n_{max} in rpm	f_{max} in Hz
180	3300	55
200	3100	51

This is particularly important to be observed for converter-fed operation and operation on 60 Hz line supplies. Option: 1LG6 motors in the design for Zones 21/22.
- 17) CCC certification is required for
 - 2-pole motors ≤ 2.2 kW
 - 4-pole motors ≤ 1.1 kW
 - 6-pole motors ≤ 0.75 kW
 - 8-pole motors ≤ 0.55 kW
- 18) Can be combined with deep-groove bearings of series 60... 62... and 63... Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 19) When motors which have a longer or shorter shaft extension are ordered, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case.
 - For order codes **Y55** and **K16**:
 - Dimensions D and DA \leq internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA $\leq 2 \times$ length E (normal) of the shaft extension

For an explanation of the order codes, see catalog part 0 "Introduction".
- 20) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external fan is standard for these motors in the version for Zone 21/22. The metal external fan is not possible in combination with a low-noise version – order code **K37** or **K38**.

IEC Squirrel-Cage Motors Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in Zones 2, 21, 22 with type of protection "n" or protection against dust explosions – Cast-iron series 1LA6 and 1LG4																	
Design for Zones 1, 2, 21 and 22 according to ATEX ¹⁾																	
Design for Zone 2 for mains-fed operation Ex nA II T3 to IEC/EN 60079-15 ²⁾	M72																
Design for Zone 2 for converter-fed operation, reduced output Ex nA II T3 to IEC/EN 60079-15 ^{2) 3) 4)}	M73																
Design for Zones 2 and 22, for non-conducting dust (IP55), for mains-fed operation ⁵⁾	M74																
Design for Zones 2 and 22, for non-conducting dust (IP55), for converter-fed operation, derating ^{3) 4) 5)}	M75																
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for mains-fed operation ⁶⁾	M34																
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating ^{2) 4) 6)}	M38																
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	M35																
Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating ^{2) 4)}	M39																
VIK design (comprises Zone 2 for mains-fed operation, without Ex nA II marking on rating plate)	K30																
Ex nA II on VIK rating plate	C27																
Alternative converter (SIMOVERT MASTERDRIVES, SINAMICS G110, SINAMICS S120 or ET 200S FC)	Y68 • and converter type																
Motor protection																	
With PTC thermistors for alarm for converter-fed operation in Zones 2, 21, 22 ⁷⁾	A10																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ⁷⁾	A11																
Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ⁷⁾	A12																
Motor temperature detection with embedded temperature sensor KTY 84-130 ⁷⁾	A23																
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ⁷⁾	A25																
Installation of 3 PT 100 resistance thermometers ⁷⁾	A60																
Installation of 6 PT 100 resistance thermometers in stator winding ⁷⁾	A61																

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For legend and footnotes, see Page 4/119.

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Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21, 22 with type of protection "n" or protection against dust explosions – Cast-iron series 1LA6 and 1LG4																
							1LA6 (cast-iron)					1LG4 (cast-iron)				
Motor protection (continued)																
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ⁷⁾	A72										✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ⁷⁾	A78										✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ⁷⁾	A80										✓	✓	✓	✓	✓	✓
Motor connection and connection box																
Two-part plate on connection box	K06										–	✓	✓	✓	✓	✓
Connection box on RHS	K09										✓	✓	✓	✓	✓	✓
Connection box on LHS	K10										✓	✓	✓	✓	✓	✓
Connection box on top, feet screwed on	K11										✓	✓	✓	✓	✓	✓
Connection box in cast-iron version	K15										✓	✓	✓	□	□	□
One cable gland, metal ⁸⁾	K54										✓	✓	✓	✓	✓	✓
Cable gland, maximum configuration ⁸⁾	K55										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Rotation of the connection box through 90°, entry from DE	K83										✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84										✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85										✓	✓	✓	✓	✓	✓
Next larger connection box	L00										–	–	–	–	–	–
External earthing	L13										□	□	□	□	□	□
Auxiliary connection box 1XB3 020	L97										–	–	–	–	–	–
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47										–	–	–	–	–	–
Windings and insulation																
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	C22										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	C23										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	C24										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	C25										✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	Y50 • and specified output, CT... °C or SA m above sea level										✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 4/119.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size													
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21, 22 with type of protection "n" or protection against dust explosions – Cast-iron series 1LA6 and 1LG4															
Colors and paint finish															
Standard finish in RAL 7030 stone gray															
Standard finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y53 • and standard finish RAL														
Special finish in RAL 7030 stone gray ¹⁰⁾	K26														
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL														
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL														
Offshore special finish	M91														
Sea air resistant special finish	M94														
Unpainted (only cast iron parts primed)	K23														
Unpainted, only primed	K24														
Special technology															
Mounting of explosion-proof rotary pulse encoder for use in Zones 2, 21, 22 ¹¹⁾	H86														
Mounting of explosion-proof separately driven fan Ex nA for use in Zone 2 ¹²⁾	M95														
Mounting of explosion-proof separately driven fan II 2D for use in Zone 21 ¹²⁾	M96														
Mounting of explosion-proof separately driven fan II 3D for use in Zone 22 ¹²⁾	M97														
Mechanical design and degrees of protection															
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar Not possible for IM V3 type of construction ¹³⁾	K17														
Low-noise version for 2-pole motors with clockwise direction of rotation ¹⁴⁾	K37														
Low-noise version for 2-pole motors with counter-clockwise direction of rotation ¹⁴⁾	K38														
IP65 degree of protection ¹⁵⁾	K50														
IP56 degree of protection (non-heavy-sea) ¹⁶⁾	K52														
Vibration-proof version	L03														
Condensation drainage holes ¹⁷⁾	L12														
Rust-resistant screws (externally)	M27														
Mechanical protection for encoder ¹⁸⁾	M68														

For legend and footnotes, see Page 4/119.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21, 22 with type of protection "n" or protection against dust explosions – Cast-iron series 1LA6 and 1LG4																
Coolant temperature and site altitude																
Coolant temperature -40 °C to +40 °C for EX motor ¹⁹⁾	D19															
Designs in accordance with standards and specifications																
Electrical according to NEMA MG1-12	D30															
Ex certification for China (only valid for Zone 2)	D32															
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50															
Bearing design for increased cantilever forces ²⁰⁾	K20															
Special bearing for DE and NDE, bearing size	K36														✓ ²¹⁾	✓ ²¹⁾
Regreasing device	K40														□	□
Located bearing DE	K94														✓	✓
Located bearing NDE	L04														□	□
Insulated bearing cartridge	L27														✓	✓
Balance and vibration quantity																
Vibration quantity A															□	□
Vibration quantity B ²²⁾	K02														✓	✓
Full key balancing	L68														✓	✓
Balancing without key	M37														✓	✓
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ²³⁾	K04														✓	✓
Second standard shaft extension ²⁴⁾	K16														✓	✓
Shaft extension with standard dimensions without featherkey way	K42														✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39														✓	✓
Standard shaft made of rust-resistant steel	M65														-	-
Non-standard cylindrical shaft extension ²⁵⁾	Y55 • and identification code														✓	✓
Heating and ventilation																
Fan cover for textile industry	H17														✓	✓
Metal external fan ²⁶⁾	K35														✓	✓
Anti-condensation heater, Ex. 230 V	M15														O. R.	O. R.
Anti-condensation heater, Ex. 115 V	M14														O. R.	O. R.
Separately driven fan with non-standard voltage and/or frequency	Y81 • and identification code														-	-
Rating plate and extra rating plates																
Second lubricating plate, supplied loose	B06														✓	✓
Second rating plate, loose	K31														✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code														✓	✓
Extra rating plate with identification code	Y82 • and identification code														✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code														✓	✓

For legend and footnotes, see Page 4/119.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21, 22 with type of protection "n" or protection against dust explosions – Cast-iron series 1LA6 and 1LG4																
Packaging, safety notes, documentation and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02															
Operating instructions German/English enclosed in print	B23															
Type test with heat run for horizontal motors, with acceptance	F83															
Wire-lattice pallet	L99															
Connected in star for dispatch	M32															
Connected in delta for dispatch	M33															

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Possible on request
- ✓ With additional charge
- Not possible

- 1) Only permitted for use in accordance with temperature class 130 (B).
- 2) These motors do not have a rated voltage range stamped on the rating plate.
- 3) According to the standard, the motor and converter must be tested as a unit. A "Manufacturer test certificate" is available for a defined spectrum of Siemens motors (frame sizes 63 M to 315 L)/converter. Please inquire in the case of a non-Siemens converter (additional charge).
- 4) With this option, PTC thermistors for temperature class 130 (B) are included. For compliance with temperature class 130 (B), derating is necessary in the case of converter-fed operation in Zones 2, 21 and 22. The operating data for the MICROMASTER converter series from Siemens are specified on the rating plate as standard. Derating information is available on request. For converter-fed operation only voltage codes/order codes with only one voltage are permitted, see also Page 4/82.
- 5) In combination with order codes **D19, K30, M95, M96 and M97** please inquire. Not possible in combination with order codes **D32, K50 and K52**.
- 6) Zone 21 takes into account conducting and non-conducting dust.
- 7) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended. When used in hazardous areas, a certified tripping unit is required. KTY 84-130 and PT 100 are not permitted as sole protection. Full motor protection for mains-fed operation implemented only with PTC thermistors, please inquire.
- 8) For 1LA6 and 1LG6 motors additional charge only applies to Zone 22. Designs for Zones 2 and 21 already have a certified metal cable gland in the standard version. Standard with designs for Zone 2, Zone 21 and VIK.
- 9) Standard with designs for Zone 2, Zone 21 and VIK.
- 10) For frame sizes 100 to 160, do not specify an order code. Order code is only necessary for frame sizes 180 to 315.
- 11) In combination with order codes **C19, C26, L27, M95, M96 and M97** please inquire. Not possible in combination with order code **K16**. Furthermore a combination with protective cover is not possible. Therefore a suitable cover must be implemented by the end user in vertical mounting position to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0).
- 12) In combination with order codes **C19, C22, C23, C24, C25, C26, C27, D19, H86, K30, K50 and K52** please inquire. Not possible in combination with order code **K16**. The type of protection of the separately driven fan must correspond to the type of protection of the motor.
- 13) Not possible for motor series 1LG4 for 2-pole motors.
- 14) For 1LG4 motors a second shaft extension is not possible in the low-noise version.
- 15) Order code **K50** (IP65 degree of protection) can only be ordered for Zone 2. For Zone 21, IP65 degree of protection is standard. Not possible for Zone 22, because only IP55 degree of protection is required.
- 16) Order code **K52** IP56 degree of protection (non-heavy-sea) is only possible for Zone 2. Not admissible for Zone 21 (IP65 degree of protection) and Zone 22 (IP55 degree of protection).
- 17) For 1LA6 motors: When supplied the condensation drainage holes are sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 18) Not necessary when a rotary pulse encoder is combined with a separately driven fan, because in this case the rotary pulse encoder is installed under the fan cover.
- 19) Not possible in combination with order code **L03**.
- 20) Not possible for 2-pole 1LG4 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration quantity level B available on request for 1LG4 motors. Not possible for 1LG4 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – order code **K04**.
- 21) Additional charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- 22) Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 23) Can be combined with deep-groove bearings of series 60.., 62.. and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 24) Possible for motors of frame size 315 and above in vertical types of construction or 2-pole for version with second shaft extension on request. Version with protective cover not possible.
- 25) When motors which have a longer or shorter shaft extension than normal are ordered, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55 and K16**:
– Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
– Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
For an explanation of the order codes, see catalog part 0 "Introduction".
- 26) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external fan is standard for these motors in the version for Zone 21/22. The metal external fan is not possible in combination with the low-noise version – order code **K37** or **K38**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size																			
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315					
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions – Cast-iron series 1LG6																					
																1LG6 (cast-iron)					
Design for Zones 1, 2, 21 and 22 according to ATEX ¹⁾																					
Design for Zone 2 for mains-fed operation Ex nA II T3 to IEC/EN 60079-15 ²⁾	M72															✓	✓	✓	✓	✓	✓
Design for Zone 2 for converter-fed operation, reduced output Ex nA II T3 to IEC/EN 60079-15 ^{2) 3) 4)}	M73															✓	✓	✓	✓	✓	✓
Design for Zones 2 and 22, for non-conducting dust (IP55), for mains-fed operation ⁵⁾	M74															✓	✓	✓	✓	✓	✓
Design for Zones 2 and 22, for non-conducting dust (IP55), for converter-fed operation, derating ^{4) 5)}	M75															✓	✓	✓	✓	✓	✓
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for mains-fed operation ⁶⁾	M34															✓	✓	✓	✓	✓	✓
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating ^{2) 4) 6)}	M38															✓	✓	✓	✓	✓	✓
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	M35															✓	✓	✓	✓	✓	✓
Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating ^{2) 4)}	M39															✓	✓	✓	✓	✓	✓
VIK design (comprises Zone 2 for mains-fed operation, without Ex nA II marking on rating plate)	K30															✓	✓	✓	✓	✓	✓
Ex nA II on VIK rating plate	C27															✓	✓	✓	✓	✓	✓
Alternative converter (SIMOVERT MASTERDRIVES, SIMOVERT S120)	Y68 • and converter type															○	○	○	○	○	○
Motor protection																					
With PTC thermistors for alarm for converter-fed operation in Zones 2, 21, 22 ⁷⁾	A10															✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ⁷⁾	A11															✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ⁷⁾	A12															✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ⁷⁾	A23															✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ⁷⁾	A25															✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ⁷⁾	A60															✓	✓	✓	✓	✓	✓
Installation of 6 PT 100 resistance thermometers in stator winding ⁷⁾	A61															✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ⁷⁾	A72															✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ⁷⁾	A78															✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 double screw-in resistance thermometers (three-wire circuit) for rolling-contact bearings ⁷⁾	A80															✓	✓	✓	✓	✓	✓

For legend, see Page 4/123, for footnotes, see Page 4/124.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions – Cast-iron series 1LG6																
																1LG6 (cast-iron)
Motor connection and connection box																
Two-part plate on connection box	K06	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on RHS	K09	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on LHS	K10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on top, feet screwed on	K11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box in cast-iron version	K15	✓	✓	✓	✓	✓	□	□	□							
One cable gland, metal ⁸⁾	K54	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cable gland, maximum configuration ⁸⁾	K55	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Rotation of the connection box through 90°, entry from DE	K83	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Next larger connection box	L00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Auxiliary connection box	L97	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Windings and insulation																
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	C22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	C23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	C24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	C25	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per per m ³ of air	C26	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with a higher coolant temperature and/or site altitude	Y50 • and specified output, CT ... °C or SA m above sea level	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Colors and paint finish																
Standard finish in RAL 7030 stone gray		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Standard finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y53 • and standard finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Offshore special finish	M91	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sea air resistant special finish	M94	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast-iron parts primed)	K23	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend, see Page 4/123, for footnotes, see Page 4/124.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size																			
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315					
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions – Cast-iron series 1LG6																					
																1LG6 (cast-iron)					
Special technology																					
Mounting of explosion-proof rotary pulse encoder for use in Zones 2, 21, 22 ¹⁰⁾	H86															✓	✓	✓	✓	✓	✓
Mounting of explosion-proof separately driven fan Ex nA for use in Zone 2 ¹¹⁾	M95															–	–	✓	✓	✓	✓
Mounting of explosion-proof separately driven fan II 2D for use in Zone 21 ¹¹⁾	M96															–	–	✓	✓	✓	✓
Mounting of explosion-proof separately driven fan II 3D for use in Zone 22 ¹¹⁾	M97															✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																					
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar Not possible for IM V3 type of construction and 2-pole motors	K17															✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation ¹²⁾	K37															–	–	–	–	–	–
Low-noise version for 2-pole motors with counter-clockwise direction of rotation ¹²⁾	K38															–	–	–	–	–	–
IP65 degree of protection ¹³⁾	K50															✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea) ¹⁴⁾	K52															✓	✓	✓	✓	✓	✓
Condensation water holes ¹⁵⁾	L12															□	□	□	□	□	□
Rust-resistant screws (externally)	M27															✓	✓	✓	✓	✓	✓
Mechanical protection for encoder ¹⁶⁾	M68															✓	✓	✓	✓	✓	✓
Coolant temperature and site altitude																					
Coolant temperature –40 °C to +40 °C for EX motor ¹⁷⁾	D19															✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																					
Electrical according to NEMA MG1-12 (standard version with EPACT)	D30															□	□	□	□	□	□
Ex certification for China (only valid for Zone 2)	D32															✓	✓	✓	✓	✓	✓
Bearings and lubrication																					
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50															✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ¹⁸⁾	K20															✓	✓	✓	✓	✓	✓
Special bearing for DE and NDE, bearing size	K36															✓	✓	✓	✓	✓ ¹⁹⁾	✓ ¹⁹⁾
Regreasing device	K40															✓	✓	✓	✓	□	□
Located bearing DE	K94															✓	✓	✓	✓	✓	✓
Located bearing NDE	L04															□	□	□	□	□	□
Insulated bearing cartridge	L27															–	–	✓	✓	✓	✓
Balance and vibration quantity																					
Vibration quantity A																□	□	□	□	□	□
Vibration quantity B ²⁰⁾	K02															✓	✓	✓	✓	✓	✓
Full key balancing	L68															✓	✓	✓	✓	✓	✓
Balancing without key	M37															✓	✓	✓	✓	✓	✓
Shaft and rotor																					
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ²¹⁾	K04															✓	✓	✓	✓	✓	✓
Second standard shaft extension ²²⁾	K16															✓	✓	✓	✓	✓	✓
Shaft extension with standard dimensions without featherkey way	K42															✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39															✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ²³⁾	Y55 • and identification code															✓	✓	✓	✓	✓	✓

For legend, see Page 4/123, for footnotes, see Page 4/124.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size													
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions – Cast-iron series 1LG6															
														1LG6 (cast-iron)	
Heating and ventilation															
Metal external fan ²⁴⁾	K35	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heater, Ex. 230 V	M15	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Anti-condensation heater, Ex. 115 V	M14	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Separately driven fan with non-standard voltage and/or frequency	Y81 • and identification code	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rating plate and extra rating plates															
Second lubricating plate, supplied loose	B06	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second rating plate, loose	K31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates															
Acceptance test certificate 3.1 according to EN 10204	B02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Operating instructions German/English enclosed in print	B23	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Type test with heat run for horizontal motors, with acceptance	F83	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connected in star for dispatch	M32	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connected in delta for dispatch	M33	✓	✓	□	□	□	□	□	□	□	□	□	□	□	□

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- O. R. Possible on request
- ✓ With additional charge
- Not possible

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

4

- 1) Only permitted for use in accordance with temperature class 130 (B).
- 2) These motors do not have a rated voltage range stamped on the rating plate.
- 3) According to the standard, the motor and converter must be tested as a unit. A "Manufacturer test certificate" is available for a defined spectrum of Siemens motors (frame sizes 63 M to 315 L)/converter. Please inquire in the case of a non-Siemens converter (additional charge).
- 4) With this option, PTC thermistors for temperature class 130 (B) are included. For compliance with temperature class 130 (B), derating is necessary in the case of converter-fed operation in Zones 2, 21 and 22. Derating information is available on request.
- 5) In combination with order codes **D19**, **K30**, **M95**, **M96** and **M97** please inquire. Not possible in combination with order codes **D32**, **K50** and **K52**. Zone 21 takes into account conducting and non-conducting dust.
- 7) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended. When used in hazardous areas, a certified tripping unit is required. KTY 84-130 and PT 100 are not permitted as sole protection. Full motor protection for mains-fed operation implemented only with PTC thermistors, please inquire.
- 8) For 1LG6 motors, additional charge only applies to Zone 22. Designs for Zones 2 and 21 already have a cable entry in the standard version.
- 9) Standard with designs for Zone 2, Zone 21 and VIK.
- 10) In combination with order codes **C19**, **C26**, **L27**, **M95**, **M96** and **M97** please inquire. Not possible in combination with order code **K16**. Furthermore a combination with protective cover is not possible. Therefore a suitable cover must be implemented by the end user in vertical mounting position to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0).
- 11) In combination with order codes **C19**, **C22**, **C23**, **C24**, **C25**, **C26**, **D19**, **H86**, **K50** and **K52** please inquire. Not possible in combination with order code **K16**. The type of protection of the separately driven fan must correspond to the type of protection of the motor.
- 12) Not necessary for 1LG6 motors because these motors are already noise optimized.
- 13) Order code **K50** (IP65 degree of protection) can only be ordered for Zone 2. For Zone 21, IP65 degree of protection is standard. Not possible for Zone 22, because only IP55 degree of protection is required.
- 14) Order code **K52** IP56 degree of protection (non-heavy-sea) is only possible for Zone 2. Not admissible for Zone 21 (IP65 degree of protection) and Zone 22 (IP55 degree of protection).
- 15) When supplied the condensation drainage holes are sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 16) Not necessary when a rotary pulse encoder is combined with a separately driven fan, because in this case the rotary pulse encoder is installed under the fan cover.
- 17) Not possible in combination with order code **L03**.
- 18) Not possible for 2-pole 1LG6 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration quantity level B available on request for 1LG6 motors. Not possible for 1LG6 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – order code **K04**.
- 19) Additional charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- 20) Can be combined with deep-groove bearings of series 60.., 62.. and 63... Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 21) Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 22) Possible for motors of frame size 315 and above in vertical types of construction or 2-pole for version with second shaft extension on request. Version with protective cover not possible.
- 23) When motors which have a longer or shorter shaft extension than normal are ordered, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **K16**:
– Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
– Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
For an explanation of the order codes, see catalog part 0 "Introduction".
- 24) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external fan is standard for these motors in the version for Zone 21/22. The metal external fan is not possible in combination with the low-noise version – order code **K37** or **K38**.

Overview

Slide rails with fixing bolts and tensioning screws to DIN 42923

Slide rails are used to tension the belt of a machine easily and conveniently when a belt tightener is not available. They are fixed to the base using stone bolts or foundation blocks.

The assignment of slide rails to motor size can be found in DIN 42923. For motors of frame sizes 355 to 450, there are no standardized slide rails (please inquire).

Available from:

Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Foundation block acc. to DIN 799

The foundation blocks are inserted into the stone foundation and embedded in concrete. They are used for fixing machines of medium size, slide rails, pedestal bearings, baseframes, etc. After the fixing bolts have been unscrewed, the machine can be dragged without it having to be lifted.

When the machine is initially installed, the foundation block that is bolted to the machine (without washers) and fitted with taper pins is not embedded with concrete until the machine has been fully aligned. In this case, the machine is positioned 2 to 3 mm lower. The difference in shaft height is compensated by inserting shims on final installation. The taper pins safeguard the exact position of the machine when it is repeatedly removed and replaced without the need for realignment.

Available from:

Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Taper pins to DIN 258 with threaded ends and constant taper lengths

Taper pins are used for components that are repeatedly removed. The drilled hole is ground conical using a conical reamer until the pin can be pushed in by hand until the cone shoulder lies 3 to 4 mm above the rim of the hole.

It can then be driven in using a hammer until it is correctly seated. The pin is removed from the drilled hole by screwing on the nut and tightening it.

Standardized taper pins are available from general engineering suppliers.

Source, for example:

Otto Roth GmbH & Co. KG
Rutesheimer Straße 22
70499 Stuttgart, Germany
Tel. +49 (0)7 11-1388-0
Fax +49 (0)7 11-1388-233

<http://www.ottoroth.de>
e-mail: info@ottoroth.de

Couplings for use in hazardous areas

The motor from Siemens is connected to the machine or gear unit through a coupling. Flender is an important coupling manufacturer with a wide range of products. For standard applications, Siemens recommends that elastic couplings of Flender types N-Eupex and Rupex or torsionally rigid couplings of types Arpex and Zapex are used. For special applications, Fludex and Elpex-S couplings are recommended. These coupling types are suitable for use in areas subject to explosion hazards and are offered with declaration of conformity and type test certificate according to directive 94/9/EU.

Source of supply:

Siemens contact partner – ordering from Catalog
Siemens MD 10.1 "FLENDER Standard Couplings"

or

A. Friedr. Flender AG
Kupplungswerk Mussum
Industriepark Bocholt
Schlavenhorst 100
46395 Bocholt, Germany
Tel. +49 (0)2871-92 2185
Fax +49 (0)2871-92 2579

<http://www.flender.com>
e-mail: couplings@flender.com

IEC Squirrel-Cage Motors

Explosion-proof motors

Accessories

More information

Spare motors and repair parts

- Supply commitment for spare motors and repair parts following delivery of the motor
 - For up to 5 years, in the event of total motor failure, Siemens will supply a comparable motor with regard to the mounting dimensions and functions (the type series may vary).
 - Repair parts will be supplied for up to 5 years.
 - For up to 10 years, Siemens will provide information and will, if necessary, supply documentation for repair parts.
- When repair parts are ordered, the following details must be provided:
 - Designation and part number
 - Order No. and factory number of the motor

Example for ordering a fan cover 1LA7,
frame size 160 M, 4-pole:

**Fan cover No. 7.40,
1LA7 163-4AA60, factory number J783298901018**

- For bearing types, see the "Introduction".
- Repair parts for 1MJ6, 1MJ7, 1MJ8, 1MJ1, 1ME8, 1ML8, 1LG8 motors and smoke-extraction motors are available on request.
- For standard components, a supply commitment does not apply.
- Support – Hotline
In Germany
Tel.: 01 80/5 05 04 48

You will find telephone numbers for other countries on our Internet site

<http://www.siemens.com/automation/service&support>

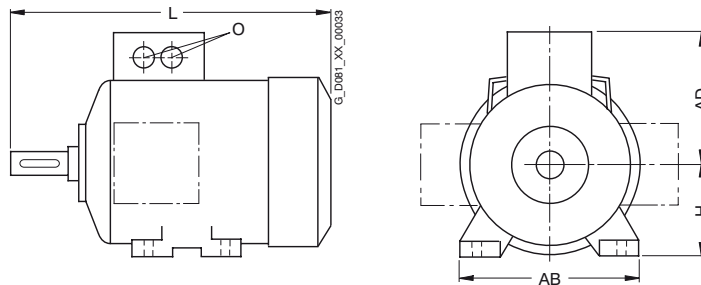
IEC Squirrel-Cage Motors

Explosion-proof motors

Dimensions

Overview

Overall dimensions



Frame size	Type	Number of poles	Dimensions					O	
			L	AD	H	AB			
56 M	1LA7		169	101	56	110	1 x M16 x 1.5		
	1LA9 050		169	101	56	110	1 x M25 x 1.5		
	1LA9 053		195	101	56	110	1 x M16 x 1.5 1 x M25 x 1.5		
63 M	1LA7		202.5	101	63	120	1 x M16 x 1.5 1 x M25 x 1.5		
	1LA9 063		202.5	101	63	120	1 x M16 x 1.5 1 x M25 x 1.5		
	1LA9 061		228.5	101	63	120	1 x M16 x 1.5 1 x M25 x 1.5		
	1MA7		202.5	135	63	120	1 x M16 x 1.5 1 x M25 x 1.5		
71 M	1LA7		240	111	71	132	1 x M16 x 1.5 1 x M25 x 1.5		
	1LA9		240	111	71	132	1 x M16 x 1.5 1 x M25 x 1.5		
	1MA7		240	145	71	132	1 x M16 x 1.5 1 x M25 x 1.5		
	1MJ6		299	201	71	140	1 x M25 x 1.5 1 x M25 x 1.5		
80 M	1LA7		273.5	120	80	150	1 x M16 x 1.5 1 x M25 x 1.5		
	1LA9 080		273.5	120	80	150	1 x M16 x 1.5 1 x M25 x 1.5		
	1LA9 083		308.5	120	80	150	1 x M16 x 1.5 1 x M25 x 1.5		
	1MA7		273.5	154	80	150	1 x M16 x 1.5 1 x M25 x 1.5		
	1MA7 083-6.		308.5	154	80	150	1 x M16 x 1.5 1 x M25 x 1.5		
	1MJ6		336	209	80	160	1 x M25 x 1.5 1 x M25 x 1.5		
90 S/ 90 L	1LA7		331	128	90	165	1 x M16 x 1.5 1 x M25 x 1.5		
	1LA9		331	128	90	165	1 x M16 x 1.5 1 x M25 x 1.5		
	1LA9 096-6K.		376	128	90	165	1 x M16 x 1.5 1 x M25 x 1.5		
	1LA9 096-2...		358	128	90	165	1 x M16 x 1.5 1 x M25 x 1.5		
	1LA9 096-4...		358	128	90	165	1 x M16 x 1.5 1 x M25 x 1.5		
	1MA7		331	162	90	165	1 x M16 x 1.5 1 x M25 x 1.5		
	1MJ6		383	218	90	168	1 x M25 x 1.5 1 x M25 x 1.5		
	100 L		1LA6		372	164	100	196	2 x M32 x 1.5
1LA7		372	135		100	196	2 x M32 x 1.5		
1LA9		407	135		100	196	2 x M32 x 1.5		
1LA9 107-4KA.		442	135		100	196	2 x M32 x 1.5		
1MA6		372	164		100	196	2 x M32 x 1.5		
1MA7		372	135		100	196	2 x M32 x 1.5		
1MJ6		426	223		100	196	2 x M32 x 1.5 1 x M16 x 1.5		
112 M		1LA6			393	178	112	226	2 x M32 x 1.5
		1LA7			393	148	112	226	2 x M32 x 1.5
		1LA9			431	148	112	226	2 x M32 x 1.5
		1MA6			393	178	112	226	2 x M32 x 1.5
		1MA7			393	148	112	226	2 x M32 x 1.5
	1MJ6	428		238	112	226	2 x M32 x 1.5 1 x M16 x 1.5		
	132 S/ 132 M	1LA6			453	194	132	256	2 x M32 x 1.5
		1LA7			452.5	167	132	256	2 x M32 x 1.5
		1LA9			452.5	167	132	256	2 x M32 x 1.5
		1LA9 131			490.5	167	132	256	2 x M32 x 1.5
		1LA9 133			490.5	167	132	256	2 x M32 x 1.5
		1LA9 134			490.5	167	132	256	2 x M32 x 1.5
		1MA6			453	194	132	256	2 x M32 x 1.5
		1MA7			452.5	167	132	256	2 x M32 x 1.5
160 M/ 160 L	1LA6		588	226	160	300	2 x M40 x 1.5		
	1LA7		588	197	160	300	2 x M40 x 1.5		
	1LA9		588	197	160	300	2 x M40 x 1.5		
	1LA9 166		628	197	160	300	2 x M40 x 1.5		
180 M/ 180 L	1MA6		588	226	160	300	2 x M40 x 1.5		
	1MA7		588	197	160	300	2 x M40 x 1.5		
	1MA7 166-4		628	197	160	300	2 x M40 x 1.5		
	1MA7 166-6		628	197	160	300	2 x M40 x 1.5		
	1MJ6		641	280	160	300	2 x M40 x 1.5 1 x M16 x 1.5		
	1LA5		712	258	180	339	2 x M40 x 1.5		
200 L	1LA9		712	258	180	339	2 x M40 x 1.5		
	1LG4		669	262	180	339	2 x M40 x 1.5		
	1LG4 188		720	262	180	339	2 x M40 x 1.5		
	1LG6 183		720	262	180	339	2 x M40 x 1.5		
	1LG6 183		669	262	180	339	2 x M40 x 1.5		
	1LG6 186		720	262	180	339	2 x M40 x 1.5		
	1MJ6		715	306	180	339	2 x M40 x 1.5		
	1LA5		769.5	305	200	388	2 x M50 x 1.5		
200 L	1LA9		768.5	305	200	388	2 x M50 x 1.5		
	1LG4		720	300	200	378	2 x M50 x 1.5		
	1LG4 208		777	300	200	378	2 x M50 x 1.5		
	1LG6 206		720	300	200	378	2 x M50 x 1.5		
	1LG6 207		777	300	200	378	2 x M50 x 1.5		
	1LG6 207		720	300	200	378	2 x M50 x 1.5		
	1MJ6		771.5	349	200	398	2 x M50 x 1.5		

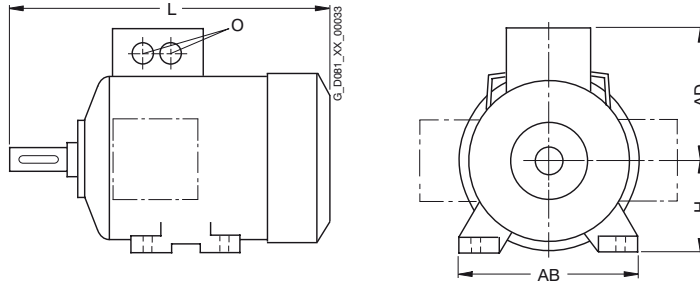
IEC Squirrel-Cage Motors

Explosion-proof motors

Dimensions

Overview (continued)

Overall dimensions



Frame size	Type	Number of poles	Dimensions				
			L	AD	H	AB	O
225 S/	1LA5		806	305	225	426	2 x M50 x 1.5
225 M	1LA5	2	776	305	225	426	2 x M50 x 1.5
	1LG4		789	325	225	436	2 x M50 x 1.5
	1LG4 223	2	759	325	225	436	2 x M50 x 1.5
	1LG4 228	2	819	325	225	436	2 x M50 x 1.5
	1LG4 228	4, 6, 8	849	325	225	436	2 x M50 x 1.5
	1LG6 220	4, 8	789	325	225	436	2 x M50 x 1.5
	1LG6 223	2	819	325	225	436	2 x M50 x 1.5
	1LG6 223	4, 6, 8	849	325	225	436	2 x M50 x 1.5
	1LG6 228	2	869	325	225	436	2 x M50 x 1.5
	1LG6 228	4, 6	899	325	225	436	2 x M50 x 1.5
	1MJ7		839	377	225	436	2 x M50 x 1.5
	1MJ7 223	2	809	377	225	436	2 x M50 x 1.5
250 M	1LG4		887	392	250	490	2 x M63 x 1.5
	1LG4 258	4	957	392	250	490	2 x M63 x 1.5
	1LG6 253	2, 6, 8	887	392	250	490	2 x M63 x 1.5
	1LG6 253	4	957	392	250	490	2 x M63 x 1.5
	1LG6 258	2, 4, 6	957	392	250	490	2 x M63 x 1.5
	1MJ7		930	466	250	506	2 x M63 x 1.5
280 S/	1LG4		960	432	280	540	2 x M63 x 1.5
280 M	1LG4 288	2, 4	1070	432	280	540	2 x M63 x 1.5
	1LG6 280	2, 4, 6, 8	960	432	280	540	2 x M63 x 1.5
	1LG6 283	2, 4	1070	432	280	540	2 x M63 x 1.5
	1LG6 283	6, 8	960	432	280	540	2 x M63 x 1.5
	1LG6 288	2, 4, 6	1070	432	280	540	2 x M63 x 1.5
	1MJ7		1010	491	280	557	2 x M63 x 1.5
315 S/	1LG4		1072	500	315	610	2 x M63 x 1.5
315 M/	1LG4 310	4, 6, 8	1102	500	315	610	2 x M63 x 1.5
315 L	1LG4 313	4, 6, 8	1102	500	315	610	2 x M63 x 1.5
	1LG4 316	2	1232	500	315	610	2 x M63 x 1.5
	1LG4 316	4, 6, 8	1262	500	315	610	2 x M63 x 1.5
	1LG4 317	2	1232	500	315	610	2 x M63 x 1.5
	1LG4 317	4, 6, 8	1262	500	315	610	2 x M63 x 1.5
	1LG4 318	8	1262	500	315	610	2 x M63 x 1.5
	1LG4 318	6	1402	500	315	610	2 x M63 x 1.5
	1LG6 310	2	1072	500	315	610	2 x M63 x 1.5
	1LG6 310	4, 6, 8	1102	500	315	610	2 x M63 x 1.5
	1LG6 313	2	1232	500	315	610	2 x M63 x 1.5
	1LG6 313	4, 6	1262	500	315	610	2 x M63 x 1.5
	1LG6 313	8	1102	500	315	610	2 x M63 x 1.5
	1LG6 316	2	1232	500	315	610	2 x M63 x 1.5
	1LG6 316	4, 6, 8	1262	500	315	610	2 x M63 x 1.5
	1LG6 317	2	1372	500	315	610	2 x M63 x 1.5
	1LG6 317	4, 6	1402	500	315	610	2 x M63 x 1.5
	1LG6 317	8	1262	500	315	610	2 x M63 x 1.5
	1LG6 318	2	1372	651	315	610	2 x M63 x 1.5
	1LG6 318	4	1402	651	315	610	2 x M63 x 1.5
	1LG6 318	6, 8	1402	500	315	610	2 x M63 x 1.5
	1MJ7	2	1114	558	315	628	2 x M63 x 1.5
	1MJ7	4, 6, 8	1140	558	315	628	2 x M63 x 1.5

Overview (continued)

Notes on the dimensions

- Dimension designations according to DIN EN 50347 and IEC 60072.
- Fits
The shaft extensions specified in the dimension tables (DIN 748) and centering spigot diameters (DIN EN 50347) are machined with the following fits:

Dimension designation	ISO fit DIN ISO 286-2	
D, DA	up to 30	j6
	over 30 to 50	k6
	over 50	m6
N	up to 250	j6
	over 250	h6
F, FA		h9
K		H17
S	flange (FF)	H17

The drilled holes of couplings and belt pulleys should have an ISO fit of at least H7.

- Dimension tolerances

For the following dimensions, the admissible deviations are given below:

Dimension designation	Dimension	Admissible deviation
H	up to 250	- 0.5
	over 250	- 1.0
E, EA		- 0.5

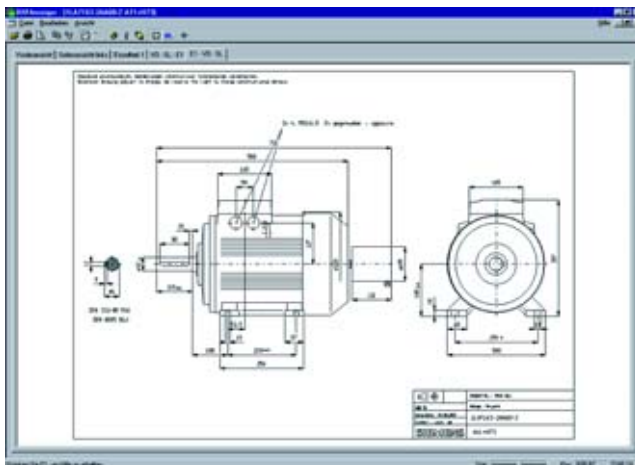
Keyways and feather keyways (dimensions GA, GC, F and FA) are made in compliance with DIN 6885 Part 1.

- All dimensions are specified in mm.

More information
Dimension sheet generator

(part of the SD configurator)

A dimension drawing can be created in the SD configurator for every configurable motor. A dimension drawing can be requested for every other motor.



When a complete Order No. is entered with or without order codes, a dimension drawing can be called up under the "Documentation" tab.

These dimension drawings can be presented in different views and sections and printed. The corresponding dimension sheets can be exported, saved and processed further in DXF format (interchange/import format for CAD systems) or as bitmap graphics. The SD configurator has been integrated into the electronic Catalog CA 01 as a selection aid (for more information, see catalog part 11 "Appendix", "Selection tool SD-configurator").

The interactive Catalog CA 01 can be ordered from your local Siemens sales representative or on the Internet at

<http://www.siemens.com/automation/CA01>

At this address, you will also find links to Tips & Tricks and to downloads for function or content updates.

Order number for CA 01 10/2008, English International:
DVD: E86060-D4001-A510-C7-7600

IEC Squirrel-Cage Motors

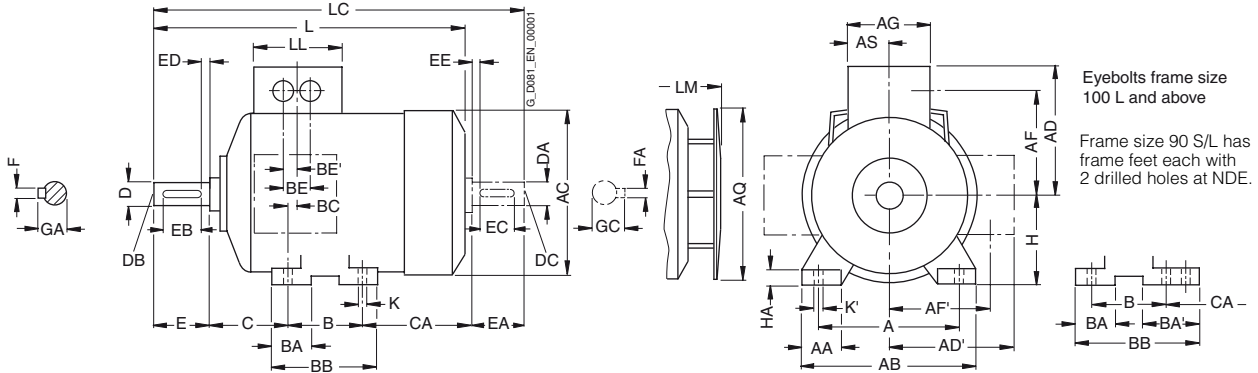
Explosion-proof motors

Dimensions

Dimensional drawings

Aluminum series 1MA7, frame sizes 63 M to 160 L

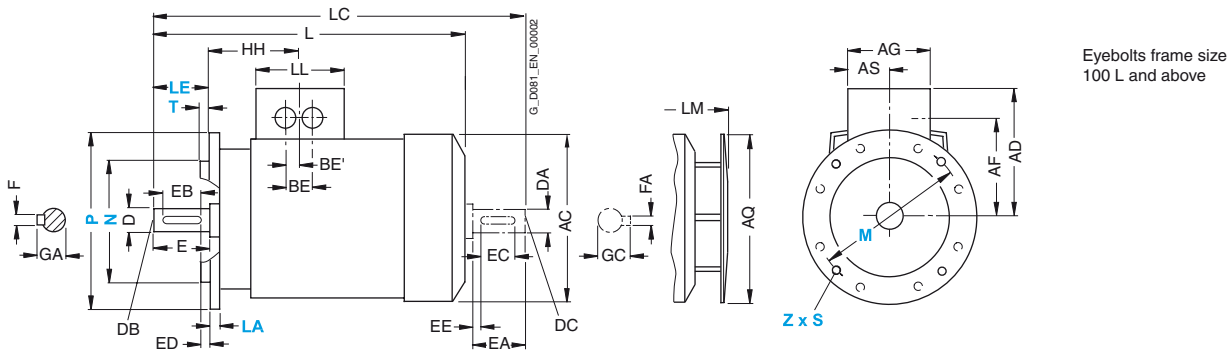
Type of construction IM B3



Eyebolts frame size 100 L and above
 Frame size 90 S/L has frame feet each with 2 drilled holes at NDE.

Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



Eyebolts frame size 100 L and above

For motor			Dimension designation acc. to IEC																					
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AQ	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H	HA
63 M	1MA7 060 1MA7 063	2, 4, 6	100	27	120	124	135	101	95	78	120	124	60	80	28	-	96	52.5	32	16	40	66	63	7
71 M	1MA7 070 1MA7 073	2, 4, 6, 8	112	27	132	145	145	111	105	88	120	124	60	90	27	-	106	41.5	32	16	45	83	71	7
80 M	1MA7 080 1MA7 083	2, 4, 6, 8	125	30.5	150	163	154	154	114	114	120	124	60	100	32	-	118	36	32	16	50	94 134 ²⁾	80	8
90 S 90 L	1MA7 090 1MA7 096	2, 4, 6, 8	140	30.5	165	180	162	162	122	122	120	170	60	100 125	33	54	143	46	32	16	56	143 118	90	10
100 L	1MA7 106 1MA7 107	2, 4, 6, 8 4, 8	160	42	196	203	135	163	78	123	120	170	60	140	47	-	176	39	42	21	63	125	100	12
112 M	1MA7 113	2, 4, 6, 8	190	46	226	227	148	176	91	136	120	170	60	140	47	-	176	32	42	21	70	141	112	12
132 S	1MA7 130 1MA7 131	2, 4, 6, 8 2	216	53	256	267	167	194	107	154	140	250	70	140	49	-	180	39	42	21	89	162.5	132	15
132 M	1MA7 133 1MA7 134	4, 6, 8 6	216	53	256	267	167	194	107	154	140	250	70	178	49	-	218	39	42	21	89	124.5 162.5 ³⁾	132	15
160 M	1MA7 163 1MA7 164	2, 4, 6, 8 2, 8	254	60	300	320	197	226	127	183	165	250	82.5	210	57	-	256	52.5	54	27	108	183	160	18
160 L	1MA7 166	2, 4, 6, 8	254	60	300	320	197	226	127	183	165	250	82.5	254	57	-	300	52.5	54	27	108	139 179 ⁴⁾	160	18

* This dimension is assigned in DIN EN 50347 to the frame size listed.

1) Measured across the bolt heads.

2) For 1MA7 083-6.

3) For 1MA7 133-4.

4) For 1MA7 166-4 and 1MA7 166-6.

IEC Squirrel-Cage Motors

Explosion-proof motors

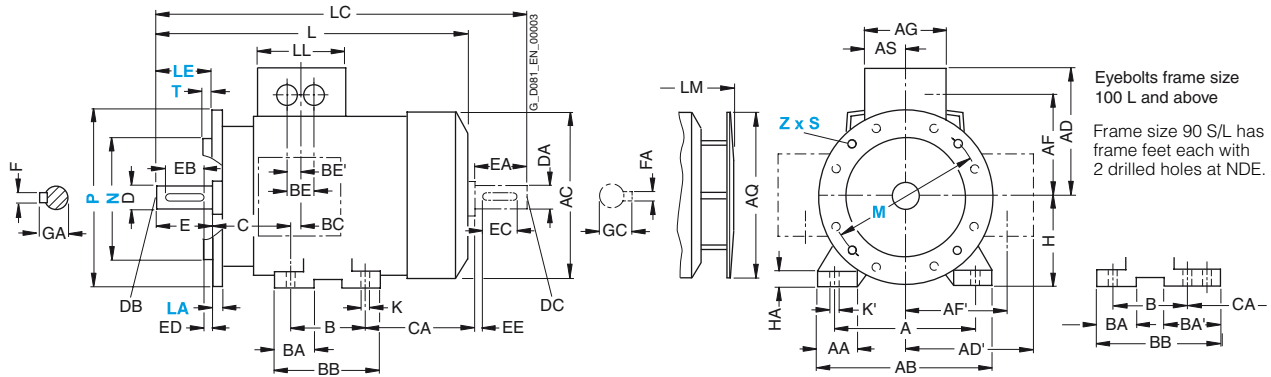
Dimensions

Dimensional drawings

Aluminum series 1MA7, frame sizes 63 M to 160 L

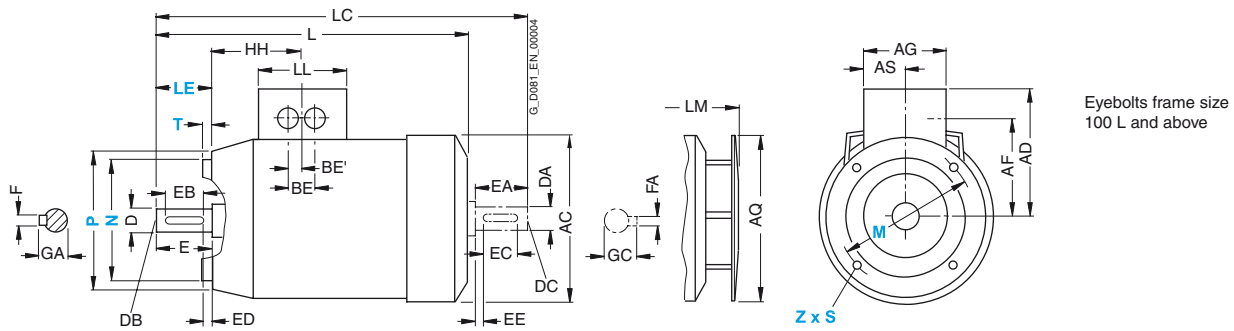
Type of construction IM B35

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor	Frame size	Type	Number of poles	Dimension designation acc. to IEC					DE shaft extension						NDE shaft extension									
				HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
63 M	1MA7 060	2, 4, 6	2, 4, 6	92.5	7	10	202.5 ¹⁾	232 ¹⁾	120	231.5 ¹⁾	11	M4	23	16	3.5	4	12.5	11	M4	23	16	3.5	4	12.5
	1MA7 063																							
71 M	1MA7 070	2, 4, 6, 8	2, 4, 6, 8	86.5	7	10	240	278	120	268	14	M5	30	22	4	5	16	14	M5	30	22	4	5	16
	1MA7 073																							
80 M	1MA7 080	2, 4, 6, 8	2, 4, 6, 8	86	9.5	13.5	273.5	324	120	299.5	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5
	1MA7 083						308.5 ²⁾	364		334.5 ²⁾														
90 S	1MA7 090	2, 4, 6, 8	2, 4, 6, 8	101.5	10	14	331	389	120	382.5	24	M8	50	40	5	8	27	19	M6	40	32	4	6	21.5
	1MA7 096																							
100 L	1MA7 106	2, 4, 6, 8	2, 4, 6, 8	102	12	16	372	438	120	423.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
	1MA7 107	4, 8																						
112 M	1MA7 113	2, 4, 6, 8	2, 4, 6, 8	102	12	16	393	461	120	444.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1MA7 130	2, 4, 6, 8	2, 4, 6, 8	128	12	16	452.5 ³⁾	551.5	140	505 ³⁾	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
	1MA7 131																							
132 M	1MA7 133	4, 6, 8	4, 6, 8	128	12	16	452.5 ³⁾	551.5	140	505 ³⁾	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
	1MA7 134	6					490.5 ⁴⁾	589.5 ⁴⁾		543 ⁴⁾														
160 M	1MA7 163	2, 4, 6, 8	2, 4, 6, 8	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
	1MA7 164	2, 8																						
160 L	1MA7 166	2, 4, 6, 8	2, 4, 6, 8	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
							628 ⁵⁾	761 ⁵⁾		680.5 ⁵⁾														

1) For 1MA7 063 with type of construction code 1 (B5, IM V1 without protective cover, IM V3) the dimensions L, LC and LM are 26 mm longer.
 2) For 1MA7 083-6.
 3) In a low-noise version, the dimension L is 8 mm greater and the dimension LM is 11.5 mm greater.

4) For 1MA7 133-4.
 5) For 1MA7 166-4 and 1MA7 166-6.

IEC Squirrel-Cage Motors

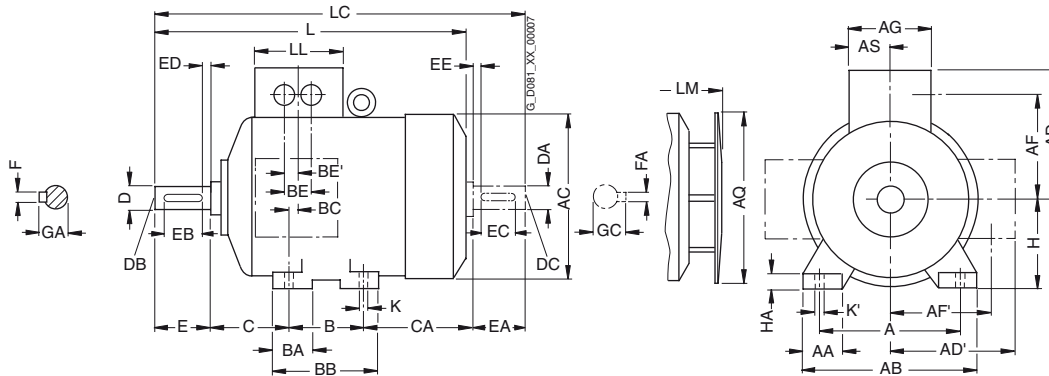
Explosion-proof motors

Dimensions

Dimensional drawings

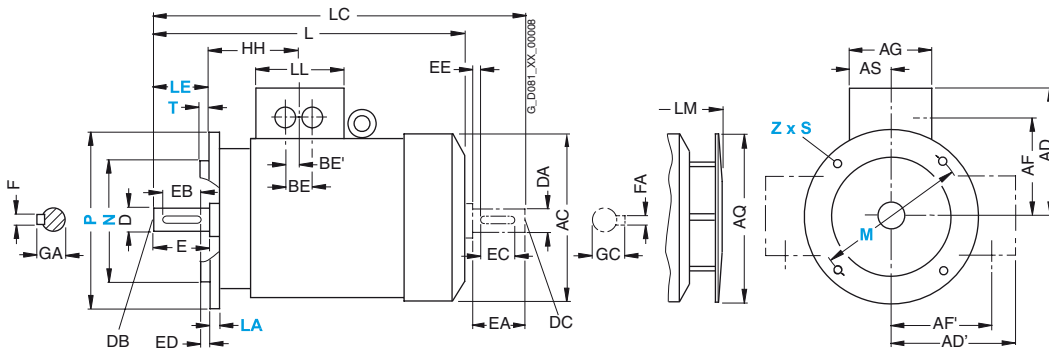
Cast-iron series 1MA6, frame sizes 100 L to 160 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																				
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AQ	AS	B	BA	BB	BC	BE	BE'	C	CA	H	HA
100 L	1MA6 106	2, 4, 6, 8	160	40	196	201	164	164	124	124	121	170	60.5	140	46	180	42	44	22	63	125	100	12
	1MA6 107	4, 8																					
112 M	1MA6 113	2, 4, 6, 8	190	42.5	226	225.5	178	178	138	138	121	170	60.5	140	46	180	34	44	22	70	141	112	15
132 S	1MA6 130	2, 4, 6, 8	216	50	256	265	194	194	154	154	141	250	70.5	140	47	180	42	44	22	89	162.5	132	17
	1MA6 131	2																					
132 M	1MA6 133	4, 6, 8	216	50	256	265	194	194	154	154	141	250	70.5	178	49	218	42	44	22	89	124.5	132	17
	1MA6 134	6																					
160 M	1MA6 163	2, 4, 6, 8	254	60	300	320	226	226	183	183	166	250	83	210	63	256	52	54	27	108	183	160	18
	1MA6 164	2, 8																					
160 L	1MA6 166	2, 4, 6, 8	254	60	300	320	226	226	183	183	166	250	83	254	63	300	52	54	27	108	139	160	18

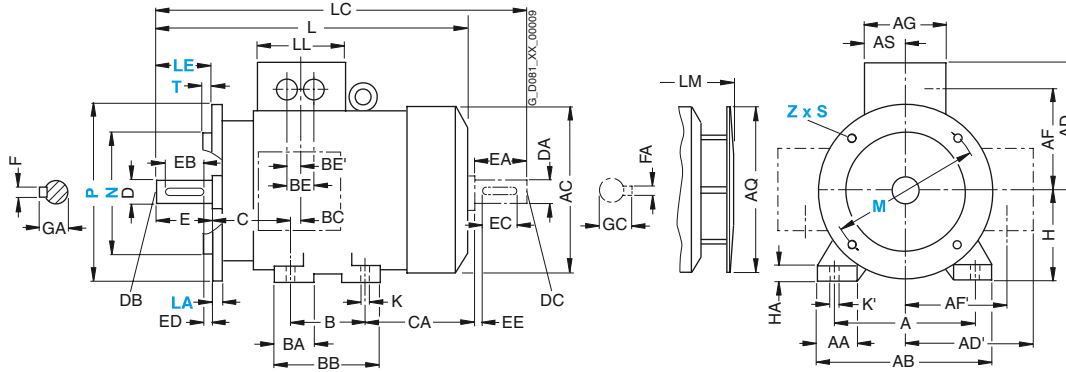
¹⁾ Measured across the bolt heads.

Dimensional drawings

Cast-iron series 1MA6, frame sizes 100 L to 160 L

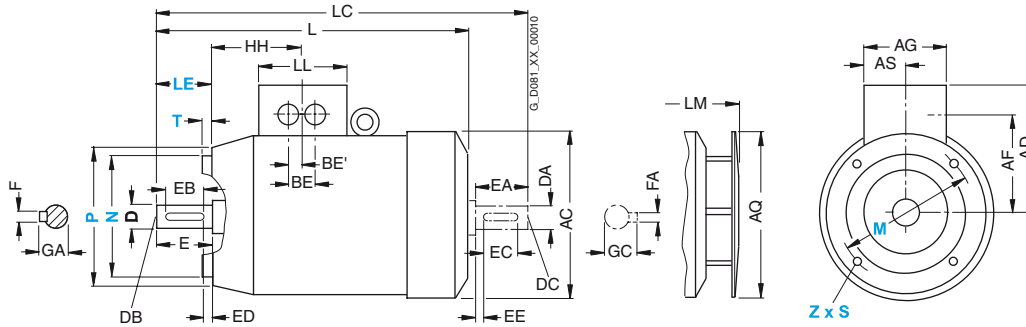
Type of construction IM B35

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor Frame size	Type	Number of poles	Dimension designation acc. to IEC								DE shaft extension					NDE shaft extension							
			HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
100 L	1MA6 106 1MA6 107	2, 4, 6, 8 4, 8	104.5	12	16	372	438	121	423.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
112 M	1MA6 113	2, 4, 6, 8	104.5	12	16	393	461	121	444.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1MA6 130 1MA6 131	2, 4, 6, 8 2	130.5	12	16	453.5	551.5	141	506	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
132 M	1MA6 133 1MA6 134	4, 6, 8 6	130.5	12	16	453.5	551.5	141	506	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
160 M	1MA6 163 1MA6 164	2, 4, 6, 8 2, 8	160	14.5	18	588	721	166	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
160 L	1MA6 166	2, 4, 6, 8	160	14.5	18	588	721	166	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45

IEC Squirrel-Cage Motors

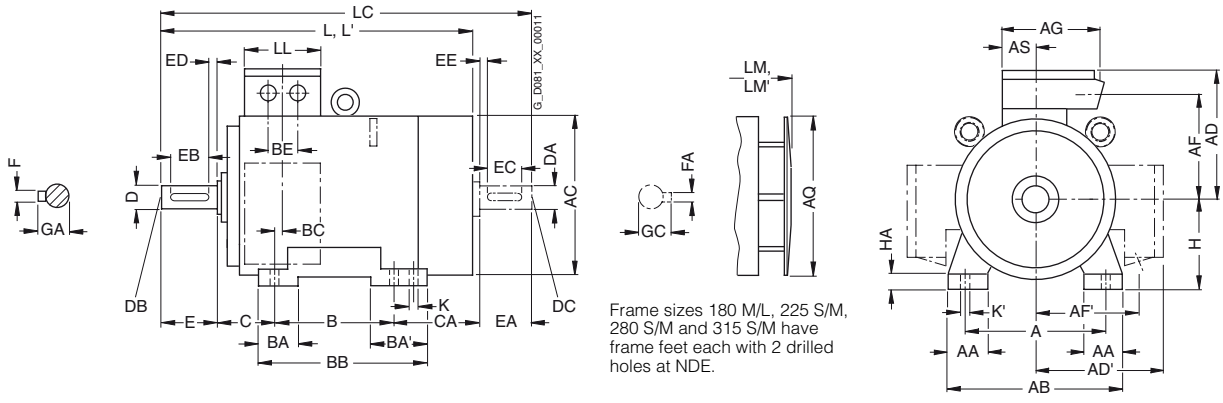
Explosion-proof motors

Dimensions

Dimensional drawings

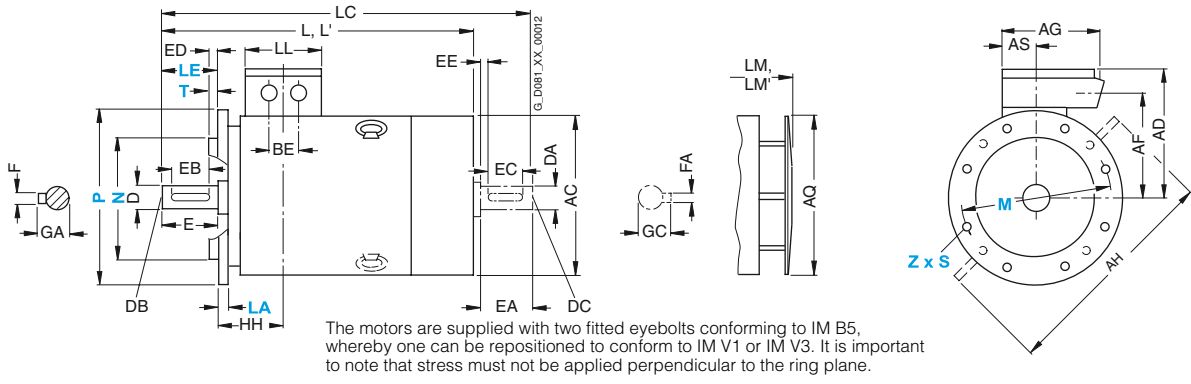
Cast-iron series 1MA6, frame sizes 180 M to 315 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor		Number of poles	Dimension designation acc. to IEC																					
Frame size	Type		A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA
180 M	1MA6 183	2	279	65	344	375	274	274	227	227	220	470	340	82	241	70	108	319	35	75	121	259	180	26
		4																						
180 L	1MA6 186	4, 6, 8	279	65	344	375	274	274	227	227	220	470	340	82	279	70	108	319	35	75	121	221	180	26
200 L	1MA6 206	2	318	80	398	402	308	308	248	248	262	530	340	99	305	85	85	355	42	85	133	239	200	34
		6																						
	1MA6 207	2	318	80	398	402	308	308	248	248	262	530	340	99	305	85	85	355	42	85	133	239	200	34
		4, 6, 8																						
225 S	1MA6 220	4, 8	356	80	436	442	339	339	269	269	264	580	425	100	286	85	110	361	25	85	149	269	225	34
225 M	1MA6 223	2	356	80	436	442	339	339	269	269	264	580	425	100	311	85	110	361	25	85	149	244	225	34
		4, 6, 8																						
250 M	1MA6 253	2	406	100	506	505	427	427	333	333	338	645	470	120	349	100	100	409	39	95	168	283	250	42
		4, 6, 8																						
280 S	1MA6 280	2	457	100	557	555	452	452	358	358	338	700	525	120	368	100	151	471	30	95	190	317	280	42
		4, 6, 8																						
280 M	1MA6 283	2	457	100	557	555	452	452	358	358	338	700	525	120	419	100	151	471	30	95	190	366	280	42
		4, 6, 8																						
315 S	1MA6 310	2	508	120	628	620	515	515	395	395	405	805	590	134	406	125	171	527	32	90	216	358	315	52
		4, 6, 8																						
315 M	1MA6 313	2	508	120	628	620	515	515	395	395	405	805	590	134	457	125	171	527	32	90	216	307	315	52
		4, 6, 8																						
315 L	1MA6 316	2	508	120	628	620	515	515	395	395	405	805	590	134	508	120	120	578	32	90	216	396	315	52
	1MA6 317	4, 6, 8																						
	1MA6 318	6, 8																						

■ Dimensions for 9-terminal connection box can be supplied on request. ¹⁾ Measured across the bolt heads.
 * This dimension is assigned in DIN EN 50347 to the frame size listed.

IEC Squirrel-Cage Motors Explosion-proof motors

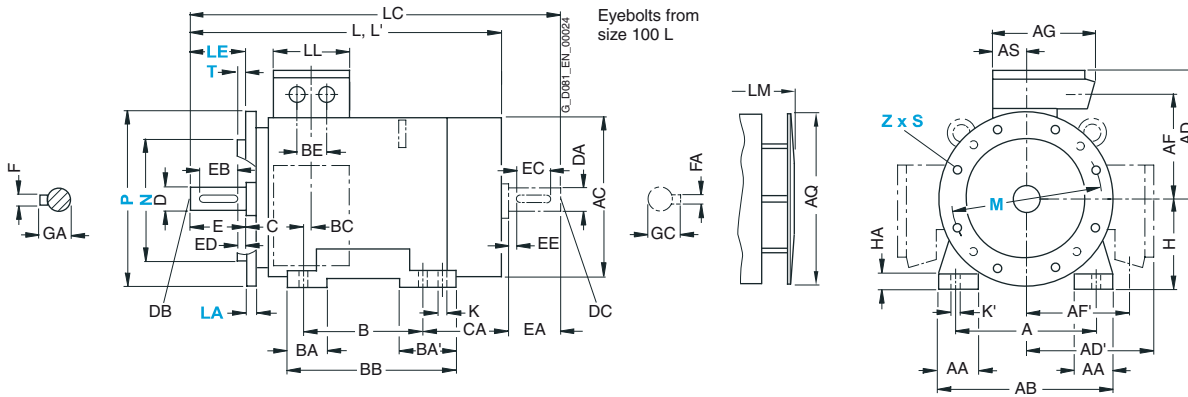
Dimensions

Dimensional drawings

Cast-iron series 1MA6, frame sizes 180 M to 315 L

Type of construction IM B35

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor		Number of poles	Dimension designation acc. to IEC							DE shaft extension					NDE shaft extension										
Frame size	Type		HH	K	K'	L	L ¹⁾	LC ²⁾	LL	LM	LM ¹⁾	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
180 M	1MA6 183	2	156	15	20	715	770	841	164	796.5	855	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
		4																							
180 L	1MA6 186	4, 6, 8	156	15	20	715	—	841	164	796.5	—	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1MA6 206	2	175	19	25		819.5	897	197	853	901	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		6				771.5	—												55	M20					16 59
	1MA6 207	2	175	19	25	771.5	819.5	897	197	853	901	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		4, 6, 8																	55	M20					16 59
225 S	1MA6 220	4, 8	174	19	25	839	—	954	200	935	—	60	M20	140	125	10	18	64	55	M20	110	100	10	16	59
225 M	1MA6 223	2	174	19	25	809	855	924	200	909	955	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		4, 6, 8				839	—	954		935	—	60		140	125	10	18	64	55	M20		100	10	16	59
250 M	1MA6 253	2	207	24	30	935	1010	1050	234	1035	1110	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
		4, 6, 8					—	1080			—	65						69	60		140	125		18	64
280 S	1MA6 280	2	220	24	30	1010	1080	1155	234	1120	1230	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8					—				75						20	79.5	65					69	
280 M	1MA6 283	2	220	24	30	1010	1080	1155	234	1120	1230	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8					—				75						20	79.5	65					69	
315 S	1MA6 310	2	248	28	35	1114	1185	1260	266	1224	1295	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8				1144	—	1290		1254	—	80		170	140		22	85	70					20	74.5
315 M	1MA6 313	2	248	28	35	1114	1185	1260	266	1224	1295	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8				1144	—	1290		1254	—	80		170	140		22	85	70					20	74.5
315 L	1MA6 316	2	248	28	35	1254	1325	1400	266	1364	1435	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1MA6 317	4, 6, 8				1284	—	1430		1394	—	80		170	140		22	85	70					20	74.5
	1MA6 318	6, 8				1284	—	1430		1394	—	80		170	140		22	85	70					20	74.5

1) For version with low-noise fan.

2) In the low-noise version, a second shaft extension is not possible.

IEC Squirrel-Cage Motors

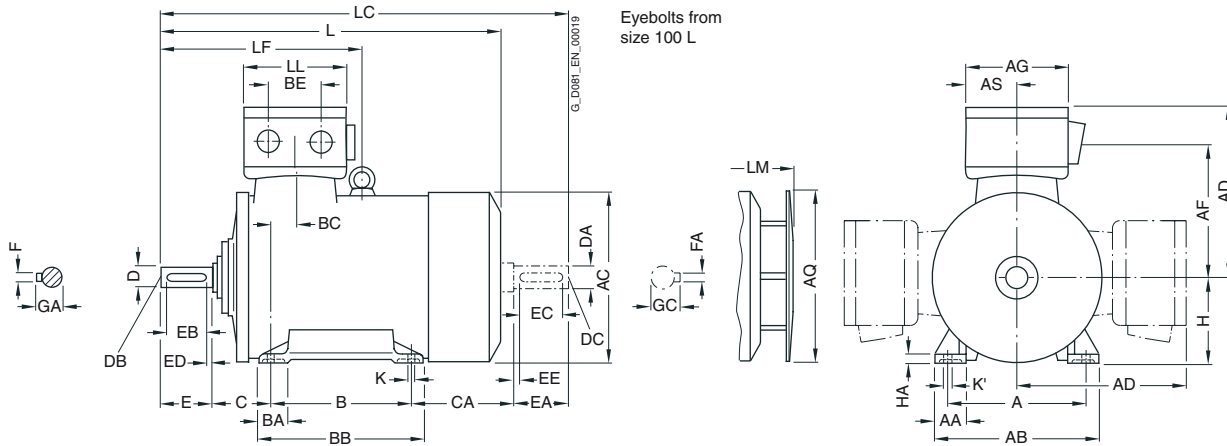
Explosion-proof motors

Dimensions

Dimensional drawings

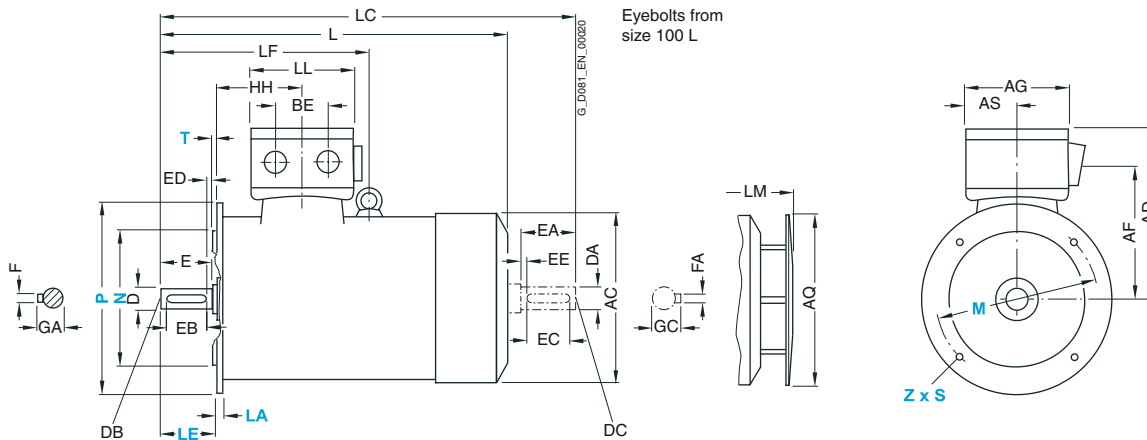
Cast-iron series 1MJ6, frame sizes 71 M to 160 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor		Number of poles	Dimension designation acc. to IEC																					
Frame size	Type		A	AA	AB	AC ¹⁾	AD	AF	AG	AQ	AS	B	BA	BB	BC	BE	C	CA	H	HA	HH	K	K'	L
71 M	1MJ6 070	2, 4	112	34	140	148.5	201 ²⁾	162	152	124	71	90	30	110	58	54	45	144	71	8	103	7	10	299
	1MJ6 073	2, 4, 6																						
80 M	1MJ6 080	2, 4, 6	125	36	160	165.5	209 ²⁾	170	152	125	71	100	35	125	44	54	50	156	80	10	93.5	9.5	13.5	336
	1MJ6 083	2, 4, 6																						
90 L	1MJ6 096	2, 4, 6, 8	140	37	168	183	218	177	162	170	81	125	35	156	54	54	56	177	90	13	109.5	10	14	383
	1MJ6 097	2, 4, 6, 8																						
100 L	1MJ6 106	2, 4, 6, 8	160	45	196	202.5	223	182	162	170	81	140	45	176	50	54	63	185	100	14	112.5	12	16	426
	1MJ6 107	4, 8																						
112 M	1MJ6 113	2, 4, 6, 8	190	50	226	228.5	238	197	162	170	81	140	45	176	52	54	70	180	112	15	121.5	12	16	428
132 S	1MJ6 130	2, 4, 6, 8	216	53	256	267.5	258	217	162	250	81	140	49	180	55	54	89	228	132	17	144	12	16	515
	1MJ6 131	2																						
132 M	1MJ6 133	4, 6, 8	216	53	256	267.5	258	217	162	250	81	178	49	218	55	54	89	190	132	17	144	12	16	515
	1MJ6 134	6																						
160 M	1MJ6 163	2, 4, 6, 8	254	60	300	323	280	239	162	250	81	210	57	256	40	54	108	238	160	20	148	15	19	641
	1MJ6 164	2, 8																						
160 L	1MJ6 166	2, 4, 6, 8	254	60	300	323	314	246	216	250	95	254	57	300	40	96	108	194	160	20	148	15	19	641

¹⁾ Measured across the bolt heads.

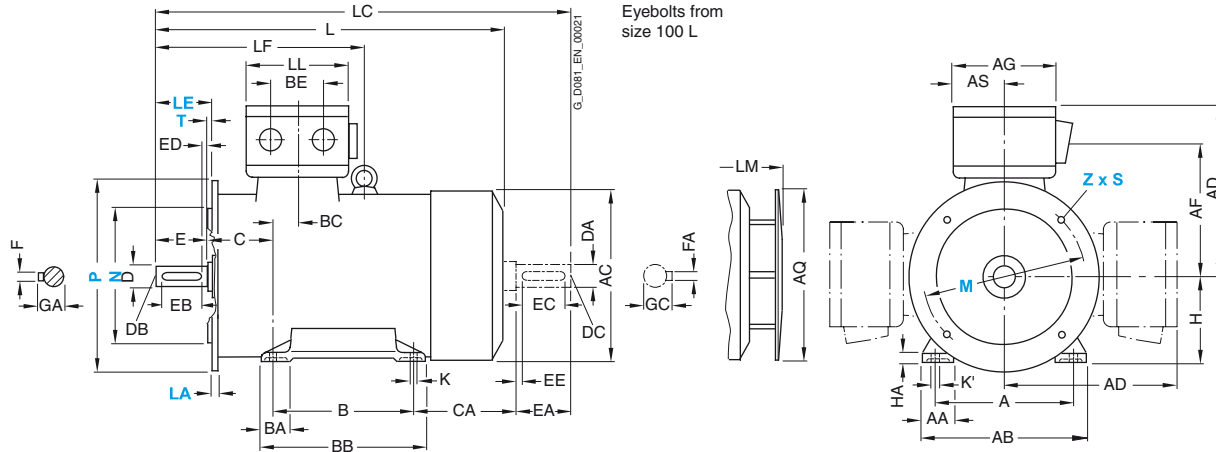
²⁾ K09 and K10 frame size 90 and above.

Dimensional drawings

Cast-iron series 1MJ6, frame sizes 71 M to 160 L

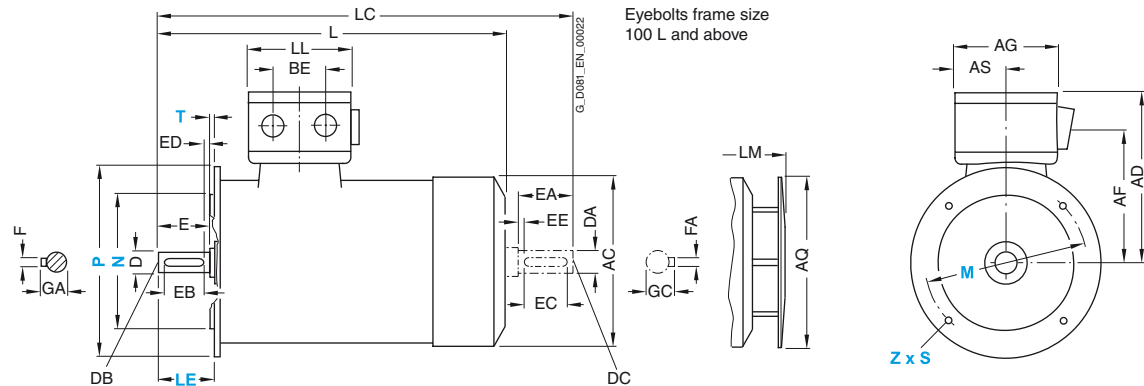
Type of construction IM B35

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



Type of construction IM B14 – only for frame sizes 71 M to 90 L

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor Frame size	Type	Number of poles	Dimension designation acc. to IEC										DE shaft extension							NDE shaft extension						
			LC	LF	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC						
71 M	1MJ6 070	2, 4	339	-	132	327	14	M5	30	22	4	5	16	14	M5	30	22	4	5	16						
	1MJ6 073	2, 4, 6																								
80 M	1MJ6 080	2, 4, 6	386	-	132	362	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5						
	1MJ6 083	2, 4, 6																								
90 L	1MJ6 096	2, 4, 6, 8	458	-	162	434.5	24	M8	50	40	5	8	27	24	M8	50	40	5	8	27						
	1MJ6 097	2, 4, 6, 8																								
100 L	1MJ6 106	2, 4, 6, 8	508	-	162	477.5	28	M10	60	50	5	8	31	28	M10	60	50	5	8	31						
	1MJ6 107	4, 8																								
112 M	1MJ6 113	2, 4, 6, 8	510	-	162	479.5	28	M10	60	50	5	8	31	28	M10	60	50	5	8	31						
132 S	1MJ6 130	2, 4, 6, 8	617	-	162	567.5	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41						
	1MJ6 131	2																								
132 M	1MJ6 133	4, 6, 8	617	-	162	567.5	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41						
	1MJ6 134	6																								
160 M	1MJ6 163	2, 4, 6, 8	776	383	162	693.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45						
	1MJ6 164	2, 8																								
160 L	1MJ6 166	2, 4, 6, 8	776	383	190	693.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45						

IEC Squirrel-Cage Motors

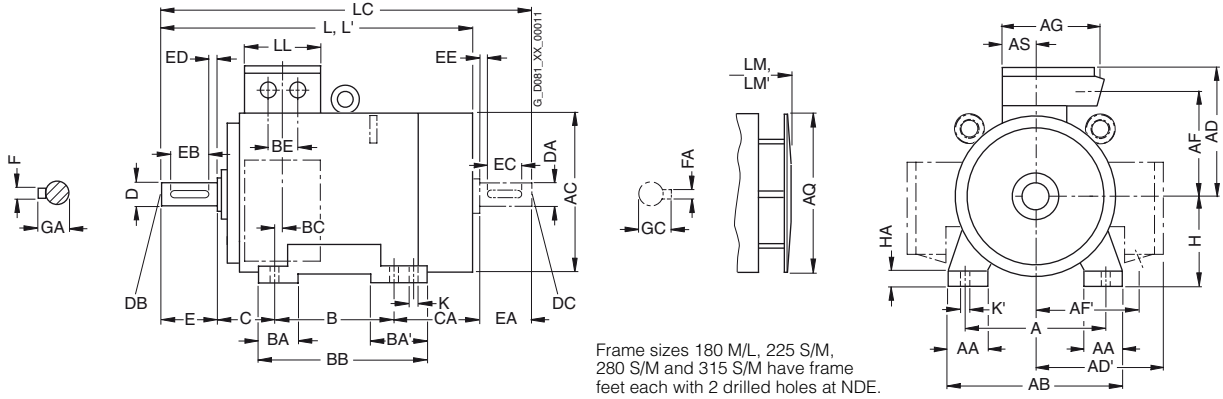
Explosion-proof motors

Dimensions

Dimensional drawings

Cast-iron series 1MJ6 and 1MJ7, frame sizes 180 M to 315 M

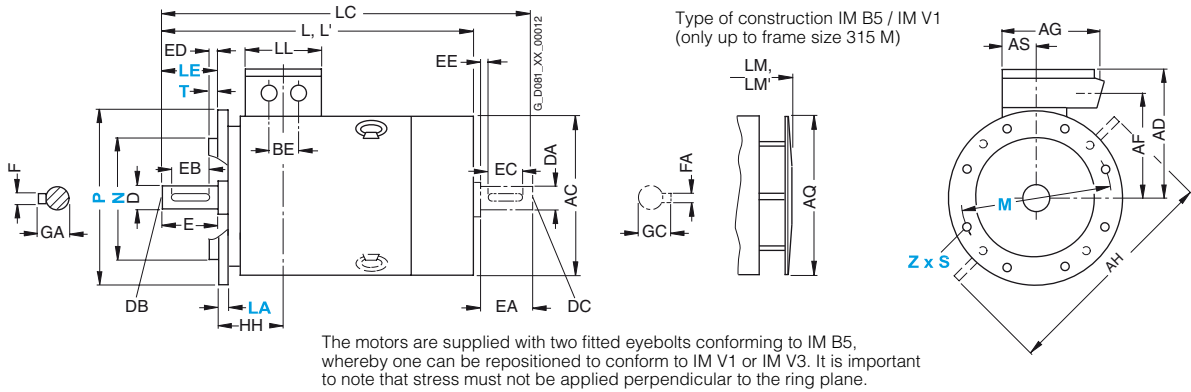
Type of construction IM B3



4

Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																						
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HH	HA
180 M	1MJ6 183	2, 4	279	65	344	375	306	306	259	259	220	470	340	82	241	70	108	319	35	75	121	259	180	156	26
180 L	1MJ6 186	4, 6, 8	279	65	344	375	306	306	259	259	220	470	340	82	279	70	108	319	35	75	121	221	180	156	26
200 L	1MJ6 206	2	318	80	398	415	349	349	289	289	262	530	340	98.5	305	85	85	355	42	85	133	239	200	175	34
	1MJ6 207	2	318	80	398	415	349	349	289	289	262	530	340	98.5	305	85	85	355	42	85	133	239	200	175	34
225 S	1MJ7 220	4, 8	356	80	436	442	377	377	315	315	262	580	425	100	286	85	110	361	25	90	149	269	225	174	34
	225 M	1MJ7 223	2	356	80	436	442	377	377	315	315	262	580	425	100	311	85	110	361	25	90	149	244	225	174	34
250 M	1MJ7 253	2	406	100	506	505	466	466	353	353	336	645	470	120	349	100	100	409	39	95	168	283	250	207	42
	1MJ7 280	2	457	100	557	555	491	491	395	395	336	700	525	120	368	100	151	479	30	95	190	317	280	220	42
280 M	1MJ7 283	2	457	100	557	555	491	491	395	395	336	700	525	120	419	100	151	479	30	95	190	266	280	220	42
	1MJ7 283	4, 6, 8	457	100	557	555	491	491	395	395	336	700	525	120	419	100	151	479	30	95	190	266	280	220	42
315 S	1MJ7 310	2	508	120	628	620	558	558	448	448	410	805	590	135	406	125	171	527	32	90	216	358	315	248	56
	1MJ7 313	2	508	120	628	620	558	558	448	448	410	805	590	135	457	125	171	527	32	90	216	307	315	248	56
315 M	1MJ7 310	4, 6, 8	508	120	628	620	558	558	448	448	410	805	590	135	406	125	171	527	32	90	216	358	315	248	56
	1MJ7 313	2	508	120	628	620	558	558	448	448	410	805	590	135	457	125	171	527	32	90	216	307	315	248	56
315 M	1MJ7 313	4, 6, 8	508	120	628	620	558	558	448	448	410	805	590	135	457	125	171	527	32	90	216	307	315	248	56

* This dimension is assigned in DIN EN 50347 to the frame size listed.

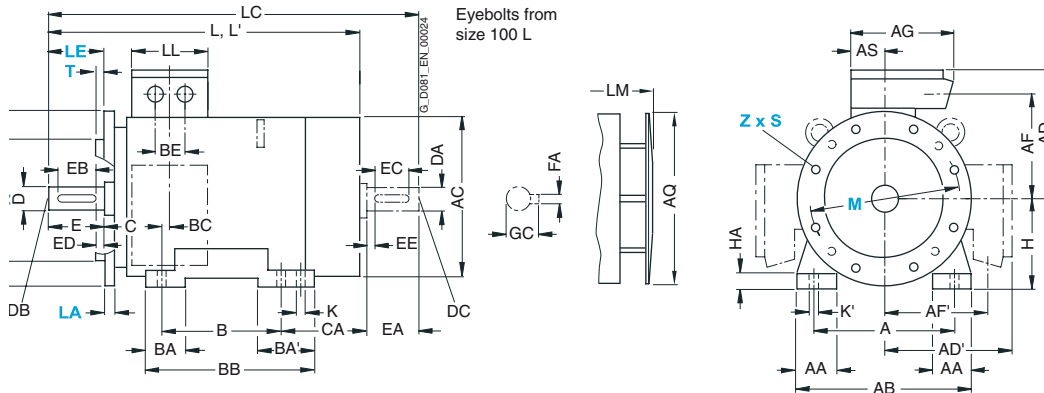
¹⁾ Measured across the bolt heads.

Dimensional drawings

Cast-iron series 1MJ6 and 1MJ7, frame sizes 180 M to 315 M

Type of construction IM B35

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor		Number of poles	Dimension designation acc. to IEC									DE shaft extension						NDE shaft extension							
Frame size	Type		K	K'	L	L ⁽¹⁾	LC ⁽²⁾	LL	LM	LM ⁽¹⁾	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC	
180 M	1MJ6 183	2, 4	15	20	715	770	841	164	796.5	885	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5	
180 L	1MJ6 186	4, 6, 8	15	20	715	—	841	164	796.5	—	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5	
200 L	1MJ6 206	2	19	25	771.5	825	897	197	853	910	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5	
	1MJ6 207	2	19	25	771.5	825	897	197	853	910	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5	
		4, 6, 8				—				—							55	M20						16	59
225 S	1MJ7 220	4, 8	19	25	839	—	954	197	939	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59	
225 M	1MJ7 223	2	19	25	809	855	924	197	909	955	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5	
		4, 6, 8			839	—	954	197	939	—	60		140	125	10	18	64	55	M20					16	59
250 M	1MJ7 253	2	24	30	930	1010	1050	234	1035	1110	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59	
		4, 6, 8				—	1080			—	65						69	60			140	125	10	18	64
280 S	1MJ7 280	2	24	30	1010	1080	1155	234	1120	1230	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
		4, 6, 8				—				—	75						20	79.5	65					69	
280 M	1MJ7 283	2	24	30	1010	1080	1155	234	1120	1230	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
		4, 6, 8				—				—	75						20	79.5	65					69	
315 S	1MJ7 310	2	28	35	1114	1185	1260	266	1224	1295	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
		4, 6, 8			1140	—	1290		1250	—	80		170	140				22	85	70				20	74.5
315 M	1MJ7 313	2	28	35	1114	1185	1260	266	1224	1295	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
		4, 6, 8			1140	—	1290		1250	—	80		170	140				22	85	70				20	74.5

¹⁾ For version with low-noise fan.

²⁾ In the low-noise version, a second shaft extension is not possible.

IEC Squirrel-Cage Motors

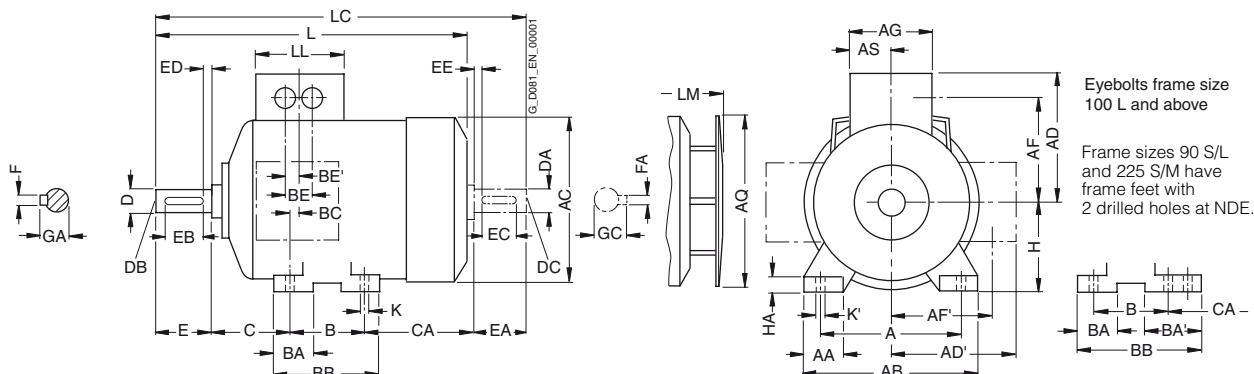
Explosion-proof motors

Dimensions

Dimensional drawings

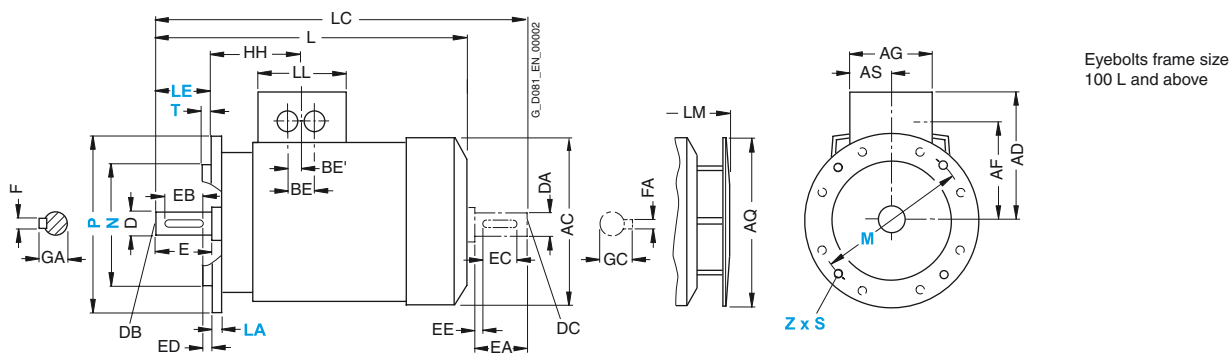
Aluminum series 1LA7 and 1LA5, frame sizes 56 M to 225 M

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																						
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AQ	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H	HA
56 M ²⁾	1LA7 050 1LA7 053	2, 4	90	25	110	116	135	135	95	95	120	-	37	71	28	-	87	56	32	18	36	53	56	6
63 M	1LA7 060 1LA7 063	2, 4, 6	100	27	120	124	135	135	95	95	120	124	37	80	28	-	96	52	32	18	40	66	63	7
71 M	1LA7 070 1LA7 073	2, 4, 6, 8	112	27	132	145	145	145	105	105	120	124	37	90	27	-	106	41	32	18	45	83	71	7
80 M	1LA7 080 1LA7 083	2, 4, 6, 8	125	30.5	150	163	154	154	114	114	120	124	37.5	100	32	-	118	36	32	18	50	94	80	8
90 S 90 L	1LA7 090 1LA7 096	2, 4, 6, 8	140	30.5	165	180	162	162	122	122	120	170	37.5	100 125	33	54	143	45.5	32	18	56	143 118	90	10
100 L	1LA7 106 1LA7 107	2, 4, 6, 8 4, 8	160	42	196	203	135	163	78	123	120	170	60	140	47	-	176	39	42	21	63	125	100	12
112 M	1LA7 113	2, 4, 6, 8	190	46	226	227	148	176	91	136	120	170	60	140	47	-	176	32	42	21	70	141	112	12
132 S	1LA7 130 1LA7 131 2	2, 4, 6, 8	216	53	256	267	167	194	107	154	140	250	70	140	49	-	180	39	42	21	89	162.5	132	15
132 M	1LA7 133 1LA7 134	4, 6, 8 6	216	53	256	267	167	194	107	154	140	250	70	178	49	-	218	39	42	21	89	124.5	132	15
160 M	1LA7 163 1LA7 164	2, 4, 6, 8 2, 8	254	60	300	320	197	226	127	183	165	250	82.5	210	57	-	256	52.5	54	27	108	183	160	18
160 L	1LA7 166	2, 4, 6, 8	254	60	300	320	197	226	127	183	165	250	82.5	254	57	-	300	52.5	54	27	108	139	160	18
180 M	1LA5 183	2, 4	279	69.5	339	363	258	258	216	216	152	340	71	241	50	-	287	38	54	27	121	259	180	18
180 L	1LA5 186	4, 6, 8	279	69.5	339	363	258	258	216	216	152	340	71	279	50	-	325	38	54	27	121	221	180	18
200 L	1LA5 206 1LA5 207	2, 6 2, 4, 6, 8	318	83	388	402	305	305	252	252	260	340	96	305	58.5	-	355	45	85	42.5	133	239	200	24
225 S	1LA5 220	4, 8	356	103	426	402	305	305	252	252	260	340	96	286	58	83	361	36	85	42.5	149	248.5	225	24
225 M	1LA5 223	2 4, 6, 8	356	103	426	402	305	305	252	252	260	340	96	311	58	83	361	36	85	42.5	149	223.5	225	24

* This dimension is assigned in DIN EN 50347 to the frame size listed.

²⁾ The motors of frame size 56 M are not ventilated.

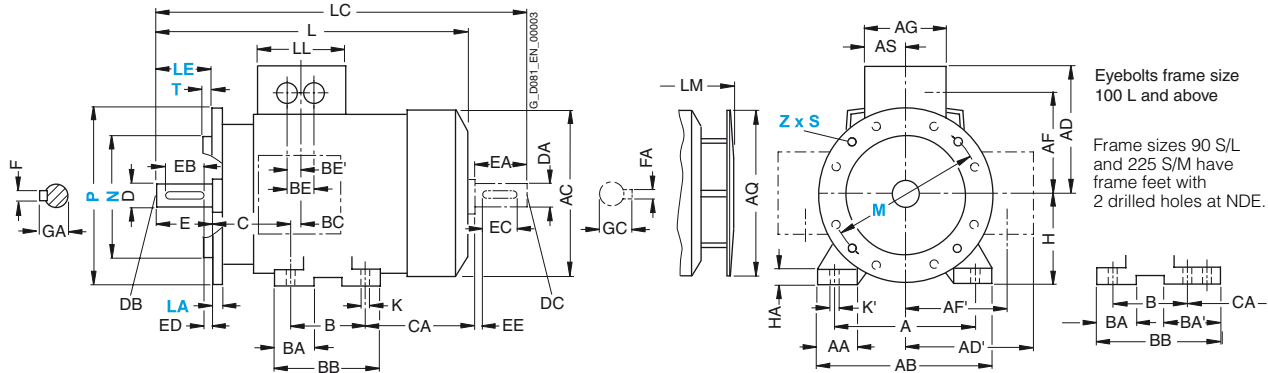
¹⁾ Measured across the bolt heads.

Dimensional drawings

Aluminum series 1LA7 and 1LA5, frame sizes 56 M to 225 M

Type of construction IM B35

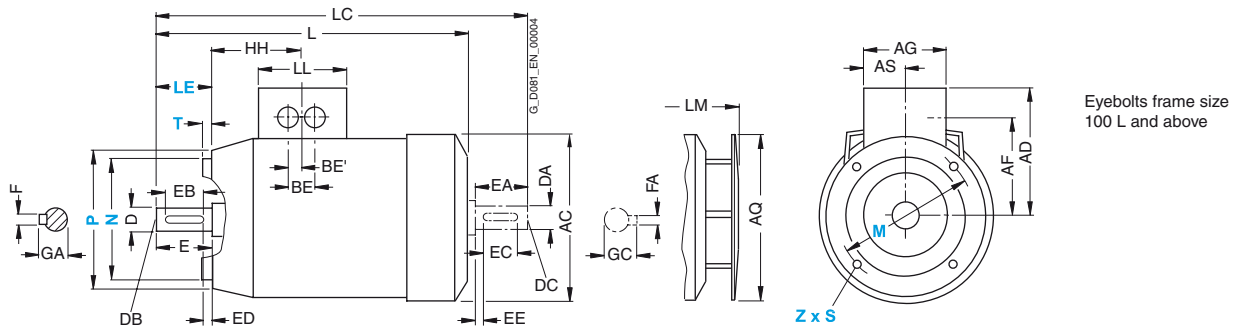
For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



Type of construction IM B14

Type of construction IM B14 not possible for 1LA5 motors, frame sizes 180 M to 225 M

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC								DE shaft extension					NDE shaft extension								
Frame size	Type	Number of poles	HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
56 M ¹⁾	1LA7 050 1LA7 053	2, 4	69.5	5.8	9	169	200	120	-	9	M3	20	14	3	3	10.2	9	M3	20	14	3	3	10.2
63 M	1LA7 060 1LA7 063	2, 4, 6	69.5	7	10	202.5 ²⁾	232 ²⁾	120	231.5 ²⁾	11	M4	23	16	3.5	4	12.5	11	M4	23	16	3.5	4	12.5
71 M	1LA7 070 1LA7 073	2, 4, 6, 8	63.5	7	10	240	278	120	268	14	M5	30	22	4	5	16	14	M5	30	22	4	5	16
80 M	1LA7 080 1LA7 083	2, 4, 6, 8	63.5	9.5	13.5	273.5	324 364	120	299.5	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5
90 S 90 L	1LA7 090 1LA7 096	2, 4, 6, 8	79	10	14	331	389	120	382.5	24	M8	50	40	5	8	27	19	M6	40	32	4	6	21.5
100 L	1LA7 106 1LA7 107	2, 4, 6, 8 4, 8	102	12	16	372	438	120	423.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
112 M	1LA7 113	2, 4, 6, 8	102	12	16	393	461	120	444.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1LA7 130 1LA7 131 2	2, 4, 6, 8	128	12	16	452.5 ³⁾	551.5	140	505 ³⁾	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
132 M	1LA7 133 1LA7 134 6	4, 6, 8	128	12	16	452.5 ³⁾	551.5	140	505 ³⁾	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
160 M	1LA7 163 1LA7 164 2, 8	2, 4, 6, 8 2, 8	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
160 L	1LA7 166	2, 4, 6, 8	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
180 M	1LA5 183	2, 4	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1LA5 186	4, 6, 8	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LA5 206 1LA5 207	2, 6 2, 4, 6, 8	178	19	25	769.5	897	192	850	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
225 S	1LA5 220	4, 8	184.5	19	25	806	933.5	192	887.5	60	M20	140	125	7.5	18	64	55	M20	110	100	5	16	59
225 M	1LA5 223	2 4, 6, 8	184.5	19	25	776 806	903.5 933.5	192	857.5 887.5	55 60	M20	110 140	100 125	5 7.5	16 18	59 64	55	M20	110	100	5	16	59

¹⁾ The motors of frame size 56 M are not ventilated.

²⁾ For 1LA7 063 with type of construction code 1 (B5, IM V1 without protective cover, IM V3) the dimensions L, LC and LM are 26 mm longer.

³⁾ In a low-noise version, the dimension L is 8 mm greater and the dimension LM is 11.5 mm greater.

IEC Squirrel-Cage Motors

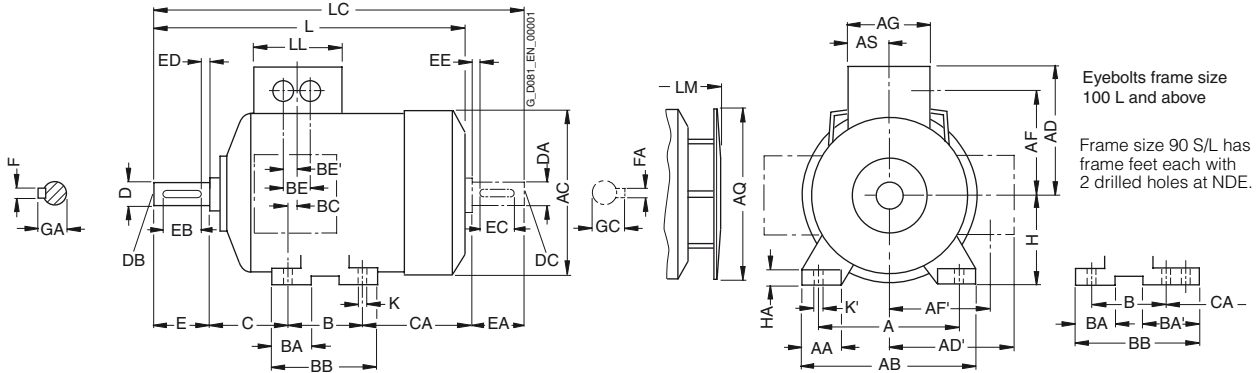
Explosion-proof motors

Dimensions

Dimensional drawings

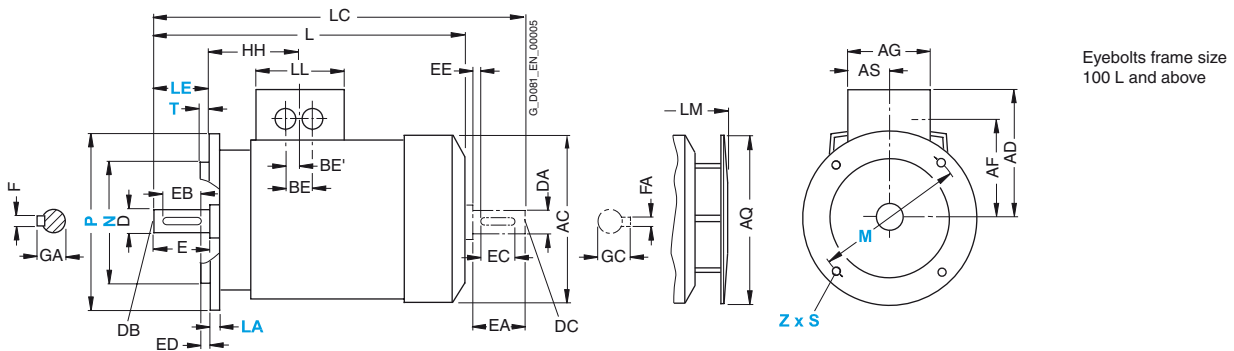
Aluminum series 1LA9, frame sizes 56 M to 200 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																						
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AQ	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H	HA
56 M ²⁾	1LA9 050	2, 4	90	25	110	116	135	135	95	95	120	-	37	71	28	-	87	56	32	18	36	53	56	6
	1LA9 053																							
63 M	1LA9 060	2, 4	100	27	120	124	135	135	95	95	120	124	37	80	28	-	96	52	32	18	40	66	63	7
	1LA9 063																							
71 M	1LA9 070	2, 4	112	30.5	132	145	145	145	105	105	120	124	37	90	27	-	106	41	32	18	45	83	71	7
	1LA9 073																							
80 M	1LA9 080	2, 4	125	30.5	150	163	154	154	114	114	120	124	37.5	100	32	-	118	36	32	18	50	94	80	8
	1LA9 083																							
90 S	1LA9 090	2, 4, 6	140	30.5	165	180	162	162	122	122	120	170	37.5	100	33	54	143	45.5	32	18	56	143	90	10
100 L	1LA9 106	2, 4, 6	160	42	196	203	135	163	78	123	120	170	60	140	47	-	176	39	42	21	63	160	100	12
	1LA9 107																							
112 M	1LA9 113	2, 4, 6	190	46	226	227	148	176	91	136	120	170	60	140	47	-	176	32	42	21	70	179	112	12
132 S	1LA9 130	2, 4	216	53	256	267	167	194	107	154	140	250	70	140	49	-	180	39	42	21	89	162.5	132	15
	1LA9 131																							
132 M	1LA9 133	2	216	53	256	267	167	194	107	154	140	250	70	178	49	-	218	39	42	21	89	124.5	132	15
	1LA9 133	4																						
	1LA9 134	6																						
160 M	1LA9 163	2, 4, 6	254	60	300	320	197	226	127	183	165	250	82.5	210	57	-	256	52.5	54	27	108	183	160	18
	1LA9 164																							
160 L	1LA9 166	2, 4, 6	254	60	300	320	197	226	127	183	165	250	82.5	254	57	-	300	52.5	54	27	108	179	160	18
180 M	1LA9 183	2, 4	279	69.5	339	363	258	258	216	216	152	340	71	241	50	-	287	38	54	27	121	259	180	18
180 L	1LA9 186	4, 6	279	69.5	339	363	258	258	216	216	152	340	71	279	50	-	325	38	54	27	121	221	180	18
200 L	1LA9 206	2, 6	318	83	388	402	305	305	252	252	260	340	96	305	58.5	-	355	45	85	42.5	133	239	200	24
	1LA9 207																							

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ Measured across the bolt heads.

²⁾ The motors of frame size 56 M are not ventilated. Frame size 56 M is not available in IM B35.

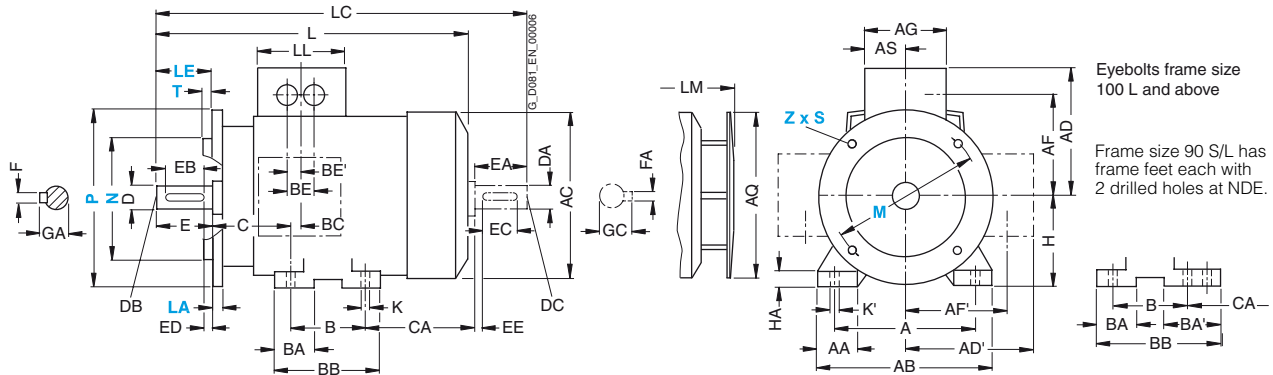
³⁾ For 1LA9 107-4KA.

Dimensional drawings

Aluminum series 1LA9, frame sizes 56 M to 200 L

Type of construction IM B35

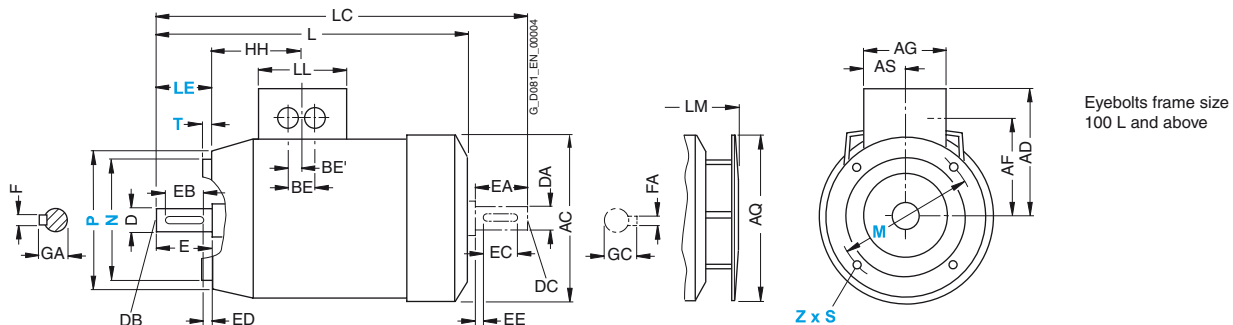
For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



Type of construction IM B14

Type of construction IM B14 not possible for 1LA9 motors, frame sizes 180 M to 200 L

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor		Number of poles	Dimension designation acc. to IEC							DE shaft extension					NDE shaft extension								
Frame size	Type		HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
56 M ¹⁾	1LA9 050	2, 4	69.5	5.8	9	169 ²⁾	200 ²⁾	120	-	9	M3	20	14	3	3	10.2	9	M3	20	14	3	3	10.2
	1LA9 053																						
63 M	1LA9 060	2, 4	69.5	7	10	202.5 ³⁾	232 ³⁾	120	231.5	11	M4	23	16	3.5	4	12.5	11	M4	23	16	3.5	4	12.5
	1LA9 063																						
71 M	1LA9 070	2, 4	63.5	7	10	240	278	120	268	14	M5	30	22	4	5	16	14	M5	30	22	4	5	16
	1LA9 073																						
80 M	1LA9 080	2, 4	63.5	9.5	13.5	273.5	324	120	299.5	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5
	1LA9 083																						
90 S	1LA9 090	2, 4, 6	79	10	14	331	389	120	382.5	24	M8	50	40	5	8	27	19	M6	40	32	4	6	21.5
100 L	1LA9 106	2, 4, 6	102	16	16	407	473	120	458.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
	1LA9 107																							442^{6)}	508^{6)}	493^{6)}
112 M	1LA9 113	2, 4, 6	102	12	16	431	499	120	482.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1LA9 130	2, 4	128	12	16	452.5	551.5	140	505	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
	1LA9 131																							490.5	589.5	543
132 M	1LA9 133	6	128	12	16	452.5	551.5	140	505	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
	1LA9 133																							490.5	589.5	543
160 M	1LA9 163	2, 4, 6	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
	1LA9 164																							2
160 L	1LA9 166	2, 4, 6	160.5	15	19	628	761	165	680.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
180 M	1LA9 183	2, 4	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1LA9 186	4, 6	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LA9 206	2, 6	178	19	25	768.5	897	192	850	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
	1LA9 207																							2, 4, 6

¹⁾ The motors of frame size 56 M are not ventilated. Frame size 56 M is not available in IM B35.

²⁾ For 1LA9 frame size 56 M with type of construction code 1 (B5, IM V1 without protective cover, IM V3) the dimensions L, LC and LM are 26 mm longer.

³⁾ For 1LA9 060 with type of construction code 1 (B5, IM V1 without protective cover, IM V3) the dimensions L, LC and LM are 26 mm longer.

⁴⁾ For 1LA9 096-6KA.

⁵⁾ For 1LA9 096-2 and 1LA9 096-4.

⁶⁾ For 1LA9 107-4KA.

IEC Squirrel-Cage Motors

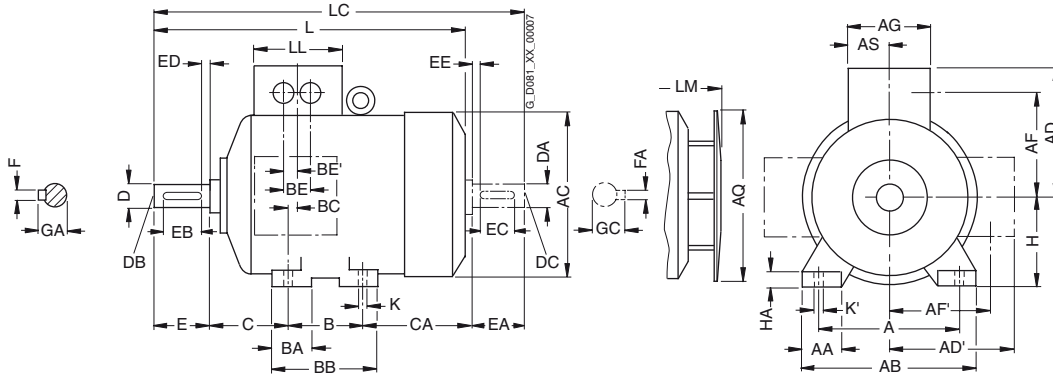
Explosion-proof motors

Dimensions

Dimensional drawings

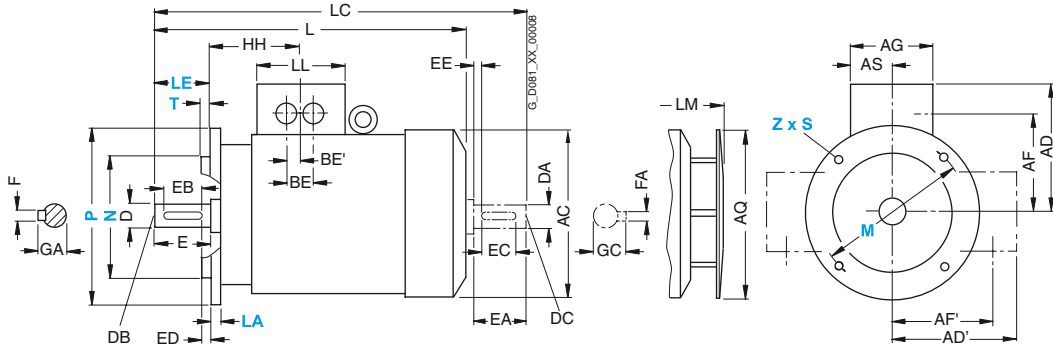
Cast-iron series 1LA6, frame sizes 100 L to 160 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



4

For motor			Dimension designation acc. to IEC																				
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AQ	AS	B	BA	BB	BC	BE	BE'	C	CA	H	HA
100 L	1LA6 106	2, 4, 6, 8	160	40	196	201	164	164	124	124	121	170	60.5	140	46	180	42	44	22	63	125	100	12
	1LA6 107	4, 8																					
112 M	1LA6 113	2, 4, 6, 8	190	42.5	226	225.5	178	178	138	138	121	170	60.5	140	46	180	34	44	22	70	141	112	15
132 S	1LA6 130	2, 4, 6, 8	216	50	256	265	194	194	154	154	141	250	70.5	140	47	180	42	44	22	89	162.5	132	17
	1LA6 131	2																					
132 M	1LA6 133	4, 6, 8	216	50	256	265	194	194	154	154	141	250	70.5	178	49	218	42	44	22	89	124.5	132	17
	1LA6 134	6																					
160 M	1LA6 163	2, 4, 6, 8	254	60	300	320	226	226	183	183	166	250	83	210	63	256	52	54	27	108	183	160	18
	1LA6 164	2, 8																					
160 L	1LA6 166	2, 4, 6, 8	254	60	300	320	226	226	183	183	166	250	83	254	63	300	52	54	27	108	139	160	18

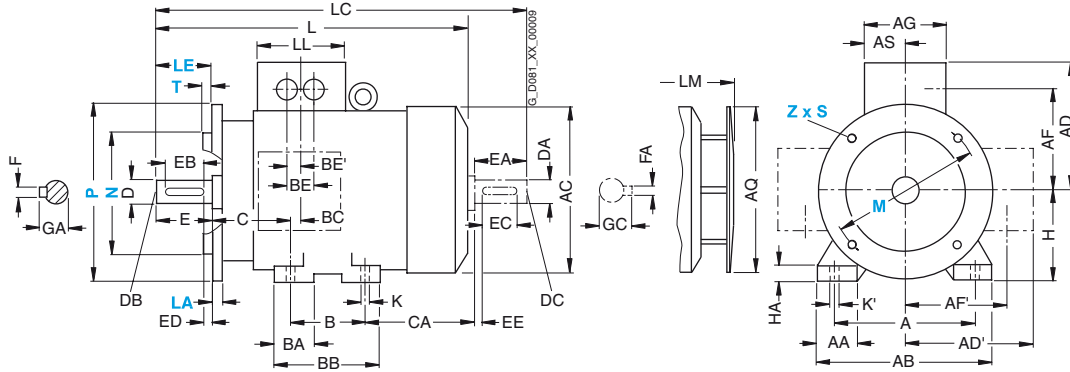
¹⁾ Measured across the bolt heads.

Dimensional drawings

Cast-iron series 1LA6, frame sizes 100 L to 160 L

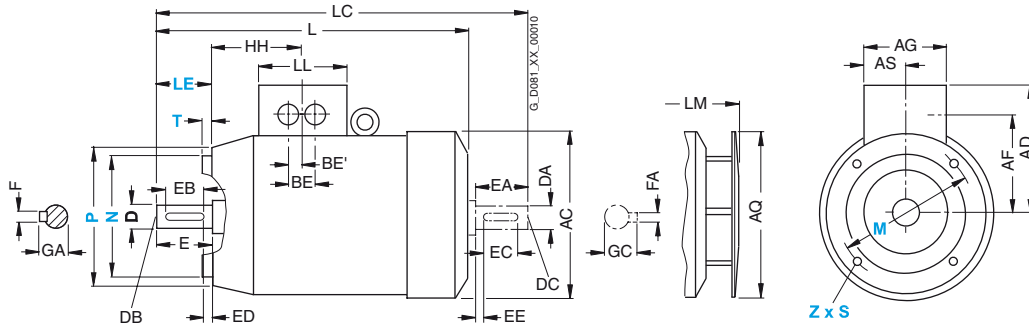
Type of construction IM B35

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



Types of construction IM B14

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor		Number of poles	Dimension designation acc. to IEC							DE shaft extension					NDE shaft extension								
Frame size	Type		HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
100 L	1LA6 106	2, 4, 6, 8	104.5	12	16	372	438	121	423.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
	1LA6 107	4, 8																					
112 M	1LA6 113	2, 4, 6, 8	104.5	12	16	393	461	121	444.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1LA6 130	2, 4, 6, 8	130.5	12	16	453.5	551.5	141	506	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
	1LA6 131	2																					
132 M	1LA6 133	4, 6, 8	130.5	12	16	453.5	551.5	141	506	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
	1LA6 134	6																					
160 M	1LA6 163	2, 4, 6, 8	160	14.5	18	588	721	166	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
	1LA6 164	2, 8																					
160 L	1LA6 166	2, 4, 6, 8	160	14.5	18	588	721	166	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45

IEC Squirrel-Cage Motors

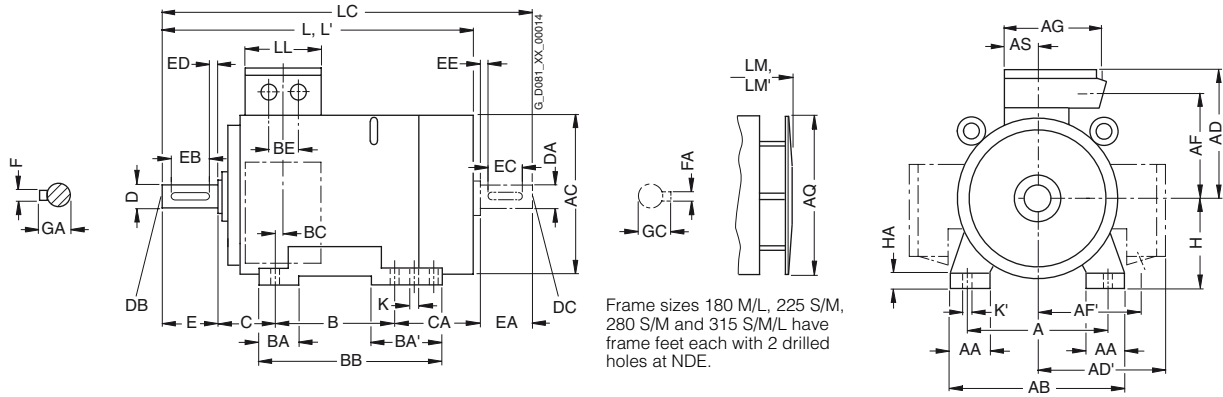
Explosion-proof motors

Dimensions

Dimensional drawings

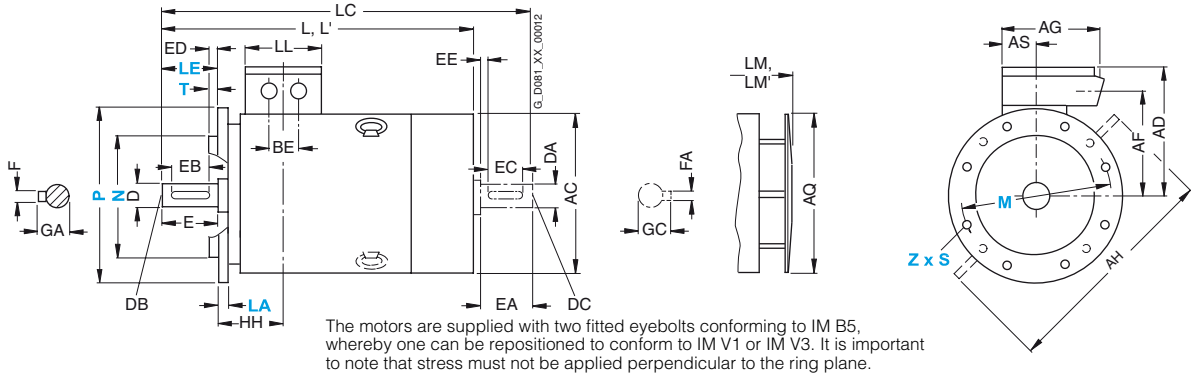
Cast-iron series 1LG4, frame sizes 180 M to 315 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																						
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA
180 M	1LG4 183	2, 4	279	65	339	363	262	262	220	220	152	452	340	71	241	70	111	328	36	54	121	202	180	20
	180 L	4, 6, 8	279	65	339	363	262	262	220	220	152	452	340	71	279	70	111	328	36	54	121	164	180	20
	1LG4 188	2, 4, 6, 8	279	65	339	363	262	262	220	220	152	452	340	71	279	70	111	328	36	54	121	215	180	20
200 L	1LG4 206	2, 6	318	70	378	402	300	300	247	247	260	512	340	96	305	80	80	355	63	85	133	177	200	25
	1LG4 207	2, 4, 6, 8	318	70	378	402	300	300	247	247	260	512	340	96	305	80	80	355	63	85	133	177	200	25
	1LG4 208	2, 6, 4, 8	318	70	378	402	300	300	247	247	260	512	340	96	305	80	80	355	63	85	133	234	200	25
																								177
225 S	1LG4 220	4, 8	356	80	436	442	325	325	272	272	260	556	425	96	286	85	110	361	47	85	149	218	225	34
225 M	1LG4 223	2	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	193	225	34
	1LG4 228	4, 6, 8	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	253	225	34
250 M	1LG4 253	2	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	235	250	40
	1LG4 258	4, 6, 8	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	235	250	40
		2																					305	235
280 S	1LG4 280	2, 4, 6, 8	457	100	540	555	432	432	348	348	300	672	525	118	368	100	151	479	62	110	190	267	280	40
280 M	1LG4 283	2	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	216	280	40
	1LG4 288	4, 6, 8	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40
		2																						
315 S	1LG4 310	2	508	120	610	610	500	500	400	400	380	780	590	154	406	125	176	527	69	110	216	315	315	50
	1LG4 310	4, 6, 8																						
315 M ²⁾	1LG4 313	2	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	527	69	110	216	264	315	50
	1LG4 313	4, 6, 8																						
315 L ²⁾	1LG4 316/317	2	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50
	1LG4 316/317	4, 6, 8																						
	1LG4 318	8																						
	1LG4 318	6	508	120	610	610	500	500	400	400	380	780	590	154	508	155	206	648	69	110	216	513	315	50

* This dimension is assigned in DIN EN 50347 to the frame size listed.

1) Measured across the bolt heads.

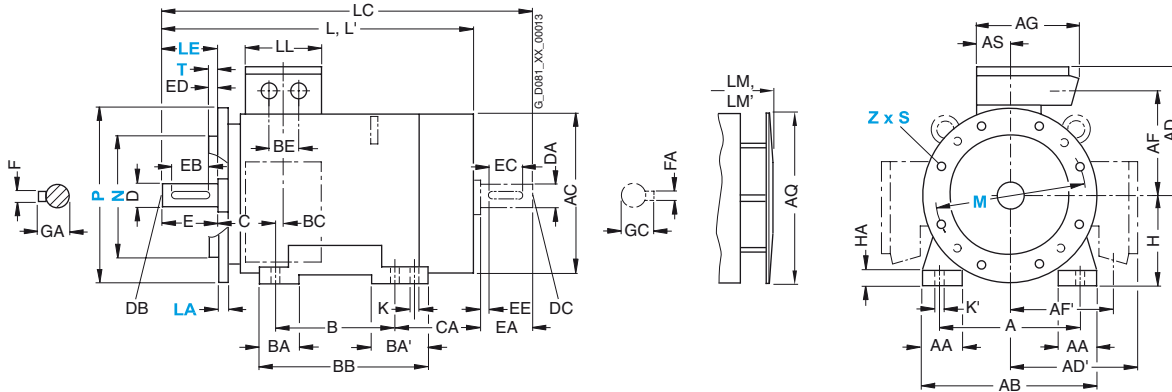
2) With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

Dimensional drawings

Cast-iron series 1LG4, frame sizes 180 M to 315 L

Type of construction IM B35

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor Frame size	Type	Number of poles	Dimension designation acc. to IEC								DE shaft extension					NDE shaft extension									
			HH	K	K'	L	L ⁽¹⁾	LC ⁽²⁾	LL	LM	LM ⁽¹⁾	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
180 M	1LG4 183	2, 4	157	15	19	669	669	784	132	759	759	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1LG4 186	4, 6, 8	157	15	19	669	—	784	132	759	—	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
	1LG4 188	2, 4, 6, 8	157	15	19	720	720	835	132	810	810	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LG4 206	2, 6	196	19	25	720	754	835	192	810	844	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
	1LG4 207	2, 4, 6, 8	196	19	25	720	754	835	192	810	844	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
	1LG4 208	2, 6	196	19	25	777	811	892	192	867	901	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
		4, 8	—	—	—	720	—	835	—	810	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
225 S	1LG4 220	4, 8	196	19	25	789	—	903	192	889	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
225 M	1LG4 223	2	196	19	25	759	793	873	192	859	893	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		4, 6, 8	—	—	—	789	—	903	—	889	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
	1LG4 228	2	196	19	25	819	853	933	192	919	953	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		4, 6, 8	—	—	—	849	—	963	—	949	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
250 M	1LG4 253	2	237	24	30	887	924	1002	236	987	1024	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
		4, 6, 8	—	—	—	—	—	1032	—	—	—	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG4 258	2	237	24	30	887	924	1002	236	987	1024	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
		4	—	—	—	957	—	1102	—	1057	—	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		6, 8	—	—	—	887	—	1032	—	987	—	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
280 S	1LG4 280	2	252	24	30	960	998	1105	236	1070	1108	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8	—	—	—	—	—	—	—	—	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
280 M	1LG4 283	2	252	24	30	960	998	1105	236	1070	1108	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8	—	—	—	—	—	—	—	—	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
	1LG4 288	2	252	24	30	1070	1108	1215	236	1180	1218	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4	—	—	—	—	—	—	—	—	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
		6, 8	—	—	—	960	—	1105	—	1070	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
315 S	1LG4 310	2	285	28	35	1072	1142	1217	307	1182	1252	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG4 310	4, 6, 8	—	—	—	1102	—	1247	—	1212	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 M ³⁾	1LG4 313	2	285	28	35	1072	1142	1217	307	1182	1252	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG4 313	4, 6, 8	—	—	—	1102	—	1247	—	1212	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 L ³⁾	1LG4 316/317	2	285	28	35	1232	1302	1377	307	1342	1412	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG4 316/317	4, 6, 8	—	—	—	1262	—	1407	—	1372	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG4 318	8	—	—	—	—	—	—	—	—	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG4 318	6	285	28	35	1402	—	1547	307	1512	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5

1) For version with low-noise fan for 2-pole motors.

2) In the low-noise version, a second shaft extension is not possible.

3) With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

IEC Squirrel-Cage Motors

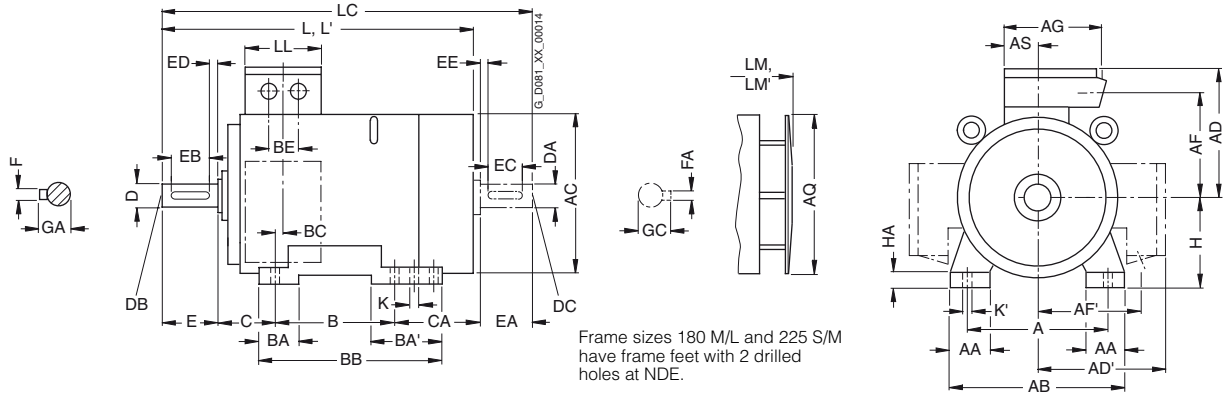
Explosion-proof motors

Dimensions

Dimensional drawings

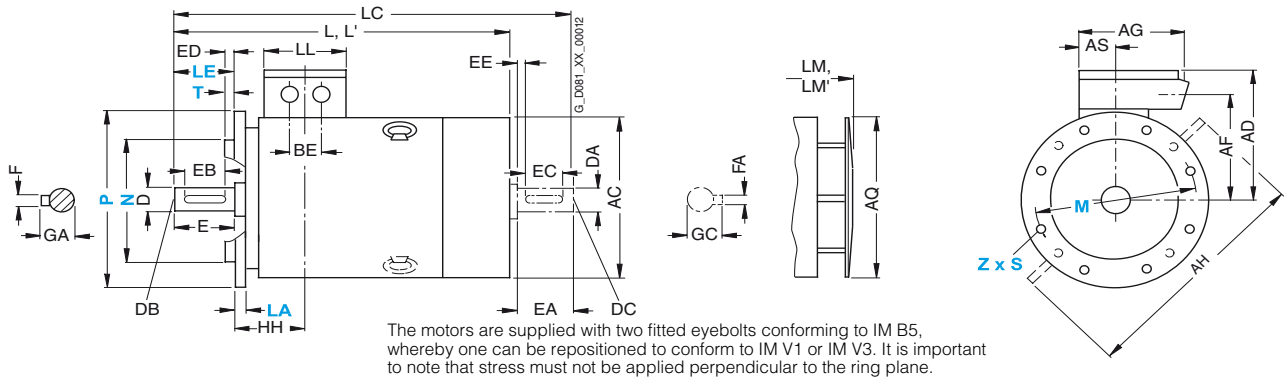
Cast-iron series 1LG6, frame sizes 180 M to 250 M

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																					
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA
180 M	1LG6 183	2	279	65	339	363	262	262	220	220	152	452	340	71	241	70	111	328	36	54	121	253	180	20
		4																							202
180 L	1LG6 186	4, 6, 8	279	65	339	363	262	262	220	220	152	452	340	71	279	70	111	328	36	54	121	215	180	20
200 L	1LG6 206	2, 6	318	70	378	402	300	300	247	247	260	512	340	96	305	80	80	355	63	85	133	177	200	25
	1LG6 207	2, 6 4, 8																							234	177
225 S	1LG6 220	4, 8	356	80	436	442	325	325	272	272	260	556	425	96	286	85	110	361	47	85	149	218	225	34
	1LG6 223	2 4, 6, 8																							253	225
225 M	1LG6 228	2 4, 6	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	303	225	34
250 M	1LG6 253	2 4 6, 8	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	235	250	40
	1LG6 258	2 4, 6																							305	235

* This dimension is assigned in DIN EN 50347 to the frame size listed.

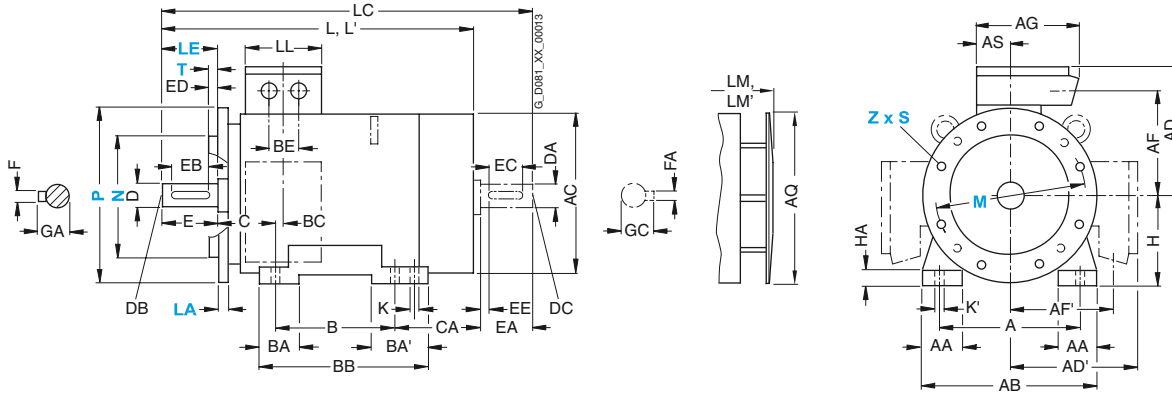
1) Measured across the bolt heads.

Dimensional drawings

Cast-iron series 1LG6, frame sizes 180 M to 250 M

Type of construction IM B35

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC													DE shaft extension					NDE shaft extension				
Frame size	Type	Number of poles	HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC		
180 M	1LG6 183	2	157	15	19	720	835	132	810	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5		
		4				669	784		759																
180 L	1LG6 186	4, 6, 8	157	15	19	720	835	132	810	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5		
		2, 6	196	19	25	720	835	192	810	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59		
200 L	1LG6 206	2, 6	196	19	25	777	892	192	867	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59		
		4, 8	196	19	25	720	835		810																
225 S	1LG6 220	4, 8	196	19	25	789	903	192	889	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59		
		2	196	19	25	819	933	192	919	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5		
225 M	1LG6 223	4, 6, 8				849	963		949	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59		
		2	196	19	25	869	983	192	969	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5		
250 M	1LG6 228	4, 6				899	1013		999	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59		
		2	237	24	30	887	1002	236	987	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59		
250 M	1LG6 253	4				957	1102		1057	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
		6, 8				887	1032		987	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
250 M	1LG6 258	2	237	24	30	957	1102	236	1057	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59		
		4, 6								65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		

IEC Squirrel-Cage Motors

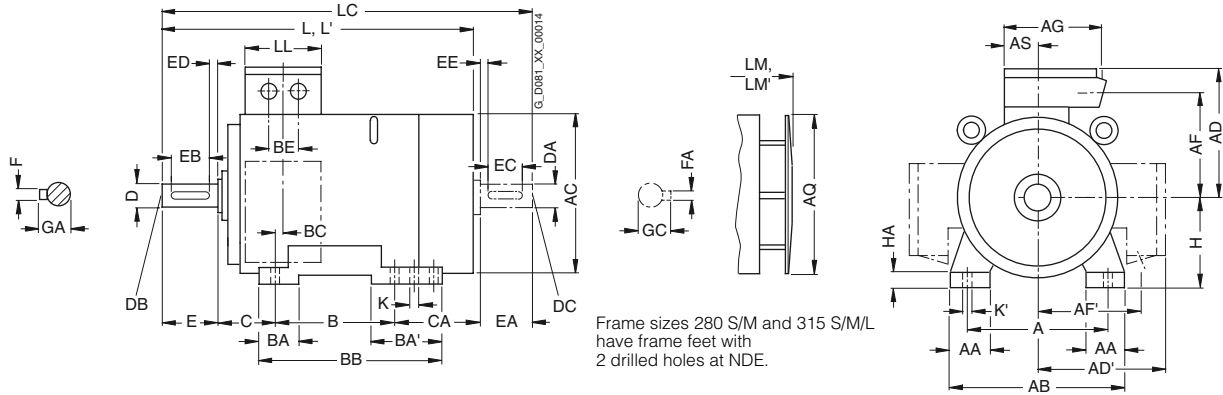
Explosion-proof motors

Dimensions

Dimensional drawings

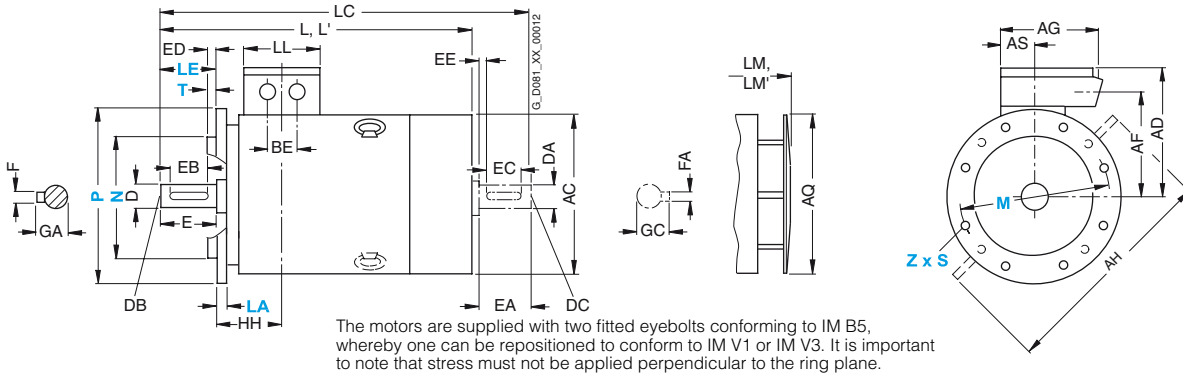
Cast-iron series 1LG6, frame sizes 280 S to 315 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor	Frame size	Type	Number of poles	Dimension designation acc. to IEC																						
				A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA	
280 S	1LG6 280	2	2	457	100	540	555	432	432	348	348	300	672	525	118	368	100	151	479	62	110	190	267	280	40	
				4, 6, 8	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40
				4	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40
280 M	1LG6 283	2	2	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40	
				4	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40
				6, 8	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40
280 L	1LG6 288	2	2	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40	
				4	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40
				6, 8	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40
315 S	1LG6 310	2	2	508	120	610	610	500	500	400	400	380	780	590	154	406	125	176	527	69	110	216	315	315	50	
				4, 6, 8	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	527	69	110	216	264	315	50
				8	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	578	69	110	216	424	315	50
315 M ²⁾	1LG6 313	2	2	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	578	69	110	216	424	315	50	
				4, 6	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	578	69	110	216	424	315	50
				8	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	578	69	110	216	424	315	50
315 L ²⁾	1LG6 316	2	2	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50	
				4, 6	508	120	610	610	500	500	400	400	380	780	590	154	508	155	206	648	69	110	216	513	315	50
				8	508	120	610	610	500	500	400	400	380	780	590	154	508	155	206	648	69	110	216	513	315	50
	1LG6 317	2	2	508	120	610	610	500	500	400	400	380	780	590	154	508	155	206	648	69	110	216	513	315	50	
				4, 6	508	120	610	610	500	500	400	400	380	780	590	154	508	155	206	648	69	110	216	513	315	50
	1LG6 318	2	2	508	120	610	610	651	651	524	524	470	780	590	165	508	155	206	648	69	135	216	513	315	50	
				4	508	120	610	610	651	651	524	524	470	780	590	165	508	155	206	648	69	135	216	513	315	50
1LG6 318	4	4	4	500	500	400	400	380																		
1LG6 318	6, 8	6, 8	6, 8																							

* This dimension is assigned in DIN EN 50347 to the frame size listed.

1) Measured across the bolt heads.

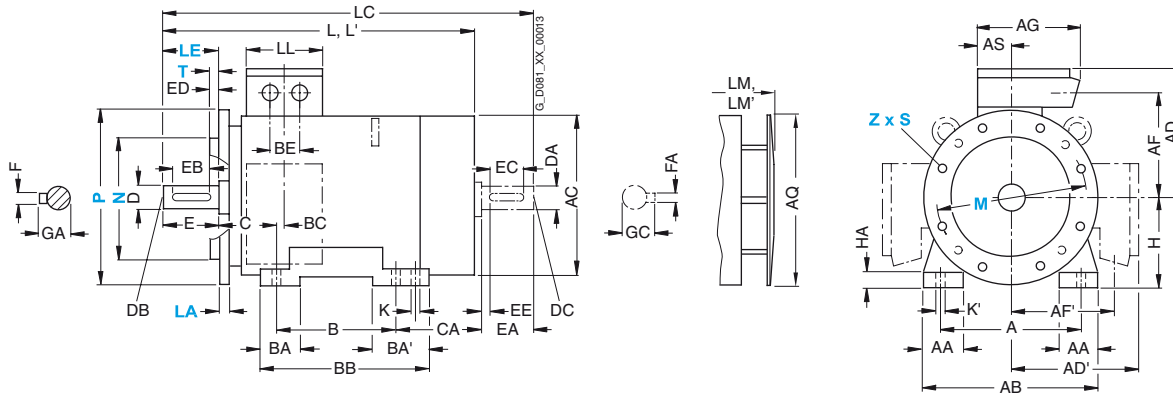
2) With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

Dimensional drawings

Cast-iron series 1LG6, frame sizes 280 S to 315 L

Type of construction IM B35

For flange dimensions, see Page 4/152 (Z = the number of retaining holes)



For motor Frame size	Type	Number of poles	Dimension designation acc. to IEC										DE shaft extension				NDE shaft extension						
			HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
280 S	1LG6 280	2	252	24	30	960	1105	236	1070	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8								75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
280 M	1LG6 283	2	252	24	30	1070	1215	236	1180	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4								75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
	1LG6 288	6, 8				960	1105		1070	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
		2	252	24	30	1070	1215	236	1180	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6								75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
315 S	1LG6 310	2	285	28	35	1072	1217	307	1182	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 310	4, 6, 8				1102	1247		1212	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 M	1LG6 313	8	285	28	35	1102	1247	307	1212	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 313	2	285	28	35	1232	1377	307	1342	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 313	4, 6				1262	1407		1372	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 L	1LG6 316	2	285	28	35	1232	1377	307	1342	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 316	4, 6				1262	1407		1372	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 316	8							80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	
	1LG6 317	2	285	28	35	1372	1517	307	1482	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 317	4, 6				1402	1547		1512	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 317	8				1262	1407		1372	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 318	2	285	28	35	1372	1517	330	1482	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 318	4				1402	1547		1512	80 ¹⁾	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 318	6, 8							307	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5

¹⁾ Diameters up to 90 mm are possible.

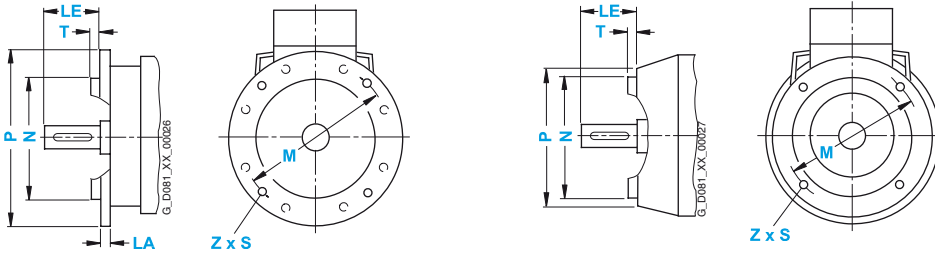
IEC Squirrel-Cage Motors

Explosion-proof motors

Dimensions

Dimensional drawings

Flange dimensions



In DIN EN 50347, the frame sizes are allocated flange FF with through holes and flange FT with tapped holes. The designation of flange A and C according to DIN 42948 (invalid since 09/2003) are also listed for information purposes. See the table below. (Z = the number of retaining holes)

Frame size	Type of construction	Flange type	Flange with through holes (FF/A) Tapped holes (FT/C)		Dimension designation acc. to IEC							
			According to DIN EN 50347	Acc. to DIN 42948	LA	LE	M	N	P	S	T	Z
56 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 100	A 120	8	20	100	80	120	7	3	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 65	C 80	–	20	65	50	80	M5	2.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 85	C 105	–	20	85	70	105	M6	2.5	4
63 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 115	A 140	8	23	115	95	140	10	3	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 75	C 90	–	23	75	60	90	M5	2.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 100	C 120	–	23	100	80	120	M6	3	4
71 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 130	A 160	9	30	130	110	160	10	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 85	C 105	–	30	85	70	105	M6	2.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 115	C 140	–	30	115	95	140	M8	3	4
80 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 165	A 200	10	40	165	130	200	12	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 100	C 120	–	40	100	80	120	M6	3	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 130	C 160	–	40	130	110	160	M8	3.5	4
90 S, 90 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 165	A 200	10	50	165	130	200	12	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 115	C 140	–	50	115	95	140	M8	3	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 130	C 160	–	50	130	110	160	M8	3.5	4
100 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 215	A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130	C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 165	C 200	–	60	165	130	200	M10	3.5	4
112 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 215	A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130	C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 165	C 200	–	60	165	130	200	M10	3.5	4
132 S, 132 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 265	A 300	12	80	265	230	300	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 165	C 200	–	80	165	130	200	M10	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 215	C 250	–	80	215	180	250	M12	4	4
160 M, 160 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 300	A 350	13	110	300	250	350	18.5	5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 215	C 250	–	110	215	180	250	M12	4	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 265	C 300	–	110	265	230	300	M12	4	4
180 M, 180 L	IM B5, IM V1, IM V3	Flange	FF 300	A 350	13	110	300	250	350	18.5	5	4
200 L	IM B5	Flange	FF 350	A 400	15	110	350	300	400	18.5	5	4
225 S, 225 M 2-pole 4-pole to 8-pole	IM B5, IM V1, IM V3	Flange	FF 400	A 450	16	110	400	350	450	18.5	5	8
250 M	IM B5, IM V1, IM V3	Flange	FF 500	A 550	18	140	500	450	550	18.5	5	8
280 S, 280 M	IM B5, IM V1, IM V3	Flange	FF 500	A 550	18	140	500	450	550	18.5	5	8
315 S, 315 M, 315 L 2-pole 4-pole to 8-pole	IM B5, IM V1, IM V3	Flange	FF 600	A 660	22	140	600	550	660	24	6	8

Motors operating with frequency converters



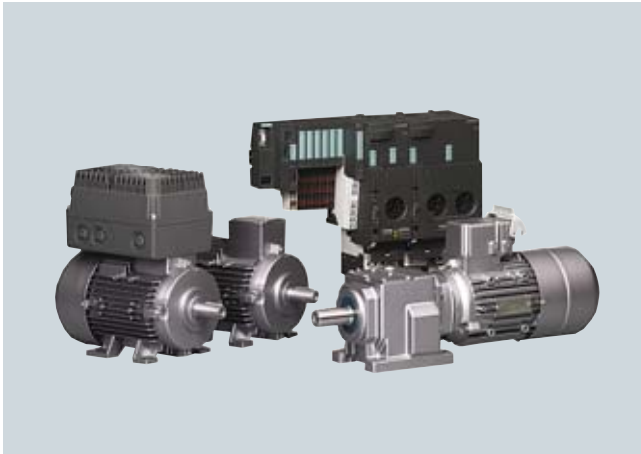
5/2	Orientation	5/18	Special versions
5/2	Overview	5/18	Overview
5/2	Benefits	5/20	Selection and ordering data
5/2	Application	5/20	• Voltages
5/3	Integration	5/21	• Types of construction
5/5	Technical specifications	5/22	• Options
5/9	Selection and ordering data		
5/9	More information	5/32	Accessories
		5/32	Overview
5/10	Surface-cooled motors with standard insulation for voltages ≤ 500 V, Aluminum or cast-iron housing	5/32	More information
5/10	Overview		
5/12	Self-ventilated motors with special insulation for voltages up to 690 V, Aluminum series 1LA7 and 1LA5	5/33	Dimensions
5/12	Selection and ordering data	5/33	Overview
		5/34	Dimensional drawings
		5/40	More information
5/14	Self-ventilated motors with special insulation for voltages up to 690 V, Cast-iron series 1LG6		
5/14	Selection and ordering data		
5/17	Self-ventilated motors up to FS 315 with special insulation for voltages up to 690 V, Cast-iron series 1LA8		
5/17	Overview		
5/17	Selection and ordering data		
5/17	Forced ventilated motors from frame size 315 with mounted separately driven fan with special insulation for voltages up to 690 V, Cast-iron series 1PQ8		
5/17	Overview		
5/17	Selection and ordering data		

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Orientation

Overview



Converter-fed operation up to 500 V +10 % mains voltage

The standard insulation of the 1LA and 1LG motors is designed such that operation is possible on the converter at mains voltages up to 460 V +10 % (for motor series 1LA8 to 500 V +10 %). This also applies for operation with a pulse-controlled AC converter with voltage rise times of $t_{\text{e}} > 0.1 \mu\text{s}$ at the motor terminals (IGBT transistors). At higher voltages, the motors require greater insulation resistance. Please inquire in the case of converter-fed operation with motors with protruding connection cables (order codes **L44**, **L45**, **L47**, **L48**, **L49**, **L51** and **L52**).

The 1LA8 non-standard motors of the types specially identified for converter-fed operation (the 9th and 10th position of the Order No. is filled with “**PB**”, “**PC**” or “**PE**”) have an insulated motor bearing as standard at the non-drive end NDE (BS). The motors are equipped with standard insulation and standard rotors and are suitable for mains-fed and converter-fed operation.

Converter-fed operation up to 690 V +10 % mains voltage

1LA5, 1LA7 and 1LG6 standard motors as well as 1LA8 and 1PQ8 non-standard motors are also available with a higher insulation resistance for operation on the converter with supply voltages from 500 V ... 690 V (+10 %), and do not usually require a filter. These motors are identified by an “**M**” in the 10th digit of the Order No. (e.g. 1LA8315-2PM). With the reinforced insulating system, there is less space in the grooves in motor series 1LA8 and 1PQ8 for the same number of windings compared to the normal version, which slightly reduces the rated output of these motors.

Converter-fed operation for motors in type of protection “d” up to 460 V +10 % mains voltage

Siemens 1MJ asynchronous motors can be operated on the mains as well as on a converter as explosion-proof motors in type of protection Ex de IIC “Explosion-proof enclosure”. In accordance with the test specifications, 1MJ motors must be equipped with PTC thermistors. When 1MJ motors are connected to converters, like the 1LA motors of the same output, depending on their load characteristics their maximum admissible torque must be reduced. 1MJ motors have a connection box in type of protection Ex e II “Increased safety” as standard.

Note:

Special measures are necessary in the case of high-speed motors, especially when separately driven fans are used. Please contact your local Siemens office for advice.

5

Benefits

Motors operating with frequency converters from Siemens offer the user numerous advantages:

- The motors feature the future-oriented insulation system DURIGNIT IR 2000 (IR = Inverter Resistant). The DURIGNIT IR 2000 insulating system is made up of high-quality enamel wires and insulating materials in conjunction with a resin impregnation which does not contain any solvents.

The specially developed motors on the frequency converter with special insulation are converter-compatible from 500 V to 690 V (+10 %).

Application

The motors can be used in numerous drive applications with variable-speed drives when they are combined with converters from the MICROMASTER and SINAMICS spectrum.

The wide field of implementation includes the following applications:

- Conveyor systems such as cranes, belts and lifting gear
- High-bay warehouses
- Packaging machines
- Automation and Drives

Their large range of mains voltages enables them to be used all over the world.

Integration

MICROMASTER 411/COMBIMASTER 411 distributed drive solutions

MICROMASTER 411/COMBIMASTER 411 is included in the DA 51.3 Catalog that includes the entire product range with ordering data, technical specifications and explanations.

Application

MICROMASTER 411 and COMBIMASTER 411 are the ideal solution for distributed drive applications that require a high degree of protection for the converter. The devices are designed for a wide drive range – for simple individual applications for pumps and fans through to multiple drives for conveyor systems in networked control systems. The ECOFAST versions of the MICROMASTER 411/COMBIMASTER 411 frequency converter series contain plug-in cables for the power supply, communications interface and motor connections. They support fast and problem-free replacement in time-critical applications and are completely compatible with the ECOFAST technology systems. They are based on the universal MICROMASTER 420 converter series and are characterized by customer-oriented performance and ease of use.

Structure

The modular structure allows MICROMASTER 411/COMBIMASTER 411 products and their accessories to be individually selected, e.g. electromechanical brake control module or PROFIBUS module.

Main features:

- Output range: 0.37 to 3.0 kW, 400 V, 3AC
- IP66 degree of protection (MICROMASTER 411), self-cooling
- Electrical isolation between the electronics and the connection terminals
- Parameter sets for fast startup and cost savings
- Modular structure with numerous accessories
- Operation without operator panel possible (using jumpers and/or control potentiometer)
- Integrated control potentiometer accessible from outside.

Accessories (overview):

- Basic Operator Panel (BOP) for parameterizing the converter
- Plain text Advanced Operator Panel (AOP) for MICROMASTER 411 and COMBIMASTER 411 with multiple-language display
- PROFIBUS module
- AS-Interface module
- DeviceNet module
- REM module (dynamic brake and control module for electro-mechanical brake)
- EM module (electromechanical brake control module)
- PC connection kit
- Mounting kits for installing the operator panels
- PC startup programs.

Note:

The application guidelines or guidelines for the design and operating performance of induction motors with squirrel-cage rotor defined in standards DIN IEC 60034-17 and DIN IEC 60034-25 must be observed for converter-fed induction motors with squirrel-cage rotor.

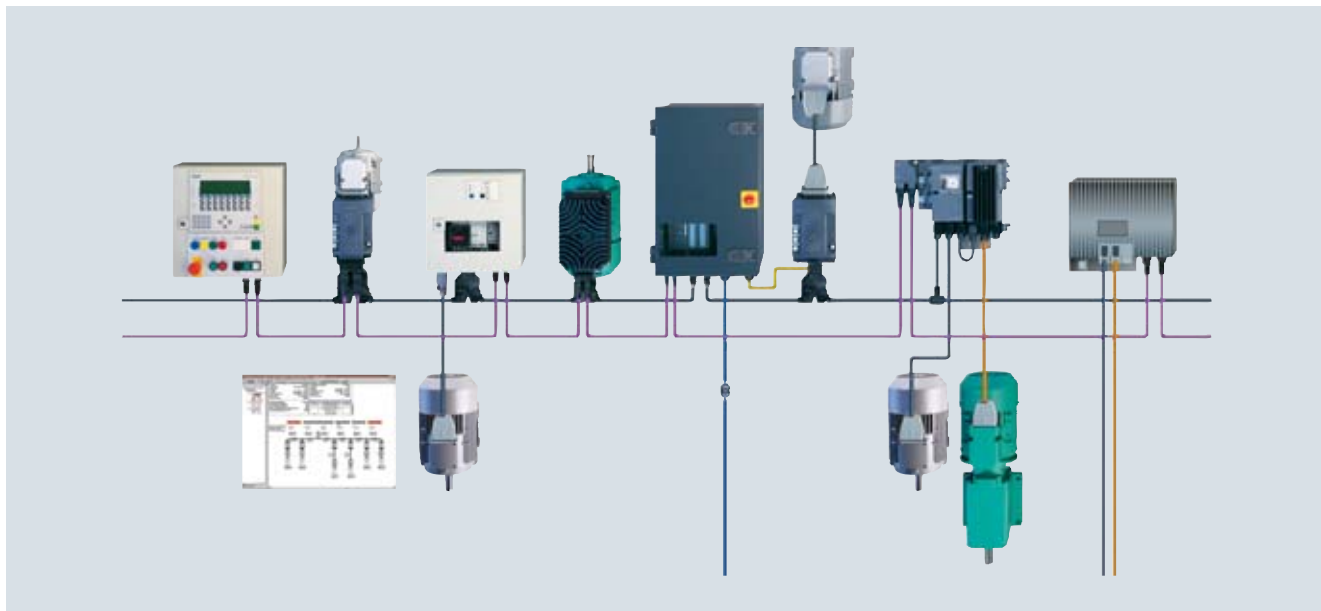
IEC Squirrel-Cage Motors

Motors operating with frequency converters

Orientation

Integration (continued)

ECOFAST system



ECOFAST is a system which permits extensive decentralization and a modular structure for installation elements on the component level.

Benefits

The main advantages of the ECOFAST motor connector over a terminal strip are as follows:

- Fast assembly of I/O devices (e.g. motor starters) from the ECOFAST system.
- Reduction of assembly and repair times at the end user
- No wiring errors due to connector technology
- Replacement of motor without intervention in the electronics.

Main features of the ECOFAST motor connector

The motor connector is mounted in the factory and replaces the connection box with terminal board. The connector is mounted towards the non-drive end (NDE). It comprises an angled motor connection casing that can be rotated by $4 \times 90^\circ$. A 10-pole (+ earth) male insert is used in the housing. In the plug-in connector, the winding connections are connected and optionally the power supply for the brake and the signal leads for the temperature sensors.

The ECOFAST motor connector is compatible with the products of the ECOFAST field device system. Further information can be found in Catalog IK PI.

The mounting dimensions of this housing match those of standard industrial connectors, so it is possible to use a complete series of different standard inserts (such as Han E, ES, ESS from Harting). The motor circuit (star or delta connection) is selected in the mating connector for motor connection. The relevant jumpers are inserted by the customer in the mating connector. As a housing for the mating connector, all standard sleeve housing with lengthwise locking, frame size 10B (e.g. from Harting) can be used.

Only one sensor (temperature sensor or PTC thermistor) can be connected.

Maximum admissible mains voltage on motor connector: ≤ 500 V

Availability of the ECOFAST motor connector

The ECOFAST motor connector can be supplied for the following motor versions with the exception of the explosion-proof motors:

- Frame sizes 56 M to 132 M
- Output range 0.06 to 5.5 kW (7.5 kW on request)
- The rated current of the ECOFAST motor connector is limited to ≤ 16 A.
- Direct on-line starting: Voltage code **1** for 230 V Δ /400 VY, 50 Hz
- Star-delta starting: Voltage code **9** with order code **L1U** for 400 V Δ , 50 Hz

More information

Further information is available in Catalog IK PI and in Catalog DA 51.3 "MICROMASTER 411/COMBIMASTER 411 distributed drive solutions" as well as on the Internet at: <http://www.siemens.com/ecofast>

Technical specifications

General note:

All the data listed in the catalog is applicable for a 50 Hz line supply. With converter-fed operation, the torque reduction factors for constant torque and drives for fans, pumps and compressors must be observed. Higher noise levels must be expected at frequencies other than 50 Hz for motors operating with converters due to the harmonic content of the supply.

Implementation of 1LA/1LG motors in areas subject to explosion hazards

Type of protection "n" (Zone 2)

II 3G Ex nA II T3
acc. to IEC/EN 60079-15

IEC/EN 60079-15 specifies that the motor and converter must be tested as a unit (individual test). Individual testing has been performed for motors of type of protection "n" operating with the MICROMASTER, SIMOVERT MASTERDRIVES, SINAMICS G110, SINAMICS S120 and SIMATIC ET 200S FC converters (partially for "Non-standard motors frame size 315" and above). For details, see factory certificate 2.1. Individual testing can be performed for non-Siemens converters on request; the customer may be required to supply the non-Siemens converter.

Design for Zone 2 for converter-fed operation, derating Ex nA II T3 acc. to IEC/EN 60079-15 ⇒ Order with order code M73

Motors protected against dust explosions (Zone 21/22)

Zone 21: II 2D Ex tD A21 IP65 T 125 °C
Zone 22: II 3D Ex tD A22 IP55 T 125 °C
acc. to EN 50281/IEC 61241

The drive system comprising motors protected against dust explosions operating on MICROMASTER, SIMOVERT MASTERDRIVE, SINAMICS G110, SINAMICS S120 and SIMATIC ET 200S FC converters has been tested. For details, see factory certificate 2.1. Please inquire about operation with non-Siemens converters.

Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating ⇒ Order with order code M38

Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating ⇒ Order with order code M39

Order codes M73, M38 and M39:

The rated operating points at 5, 25, 50 Hz and f_{max} are stamped on the rating plate; (alternative rated operating points at 6, 30, 60 Hz and f_{max} when ordered with 60 Hz voltage) for operation on MICROMASTER.

Alternatively, these rated operating points can be ordered for SIMOVERT MASTERDRIVES, SINAMICS G110, SINAMICS S120 or SIMATIC ET 200S FC with order code **Y68** and "Plain text". The type of converter is specified on the rating plate. The motors already have PTC thermistors for tripping in accordance with temperature class 130 (B). The thermistors must be operated by a tripping unit certified by the relevant testing authority.

With some motors it is necessary to reduce the limit speed or to use metal fans.

When 1LA8 motors are ordered, it must be specified in plain text whether "constant torque drive" or "fan/pump/compressor drive" is required.

Rated voltage

The tolerance of the motors specially developed for converter-fed operation with special insulation up to 690 V (the 9th and 10th position of the Order No. is marked with "PM") is generally in accordance with DIN EN 60034-1 – A rated voltage range is not specified on the rating plate.

Mechanical limit speeds

When the motor is operated at its rated frequency, it is important to note that the maximum speeds are limited by the limits for the roller bearings, critical rotor speed and rigidity of the rotating parts.

Motor protection

A motor protection function can be implemented using the I^2t detection present in the converter software.

If required, more precise motor protection can be afforded by direct temperature measurement using KTY84 sensors or PTC thermistors in the motor winding. Some converters from Siemens determine the motor temperature using the resistance of the temperature sensor. They can be set to a required temperature for alarm and tripping.

Insulation

The standard insulation of 1LA and 1LG motors is designed such that converter-fed operation is possible up to 460 V +10 % (for motor serie 1LA8 up to 500 V +10 %). This also applies for operation with a pulse-controlled AC converter with voltage rise times $t_s > 0.1 \mu s$ at the motor terminals.

All motors with voltage codes 1, 3, 5, and 6 (400 V motors Δ connection) operating with a converter must be operated under these conditions. This does not apply to motors with voltages from 500 V to 690 V (+10 %), that must have special insulation for operation on a pulse-controlled AC converter (SIMOVERT MASTERDRIVES and MICROMASTER 440 for voltages between 500 and 600 V), (10th position of the Order No. = "M"). For converter-fed operation with the outputs specified in the catalog, the motors are used according to temperature class 155 (F), i.e. in this case neither a service factor > 1 nor an increased coolant temperature is possible (order codes **C11**, **C12** and **C13** cannot be ordered).

Motor connection

When connecting the motors, it is important to consider the restrictions for mains-fed machines as well as the maximum admissible conductor cross-sections for the converter.

Ventilation and noise generation

The fan noise can increase at speeds that are higher than the rated speed of self-ventilated motors. To increase motor utilization at low speeds it is recommended that forced ventilated motors are used.

Mechanical stress and grease lifetime

Due to the increased speeds above the rated speed and the thereby increased vibrations, the mechanical smooth running is changed and the bearings are used stronger mechanically. Hereby, the grease lifetime and the bearing lifetime are reduced. Further information on request.

Utilization (non-standard motors)

When temperature class 155 (F) is used according to 130 (B), derating of 15 % is necessary.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Orientation

Technical specifications (continued)

Mechanical limit speeds $n_{\max.}$ at maximum supply frequency $f_{\max.}$

Default values

The values in the following table are valid for all areas of application with the exception of explosion-proof motors (see overleaf).

The values for motor series 1 LA8, 1PQ8 and 1LL8 are listed in the selection and ordering data in catalog part "Non-standard motors frame size 315 and above".

Motor frame size	Motor type		2-pole ¹⁾		4-pole		6-pole		8-pole	
			$n_{\max.}$ rpm	$f_{\max.}$ Hz	$n_{\max.}$ rpm	$f_{\max.}$ Hz	$n_{\max.}$ rpm	$f_{\max.}$ Hz	$n_{\max.}$ rpm	$f_{\max.}$ Hz
1LA5, 1LA6, 1LA7, 1LA9, 1LP5, 1LP7, 1PP5, 1PP7										
56 M	1LA7/1LA9	05.	6000	100	4200	140	3600	180	3000	200
63 M	1LA7/1LA9 1LP7/1PP7	06.	6000	100	4200	140	3600	180	3000	200
71 M	1LA7/1LA9 1LP7/1PP7	07.	6000	100	4200	140	3600	180	3000	200
80 M	1LA7/1LA9 1LP7/1PP7	08.	6000	100	4200	140	3600	180	3000	200
90 L	1LA7/1LA9 1LP7/1PP7	09.	6000	100	4200	140	3600	180	3000	200
100 L	1LA6/1LA7/1LA9 1LP7/1PP7/1PP6	10.	6000	100	4200	140	3600	180	3000	200
112 M	1LA6/1LA7/1LA9 1LP7/1PP7/1PP6	11.	6000	100	4200	140	3600	180	3000	200
132 S/M	1LA6/1LA7/1LA9 1LP7/1PP7/1PP6	13.	5600	90	4200	140	3600	180	3000	200
160 M/L	1LA6/1LA7/1LA9 1LP7/1PP7/1PP6	16.	4800	80	4200	140	3600	180	3000	200
180 M/L	1LA5/1LA9 1LP5/1PP5	18.	5100	85	4200	140	3600	180	3000	200
200 L	1LA5/1LA9 1LP5/1PP5	20.	5100	85	4200	140	3600	180	3000	200
225 S/M	1LA5	22.	4500	75	4200	140	3600	180	3000	200
1LG4, 1LG6, 1LP4, 1PP4, 1PP6										
180 M/L	1LG4/1LG6 1LP4/1PP4/1PP6	18.	4600	76	4200	140	3600	180	3000	200
200 L	1LG4/1LG6 1LP4/1PP4/1PP6	20.	4500	75	4200	140	3600	180	3000	200
225 S/M	1LG4/1LG6 1LP4/1PP4/1PP6	22.	4500	75	4500	150	4400	220	4400	293
250 M	1LG4/1LG6 1LP4/1PP4/1PP6	25.	3900	65	3700	123	3700	185	3700	247
280 S/M	1LG4/1LG6 1LP4/1PP4/1PP6	28.	3600	60	3000	100	3000	150	3000	200
315 S	1LG4/1LG6 1LP4/1PP4/1PP6	310	3600	60	2600	87	2600	130	2600	176
315 M	1LG4/1LG6 1LP4/1PP4/1PP6	313	3600	60	2600	87	2600	130	2600	173
315 L	1LG4/1LG6 1LP4/1PP4/1PP6	316 317 318	3600 ²⁾	60 ²⁾	2600	87	2600	130	2600	173

¹⁾ Request required for continuous duty in the $f_{\max.}$ ($n_{\max.}$) range.

²⁾ For vertical mounting $n_{\max.} = 3000$ rpm, $f_{\max.} = 50$ Hz.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Orientation

Technical specifications (continued)

Explosion-proof motors in Zone 1 with type of protection “de” (motor series 1MJ)

Motor frame size	Motor type	2-pole ¹⁾		4-pole		6-pole		8-pole		
		n_{max} rpm	f_{max} Hz	n_{max} rpm	f_{max} Hz	n_{max} rpm	f_{max} Hz	n_{max} rpm	f_{max} Hz	
1MJ6										
71 M	1MJ6 07 .	6000	100	3000	100	2000	100	1500	100	
80 M	1MJ6 08 .	6000	100	3000	100	2000	100	1500	100	
90 L	1MJ6 09 .	6000	100	3000	100	2000	100	1500	100	
100 L	1MJ6 10 .	5400	90	3000	100	2000	100	1500	100	
112 M	1MJ6 11 .	5400	90	3000	100	2000	100	1500	100	
132 S/M	1MJ6 13 .	4800	80	3000	100	2000	100	1500	100	
160 M/L	1MJ6 16 .	4500	75	3000	100	2000	100	1500	100	
180 M/L	1MJ6 18 .	5100	85	3000	100	2000	100	1500	100	
200 L	1MJ6 20 .	5100	85	3000	100	2000	100	1500	100	
1MJ7										
225 S/M	1MJ7 22 .	4500	75	3000	100	2000	100	1500	100	
250 M	1MJ7 25 .	3900	65	3700	100	2000	100	1500	100	
280 S	1MJ7 28 .	3600	60	3000	100	2000	100	1500	100	
315 S/M	1MJ7 31 .	3600 ²⁾	60 ²⁾	2600	87	2000	100	1500	100	

Explosion-proof motors in Zone 1 with type of protection “e” (motor series 1MA)

1MA motors cannot be operated with a converter.

Explosion-proof motors in Zones 2, 21 and 22 with type of protection “n” or protection against dust explosions (motor series 1LA, 1LG and 1PQ8)

The values for motor series 1LA8 and 1PQ8 in Zones 2 and 22 are listed in the selection and ordering data in catalog part “Non-standard motors frame size 315 and above”.

Motor frame size	Motor type	2-pole ¹⁾		4-pole		6-pole		8-pole		
		n_{max} rpm	f_{max} Hz	n_{max} rpm	f_{max} Hz	n_{max} rpm	f_{max} Hz	n_{max} rpm	f_{max} Hz	
1LA5, 1LA6, 1LA7, 1LA9										
56 M	1LA7/1LA9 05.	6000	100	3000	100	2000	100	1500	100	
63 M	1LA7/1LA9 06.	6000	100	3000	100	2000	100	1500	100	
71 M	1LA7/1LA9 07.	6000	100	3000	100	2000	100	1500	100	
80 M	1LA7/1LA9 08.	6000	100	3000	100	2000	100	1500	100	
90 L	1LA7/1LA9 09.	6000	100	3000	100	2000	100	1500	100	
100 L	1LA6/1LA7/1LA9 10.	5400	90	3000	100	2000	100	1500	100	
112 M	1LA6/1LA7/1LA9 11.	5400	90	3000	100	2000	100	1500	100	
132 S/M	1LA6/1LA7/1LA9 13.	4800	80	3000	100	2000	100	1500	100	
160 M/L	1LA6/1LA7/1LA9 16.	4500	75	3000	100	2000	100	1500	100	
180 M/L	1LA5/1LA9 18.	5100 ³⁾	85 ³⁾	3000	100	2000	100	1500	100	
200 L	1LA5/1LA9 20.	5100 ³⁾	85 ³⁾	3000	100	2000	100	1500	100	
225 S/M	1LA5 22.	5100	85	3000	100	2000	100	1500	100	
1LG4, 1LG6										
180 M/L	1LG4/1LG6 18.	4500	75	3000	100	2000	100	1500	100	
200 L	1LG4/1LG6 20.	4500	75	3000	100	2000	100	1500	100	
225 S/M	1LG4/1LG6 22.	4500	75	3000	100	2000	100	1500	100	
250 M	1LG4/1LG6 25.	3900	65	3000	100	2000	100	1500	100	
280 S/M	1LG4/1LG6 28.	3600	60	3000	100	2000	100	1500	100	
315 S/M/L	1LG4/1LG6 31.	3600 ¹⁾	60 ¹⁾	2600	87	2000	100	1500	100	

¹⁾ Request required for continuous duty in the f_{max} , (n_{max}) range.

²⁾ For vertical mounting n_{max} = 3000 rpm, f_{max} = 50 Hz.

³⁾ For 1LA9 motors frame sizes 180 M/L and 200 L, n_{max} = 4500 rpm and f_{max} = 75 Hz.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Orientation

Technical specifications (continued)

Bearings and bearing currents

When operating multiphase induction machines on a converter, an electrical bearing stress results from a capacitive induced voltage via the bearing lubricating film, depending on the principle being used. The physical cause of this is the common-mode voltage at the converter output. The sum of the three phase-to-neutral voltages is not zero at all times, unlike with direct on-line operation. The high-frequency, pulse-shaped common-mode voltage brings about a residual current, which closes back to the converter's DC link via the machine's internal capacitances, the machine housing and the earthing circuit. The machine's internal capacitances include the main insulation winding capacitance, the geometric capacitance between the rotor and stator, the lubricating film capacitance and the capacitance of any bearing insulation that may be present. The current level via the internal capacitances is proportional to the common-mode voltage regulation ($i_{(t)} = C \cdot du/dt$).

In order to apply currents to the motor which are sinusoidal as far as possible (smooth running, oscillation torques, stray losses), a high clock frequency is required for the converter's output voltage. The related (very steep) switching edges of the converter output voltage (and also, therefore, of the common-mode voltage) cause correspondingly high capacitive currents and voltages on the machine's internal capacitances.

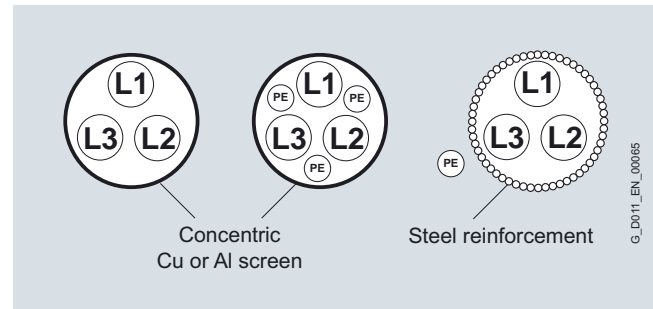
In the worst-case scenario, the capacitive voltage induced via the bearing can lead to random punctures of the bearing lubricating film, thus damaging the bearing/causing premature wear. The current pulses caused by the puncture in the lubricating film are referred to as EDM (Electrostatic Discharge Machining) currents, although this is not primarily a question of an electrostatic effect, but more of (partial) punctures of insulating material, i.e., of partial discharges.

This physical effect, which occurs in isolated cases, has mostly been observed in connection with larger motors.

EMC-compliant installation of the drive system is a basic prerequisite for preventing premature bearing damage via bearing currents.

The most important measures for reducing bearing currents:

- Insulated motor bearings at the non-drive end NDE
The insulated bearing is standard for all non-standard 1LA8 motors designated for converter operation. Furthermore it is recommended that an insulated bearing is ordered for NDE for motor series 1LG, 1PP4, 1LP4 and 1MJ7 frame size 225 and above (order code **L27**).
- Hybrid bearings with ceramic bearing elements on drive end (DE) and non-drive end (NDE)
- Earthing brush for converter-fed operation for 1LG motors (order code **M44**)
- Use of cables with a symmetrical cable cross-section:



- Use of motor reactors
- Use of earthing cables with low impedance in a large frequency range (0 Hz up to approximately 70 MHz): for example, plaited copper ribbon cables, HF litz wires
- Separate HF equipotential-bonding cable between motor housing and driven machine
- Separate HF equipotential-bonding cable between motor housing and converter PE busbar
- 360° HF contacting of the cable shield on the motor housing and the converter PE busbar. This can be achieved using EMC screwed glands on the motor end and EMC shield clips on the converter end, for example.
- Common-mode filters at the converter output (e.g. nanoperm rings).

The given measures can be required for motor series 1LA5 frame size 225 and 1LG frame size 225 and above depending on the application with converter-fed operation and are therefore recommend.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Orientation

Selection and ordering data

Preliminary selection of the motor according to motor type/series, speed or number of poles, frame size, rated output, rated torque, rated speed and rated current

Surface-cooled motors with standard insulation for voltages ≤500 V – Aluminum or cast-iron housing

See section “Surface-cooled motors with standard insulation for voltages ≤500 V – Aluminum or cast-iron housing” Pages 5/10 and 5/11.

Self-ventilated motors with special insulation for voltages up to 690 V

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 690 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Aluminum series 1LA7 and 1LA5						
3000, 2-pole	100 L ... 225 M	3 ... 45	2890 ... 2960	9.9 ... 145	3.5 ... 45.0	5/12 ... 5/13
1500, 4-pole	100 L ... 225 S	2.2 ... 37	1420 ... 1470	15 ... 240	2.75 ... 38.5	5/12 ... 5/13
1000, 6-pole	100 L ... 225 M	1.5 ... 30	925 ... 978	15 ... 293	2.25 ... 35.5	5/12 ... 5/13
Cast-iron series 1LG6						
3000, 2-pole	180 M ... 315 L	22 ... 200	2955 ... 2982	71 ... 641	22.5 ... 188	5/14 ... 5/16
1500, 4-pole	180 M ... 315 L	18.5 ... 200	1470 ... 1490	120 ... 1282	20 ... 198	5/14 ... 5/16
1000, 6-pole	180 L ... 315 L	15 ... 160	975 ... 990	147 ... 1543	17.2 ... 164	5/14 ... 5/16
750, 8-pole	180 L ... 315 L	11 ... 132	725 ... 740	145 ... 1704	13.8 ... 140	5/14 ... 5/16
Cast-iron series 1LA8						
3000, 2-pole	315 ... 450	240 ... 970	2978 ... 2987	770 ... 3101	730 ... 900	3/18 ... 3/19
1500, 4-pole	315 ... 450	235 ... 980	1485 ... 1492	1511 ... 6273	235 ... 950	3/18 ... 3/19
1000, 6-pole	315 ... 450	190 ... 780	990 ... 993	1833 ... 7502	196 ... 790	3/20 ... 3/21
750, 8-pole	315 ... 450	145 ... 600	740 ... 745	1871 ... 7691	162 ... 660	3/20 ... 3/21

Forced ventilated motors with mounted separately driven fan with special insulation for voltages up to 690 V

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 690 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Cast-iron series 1PQ8						
3000, 2-pole	315 ... 450	240 ... 970	2978 ... 2987	770 ... 3101	730 ... 900	3/26 ... 3/27
1500, 4-pole	315 ... 450	235 ... 980	1485 ... 1492	1511 ... 6273	235 ... 950	3/26 ... 3/27
1000, 6-pole	315 ... 450	190 ... 780	990 ... 993	1833 ... 7502	196 ... 790	3/28 ... 3/29
750, 8-pole	315 ... 450	145 ... 600	740 ... 745	1871 ... 7691	162 ... 660	3/28 ... 3/29

More information

Planning notes for drives with constant and square-law torque can be found in the following catalogs:

- Frequency converters – MICROMASTER 420/430/440: Catalog DA 51.2
- Frequency converters for distributed drive solutions – MICROMASTER 411/COMBIMASTER 411: Catalog DA 51.3
- SIMOVERT MASTERDRIVES Motion Control/Vector Control: Catalog series DA 65
- SINAMICS G130 and G150 frequency converters: Catalog series D 11
- Frequency converters SINAMICS G110, SINAMICS G120 and SINAMICS G120 D: Catalog D11.1
- SINAMICS S120 and S150 drive systems: Catalog series D 21

These catalogs contain tables that specify the assignment of squirrel-cage motors to converters from Siemens in accordance with the load characteristic of the driven machine.

For further information, please contact your local Siemens contact – see “Siemens Contacts Worldwide” in the Appendix.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Surface-cooled motors with standard insulation
up to 500 V – Aluminum or cast-iron housing

Overview

Standard motors up to frame size 315 L

The standard motors from Siemens are suitable for converter-fed operation at rated voltages up to 460 V. The following table shows the available motor series:

Standard motors up to frame size 315 L for converter-fed operation up to 460 V rated voltage

Motor type	Standard type of protection	Frame design	Motor series	Motor frame sizes	Output range kW
Self-ventilated motors with improved efficiency (energy-saving motors according to efficiency class EFF2 Improved Efficiency for 2-pole and 4-pole motors with outputs from 1.1 to 90 kW)	IP55	Aluminum	1LA7	56 M ... 160 L	0.06 ... 18.5
			1LA5	180 M ... 225 M	11 ... 45
		Cast-iron	1LA6	100 L ... 160 L	0.75 ... 18.5
			1LG4	180 M ... 315 L	11 ... 200
Self-ventilated motors with high efficiency (energy-saving motors according to efficiency class EFF1 High Efficiency for 2-pole and 4-pole motors with outputs from 1.1 to 90 kW)	IP55	Aluminum	1LA9	56 M ... 200 L	0.06 ... 37
		Cast-iron	1LG6	180 M ... 315 L	11 ... 200
Self-ventilated motors with increased output	IP55	Aluminum	1LA9	56 M ... 200 L	0.14 ... 53
		Cast-iron	1LG4	180 M ... 280 M	15 ... 110
Self-cooled motors without external fan	IP55	Aluminum	1LP7	63 M ... 160 L	0.045 ... 7
			1LP5	180 M ... 200 L	5.5 ... 16.5
		Cast-iron	1LP4	180 L ... 315 L	3.7 ... 67
Pole-changing motors	IP55	Aluminum	1LA7	63 M ... 160 L	0.1 ... 17
			1LA5	180 M ... 200 L	11 ... 31

For technical data, selection and ordering data and special versions, see the relevant sections of "Standard motors up to frame size 315 L".

5

Non-standard motors frame size 315 and above

The non-standard motors from Siemens are suitable for converter-fed operation at rated voltages up to 500 V. The following table shows the available motor series:

Non-standard motors up to frame size 315 for converter-fed operation up to 500 V rated voltage

Motor type	Standard type of protection	Frame design	Motor series	Motor frame sizes	Output range kW
Self-ventilated motors for converter-fed operation – Cast-iron series 1LA8	IP55	Cast-iron	1LA8	315 ... 450	145 ... 1000
Forced ventilated motors with mounted separately driven fan for converter-fed operation – Cast-iron series 1PQ8	IP55	Cast-iron	1PQ8	315 ... 450	145 ... 1000
Self-ventilated motors with through ventilation for converter-fed operation – Cast-iron series 1LL8	IP23	Cast-iron	1LL8	315 ... 450	200 ... 1250

For technical data, selection and ordering data and special versions, see the relevant sections of "Non-standard motors up to frame size 315".

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Surface-cooled motors with standard insulation
up to 500 V – Aluminum or cast-iron housing

Overview (continued)

Explosion-proof motors

The explosion-proof motors from Siemens listed below up to frame size 315 L can be operated with a converter at rated voltages up to 460 V (for motor series 1LA8 and 1PQ8 up to 500 V):

Explosion-proof motors up to frame size 315 L for converter-fed operation up to 460 V (for motor series 1LA8 and 1PQ8 up to 500 V) rated voltage

Motor type	Standard type of protection	Frame design	Motor series ¹⁾	Motor frame sizes	Output range
					kW
Self-ventilated motors in Zone 1 with type of protection "d" (Zone 1 Exde IIC T4)	IP55	Cast-iron	1MJ6	71 M ... 200 L	0.25 ... 37
			1MJ7	225 M ... 315 L	30 ... 132
Self-ventilated motors in Zone 2 with type of protection "n" or protection against dust explosions	IP55	Aluminum	1LA7	63 M ... 160 L	0.09 ... 18.5
		Cast-iron	1LA9	56 M ... 200 L	0.06 ... 37
			1LA6	100 L ... 160 L	0.75 ... 18.5
			1LG4/1LG6	180 M ... 315 L	11 ... 200
Self-ventilated motors in Zone 21 with type of protection "n" or protection against dust explosions	IP55	Aluminum	1LA7	56 M ... 160 L	0.09 ... 18.5
		Cast-iron	1LA5	180 M ... 225 M	11 ... 45
			1LA9	56 M ... 200 L	0.06 ... 37
			1LG4/1LG6	180 M ... 315 L	11 ... 200
Self-ventilated motors in Zone 22 with type of protection "n" or protection against dust explosions	IP55	Aluminum	1LA7	56 M ... 160 L	0.09 ... 18.5
		Cast-iron	1LA5	180 M ... 225 M	11 ... 45
			1LA9	56 M ... 200 L	0.06 ... 37
			1LA6	100 L ... 160 L	0.75 ... 18.5
Self-ventilated motors in Zones 2 and 22 with type of protection "n" or protection against dust explosions	IP55	Cast-iron	1LA8	315 ... 450	145 ... 1000
			1PQ8	315 ... 450	145 ... 1000

For technical data, selection and ordering data and special versions, see the relevant sections of "Explosion-proof motors".

Fan motors

The fan motors from Siemens listed below are suitable for converter-fed operation at rated voltages up to 460 V :

Fan motors for converter-fed operation at 460 V rated voltage

Motor type	Standard degree of protection	Frame design	Motor series	Motor frame sizes	Output range
					kW
Self-ventilated motors in pole-changing version	IP55	Aluminum	1LA7	80 M ... 160 L	0.15 ... 17
			1LA5	180 M ... 200 L	18 ... 31
			1LG4	180 M ... 315 L	11 ... 200
Forced-air cooled motors without external fan and fan cover	IP55	Aluminum	1PP7	63 M ... 160 L	0.09 ... 18.5
			1PP5	180 M ... 200 L	15 ... 37
			1PP4	180 M ... 315 L	11 ... 200

For technical data, selection and ordering data and special versions, see the relevant sections of "Fan motors".

¹⁾ For converter-fed operation with frame size 225 and above, it is recommended that an "Insulated bearing cartridge" – order code **L27** – is used. For motor series 1LA8 and 1PQ8, the insulated bearing cartridge is standard.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Self-ventilated motors with special insulation
up to 690 V – Aluminum series 1LA7 and 1LA5

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output								Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight Type of construction IM B3 approx. m kg
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Power factor at 50 Hz 3/4-load	Rated current at 400 V, 50 Hz	Rated current at 690 V, 50 Hz			
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	$\cos\phi_{\text{rated}}$	I_{rated} A	I_{rated} A			
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES												
3	100 L	2890	9.9	84	84	0.85	0.81	6.1	3.5	1LA7 106-2PM00		21
4	112 M	2905	13	86	86	0.86	0.83	7.8	4.55	1LA7 113-2PM00		27
5.5	132 S	2925	18	86.5	86.5	0.89	0.86	10.4	6	1LA7 130-2PM00		37
7.5	132 S	2930	24	88	88	0.89	0.86	13.8	8	1LA7 131-2PM00		42
11	160 M	2930	36	89.5	89.5	0.88	0.85	20	11.6	1LA7 163-2PM00		63
15	160 M	2940	49	90	90.2	0.9	0.88	26.5	15.4	1LA7 164-2PM00		72
18.5	160 L	2940	60	91	91.2	0.91	0.89	32	18.6	1LA7 166-2PM00		82
22	180 M	2940	71	91.7	91.7	0.88	0.85	31.5	23	1LA5 183-2PM00		113
30	200 L	2945	97	92.3	92.3	0.89	0.86	53	30.5	1LA5 206-2PM00		159
37	200 L	2945	120	92.8	92.8	0.89	0.86	65	37.5	1LA5 207-2PM00		179
45	225 M	2960	145	93.6	93.6	0.89	0.86	78	45	1LA5 223-2PM00		209
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES												
2.2	100 L	1420	15	82	82.5	0.82	0.77	4.7	2.75	1LA7 106-4PM00		20
3	100 L	1420	20	82.6	82.6	0.82	0.77	6.4	3.7	1LA7 107-4PM00		23
4	112 M	1440	27	85	85.5	0.83	0.79	8.2	4.75	1LA7 113-4PM00		29
5.5	132 S	1455	36	86	86	0.81	0.76	11.4	6.6	1LA7 130-4PM00		39
7.5	132 M	1455	49	87	87.5	0.82	0.77	15.2	8.8	1LA7 133-4PM00		46
11	160 M	1460	72	88.5	89	0.84	0.8	21.5	12.4	1LA7 163-4PM00		67
15	160 L	1460	98	90	90.2	0.84	0.8	28.5	16.6	1LA7 166-4PM00		81
18.5	180 M	1460	121	90.5	90.5	0.83	0.79	35.5	20.5	1LA5 183-4PM00		113
22	180 L	1460	144	91.2	91.2	0.84	0.8	41.5	24	1LA5 186-4PM00		123
30	200 L	1465	196	91.8	91.8	0.86	0.83	55	32	1LA5 207-4PM00		157
37	225 S	1470	240	92.9	92.9	0.87	0.84	66	38.5	1LA5 220-4PM00		206
45	225 M	1470	292	93.4	93.4	0.87	0.84	80	46.5	1LA5 223-4PM00		232
6-pole, 1000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES												
1.5	100 L	925	15	74	74	0.75	0.69	3.9	2.25	1LA7 106-6PM00		20
2.2	112 M	940	22	78	78.5	0.78	0.72	5.2	3.05	1LA7 113-6PM00		24
3	132 S	950	30	79	79.5	0.76	0.7	7.2	4.2	1LA7 130-6PM00		34
4	132 M	950	40	80.5	80.5	0.76	0.7	9.4	5.5	1LA7 133-6PM00		41
5.5	132 M	950	55	83	83	0.76	0.7	12.6	7.3	1LA7 134-6PM00		50
7.5	160 M	960	75	86	86	0.74	0.68	17	9.9	1LA7 163-6PM00		70
11	160 L	960	109	87.5	87.5	0.74	0.68	24.5	14.2	1LA7 166-6PM00		89
15	180 L	970	148	89.5	89.5	0.77	0.71	31.5	18.2	1LA5 186-6PM00		126
18.5	200 L	975	181	90.2	90.2	0.77	0.71	38.5	22.5	1LA5 206-6PM00		161
22	200 L	975	215	90.8	90.8	0.77	0.71	45.5	26.5	1LA5 207-6PM00		183
30	225 M	978	293	91.8	91.8	0.77	0.71	61	35.5	1LA5 223-6PM00		214

Order No. supplements

Motor type	Penultimate position: Voltage code			Final position: Type of construction code						
	500 VY	500 VΔ	690 VY	Without flange		With flange		With standard flange		With special flange
	No rated voltage range			IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover ¹⁾ , IM V3	IM V1 with protective cover ^{1) 2)}	IM B35	IM B14, IM V18 without protective cover, IM V19	IM B34	IM B14, IM V18 without protective cover, IM V19
	3	5	8	0	1	4	6	2	7	3
1LA7 10 □□	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA5 20 □□	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA5 22 □□	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

□ Standard version
○ Without additional charge

✓ With additional charge
– Not possible

For additional text and footnotes, see Page 5/13.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Self-ventilated motors with special insulation
up to 690 V – Aluminum series 1LA7 and 1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise rated output Measuring surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES							
1LA7 106-2PM□□	2.8	6.8	3	16	0.0035	62	74
1LA7 113-2PM□□	2.6	7.2	2.9	16	0.0059	63	75
1LA7 130-2PM□□	2	5.9	2.8	16	0.015	68	80
1LA7 131-2PM□□	2.3	6.9	3	16	0.019	68	80
1LA7 163-2PM□□	2.1	6.5	2.9	16	0.034	70	82
1LA7 164-2PM□□	2.2	6.6	3	16	0.043	70	82
1LA7 166-2PM□□	2.4	7	3.1	16	0.051	70	82
1LA5 183-2PM□□	2.5	6.9	3.2	16	0.077	70	83
1LA5 206-2PM□□	2.4	7.2	2.8	16	0.14	71	84
1LA5 207-2PM□□	2.4	7.7	2.8	16	0.16	71	84
1LA5 223-2PM□□	2.8	7.7	3.4	16	0.2	71	84
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES							
1LA7 106-4PM□□	2.5	5.6	2.8	16	0.0047	53	65
1LA7 107-4PM□□	2.7	5.6	3	16	0.0055	53	65
1LA7 113-4PM□□	2.7	6	3	16	0.012	53	65
1LA7 130-4PM□□	2.5	6.3	3.1	16	0.018	62	74
1LA7 133-4PM□□	2.7	6.7	3.2	16	0.023	62	74
1LA7 163-4PM□□	2.2	6.2	2.7	16	0.043	66	78
1LA7 166-4PM□□	2.6	6.5	3	16	0.055	66	78
1LA5 183-4PM□□	2.3	7.5	3	16	0.13	63	76
1LA5 186-4PM□□	2.3	7.5	3	16	0.15	63	76
1LA5 207-4PM□□	2.6	7	3.2	16	0.24	65	78
1LA5 220-4PM□□	2.8	7	3.2	16	0.32	65	78
1LA5 223-4PM□□	2.8	7.7	3.3	16	0.36	65	78
6-pole, 1000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES							
1LA7 106-6PM□□	2.3	4	2.3	16	0.0047	47	59
1LA7 113-6PM□□	2.2	4.6	2.5	16	0.0091	52	64
1LA7 130-6PM□□	1.9	4.2	2.2	16	0.015	63	75
1LA7 133-6PM□□	2.1	4.5	2.4	16	0.019	63	75
1LA7 134-6PM□□	2.3	5	2.6	16	0.025	63	75
1LA7 163-6PM□□	2.1	4.6	2.5	16	0.044	66	78
1LA7 166-6PM□□	2.3	4.8	2.6	16	0.063	66	78
1LA5 186-6PM□□	2	5.2	2.4	16	0.15	66	78
1LA5 206-6PM□□	2.7	5.5	2.8	16	0.24	66	78
1LA5 207-6PM□□	2.8	5.5	2.9	16	0.28	66	78
1LA5 223-6PM□□	2.8	5.7	2.9	16	0.36	66	78

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- For type of construction IM V1 with/without protective cover, motors 1LA5 183-... to 1LA5 223-... (motor series 1LA5 frame sizes 180 M to 225 M) can be supplied with two additional eyebolts. Specify order supplement **"Z"** and order code **K32**.
- The "Second shaft extension" option, order code **K16** is not possible.
- Type of construction IM V3 can only be ordered using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Self-ventilated motors with special insulation
up to 690 V – Cast-iron series 1LG6

Selection and ordering data

Rated output at 50 Hz P_{rated} kW	Frame size FS	Operating values at rated output								Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight Type of construction IM B3 approx. m kg
		Rated speed at 50 Hz n_{rated} rpm	Rated torque at 50 Hz T_{rated} Nm	Efficiency at 50 Hz 4/4-load η_{rated} %	Efficiency at 50 Hz 3/4-load η_{rated} %	Power factor at 50 Hz 4/4-load $\cos\phi_{\text{rated}}$	Power factor at 50 Hz 3/4-load $\cos\phi_{\text{rated}}$	Rated current at 400 V, 50 Hz I_{rated} A	Rated current at 690 V, 50 Hz I_{rated} A			
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES												
22	180 M	2955	71	93.7	94.1	0.88	0.85	38.5	22.5	1LG6 183-2PM00	180	
30	200 L	2960	97	93.1	93	0.89	0.85	53	30.5	1LG6 206-2PM00	225	
37	200 L	2960	119	93.6	93.5	0.89	0.86	64	37	1LG6 207-2PM00	255	
45	225 M	2965	145	94.4	94.6	0.89	0.87	77	45	1LG6 223-2PM00 ¹⁾	330	
55	250 M	2975	177	95	95	0.9	0.88	93	54	1LG6 253-2PM00 ¹⁾	420	
75	280 S	2975	241	95	95	0.89	0.87	128	74	1LG6 280-2PM00 ¹⁾	530	
90	280 M	2978	289	95.3	95.4	0.9	0.88	150	88	1LG6 283-2PM00 ¹⁾	615	
110	315 S	2982	352	95.5	95.4	0.91	0.89	182	106	1LG6 310-2PM00 ¹⁾	790	
132	315 M	2982	423	95.8	95.7	0.91	0.91	220	126	1LG6 313-2PM00 ¹⁾	915	
160	315 L	2982	512	96.2	96.2	0.92	0.91	260	152	1LG6 316-2PM00 ¹⁾	1055	
200	315 L	2982	641	96.2	96.2	0.93	0.92	320	188	1LG6 317-2PM00 ¹⁾	1245	
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES												
18.5	180 M	1470	120	92.1	92.7	0.83	0.78	34.5	20	1LG6 183-4PM00	155	
22	180 L	1470	143	92.7	93	0.84	0.79	40.5	23.5	1LG6 186-4PM00	180	
30	200 L	1470	195	92.7	92.8	0.85	0.8	55	32	1LG6 207-4PM00	225	
37	225 S	1480	239	93.6	94	0.85	0.81	67	39	1LG6 220-4PM00 ¹⁾	290	
45	225 M	1480	290	94.1	94.3	0.85	0.82	81	47	1LG6 223-4PM00 ¹⁾	330	
55	250 M	1485	354	94.8	95	0.87	0.83	96	56	1LG6 253-4PM00 ¹⁾	460	
75	280 S	1485	482	94.7	94.8	0.87	0.84	130	76	1LG6 280-4PM00 ¹⁾	575	
90	280 M	1486	578	95.1	95.2	0.86	0.83	158	92	1LG6 283-4PM00 ¹⁾	675	
110	315 S	1488	706	95.6	95.7	0.87	0.84	190	110	1LG6 310-4PM00 ¹⁾	810	
132	315 M	1488	847	95.9	96	0.88	0.85	225	130	1LG6 313-4PM00 ¹⁾	965	
160	315 L	1490	1026	96.1	96.2	0.88	0.85	275	158	1LG6 316-4PM00 ¹⁾	1105	
200	315 L	1490	1282	96.1	96.2	0.88	0.86	340	198	1LG6 317-4PM00 ¹⁾	1305	
6-pole, 1000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES												
15	180 L	975	147	90	90.8	0.81	0.77	29.5	17.2	1LG6 186-6PM00	175	
18.5	200 L	978	181	90.5	91.1	0.81	0.76	36	21	1LG6 206-6PM00	210	
22	200 L	978	215	91.4	92	0.82	0.78	42	24.5	1LG6 207-6PM00	240	
30	225 M	980	292	92.6	93.1	0.83	0.8	56	32.5	1LG6 223-6PM00 ¹⁾	325	
37	250 M	985	359	93.1	93.5	0.83	0.79	69	40	1LG6 253-6PM00 ¹⁾	405	
45	280 S	988	435	93.9	94.1	0.85	0.81	81	47	1LG6 280-6PM00 ¹⁾	520	
55	280 M	988	532	93.9	94.1	0.85	0.81	99	58	1LG6 283-6PM00 ¹⁾	570	
75	315 S	990	723	94.6	94.6	0.83	0.79	138	80	1LG6 310-6PM00 ¹⁾	760	
90	315 M	990	868	94.9	95	0.85	0.81	160	93	1LG6 313-6PM00 ¹⁾	935	
110	315 L	990	1061	95.2	95.3	0.85	0.82	196	114	1LG6 316-6PM00 ¹⁾	1010	
132	315 L	990	1273	95.4	95.4	0.85	0.82	235	136	1LG6 317-6PM00 ¹⁾	1180	
160	315 L	990	1543	95.3	95.4	0.86	0.82	280	164	1LG6 318-6PM00 ¹⁾	1245	
8-pole, 750 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES												
11	180 L	725	145	88.1	89	0.76	0.69	23.5	13.8	1LG6 186-8PM00	165	
15	200 L	725	198	88.2	88.7	0.8	0.73	30.5	17.8	1LG6 207-8PM00	235	
18.5	225 S	730	242	89.9	90.6	0.81	0.75	36	21.5	1LG6 220-8PM00 ¹⁾	295	
22	225 M	730	288	90.6	91.1	0.81	0.75	43	25	1LG6 223-8PM00 ¹⁾	335	
30	250 M	735	390	91.9	92.4	0.82	0.77	57	33.5	1LG6 253-8PM00 ¹⁾	435	
37	280 S	738	479	92.6	92.8	0.81	0.76	71	41.5	1LG6 280-8PM00 ¹⁾	510	
45	280 M	738	582	93.3	93.6	0.81	0.77	86	50	1LG6 283-8PM00 ¹⁾	560	
55	315 S	740	710	93.8	93.9	0.82	0.77	102	60	1LG6 310-8PM00 ¹⁾	750	
75	315 M	740	968	93.9	94.1	0.83	0.78	138	81	1LG6 313-8PM00 ¹⁾	840	
90	315 L	740	1161	94.2	94.6	0.84	0.8	164	95	1LG6 316-8PM00 ¹⁾	1005	
110	315 L	740	1420	94.3	94.6	0.84	0.79	200	116	1LG6 317-8PM00 ¹⁾	1100	
132	315 L	740	1704	94.4	94.7	0.84	0.8	240	140	1LG6 318-8PM00 ¹⁾	1270	

For Order No. supplement, see Page 5/16.

¹⁾ Insulated bearing cartridge at non-drive-end NDE is recommended (order code L27).

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Self-ventilated motors with special insulation
up to 690 V – Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output Measuring surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	$L_{p(A)}$ dB(A)	L_{WA} DB(A)
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES							
1LG6 183-2PM□□	2.5	7.2	3.4	16	0.086	67	80
1LG6 206-2PM□□	2.4	7	3.3	16	0.15	71	84
1LG6 207-2PM□□	2.5	7.2	3.3	16	0.18	71	84
1LG6 223-2PM□□	2.5	7.3	3.2	16	0.27	71	84
1LG6 253-2PM□□	2.4	6.8	3	16	0.47	71	84
1LG6 280-2PM□□	2.5	7	3	13	0.83	73	86
1LG6 283-2PM□□	2.6	7.6	3.1	13	1	73	86
1LG6 310-2PM□□	2.4	6.9	2.8	13	1.4	76	89
1LG6 313-2PM□□	2.6	7.1	2.9	13	1.6	76	89
1LG6 316-2PM□□	2.5	7.1	2.9	13	2.1	76	89
1LG6 317-2PM□□	2.5	6.9	2.8	13	2.5	76	89
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES							
1LG6 183-4PM□□	2.5	6.4	3	16	0.12	60	73
1LG6 186-4PM□□	2.5	6.7	3.1	16	0.14	60	73
1LG6 207-4PM□□	2.6	6.7	3.3	16	0.23	62	75
1LG6 220-4PM□□	2.7	6.8	3	16	0.4	60	73
1LG6 223-4PM□□	2.8	6.9	3	16	0.49	60	73
1LG6 253-4PM□□	2.6	7.5	3	16	0.86	65	78
1LG6 280-4PM□□	2.5	6.8	2.9	16	1.4	67	80
1LG6 283-4PM□□	2.7	7.5	3.1	16	1.7	68	82
1LG6 310-4PM□□	2.7	7.1	2.9	16	2.3	68	82
1LG6 313-4PM□□	2.7	7.3	2.9	16	2.9	69	83
1LG6 316-4PM□□	3	7.4	3	16	3.5	69	83
1LG6 317-4PM□□	3.2	7.6	3	16	4.2	69	83
6-pole, 1000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES							
1LG6 186-6PM□□	2.4	5.5	2.5	16	0.2	56	69
1LG6 206-6PM□□	2.4	5.6	2.4	16	0.29	59	72
1LG6 207-6PM□□	2.4	5.6	2.4	16	0.36	59	72
1LG6 223-6PM□□	2.8	6.5	2.9	16	0.63	59	72
1LG6 253-6PM□□	2.9	6.8	2.5	16	0.93	59	72
1LG6 280-6PM□□	3	6.8	2.7	16	1.4	58	71
1LG6 283-6PM□□	3.3	7.3	2.9	16	1.6	58	71
1LG6 310-6PM□□	2.8	7.3	3	16	2.5	61	74
1LG6 313-6PM□□	2.7	7.3	2.9	16	3.2	61	74
1LG6 316-6PM□□	2.9	7.4	2.9	16	4	61	74
1LG6 317-6PM□□	3.1	7.8	3.1	16	4.7	61	74
1LG6 318-6PM□□	3.2	7.8	3.1	16	5.4	64	77
8-pole, 750 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES							
1LG6 186-8PM□□	1.7	4.6	2.2	13	0.21	62	75
1LG6 207-8PM□□	2.3	5.3	2.6	13	0.37	62	75
1LG6 220-8PM□□	2.3	5.6	2.6	13	0.55	54	67
1LG6 223-8PM□□	2.4	5.8	2.8	13	0.66	58	71
1LG6 253-8PM□□	2.5	6	2.8	13	1.1	57	70
1LG6 280-8PM□□	2.3	5.7	2.3	13	1.4	58	71
1LG6 283-8PM□□	2.6	6.1	2.4	13	1.6	58	71
1LG6 310-8PM□□	2.5	6.3	2.9	13	2.5	61	75
1LG6 313-8PM□□	2.5	6.7	2.9	13	3.1	60	74
1LG6 316-8PM□□	2.4	6.3	2.8	13	3.9	64	77
1LG6 317-8PM□□	2.4	6.4	2.6	13	4.5	64	77
1LG6 318-8PM□□	2.5	6.7	2.9	13	5.3	64	77

For Order No. supplement, see Page 5/16.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Self-ventilated motors with special insulation
up to 690 V – Cast-iron series 1LG6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code			Final position: Type of construction code							
	50 Hz 500 VY	500 VΔ	690 VY	Without flange IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	With flange IM B5, IM V1 without protective cover ²⁾	IM V1 without protective cover ²⁾	IM V1 with protective cover ²⁾³⁾	IM B35	With standard flange IM B14, IM V18 with- out protec- tive cover, IM V19	IM B34	With special flange IM B14, IM V18 without protective cover, IM V19
	3	5	8	0	1	8	4	6	2	7	3
1LG6 18 . . . PM□□	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 20 . . . PM□□	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 22 . . . PM□□	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 25 . . . PM□□	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 28 . . . PM□□	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 310 . . . PM□□	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 313 . . . PM□□	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 316 . . . PM□□	○	○	○	□ ⁴⁾	–	✓ ⁵⁾	✓ ⁵⁾	✓	–	–	–
1LG6 317 . . . PM□□	○	○	○	□ ⁴⁾	–	✓ ⁵⁾	✓ ⁵⁾	✓	–	–	–
1LG6 318 . . . PM□□	○	○	○	□ ⁴⁾	–	✓ ⁵⁾	✓ ⁵⁾	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

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¹⁾ If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ The “Second shaft extension” option, order code **K16** is not possible.

⁴⁾ Type of construction IM V6/IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** and **M1D**.

⁵⁾ 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Self-ventilated motors FS 315 a. above, w. special insulation up to 690 V – Cast-iron series 1LA8

Overview

Recommended types:

- 1LA8 in output range from 145 to 980 kW (at 50 Hz).

Selection and ordering data

The data for motor series 1LA8 with special insulation for voltages up to 690 V for converter-fed operation can be found in the "Technical specifications" and "Selection and ordering data" in catalog part 3 "Non-standard motors frame size 315 and above". They are ordered using additional order options (special versions). These special versions for voltages, construction types or options are listed in catalog part 3 "Non-standard motors frame size 315 and above".

Forced-air cooled motors FS 315 a. above, w. fan, with special insulation up to 690 V – Cast-iron series 1PQ8

Overview

Recommended types:

- 1PQ8 in output range from 145 to 980 kW (at 50 Hz)

Selection and ordering data

The data for motor series 1PQ8 with special insulation for voltages up to 690 V for converter-fed operation can be found in the "Technical specifications" and "Selection and ordering data" in catalog part 3 "Non-standard motors frame size 315 and above". They are ordered using additional order options (special versions). These special versions for voltages, construction types or options are listed in catalog part 3 "Non-standard motors frame size 315 and above". Please inquire about 1PQ8 motors.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Overview

Motor protection

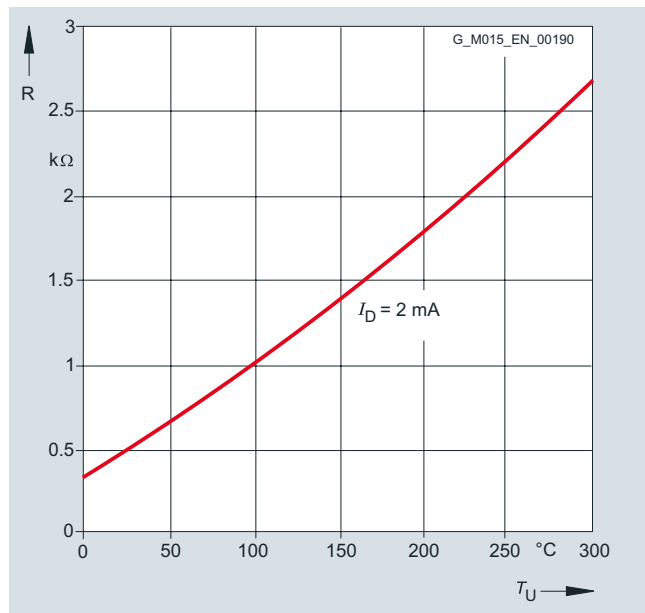
KTY 84 temperature sensor

Order code

A23: 1 x KTY 84-130

A25: 2 x KTY 84-130

This sensor is a semi-conductor that changes its resistance depending on temperature in accordance with a defined curve.



KTY 84 temperature sensor

For 1LA8 motors, the PTC thermistors supplied as standard are omitted when ordering with order code **A23**.

For mains-fed operation, the temperature monitoring device 3RS10 that is part of the protection equipment can be ordered separately. For further details, see Catalog LV1.

Motor protection for explosion-proof motors

The explosion-proof motors for Zones 2, 21 and 22 for converter-fed operation (ordered with order codes **M73**, **M38**, **M39**, **M75** or **M77**) already have PTC thermistors for tripping as standard. For converter-fed operation, thermistors can be additionally ordered for alarm (order code **A10**).

For the explosion-proof motor series of Zone 1 with type of protection "d", order codes **A15** and **A16** are available specially for converter-fed operation:

Order code **A15**: Motor protection with PTC thermistors for converter-fed operation with 3 or 4 embedded temperature sensors for tripping.

Order code **A16**: Motor protection with PTC thermistors for converter-fed operation with 6 or 8 embedded temperature sensors for alarm and tripping.

Order code **M77** (incl. order code **A15**): Design for Zones 1 and 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating.

Rating plate data for motors operating with frequency converters for Zones 2, 21 and 22

"MICROMASTER DUTY S9" is stamped on the rating plate as standard, i.e. the rating data for the MICROMASTER converter series from Siemens are indicated. For other converter types (SIMOVERT MASTERDRIVES, SINAMICS G110, SINAMICS S120 or SIMATIC ET 200S FC), the converter type required must be specified in the order in plain text following the order code **Y68**. This is due to the different degree of utilization of the converter and the resulting derating of the motor.

Bearing

For converter-fed operation with frame size 225 and above, it is recommended that an "Insulated bearing cartridge" – Order code **L27** is used.

Ventilation/noise generation

The fan noise can increase at speeds that are higher than the rated speed of self-ventilated motors.

To increase motor utilization at low speeds, it is recommended that forced ventilated motors are used, in particular motor series 1LA5, 1LA7, 1LG4 and 1LG6 with order code **G17** or motor series 1PQ8.

Insulation

For converter-fed operation with the outputs specified in the catalog, the motors are used according to temperature class 155 (F), i.e. in this case neither a service factor >1 nor an increased coolant temperature is possible, that is order codes **C11**, **C12** and **C13** cannot be ordered. Explosion-proof motors for Zones 2, 21 and 22 are utilised in accordance with temperature class 130 (B).

Supply frequencies larger than 60 Hz

For converter-fed operation with frequencies greater than 60 Hz, special balancing is required for compliance with the specified limit values (plain text: Max. speed).

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Overview (continued)**ECOFAST motor connectors**

In combination with the ECOFAST versions of the MICROMASTER 411 distributed drive solutions, the following motor connectors can be ordered separately:

- ECOFAST motor connector, standard (unshielded connection): Order code **G55**.
- ECOFAST motor connector, EMC (shielded connection): Order code **G56**.
Shielded motor connection cables must be used for frequency converters and soft starters.

Maximum admissible mains voltage on motor connector: ≤500 V

Ordering example:

Selection criteria	Requirement	Structure of the Order No.
Motor type	Standard motor with high efficiency (EFF1), IP55 degree of protection, aluminum housing	1LA9 000-00000
No. of poles/speed	4-pole/1500 rpm	1LA9 090-4KA90
Rated output	1.1 kW	L1U
Special voltage and frequency	Star/delta starting for a mains voltage 400 VΔ, 50 Hz ¹⁾	
Type of construction	IM B3	
ECOFAST connector	Shielded connection	1LA9 090-4KA90 – Z L1U + G56

Converter mounting

Motor series 1LA7 with standard insulation up to 500 V in catalog parts 2 "Standard motors up to frame size 315 L" and 7 "Fan motors" can be prepared for mounting an MMI (MICROMASTER Integrated). Order code **H15** is required for this purpose.

Earth brushes for converter-fed operation

Earth brushes are available for converter-fed operation for 1LG4 and 1LG6 motors with order code **M44**. Please contact your local Siemens office for advice.

Motor series with special insulation up to 690 V

For motor series 1LA7/5 and 1LG6 with special insulation up to 690 V, the following special versions are generally not possible:

Description	Order code
With PTC thermistors for alarm for converter-fed operation in Zones 2, 21 and 22	A10
Temperature detectors for tripping	A31
Installation of 3PT100 resistance thermometers	A60
Installation of 6PT100 resistance thermometers in stator winding	A61
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	C11
Temperature class 155 (F), used acc. to 155 (F), with increased output	C12
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13
Temperature class 180 (H) at rated output and max. CT 60 °C	C18
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26
Stamping of Ex nA II on VIK rating plate	C27
Coolant temperature –40 °C to +40 °C for EX motor	D19
Design according to UL with "Recognition Mark"	D31
Canadian regulations (CSA)	D40
ECOFAST motor connector Han-Drive 10e for 230 VΔ/400 VY	G55
ECOFAST motor connector EMC Han-Drive 10e for 230 VΔ/400 VY	G56
Prepared for mounting the MICROMASTER Integrated frequency converter	H15
Mounting of explosion-proof rotary pulse encoder for use in Zones 2, 21, 22	H86
VIK design (comprises Zone 2 for mains-fed operation, without Ex nA II marking on rating plate)	K30
Anti-condensation heater, Ex. 115 V	M14
Anti-condensation heater, Ex. 230 V	M15
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for mains-fed operation	M34
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	M35
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating	M38
Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating	M39
Design for Zone 2 for mains-fed operation Ex nA II T3 acc. to IEC/EN 60079-15	M72
Design for Zone 2 for converter-fed operation, derating acc. to IEC/EN 60079-15	M73
Design for Zones 2 and 22, for non-conducting dust (IP55), for mains-fed operation	M74
Design for Zones 2 and 22, for non-conducting dust (IP55), for converter-fed operation, derating	M75
Mounting of explosion-proof separately driven fan Ex nA for use in Zone 2	M95
Mounting of explosion-proof separately driven fan II 2D for use in Zone 21	M96
Mounting of explosion-proof separately driven fan II 3D for use in Zone 22	M97
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52
Alternative converter (SIMOVERT MASTERDRIVES, SINAMICS G110, SINAMICS S120 or ET 200S FC)	Y68

¹⁾ Note: Voltage code **9** with order code **L1U** must be selected due to the 400 V voltage. With voltage code 6 (= 400 VΔ/690 VY, 50 Hz), temporary voltage peaks of 690 V can arise which can cause faults on the ECOFAST connectors.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Selection and ordering data

Voltages

Additional order codes for other voltages or voltage codes
(without **-Z** supplement)

For some non-standard voltages at 50 or 60 Hz, order codes are specified. They are ordered by specifying the code **9** for voltage in the 11th position of the Order No. and the appropriate order code.

Special versions	Voltage code 11th position of the Order No.	Additional identification code with order code and, if required, with plain text	Motor type frame size														
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with special insulation for voltages up to 690 V – Aluminum series 1LA7 and 1LA5																	
Non-standard voltage and/or frequencies																	
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ¹⁾	9	L1Y •															
Self-ventilated motors with special insulation for voltages up to 690 V – Cast-iron series 1LG6																	
Non-standard voltage and/or frequencies																	
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ¹⁾	9	L1Y •															

- ✓ With additional charge
- This order code only determines the price of the version – Additional plain text is required.

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¹⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

²⁾ For voltages in the 200 V range, please contact your local Siemens representative.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Types of construction

Additional order codes for other types of construction or type of construction codes (without **-Z** supplement)

Order codes have been defined for some special types of construction. They are ordered by specifying the code **9** for the type of construction in the 12th position of the Order No. and the appropriate order code.

Special versions	Type of construction code 12th position of the Order No.	Additional identification code with order code and, if required, with plain text	Motor type frame size													315 L S/M	2- pole	4-, 6-, 8- pole
			56	63	71	80	90	100	112	132	160	180	200	225	250				280
Self-ventilated motors with special insulation for voltages up to 690 V – Aluminum series 1LA7 and 1LA5																		
			1LA7 (aluminum)						1LA5 (aluminum)									
Without flange																		
IM V5 with protective cover ¹⁾	9	M1F	✓	✓	✓	✓	✓	✓	✓	✓								
With flange																		
IM V3 ²⁾	9	M1G	–	–	–	–	–	✓	✓	✓								
With standard flange																		
IM V18 with protective cover ¹⁾	9	M2A	✓	✓	✓	✓	✓	–	–	–								
With special flange																		
IM V18 with protective cover ¹⁾	9	M2B	✓	✓	✓	✓	✓	–	–	–								
IM B34	9	M2C	✓	✓	✓	✓	✓	–	–	–								
Self-ventilated motors with special insulation for voltages up to 690 V – Cast-iron series 1LG6																		
			1LG6 (cast-iron)															
Without flange																		
IM V5 without protective cover ⁴⁾	9	M1D	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓ ³⁾	○
IM V6 ⁴⁾	9	M1E	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓ ³⁾	○
IM V5 with protective cover ^{1) 4)}	9	M1F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ ³⁾	✓
With flange																		
IM V3 ⁵⁾	9	M1G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–

- Without additional charge
- ✓ With additional charge
- Not possible

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.
²⁾ For frame sizes 180 M to 225 M, the 1LA5 motors can be supplied with two additional eyebolts; state Order No. suffix "**Z**" and order code **K32**.
³⁾ 60 Hz version is possible on request

⁴⁾ If motors of frame sizes 180 M to 315 L are mounted on the wall, it is recommended that the motor feet are supported.
⁵⁾ 1LG6 motors of frame sizes 225 S to 315 M are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Options

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with special insulation for voltages up to 690 V – Aluminum series 1LA7 and 1LA5																
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11						✓	✓	✓	✓	✓	✓	✓			
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12						✓	✓	✓	✓	✓	✓	✓			
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23						✓	✓	✓	✓	✓	✓	✓			
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25						✓	✓	✓	✓	✓	✓	✓			
Motor connection and connection box																
Connection box on RHS	K09						✓	✓	✓	✓	✓	✓	✓			
Connection box on LHS	K10						✓	✓	✓	✓	✓	✓	✓			
One cable gland, metal	K54						✓	✓	✓	✓	✓	✓	✓			
Cable gland, maximum configuration	K55						✓	✓	✓	✓	✓	✓	✓			
Rotation of the connection box through 90°, entry from DE (AS)	K83						✓	✓	✓	✓	✓	✓	✓			
Rotation of the connection box through 90°, entry from NDE (BS)	K84						✓	✓	✓	✓	✓	✓	✓			
Rotation of connection box through 180°	K85						○	○	○	○	✓	✓	✓			
Next larger connection box	L00						–	–	–	–	✓	✓	✓			
External earthing	L13						✓	✓	✓	✓	✓	✓	✓			
3 cables protruding, 0.5 m long ²⁾	L44						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.			
3 cables protruding, 1.5 m long ²⁾	L45						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.			
6 cables protruding, 0.5 m long ²⁾	L47						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.			
6 cables protruding, 1.5 m long ²⁾	L48						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.			
6 cables protruding, 3 m long ²⁾	L49						–	–	–	–	O. R.	O. R.	O. R.			
Connection box on NDE (BS)	M64						✓	✓	✓	✓	✓	✓	✓			
Windings and insulation																
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	C22						✓	✓	✓	✓	✓	✓	✓			
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	C23						✓	✓	✓	✓	✓	✓	✓			
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	C24						✓	✓	✓	✓	✓	✓	✓			
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	C25						✓	✓	✓	✓	✓	✓	✓			

For legend and footnotes, see Page 5/26.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors with special insulation for voltages up to 690 V – Aluminum series 1LA7 and 1LA5																	
		1LA7 (aluminum)						1LA5 (aluminum)									
Colors and paint finish																	
Special finish in RAL 7030 stone gray							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54• and special finish RAL						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51• and special finish RAL						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Sea air resistant special finish	M94						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	
Unpainted (only cast iron parts primed)	K23						○	○	○	○	○	○	○	○	○	○	
Unpainted, only primed	K24						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Modular technology – Basic versions ³⁾																	
Mounting of separately driven fan	G17						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Mounting of brake ⁴⁾	G26						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	H57						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	H58						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Modular technology – Combinations of basic versions ³⁾																	
Mounting of separately driven fan and 1XP8 001-1 rotary pulse encoder	H61						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Mounting of brake and 1XP8 001-1 rotary pulse encoder ⁴⁾	H62						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Mounting of brake and separately driven fan ⁴⁾	H63						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Mounting of brake, separately driven fan and 1XP8 001-1 rotary pulse encoder ⁴⁾	H64						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Mounting of separately driven fan and 1XP8 001-2 rotary pulse encoder	H97						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Mounting of brake and 1XP8 001-2 rotary pulse encoder ⁴⁾	H98						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Mounting of brake, separately driven fan and 1XP8 001-2 rotary pulse encoder ⁴⁾	H99						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with special insulation for voltages up to 690 V – Aluminum series 1LA7 and 1LA5																
											1LA7 (aluminum)		1LA5 (aluminum)			
Modular technology – Additional versions																
Brake supply voltage 24 V DC	C00										✓	✓	✓	✓	✓	✓
Brake supply voltage 400 V AC	C01										✓	✓	✓	✓	✓	✓
Brake supply voltage 180 V DC, for operation on MM411-ECOFAST	C02										✓	✓	✓	–	–	–
Mechanical manual brake release with lever (no locking)	K82										✓	✓	✓	✓	✓	✓
Special technology ³⁾																
Mounting of LL 861 900 220 rotary pulse encoder	H70										✓	✓	✓	✓	✓	✓
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72										✓	✓	✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73										✓	✓	✓	✓	✓	✓
Prepared for mounting LL 861 900 220	H78										✓	✓	✓	✓	✓	✓
Prepared for mounting HOG 9 D 1024 I	H79										✓	✓	✓	✓	✓	✓
Prepared for mounting HOG 10 D 1024 I	H80										✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors with oil resistance up to 0.1 bar Not possible for IM V3 type of construction.	K17										✓	✓	✓	✓	✓	✓
With two additional eyebolts for IM V1/IM V3	K32										–	–	–	–	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation	K37										–	–	✓	✓	✓	✓
Low-noise version for 2-pole motors with counter-clockwise direction of rotation	K38										–	–	✓	✓	✓	✓
IP65 degree of protection ⁵⁾	K50										✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea) ⁶⁾	K52										✓	✓	✓	✓	✓	✓
Vibration-proof version	L03										✓	✓	✓	✓	✓	✓
Condensation drainage holes ⁷⁾	L12										✓	✓	✓	✓	✓	✓
Non-rusting screws (externally)	M27										✓	✓	✓	✓	✓	✓
Mechanical protection for encoder ⁸⁾	M68										✓	✓	✓	✓	✓	✓
Coolant temperature and site altitude																
Coolant temperature –40 to +40 °C ⁹⁾	D03										✓	✓	✓	✓	✓	✓
Coolant temperature –30 to +40 °C ⁹⁾	D04										✓	✓	✓	✓	✓	✓

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For legend and footnotes, see Page 5/26.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with special insulation for voltages up to 690 V – Aluminum series 1LA7 and 1LA5																
Designs in accordance with standards and specifications																
CCC China Compulsory Certification ¹⁰⁾	D01						✓	✓	–	–	–	–	–	–	–	–
Electrical according to NEMA MG1-12	D30						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection ¹¹⁾	G50						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces	K20						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regreasing device ¹¹⁾	K40						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing DE (AS)	K94						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing NDE (BS)	L04						✓	✓	✓	✓	□	□	□	□	□	□
Balance and vibration quantity																
Vibration quantity level A							□	□	□	□	□	□	□	□	□	□
Vibration quantity level B	K02						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Full key balancing	L68						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Balancing without key	M37						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹²⁾	K04						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second standard shaft extension	K16						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft extension with normal dimensions without feather key	K42						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Standard shaft made of non-rusting steel	M65						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ¹³⁾	Y55 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heating and ventilation																
Fan cover for textile industry	H17						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Metal external fan ¹⁴⁾	K35						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Anti-condensation heaters for 115 V	K46						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Rating plate and extra rating plates																
Second lubricating plate, supplied loose	B06						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second rating plate, loose	K31						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with special insulation for voltages up to 690 V – Aluminum series 1LA7 and 1LA5																
Packaging, safety notes, documentation and test certificates																
Without safety and commissioning note. Customer's declaration of renouncement required.	B00															
With one safety and startup guide per box pallet	B01															
Acceptance test certificate 3.1 according to EN 10204	B02															
Operating instructions German/English enclosed in print	B23															
Wire-lattice pallet	L99															
Connected in star for dispatch	M32															
Connected in delta for dispatch	M33															

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- O.R. Possible on request
- ✓ With additional charge
- Not possible

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- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 2) In combination with the PTC thermistor option or anti-condensation heating option, please inquire before ordering.
- 3) A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various technologies nor with each other within the same technology system. This applies for:
 - Modular technology – Basic versions
 - Modular technology – Combination of basic versions
 - Special technology
- 4) The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00**, **C01** and **C02**.
- 5) Not possible in combination with rotary pulse encoder HOG 9 D 10241 (order code **H72**, **H79**) and/or brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 6) Not possible in combination with brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 7) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 8) Not necessary when a rotary pulse encoder is combined with a separately driven fan, because in this case the rotary pulse encoder is installed under the fan cover.
- 9) In connection with mountings, the respective technical data must be observed; request required.

- 10) CCC certification is required for
 - 2-pole motors ≤ 2.2 kW
 - 4-pole motors ≤ 1.1 kW
 - 6-pole motors ≤ 0.75 kW
 - 8-pole motors ≤ 0.55 kW
- 11) Not possible when brake is mounted.
- 12) Can be combined with deep-groove bearings of series 60.., 62.. and 63.. . Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**) brake or encoder fitting.
- 13) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively.

Not applicable for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case.

The add-on prices also apply for "Shaft extension DE without featherkey way".

For order codes **Y55** and **K16**:

 - Dimensions D and DA \leq Inner diameter of roller bearing (see tables under "Dimensions")
 - Dimensions E and EA $\leq 2 \times$ Length E (normal) of the shaft extension

For explanation of the order codes, see catalog part 0 "Introduction".
- 14) For 1LA5, 1LA6, 1LA7, 1LA9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external fan is not possible in combination with the low-noise version – order code **K37** or **K38**.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with special insulation for voltages up to 690 V – Cast-iron series 1LG6																
1LG6 (cast-iron)																
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11										✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12										✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23										✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25										✓	✓	✓	✓	✓	✓
Temperature detectors for tripping ¹⁾	A31										✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ^{1) 2)}	A72										✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A78										✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A80										✓	✓	✓	✓	✓	✓
Motor connection and connection box																
Two-part plate on connection box	K06										–	✓	✓	✓	✓	✓
Connection box on RHS	K09										✓	✓	✓	✓	✓	✓
Connection box on LHS	K10										✓	✓	✓	✓	✓	✓
Connection box on top, feet screwed on	K11										✓	✓	✓	✓	✓	✓
Connection box in cast-iron version	K15										✓	✓	✓	–	–	–
One cable gland, metal	K54										✓	✓	✓	✓	✓	✓
Cable gland, maximum configuration	K55										✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83										✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84										✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85										✓	✓	✓	✓	✓	✓
Next larger connection box	L00										✓	✓	✓	✓	✓	✓
6 cables protruding, 1.5 m long ³⁾	L48										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
6 cables protruding, 3 m long ³⁾	L49										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends – right side ^{3) 4)}	L51										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends – left side ^{3) 4)}	L52										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Auxiliary connection box 1XB3 020	L97										✓	✓	✓	✓	✓	✓
Stud terminal for cable connection, accessories pack (3 items)	M46										–	–	–	✓	✓	✓
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47										–	–	–	✓	✓	✓

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors with special insulation for voltages up to 690 V – Cast-iron series 1LG6																	
1LG6 (cast-iron)																	
Windings and insulation																	
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	C22											✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	C23											✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	C24											✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	C25											✓	✓	✓	✓	✓	✓
Colors and paint finish																	
Standard finish in RAL 7030 stone gray												□	□	□	□	□	□
Standard finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y53 • and standard finish RAL											✓	✓	✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26											✓	✓	✓	✓	✓	✓
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL											✓	✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" Page 0/19	Y51 • and special finish RAL											✓	✓	✓	✓	✓	✓
Offshore special finish	M91											✓	✓	✓	✓	✓	✓
Sea air resistant special finish	M94											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23											○	○	○	○	○	○
Unpainted, only primed	K24											✓	✓	✓	✓	✓	✓
Modular technology – Basic versions ⁵⁾																	
Mounting of separately driven fan ⁶⁾	G17											✓	✓	✓	✓	✓	✓
Mounting of brake ^{6) 7)}	G26											✓	✓	✓	✓	✓	✓
Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	H57											✓	✓	✓	✓	✓	✓
Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	H58											✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 5/31.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with special insulation for voltages up to 690 V – Cast-iron series 1LG6																
1LG6 (cast-iron)																
Modular technology – Combinations of basic versions ⁵⁾																
Mounting of separately driven fan and 1XP8 001-1 rotary pulse encoder	H61											✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-1 rotary pulse encoder ⁷⁾	H62											✓	✓	✓	✓	✓
Mounting of brake and separately driven fan ⁷⁾	H63											✓	✓	✓	✓	✓
Mounting of brake, separately driven fan and 1XP8 001-1 rotary pulse encoder ⁷⁾	H64											✓	✓	✓	✓	✓
Mounting of separately driven fan and 1XP8 001-2 rotary pulse encoder	H97											✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-2 rotary pulse encoder ⁷⁾	H98											✓	✓	✓	✓	✓
Mounting of brake, separately driven fan and 1XP8 001-2 rotary pulse encoder ⁷⁾	H99											✓	✓	✓	✓	✓
Modular technology – Additional versions																
Brake supply voltage 24 V DC	C00											✓	✓	✓	✓	✓
Brake supply voltage 400 V AC	C01											✓	✓	✓	✓	✓
Mechanical manual brake release with lever (no locking)	K82											✓	✓	✓	✓	✓
Special technology ⁵⁾																
Mounting of LL 861 900 220 rotary pulse encoder	H70											✓	✓	✓	✓	✓
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72											✓	✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73											✓	✓	✓	✓	✓
Prepared for mounting LL 861 900 220	H78											✓	✓	✓	✓	✓
Prepared for mounting HOG 9 D 1024 I	H79											✓	✓	✓	✓	✓
Prepared for mounting HOG 10 D 1024 I	H80											✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors with oil resistance to 0.1 bar Not possible for IM V3 type of construction and 2-pole motors.	K17											✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation ⁸⁾	K37											–	–	–	–	–
Low-noise version for 2-pole motors with counter-clockwise direction of rotation ⁸⁾	K38											–	–	–	–	–
IP65 degree of protection ⁹⁾	K50											✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea) ¹⁰⁾	K52											✓	✓	✓	✓	✓
Condensation water holes ¹¹⁾	L12											□	□	□	□	□
Non-rusting screws (externally)	M27											✓	✓	✓	✓	✓
Earth brushes for converter-fed operation	M44											–	–	–	–	O. R. O. R.
Mechanical protection for encoder ¹²⁾	M68											✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors with special insulation for voltages up to 690 V – Cast-iron series 1LG6																	
1LG6 (cast-iron)																	
Coolant temperature and site altitude																	
Coolant temperature –50 to +40 °C ¹³⁾	D02											✓	✓	✓	✓	✓	✓
Coolant temperature –40 to +40 °C ¹³⁾	D03											✓	✓	✓	✓	✓	✓
Coolant temperature –30 to +40 °C ¹³⁾	D04											✓	✓	✓	✓	✓	✓
Bearings and lubrication																	
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50											✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ¹⁴⁾	K20											✓	✓	✓	✓	✓	✓
Special bearing for DE and NDE, bearing size 63	K36											✓	✓	✓	✓	✓ ¹⁵⁾	✓ ¹⁵⁾
Regreasing device	K40											✓	✓	✓	✓	□	□
Located bearing DE	K94											✓	✓	✓	✓	✓	✓
Located bearing NDE	L04											□	□	□	□	□	□
Insulated bearing cartridge ¹⁶⁾	L27											–	–	✓	✓	✓	✓
Balance and vibration quantity																	
Vibration quantity level A												□	□	□	□	□	□
Vibration quantity level B	K02											✓	✓	✓	✓	✓	✓
Full key balancing	L68											✓	✓	✓	✓	✓	✓
Balancing without key	M37											✓	✓	✓	✓	✓	✓
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R ₁ for flange-mounting motors ¹⁷⁾	K04											✓	✓	✓	✓	✓	✓
Second standard shaft extension ¹⁸⁾	K16											✓	✓	✓	✓	✓	✓
Shaft extension with normal dimensions without feather key	K42											✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39											✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ¹⁹⁾	Y55 • and identification code											✓	✓	✓	✓	✓	✓
Heating and ventilation																	
Metal external fan ²⁰⁾	K35											✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45											✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46											✓	✓	✓	✓	✓	✓
Sheet metal fan cover	L36											✓	✓	✓	✓	✓	✓
Separately driven fan with non-standard voltage and/or frequency	Y81 • and identification code											–	–	✓	✓	✓	✓

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For legend and footnotes, see Page 5/31.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with special insulation for voltages up to 690 V – Cast-iron series 1LG6																
1LG6 (cast-iron)																
Rating plate and extra rating plates																
Second lubricating plate, supplied loose	B06															
Second rating plate, loose	K31															
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code															
Extra rating plate with identification code	Y82 • and identification code															
Additional information on rating plate and on package label (max. of 20 characters)	Y84 • and identification code															
Packaging, safety notes; documentation and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02															
Operating instructions German/English enclosed in print	B23															
Connected in star for dispatch	M32															
Connected in delta for dispatch	M33															

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- O.R. Possible on request
- ✓ With additional charge
- Not possible

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 2) This option is not possible for frame sizes 225 to 315 in combination with the option "Insulated bearing cartridge" – order code **L27**.
- 3) In combination with the PTC thermistor option or anti-condensation heating option, please inquire before ordering.
- 4) Possible in combination with order code **L44** to **L49** or length specification in plain text.
- 5) A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various technologies nor with each other within the same technology system. This applies for:
 - Modular technology – Basic versions
 - Modular technology – Combination of basic versions
- 6) For 1LG6 motors, order codes **G17**, **G26** and **H63** frame size 225 and above can also be combined with rotary pulse encoders, see the "Special technology" range.
- 7) The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00** and **C01**.
- 8) Not necessary for 1LG6 motors because these motors are already noise optimized.
- 9) Not possible in combination with rotary pulse encoder HOG 9 D 1024I (order code **H72**, **H79**) and/or brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 10) Not possible in combination with brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 11) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 12) Not necessary when a rotary pulse encoder is combined with a separately driven fan, because in this case the rotary pulse encoder is installed under the fan cover.
- 13) In connection with mountings, the respective technical data must be observed; request required.
- 14) Not possible for 2-pole 1LG6 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration quantity level B available on request for 1LG6 motors. Not possible for 1LG6 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – order code **K04**.
- 15) Additional charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- 16) This option is not possible for frame sizes 225 to 315 in combination with the option "Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings" – order code **A72**.
- 17) Can be combined with deep-groove bearings of series 60... 62... and 63... . Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**) brake or encoder fitting.
- 18) Possible for motors of frame size 315 and above in vertical types of construction or 2-pole for version with second shaft extension on request. Version with protective cover not possible.
- 19) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not applicable for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see catalog part 0 "Introduction".
- 20) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external fan is not possible in combination with the low-noise version – order code **K37** or **K38**.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Accessories

Overview

Slide rails with fixing bolts and tensioning screws to DIN 42923

Slide rails are used to tension the belt of a machine easily and conveniently when a belt tightener is not available. They are fixed to the base using stone bolts or foundation blocks.

The assignment of slide rails to motor size can be found in DIN 42923. For motors of frame sizes 355 to 450, there are no standardized slide rails (please inquire).

Available from:
Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Foundation block acc. to DIN 799

The foundation blocks are inserted into the stone foundation and embedded in concrete. They are used for fixing machines of medium size, slide rails, pedestal bearings, baseframes, etc. After the fixing bolts have been unscrewed, the machine can be dragged without it having to be lifted.

When the machine is initially installed, the foundation block that is bolted to the machine (without washers) and fitted with taper pins is not embedded with concrete until the machine has been fully aligned. In this case, the machine is positioned 2 to 3 mm lower. The difference in shaft height is compensated by inserting shims on final installation. The taper pins safeguard the exact position of the machine when it is repeatedly removed and replaced without the need for realignment.

Available from:
Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Taper pins to DIN 258 with threaded ends and constant taper lengths

Taper pins are used for components that are repeatedly removed. The drilled hole is ground conical using a conical reamer until the pin can be pushed in by hand until the cone shoulder lies 3 to 4 mm above the rim of the hole.

It can then be driven in using a hammer until it is correctly seated. The pin is removed from the drilled hole by screwing on the nut and tightening it.

Standardized taper pins are available from general engineering suppliers.

Available from:
Otto Roth GmbH & Co. KG
Rutesheimer Straße 22
70499 Stuttgart, Germany
Tel. +49 (0)711-13880
Fax +49 (0)711-1388233

<http://www.ottoroth.de>
e-mail: info@ottoroth.de

Couplings

In most cases, the motor is connected to the driving machine through coupling.

Source of supply:
Siemens contact partner – ordering from Catalog
Siemens MD 10.1 "FLENDER Standard Couplings"

or

A. Friedr. Flender AG
Kupplungswerk Mussum
Industriepark Bocholt
Schlavenhorst 100
46395 Bocholt, Germany
Tel. +49 (0)2871-922185
Fax +49 (0)2871-922579

<http://www.flender.com>
e-mail: couplings@flender.com

Mounting of encoder

In the case of mounting by the customer.

Options H79, H80

Baumer Hübner GmbH
Planufer 92b
10967 Berlin, Germany
Tel. +49 (0)30-69003-0
Fax +49 (0)30-69003-104

<http://www.baumerhuebner.com>
e-mail: info@baumerhuebner.com

Option H78

Leine & Linde (Deutschland) GmbH
Bahnhofstraße 36
73430 Aalen, Germany
Tel. +49 (0)7361-78093-0
Fax +49 (0)7361-78093-11

<http://www.leinelinde.com>
e-mail: info@leinelinde.se

More information

Spare motors and repair parts

- Supply commitment for spare motors and repair parts following delivery of the motor
 - For up to 5 years, in the event of total motor failure, Siemens will supply a comparable motor with regard to the mounting dimensions and functions (the type series may vary).
 - Repair parts will be supplied for up to 5 years.
 - For up to 10 years, Siemens will provide information and will, if necessary, supply documentation for repair parts.
- When repair parts are ordered, the following details must be provided:
 - Designation and part number
 - Order No. and factory number of the motor

Example for ordering a fan cover 1LA7, frame size 160 M, 4-pole:

Fan cover No. 7.40, 1LA7 163-4AA60, factory number J783298901018

- For bearing types, see the "Introduction".
- Repair parts for 1MJ6, 1MJ7, 1MJ8, 1MJ1, 1ME8, 1ML8, 1LG8 motors and smoke-extraction motors are available on request.
- For standard components, a supply commitment does not apply.
- Support – Hotline
In Germany
Tel.: 0180/5050448

National telephone numbers can be found on the Internet page:
<http://www.siemens.com/automation/service&support>

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Dimensions

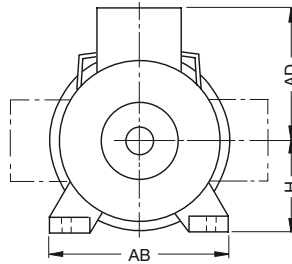
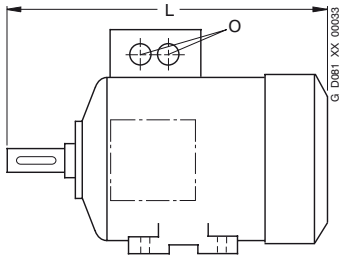
Overview

Note

The following overall dimensions and dimension drawings are only applicable for self-ventilated 1LA7/1LA5 and 1LG6 motors with special insulation for voltages up to 690 V. For overall dimensions of 1LA8/1PQ8 motors with special insulation for voltages up to 690 V, see catalog part 3 "Non-standard motors".

For overall dimensions and dimension drawings for surface-cooled motors with standard insulation for voltages up to 500 V, see the relevant catalog part.

Overall dimensions



Frame size	Type	Number of poles	Dimensions				
			L	AD	H	AB	O
100 L	1LA7		372	135	100	196	2 x M32 x 1.5
112 M	1LA7		393	148	112	226	2 x M32 x 1.5
132 S/ 132 M	1LA7		452.5	167	132	256	2 x M32 x 1.5
160 M/ 160 L	1LA7		588	197	160	300	2 x M40 x 1.5
180 M/ 180 L	1LA5		712	258	180	339	2 x M40 x 1.5
	1LG6 183	2	720	262	180	339	2 x M40 x 1.5
	1LG6 183	4	669	262	180	339	2 x M40 x 1.5
	1LG6 186	4, 6, 8	720	262	180	339	2 x M40 x 1.5
200 L	1LA5		769.5	305	200	388	2 x M50 x 1.5
	1LG6 206		720	300	200	378	2 x M50 x 1.5
	1LG6 207		777	300	200	378	2 x M50 x 1.5
	1LG6 207	4, 8	720	300	200	378	2 x M50 x 1.5
225 S/ 225 M	1LA5		806	305	225	426	2 x M50 x 1.5
	1LA5	2	776	305	225	426	2 x M50 x 1.5
	1LG6 220	4, 8	789	325	225	436	2 x M50 x 1.5
	1LG6 223	2	819	325	225	436	2 x M50 x 1.5
	1LG6 223	4, 6, 8	849	325	225	436	2 x M50 x 1.5
	1LG6 228	2	869	325	225	436	2 x M50 x 1.5
	1LG6 228	4, 6	899	325	225	436	2 x M50 x 1.5

Frame size	Type	Number of poles	Dimensions				
			L	AD	H	AB	O
250 M	1LG6 253	2, 6, 8	887	392	250	490	2 x M63 x 1.5
	1LG6 253	4	957	392	250	490	2 x M63 x 1.5
	1LG6 258	2, 4, 6	957	392	250	490	2 x M63 x 1.5
280 S/ 280 M	1LG6 280	2, 4, 6, 8	960	432	280	540	2 x M63 x 1.5
	1LG6 283	2, 4	1070	432	280	540	2 x M63 x 1.5
	1LG6 283	6, 8	960	432	280	540	2 x M63 x 1.5
	1LG6 288	2, 4, 6	1070	432	280	540	2 x M63 x 1.5
315 S/ 315 M/ 315 L	1LG6 310	2	1072	500	315	610	2 x M63 x 1.5
	1LG6 310	4, 6, 8	1102	500	315	610	2 x M63 x 1.5
	1LG6 313	8	1102	500	315	610	2 x M63 x 1.5
	1LG6 313	2	1232	500	315	610	2 x M63 x 1.5
	1LG6 313	4, 6	1262	500	315	610	2 x M63 x 1.5
	1LG6 316	2	1232	500	315	610	2 x M63 x 1.5
	1LG6 316	4, 6, 8	1262	500	315	610	2 x M63 x 1.5
	1LG6 317	8	1262	500	315	610	2 x M63 x 1.5
	1LG6 317	2	1372	500	315	610	2 x M63 x 1.5
	1LG6 317	4, 6	1402	500	315	610	2 x M63 x 1.5
	1LG6 318	2	1372	651	315	610	2 x M63 x 1.5
	1LG6 318	4	1402	651	315	610	2 x M63 x 1.5
	1LG6 318	6, 8	1402	500	315	610	2 x M63 x 1.5

Notes on the dimensions

■ Dimension designations according to DIN EN 50347 and IEC 60072.

■ Fits

The shaft extensions specified in the dimension tables (DIN 748) and centering spigot diameters (DIN EN 50347) are machined with the following fits:

Dimension designation	ISO fit	DIN ISO 286-2
D, DA	to 30	j6
	over 30 to 50	k6
	over 50	m6
N	to 250	j6
	over 250	h6
F, FA		h9
K		H17
S	Flange (FF)	H17

The drilled holes of couplings and belt pulleys should have an ISO fit of at least H7.

■ Dimension tolerances

For the following dimensions, the admissible deviations are given below:

Dimension designation	Dimension	Admissible deviation
H	to 250	- 0.5
	over 250	- 1.0
E, EA		- 0.5

Keyways and feather keyways (dimensions GA, GC, F and FA) are made in compliance with DIN 6885 Part 1.

■ All dimensions are specified in mm.

IEC Squirrel-Cage Motors

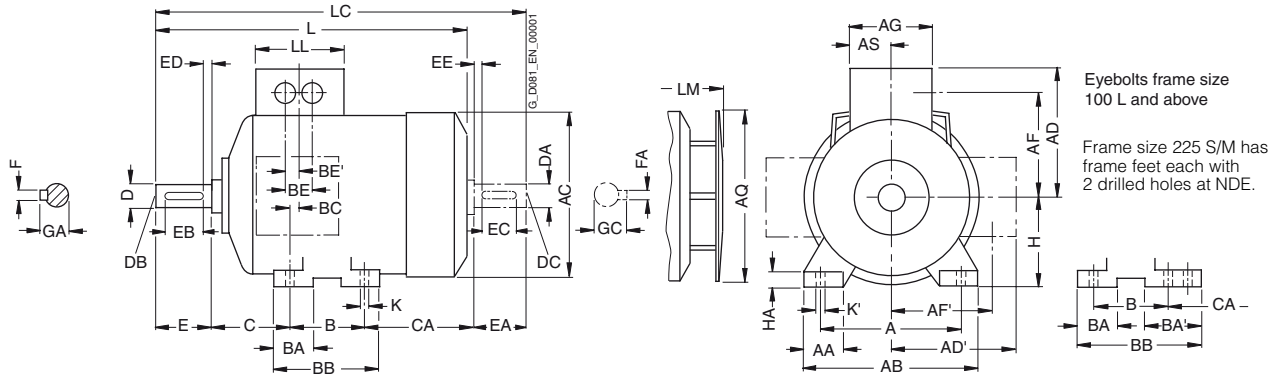
Motors operating with frequency converters

Dimensions

Dimensional drawings

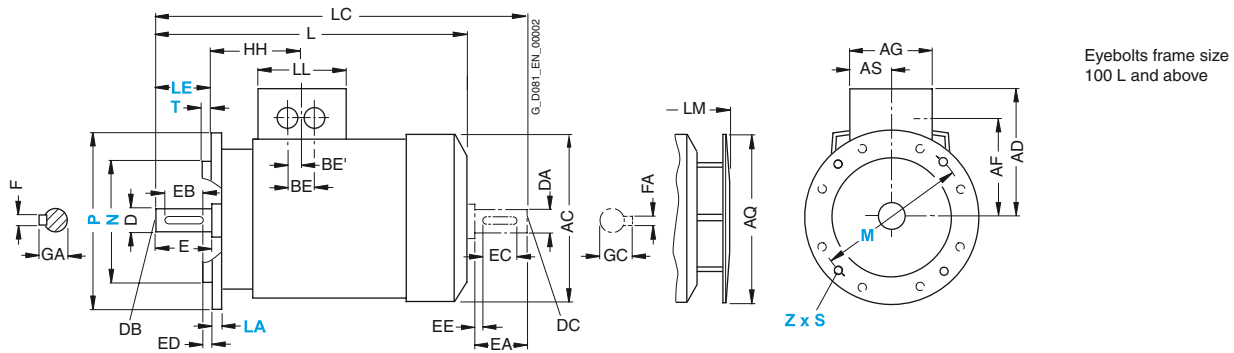
Aluminum series 1LA7 and 1LA5, frame sizes 100 L to 225 M · with special insulation for voltages up to 690 V

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 5/40 (Z = the number of retaining holes)



5

For motor	Dimension designation acc. to IEC																							
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD ²⁾	AD'	AF ²⁾	AF'	AG ²⁾	AQ	AS	B*	BA	BA'	BB	BC	BE ²⁾	BE ⁽²⁾	C	CA*	H	HA
100 L	1LA7 106 1LA7 107	2, 4, 6, 8 4, 8	160	42	196	203	135	163	78	123	120	170	60	140	47	-	176	39	42	21	63	125	100	12
112 M	1LA7 113	2, 4, 6, 8	190	46	226	227	148	176	91	136	120	170	60	140	47	-	176	32	42	21	70	141	112	12
132 S	1LA7 130 1LA7 131	2, 4, 6, 8 2	216	53	256	267	167	194	107	154	140	250	70	140	49	-	180	39	42	21	89	162.5	132	15
132 M	1LA7 133 1LA7 134	4, 6, 8 6	216	53	256	267	167	194	107	154	140	250	70	178	49	-	218	39	42	21	89	124.5	132	15
160 M	1LA7 163 1LA7 164	2, 4, 6, 8 2, 8	254	60	300	320	197	226	127	183	165	250	82.5	210	57	-	256	52.5	54	27	108	183	160	18
160 L	1LA7 166	2, 4, 6, 8	254	60	300	320	197	226	127	183	165	250	82.5	254	57	-	300	52.5	54	27	108	139	160	18
180 M	1LA5 183	2, 4	279	69.5	339	363	258	258	216	216	152	340	71	241	50	-	287	38	54	27	121	259	180	18
180 L	1LA5 186	4, 6, 8	279	69.5	339	363	258	258	216	216	152	340	71	279	50	-	325	38	54	27	121	221	180	18
200 L	1LA5 206 1LA5 207	2, 6 2, 4, 6, 8	318	83	388	402	305	305	252	252	260	340	96	305	58.5	-	355	45	85	42.5	133	239	200	24
225 S	1LA5 220	4, 8	356	103	426	402	305	305	252	252	260	340	96	286	58	83	361	36	85	42.5	149	248.5	225	24
225 M	1LA5 223	2 4, 6, 8	356	103	426	402	305	305	252	252	260	340	96	311	58	83	361	36	85	42.5	149	223.5	225	24

* This dimension is assigned in DIN EN 50347 to the frame size listed.

1) Measured across the bolt heads.

2) The values increase if the connection box is rotated or if a brake is mounted. Further information is provided by the dimension sheet generator in SD configurator.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

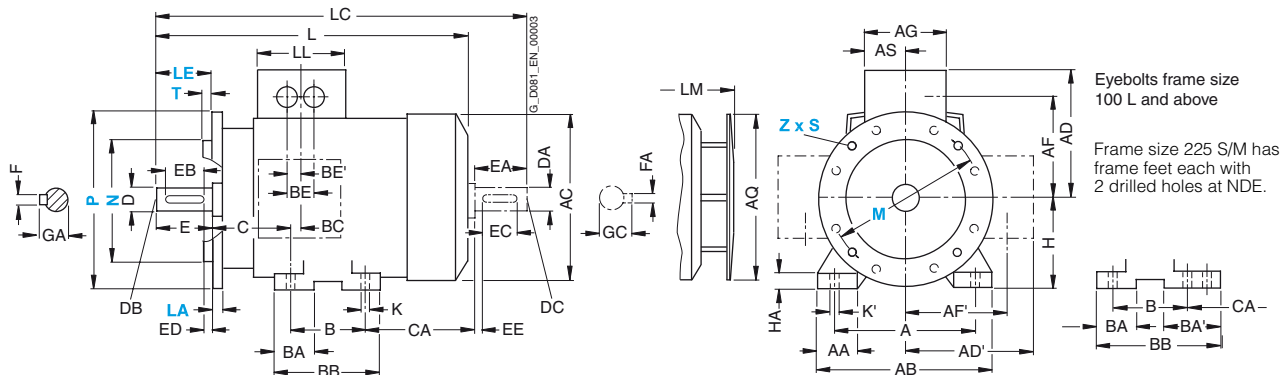
Dimensions

Dimensional drawings

Aluminum series 1LA7 and 1LA5, frame sizes 100 L to 225 M · with special insulation for voltages up to 690 V

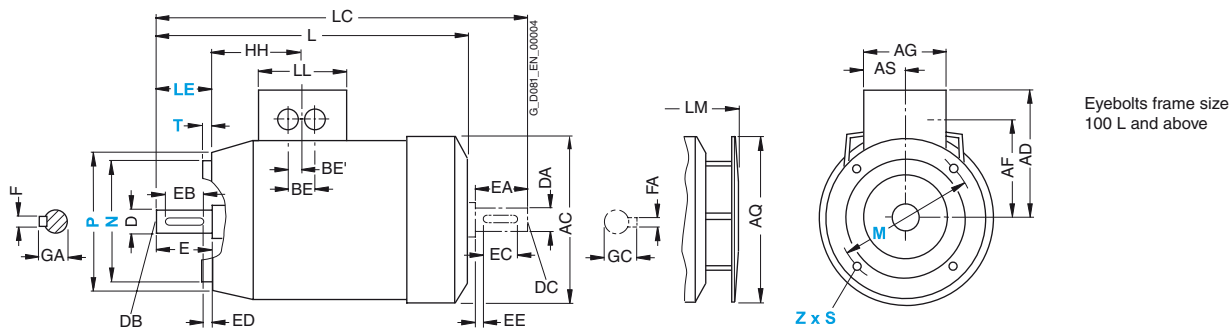
Type of construction IM B35

For flange dimensions, see Page 5/40 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see Page 5/40 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC										DE shaft extension					NDE shaft extension						
Frame size	Type	Number of poles	HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
100 L	1LA7 106 1LA7 107	2, 4, 6, 8 4, 8	102	12	16	372	438	120	423.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
112 M	1LA7 113	2, 4, 6, 8	102	12	16	393	461	120	444.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1LA7 130 1LA7 131 2	2, 4, 6, 8 2	128	12	16	452.5 ¹⁾	551.5	140	505 ¹⁾	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
132 M	1LA7 133 1LA7 134 6	4, 6, 8 6	128	12	16	452.5 ¹⁾	551.5	140	505 ¹⁾	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
160 M	1LA7 163 1LA7 164 2, 8	2, 4, 6, 8 2, 8	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
160 L	1LA7 166	2, 4, 6, 8	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
180 M	1LA5 183	2, 4	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1LA5 186	4, 6, 8	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LA5 206 1LA5 207	2, 6 2, 4, 6, 8	178	19	25	769.5	897	192	850	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
225 S	1LA5 220	4, 8	184.5	19	25	806	933.5	192	887.5	60	M20	140	125	7.5	18	64	55	M20	110	100	5	16	59
225 M	1LA5 223	2 4, 6, 8	184.5	19	25	776 806	903.5 933.5	192	857.5 887.5	55 60	M20	110 140	100 125	5 7.5	16 18	59 64	55	M20	110	100	5	16	59

¹⁾ In a low-noise version, the dimension L is 8 mm greater and the dimension LM is 11.5 mm greater.

IEC Squirrel-Cage Motors

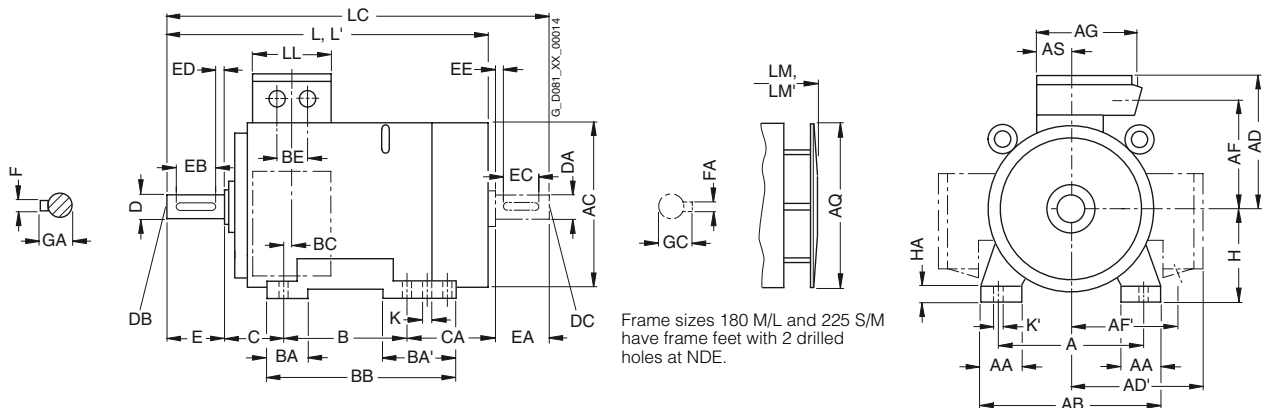
Motors operating with frequency converters

Dimensions

Dimensional drawings

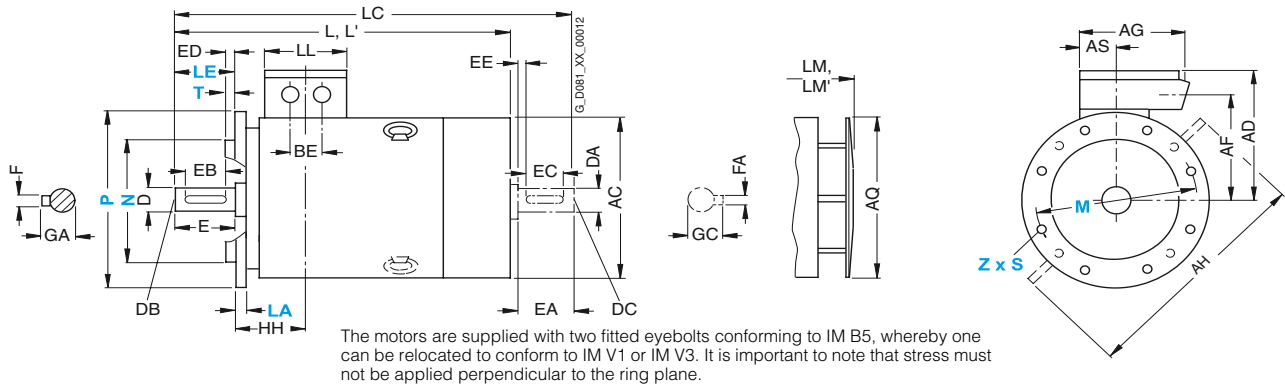
Cast-iron series 1LG6, frame sizes 180 M to 250 M · with special insulation for voltages up to 690 V

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 5/40 (Z = the number of retaining holes)



5

For motor		Dimension designation acc. to IEC																						
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA
180 M	1LG6 183	2	279	65	339	363	262	262	220	220	152	452	340	71	241	70	111	328	36	54	121	253	180	20
		4																							202
180 L	1LG6 186	4, 6, 8	279	65	339	363	262	262	220	220	152	452	340	71	279	70	111	328	36	54	121	215	180	20
200 L	1LG6 206	2, 6	318	70	378	402	300	300	247	247	260	512	340	96	305	80	80	355	63	85	133	177	200	25
		4, 8																							234
200 L	1LG6 207	4, 8	318	70	378	402	300	300	247	247	260	512	340	96	305	80	80	355	63	85	133	177	200	25
225 S	1LG6 220	4, 8	356	80	436	442	325	325	272	272	260	556	425	96	286	85	110	361	47	85	149	218	225	34
		2																							311
225 M	1LG6 223	4, 6, 8	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	253	225	34
		2	311																					
225 M	1LG6 228	4, 6	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	303	225	34
		2	311																					
250 M	1LG6 253	2	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	235	250	40
		4																							305
250 M	1LG6 258	6, 8	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	235	250	40
		2	305																					
250 M	1LG6 258	4, 6	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	305	250	40
		2	305																					

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ Measured across the bolt heads.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

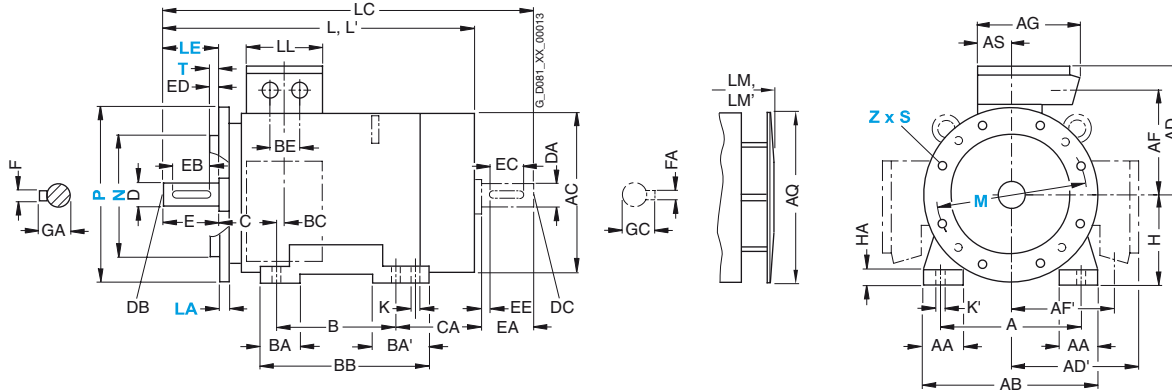
Dimensions

Dimensional drawings

Cast-iron series 1LG6, frame sizes 180 M to 250 M · with special insulation for voltages up to 690 V

Type of construction IM B35

For flange dimensions, see Page 5/40 (Z = the number of retaining holes)



For motor		Number of poles	Dimension designation acc. to IEC							DE shaft extension					NDE shaft extension									
Frame size	Type		HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC	
180 M	1LG6 183	2	157	15	19	720	835	132	810	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5	
		4				669	784	759																
180 L	1LG6 186	4, 6, 8	157	15	19	720	835	132	810	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5	
200 L	1LG6 206	2, 6	196	19	25	720	835	192	810	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59	
		4, 8				720	835	810																
225 S	1LG6 220	4, 8	196	19	25	789	903	192	889	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59	
		2				819	933	919																
225 M	1LG6 223	2	196	19	25	819	933	192	919	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5	
		4, 6, 8				849	963	949																
	1LG6 228	2	196	19	25	869	983	192	969	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5	
		4, 6				899	1013	999																
250 M	1LG6 253	2	237	24	30	887	1002	236	987	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59	
		4				957	1102	1057																
	6, 8	1LG6 258	2	237	24	30	887	1032	236	987	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
			4, 6				957	1102	1057															

IEC Squirrel-Cage Motors

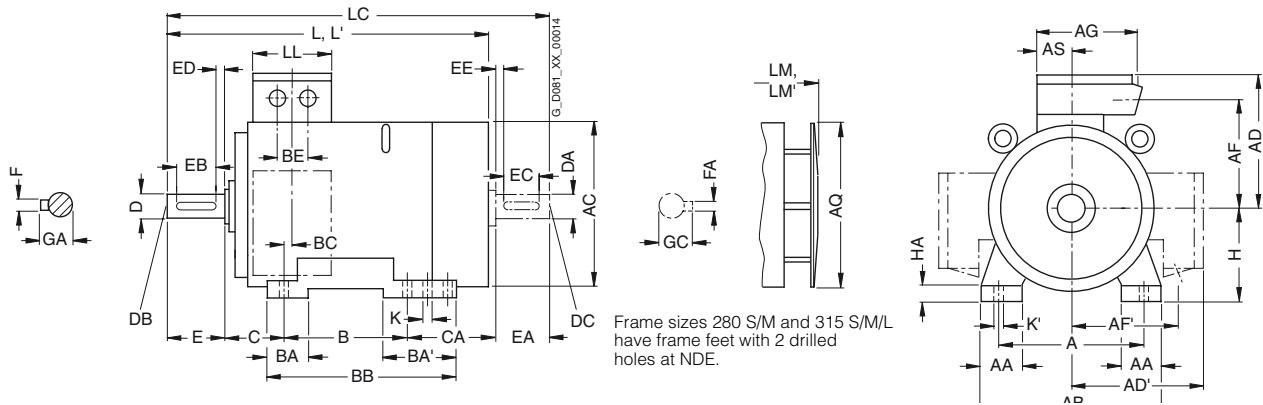
Motors operating with frequency converters

Dimensions

Dimensional drawings

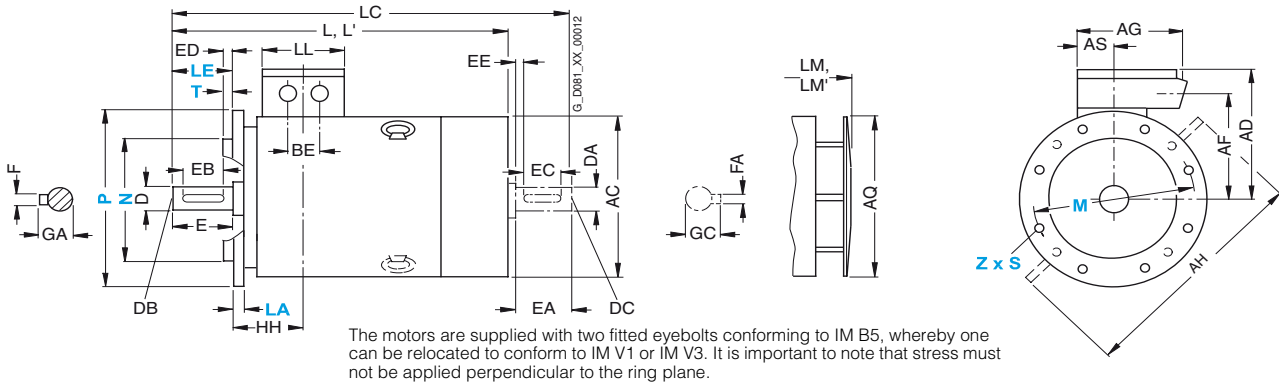
Cast-iron series 1LG6, frame sizes 280 S to 315 L · with special insulation for voltages up to 690 V

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 5/40 (Z = the number of retaining holes)



5

For motor	Frame size	Type	Number of poles	Dimension designation acc. to IEC																					
				A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA
280 S	1LG6 280	2	2	457	100	540	555	432	432	348	348	300	672	525	118	368	100	151	479	62	110	190	267	280	40
280 M	1LG6 283	2	4	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40
			6, 8	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	216	326	280	40
315 S	1LG6 310	2	4	508	120	610	610	500	500	400	400	380	780	590	154	406	125	176	527	69	110	216	315	315	50
			6, 8	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	527	69	110	216	264	315	50
315 M ²⁾	1LG6 313	8	4	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	578	69	110	216	424	315	50
			6, 8	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50
315 L ²⁾	1LG6 316	2	4	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50
			6, 8	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	513	315	50
	1LG6 316	8	4	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	513	315	50
			6, 8	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	513	315	50
	1LG6 317	2	4	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	513	315	50
			6, 8	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	513	315	50
	1LG6 317	8	4	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	513	315	50
			6, 8	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	513	315	50
1LG6 318	4	508	120	610	610	651	651	524	524	470	780	590	165	508	155	206	648	69	135	216	513	315	50		
1LG6 318	6, 8	500	500	400	400	380													110						

* This dimension is assigned in DIN EN 50347 to the frame size listed.

1) Measured across the bolt heads.

2) With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

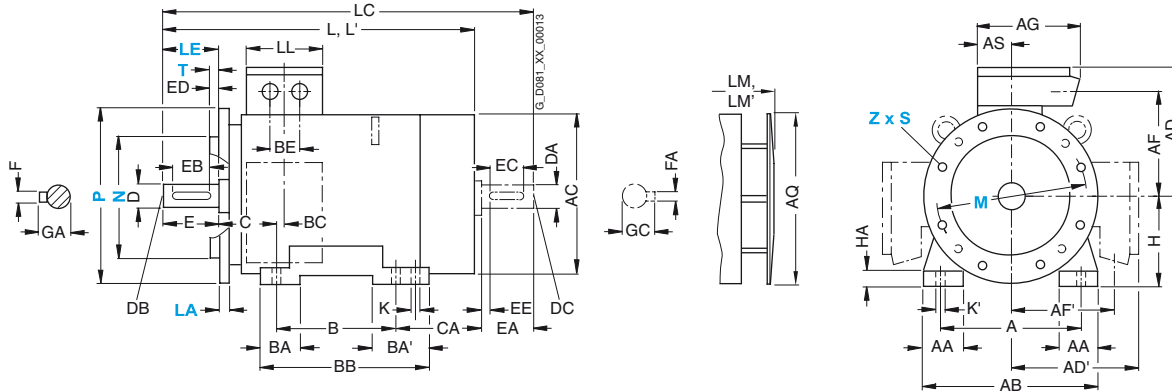
Dimensions

Dimensional drawings

Cast-iron series 1LG6, frame sizes 280 S to 315 L · with special insulation for voltages up to 690 V

Type of construction IM B35

For flange dimensions, see Page 5/40 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC							DE shaft extension					NDE shaft extension								
Frame size	Type	Number of poles	HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
280 S	1LG6 280	2	252	24	30	960	1105	236	1070	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8								75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
280 M	1LG6 283	2	252	24	30	1070	1215	236	1180	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4								75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
	1LG6 288	6, 8				960	1105		1070	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
		2	252	24	30	1070	1215	236	1180	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6								75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
315 S	1LG6 310	2	285	28	35	1072	1217	307	1182	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 310	4, 6, 8								1102	1247	307	1212	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 M	1LG6 313	8	285	28	35	1102	1247	307	1212	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
		2								65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 313	4, 6				1262	1407		1372	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 L	1LG6 316	2	285	28	35	1232	1377	307	1342	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6								80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 316	8				1262	1407		1372	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 317	2	285	28	35	1372	1517	307	1482	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 317	4, 6								1402	1547		1512	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 317	8				1262	1407		1372	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 318	2	285	28	35	1372	1517	330	1482	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 318	4								1402	1547		1512	80 ¹⁾	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 318	6, 8						307	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	

¹⁾ Diameters up to 90 mm are possible.

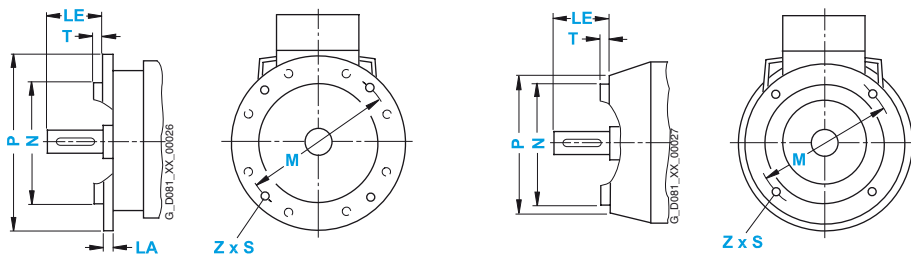
IEC Squirrel-Cage Motors

Motors operating with frequency converters

Dimensions

Dimensional drawings

Flange dimensions



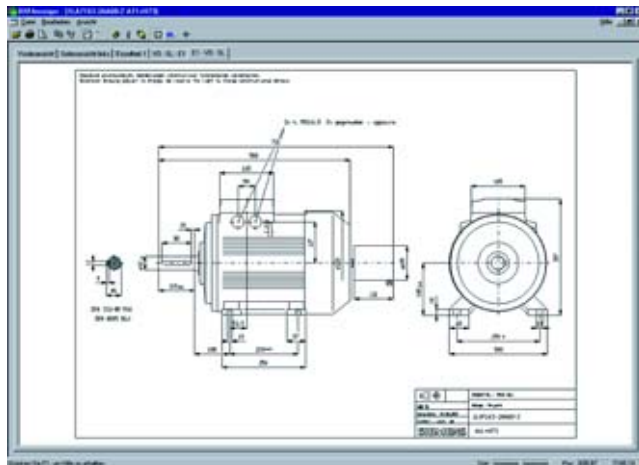
In DIN EN 50347, the frame sizes are allocated flange FF with through holes and flange FT with tapped holes. The designation of flange A and C according to DIN 42948 (invalid since 09/2003) are also listed for information purposes. See the table below. (Z = the number of retaining holes)

Frame size	Type of construction	Flange type	Flange with through holes (FF/A) tapped holes (FT/C)	Acc. to DIN EN 50347	Acc. to DIN 42948	Dimension designation acc. to IEC							
						LA	LE	M	N	P	S	T	Z
100 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 215		A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130		C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 165		C 200	–	60	165	130	200	M10	3.5	4
112 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 215		A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130		C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 165		C 200	–	60	165	130	200	M10	3.5	4
132 S, 132 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 265		A 300	12	80	265	230	300	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 165		C 200	–	80	165	130	200	M10	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 215		C 250	–	80	215	180	250	M12	4	4
160 M, 160 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 300		A 350	13	110	300	250	350	18.5	5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 215		C 250	–	110	215	180	250	M12	4	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 265		C 300	–	110	265	230	300	M12	4	4
180 M, 180 L	IM B5, IM V1, IM V3	Flange	FF 300		A 350	13	110	300	250	350	18.5	5	4
200 L	IM B5	Flange	FF 350		A 400	15	110	350	300	400	18.5	5	4
225 S, 225 M 2-pole 4-pole to 8-pole	IM B5, IM V1, IM V3	Flange	FF 400		A 450	16	110	400	350	450	18.5	5	8
						140							
250 M	IM B5, IM V1, IM V3	Flange	FF 500		A 550	18	140	500	450	550	18.5	5	8
280 S, 280 M	IM B5, IM V1, IM V3	Flange	FF 500		A 550	18	140	500	450	550	18.5	5	8
315 S, 315 M, 315 L 2-pole 4-pole to 8-pole	IM B5, IM V1, IM V3	Flange	FF 600		A 660	22	140	600	550	660	24	6	8
						170							

More information

Dimension sheet generator (part of the SD configurator)

A dimensional drawing can be created in the SD configurator for every configurable motor. A dimension drawing can be requested for every other motor.



When a complete Order No. is entered with or without order codes, a dimension drawing can be called up under the "Documentation" tab.

These dimensional drawings can be presented in different views and sections and printed.

The corresponding dimension sheets can be exported, saved and processed further in DXF format (interchange/import format for CAD systems) or as bitmap graphics.

The SD configurator has been integrated into the electronic Catalog CA 01 as a selection aid (for more information, see catalog part 11 "Appendix", "Selection tool SD configurator").

The interactive Catalog CA 01 can be ordered from your local Siemens sales representative or on the Internet at

<http://www.siemens.com/automation/CA01>

At this address, you will also find links to Tips & Tricks and to downloads for function or content updates.

Order number for CA 01 10/2008, english international:
DVD: E86060-D4001-A510-C7-7600

Pump motors



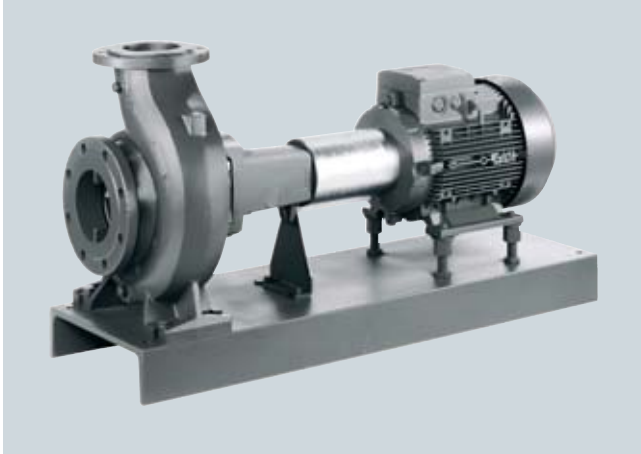
6/2	Orientation
6/2	Overview
6/2	Benefits
6/2	Application
6/2	More information
6/3	Surface-cooled motors up to frame size 315 L
	Aluminum and cast-iron housing
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6/3	Surface-cooled motors frame size 315 and above
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6/4	Overview
6/4	Dimensions
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IEC Squirrel-Cage Motors

Pump motors

Orientation

Overview



Pump motors are motors specially designed for use in various pump applications that can either be driven directly or through a belt drive.

The different application areas and types of construction of the pumps demand special technical characteristics of the motors and compactness through

- Using motors with increased output
- Reinforced bearings and use of a located bearing at the drive end (DE) of the motor
- Special materials for shafts, lubricants and seals as well as special flanges and special housings; these are possible on request

For converter-fed operation, winding monitoring through embedded KTY 84-130 temperature sensors is recommended as well as insulated bearings in the case of large output ranges.

Benefits

The pump motors offer the user a number of advantages and benefits:

- Pump motors with located bearings at the drive end of the motor and with embedded thermistors can, in most cases, be supplied from stock
- Motors with increased efficiency to CEMEP EFF 1 or EPACT lead to significant energy savings under typical continuous duty
- Under converter-fed operation, by setting the precise speed and therefore the operating point, a considerable energy saving can be achieved combined with reduced stress on the plant
- The motors are suitable, in general, for mains-fed operation up to 690 V and converter-fed operation up to 460 V (with motor series 1LA8 to 500 V) (voltage rise times $t_s > 0.1$ ms)
- Extensive experience is available in customized applications especially with regard to special flanges and special bearings

Application

Pump motors are particularly suitable for the following pump types:

- Close-coupled pumps
- Industrial pumps
- Submersible pumps

With regard to the ambient conditions of the pump motors, it is important to ensure that the motor is located outside the pumped medium, i.e. the motor must be selected in accordance with the degree of protection. Further requirements are available on request.

More information

For more information, please contact your local Siemens contact – see “Siemens contacts worldwide” in the Appendix.

IEC Squirrel-Cage Motors

Pump motors

Surface-cooled motors up to frame size 315 L
Aluminum and cast-iron housing

Overview

Recommended motor types:

- Self-ventilated motors with improved efficiency according to CEMEP EFF 2 – Aluminum series 1LA7 and 1LA5 in the output range from 0.06 to 45 kW
- Self-ventilated motors with improved efficiency according to CEMEP EFF2 – Aluminum series 1LE1 in the output range from 0.3 to 22 kW
- Self-ventilated motors with improved efficiency according to CEMEP EFF 2 – Cast-iron series 1LA6 and 1LG4 in the output range from 0.75 to 200 kW
- Self-ventilated motors with high efficiency according to CEMEP EFF1 – Aluminum series 1LA9 in the output range from 0.06 to 37 kW
- Self-ventilated motors with high efficiency according to CEMEP EFF1 – Aluminum series 1LE1 in the output range from 0.75 to 18.5 kW
- Self-ventilated motors with increased output – Cast-iron series 1LG4 in the output range from 15 to 100 kW
- Self-ventilated motors with improved efficiency according to CEMEP EFF2 with increased output – Aluminum series 1LE1 in the output range from 2.2 to 22 kW
- Self-ventilated motors with increased output – Aluminum series 1LA9 with outputs from 0.14 to 53 kW
- Self-ventilated motors with high efficiency according to CEMEP EFF1 with increased output – Aluminum series 1LE1 in the output range from 2.2 to 22 kW

Recommended specifications:

Most applications require a non-variable speed, i.e. it is sufficient to feed the drive motors with a fixed, unchanging rated frequency. In an ever-increasing number of applications, it is necessary to match the pump to the overall plant accurately (based on the pump characteristic). The pumps must respond quickly to changing conditions in the plant, supplying the drive motors with a variable rated frequency (converter-fed operation) is desirable.

Pole-changing motors can also be used. In this way, coarse adaptation of the pump characteristic can be achieved (in accordance with the possible motor speeds). For information about adapting the drive motors to the requirements of the pump with reference to the type of construction (e.g. flange, feet or special) as well as for a number of other options, see "Special versions".

For technical specifications, selection and ordering data and "Special versions", see catalog parts 1 "New Generation 1LE1/1PC1" and 2 "Standard motors up to frame size 315 L".

Surface-cooled motors frame size 315 and above
Cast-iron housing

Overview

Recommended motor types:

- Non-standard motors for mains-fed and converter-fed operation, cast-iron series 1LA8, with outputs from 160 to 1000 kW

For technical specifications and selection and ordering data, see catalog part 3 "Non-standard motors frame size 315 and above".

Special versions

Overview

Recommended special versions for mains-fed and converter-fed operation

- Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping – Order code **A11** for 1LE1 – 15th position of the Order No. letter **B**
- Located bearing at drive-end (DE) of motor – Order code **K94** for 1LE1 – order code **L20**
- Insulated bearing cartridge at non-drive-end (NDE) – Order code **L27**
- Bearings for increased cantilever forces – Order code **K20** for 1LE1 – order code **L22**
- Screwed-on feet for type of construction IM B35 frame size 112 and above in standard version or order code **K11** for 1LE1 – 16th position of the Order No. digit **4**

Pump version from stock – Order code X66

The pump version from stock comprises 3 embedded temperature sensors for tripping (order code **A11**), located bearing at drive-end (DE) of the motor (order code **K94**) as well as screwed-on feet (for type of construction IM B35 frame size 112 and above in standard version or order code **K11**) and is defined for the following motors:

- Self-ventilated motors with improved efficiency – Aluminum series 1LA7, 2-pole and 4-pole – Output range 0.25 to 18.5 kW
- Self-ventilated motors with improved efficiency – Cast-iron series 1LG4, 2-pole and 4-pole – Output range 18.5 to 37 kW

If other special versions are required, order codes **A11+K94+K11**, that are included in **X66**, must be specified individually in the order.

IEC Squirrel-Cage Motors

Pump motors

Special versions

Overview (continued)

Pump motors that can be supplied from stock according to CEMEP "Improved Efficiency" EFF 2, IP55 degree of protection, 50/60 Hz and temperature class F for a service factor of 1.1 with order code X66.

Certified in accordance with	Rated output at 50 Hz	Frame size	Efficiency Class acc. to CEMEP	Pump version for		Voltage:		Voltage:		Voltage:		
				Order No. (additional charge)	Order code	230 VΔ / 400 VY, 50 Hz, 460 VY, 60 Hz	Order No. (additional charge)	Order code	400 VΔ / 690 VY, 50 Hz, 460 VY, 60 Hz	Order No. (additional charge)	Order code	400 VΔ / 690 VY, 50 Hz, 460 VY, 60 Hz
				Type:			Type:			Type:		
				IM B5, IM V1 without protective cover IM V3			IM B5, IM V1 without protective cover IM V3			IM B35		
3000 rpm, 2-pole												
CCC	0.75	80 M		1LA7 080-2AA11-Z	X66	–	–	–	–	–	–	–
CCC	1.1		EFF 2	1LA7 083-2AA11-Z	X66	–	–	–	–	–	–	–
CCC	1.5	90 S	EFF 2	1LA7 090-2AA11-Z	X66	–	–	–	–	–	–	–
CCC	2.2	90 L	EFF 2	1LA7 096-2AA11-Z	X66	–	–	–	–	–	–	–
	3	100 L	EFF 2	–	–	–	–	1LA7 106-2AA61-Z	X66	–	–	–
	4	112 M	EFF 2	–	–	–	–	1LA7 113-2AA61-Z	X66	–	–	–
	5.5	132 S	EFF 2	–	–	–	–	–	–	1LA7 130-2AA66-Z	X66	–
	7.5		EFF 2	–	–	–	–	–	–	1LA7 131-2AA66-Z	X66	–
	11	160 M	EFF 2	–	–	–	–	–	–	1LA7 163-2AA66-Z	X66	–
	15		EFF 2	–	–	–	–	–	–	1LA7 164-2AA66-Z	X66	–
	18.5	160 L	EFF 2	–	–	–	–	–	–	1LA7 166-2AA66-Z	X66	–
	22	180 M	EFF 2	–	–	–	–	–	–	1LG4 183-2AA66-Z	X66	–
	30	200 L	EFF 2	–	–	–	–	–	–	1LG4 206-2AA66-Z	X66	–
	37		EFF 2	–	–	–	–	–	–	1LG4 207-2AA66-Z	X66	–
1500 rpm, 4-pole												
CCC	0.25	71 M		1LA7 070-4AB11-Z	X66	–	–	–	–	–	–	–
CCC	0.37			1LA7 073-4AB11-Z	X66	–	–	–	–	–	–	–
CCC	0.55	80 M		1LA7 080-4AA11-Z	X66	–	–	–	–	–	–	–
CCC	0.75			1LA7 083-4AA11-Z	X66	–	–	–	–	–	–	–
CCC	1.1	90 S	EFF 2	1LA7 090-4AA11-Z	X66	–	–	–	–	–	–	–
	1.5	90 L	EFF 2	1LA7 096-4AA11-Z	X66	–	–	–	–	–	–	–
	2.2	100 L	EFF 2	1LA7 106-4AA11-Z	X66	–	–	–	–	–	–	–
	3		EFF 2	–	–	–	–	1LA7 107-4AA61-Z	X66	–	–	–
	4	112 M	EFF 2	–	–	–	–	1LA7 113-4AA61-Z	X66	–	–	–
	5.5	132 S	EFF 2	–	–	–	–	–	–	1LA7 130-4AA66-Z	X66	–
	7.5	132 M	EFF 2	–	–	–	–	–	–	1LA7 133-4AA66-Z	X66	–
	11	160 M	EFF 2	–	–	–	–	–	–	1LA7 163-4AA66-Z	X66	–
	15		EFF 2	–	–	–	–	–	–	1LA7 166-4AA66-Z	X66	–
	18.5	180 M	EFF 2	–	–	–	–	–	–	1LG4 183-4AA66-Z	X66	–
	22	180 L	EFF 2	–	–	–	–	–	–	1LG4 186-4AA66-Z	X66	–
	30	200 L	EFF 2	–	–	–	–	–	–	1LG4 207-4AA66-Z	X66	–

– Pump version (order code **X66**) not supplied from stock.

CCC (China Compulsory Certification) for export to China:

The motors supplied from stock marked with "CCC" include the order code **D01**; i.e. the "CCC" logo complete with "Factory code" is indicated on the rating plate and on the packaging.

Other special versions

For other special versions, see catalog parts 2 "Standard motors up to frame size 315 L" and 3 "Non-standard motors frame size 315 and above".

Accessories

Overview

See catalog parts 1 "New Generation 1LE1/1PC1", 2 "Standard motors frame size 315 L and above" and 3 "Non-standard motors frame size 315 and above".

Dimensions

Overview

See dimensions catalog parts 2 "Standard motors frame size 315 L and above" and 3 "Non-standard motors frame size 315 and above".

Fan motors



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IEC Squirrel-Cage Motors

Fan motors

Orientation

Overview



The fan motors are suitable for driving fans. The fan wheel can be located directly on the motor shaft or the fan shaft can be coupled with the motor shaft over a coupling or over a belt drive.

For fans with a belt drive, it is important to note the cantilever forces that are applied to the motor.

The different application areas for the fans demand special technical characteristics of the motors, such as:

- The use of reinforced bearings and a located bearing at the drive-end (DE) of the motor, especially with belt drive
- In confined spaces, it is recommended that the motor is ordered with the connection box located at the non-drive end (NDE) or with protruding cable ends instead of a connection box
- For flange types of construction with the shaft extension pointing upwards (e.g. IM V6) and when condensation is a possibility, a flange drainage hole is recommended
- For converter-fed operation, winding monitoring through embedded KTY 84-130 temperature sensors is recommended as well as insulated bearings in the case of large output ranges.

The resonance of mountings and reactions from driven machines can cause high levels of vibration in the overall equipment unit. This has a significant effect on the expected service life of the bearing.

For evaluation of these vibrations, vibration levels N, R and S are used in accordance with DIN EN 60034-14 (corresponding to evaluation zones A and B according to ISO 10816).

Note:

For information about motors according to EN 12101-3 for driving smoke extraction fans, see "Smoke extraction motors".

Benefits

The fan motors offer the user numerous advantages:

- Reduced construction volume and therefore lower weight thanks to motors with increased output
- Uniform forced-air cooled motor series 1PP from 0.09 to 200 kW as well as forced-air cooled motor series 1LE1 with order code F90
- Motors with increased efficiency to CEMEP EFF 1 or EPACT lead to significant energy savings under typical continuous duty; efficiency requirements that exceed this are possible on request
- Under converter-fed operation, by setting the precise speed and therefore the operating point, a considerable energy saving can be achieved combined with reduced stress on the plant
- The motors are suitable, in general, for mains-fed operation up to 690 V and converter-fed operation up to 460 V (voltage rise times $t_s > 0.1$ ms)
- Extensive experience is available in customized applications especially with regard to special bearing design.

Application

The fan motors are mainly used to drive fans:

- Axial-flow fans
- Radial-flow fans
- Side channel compressor

Technical specifications

Necessary minimum cooling air flow in standard duty

Frame size	1LA7/ 1PP7	1LA5/ 1PP5	Required cooling air flow for number of poles			
			2, 4/2 m ³ /min	4, 6/4, 8/4, 8/6/4 m ³ /min	6 m ³ /min	8 m ³ /min
63	X		0.83	0.41	0.28	–
71	X		1.40	0.70	0.47	0.35
80	X		1.74	0.90	0.60	0.44
90	X		3.12	1.56	1.08	0.78
100	X		3.96	1.86	1.26	0.93
112	X		4.98	3.00	1.98	1.50
132	X		8.04	5.04	3.36	2.52
160	X		12.90	9.54	6.36	4.80
180		X	10.98	10.98	7.27	5.44
200		X	15.12	13.02	8.58	6.36

Frame size	1PP4	Required cooling air flow for number of poles			
		2 m ³ /min	4 m ³ /min	6 m ³ /min	8 m ³ /min
180	X	12.0	13.0	8.5	6.5
200	X	20.5	17.0	11.0	8.0
225	X	20.5	18.5	12.5	9.5
250	X	25.5	22.5	17.0	12.5
280	X	24.5	28.0	21.5	16.0
315	X	47.0	36.0	26.5	19.0

In the motor version without an integrated fan (1PP5, 1PP7 and 1PP4), the motor is located in the air flow of the ventilator to be driven which must drive the minimum cooling air flow over the motor housing. For a faster air flow, the operating temperature of the motor can be reduced.

IEC Squirrel-Cage Motors

Fan motors

Orientation

Selection and ordering data

Preliminary selection of the motor according to motor type/series, speed or number of poles, frame size, rated output, rated torque, rated speed and rated current

Self-ventilated motors in pole-changing version

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LA7 and 1LA5						
1500/3000, 4/2-pole	80 M ... 200 L	0.15 ... 17	1385 ... 2930	1 ... 55	0.39 ... 31	7/6 ... 7/7
1000/1500, 6/4-pole	80 M ... 200 L	0.1 ... 26	680 ... 1470	1.4 ... 182	0.57 ... 52	7/8 ... 7/9
750/1500, 8/4-pole	80 M ... 200 L	0.12 ... 28	930 ... 1470	1.2 ... 170	0.51 ... 49	7/10 ... 7/11
750/1000/1500, 8/6/4-pole	90 S ... 200 L	0.15 ... 22	700 ... 980	2 ... 143	0.72 ... 42	7/12 ... 7/13
Cast-iron series 1LG4						
1500/3000, 4/2-pole	180 M ... 315 L	4.8 ... 170	1465 ... 2976	31 ... 546	9.1 ... 280	7/14 ... 7/15
1000/1500, 6-/4-pole	180 M ... 315 L	5.5 ... 170	960 ... 1490	55 ... 1092	12 ... 310	7/16 ... 7/17
750/1500, 8-/4-pole	180 M ... 315 L	4.5 ... 175	725 ... 1490	59 ... 1125	12.6 ... 315	7/18 ... 7/19

Forced-air cooled motors without external fan and fan cover with improved efficiency

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1PP7 and 1PP5						
3000, 2-pole	63 M ... 200 L	0.18 ... 37	2820 ... 2945	0.61 ... 120	0.5 ... 65	7/20
1500, 4-pole	63 M ... 200 L	0.12 ... 30	1350 ... 1465	0.85 ... 196	0.42 ... 55	7/21
1000, 6-pole	63 M ... 200 L	0.09 ... 22	850 ... 975	1.0 ... 215	0.44 ... 5	7/22
750, 8-pole	71 M ... 200 L	0.09 ... 15	630 ... 725	1.4 ... 198	0.36 ... 31.5	7/23
Cast-iron series 1PP4						
3000, 2-pole	180 M ... 315 L	22 ... 200	2945 ... 2982	71 ... 641	40.5 ... 325	7/24
1500, 4-pole	180 M ... 315 L	18.5 ... 200	1465 ... 1486	121 ... 1285	35 ... 340	7/25
1000, 6-pole	180 M ... 315 L	15 ... 160	965 ... 988	148 ... 1276	29.5 ... 235	7/26
750, 8-pole	180 M ... 315 L	11 ... 132	725 ... 738	145 ... 1423	25 ... 205	7/27

Forced-air cooled motors without external fan and fan cover with increased output

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Cast-iron series 1PP4						
3000, 2-pole	180 M ... 280 M	30 ... 110	2950 ... 2975	97 ... 353	54 ... 184	7/28
1500, 4-pole	180 M ... 280 M	30 ... 110	1465 ... 1488	196 ... 706	59 ... 198	7/28
1000, 6-pole	180 M ... 315 L	18.5 ... 160	970 ... 988	182 ... 1547	37.5 ... 285	7/29
750, 8-pole	180 M ... 315 L	15 ... 132	720 ... 738	199 ... 1708	34 ... 245	7/29

Selection and ordering data (continued)

Forced-air cooled motors without external fan and fan cover with improved efficiency (Improved Efficiency EFF2)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (Motors without external fan and fan cover)						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2835 ... 2935	10 ... 60	6 ... 34	1/38 ... 1/39
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1425 ... 1460	14.8 ... 98	4.85 ... 29.5	1/38 ... 1/39
1000, 6-pole	100 L ... 160 L	1.5 ... 11	930 ... 970	15.3 ... 110	3.95 ... 23.5	1/38 ... 1/39
750, 8-pole	100 L ... 160 L	0.75 ... 7.5	700 ... 720	10.4 ... 100	2.65 ... 18.6	1/38 ... 1/39

Forced-air cooled motors without external fan and fan cover with high efficiency (High Efficiency EFF1)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (Motors without external fan and fan cover)						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2905 ... 2955	9.9 ... 60	5.9 ... 33	1/42 ... 1/43
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1455 ... 1475	14 ... 97	4.55 ... 27.5	1/42 ... 1/43
1000, 6-pole	100 L ... 160 L	1.5 ... 11	965 ... 975	15 ... 108	3.5 ... 22	1/42 ... 1/43
750, 8-pole	100 L ... 160 L	0.75 ... 7.5	720 ... 735	9.9 ... 98	2.75 ... 17.4	1/42 ... 1/43

More information

For more information, please contact your local Siemens contact – see “Siemens Contacts Worldwide” in the Appendix.

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, in pole-changing version
Aluminum series 1LA7/5

Selection and ordering data

Rated output at 50 Hz,		Frame size	Rated speed at 50 Hz,		Rated torque at 50 Hz,		Efficiency at 50 Hz 4/4-load		Power factor at 50 Hz 4/4-load		Rated current at 400 V, 50 Hz		Order No.	Price	Weight motor
1500 rpm	3000 rpm		1500 rpm	3000 rpm	1500 rpm	3000 rpm	1500 rpm	3000 rpm	1500 rpm	3000 rpm	1500 rpm	3000 rpm			
P_{rated} kW		FS	n_{rated} rpm		T_{rated} Nm		η_{rated} %		$\cos\phi_{\text{rated}}$		I_{rated} A				m kg
4/2-pole, 1500/3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection															
Double pole-changing for driving fans with a winding in a Dahlander circuit															
0.15	0.7	80 M	1400	2745	1	2.4	67	63	0.83	0.91	0.39	1.76	1LA7 080-0BAQQ		10
0.25	0.95	80 M	1385	2780	1.7	3.3	67	64	0.88	0.89	0.61	2.4	1LA7 083-0BAQQ		11
0.33	1.4	90 S	1420	2835	2.2	4.8	75	70	0.84	0.83	0.76	3.5	1LA7 090-0BAQQ		13
0.5	2	90 L	1420	2835	3.4	6.8	77	70	0.87	0.86	1.08	4.8	1LA7 096-0BAQQ		16
0.65	2.5	100 L	1430	2865	4.4	8.4	73	75	0.89	0.89	1.44	5.4	1LA7 106-0BAQQ		21
0.8	3.1	100 L	1425	2860	5.4	10	79	77	0.86	0.83	1.7	7	1LA7 107-0BAQQ		24
1.1	4.4	112 M	1445	2885	7.3	15	77	74	0.83	0.8	2.5	10.7	1LA7 113-0BAQQ		31
1.45	5.9	132 S	1455	2920	9.5	19	83	80	0.84	0.83	3	12.8	1LA7 130-0BAQQ		41
2	8	132 M	1455	2930	13	26	85	86	0.85	0.84	4	16	1LA7 133-0BAQQ		50
2.9	11.5	160 M	1455	2930	19	37	85.5	85	0.86	0.89	5.7	22	1LA7 163-0BAQQ		74
4.3	17	160 L	1455	2930	28	55	86	86	0.86	0.92	8.4	31	1LA7 166-0BAQQ		92

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz, direct online starting				Without flange		With flange			With standard flange		With special flange
	230 V	400 V	500 V	690 V	IM B3, IM B6/7/8, IM V6/5 without protective cover	IM B5, IM V1 without protective cover, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	5	0	0	1	4	6	2	7	3	
1LA7 08 .- . . . □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 09 .- . . . □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 10 .- . . . □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 11 .- . . . □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 13 .- . . . □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 16 .- . . . □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

1) For type of construction IM V1 with/without protective cover, motors 1LA5 183-... to 1LA5 223-... (motor series 1LA5 frame sizes 180 M to 225 M) can be supplied with two additional eyebolts; specify order supplement "Z" and order code **K32**.

2) The "Second shaft extension" option, order code **K16** is not possible.

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, in pole-changing version
Aluminum series 1LA7/5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting 1500 rpm T_{LR}/T_{rated}	Locked-rotor torque as multiple torque 3000 rpm T_{LR}/T_{rated}	Locked-rotor current of rated current 1500 rpm I_{LR}/I_{rated}	Locked-rotor current 3000 rpm I_{LR}/I_{rated}	Breakdown torque 1500 rpm T_B/T_{rated}	Breakdown torque 3000 rpm T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Mechanical limit speed at maximum supply frequency $n_{max.}$ rpm
4/2-pole, 1500/3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection									
Double pole-changing for driving fans with a winding in a Dahlander circuit									
1LA7 080-0BA□□	1.8	1.6	3.8	4	2	2	10	0.0014	4200
1LA7 083-0BA□□	1.8	1.9	3.8	4.2	2	2	10	0.0017	4200
1LA7 090-0BA□□	1.9	1.8	4.5	4.3	2.1	2	10	0.0024	4200
1LA7 096-0BA□□	2.2	2.2	5.1	5	2.5	2.5	10	0.0033	4200
1LA7 106-0BA□□	1.7	2.2	5	5.5	2.3	2.3	10	0.0048	4200
1LA7 107-0BA□□	1.8	2.3	5.7	6.1	2.6	2.6	10	0.0055	4200
1LA7 113-0BA□□	2.1	2.2	6.2	6.2	2.4	2.4	10	0.011	4200
1LA7 130-0BA□□	2	2.1	6.8	6.5	2.8	2.8	10	0.018	4200
1LA7 133-0BA□□	1.9	2.1	7.6	7.5	2.6	2.6	10	0.023	4200
1LA7 163-0BA□□	1.8	1.8	6.9	7.4	2.5	2.4	10	0.043	4200
1LA7 166-0BA□□	1.9	2.2	7.1	8.5	2.5	2.6	10	0.06	4200

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, in pole-changing version
Aluminum series 1LA7/5

Selection and ordering data (continued)

Rated output at 50 Hz,		Frame size	Rated speed at 50 Hz,		Rated torque at 50 Hz,		Efficiency at 50 Hz 4/4-load		Power factor at 50 Hz 4/4-load		Rated current at 400 V, 50 Hz		Order No.	Price	Weight motor
1000 rpm	1500 rpm		1000 rpm	1500 rpm	1000 rpm	1500 rpm	1000 rpm	1500 rpm	1000 rpm	1500 rpm	1000 rpm	1500 rpm			
P_{rated} kW	kW	FS	n_{rated} rpm	rpm	T_{rated} Nm	Nm	η_{rated} %	%	$\cos\phi_{rated}$	I_{rated} A	A	A			<i>m</i> kg
6/4-pole, 1000/1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection															
Double pole-changing for driving fans with two windings															
0.12	0.4	80 M	940	1430	1.2	2.7	45	55	0.75	0.76	0.51	1.38	1LA7 080-1BDQQ		9
0.18	0.55	80 M	930	1420	1.9	3.7	49	66	0.72	0.74	0.73	1.62	1LA7 083-1BDQQ		10
0.29	0.8	90 S	950	1430	2.9	5.3	55	68	0.71	0.81	1.07	2.1	1LA7 090-1BDQQ		13
0.38	1.1	90 L	950	1430	3.8	7.3	58	74	0.71	0.81	1.33	2.65	1LA7 096-1BDQQ		16
0.6	1.7	100 L	950	1410	6	11	67	75	0.74	0.86	1.75	3.8	1LA7 106-1BDQQ		21
0.75	2.1	100 L	950	1420	7.5	14	63	78	0.75	0.86	2.3	4.55	1LA7 107-1BDQQ		24
0.9	3	112 M	980	1450	8.8	20	71	81	0.61	0.8	3	6.7	1LA7 113-1BDQQ		31
1.2	3.9	132 S	975	1460	12	26	72	81	0.69	0.83	3.5	8.4	1LA7 130-1BDQQ		41
1.7	5.4	132 M	975	1460	17	35	75	82.5	0.72	0.83	4.55	11.4	1LA7 133-1BDQQ		49
2.5	7.2	160 M	980	1470	24	47	78	86	0.72	0.84	6.4	14.4	1LA7 163-1BDQQ		74
3.7	12	160 L	980	1470	36	78	77	89.5	0.75	0.83	9.3	23.3	1LA7 166-1BDQQ		92
5.5	16	180 M	965	1470	54	104	84	90.5	0.8	0.81	11.8	31.5	1LA5 183-1BDQQ		114
6.5	19	180 L	965	1460	64	124	84	88.5	0.81	0.85	13.8	36.5	1LA5 186-1BDQQ		128
9.5	26	200 L	980	1470	93	170	87	92.3	0.79	0.83	20	49	1LA5 207-1BDQQ		157

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code				With standard flange		With special flange
	50 Hz, direct online starting				Without flange	With flange			IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	230 V	400 V	500 V	690 V	IM B3, IM B6/7/8, IM V6/5 without protective cover	IM B5, IM V1 without protective cover, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35			
	1	6	5	0	0	1	4	6	2	7	3
1LA7 08 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 QQ	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA5 20 QQ	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For type of construction IM V1 with/without protective cover, motors 1LA5 183-... to 1LA5 223-... (motor series 1LA5 frame sizes 180 M to 225 M) can be supplied with two additional eyebolts; specify order supplement "**Z**" and order code **K32**.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, in pole-changing version
Aluminum series 1LA7/5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting 1000 rpm T_{LR}/T_{rated}	Locked-rotor torque as multiple torque 1500 rpm T_{LR}/T_{rated}	Locked-rotor current of rated current 1000 rpm I_{LR}/I_{rated}	Locked-rotor current 1500 rpm I_{LR}/I_{rated}	Breakdown torque 1000 rpm T_B/T_{rated}	Breakdown torque 1500 rpm T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Mechanical limit speed at maximum supply frequency n_{max} rpm
6/4-pole, 1000/1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection									
Double pole-changing for driving fans with two windings									
1LA7 080-1BD□□	1.7	1.7	2.8	4	1.8	2	10	0.0014	4200
1LA7 083-1BD□□	1.5	1.7	2.5	4	1.8	2	10	0.0017	4200
1LA7 090-1BD□□	1.5	1.5	3.4	4.3	2	2	10	0.0027	4200
1LA7 096-1BD□□	1.8	1.8	3.8	4.9	2.3	2.3	10	0.0033	4200
1LA7 106-1BD□□	1.8	1.8	4.2	5.2	2.2	2.2	10	0.0049	4200
1LA7 107-1BD□□	1.6	1.9	3.9	5.2	2	2.2	10	0.0057	4200
1LA7 113-1BD□□	2	2.1	4.5	6.1	2.5	2.5	10	0.012	4200
1LA7 130-1BD□□	1.9	1.7	5.1	6.1	2.5	2.2	10	0.018	4200
1LA7 133-1BD□□	2.1	1.9	5.1	6.6	2.6	2.5	10	0.023	4200
1LA7 163-1BD□□	1.9	2	5.6	7.3	1.9	2	10	0.043	4200
1LA7 166-1BD□□	1.9	2.4	5.7	8.1	2.3	3	10	0.06	4200
1LA5 183-1BD□□	1.8	1.9	4.3	5.9	1.9	2.6	10	0.081	4200
1LA5 186-1BD□□	1.8	1.9	4.3	5.6	2.1	2.6	10	0.094	4200
1LA5 207-1BD□□	1.9	1.5	5.3	5.5	2.1	2.1	10	0.16	4200

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, in pole-changing version
Aluminum series 1LA7/5

Selection and ordering data (continued)

Rated output at 50 Hz,		Frame size	Rated speed at 50 Hz,		Rated torque at 50 Hz,		Efficiency at 50 Hz 4/4-load		Power factor at 50 Hz 4/4-load		Rated current at 400 V, 50 Hz		Order No.	Price	Weight motor
750 rpm	1500 rpm		750 rpm	1500 rpm	750 rpm	1500 rpm	750 rpm	1500 rpm	750 rpm	1500 rpm	750 rpm	1500 rpm			
P_{rated} kW	kW	FS	n_{rated} rpm	rpm	T_{rated} Nm	Nm	η_{rated} %	%	$\cos\phi_{rated}$	I_{rated} A	A	A			m kg
8/4-pole, 750/1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection															
Double pole-changing for driving fans with a winding in a Dahlander circuit															
0.1	0.5	80 M	680	1375	1.4	3.5	42	69	0.61	0.82	0.57	1.28	1LA7 080-0BBQQ		9
0.15	0.7	80 M	685	1380	2.1	4.8	46	70	0.61	0.82	0.77	1.76	1LA7 083-0BBQQ		10
0.22	1	90 S	695	1370	3	7	41	70	0.62	0.86	1.25	2.4	1LA7 090-0BBQQ		13
0.33	1.5	90 L	700	1375	4.5	10	43	75	0.61	0.88	1.8	3.3	1LA7 096-0BBQQ		16
0.5	2	100 L	710	1415	6.7	13	51	79	0.57	0.85	2.5	4.3	1LA7 106-0BBQQ		21
0.65	2.5	100 L	700	1400	8.9	17	55	77	0.61	0.88	2.8	5.3	1LA7 107-0BBQQ		24
0.9	3.6	112 M	720	1440	12	24	55	78	0.5	0.83	4.7	11	1LA7 113-0BBQQ		31
1.1	4.7	132 S	720	1455	15	31	76	79	0.6	0.78	3.5	10.3	1LA7 130-0BBQQ		41
1.4	6.4	132 M	720	1455	19	42	77	83.5	0.6	0.83	4.4	13.3	1LA7 133-0BBQQ		49
2.2	9.5	160 M	725	1465	29	62	79	84	0.62	0.83	6.5	19.7	1LA7 163-0BBQQ		73
3.3	14	160 L	730	1470	43	91	85.5	88.5	0.6	0.8	9.3	28.6	1LA7 166-0BBQQ		91
4.5	16	180 M	730	1470	59	104	81	86	0.59	0.83	13.1	32.3	1LA5 183-0BBQQ		111
5	18.5	180 L	730	1470	65	120	80	88	0.6	0.83	15	36.5	1LA5 186-0BBQQ		118
7.5	28	200 L	732	1470	98	182	85	90.4	0.62	0.86	20.5	52	1LA5 207-0BBQQ		157

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code				With standard flange		With special flange
	50 Hz, direct online starting				Without flange	With flange			IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	230 V	400 V	500 V	690 V	IM B3, IM B6/7/8, IM V6/5 without protective cover	IM B5, IM V1 without protective cover, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35			
	1	6	5	0	0	1	4	6	2	7	3
1LA7 08 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 QQ	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA5 20 QQ	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For type of construction IM V1 with/without protective cover, motors 1LA5 183-... to 1LA5 223-... (motor series 1LA5 frame sizes 180 M to 225 M) can be supplied with two additional eyebolts; specify order supplement "**Z**" and order code **K32**.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, in pole-changing version
Aluminum series 1LA7/5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque 750 rpm T_{LR}/T_{rated}	Locked-rotor torque as multiple torque 1500 rpm T_{LR}/T_{rated}	Locked-rotor current of rated current 750 rpm I_{LR}/I_{rated}	Locked-rotor current 1500 rpm I_{LR}/I_{rated}	Breakdown torque 750 rpm T_B/T_{rated}	Breakdown torque 1500 rpm T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Mechanical limit speed at maximum supply frequency n_{max} rpm
8/4-pole, 750/1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection									
Double pole-changing for driving fans with a winding in a Dahlander circuit									
1LA7 080-0BB□□	1.4	1.7	2.3	4.1	1.7	1.8	10	0.0014	4200
1LA7 083-0BB□□	1.4	1.8	2.4	4.2	1.7	1.8	10	0.0017	4200
1LA7 090-0BB□□	1.3	1.5	2.4	3.7	1.8	2	10	0.0024	4200
1LA7 096-0BB□□	1.5	1.8	2.6	4.2	1.8	2	10	0.0033	4200
1LA7 106-0BB□□	1.1	1.9	3.1	5.2	1.8	2.1	10	0.0047	4200
1LA7 107-0BB□□	1.1	1.9	3.1	5.4	1.8	2.1	10	0.0054	4200
1LA7 113-0BB□□	1.6	2.6	3.2	6.5	2.4	2.6	10	0.012	4200
1LA7 130-0BB□□	2	2.3	4.3	6.4	2.5	2.9	10	0.018	4200
1LA7 133-0BB□□	2.2	1.9	4.6	6.8	2.7	2.5	10	0.023	4200
1LA7 163-0BB□□	1.7	2	4.1	7	2	2.6	10	0.043	4200
1LA7 166-0BB□□	2	2.6	4.7	8.1	2.2	3.1	10	0.06	4200
1LA5 183-0BB□□	1.4	2.3	3.8	7	2.1	2.9	10	0.13	4200
1LA5 186-0BB□□	1.5	2.3	3.8	7	2.1	2.7	10	0.15	4200
1LA5 207-0BB□□	1.9	2.5	4.3	7.1	2.2	2.5	10	0.24	4200

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, in pole-changing version
Aluminum series 1LA7/5

Selection and ordering data (continued)

Rated output at 50 Hz			Frame size	Rated speed n _{rated} at 50 Hz			Rated torque at 50 Hz			Efficiency at 50 Hz 4/4-load			Power factor at 50 Hz 4/4-load			Rated current I _{rated} at 50 Hz			Order No.	Price	Weight motor
750 rpm	1000 rpm	1500 rpm	FS	750 rpm	1000 rpm	1500 rpm	750 rpm	1000 rpm	1500 rpm	750 rpm	1000 rpm	1500 rpm	750 rpm	1000 rpm	1500 rpm	750 rpm	1000 rpm	1500 rpm			m
P _{rated} kW	P _{rated} kW	P _{rated} kW		n _{rated} rpm	n _{rated} rpm	n _{rated} rpm	T _{rated} Nm	T _{rated} Nm	T _{rated} Nm	η _{rated} %	η _{rated} %	η _{rated} %	cos φ _{rated}	cos φ _{rated}	cos φ _{rated}	I _{rated} A	I _{rated} A	I _{rated} A			kg
8/6/4-pole, 750/1000/1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection																					
Triple pole-changing for driving fans with two windings, of which 750/1500 rpm in a Dahlander circuit																					
0.15	0.22	0.7	90 S	705	960	1430	2	2.3	4.7	48	56	70	0.63	0.69	0.83	0.72	0.82	1.74	1LA7 090-1BJQQ		12
0.22	0.3	0.95	90 L	705	955	1435	3	3	6.4	50	51	74	0.6	0.75	0.81	1.06	1.13	2.3	1LA7 096-1BJQQ		15
0.37	0.55	1.5	100 L	700	955	1400	5	5.5	10	51	63	76	0.63	0.74	0.88	1.66	1.71	3.25	1LA7 106-1BJQQ		20
0.45	0.7	1.8	100 L	700	970	1400	6.1	7	12	54	63	75	0.65	0.75	0.89	1.85	2.15	3.9	1LA7 107-1BJQQ		22
0.6	0.85	2.4	112 M	715	970	1445	8	8.4	16	53	66	79	0.59	0.66	0.86	2.75	2.8	5.1	1LA7 113-1BJQQ		29
0.75	1.1	3.1	132 S	730	980	1460	9.8	11	20	65	69	77	0.62	0.68	0.81	2.7	3.4	7.2	1LA7 130-1BJQQ		39
1	1.5	4.4	132 M	730	980	1460	13	15	29	68	71	79	0.6	0.68	0.83	3.55	4.5	9.7	1LA7 133-1BJQQ		46
1.6	2.2	6.6	160 M	730	980	1470	21	21	43	78	74	83	0.58	0.66	0.81	5.1	6.5	14.2	1LA7 163-1BJQQ		67
2.4	3.5	10	160 L	730	980	1470	31	34	65	79	78	85	0.58	0.69	0.82	7.6	9.4	20.7	1LA7 166-1BJQQ		85
3	4.5	13	180 M	730	980	1470	40	44	85	84.5	84	87.5	0.61	0.76	0.84	8.4	10.2	25.5	1LA5 183-1BJQQ		114
3.7	5.5	16	180 L	725	975	1465	49	54	104	83.5	86.5	87.5	0.62	0.76	0.85	10.3	12.1	31	1LA5 186-1BJQQ		128
5	8	22	200 L	730	975	1465	65	78	143	84	86	89	0.64	0.81	0.85	13.4	16.6	42	1LA5 207-1BJQQ		157

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code				With standard flange		With special flange
	50 Hz, direct online starting				Without flange	With flange					
	230 V	400 V	500 V	690 V	IM B3, IM B6/7/8, IM V6/5 without protective cover	IM B5, IM V1 without protective cover, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	5	0	0	1	4	6	2	7	3
1LA7 09 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA5 20 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For type of construction IM V1 with/without protective cover, motors 1LA5 183-... to 1LA5 223-... (motor series 1LA5 frame sizes 180 M to 225 M) can be supplied with two additional eyebolts; specify order supplement "Z" and order code **K32**.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, in pole-changing version
Aluminum series 1LA7/5

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor torque	Locked-rotor torque	Locked-rotor current	Locked-rotor current	Locked-rotor current	Break-down torque	Break-down torque	Break-down torque	Torque class	Moment of inertia	Mechanical limit speed at maximum supply frequency
	with direct starting torque 750 rpm	starting as torque 1000 rpm	multiple of torque 1500 rpm	rated current 750 rpm	rated current 1000 rpm	rated current 1500 rpm	torque 750 rpm	torque 1000 rpm	torque 1500 rpm			
	T_{LR}/T_{rated}	T_{LR}/T_{rated}	T_{LR}/T_{rated}	I_{LR}/I_{rated}	I_{LR}/I_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	T_B/T_{rated}	T_B/T_{rated}	CL	J kgm ²	n_{max} . rpm
8/6/4-pole, 750/1000/1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection												
Triple pole-changing for driving fans with two windings, of which 750/1500 rpm in a Dahlander circuit												
1LA7 090-1BJQQ	1.3	1.3	1.3	2.5	2.9	4.3	1.9	1.9	1.9	10	0.0028	4200
1LA7 096-1BJQQ	1.4	1.2	1.4	2.5	3.1	4.6	2.1	1.9	2.2	10	0.0035	4200
1LA7 106-1BJQQ	0.9	1.2	1.5	2.8	3.8	4.7	1.9	1.9	2.1	7	0.0048	4200
1LA7 107-1BJQQ	0.9	1.2	1.7	2.8	3.8	4.7	1.9	2	2.1	7	0.0058	4200
1LA7 113-1BJQQ	1.1	1.3	1.9	3.1	4.4	6	2.1	2.3	2.5	7	0.011	4200
1LA7 130-1BJQQ	1.7	1.7	1.5	3.7	4.5	5.5	2.3	2.3	2.5	10	0.018	4200
1LA7 133-1BJQQ	1.8	1.9	1.6	3.9	4.9	5.8	2.4	2.4	2.5	10	0.024	4200
1LA7 163-1BJQQ	1.4	1.7	1.7	3.9	5.1	7	2.1	2.4	2.7	7	0.04	4200
1LA7 166-1BJQQ	1.6	1.8	2	4.1	5.3	7.7	2.2	2.3	3	7	0.054	4200
1LA5 183-1BJQQ	1.2	1.8	1.3	3.9	5	5.4	1.6	2.2	2.3	7	0.081	4200
1LA5 186-1BJQQ	1.1	1.9	1.3	3.9	5	5.4	1.6	2.2	2.3	7	0.094	4200
1LA5 207-1BJQQ	1.2	1.9	1.3	3.6	5	5.4	1.8	2.2	2.6	7	0.16	4200

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, pole-changing version Cast-iron series 1LG4

Selection and ordering data

Rated output at 50 Hz,		Frame size	Rated speed at 50 Hz,		Rated torque at 50 Hz,		Efficiency at 50 Hz, 4/4-load,		Power factor at 50 Hz, 4/4-load,		Rated current at 400 V, 50 Hz		Order No.	Price	Weight motor
1500 rpm	3000 rpm	FS	1500 rpm	3000 rpm	1500 rpm	3000 rpm	1500 rpm	3000 rpm	1500 rpm	3000 rpm	1500 rpm	3000 rpm			
P_{rated}			n_{rated}		T_{rated}		η_{rated}		$\cos\phi_{rated}$		I_{rated}				m
kW	kW		rpm	rpm	Nm	Nm	%	%			A	A			kg
4/2-pole, 1500/3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection															
Double pole-changing for driving fans with a winding in a Dahlander circuit															
4.8	18	180 M	1465	2935	31	59	89.0	84.8	0.86	0.92	9.1	33.5	1LG4 183-0BA□□		155
5.8	21.5	180 L	1470	2950	38	70	88.1	87.5	0.85	0.93	11.2	38.5	1LG4 186-0BA□□		180
8.4	31	200 L	1475	2950	55	101	90.9	88.5	0.87	0.92	15.5	55	1LG4 207-0BA□□		225
10.5	38	225 S	1475	2955	68	123	90.8	87.9	0.85	0.92	20	68	1LG4 220-0BA□□		290
13	45	225 M	1475	2960	84	145	91.4	90.0	0.89	0.93	23	78	1LG4 223-0BA□□		330
15	55	250 M	1480	2960	97	177	91.9	88.0	0.86	0.89	27	102	1LG4 253-0BA□□		390
18	67	280 S	1490	2970	115	215	92.0	89.2	0.87	0.90	32.5	120	1LG4 280-0BA□□		520
22	80	280 M	1490	2975	141	257	92.9	91.2	0.86	0.91	39.5	140	1LG4 283-0BA□□		560
26	90	315 S	1492	2978	166	289	93.7	90.7	0.84	0.88	47	162	1LG4 310-0BA□□		730
32	110	315 M	1492	2976	205	353	93.6	90.5	0.87	0.93	57	190	1LG4 313-0BA□□		810
35	140	315 L	1492	2974	224	450	94.5	93.2	0.87	0.93	62	230	1LG4 316-0BA□□		960
45	170	315 L	1492	2976	288	546	94.9	93.8	0.88	0.94	78	280	1LG4 317-0BA□□		1060

Order No. supplements

Motor type	Penultimate position: Voltage code 50 Hz, direct online starting				Final position: Type of construction code					With standard flange		With special flange
	230 V	400 V	500 V	690 V	Without flange	With flange		IM B35	IM B14, IM V19	IM B34	IM B14, IM V19	
					IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V1 without protective cover, IM V3 ²⁾	IM V1 without protective cover ²⁾	IM V1 with protective cover ²⁾³⁾		IM B14, IM V19 without protective cover	IM V18 without protective cover	
	1	6	5	0	0	1	8	4	6	2	7	3
1LG4 18 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 20 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 22 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 25 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 28 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 310 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 313 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 316 □□	–	○	○	○	□ ⁵⁾	–	✓	✓	✓	–	–	–
1LG4 317 □□	–	○	○	○	□ ⁵⁾	–	✓	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 2) Motors 1LG4 220-... to 1LG4 318-... (motor series 1LG4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 3) The "Second shaft extension" option, order code **K16** is not possible.
- 4) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 5) Type of construction IM V6/IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** and **M1D**.

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, pole-changing version
Cast-iron series 1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor torque	Locked-rotor current	Locked-rotor current	Break-down torque	Break-down torque	Torque class	Moment of inertia	Mechanical limit speed at maximum supply frequency
	with direct starting as multiple torque 1500 rpm	with direct starting as multiple torque 3000 rpm	of rated current 1500 rpm	of rated current 3000 rpm	torque 1500 rpm	torque 3000 rpm			
	T_{LR}/T_{rated}	T_{LR}/T_{rated}	I_{rated}/I_{rated}	I_{rated}/I_{rated}	T_B/T_{rated}	T_B/T_{rated}	CL	J kgm ²	$n_{max.}$ rpm
4/2-pole, 1500/3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection									
Double pole-changing for driving fans with a winding in a Dahlander circuit									
1LG4 183-0BA□□	2.3	2.5	7.5	8.1	2.8	3.0	10	0.12	4600
1LG4 186-0BA□□	2.0	2.3	6.8	7.7	2.8	3.3	10	0.14	4600
1LG4 207-0BA□□	2.5	2.8	7.6	8.7	3.1	3.5	10	0.23	4500
1LG4 220-0BA□□	2.3	2.4	6.7	7.5	2.8	3.1	10	0.40	4500
1LG4 223-0BA□□	2.2	2.5	6.2	8.1	2.6	3.5	10	0.49	4500
1LG4 253-0BA□□	2.2	2.3	6.2	6.6	2.0	3.0	10	0.69	3900
1LG4 280-0BA□□	2.5	2.3	7.0	7.6	2.8	3.3	10	1.20	3600
1LG4 283-0BA□□	2.2	2.1	6.1	7.5	2.4	2.9	10	1.40	3600
1LG4 310-0BA□□	2.4	1.9	8.4	8.1	2.9	3.3	10	1.90	3600
1LG4 313-0BA□□	2.3	1.7	7.6	6.7	2.9	2.9	10	2.30	3600
1LG4 316-0BA□□	2.2	1.8	7.6	7.1	2.6	2.6	10	2.90	3600 ¹⁾
1LG4 317-0BA□□	2.2	1.9	7.5	7.4	2.7	2.8	10	3.50	3600 ¹⁾

¹⁾ This is only valid for horizontal installation – reduction to 3000 rpm with vertical installation

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, pole-changing version Cast-iron series 1LG4

Selection and ordering data (continued)

Rated output at 50 Hz,		Frame size	Rated speed at 50 Hz,		Rated torque at 50 Hz,		Efficiency at 50 Hz 4/4-load		Power factor at 50 Hz 4/4-load		Rated current at 400 V, 50 Hz		Order No.	Price	Weight motor
1000 rpm	1500 rpm		1000 rpm	1500 rpm	1000 rpm	1500 rpm	1000 rpm	1500 rpm	1000 rpm	1500 rpm	1000 rpm	1500 rpm			
P_{rated}		FS	n_{rated}		T_{rated}		η_{rated}		$\cos \phi_{rated}$		I_{rated}				m
kW	kW		rpm	rpm	Nm	Nm	%	%			A	A			kg
6/4-pole, 1000/1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection															
Double pole-changing for driving fans with two windings															
5.5	16	180 M	960	1460	55	105	81.3	88.8	0.82	0.83	12	31.5	1LG4 183-1BD□□		155
6.5	19	180 L	960	1460	65	124	81.4	89.3	0.82	0.84	14	36.5	1LG4 186-1BD□□		175
9.5	26	200 L	975	1460	93	170	84	90.3	0.82	0.85	20	49	1LG4 207-1BD□□		235
12	34	225 S	980	1465	117	222	86.2	90.8	0.82	0.86	24.5	63	1LG4 220-1BD□□		285
14.5	40	225 M	980	1470	141	260	88	92.2	0.83	0.87	28.5	72	1LG4 223-1BD□□		340
18	52	250 M	980	1475	175	337	88.7	93.3	0.86	0.88	34	91	1LG4 253-1BD□□		380
25	70	280 S	980	1480	243	452	89.3	92.4	0.86	0.88	47	124	1LG4 280-1BD□□		540
30	82	280 M	985	1480	291	529	90.3	93	0.86	0.86	56	148	1LG4 283-1BD□□		580
33	92	315 S	990	1490	319	591	90.5	92.6	0.84	0.82	63	176	1LG4 310-1BD□□		730
45	120	315 M	990	1485	435	771	91.0	94.3	0.84	0.86	85	215	1LG4 313-1BD□□		810
50	150	315 L	990	1485	483	966	91.0	94.5	0.85	0.87	93	260	1LG4 316-1BD□□		990
55	170	315 L	990	1490	532	1092	90.8	94.6	0.86	0.84	102	310	1LG4 317-1BD□□		1060

Order No. supplements

Motor type	Penultimate position: Voltage code 50 Hz, direct online starting				Final position: Type of construction code							
	230 V	400 V	500 V	690 V	Without flange	With flange			With standard flange		With special flange	
					IM B3, IM B6/7/8, IM V6/5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾	IM V1 without protective cover ²⁾	IM V1 with protective cover ²⁾³⁾	IM B35	IM B14, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	5	0	0	1	8	4	6	2	7	3
1LG4 18 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 20 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 22 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 25 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 28 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 310 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 313 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 316 □□	–	○	○	○	□ ⁵⁾	–	✓	✓	✓	–	–	–
1LG4 317 □□	–	○	○	○	□ ⁵⁾	–	✓	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- ²⁾ Motors 1LG4 220-... to 1LG4 318-... (motor series 1LG4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- ³⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁵⁾ Type of construction IM V6/IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** and **M1D**.

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, pole-changing version
Cast-iron series 1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting 1000 rpm T_{LR}/T_{rated}	Locked-rotor torque as multiple of rated torque 1500 rpm T_{LR}/T_{rated}	Locked-rotor current of rated current 1000 rpm I_{LR}/I_{rated}	Locked-rotor current 1500 rpm I_{LR}/I_{rated}	Breakdown torque 1000 rpm T_B/T_{rated}	Breakdown torque 1500 rpm T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Mechanical limit speed at maximum supply frequency n_{max} rpm
6/4-pole, 1000/1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection									
Double pole-changing for driving fans with two windings									
1LG4 183-1BD□□	1.6	1.7	4	5.3	1.8	2.5	10	0.08	4200
1LG4 186-1BD□□	1.6	1.7	4	5.2	1.8	2.4	10	0.08	4200
1LG4 207-1BD□□	1.9	1.7	5	5.1	2.2	2.4	10	0.15	4200
1LG4 220-1BD□□	2.3	1.7	5.7	5.6	2.1	2.3	10	0.29	4500
1LG4 223-1BD□□	2.2	1.9	5.6	5.8	2.1	2.3	10	0.37	4500
1LG4 253-1BD□□	2	2	4.9	5.9	2	2.7	10	0.44	3700
1LG4 280-1BD□□	2.1	2.2	5	6.2	1.9	2.6	10	1.19	3000
1LG4 283-1BD□□	2.5	2.4	5.5	6.6	2.2	2.8	10	1.39	3000
1LG4 310-1BD□□	2.5	2.4	5.9	6.7	2.5	2.9	10	1.90	2600
1LG4 313-1BD□□	2.4	2.3	5.4	6.4	2.3	2.8	10	2.30	2600
1LG4 316-1BD□□	2.4	2.0	5.2	5.9	2.1	2.3	10	2.50	2600
1LG4 317-1BD□□	2.3	2.7	5.6	7.9	2.1	3.1	10	3.50	2600

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, pole-changing version Cast-iron series 1LG4

Selection and ordering data (continued)

Rated output at 50 Hz,		Frame size	Rated speed at 50 Hz,		Rated torque at 50 Hz,		Efficiency at 50 Hz 4/4-load		Power factor at 50 Hz 4/4-load		Rated current at 400 V, 50 Hz		Order No.	Price	Weight motor
750 rpm	1500 rpm	FS	750 rpm	1500 rpm	750 rpm	1500 rpm	750 rpm	1500 rpm	750 rpm	1500 rpm	750 rpm	1500 rpm			
P_{rated}			n_{rated}		T_{rated}		η_{rated}		$\cos \phi_{rated}$		I_{rated}				m
kW	kW		rpm	rpm	Nm	Nm	%	%			A	A			kg
8/4-pole, 750/1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection															
Double pole-changing for driving fans with a winding in a Dahlander circuit															
4.5	16	180 M	725	1465	59	104	81.6	88.6	0.63	0.84	12.6	31	1LG4 183-0BB□□		155
5	18.5	180 L	725	1470	66	120	82.5	91	0.62	0.85	14.2	35	1LG4 186-0BB□□		180
7.5	28	200 L	730	1465	98	183	84.7	91	0.6	0.86	21.5	52	1LG4 207-0BB□□		220
9.5	35	225 S	738	1478	123	226	86	92	0.61	0.86	26	64	1LG4 220-0BB□□		295
11.5	42	225 M	738	1475	149	272	87.8	92.7	0.62	0.87	30.5	75	1LG4 223-0BB□□		330
14.5	52	250 M	740	1480	187	335	88.3	93.2	0.62	0.86	38	94	1LG4 253-0BB□□		430
19	70	280 S	740	1480	245	451	90.7	94	0.62	0.86	49	124	1LG4 280-0BB□□		530
23	83	280 M	740	1485	296	534	91	94.2	0.63	0.87	58	146	1LG4 283-0BB□□		665
26	95	315 S	742	1484	334	610	91.5	94.2	0.62	0.85	66	172	1LG4 310-0BB□□		730
30	115	315 M	744	1488	385	738	91.5	94.0	0.58	0.83	82	215	1LG4 313-0BB□□		810
35	140	315 L	744	1486	449	899	92.5	95.0	0.62	0.86	88	245	1LG4 316-0BB□□		960
45	175	315 L	744	1490	577	1125	92.5	95.0	0.57	0.84	124	315	1LG4 317-0BB□□		1090

Order No. supplements

Motor type	Penultimate position: Voltage code 50 Hz, direct online starting				Final position: Type of construction code							
	230 V	400 V	500 V	690 V	Without flange	With flange			With standard flange		With special flange	
					IM B3, IM B6/7/8, IM V6/5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾	IM V1 without protective cover ²⁾	IM V1 with protective cover ²⁾³⁾	IM B35	IM B14, IM V19 without protective cover	IM B34	IM B14, IM V19 without protective cover
	1	6	5	0	0	1	8	4	6	2	7	3
1LG4 18 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 20 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 22 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 25 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 28 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 310 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 313 □□	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 316 □□	–	○	○	○	□ ⁵⁾	–	✓	✓	✓	–	–	–
1LG4 317 □□	–	○	○	○	□ ⁵⁾	–	✓	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- ²⁾ Motors 1LG4 220-... to 1LG4 318-... (motor series 1LG4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- ³⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁵⁾ Type of construction IM V6/IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** and **M1D**.

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, pole-changing version
Cast-iron series 1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting at 750 rpm T_{LR}/T_{rated}	Locked-rotor torque as multiple of rated torque at 1500 rpm T_{LR}/T_{rated}	Locked-rotor current of rated current at 750 rpm I_{LR}/I_{rated}	Locked-rotor current at 1500 rpm I_{LR}/I_{rated}	Breakdown torque at 750 rpm T_B/T_{rated}	Breakdown torque at 1500 rpm T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Mechanical limit speed at maximum supply frequency n_{max} rpm
8/4-pole, 750/1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection									
Double pole-changing for driving fans with a winding in a Dahlander circuit									
1LG4 183-0BB□□	1.4	2.2	3.6	6.8	2	3.1	10	0.11	4200
1LG4 186-0BB□□	1.6	2.4	3.7	7.2	2.1	3.3	10	0.14	4200
1LG4 207-0BB□□	2.1	2.7	4.3	7.3	2.5	2.9	10	0.19	4200
1LG4 220-0BB□□	2	1.7	4.4	6.9	2.3	2.9	10	0.44	4500
1LG4 223-0BB□□	1.9	2.4	4.5	6.9	2.2	3	10	0.48	4500
1LG4 253-0BB□□	2	2.5	4	6.8	1.8	2.6	10	0.85	3700
1LG4 280-0BB□□	1.8	2	4	6.3	1.8	2.5	10	1.19	3000
1LG4 283-0BB□□	1.9	2.2	4.2	7.2	1.8	2.7	10	1.71	3000
1LG4 310-0BB□□	1.9	2.3	4.6	6.5	1.9	2.6	10	1.90	2600
1LG4 313-0BB□□	2.1	2.5	5.0	7.4	2.1	2.7	10	2.30	2600
1LG4 316-0BB□□	2.0	2.4	4.7	7.0	2.1	2.6	10	2.90	2600
1LG4 317-0BB□□	2.1	3.1	4.7	7.5	2.2	3.0	10	4.20	2600

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover with improved efficiency – Aluminum series 1PP7/5

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class "Improved Efficiency" according to CEMEP	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V								
P_{rated}	FS	n_{rated}	T_{rated}	η_{rated}	$\cos\phi_{rated}$	I_{rated}	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}		J			Type of construction IM B3 approx. m	
kW		rpm	Nm	EFF 2	%	A					kg m ²	► Phase-out model		kg	
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection															
0.18	63 M	2820	0.61		63.0	0.82	0.50	2.0	3.7	2.2	16	0.00018	1PP7 060-2AA□□	4	
0.25	63 M	2830	0.84		65.0	0.82	0.68	2.0	4.0	2.2	16	0.00022	1PP7 063-2AA□□	4	
0.37	71 M	2740	1.3		66.0	0.82	1.00	2.3	3.5	2.3	16	0.00029	1PP7 070-2AA□□	5	
0.55	71 M	2800	1.9		71.0	0.82	1.36	2.5	4.3	2.6	16	0.00041	1PP7 073-2AA□□	6	
0.75	80 M	2855	2.5		73.0	0.86	1.73	2.3	5.6	2.4	16	0.00079	1PP7 080-2AA□□	9	
1.1	80 M	2845	3.7	EFF 2	77.0	0.87	2.40	2.6	6.1	2.7	16	0.0010	1PP7 083-2AA□□	11	
1.5	90 S	2860	5.0	EFF 2	79.0	0.85	3.25	2.4	5.5	2.7	16	0.0014	1PP7 090-2AA□□	13	
2.2	90 L	2880	7.3	EFF 2	82.0	0.85	4.55	2.8	6.3	3.1	16	0.0018	1PP7 096-2AA□□	16	
3	100 L	2890	9.9	EFF 2	84.0	0.85	6.10	2.8	6.8	3.0	16	0.0035	► 1PP7 106-2AA□□	22	
4	111 M	2905	13	EFF 2	86.0	0.86	7.80	2.6	7.2	2.9	16	0.0059	► 1PP7 113-2AA□□	29	
5.5	132 S	2925	18	EFF 2	86.5	0.89	10.4	2.0	5.9	2.8	16	0.015	► 1PP7 130-2AA□□	39	
7.5	132 S	2930	24	EFF 2	88.0	0.89	13.8	2.3	6.9	3.0	16	0.019	► 1PP7 131-2AA□□	48	
11	160 M	2940	36	EFF 2	89.5	0.88	20.0	2.1	6.5	2.9	16	0.034	► 1PP7 163-2AA□□	68	
15	160 M	2940	49	EFF 2	90.0	0.90	26.5	2.2	6.6	3.0	16	0.043	► 1PP7 164-2AA□□	77	
18.5	160 L	2940	60	EFF 2	91.0	0.91	32.0	2.4	7.0	3.1	16	0.051	► 1PP7 166-2AA□□	86	
22	180 M	2940	71	EFF 2	91.7	0.88	39.5 ¹⁾	2.5	6.9	3.2	16	0.077	1PP5 183-2AA□□	111	
30	200 L	2945	97	EFF 2	92.3	0.89	53	2.4	7.2	2.8	16	0.14	1PP5 206-2AA□□	159	
37	200 L	2945	120	EFF 2	92.8	0.89	65.0 ¹⁾	2.4	7.7	2.8	16	0.16	1PP5 207-2AA□□	179	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange		With standard flange			With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6/5 without protective cover	IM B5, IM V3 ²⁾	IM V1 without protective cover ²⁾³⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0	1	1	6	2	7	3
1PP7 06 □□	○	○	○	-	□	✓	✓	-	✓	-	✓
1PP7 07 □□	○	○	○	-	□	✓	✓	-	✓	-	✓
1PP7 08 □□	○	○	○	-	□	✓	✓	-	✓	-	✓
1PP7 09 □□	○	○	○	-	□	✓	✓	-	✓	-	✓
1PP7 10 □□	○	○	○	○	□	✓	✓	-	✓	-	✓
1PP7 11 □□	○	○	○	○	□	✓	✓	-	✓	-	✓
1PP7 13 □□	○	○	○	○	□	✓	✓	-	✓	-	✓
1PP7 16 □□	○	○	○	○	□	✓	✓	-	✓	-	✓
1PP5 18 □□	○	○	○	○	□	✓ ⁴⁾	✓	-	-	-	-
1PP5 20 □□	○	○	○	○	□	✓ ⁴⁾	✓	-	-	-	-

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

► The Order No. for 1PP7 motors marked with this symbol are phase-out models. 1LE1 motors are the successors. For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Forced-air cooled motors without external fan and fan cover" Pages 1/38 to 1/45.

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

1) For connection to 230 V, parallel feeders are necessary (see the "Technical information" section, "Connection, circuit and connection box" Page 0/38).
 2) Motors 1PP5 183... to 1PP5 223... (motor series 1PP5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement "Z" and order code **K32**.

3) The "Second shaft extension" option, order code **K16** is not possible.
 4) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover with improved efficiency – Aluminum series 1PP7/5

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class "Improved Efficiency" according to CEMEP	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V								
P_{rated}	FS	n_{rated}	T_{rated}	η_{rated}	$\cos\phi_{rated}$	I_{rated}	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}		J			Type of construction IM B3 approx. m	
kW		rpm	Nm	EFF2 %		A					kg m ²	► Phase-out model		kg	
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection															
0.12	63 M	1350	0.85	55.0	75	0.42	1.9	2.8	2.0	13	0.00029	1PP7 060-4AB□□		4	
0.18	63 M	1350	1.3	60.0	77	0.56	1.9	3.0	1.9	13	0.00037	1PP7 063-4AB□□		4	
0.25	71 M	1350	1.8	60.0	78	0.77	1.9	3.0	1.9	13	0.00052	1PP7 070-4AB□□		5	
0.37	71 M	1370	2.6	65.0	78	1.06	1.9	3.3	2.1	13	0.00077	1PP7 073-4AB□□		6	
0.55	80 M	1395	3.8	67.0	82	1.44	2.2	3.9	2.2	16	0.0014	1PP7 080-4AA□□		9	
0.75	80 M	1395	5.1	EFF 2 72.0	81	1.91	2.3	4.2	2.3	16	0.0017	1PP7 083-4AA□□		10	
1.1	90 S	1415	7.4	EFF 2 77.0	81	2.55	2.3	4.6	2.4	16	0.0024	1PP7 090-4AA□□		13	
1.5	90 L	1420	10	EFF 2 79.0	81	3.40	2.4	5.3	2.6	16	0.0033	1PP7 096-4AA□□		16	
2.2	100 L	1420	15	EFF 2 82.0	82	4.70	2.5	5.6	2.8	16	0.0047	► 1PP7 106-4AA□□		21	
3	100 L	1420	20	EFF 2 83.0	82	6.40	2.7	5.6	3.0	16	0.0055	► 1PP7 107-4AA□□		24	
4	112 M	1440	27	EFF 2 85.0	83	8.20	2.7	6.0	3.0	16	0.012	► 1PP7 113-4AA□□		31	
5.5	132 S	1455	36	EFF 2 86.0	81	11.4	2.5	6.3	3.1	16	0.018	► 1PP7 130-4AA□□		41	
7.5	132 M	1455	49	EFF 2 87.0	82	15.2	2.7	6.7	3.2	16	0.023	► 1PP7 133-4AA□□		49	
11	160 M	1460	72	EFF 2 88.5	84	21.5	2.2	6.2	2.7	16	0.043	► 1PP7 163-4AA□□		73	
15	160 L	1460	98	EFF 2 90.0	84	28.5	2.6	6.5	3.0	16	0.055	► 1PP7 166-4AA□□		85	
18.5	180 M	1460	121	EFF 2 90.5	83	35.5 ¹⁾	2.3	7.5	3.0	16	0.13	1PP5 183-4AA□□		108	
22	180 L	1460	144	EFF 2 91.2	84	41.5 ¹⁾	2.3	7.5	3.0	16	0.15	1PP5 186-4AA□□		118	
30	200 L	1465	196	EFF 2 91.8	86	55	2.6	7.0	3.2	16	0.24	1PP5 207-4AA□□		157	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange			With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3, IM B6/7/8, IM V6/5 without protective cover	IM B5, IM V3 ²⁾	IM V1 without protective cover ²⁾³⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0	1	1	6	2	7	3
1PP7 06 □□	○	○	○	-	□	✓	✓	-	✓	-	✓
1PP7 07 □□	○	○	○	-	□	✓	✓	-	✓	-	✓
1PP7 08 □□	○	○	○	-	□	✓	✓	-	✓	-	✓
1PP7 09 □□	○	○	○	-	□	✓	✓	-	✓	-	✓
1PP7 10 □□	○	○	○	○	□	✓	✓	-	✓	-	✓
1PP7 11 □□	○	○	○	○	□	✓	✓	-	✓	-	✓
1PP7 13 □□	○	○	○	○	□	✓	✓	-	✓	-	✓
1PP7 16 □□	○	○	○	○	□	✓	✓	-	✓	-	✓
1PP5 18 □□	○	○	○	○	□	✓ ⁴⁾	✓	-	-	-	-
1PP5 20 □□	○	○	○	○	□	✓ ⁴⁾	✓	-	-	-	-

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

► The Order No. for 1PP7 motors marked with this symbol are phase-out models. 1LE1 motors are the successors. For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Forced-air cooled motors without external fan and fan cover" Pages 1/38 to 1/45.

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Technical information" section, "Connection, circuit and connection box" Page 0/38).
²⁾ Motors 1PP5 183... to 1PP5 223... (motor series 1PP5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement "Z" and order code **K32**.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.
⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover with improved efficiency – Aluminum series 1PP7/5

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current as multiple of rated current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V								
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²	► Phase-out model	Type of construction IM B3 approx. m kg	
6-pole, 1000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection														
0.09	63 M	850	1.0	45.0	0.66	0.44	1.8	2.0	1.9	13	0.00037	1PP7 063-6AA□□	4	
0.18	71 M	850	2.0	53.0	0.73	0.67	2.1	2.3	1.9	16	0.00055	1PP7 070-6AA□□	5	
0.25	71 M	860	2.8	60.0	0.76	0.79	2.2	2.7	2.0	16	0.00080	1PP7 073-6AA□□	6	
0.37	80 M	920	3.8	62.0	0.72	1.20	1.9	3.1	2.1	16	0.0014	1PP7 080-6AA□□	9	
0.55	80 M	910	5.8	67.0	0.74	1.60	2.1	3.4	2.2	16	0.0017	1PP7 083-6AA□□	10	
0.75	90 S	915	7.8	69.0	0.76	2.05	2.2	3.7	2.2	16	0.0024	1PP7 090-6AA□□	13	
1.1	90 L	915	11	72.0	0.77	2.85	2.3	3.8	2.3	16	0.0033	1PP7 096-6AA□□	16	
1.5	100 L	925	15	74.0	0.75	3.90	2.3	4.0	2.3	16	0.0047	► 1PP7 106-6AA□□	21	
2.2	112 M	940	22	78.0	0.78	5.20	2.2	4.6	2.5	16	0.0091	► 1PP7 113-6AA□□	26	
3	132 S	950	30	79.0	0.76	7.20	1.9	4.2	2.2	16	0.015	► 1PP7 130-6AA□□	38	
4	132 M	950	40	80.5	0.76	9.40	2.1	4.5	2.4	15	0.019	► 1PP7 133-6AA□□	44	
5.5	132 M	950	55	83.0	0.76	12.6	2.3	5.0	2.6	16	0.025	► 1PP7 134-6AA□□	52	
7.5	160 M	960	75	86.0	0.74	17.0	2.1	4.6	2.5	16	0.044	► 1PP7 163-6AA□□	74	
11	160 L	960	109	87.5	0.74	24.5	2.3	4.8	2.6	16	0.063	► 1PP7 166-6AA□□	95	
15	180 M	970	148	89.5	0.77	31.5	2.0	5.2	2.4	16	0.15	1PP5 186-6AA□□	124	
18.5	200 L	975	181	90.2	0.77	38.5	2.7	5.5	2.8	16	0.24	1PP5 206-6AA□□	161	
22	200 L	975	215	90.8	0.77	45.5	2.8	5.5	2.9	16	0.28	1PP5 207-6AA□□	183	

Order No. supplements

Motor type	Penultimate position: Voltage code 50 Hz				Final position: Type of construction code							
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	Without flange	With flange			With standard flange		With special flange	
					IM B3, IM B6/7/8, IM V6/5 without protective cover	IM B5, IM V3 ¹⁾	IM V1 without protective cover ^{1) 2)}	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	0	1	1	6	2	7	3	
1PP7 06 □□	○	○	○	–	□	✓	✓	–	✓	–	✓	
1PP7 07 □□	○	○	○	–	□	✓	✓	–	✓	–	✓	
1PP7 08 □□	○	○	○	–	□	✓	✓	–	✓	–	✓	
1PP7 09 □□	○	○	○	–	□	✓	✓	–	✓	–	✓	
1PP7 10 □□	○	○	○	○	□	✓	✓	–	✓	–	✓	
1PP7 11 □□	○	○	○	○	□	✓	✓	–	✓	–	✓	
1PP7 13 □□	○	○	○	○	□	✓	✓	–	✓	–	✓	
1PP7 16 □□	○	○	○	○	□	✓	✓	–	✓	–	✓	
1PP5 18 □□	○	○	○	○	□	✓ ³⁾	✓	–	–	–	–	
1PP5 20 □□	○	○	○	○	□	✓ ³⁾	✓	–	–	–	–	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

► The Order No. for 1PP7 motors marked with this symbol are phase-out models.
1LE1 motors are the successors.
For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Forced-air cooled motors without external fan and fan cover" Pages 1/38 to 1/45.

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) Motors 1PP5 183-... to 1PP5 223-... (motor series 1PP5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement "Z" and order code **K32**.
- 2) The "Second shaft extension" option, order code **K16** is not possible.
- 3) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover
with improved efficiency – Aluminum series 1PP7/5

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current of rated current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V								
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²	► Phase-out model	Type of construction IM B3 approx. m kg	
8-pole, 750 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection														
0.09	71 M	630	1.4	53.0	0.68	0.36	1.9	2.2	1.7	13	0.0008	1PP7 070-8AB□□	6	
0.12	71 M	645	1.8	53.0	0.64	0.51	2.2	2.2	2.0	13	0.0008	1PP7 073-8AB□□	6	
0.18	80 M	675	2.5	51.0	0.68	0.75	1.7	2.3	1.9	13	0.0014	1PP7 080-8AB□□	9	
0.25	80 M	685	3.5	55.0	0.64	1.02	2.0	2.6	2.2	13	0.0017	1PP7 083-8AB□□	10	
0.37	90 S	675	5.2	63.0	0.75	1.14	1.6	2.9	1.8	13	0.0023	1PP7 090-8AB□□	11	
0.55	90 L	675	7.8	66.0	0.76	1.58	1.7	3.0	1.9	13	0.0031	1PP7 096-8AB□□	13	
0.75	100 L	680	11	66.0	0.76	2.15	1.6	3.0	1.9	13	0.0051	► 1PP7 106-8AB□□	19	
1.1	100 L	680	15	72.0	0.76	2.90	1.8	3.3	2.1	13	0.0063	► 1PP7 107-8AB□□	22	
1.5	112 M	705	20	74.0	0.76	3.85	1.8	3.7	2.1	13	0.013	► 1PP7 113-8AB□□	24	
2.2	132 S	700	30	75.0	0.74	5.70	1.9	3.9	2.3	13	0.014	► 1PP7 130-8AB□□	38	
3	132 M	700	41	77.0	0.74	7.60	2.1	4.1	2.4	13	0.019	► 1PP7 133-8AB□□	44	
4	160 M	715	53	80.0	0.72	10.0	2.2	4.5	2.6	13	0.036	► 1PP7 163-8AB□□	64	
5.5	160 L	710	74	83.5	0.73	13.0	2.3	4.7	2.7	13	0.046	► 1PP7 164-8AB□□	74	
7.5	160 L	715	100	85.5	0.72	17.6	2.7	5.3	3.0	13	0.064	► 1PP7 166-8AB□□	94	
11	180 M	725	145	87.0	0.75	24.5	2.0	5.0	2.2	13	0.21	1PP5 186-8AB□□	126	
15	200 L	725	198	87.5	0.78	31.5	2.1	5.0	2.2	13	0.37	1PP5 207-8AB□□	176	

Order No. supplements

Motor type	Penultimate position: Voltage code 50 Hz				Final position: Type of construction code							
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	Without flange IM B3/6/7/8, IM V6/5 without protective cover	With flange IM B5, IM V3 ¹⁾	IM V1 without protective cover ^{1) 2)}	IM B35	With standard flange IM B14, IM V19 IM V18 without protective cover	IM B34	With special flange IM B14, IM V19 IM V18 without protective cover	
	1	6	3	5	0	1	1	6	2	7	3	
1PP7 07 □□	○	○	○	–	□	✓	✓	–	✓	–	✓	
1PP7 08 □□	○	○	○	–	□	✓	✓	–	✓	–	✓	
1PP7 09 □□	○	○	○	–	□	✓	✓	–	✓	–	✓	
1PP7 10 □□	○	○	○	○	□	✓	✓	–	✓	–	✓	
1PP7 11 □□	○	○	○	○	□	✓	✓	–	✓	–	✓	
1PP7 13 □□	○	○	○	○	□	✓	✓	–	✓	–	✓	
1PP7 16 □□	○	○	○	○	□	✓	✓	–	✓	–	✓	
1PP5 18 □□	○	○	○	○	□	✓ ³⁾	✓	–	–	–	–	
1PP5 20 □□	○	○	○	○	□	✓ ³⁾	✓	–	–	–	–	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

► The Order No. for 1PP7 motors marked with this symbol are phase-out models.
1LE1 motors are the successors.
For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Forced-air cooled motors without external fan and fan cover" Pages 1/38 to 1/45.

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) Motors 1PP5 183-... to 1PP5 223-... (motor series 1PP5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement "Z" and order code **K32**.
- 2) The "Second shaft extension" option, order code **K16** is not possible.
- 3) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover
with improved efficiency – Cast-iron series 1PP4

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque with direct starting torque	Locked-rotor current multiple of rated current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class "Improved Efficiency" according to CEMEP	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V								
P_{rated}	FS	n_{rated}	T_{rated}	η_{rated}	$\cos\phi_{rated}$	I_{rated}	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}		J			Type of construction IM B3 approx. m	
kW		rpm	Nm	(EFF2) %		A					kg m ²			kg	
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection															
22	180 M	2945	71	EFF 2	92.1	0.86	40	2.5	6.4	3.4	16	0.068	1PP4 183-2FA□□	140	
30	200 L	2950	97	EFF 2	92.4	0.88	53	2.3	6.5	3.0	16	0.129	1PP4 206-2FA□□	195	
37	200 L	2955	120	EFF 2	93.4	0.89	64	2.5	7.2	3.3	16	0.153	1PP4 207-2FA□□	215	
45	225 M	2960	145	EFF 2	93.9	0.88	79	2.4	6.7	3.1	16	0.217	1PP4 223-2FA□□	275	
55	250 M	2970	177	EFF 2	94.1	0.88	96	2.1	6.7	3.1	13	0.403	1PP4 253-2FB□□	360	
75	280 S	2975	241	EFF 2	94.9	0.88	130	2.5	7.5	3.1	13	0.715	1PP4 280-2FB□□	480	
90	280 M	2975	289	EFF 2	95.4	0.89	152	2.6	7.2	3.1	13	0.832	1PP4 283-2FB□□	520	
110	315 S	2982	352		95.2	0.88	190	2.4	7.2	3.1	13	1.19	1PP4 310-2FB□□	700	
132	315 M	2982	423		95.6	0.90	220	2.4	6.9	3.0	13	1.39	1PP4 313-2FB□□	755	
160	315 L	2982	512		96.0	0.91	265	2.4	7.0	3.0	13	1.62	1PP4 316-2FB□□	880	
200	315 L	2982	641		96.3	0.92	325	2.3	6.7	2.9	13	2.09	1PP4 317-2FB□□	995	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange			With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6/5 without protective cover 1)	IM B5, IM V1 without protective cover 2)	IM V1 without protective cover 2)	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	0	1	8	6	2	7	3	
1PP4 18 - . . . □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 20 - . . . □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 22 - . . . □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 25 - . . . □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 28 - . . . □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 310 - . . . □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 313 - . . . □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 316 - . . . □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–	
1PP4 317 - . . . □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

1) If motors 1PP4 183-... to 1PP4 317-... (motor series 1PP4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

2) Motors 1PP4 220-... to 1PP4 317-... (motor series 1PP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

3) Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover
with improved efficiency – Cast-iron series 1PP4

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class "Improved Efficiency" according to CEMEP	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V								
P_{rated}	FS	n_{rated}	T_{rated}	η_{rated}	$\cos\phi_{rated}$	I_{rated}	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}		J			Type of construction IM B3 approx. m	
kW		rpm	Nm	(EFF2) %		A					kg m ²			kg	
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection															
18.5	180 M	1465	121	EFF 2	90.8	0.84	35	2.4	6.7	3.1	16	0.099	1PP4 183-4FA□□	135	
22	180 L	1465	143	EFF 2	91.4	0.84	41.5	2.5	6.9	3.2	16	0.117	1PP4 186-4FA□□	150	
30	200 L	1465	196	EFF 2	92.0	0.85	55	2.5	6.7	3.4	16	0.191	1PP4 207-4FA□□	195	
37	225 S	1475	240	EFF 2	92.5	0.85	68	2.5	6.7	3.1	16	0.374	1PP4 220-4FA□□	255	
45	225 M	1475	291	EFF 2	93.4	0.86	81	2.7	7.2	3.2	16	0.447	1PP4 223-4FA□□	290	
55	250 M	1480	355	EFF 2	93.8	0.85	100	2.4	6.1	2.8	16	0.688	1PP4 253-4FA□□	375	
75	280 S	1485	482	EFF 2	94.6	0.85	134	2.5	7.1	3.0	16	1.19	1PP4 280-4FA□□	515	
90	280 M	1485	579	EFF 2	95.0	0.86	160	2.5	7.4	3.0	16	1.39	1PP4 283-4FA□□	560	
110	315 S	1488	706		95.0	0.85	196	2.5	6.4	2.8	16	1.94	1PP4 310-4FA□□	710	
132	315 M	1488	847		95.5	0.85	235	2.7	6.8	2.9	16	2.31	1PP4 313-4FA□□	790	
160	315 L	1486	1028		95.9	0.86	280	2.7	6.8	2.8	16	2.88	1PP4 316-4FA□□	935	
200	315 L	1486	1285		96.1	0.88	340	2.6	6.5	2.8	16	3.46	1PP4 317-4FA□□	1040	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6/5 without protective cover 1)	IM B5, IM V1 without protective cover 2)	IM V1 without protective cover 2)	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0	1	8	6	2	7	3
1PP4 18 □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 20 □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 22 □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 25 □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 28 □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 310 □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 313 □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 316 □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–
1PP4 317 □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

1) If motors 1PP4 183-... to 1PP4 317-... (motor series 1PP4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

2) Motors 1PP4 220-... to 1PP4 317-... (motor series 1PP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

3) Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover with improved efficiency – Cast-iron series 1PP4

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V									Type of construction IM B3 approx. m kg
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²			
6-pole, 1000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection														
15	180 L	965	148	89.1	0.83	29.5	2.3	5.3	2.5	16	0.175	1PP4 186-6FA□□	145	
18.5	200 L	975	181	90.2	0.81	36.5	2.5	5.6	2.5	16	0.238	1PP4 206-6FA□□	185	
22	200 L	975	215	90.6	0.81	43.5	2.6	5.7	2.5	16	0.287	1PP4 207-6FA□□	195	
30	225 M	978	293	92.0	0.83	57	2.7	5.6	2.5	16	0.492	1PP4 223-6FA□□	270	
37	250 M	980	361	92.7	0.83	69	2.7	6.0	2.3	16	0.762	1PP4 253-6FA□□	355	
45	280 S	985	436	92.7	0.85	82	2.4	6.1	2.4	16	1.12	1PP4 280-6FA□□	455	
55	280 M	985	533	93.0	0.86	99	2.5	6.3	2.5	16	1.37	1PP4 283-6FA□□	490	
75	315 S	988	725	93.8	0.84	138	2.5	6.5	2.8	16	2.10	1PP4 310-6FA□□	665	
90	315 M	988	870	94.2	0.84	164	2.6	6.8	2.9	16	2.50	1PP4 313-6FA□□	730	
110	315 L	988	1063	94.5	0.86	196	2.5	6.8	2.9	16	3.20	1PP4 316-6FA□□	870	
132	315 L	988	1276	95.0	0.86	235	3.1	7.3	3.0	16	4.02	1PP4 317-6FA□□	960	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6/5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾	IM V1 without protective cover ²⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0	1	8	6	2	7	3
1PP4 18 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 20 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 22 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 25 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 28 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 310 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 313 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 316 - ... □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–
1PP4 317 - ... □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1PP4 183-... to 1PP4 317-... (motor series 1PP4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ Motors 1PP4 220-... to 1PP4 317-... (motor series 1PP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover
with improved efficiency – Cast-iron series 1PP4

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V									Type of construction IM B3 approx. m kg
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²			
8-pole, 750 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection														
11	180 L	725	145	87.7	0.73	25	1.7	4.2	2.1	13	0.169	1PP4 186-8FB□□	145	
15	200 L	725	198	87.9	0.76	32.5	2.2	4.9	2.6	13	0.290	1PP4 207-8FB□□	195	
18.5	225 S	730	242	89.5	0.78	38.5	2.3	5.5	2.7	13	0.482	1PP4 220-8FB□□	260	
22	225 M	730	288	89.8	0.79	45	2.3	5.6	2.8	13	0.551	1PP4 223-8FB□□	280	
30	250 M	730	392	91.6	0.81	58	2.3	5.5	2.6	13	0.837	1PP4 253-8FB□□	370	
37	280 S	735	481	92.2	0.81	72	2.2	5.0	2.1	13	1.11	1PP4 280-8FB□□	455	
45	280 M	735	585	92.6	0.81	87	2.2	5.1	2.1	13	1.35	1PP4 283-8FB□□	495	
55	315 S	740	710	93.2	0.81	106	2.2	5.8	2.6	13	2.08	1PP4 310-8FB□□	660	
75	315 M	738	971	93.4	0.83	140	2.2	5.7	2.6	13	2.48	1PP4 313-8FB□□	725	
90	315 L	738	1165	93.5	0.83	168	2.2	5.8	2.7	13	3.14	1PP4 316-8FB□□	845	
110	315 L	738	1423	94.1	0.83	205	2.4	6.1	2.8	13	3.95	1PP4 317-8FB□□	1000	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6/5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾	IM V1 without protective cover ²⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0	1	8	6	2	7	3
1PP4 18 - . . . □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 20 - . . . □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 22 - . . . □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 25 - . . . □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 28 - . . . □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 310 - . . . □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 313 - . . . □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 316 - . . . □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–
1PP4 317 - . . . □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1PP4 183-... to 1PP4 317-... (motor series 1PP4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ Motors 1PP4 220-... to 1PP4 317-... (motor series 1PP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover
with increased output – Cast-iron series 1PP4

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output							Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz		Power factor at 50 Hz		Rated current at 50 Hz 400 V								
P_{rated}	FS	n_{rated}	T_{rated}	η_{rated}	η_{rated}	$\cos \varphi_{rated}$	$\cos \varphi_{rated}$	I_{rated}	$\frac{T_{LR}}{I_{rated}}$	$\frac{I_{LR}}{I_{rated}}$	$\frac{T_B}{I_{rated}}$	CL	J			Type of construction IM B3 approx. m
kW	rpm	Nm	%	%	%	%	A						kg m ²			kg
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection																
30	180 L	2950	97	93.2	93.3	0.86	0.82	54	2.4	7.1	3.4	16	0.086	1PP4 188-2FA□□		170
45	200 L	2955	145	94.0	94.1	0.89	0.87	78	2.5	6.9	3.2	16	0.182	1PP4 208-2FA□□		245
55	225 M	2960	177	95.1	95.3	0.89	0.86	94	2.6	7.3	3.2	16	0.266	1PP4 228-2FA□□		325
75	250 M	2970	241	94.9	94.9	0.88	0.85	130	2.4	7.1	3.1	16	0.483	1PP4 258-2FA□□		405
110	280 M	2975	353	95.8	95.9	0.90	0.88	184	2.5	7.0	3.0	13	1.00	1PP4 288-2FB□□		610
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection																
30	180 L	1465	196	92.0	92.2	0.80	0.76	59	2.6	6.3	2.9	16	0.144	1PP4 188-4FA□□		175
37	200 L	1465	241	92.8	93.1	0.83	0.78	70	2.6	6.5	3.0	16	0.234	1PP4 208-4FA□□		220
55	225 M	1475	356	93.6	94.1	0.86	0.83	99	2.5	6.5	2.7	16	0.486	1PP4 228-4FA□□		320
75	250 M	1482	483	94.5	94.6	0.85	0.81	136	2.5	7.0	3.0	16	0.856	1PP4 258-4FA□□		445
110	280 M	1488	706	95.5	95.2	0.84	0.78	198	2.8	7.9	3.3	16	1.71	1PP4 288-4FA□□		660

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code					
	50 Hz				Without flange	With flange		With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6/5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0	1	6	2	7	3
1PP4 188 - ... □□	○	○	○	○	□	✓	✓	–	–	–
1PP4 208 - ... □□	○	○	○	○	□	✓	✓	–	–	–
1PP4 228 - ... □□	○	○	○	○	□	✓	✓	–	–	–
1PP4 258 - ... □□	○	○	○	○	□	✓	✓	–	–	–
1PP4 288 - ... □□	○	○	○	○	□	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1PP4 188-... to 1PP4 318-... (motor series 1PP4 frame sizes 180 L to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ Motors 1PP4 220-... to 1PP4 318-... (motor series 1PP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover
with increased output – Cast-iron series 1PP4

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output								Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current as multiple of rated current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz		Power factor at 50 Hz		Rated current at 50 Hz									
P_{rated}	FS	n_{rated}	T_{rated}	η_{rated}	η_{rated}	$\cos \phi_{rated}$	$\cos \phi_{rated}$	I_{rated}	$\frac{T_{LR}}{I_{rated}}$	$\frac{I_{LR}}{I_{rated}}$	$\frac{T_B}{I_{rated}}$	CL	J			Type of construction IM B3 approx. m	
kW	rpm	Nm	%	%	%	%	A						kg m ²			kg	
6-pole, 1000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection																	
18.5	180 L	970	182	89.8	90.5	0.80	0.75	37.5	2.3	4.9	2.4	16	0.203	1PP4 188-6FA□□		170	
30	200 L	975	294	91.1	91.5	0.80	0.75	60	2.6	5.8	2.6	16	0.362	1PP4 208-6FA□□		235	
37	225 M	978	361	92.3	93.1	0.83	0.80	70	2.5	5.9	2.8	16	0.624	1PP4 228-6FA□□		315	
45	250 M	982	438	93.6	94.1	0.83	0.80	84	2.7	6.3	2.3	16	0.934	1PP4 258-6FA□□		390	
75	280 M	985	727	94.0	94.5	0.85	0.80	136	3.0	6.8	2.8	16	1.65	1PP4 288-6FA□□		550	
160	315 L	988	1547	95.2	95.3	0.86	0.82	285	3.0	7.5	3.0	16	4.71	1PP4 318-6FA□□		1160	
8-pole, 750 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection																	
15	180 L	720	199	88.0	88.7	0.73	0.63	34	2.0	4.5	2.4	13	0.206	1PP4 188-8FB□□		160	
18.5	200 L	725	244	88.4	89.3	0.78	0.72	39	2.4	5.2	2.6	13	0.367	1PP4 208-8FB□□		220	
30	225 M	730	392	90.5	91.3	0.79	0.74	61	2.6	5.6	2.8	13	0.658	1PP4 228-8FB□□		330	
37	25 M	730	484	92.1	93.0	0.82	0.77	71	2.4	5.6	2.6	13	1.06	1PP4 258-8FB□□		415	
55	280 M	735	715	93.1	93.9	0.81	0.77	106	2.4	5.6	2.3	13	1.63	1PP4 288-8FB□□		545	
132	315 L	738	1708	94.3	94.7	0.83	0.79	245	2.5	6.5	2.9	13	4.52	1PP4 318-8FB□□		1080	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange			With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6/5 without protective cover 1)	IM B5, IM V1 without protective cover 2)	IM V1 without protective cover 2)	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	0	1	8	6	2	7	3	
1PP4 188 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 208 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 228 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 258 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 288 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 318 - ... □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–	

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

1) If motors 1PP4 188-... to 1PP4 318-... (motor series 1PP4 frame sizes 180 L to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

2) Motors 1PP4 220-... to 1PP4 318-... (motor series 1PP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

3) Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Overview

Recommended special versions:

- The connection box is at the non-drive-end (NDE) – Order code **M64**
- 6 protruding cable ends
 - 0.5 m long – Order code **L47**
 - 1.5 m long – Order code **L48**
 - 3.0 m long – Order code **L49**
- Bearings for increased cantilever forces – Order code **K20**

- Special bearing for drive-end (DE) of the motor, reinforced deep-groove bearing (bearing size 63) – Order code **K36**
- Located bearing at drive-end (DE) of motor – Order code **K94**
- Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping – Order code **A11**
- Temperature detectors (bi-metal strip) in motor winding for tripping – Order code **A31**

Selection and ordering data

Voltages

Additional order codes for other voltages or voltage codes (without “-Z” supplement)

For some non-standard voltages at 50 or 60 Hz, order codes are specified. They are ordered by specifying the code digit **9** for voltage in the 11th position of the Order No. and the appropriate order code.

Special versions	Voltage code	11th position of Order No.	Additional identification code with order code and, if required, with plain text data	Motor type frame size													
				56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L
Self-ventilated motors in pole-changing version																	
				1LA7 (aluminum)						1LA5 (aluminum)							
Voltage at 60 Hz																	
220 V; 50 Hz output	9		L4A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
220 V; 60 Hz output	9		L4B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 V; 50 Hz output	9		L4C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 V; 60 Hz output	9		L4D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 V; 50 Hz output	9		L4G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 V; 60 Hz output	9		L4E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 V; 50 Hz output	9		L4J	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 V; 60 Hz output	9		L4H	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 V; 50 Hz output	9		L4N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 V; 60 Hz output	9		L4M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard voltage and/or frequencies																	
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ¹⁾	9		L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard winding for Y/Δ starting at low speed			L3Y •	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1LG4 (cast-iron)																	
Voltage at 60 Hz																	
220 V; 50 Hz output at 60 Hz	9		L4A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
220 V; 60 Hz output at 60 Hz	9		L4B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 V; 50 Hz output	9		L4C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 V; 60 Hz output	9		L4D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 V; 50 Hz output	9		L4G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 V; 60 Hz output	9		L4E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 V; 50 Hz output	9		L4J	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 V; 60 Hz output	9		L4H	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 V; 50 Hz output	9		L4N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 V; 60 Hz output	9		L4M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard voltage and/or frequencies																	
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ¹⁾	9		L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 7/32.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Voltage code	Additional identification code with order code and, if required, with plain text data	Motor type frame size														
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L
Forced-air cooled motors without external fan and fan cover																	
			1PP7 (aluminum)										1PP5 (aluminum)				
Voltage at 50 Hz																	
220 VΔ/380 VY (440 VΔ at 60Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ²⁾	9	L1R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔ (220 ... 240 VΔ); 50 Hz output ²⁾	9	L1E	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
380 VΔ/660 VY (440 VY at 60 Hz) (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ²⁾	9	L1L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ²⁾	9	L1C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VΔ (395 ... 435 VΔ); 50 Hz output ²⁾	9	L1D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ²⁾	9	L1A	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ (380 ... 420 VΔ); 50 Hz output ²⁾	9	L1B	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ²⁾	9	L1U	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Voltage at 60 Hz																	
220 VΔ/380 VY; 50 Hz output	9	L2A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
220 VΔ/380 VY; 60 Hz output	9	L2B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 50 Hz output	9	L2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 60 Hz output	9	L2W	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 50 Hz output	9	L2R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 60 Hz output	9	L2E	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
460 VΔ; 50 Hz output	9	L2T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9	L2F	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
575 VY; 50 Hz output	9	L2U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VY; 60 Hz output	9	L2L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 50 Hz output	9	L2V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Voltage changeover at 60 Hz																	
230 VY/460 VY 60 Hz; 50 Hz output, 9 main terminals and electrical design to NEMA	9	L3E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VY/460 VY 60 Hz; 60 Hz output, 9 main terminals and electrical design to NEMA	9	L3F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔ/460 VΔ 60 Hz; 50 Hz output, 12 main terminals and electrical design to NEMA	9	L3G	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230 VΔ/460 VΔ 60 Hz; 60 Hz output, 12 main terminals and electrical design to NEMA	9	L3H	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard voltage and/or frequencies																	
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ¹⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Voltage code	Additional identification code with order code and, if required, with plain text data	Motor type frame size																
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L	
1PP4 (cast-iron)																			
Voltage at 50 Hz																			
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ²⁾	9	L1R											✓	✓	✓	✓	✓	✓	–
230 VΔ (220 ... 240 VΔ); 50 Hz output ²⁾	9	L1E											○	○	○	○	○	○	–
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ²⁾	9	L1L											✓	✓	✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ²⁾	9	L1C											✓	✓	✓	✓	✓	✓	–
415 VΔ (395 ... 435 VΔ); 50 Hz output ²⁾	9	L1D											✓	✓	✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ²⁾	9	L1A											○	○	○	○	○	○	–
400 VΔ (380 ... 420 VΔ); 50 Hz output ²⁾	9	L1B											○	○	○	○	○	○	○
400 VΔ (460 VΔ at 60Hz) (380 ... 420 VΔ); 50 Hz output ²⁾	9	L1U											○	○	○	○	○	○	○
Voltage at 60 Hz																			
220 VΔ/380 VY; 50 Hz output	9	L2A											✓	✓	✓	✓	✓	✓	–
220 VΔ/380 VY; 60 Hz output	9	L2B											✓	✓	✓	✓	✓	✓	–
380 VΔ/660 VY; 50 Hz output	9	L2C											✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D											✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q											✓	✓	✓	✓	✓	✓	–
440 VY; 60 Hz output	9	L2W											✓	✓	✓	✓	✓	✓	–
440 VΔ; 50 Hz output	9	L2R											✓	✓	✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X											✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S											✓	✓	✓	✓	✓	✓	–
460 VY; 60 Hz output	9	L2E											○	○	○	○	○	○	–
460 VΔ; 50 Hz output	9	L2T											✓	✓	✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9	L2F											○	○	○	○	○	○	○
575 VY; 50 Hz output	9	L2U											✓	✓	✓	✓	✓	✓	–
575 VY; 60 Hz output	9	L2L											✓	✓	✓	✓	✓	✓	–
575 VΔ; 50 Hz output	9	L2V											✓	✓	✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M											○	○	○	○	○	○	○
Non-standard voltage and/or frequencies																			
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ¹⁾	9	L1Y •											✓	✓	✓	✓	✓	✓	✓

- Without additional charge
- ✓ With additional charge
- Not possible
- This order code only determines the price of the version – Additional plain text is required.

1) Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

2) With order codes **L1A**, **L1B**, **L1C**, **L1D**, **L1E**, **L1L**, **L1R** and **L1U**, a rated voltage range is also specified on the rating plate.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Types of construction

Additional order codes for other types of construction or type of construction codes (without “-Z” supplement)

Order codes have been defined for some special types of construction. They are ordered by specifying the code digit **9** for the type of construction in the 12th position of the Order No. and the appropriate order code.

Special versions	Voltage code	Additional identification code with order code and, if required, with plain text data	Motor type frame size															
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L
Self-ventilated motors in pole-changing version																		
			1LA7 (aluminum)							1LA5 (aluminum)								
Without flange																		
IM V5 with protective cover ¹⁾	9	M1F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With flange (acc. to DIN EN 50347)																		
IM V3 ²⁾	9	M1G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
With standard flange																		
IM V18 with protective cover ¹⁾	9	M2A	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	
With special flange																		
IM V18 with protective cover ¹⁾	9	M2B	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	
IM B34	9	M2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	
1LG4 (cast-iron)																		
Without flange																		
IM V5 without protective cover ³⁾	9	M1D	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	
IM V6 ³⁾	9	M1E	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	
IM V5 with protective cover ^{1) 3)}	9	M1F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With flange (acc. to DIN EN 50347):																		
IM V3 ⁴⁾	9	M1G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
Motor type frame size																		
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L
																		2- pole
																		4- pole
																		8- pole
Forced-air cooled motors without external fan and fan cover																		
			1PP7 (aluminum)							1PP5 (aluminum)								
Without flange																		
IM V5 with protective cover ¹⁾	9	M1F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With flange (acc. to DIN EN 50347)																		
IM V3 ²⁾	9	M1G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
With standard flange																		
IM V18 with protective cover ¹⁾	9	M2A	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	
With special flange																		
IM V18 with protective cover ¹⁾	9	M2B	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	
IM B34	9	M2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	
1PP4 (cast-iron)																		
Without flange																		
IM V5 without protective cover ³⁾	9	M1D	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓ ⁵⁾ ○	
IM V6 ³⁾	9	M1E	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓ ⁵⁾ ○	
IM V5 with protective cover ^{1) 3)}	9	M1F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ ⁵⁾ ✓	
With flange (acc. to DIN EN 50347)																		
IM V3 ⁴⁾	9	M1G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	

- Without additional charge
✓ With additional charge
– Not possible

¹⁾ The “Second shaft extension” option, order code K16 is not possible.
²⁾ For frame sizes 180 M to 225 M, motors 1LA5/1PP5 can be supplied with two additional eyebolts; state Order No. suffix “Z” and order code **K32**.
³⁾ If motors of frame sizes 180 M to 315 L are mounted on the wall, it is recommended that the motor feet are supported.

⁴⁾ Motors 1LG4 of frame sizes 225 S to 315 L are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be relocated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
⁵⁾ 60 Hz version is possible on request.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Options

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in pole-changing version																	
Motor protection																	
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature detectors for tripping ¹⁾	A31				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60				-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor connection and connection box																	
Connection box on RHS	K09				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on LHS	K10				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
One cable gland, metal	K54				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cable gland, maximum configuration	K55				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85				✓	✓	○	○	○	○	✓	✓	✓	✓	✓	✓	✓
Next larger connection box	L00				-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓
External earthing	L13				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3 cables protruding, 0.5 m long ²⁾	L44				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	
3 cables protruding, 1.5 m long ²⁾	L45				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	
6 cables protruding, 0.5 m long ²⁾	L47				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	
6 cables protruding, 1.5 m long ²⁾	L48				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6 cables protruding, 3 m long ²⁾	L49				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on NDE	M64				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Terminal strip for main and auxiliary terminals	M69				✓	✓	-	-	-	-	✓	✓	✓	✓	✓	✓	✓
Windings and insulation																	
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	C11				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output	C12				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 180 (H) at rated output and max. CT 60 °C ³⁾	C18				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 7/38.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in pole-changing version																
					1LA7 (aluminum)						1LA5 (aluminum)					
Windings and insulation (continued)																
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	C22				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	C23				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	C24				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	C25				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	Y50 • and specified output, CT... °C or SA m above sea level				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and specify output, CT... °C or SA m above sea level				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Colors and paint finish																
Special finish in RAL 7030 stone gray					□	□	□	□	□	□	□	□	□	□	□	□
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sea air resistant special finish	M94				O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23				○	○	○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in pole-changing version																
									1LA7 (aluminum)		1LA5 (aluminum)					
Modular technology – Basic versions ⁴⁾																
Mounting of separately driven fan	G17								✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake ⁵⁾	G26								✓	✓	✓	✓	✓	✓	✓	✓
Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	H57								✓	✓	✓	✓	✓	✓	✓	✓
Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	H58								✓	✓	✓	✓	✓	✓	✓	✓
Modular technology – Combinations of basic versions ⁴⁾																
Mounting of separately driven fan and 1XP8 001-1 rotary pulse encoder	H61								✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-1 rotary pulse encoder ⁵⁾	H62								✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake and separately driven fan	H63								✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake, separately driven fan and 1XP8 001-1 rotary pulse encoder ⁵⁾	H64								✓	✓	✓	✓	✓	✓	✓	✓
Mounting of separately driven fan and 1XP8 001-2 rotary pulse encoder	H97								✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-2 rotary pulse encoder ⁵⁾	H98								✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake, separately driven fan and 1XP8 001-2 rotary pulse encoder ⁵⁾	H99								✓	✓	✓	✓	✓	✓	✓	✓
Modular technology – Additional versions																
Brake supply voltage 24 V DC	C00								✓	✓	✓	✓	✓	✓	✓	✓
Brake supply voltage 400 V AC	C01								✓	✓	✓	✓	✓	✓	✓	✓
Mechanical manual release of the brake with operating lever	K82								✓	✓	✓	✓	✓	✓	✓	✓
Special technology ⁴⁾																
Prepared for mounting MMI ⁶⁾	H15								✓	✓	✓	✓	✓	✓	✓	✓
Mounting of LL 861 900 220 rotary pulse encoder	H70								✓	✓	✓	✓	✓	✓	✓	✓
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72								✓	✓	✓	✓	✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73								✓	✓	✓	✓	✓	✓	✓	✓
Prepared for mounting LL 861 900 220	H78								✓	✓	✓	✓	✓	✓	✓	✓
Prepared for mounting HOG 9 D 1024 I	H79								✓	✓	✓	✓	✓	✓	✓	✓
Prepared for mounting HOG 10 D 1024 I	H80								✓	✓	✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
Drive-end (DE) seal for flange-mounting motors with oil resistance to 0.1 bar Not possible for IM V3 type of construction	K17								✓	✓	✓	✓	✓	✓	✓	✓
With two additional eyebolts for IM V1/IM V3	K32								–	–	–	–	–	–	✓	✓
IP65 degree of protection ⁷⁾	K50								✓	✓	✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea) ⁸⁾	K52								✓	✓	✓	✓	✓	✓	✓	✓
Vibration-proof version	L03								✓	✓	✓	✓	✓	✓	✓	✓
Condensation drainage holes ⁹⁾	L12								✓	✓	✓	✓	✓	✓	✓	✓
Non-rusting screws (externally)	M27								✓	✓	✓	✓	✓	✓	✓	✓
Mechanical protection for encoder ¹⁰⁾	M68								✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 7/38.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in pole-changing version																
					1LA7 (aluminum)						1LA5 (aluminum)					
Coolant temperature and site altitude																
Coolant temperature -40 to +40 °C	D03				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Coolant temperature -30 to +40 °C	D04				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																
CCC China Compulsory Certification ¹¹⁾	D01				✓	✓	✓	✓	–	–	–	–	–	–	–	–
Electrical according to NEMA MG1-12	D30				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Design according to IUL with "Recognition Mark" ¹²⁾	D31				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Canadian regulations (CSA) ¹³⁾	D40				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PSE Mark Japan ¹⁴⁾	D46				✓	✓	✓	✓	✓	–	–	–	–	–	–	–
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection ¹⁵⁾	G50				–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces	K20				–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regreasing device ¹⁵⁾	K40				–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing DE	K94				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing NDE	L04				✓	✓	✓	✓	✓	✓	□	□	□	□	□	□
Balance and vibration quantity																
Vibration quantity A					□	□	□	□	□	□	□	□	□	□	□	□
Vibration quantity B	K02				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Full key balancing	L68				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Balancing without key	M37				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁶⁾	K04				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second standard shaft extension	K16				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft extension with normal dimensions without featherkey way	K42				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Standard shaft made of non-rusting steel	M65				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ¹⁷⁾	Y55 • and identification code				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heating and ventilation																
Fan cover for textile industry	H17				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Metal external fan ¹⁸⁾	K35				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rating plate and extra rating plates																
Second lubricating plate, supplied loose	B06				–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second rating plate, loose	K31				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 7/38.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in pole-changing version																
Packaging, safety notes, documentation and test certificates																
Without safety and commissioning note. Customer's declaration of renouncement required.	B00															
With one safety and startup guide per box pallet	B01															
Acceptance test certificate 3.1 according to EN 10204	B02															
Operating instructions German/English enclosed in print	B23															
Type test with heat run for horizontal motors, with acceptance	F83															
Wire-lattice pallet	L99															
Connected in star for dispatch	M32															
Connected in delta for dispatch	M33															

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- , R. Possible on request
- ✓ With additional charge
- Not possible

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- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended. For pole-changing motors with separate windings, the number of temperature sensors must be doubled (order code **A11**, price of **A12** or order code **A12**, price available on request).
- 2) In combination with the PTC thermistor option or anti-condensation heating option, please inquire before ordering.
- 3) Cannot be used for motors in UL version (order code **D31**). Cannot be used for motors according to CSA approval (order code **D40**) for motor series 1LA5 frame size 180 to 200. The grease lifetime specified in catalog part 0 "Introduction" refers to CT 40 °C. When the coolant temperature rises by 10 K, the grease lifetime or relubrication interval is halved.
- 4) A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various technologies nor with each other within the same technology system. This applies for:
 - Modular technology
 - Basic versions of "Modular technology"
 - Combination of special versions "Special technology"
- 5) The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00** and **C01**.
- 6) Converter mounting is possible for 230 VΔ/400 VY, please also specify Order No. of the MICROMASTER 411 according to Catalog DA 51.3.
- 7) Not possible in combination with rotary pulse encoder HOG 9 D 10241 (order code **H72**, **H79**) and / or brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 8) Not possible in combination with brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 9) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 10) Not necessary when a rotary pulse encoder is combined with a separately driven fan, because in this case the rotary pulse encoder is installed under the fan cover.
- 11) CCC certification is required for
 - 2-pole motors ≤2.2 kW
 - 4-pole motors ≤1.1 kW
 - 6-pole motors ≤0.75 kW
 - 8-pole motors ≤0.55 kW
- 12) Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 13) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 14) "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the marking.
- 15) Not possible when brake is mounted.
- 16) Can be combined with deep-groove bearings of series 60... 62... and 63... . Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**), brake or encoder mounting.
- 17) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see catalog part 0 "Introduction".
- 18) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in pole-changing version																	
1LG4 (cast-iron)																	
Motor protection																	
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11											✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12											✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23											✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25											✓	✓	✓	✓	✓	✓
Temperature detectors for tripping ¹⁾	A31											✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60											✓	✓	✓	✓	✓	✓
Installation of 6 PT 100 resistance thermometers in stator winding ¹⁾	A61											✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ¹⁾	A72											✓	✓ ²⁾	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A78											✓	✓ ²⁾	✓	✓	✓	✓
Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A80											✓	✓ ²⁾	✓	✓	✓	✓
Motor connection and connection box																	
Two-part plate on connection box	K06											–	✓	✓	✓	✓	✓
Connection box on RHS	K09											✓	✓	✓	✓	✓	✓
Connection box on LHS	K10											✓	✓	✓	✓	✓	✓
Connection box on top, feet screwed on	K11											✓	✓	✓	✓	✓	✓
Connection box in cast-iron version	K15											✓	✓	✓	□	□	□
One cable gland, metal	K54											✓	✓	✓	✓	✓	✓
Cable gland, maximum configuration	K55											✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83											✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84											✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85											✓	✓	✓	✓	✓	✓
Next larger connection box	L00											✓	✓	✓	✓	✓	✓
Undrilled entry plate	L01											○	○	○	○	○	○
External earthing	L13											□	□	□	□	□	□
6 cables protruding, 1.5 m long ³⁾	L48											✓	✓	✓	O. R.	O. R.	O. R.
6 cables protruding, 3 m long ³⁾	L49											✓	✓	✓	O. R.	O. R.	O. R.
Protruding cable ends – right side ³⁾⁴⁾	L51											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends – left side ³⁾⁴⁾	L52											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Auxiliary connection box 1XB3 020	L97											✓	✓	✓	✓	✓	✓

For legend, see Page 7/43, for footnotes, see Page 7/44.

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Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in pole-changing version																
1LG4 (cast-iron)																
Motor connection and connection box (continued)																
Stud terminal for cable connection, accessories pack (3 items)	M46													✓	✓	✓
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47													✓	✓	✓
Windings and insulation																
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	C11													✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output ⁵⁾	C12													✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13													✓	✓	✓
Temperature class 180 (H) at rated output and max. CT 60 °C ⁶⁾	C18													✓	✓	✓
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19													✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 % ⁵⁾	C22													✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 % ⁵⁾	C23													✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 % ⁵⁾	C24													✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 % ⁵⁾	C25													✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26													✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with a higher coolant temperature and/or site altitude	Y50 • and specified output, CT .. °C or SA m above sea level													✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and specify output, CT .. °C or SA m above sea level													✓	✓	✓
Colors and paint finish																
Standard finish in RAL 7030 stone gray														□	□	□
Standard finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y53 • and standard finish RAL													✓	✓	✓
Special finish in RAL 7030 stone gray	K26													✓	✓	✓

For legend, see Page 7/43, for footnotes, see Page 7/44.

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Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in pole-changing version																
1LG4 (cast-iron)																
Colors and paint finish (continued)																
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL										✓	✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL										✓	✓	✓	✓	✓	✓
Offshore special finish	M91										✓	✓	✓	✓	✓	✓
Sea air resistant special finish	M94										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23										○	○	○	○	○	○
Unpainted, only primed	K24										✓	✓	✓	✓	✓	✓
Modular technology – Basic versions ⁷⁾																
Mounting of separately driven fan ⁸⁾	G17										✓	✓	✓	✓	✓	✓
Mounting of brake ^{8) 9)}	G26										✓	✓	✓	✓	✓	✓
Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	H57										✓	✓	✓	✓	✓	✓
Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	H58										✓	✓	✓	✓	✓	✓
Modular technology – Combinations of basic versions ⁷⁾																
Mounting of separately driven fan and 1XP8 001-1 rotary pulse encoder	H61										✓	✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-1 rotary pulse encoder ⁹⁾	H62										✓	✓	✓	✓	✓	✓
Mounting of brake and separately driven fan ^{8) 9)}	H63										✓	✓	✓	✓	✓	✓
Mounting of brake, separately driven fan and 1XP8 001-1 rotary pulse encoder ⁹⁾	H64										✓	✓	✓	✓	✓	✓
Mounting of separately driven fan and 1XP8 001-2 rotary pulse encoder	H97										✓	✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-2 rotary pulse encoder	H98										✓	✓	✓	✓	✓	✓
Mounting of brake, separately driven fan and 1XP8 001-2 rotary pulse encoder ⁹⁾	H99										✓	✓	✓	✓	✓	✓
Modular technology – Additional versions																
Brake supply voltage 24 V DC	C00										✓	✓	✓	✓	✓	✓
Brake supply voltage 400 V AC	C01										✓	✓	✓	✓	✓	✓
Mechanical manual release of the brake with operating lever	K82										✓	✓	✓	✓	✓	✓
Special technology ⁷⁾																
Mounting of LL 861 900 220 rotary pulse encoder	H70										✓	✓	✓	✓	✓	✓
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72										✓	✓	✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73										✓	✓	✓	✓	✓	✓
Prepared for mounting LL 861 900 220	H78										✓	✓	✓	✓	✓	✓
Prepared for mounting HOG 9 D 1024 I	H79										✓	✓	✓	✓	✓	✓
Prepared for mounting HOG 10 D 1024 I	H80										✓	✓	✓	✓	✓	✓

For legend, see Page 7/43, for footnotes, see Page 7/44.

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Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in pole-changing version																	
Mechanical design and degrees of protection																	
Drive-end seal for flange-mounting motors with oil resistance to 0.1 bar (not possible for IM V3 type of construction)	K17											✓	✓	✓	✓	✓	✓
IP65 degree of protection ¹⁰⁾	K50											✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea) ¹¹⁾	K52											✓	✓	✓	✓	✓	✓
Condensation water holes ¹²⁾	L12											□	□	□	□	□	□
Non-rusting screws (externally)	M27											✓	✓	✓	✓	✓	✓
Earth brushes for converter-fed operation	M44											-	-	-	-	O. R.	O. R.
Mechanical protection for encoder ¹³⁾	M68											✓	✓	✓	✓	✓	✓
Coolant temperature and site altitude																	
Coolant temperature -50 to +40 °C	D02											✓	✓	✓	✓	✓	✓
Coolant temperature -40 to +40 °C	D03											✓	✓	✓	✓	✓	✓
Coolant temperature -30 to +40 °C	D04											✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																	
Electrical according to NEMA MG1-12	D30											✓	✓	✓	✓	✓	✓
Design according to UL with "Recognition Mark" ¹⁴⁾	D31											✓	✓	✓	✓	✓	✓
Canadian regulations (CSA) ¹⁵⁾	D40											✓	✓	✓	✓	✓	✓
Bearings and lubrication																	
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50											✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ¹⁶⁾	K20											✓	✓	✓	✓	✓	✓
Special bearing for DE and NDE, bearing size 63	K36											✓	✓	✓	✓	□	□
Regreasing device	K40											✓	✓	✓	✓	□	□
Located bearing DE	K94											✓	✓	✓	✓	✓	✓
Located bearing NDE	L04											□	□	□	□	□	□
Insulated bearing cartridge	L27											-	-	✓	✓	✓	✓
Balance and vibration quantity																	
Vibration quantity A												□	□	□	□	□	□
Vibration quantity B	K02											✓	✓	✓	✓	✓	✓
Full key balancing	L68											✓	✓	✓	✓	✓	✓
Balancing without key	M37											✓	✓	✓	✓	✓	✓
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁷⁾	K04											✓	✓	✓	✓	✓	✓
Second standard shaft extension	K16											✓	✓	✓	✓	✓	✓
Shaft extension with standard dimensions without featherkey way	K42											✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39											✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ¹⁸⁾	Y55 • and identification code											✓	✓	✓	✓	✓	✓

For legend, see Page 7/43, for footnotes, see Page 7/44.

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Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in pole-changing version																
1LG4 (cast-iron)																
Heating and ventilation																
Metal external fan ¹⁹⁾	K35										✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45										✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46										✓	✓	✓	✓	✓	✓
Sheet metal fan cover	L36										✓	✓	✓	✓	✓	✓
Separately driven fan with non-standard voltage and/or frequency	Y81 • and identification code										–	–	✓	✓	✓	✓
Rating plate and extra rating plates																
Second lubricating plate, supplied loose	B06										✓	✓	✓	✓	✓	✓
Second rating plate, loose	K31										✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code										✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code										✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code										✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02										✓	✓	✓	✓	✓	✓
Operating instructions German/English enclosed in print	B23										✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83										✓	✓	✓	✓	✓	✓
Connected in star for dispatch	M32										✓	✓	✓	✓	✓	✓
Connected in delta for dispatch	M33										✓	✓	□	□	□	□

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- , R. Possible on request
- ✓ With additional charge
- Not possible

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- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended. For pole-changing motors with separate windings, the number of temperature sensors must be doubled (order code **A11**, price of **A12** or order code **A12**, price available on request).
- 2) PT 100 bearing monitoring only possible at drive end (DE).
- 3) In combination with the PTC thermistor option or anti-condensation heating option, please inquire before ordering.
- 4) Only possible in combination with order code **L44** to **L49** or length specification in plain text.
- 5) Only the 50 Hz data are specified on the rating plate.
- 6) Cannot be used for motors in UL version (order code **D31**) or CSA approval (order code **D40**). The grease lifetime specified in catalog part 0 "Introduction" refers to CT 40 °C. When the coolant temperature rises by 10 K, the grease lifetime or relubrication interval is halved.
- 7) A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various technologies nor with each other within the same technology system. This applies for:
 - Modular technology
 - Basic versions of "Modular technology"
 - Combination of special versions "Special technology"
- 8) For 1LG4/1LG6 motors, order codes **G17**, **G26** and **H63** frame size 225 and above can also be combined with all rotary pulse encoders in the "Special technology" range.
- 9) The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00** and **C01**.
- 10) Not possible in combination with rotary pulse encoder HOG 9 D 10241 (order code **H72**, **H79**) and / or brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 11) Not possible in combination with brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 12) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 13) Not necessary when a rotary pulse encoder is combined with a separately driven fan, because in this case the rotary pulse encoder is installed under the fan cover.
- 14) Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 15) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 16) Bearings for increased cantilever forces at vibration quantity level B on request for 1LG4 motors. Not possible for 1LG4 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – order code **K04**.
- 17) Can be combined with deep-groove bearings of series 60.., 62.. and 63.. . Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 18) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see catalog part 0 "Introduction".
- 19) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted.

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Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Forced-air cooled motors without external fan and fan cover																
			1PP7 (aluminum)								1PP5 (aluminum)					
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature detectors for tripping ¹⁾	A31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor connection and connection box																
ECOFAST motor plug Han-Drive 10e for 230 VΔ/400 VY ²⁾	G55		✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–
ECOFAST motor plug EMC Han-Drive 10e for 230 VΔ/400 VY ³⁾	G56		✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–
Connection box on RHS	K09		–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on LHS	K10		–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
One cable gland, metal	K54		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85		✓	✓	✓	✓	✓	○	○	○	○	✓	✓	✓	✓	✓
Next larger connection box	L00		–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓
External earthing	L13		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3 cables protruding, 0.5 m long ⁴⁾	L44		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	O. R.
3 cables protruding, 1.5 m long ⁴⁾	L45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	O. R.
6 cables protruding, 0.5 m long ⁴⁾	L47		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	O. R.
6 cables protruding, 1.5 m long ⁴⁾	L48		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on NDE	M64		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Terminal strip for main and auxiliary terminals	M69		✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–
Windings and insulation																
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	C11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output	C12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 180 (H) at rated output and max. CT 60 °C ⁵⁾	C18		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 7/48.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Forced-air cooled motors without external fan and fan cover																
			1PP7 (aluminum)								1PP5 (aluminum)					
Windings and insulation (continued)																
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	C22		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	C23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	C24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	C25		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with a higher coolant temperature and/or site altitude	Y50 • and specified output, CT... °C or SA m above sea level		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and specified output, CT... °C or SA m above sea level		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Colors and paint finish																
Special finish in RAL 7030 stone gray			□	□	□	□	□	□	□	□	□	□	□	□	□	□
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sea air resistant special finish	M94		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors with oil resistance to 0.1 bar Not possible for IM V3 type of construction	K17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With two additional eyebolts for IM V1/IM V3	K32		–	–	–	–	–	–	–	–	–	–	–	–	✓	✓
IP65 degree of protection	K50		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea)	K52		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration-proof version	L03		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Condensation drainage holes ⁶⁾	L12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-rusting screws (externally)	M27		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 7/48.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Forced-air cooled motors without external fan and fan cover																	
		1PP7 (aluminum)						1PP5 (aluminum)									
Coolant temperature and site altitude																	
Coolant temperature -40 to +40 °C	D03	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Coolant temperature -30 to +40 °C	D04	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Designs in accordance with standards and specifications																	
Design according to UL with "Recognition Mark" ⁷⁾	D31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Canadian regulations (CSA) ⁸⁾	D40	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
PSE Mark Japan ⁹⁾	D46	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	
Bearings and lubrication																	
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Bearing design for increased cantilever forces	K20	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Regreasing device	K40	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Located bearing DE	K94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Located bearing NDE	L04	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	
Balance and vibration quantity																	
Vibration quantity A		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	
Vibration quantity B	K02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Full key balancing	L68	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Balancing without key	M37	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁰⁾	K04	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Second standard shaft extension	K16	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Shaft extension with standard dimensions without featherkey way	K42	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Standard shaft made of non-rusting steel	M65	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Non-standard cylindrical shaft extension ¹¹⁾	Y55 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Heating and ventilation																	
Anti-condensation heaters for 230 V	K45	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Anti-condensation heaters for 115 V	K46	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Rating plate and extra rating plates																	
Second lubricating plate, supplied loose	B06	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Second rating plate, loose	K31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Extra rating plate with identification code	Y82 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

For legend and footnotes, see Page 7/48.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Forced-air cooled motors without external fan and fan cover																	
			1PP7 (aluminum)						1PP5 (aluminum)								
Packaging, safety notes, documentation and test certificates																	
Without safety and commissioning note. Customer's declaration of renunciation required.	B00		–	○	○	○	○	○	○	○	○	○	○	○	○	○	○
With one safety and startup guide per box pallet	B01		–	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Acceptance test certificate 3.1 according to EN 10204	B02		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Operating instructions German/English enclosed in print	B23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F83		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wire-lattice pallet	L99		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Connected in star for dispatch	M32		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connected in delta for dispatch	M33		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Possible on request
- ✓ With additional charge
- Not possible

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- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 2) Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 VΔ/400 VY and special voltage with voltage code **9** and order code **L1U** (400 VΔ). The following order codes cannot be used in combination with the ECOFAST plugs, order code **G55: A12, C02, C18, D31, D40, G50, H15, H17, H62, H63, H64, H90, H91, H92, H93, H94, H95, H98, H99, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52**.
- 3) Not possible for pole-changing motors. Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 VΔ/400 VY and special voltage with voltage code **9** and order code **L1U** (400 VΔ). The following order codes cannot be used in combination with the ECOFAST plugs, order code **G56: A12, A23, A31, C00, C18, D31, D40, G50, H15, H17, H90, H91, H92, H93, H94, H95, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52**.
- 4) In combination with the PTC thermistor option or anti-condensation heating option, please inquire before ordering.
- 5) Cannot be used for motors in UL version (order code **D31**). Cannot be used for motors according to CSA approval (order code **D40**) for motor series 1PP7 frame size 180 to 200. The grease lifetime specified in catalog part 0 "Introduction" refers to CT 40 °C. When the coolant temperature rises by 10 K, the grease lifetime or relubrication interval is halved.
- 6) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 7) Possible up to 600 V max. The rated voltage is indicated on the rating plate without voltage range.
- 8) The rated voltage is indicated on the rating plate without voltage range.
- 9) "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the marking.
- 10) Can be combined with deep-groove bearings of series 60.., 62.. and 63.. . Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**) brake or encoder mounting.
- 11) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see catalog part 0 "Introduction".

IEC Squirrel-Cage Motors

Fan motors

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Forced-air cooled motors without external fan and fan cover																	
1PP4 (cast-iron)																	
Motor protection																	
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11											✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12											✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23											✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25											✓	✓	✓	✓	✓	✓
Temperature detectors for tripping	A31											✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60											✓	✓	✓	✓	✓	✓
Installation of 6 PT 100 resistance thermometers in stator winding ¹⁾	A61											✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ¹⁾	A72											✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A78											✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A80											✓	✓	✓	✓	✓	✓
Motor connection and connection box																	
Two-part plate on connection box	K06											–	✓	✓	✓	✓	✓
Connection box on RHS	K09											✓	✓	✓	✓	✓	✓
Connection box on LHS	K10											✓	✓	✓	✓	✓	✓
Connection box on top, feet screwed on	K11											✓	✓	✓	✓	✓	✓
One cable gland, metal	K54											✓	✓	✓	✓	✓	✓
Cable gland, maximum configuration	K55											✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83											✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84											✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85											✓	✓	✓	✓	✓	✓
Next larger connection box	L00											✓	✓	✓	✓	✓	✓
External earthing	L13											□	□	□	□	□	□
6 cables protruding, 1.5 m long ²⁾	L48											✓	✓	✓	O. R.	O. R.	O. R.
6 cables protruding, 3 m long ²⁾	L49											✓	✓	✓	O. R.	O. R.	O. R.
Protruding cable ends – right side ^{2) 3)}	L51											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends – left side ^{2) 3)}	L52											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Auxiliary connection box 1XB3 020	L97											✓	✓	✓	✓	✓	✓
Stud terminal for cable connection, accessories pack (3 items)	M46											–	–	–	✓	✓	✓
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47											–	–	–	✓	✓	✓

For legend and footnotes, see Page 7/52.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Forced-air cooled motors without external fan and fan cover																
Windings and insulation																
1PP4 (cast-iron)																
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	C11										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output ⁴⁾	C12										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13										✓	✓	✓	✓	✓	✓
Temperature class 180 (H) at rated output and max. CT 60 °C ⁵⁾	C18										✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 30 to 60 g water per m ³ of air ³⁾	C19										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	C22										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	C23										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	C24										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	C25										✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air ³⁾	C26										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with a higher coolant temperature and/or site altitude	Y50 • and specified output, CT ... °C or SA ... m above sea level										✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and specified output, CT ... °C or SA ... m above sea level										✓	✓	✓	✓	✓	✓
Colors and paint finish																
Standard finish in RAL 7030 stone gray											□	□	□	□	□	□
Standard finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y53 • and standard finish RAL										✓	✓	✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26										✓	✓	✓	✓	✓	✓
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL										✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 7/52.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Forced-air cooled motors without external fan and fan cover																	
Colors and paint finish (continued)																	
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL											✓	✓	✓	✓	✓	✓
Offshore special finish	M91											✓	✓	✓	✓	✓	✓
Sea air resistant special finish	M94											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23											○	○	○	○	○	○
Unpainted, only primed	K24											✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																	
Drive-end seal for flange-mounting motors with oil resistance to 0.1 bar (Not possible for type of construction IM V3) ⁶⁾	K17											✓	✓	✓	✓	✓	✓
IP65 degree of protection	K50											✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea)	K52											✓	✓	✓	✓	✓	✓
Non-rusting screws (externally)	M27											✓	✓	✓	✓	✓	✓
Coolant temperature and site altitude																	
Coolant temperature -50 to +40 °C	D02											✓	✓	✓	✓	✓	✓
Coolant temperature -40 to +40 °C	D03											✓	✓	✓	✓	✓	✓
Coolant temperature -30 to +40 °C	D04											✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																	
Design according to UL with "Recognition Mark" ⁷⁾	D31											✓	✓	✓	✓	✓	✓
Canadian regulations (CSA) ⁸⁾	D40											✓	✓	✓	✓	✓	✓
Bearings and lubrication																	
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50											✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ⁹⁾	K20											✓	✓	✓	✓	✓	✓
Special bearing for DE and NDE, bearing size 63	K36											✓	✓	✓	✓	✓ ¹⁰⁾	✓ ¹⁰⁾
Regreasing device	K40											✓	✓	✓	✓	–	–
Located bearing DE	K94											✓	✓	✓	✓	✓	✓
Located bearing NDE	L04											□	□	□	□	□	□
Insulated bearing cartridge	L27											–	–	✓	✓	✓	✓
Balance and vibration quantity																	
Vibration quantity A												□	□	□	□	□	□
Vibration quantity B	K02											✓	✓	✓	✓	✓	✓
Full key balancing	L68											✓	✓	✓	✓	✓	✓
Balancing without key	M37											✓	✓	✓	✓	✓	✓
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹¹⁾	K04											✓	✓	✓	✓	✓	✓
Second standard shaft extension ¹²⁾	K16											✓	✓	✓	✓	✓	✓
Shaft extension with standard dimensions without featherkey way	K42											✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39											✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ¹³⁾	Y55 • and identification code											✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 7/52.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Forced-air cooled motors without external fan and fan cover																	
1PP4 (cast-iron)																	
Heating and ventilation																	
Anti-condensation heaters for 230 V	K45											✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46											✓	✓	✓	✓	✓	✓
Rating plate and extra rating plates																	
Second lubricating plate, supplied loose	B06											✓	✓	✓	✓	✓	✓
Second rating plate, loose	K31											✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code											✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code											✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code											✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates																	
Acceptance test certificate 3.1 according to EN 10204	B02											✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F83											✓	✓	✓	✓	✓	✓
Connected in star for dispatch	M32											✓	✓	✓	✓	✓	✓
Connected in delta for dispatch	M33											✓	✓	□	□	□	□

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Possible on request
- ✓ With additional charge
- Not possible

7

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) recommended.
- 2) In combination with the PTC thermistor option or anti-condensation heating option, please inquire before ordering.
- 3) Possible in combination with order code **L44** to **L49** or length specification in plain text.
- 4) Only the 50 Hz data are indicated on the rating plate.
- 5) Cannot be used for motors in UL version (order code **D31**). Cannot be used for motors according to CSA approval (order code **D40**) for motor series 1PP7 frame size 180 to 200. The grease lifetime specified in catalog part 0 "Introduction" refers to CT 40 °C. When the coolant temperature rises by 10 K, the grease lifetime or relubrication interval is halved.
- 6) Not available for 2-pole motors.
- 7) Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 8) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 9) Not possible for 2-pole 1PP4 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration quantity level B available on request for 1PP4 motors. Not possible for 1PP4 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – order code **K04**.
- 10) Additional charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- 11) Can be combined with deep-groove bearings of series 60.., 62.. and 63.. . Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 12) Possible for motors of frame size 315 and above in vertical types of construction or 2-pole for version with second shaft extension on request. Version with protective cover not possible.
- 13) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see catalog part 0 "Introduction".

Overview

Slide rails with fixing bolts and tensioning screws to DIN 42923

Slide rails are used to tension the belt of a machine easily and conveniently when a belt tightener is not available. They are fixed to the base using stone bolts or foundation blocks.

The assignment of slide rails to motor size can be found in DIN 42923. For motors of frame sizes 355 to 450, there are no standardized slide rails (please inquire).

Available from:
Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Foundation block acc. to DIN 799

The foundation blocks are inserted into the stone foundation and embedded in concrete. They are used for fixing machines of medium size, slide rails, pedestal bearings, baseframes, etc. After the fixing bolts have been unscrewed, the machine can be dragged without it having to be lifted.

When the machine is initially installed, the foundation block that is bolted to the machine (without washers) and fitted with taper pins is not embedded with concrete until the machine has been fully aligned. In this case, the machine is positioned 2 to 3 mm lower. The difference in shaft height is compensated by inserting shims on final installation. The taper pins safeguard the exact position of the machine when it is repeatedly removed and replaced without the need for realignment.

Available from:
Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Taper pins to DIN 258 with threaded ends and constant taper lengths

Taper pins are used for components that are repeatedly removed. The drilled hole is ground conical using a conical reamer until the pin can be pushed in by hand until the cone shoulder lies 3 to 4 mm above the rim of the hole.

It can then be driven in using a hammer until it is correctly seated. The pin is removed from the drilled hole by screwing on the nut and tightening it.

Standardized taper pins are available from general engineering suppliers.

Available from:
Otto Roth GmbH & Co. KG
Rutesheimer Straße 22
70499 Stuttgart, Germany
Tel. +49 (0)7 11-1388-0
Fax +49 (0)7 11-1388-233

<http://www.ottoroth.de>
e-mail: info@ottoroth.de

Couplings

The motor from Siemens is connected to the machine or gear unit through a coupling. Flender is an important coupling manufacturer with a wide range of products. For standard applications, Siemens recommends that elastic couplings of Flender types N-Eupex and Rupex or torsionally rigid couplings of types Arpex and Zapex are used. For special applications, Fludex and Elpex couplings are recommended.

Source of supply:
Siemens contact partner – ordering from Catalog
Siemens MD 10.1 "FLENDER Standard Couplings"

or

A. Friedr. Flender AG
Kupplungswerk Mussum
Industriepark Bocholt
Schlavenhorst 100
46395 Bocholt, Germany
Tel. +49 (0)2871-922185
Fax +49 (0)2871-922579

<http://www.flender.com>
e-mail: couplings@flender.com

IEC Squirrel-Cage Motors

Fan motors

Accessories

More information

Spare motors and repair parts

- Supply commitment for spare motors and repair parts following delivery of the motor
 - For up to 5 years, in the event of total motor failure, Siemens will supply a comparable motor with regard to the mounting dimensions and functions (the type series may vary).
 - Repair parts will be supplied for up to 5 years.
 - For up to 10 years, Siemens will provide information and will, if necessary, supply documentation for repair parts.
- When repair parts are ordered, the following details must be provided:
 - Designation and part number
 - Order No. and factory number of the motor

Example for ordering a fan cover 1LA7,
frame size 160 M, 4-pole:

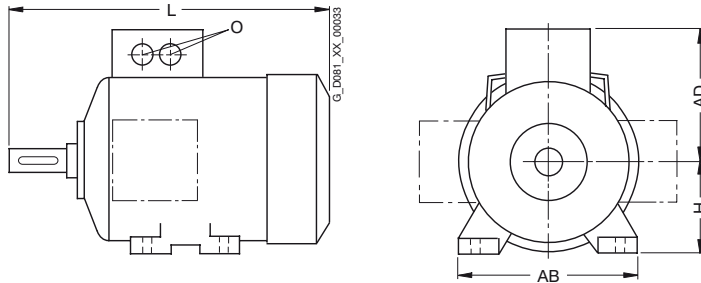
**Fan cover No. 7.40,
1LA7 163-4AA60, factory number J783298901018**

- For bearing types, see the "Introduction".
- Repair parts for 1MJ6, 1MJ7, 1MJ8, 1MJ1, 1ME8, 1ML8, 1LG8 motors and smoke-extraction motors are available on request.
- For standard components, a supply commitment does not apply.
- Support – Hotline
In Germany
Tel.: 0180/5050448

National telephone numbers can be found on the Internet page:
<http://www.siemens.com/automation/service&support>

Overview

Overall dimensions



Frame size	Type	Number of poles	Dimensions				
			L	AD	H	AB	O
63 M	1PP7		172	101	63	120	1 x M16 x 1.5
							1 x M25 x 1.5
71 M	1PP7		207	111	71	132	1 x M16 x 1.5 1 x M25 x 1.5
80 M	1LA7		273.5	120	80	150	1 x M16 x 1.5 1 x M25 x 1.5
	1PP7		237	120	80	150	1 x M16 x 1.5 1 x M25 x 1.5
90 S/ 90 L	1LA7		331	128	90	165	1 x M16 x 1.5 1 x M25 x 1.5
	1PP7		286	128	90	165	1 x M16 x 1.5 1 x M25 x 1.5
100 L	1LA7		372	135	100	196	2 x M32 x 1.5
	1PP7		331	135	100	196	2 x M32 x 1.5
112 M	1LA7		393	148	112	226	2 x M32 x 1.5
	1PP7		349	148	112	226	2 x M32 x 1.5
132 S/ 132 M	1LA7		452.5	167	132	256	2 x M32 x 1.5
	1PP7		397	167	132	256	2 x M32 x 1.5
160 M/ 160 L	1LA7		588	197	160	300	2 x M40 x 1.5
	1PP7		529	197	160	300	2 x M40 x 1.5
180 M/ 180 L	1LA5		712	258	180	339	2 x M40 x 1.5
	1LG4		669	262	180	339	2 x M40 x 1.5
	1PP4		562	262	180	339	2 x M40 x 1.5
	1PP4 188		613	262	180	339	2 x M40 x 1.5
	1PP5		611	258	180	339	2 x M40 x 1.5

Frame size	Type	Number of poles	Dimensions				
			L	AD	H	AB	O
200 L	1LA5		769.5	305	200	388	2 x M50 x 1.5
	1LG4		720	300	200	378	2 x M50 x 1.5
	1PP4		617	300	200	378	2 x M50 x 1.5
	1PP4 208	2, 6	674	300	200	378	2 x M50 x 1.5
225 S/ 225 M	1PP5		675	305	200	388	2 x M50 x 1.5
	1LG4		789	325	225	436	2 x M50 x 1.5
	1PP4		670	325	225	436	2 x M50 x 1.5
	1PP4 223	2	640	325	225	436	2 x M50 x 1.5
250 M	1PP4 228	2	700	325	225	436	2 x M50 x 1.5
	1PP4 228	4, 6, 8	730	325	225	436	2 x M50 x 1.5
	1LG4		887	392	250	490	2 x M63 x 1.5
280 S/ 280 M	1PP4		764	392	250	490	2 x M63 x 1.5
	1PP4 258	4	834	392	250	490	2 x M63 x 1.5
	1LG4		960	432	280	540	2 x M63 x 1.5
315 S/ 315 M/ 315 L	1PP4		830	432	280	540	2 x M63 x 1.5
	1PP4 288	2, 4	940	432	280	540	2 x M63 x 1.5
	1LG4 310		1102	500	315	610	2 x M63 x 1.5
	1PP4 310	2	925	500	315	610	2 x M63 x 1.5
	1PP4 310	4, 6, 8	955	500	315	610	2 x M63 x 1.5
	1LG4 313		1102	500	315	610	2 x M63 x 1.5
	1PP4 313	2	925	500	315	610	2 x M63 x 1.5
	1PP4 313	4, 6, 8	955	500	315	610	2 x M63 x 1.5
	1LG4 316		1262	500	315	610	2 x M63 x 1.5
	1PP4 316	2	1085	500	315	610	2 x M63 x 1.5
	1PP4 316	4, 6, 8	1115	500	315	610	2 x M63 x 1.5
	1LG4 317		1262	500	315	610	2 x M63 x 1.5
1PP4 317	2	1085	500	315	610	2 x M63 x 1.5	
1PP4 317	4, 6, 8	1115	500	315	610	2 x M63 x 1.5	
1PP4 318	6	1255	500	315	610	2 x M63 x 1.5	
1PP4 318	8	1115	500	315	610	2 x M63 x 1.5	

Notes on the dimensions

■ Dimension designations according to DIN EN 50347 and IEC 60072.

■ Fits

The shaft extensions specified in the dimension tables (DIN 748) and centering spigot diameters (DIN EN 50347) are machined with the following fits:

Dimension designation	ISO fit	DIN ISO 286-2
D, DA	to 30	j6
	over 30 to 50	k6
	over 50	m6
N	to 250	j6
	over 250	h6
F, FA		h9
K		H17
S	Flange (FF)	H17

The drilled holes of couplings and belt pulleys should have an ISO fit of at least H7.

■ Dimension tolerances

For the following dimension designations, the permissible deviations are given below:

Dimension designation	Dimension	Permitted deviation
H	to 250	- 0.5
	over 250	- 1.0
E, EA		- 0.5

Keyways and feather keyways (dimensions GA, GC, F and FA) are made in compliance with DIN 6885 Part 1.

■ All dimensions are specified in mm.

IEC Squirrel-Cage Motors

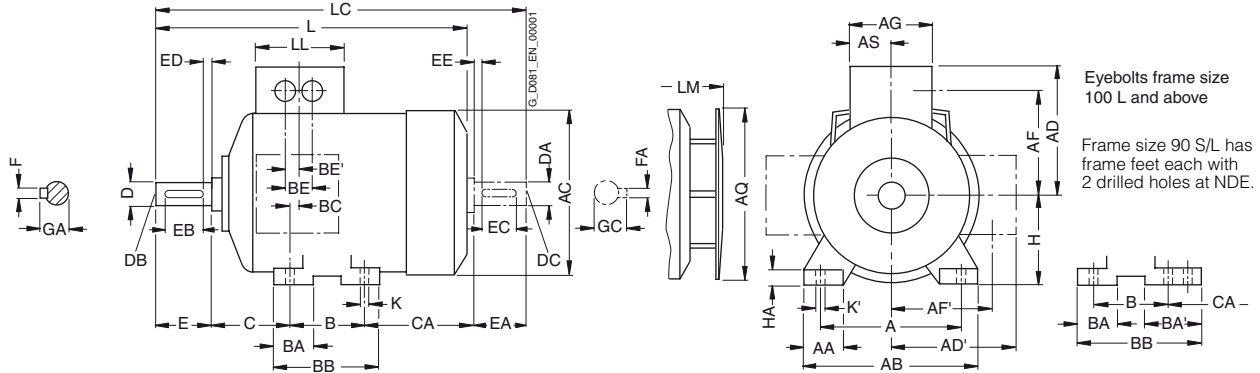
Fan motors

Dimensions

Dimensional drawings

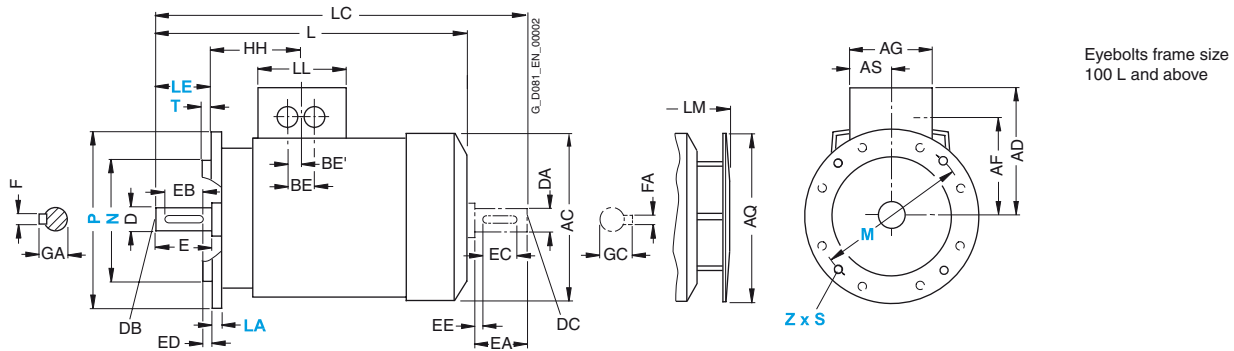
Aluminum series 1LA7 and 1LA5, frame sizes 80 M to 200 L · pole-changing version

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 7/64 (Z = the number of retaining holes)



7

For motor	Frame size	Type	Dimension designation acc. to IEC																					
			A	AA	AB	AC ¹⁾	AD ²⁾	AD'	AF ²⁾	AF'	AG ²⁾	AQ	AS	B*	BA	BA'	BB	BC	BE ²⁾	BE' ²⁾	C	CA*	H	HA
80 M	1LA7 080	1LA7 083	125	30.5	150	163	120	120	97	97	75	124	37.5	100	32	-	118	14	32	18	50	94	80	8
90 S	1LA7 090	1LA7 096	140	30.5	165	180	128	128	105	105	75	170	37.5	100	33	54	143	23	32	18	56	143	90	10
100 L	1LA7 106	1LA7 107	160	42	196	203	135	163	78	123	120	170	60	140	47	-	176	39	42	21	63	125	100	12
112 M	1LA7 113		190	46	226	227	148	176	91	136	120	170	60	140	47	-	176	32	42	21	70	141	112	12
132 S	1LA7 130	1LA7 131	216	53	256	267	167	194	107	154	140	250	70	140	49	-	180	39	42	21	89	162.5	132	15
132 M	1LA7 133	1LA7 134	216	53	256	267	167	194	107	154	140	250	70	178	49	-	218	39	42	21	89	124.5	132	15
160 M	1LA7 163	1LA7 164	254	60	300	320	197	226	127	183	165	250	82.5	210	57	-	256	52.5	54	27	108	183	160	18
160 L	1LA7 166		254	60	300	320	197	226	127	183	165	250	82.5	254	57	-	300	52.5	54	27	108	139	160	18
180 M	1LA5 183		279	69.5	339	363	258	258	216	216	152	340	71	241	50	-	287	38	54	27	121	259	180	18
180 L	1LA5 186		279	69.5	339	363	258	258	216	216	152	340	71	279	50	-	325	38	54	27	121	221	180	18
200 L	1LA5 206	1LA5 207	318	83	388	402	305	305	252	252	260	340	96	305	58.5	-	355	45	85	42.5	133	239	200	24

* This dimension is assigned in DIN EN 50347 to the frame size listed.

1) Measured across the bolt heads.

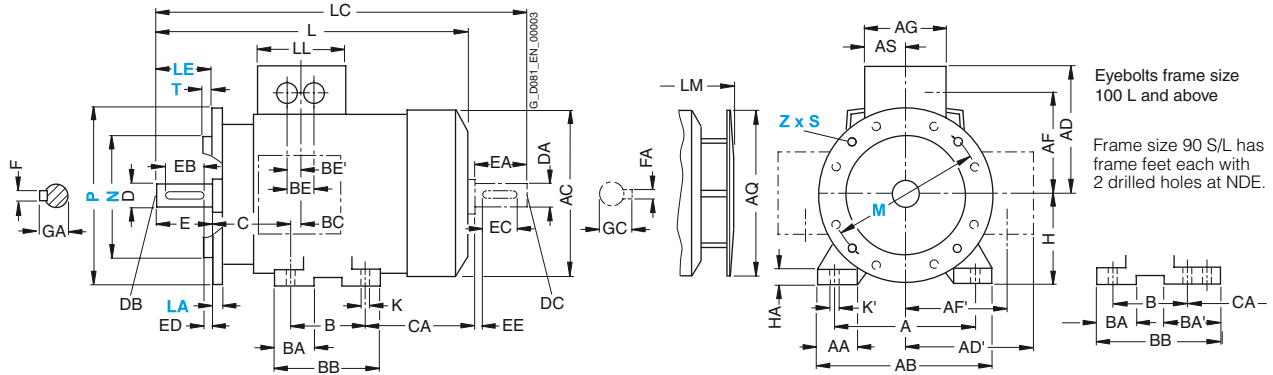
2) The values increase if the connection box is rotated or if a brake is mounted. Further information is provided by the dimension sheet generator in SD configurator.

Dimensional drawings

Aluminum series 1LA7 and 1LA5, frame sizes 80 M to 200 L · pole-changing version

Type of construction IM B35

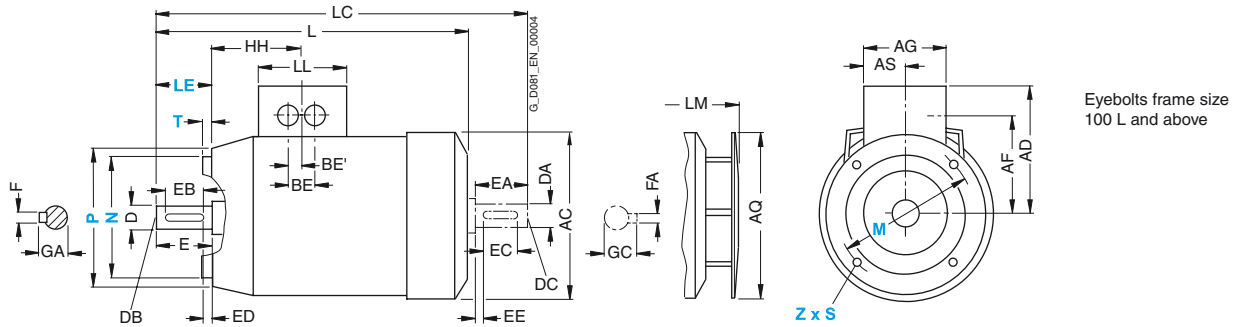
For flange dimensions, see Page 7/64 (Z = the number of retaining holes)



Type of construction IM B14

Type of construction IM B14 not possible for 1LA5 motors, frame sizes 180 M to 200 L

For flange dimensions, see Page 7/64 (Z = the number of retaining holes)



For motor Frame size	Type	Dimension designation acc. to IEC						DE shaft extension						NDE shaft extension								
		HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
80 M	1LA7 080	63.5	9.5	13.5	273.5	324	75	299.5	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5
	1LA7 083					364																
90 S 90 L	1LA7 090	79	10	14	331	389	75	382.5	24	M8	50	40	5	8	27	19	M6	40	32	4	6	21.5
	1LA7 096																					
100 L	1LA7 106	102	12	16	372	438	120	423.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
	1LA7 107																					
112 M	1LA7 113	102	12	16	393	461	120	444.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1LA7 130	128	12	16	452.5	551.5	140	505	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
	1LA7 131																					
132 M	1LA7 133	128	12	16	452.5	551.5	140	505	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
	1LA7 134																					
160 M	1LA7 163	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
	1LA7 164																					
160 L	1LA7 166	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
180 M	1LA5 183	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
	1LA5 186	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LA5 206	178	19	25	769.5	897	192	850	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
	1LA5 207																					



IEC Squirrel-Cage Motors

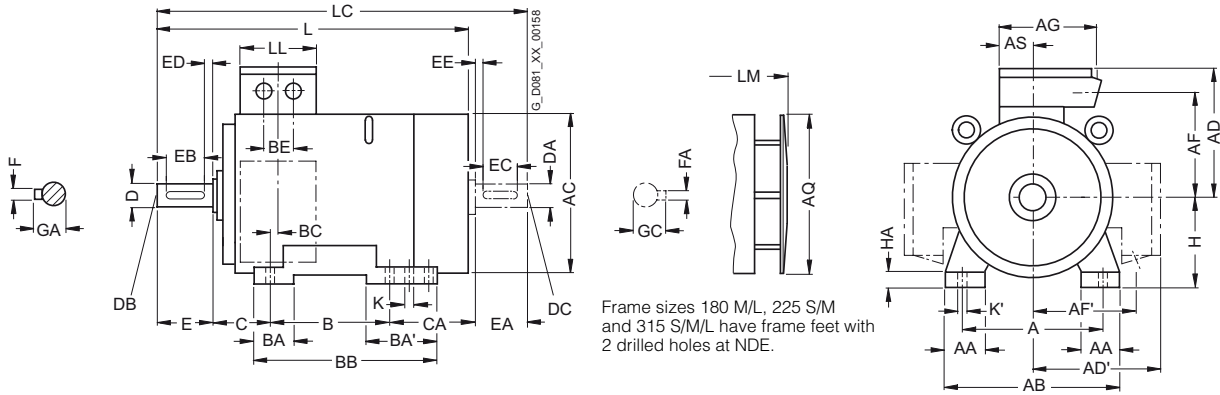
Fan motors

Dimensions

Dimensional drawings

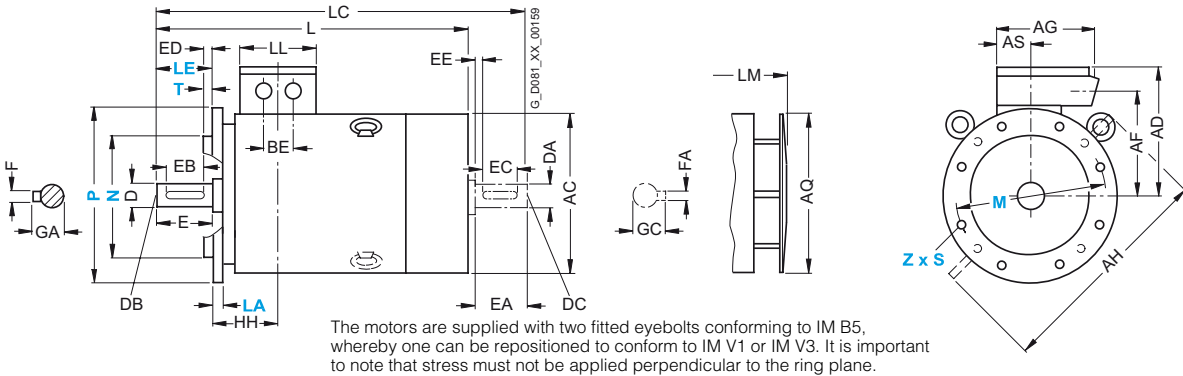
Cast-iron series 1LG4, frame sizes 180 M to 315 L · pole-changing version

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 7/64 (Z = the number of retaining holes)



For motor Frame size	Type	Dimension designation acc. to IEC																					
		A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA
180 M	1LG4 183	279	65	339	363	262	262	220	220	152	452	340	71	241	70	111	328	36	54	121	202	180	20
180 L	1LG4 186	279	65	339	363	262	262	220	220	152	452	340	71	279	70	111	328	36	54	121	164	180	20
200 L	1LG4 207	318	70	378	402	300	300	247	247	260	512	340	96	305	80	80	355	63	85	133	177	200	25
225 S	1LG4 220	356	80	436	442	325	325	272	272	260	556	425	96	286	85	110	361	47	85	149	218	225	34
225 M	1LG4 223	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	193	225	34
250 M	1LG4 253	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	235	250	40
280 S	1LG4 280	457	100	540	555	432	432	348	348	300	672	525	118	368	100	151	479	62	110	190	267	280	40
280 M	1LG4 283	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	216	280	40
315 S	1LG4310	508	120	610	610	500	500	400	400	380	780	590	154	406	125	176	527	69	110	216	315	315	50
315 M ²⁾	1LG4313	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	527	69	110	216	264	315	50
315 L ²⁾	1LG4316	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50
	1LG4317	508	120	610	610	500	500	400	400	380	780	590	154	508	155	206	648	69	110	216	513	315	50

* This dimension is assigned in DIN EN 50347 to the frame size listed.

1) Measured across the bolt heads.

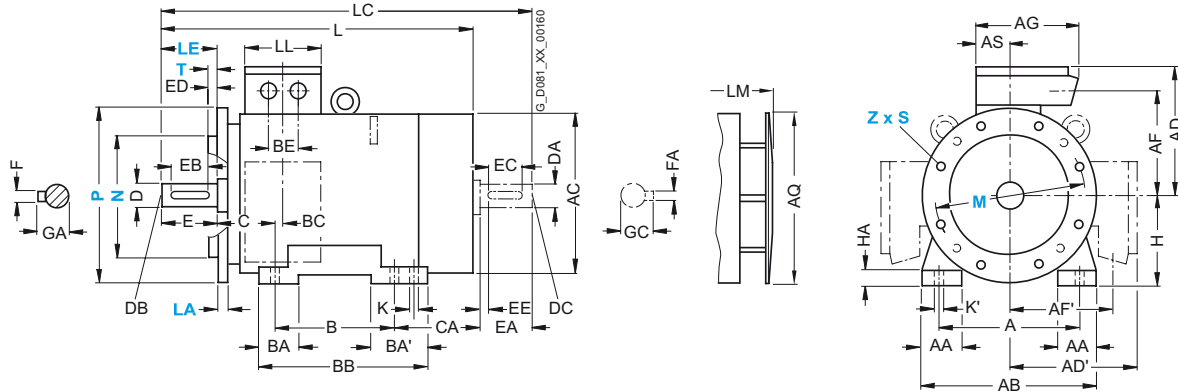
2) With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

Dimensional drawings

Cast-iron series 1LG4, frame sizes 180 M to 315 L · pole-changing version

Type of construction IM B35

For flange dimensions, see Page 7/64 (Z = the number of retaining holes)



For motor Frame size	Type	Dimension designation acc. to IEC							DE shaft extension					NDE shaft extension								
		HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
180 M	1LG4 183	157	15	19	669	784	132	759	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1LG4 186	157	15	19	669	784	132	759	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LG4 207	196	19	25	720	835	192	810	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
225 S	1LG4 220	196	19	25	789	903	192	889	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
225 M	1LG4 223	196	19	25	789	903	192	889	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
250 M	1LG4 253	237	24	30	887	1032	236	987	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
280 S	1LG4 280	252	24	30	960	1105	236	1070	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
280 M	1LG4 283	252	24	30	960	1105	236	1070	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
315 S	1LG4310	285	28	35	1102	1247	307	1212	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 M ¹⁾	1LG4313	285	28	35	1102	1247	307	1212	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 L ¹⁾	1LG4316	285	28	35	1262	1407	307	1372	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG4317	285	28	35	1262	1407	307	1372	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5

¹⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm).
BB will then be 666 mm.

IEC Squirrel-Cage Motors

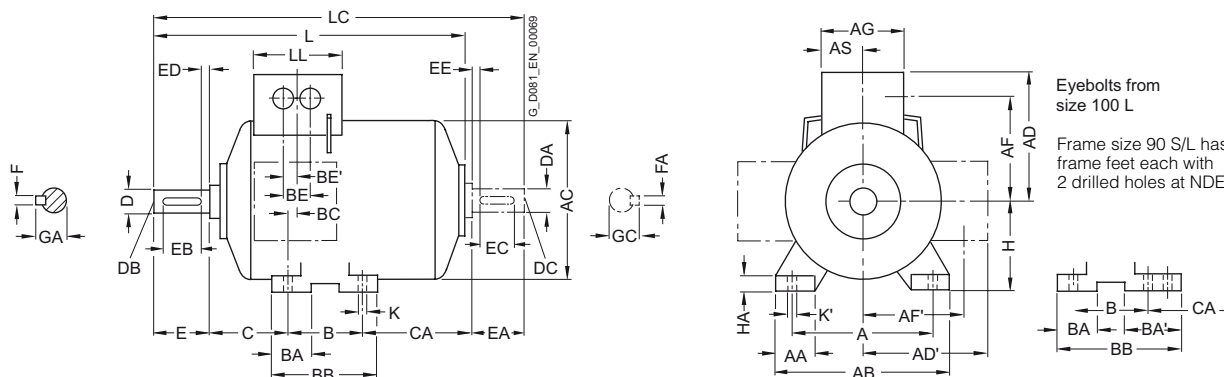
Fan motors

Dimensions

Dimensional drawings

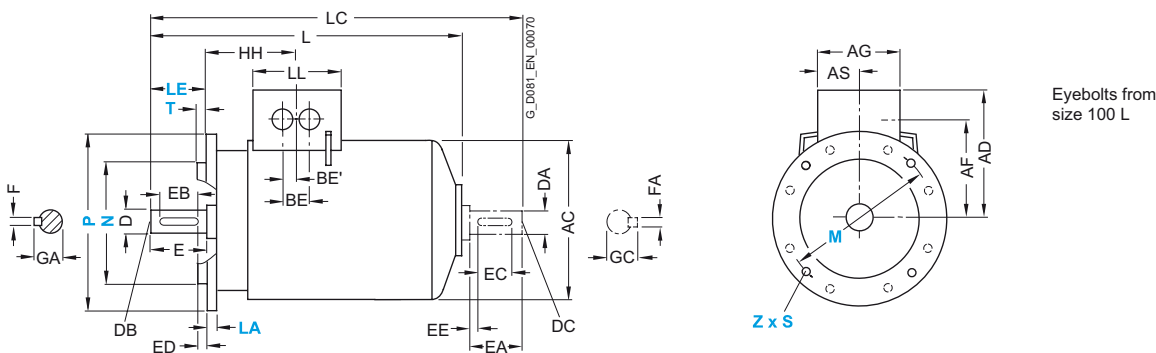
Aluminum series 1PP7 and 1PP5, frame sizes 63 M to 200 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 7/64 (Z = the number of retaining holes)



7

For motor			Dimension designation acc. to IEC																				
Frame size	Type	Number of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H	HA
63 M	1PP7 060 1PP7 063	2, 4, 6	100	27	120	124	101	101	78	78	75	37.5	80	28	-	96	30	32	18	40	40	63	7
71 M	1PP7 070 1PP7 073	2, 4, 6, 8	112	27	132	145	111	111	88	88	75	37.5	90	27	-	106	18	32	18	45	42	71	7
80 M	1PP7 080 1PP7 083	2, 4, 6, 8	125	30.5	150	163	120	120	97	97	75	37.5	100	32	-	118	14	32	18	50	47	80	8
90 S 90 L	1PP7 090 1PP7 096	2, 4, 6, 8	140	30.5	165	180	128	128	105	105	75	37.5	100 125	33	54	143	23	32	18	56	80 55	90	10
100 L	1PP7 106 1PP7 107	2, 4, 6, 8 4, 8	160	42	196	203	135	163	78	123	120	60	140	47	-	176	39	42	21	63	68	100	12
112 M	1PP7 113	2, 4, 6, 8	190	46	226	227	148	176	91	136	120	60	140	47	-	176	32	42	21	70	79	112	12
132 S	1PP7 130 1PP7 131	2, 4, 6, 8 2	216	53	256	267	167	194	107	154	140	70	140	49	-	180	39	42	21	89	96	132	15
132 M	1PP7 133 1PP7 134	4, 6, 8 6	216	53	256	267	167	194	107	154	140	70	178	49	-	218	39	42	21	89	58	132	15
160 M	1PP7 163 1PP7 164	2, 4, 6, 8 2, 8	254	60	300	320	197	226	127	183	165	82.5	210	57	-	256	52.5	54	27	108	107	160	18
160 L	1PP7 166	2, 4, 6, 8	254	60	300	320	197	226	127	183	165	82.5	254	57	-	300	52.5	54	27	108	63	160	18
180 M	1PP5 183	2, 4	279	69.5	339	363	258	258	216	216	152	71	241	50	-	287	38	54	27	121	145	180	18
180 L	1PP5 186	4, 6, 8	279	69.5	339	363	258	258	216	216	152	71	279	50	-	325	38	54	27	121	107	180	18
200 L	1PP5 206 1PP5 207	2, 6 2, 4, 6, 8	318	83	388	402	305	305	252	252	260	96	305	58.5	-	355	45	85	42.5	133	133	200	24

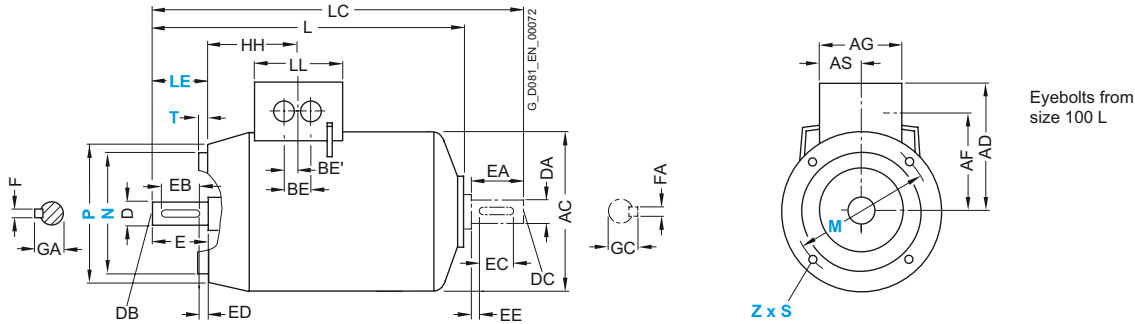
* This dimension is assigned in DIN EN 50347 to the frame size listed.

Dimensional drawings

Aluminum series 1PP7 and 1PP5, frame sizes 63 M to 200 L

Type of construction IM B14

Type of construction IM B14 not possible for 1PP5 motors, frame sizes 180 M to 200 L
For flange dimensions, see Page 7/64 (Z = the number of retaining holes)



For motor		Number of poles	Dimension designation acc. to IEC						DE shaft extension						NDE shaft extension							
Frame size	Type		HH	K	K'	L	LC	LL	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
63 M	1PP7 060 1PP7 063	2, 4, 6	69.5	7	10	172 ¹⁾	206 ¹⁾	75	11	M4	23	16	3.5	4	12.5	11	M4	23	16	3.5	4	12.5
71 M	1PP7 070 1PP7 073	2, 4, 6, 8	63.5	7	10	207	240	75	14	M5	30	22	4	5	16	14	M5	30	22	4	5	16
80 M	1PP7 080 1PP7 083	2, 4, 6, 8	63.5	9.5	13.5	237	280	75	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5
90 S 90 L	1PP7 090 1PP7 096	2, 4, 6, 8	79	10	14	286	333	75	24	M8	50	40	5	8	27	19	M6	40	32	4	6	21.5
100 L	1PP7 106 1PP7 107	2, 4, 6, 8 4, 8	102	12	16	331	385 ²⁾	120	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
112 M	1PP7 113	2, 4, 6, 8	102	12	16	349 ³⁾	403 ⁴⁾	120	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1PP7 130 1PP7 131	2, 4, 6, 8 2	128	12	16	397	485	140	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
132 M	1PP7 133 1PP7 134	4, 6, 8 6	128	12	16	397	485	140	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
160 M	1PP7 163 1PP7 164	2, 4, 6, 8 2, 8	160.5	15	19	529	645	165	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
160 L	1PP7 166	2, 4, 6, 8	160.5	15	19	529	645	165	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
180 M	1PP5 183	2, 4	159	15	19	611	727	132	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1PP5 186	4, 6, 8	159	15	19	611	727	132	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1PP5 206 1PP5 207	2, 6 2, 4, 6, 8	178	19	25	675	791	192	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59

¹⁾ For 1PP7 063 with type of construction code 1 (B5, IM V1 without protective cover, IM V3) the dimensions L and LC are 26 mm longer.

²⁾ 381 mm for IM B14 type of construction.

³⁾ 345 mm for IM B5 type of construction.

⁴⁾ 399 mm for IM B5 type of construction.

IEC Squirrel-Cage Motors

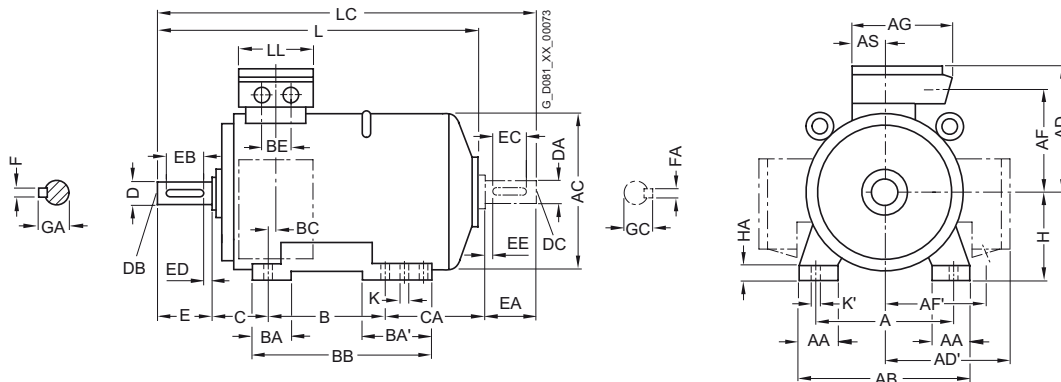
Fan motors

Dimensions

Dimensional drawings

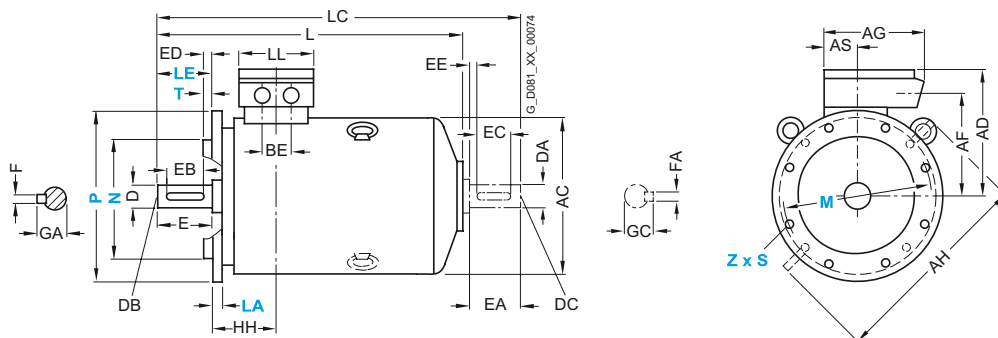
Cast-iron series 1PP4, frame sizes 180 M to 315 L

Type of construction IM B3



Types of construction IM B5 and IM V1 (IM B5 only up to frame size 315 M)

For flange dimensions, see Page 7/64 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																					
Frame size	Type	Number of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AH	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA
180 M	1PP4 183	2, 4	279	65	339	363	262	262	220	220	152	452	71	241	70	111	328	36	54	121	94	180	20
180 L	1PP4 186	4, 6, 8	279	65	339	363	262	262	220	220	152	452	71	279	70	111	328	36	54	121	56	180	20
	1PP4 188	2, 4, 6, 8	279	65	339	363	262	262	220	220	152	452	71	279	70	111	328	36	54	121	107	180	20
200 L	1PP4 206	2, 6	318	70	378	402	300	300	247	247	260	512	96	305	80	80	355	63	85	133	76	200	25
	1PP4 207	2, 4, 6, 8	318	70	378	402	300	300	247	247	260	512	96	305	80	80	355	63	85	133	76	200	25
	1PP4 208	2, 6, 4, 8	318	70	378	402	300	300	247	247	260	512	96	305	80	80	355	63	85	133	133	200	25
225 S	1PP4 220	4, 8	356	80	436	442	325	325	272	272	260	556	96	286	85	110	361	47	85	149	99	225	34
	1PP4 223	2	356	80	436	442	325	325	272	272	260	556	96	311	85	110	361	47	85	149	74	225	34
	1PP4 228	4, 6, 8, 4, 6, 8	356	80	436	442	325	325	272	272	260	556	96	311	85	110	361	47	85	149	134	225	34
250 M	1PP4 253	2	406	100	490	495	392	392	308	308	300	620	118	349	100	100	409	69	110	168	111	250	40
	1PP4 258	4, 6, 8, 2, 4, 6, 8	406	100	490	495	392	392	308	308	300	620	118	349	100	100	409	69	110	168	111	250	40
																					181		
280 S	1PP4 280	2, 4, 6, 8, 2	457	100	540	555	432	432	348	348	300	672	118	368	100	151	479	62	110	190	137	280	40
	1PP4 283	4, 6, 8, 2	457	100	540	555	432	432	348	348	300	672	118	414	100	151	479	62	110	190	86	280	40
	1PP4 288	4, 6, 8, 2, 4, 6, 8	457	100	540	555	432	432	348	348	300	672	118	419	100	151	479	62	110	190	196	280	40
315 S	1PP4 310	2	508	120	610	610	500	500	400	400	380	780	154	406	125	176	527	69	110	216	168	315	50
	1PP4 310	4, 6, 8	508	120	610	610	500	500	400	400	380	780	154	457	125	176	527	69	110	216	117	315	50
	1PP4 313	2	508	120	610	610	500	500	400	400	380	780	154	457	125	176	527	69	110	216	117	315	50
315 M ¹⁾	1PP4 313	4, 6, 8	508	120	610	610	500	500	400	400	380	780	154	508	125	176	578	69	110	216	226	315	50
	1PP4 316/317	2	508	120	610	610	500	500	400	400	380	780	154	508	125	176	578	69	110	216	226	315	50
	1PP4 316/317	4, 6, 8	508	120	610	610	500	500	400	400	380	780	154	508	125	176	578	69	110	216	226	315	50
315 L ¹⁾	1PP4 318	8	508	120	610	610	500	500	400	400	380	780	154	508	155	206	648	69	110	216	366	315	50
	1PP4 318	6	508	120	610	610	500	500	400	400	380	780	154	508	155	206	648	69	110	216	366	315	50

* This dimension is assigned in DIN EN 50347 to the frame size listed.

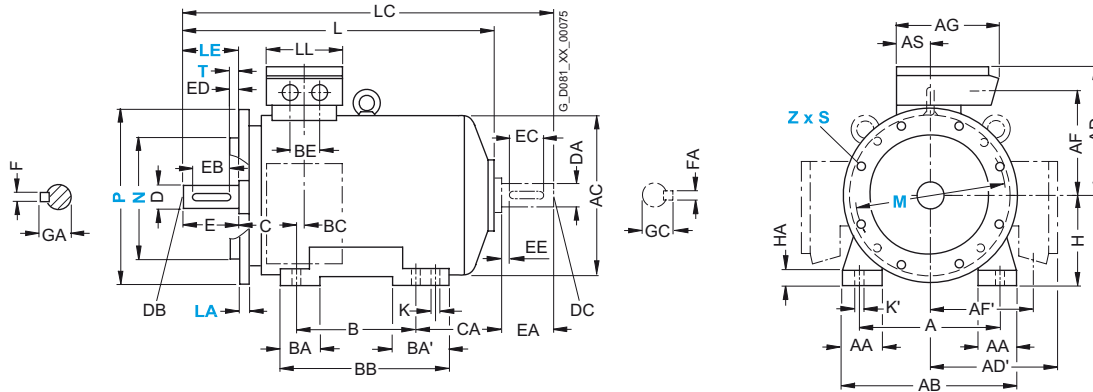
¹⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 506 mm). BB will then be 666 mm.

Dimensional drawings

Cast-iron series 1PP4, frame sizes 180 M to 315 L

Type of construction IM B35

For flange dimensions, see Page 7/64 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC										DE shaft extension					NDE shaft extension					
Frame size	Type	Number of poles	HH	K	K'	L	LC	LL	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
180 M	1PP4 183	2, 4	157	15	19	562	676	132	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1PP4 186	4, 6, 8	157	15	19	562	676	132	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
	1PP4 188	2, 4, 6, 8	157	15	19	613	727	132	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1PP4 206	2, 6	196	19	25	617	734	192	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
	1PP4 207	2, 4, 6, 8	196	19	25	617	734	192	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
	1PP4 208	2, 6	196	19	25	674	791	192	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
		4, 8				617	734															
225 S	1PP4 220	4, 8	196	19	25	670	784	192	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
225 M	1PP4 223	2	196	19	25	640	754	192	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		4, 6, 8				670	784		60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
	1PP4 228	2	196	19	25	700	814	192	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		4, 6, 8				730	844		60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
250 M	1PP4 253	2	237	24	30	764	878	236	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
		4, 6, 8					908		65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1PP4 258	2	237	24	30	764	878	236	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
		4				834	978		65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		6, 8				764	908		65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
280 S	1PP4 280	2	252	24	30	830	975	236	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8					75		75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
280 M	1PP4 283	2	252	24	30	830	975	236	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8					75		75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
	1PP4 288	2	252	24	30	940	1085	236	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4					75		75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
		6, 8				830	975		75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
315 S	1PP4 310	2	285	28	35	925	1070	307	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1PP4 310	4, 6, 8				955	1100		80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 M ¹⁾	1PP4 313	2	285	28	35	925	1070	307	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1PP4 313	4, 6, 8				955	1100		80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 L ¹⁾	1PP4 316/317	2	285	28	35	1085	1230	307	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1PP4 316/317	4, 6, 8				1115	1260		80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1PP4 318	8							80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1PP4 318	6	285	28	35	1255	1400	307	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5

¹⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 506 mm). BB will then be 666 mm.

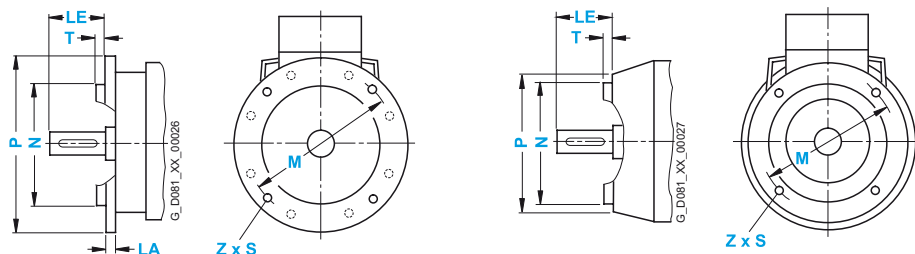
IEC Squirrel-Cage Motors

Fan motors

Dimensions

Dimensional drawings

Flange dimensions



In DIN EN 50347, the frame sizes are allocated flange FF with through holes and flange FT with tapped holes.

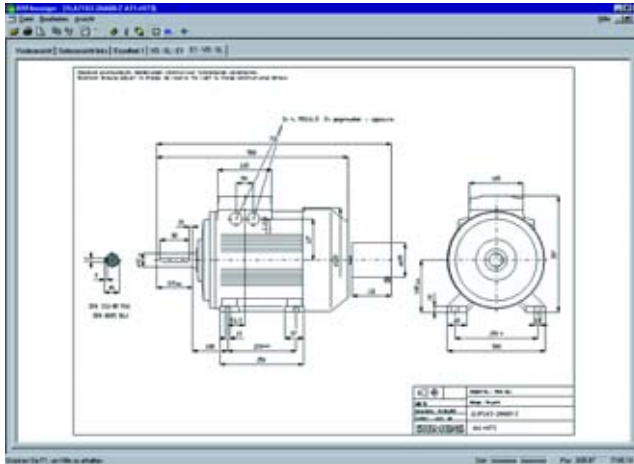
The designation of flange A and C according to DIN 42948 (invalid since 09/2003) are also listed for information purposes. See the table below. (Z = the number of retaining holes)

Frame size	Type of construction	Flange type	Flange with through holes (FF/A) Tapped holes (FT/C)	Acc. to DIN EN 50347	Acc. to DIN 42948	Dimension designation acc. to IEC							
						LA	LE	M	N	P	S	T	Z
63 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 115		A 140	8	23	115	95	140	10	3	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 75		C 90	–	23	75	60	90	M5	2.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 100		C 120	–	23	100	80	120	M6	3	4
71 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 130		A 160	9	30	130	110	160	10	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 85		C 105	–	30	85	70	105	M6	2.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 115		C 140	–	30	115	95	140	M8	3	4
80 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 165		A 200	10	40	165	130	200	12	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 100		C 120	–	40	100	80	120	M6	3	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 130		C 160	–	40	130	110	160	M8	3.5	4
90 S, 90 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 165		A 200	10	50	165	130	200	12	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 115		C 140	–	50	115	95	140	M8	3	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 130		C 160	–	50	130	110	160	M8	3.5	4
100 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 215		A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130		C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 165		C 200	–	60	165	130	200	M10	3.5	4
112 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 215		A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130		C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 165		C 200	–	60	165	130	200	M10	3.5	4
132 S, 132 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 265		A 300	12	80	265	230	300	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 165		C 200	–	80	165	130	200	M10	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 215		C 250	–	80	215	180	250	M12	4	4
160 M, 160 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 300		A 350	13	110	300	250	350	18.5	5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 215		C 250	–	110	215	180	250	M12	4	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 265		C 300	–	110	265	230	300	M12	4	4
180 M, 180 L	IM B5, IM V1, IM V3	Flange	FF 300		A 350	13	110	300	250	350	18.5	5	4
200 L	IM B5	Flange	FF 350		A 400	15	110	350	300	400	18.5	5	4
225 S, 225 M 2-pole 4-pole to 8-pole	IM B5, IM V1, IM V3	Flange	FF 400		A 450	16	110	400	350	450	18.5	5	8
250 M	IM B5, IM V1, IM V3	Flange	FF 500		A 550	18	140	500	450	550	18.5	5	8
280 S, 280 M	IM B5, IM V1, IM V3	Flange	FF 500		A 550	18	140	500	450	550	18.5	5	8
315 S, 315 M, 315 L 2-pole 4-pole to 8-pole	IM B5, IM V1, IM V3	Flange	FF 600		A 660	22	140	600	550	660	24	6	8

More information***Dimension sheet generator***

(part of the SD configurator)

A dimension drawing can be created in the SD configurator for every configurable motor. A dimension drawing can be requested for every other motor.



When a complete Order No. is entered with or without order codes, a dimension drawing can be called up under the "Documentation" tab.

These dimension drawings can be presented in different views and sections and printed.

The corresponding dimension sheets can be exported, saved and processed further in DXF format (interchange/import format for CAD systems) or as bitmap graphics.

The SD configurator has been integrated into the electronic Catalog CA 01 as a selection aid (for further information, see catalog part 11 "Appendix", "Selection tool SD configurator").

The interactive Catalog CA 01 can be ordered from your local Siemens sales representative or on the Internet at

<http://www.siemens.com/automation/CA01>

At this address, you will also find links to Tips & Tricks and to downloads for function or content updates.

Order number for CA 01 10/2008, English International:
DVD: E86060-D4001-A510-C7-7600

IEC Squirrel-Cage Motors

Fan motors

Notes

7

Compressor motors



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IEC Squirrel-Cage Motors

Compressor motors

Orientation

Overview



The compressor motors are used preferentially in compressors for direct drive. In compressors with belt drive, the cantilever forces must be taken into account.

Due to the necessary compactness and confined space within the compressor, it is recommended that the following are used:

- Motors with increased output
- If required, versions with protruding cables instead of a connection box
- Special versions for high-speed applications – possible on request
- With converter-fed operation, winding monitoring with embedded KTY 84-130 temperature sensors or bimetal temperature sensors and additional insulated bearings for wide output ranges.

Benefits

The implemented motors offer the user the following advantages:

- Depending on the motor type used, service factors of up to 1.25 are possible, i.e. the motor can be continuously overloaded with 25 % of the rated output.
- Motors with increased efficiency to CEMEP EFF 1 or EPACT lead to significant energy savings under typical continuous duty. Please inquire regarding any efficiency requirements that exceed this.
- Noise-optimized versions.
- Under converter-fed operation, by setting the precise speed and therefore the operating point, a considerable energy saving can be achieved combined with reduced stress on the plant.
- The motors are suitable, in general, for mains-fed operation up to 690 V and converter-fed operation up to 460 V (with motor series 1LA8 to 500 V) (voltage rise times $t_{\text{v}} > 0.1$ ms).
- Extensive experience is available in customized applications especially with regard to special flanges and special bearings.

Application

The motors can be used for the following compressor types:

- Screw compressors
- Reciprocating compressors
- Rotary blowers

More information

For more information, please contact your local Siemens AG contact – see “Siemens contacts worldwide” in the Appendix.

IEC Squirrel-Cage Motors

Compressor motors

Surface-cooled motors up to frame size 315 L
Aluminum and cast-iron housing

Overview

Recommended motor types:

- Self-ventilated motors with high efficiency according to CEMEP EFF1 – Aluminum series 1LA9 in the output range from 0.06 to 37 kW, 50 and 60 Hz
- Self-ventilated motors with high efficiency according to CEMEP EFF1 – Cast-iron series 1LG6 in the output range from 11 to 200 kW, 50 and 60 Hz
- Self-ventilated motors with high efficiency according to CEMEP EFF1 – Aluminum series 1LE1 in the output range from 0.75 to 18.5 kW, 50 and 60 Hz
- Self-ventilated motors with increased output – Aluminum series 1LA9 and cast-iron series 1LG4 in output range from 3 to 110 kW, 50 and 60 Hz
- Self-ventilated motors with high efficiency and increased output are available on request
- Self-ventilated motors with improved efficiency according to CEMEP EFF2 with increased output – Aluminum series 1LE1 in the output range from 2.2 to 22 kW, 50 and 60 Hz
- Self-ventilated motors with high efficiency according to CEMEP EFF1 with increased output – Aluminum series 1LE1 in the output range from 2.2 to 22 kW, 50 and 60 Hz

For technical specifications and selection and ordering data, see catalog parts 1 “New Generation 1LE1/1PC1” and 2 “Standard motors up to frame size 315 L”.

Surface-cooled motors frame size 315 and above
Cast-iron housing

Overview

Recommended motor types:

- Non-standard motor for mains-fed and converter-fed operation – cast-iron housing 1LA8

For technical specifications and selection and ordering data, see catalog part 3 “Non-standard motors frame size 315 and above”.

IEC Squirrel-Cage Motors

Compressor motors

Special versions

Overview

Recommended special versions for mains-fed and converter-fed operation

- Motor temperature sensing using built-in temperature sensor KTY 84-130 – order code **A23** for 1LE1 – 15th position of the Order No. letter **F**
- Insulated bearing cartridge at non-drive-end (NDE) – order code **L27**
- External earthing – order code **L13** for 1LE1 – order code **H04**
- 6 protruding cable ends
 - 0.5 m long – order code **L47** for 1LE1 – order code **R22**
 - 1.5 m long – order code **L48** for 1LE1 – order code **R23**
 - 3.0 m long – order code **L49** for 1LE1 – order code **R24**

Other special versions

For other special versions, see catalog parts 2 “Standard motors up to frame size 315 L” and 3 “Non-standard motors frame size 315 and above”.

Accessories

Overview

See catalog parts 1 “New Generation 1LE1/1PC1”, 2 “Standard motors up to frame size 315 L” and 3 “Non-standard motors frame size 315 and above”.

Dimensions

Overview

See dimensions under catalog parts 1 “New Generation 1LE1/1PC1”, 2 “Standard motors up to frame size 315 L” and 3 “Non-standard motors frame size 315 and above”.

Smoke-extraction motors



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IEC Squirrel-Cage Motors

Smoke-extraction motors

Orientation

Overview



The low-voltage motors with squirrel-cage rotors for implementation in automatic smoke and heat extraction units to EN 12101-3 are mainly designed for driving smoke extraction fans. For this reason, they are known as smoke-extraction motors. They are mainly used in buildings or structures in which smoke control is necessary due to their shape and arrangement.

Temperature/time classification according to EN 12101-3

- F200 corresponds to 200 °C for 120 min.
- F300 corresponds to 300 °C for 60 min.
- F400 corresponds to 400 °C for 120 min.

Testing and test certificates

The smoke-extraction motors are tested by the Research and Testing Laboratory of the Department of Air-Conditioning Systems and Building Services Installations of the Technical University of Munich in accordance with EN 12101-3.

Test conditions for F200/F300:

- Temperature **300 °C**
- Time **120 min.**

The test certificates are available.



The motors are manufactured with aluminum or cast-iron housings in accordance with the smoke classes. The smoke-extraction motors are based on the standard motors and comprise the following motor types:

- Temperature/time classes F200 and F300
 - Self-ventilated motors – Aluminum series 1LA7 and 1LA5, cast-iron series 1LG6 – Version with integrated fan (metal)
 - Self-ventilated motors – Aluminum series 1LA7 and 1LA5 **double pole-changing with square-law load torque** – Version with integrated fan (metal)
 - Forced-air cooled motors – Aluminum series 1PP7 and 1PP5, cast-iron series 1PP6 – Version without integrated fan, located in air flow of fan to be driven
 - Forced-air cooled motors – Aluminum series 1PP7 and 1PP5 **double pole-changing with square-law load torque** – Version without integrated fan, located in air flow of fan to be driven
- Temperature/time classes F400
 - Self-ventilated motors – Cast-iron series 1LA6 and 1LG6 – Version with integrated fan (metal)
 - Self-ventilated motors – Cast-iron series 1LA6 **double pole-changing with square-law load torque** – Version with integrated fan (metal)
 - Forced-air cooled motors – Cast-iron series 1PP6 – Version without integrated fan, located in air flow of fan to be driven
 - Forced-air cooled motors – Cast-iron series 1PP6 **double pole-changing with square-law load torque** – Version without integrated fan, located in air flow of fan to be driven.

The resonance of mountings and reactions from driven machines can cause high levels of vibration in the overall equipment unit. This has a significant effect on the expected service life of the bearing.

These vibrations are evaluated in accordance with Zones A and B according to ISO 10816.

Benefits

The smoke-extraction motors operate as so-called "Dual-function motors":

- Normal operation (no instance of fire):
Incoming/outgoing air flow
- Fault operation (in case of fire):
 - Removal of smoke from escape and access routes
 - Supporting fire fighting by creating a smoke-free zone
 - Protecting devices and equipment
 - Reducing the heat stress of components during a fire
 - Reducing secondary damage due to thermal bi-products and hot gases

The smoke-extraction motors offer the user a number of advantages:

- The assignment of standard outputs is unchanged. This means that a larger construction size is not required for smoke-extraction motors.
- Smoke-extraction motors are generally equipped with located bearings at the drive-end (DE) of the motor.
- A rating plate for conditions of fire is screwed onto the motor.
- Cables protruding from the non-drive-end (NDE) are included in the scope of supply.
- Radial-flow and axial-flow fan drive are possible.
 - Self-ventilated motors of series 1LA/1LG with a metal fan impeller can be used as radial-flow fan drives.
 - Forced-air cooled motors of series 1PP can be used as axial-flow fan drives taking into account the required volumetric flow for motor cooling. In this case the driven fan performs the ventilation.

Application

The smoke-extraction motors are designed for use in automatic smoke and heat extraction units to EN 12101-3.

Typical application examples include:

- Tunnels
- Single and multi-storey shopping centers
- Industrial buildings and warehouses
- Building complexes and atriums
- Theatres
- Indoor car parks
- Staircases

IEC Squirrel-Cage Motors

Smoke-extraction motors

Orientation

Technical specifications

Standards and specifications

In addition to the relevant standards and regulations, EN 12101-3 applies for non-portable fire-fighting systems:

Systems for controlling smoke and heat flows, part 3, specifications for smoke and heat extraction units.

Voltage and frequency

Rated voltages according to IEC 60034-1

- 230 VΔ 50 Hz
- 400 VΔ 50 Hz and 400 VY 50 Hz
- 500 VΔ 50 Hz and 500 VY 50 Hz
- 690 VY 50 Hz

Non-standard voltages (voltage code **9** and order code **L1Y**) as well as 60 Hz are available on request, only for 4, 6, 8-pole motors as well as 6/4 and 8/4-pole motors with $n_{max.} = 3000$ rpm)

The following rating plates are available for the smoke-extraction motors:

- Rating plate
For the listed rated voltages with 50 Hz output data.
- Fire event plate
Complete with number and year of issue of the European standard, temperature/time class and minimum duration of function.

All plates are resistant to corrosion. A second set of plates is included with the motor, loose.

Rated output, duty type, number of poles

The rated output applied for continuous duty (normal duty) according to IEC 60034-1, for a frequency of 50 Hz, coolant temperatures of up to 40 °C, site altitude of up to 1000 m above sea level.

Derating is necessary at higher coolant temperatures and site altitudes (reduction factor k_{HT}), see table below.

Reduction factor k_{HT} for different site altitudes and/or coolant temperatures

Site altitude above sea level	Coolant temperature in °C					
in m	<30	30-40	45	50	55	60
1000	1.07	1.00	0.96	0.92	0.87	0.82
1500	1.04	0.97	0.93	0.89	0.84	0.79
2000	1.00	0.94	0.9	0.86	0.82	0.77
2500	0.96	0.90	0.86	0.83	0.78	0.74
3000	0.92	0.86	0.82	0.79	0.75	0.70
3500	0.88	0.82	0.79	0.75	0.71	0.67
4000	0.82	0.77	0.74	0.71	0.67	0.63

Coolant temperature and site altitude are rounded up to 5 °C or 500 m.

Operation in the event of fire

In addition to normal duty, operation in the event of a fire as specified in EN 12101-3 is available.

At the end of the fire incident, the motor may be unfit for normal duty. **It is therefore specified that the motor is removed and overhauled or replaced with a new motor.**

In the event of a fire, any "thermal motor protection" must be deactivated.

Standard number of poles

- 2, 4 and 6
- For more poles and pole-changing motors, please inquire.

Insulation system

The special insulation systems are adapted to the respective temperature/time classes.

The insulation of the smoke extraction motors is designed such that converter-fed operation is possible without limitation at voltages ≤ 460 V. This also applies for operation with a pulse-controlled AC converter with voltage rise times $t_s > 0.1 \mu s$ at the motor terminals.

In the event of fire, the motors must be switched over from converter-fed operation to mains-fed operation. If converter-fed operation is also required in the event of fire, system testing and acceptance testing must be performed in accordance with this (please inquire).

Drainage holes

Generally available, but closed if ordered according to IP55 degree of protection.

Bearing plates

All bearing plates are in cast-iron.

Termination system

Protruding cable with casing, without connection box with cover plate or "Nozzle cap". Cable length depends on the shaft height.

- Frame sizes 80 to 112: 1.0 m
- Frame sizes 132 to 200: 1.5 m
- Frame sizes 225 to 315: 2.5 m

Special versions of connecting cables are available on request.

Position of the connecting cable

- Frame sizes 80 to 160:
 - On the top at non-drive-end (NDE) as standard. Optionally left or right at non-drive-end (NDE) (for type of construction with screwed-on feet).
- Frame sizes 180 to 315:
 - Flange types of construction without feet:
 - On the top at non-drive-end (NDE) as standard. Optionally on left or right at non-drive-end (NDE).
 - All types of construction with feet:
 - On the top at drive-end (DE) as standard with connection cable routed towards the non-drive end (NDE). Optionally on left or right at drive-end (DE) with connection cable routed towards the non-drive-end (NDE) (for types of construction with screwed-on feet).

The equipment is earthed with a protruding cable.

Technical specifications (continued)

Bearings, grease

Special bearing systems are used that are matched to the respective temperature classes.

Deep-groove bearings of series 60, 62 or 63 without play are used depending on the fire classes F200/F300, F400 and the frame sizes.

The located bearing is generally at the drive-end (DE).

The nominal bearing lifetime L_{10h} (fan drive) is at least 20,000 hours at full rated load.

The motors of frame sizes 80 to 250 generally have bearings that are greased for life.

Paint finish

The motors have a two-component finish (worldwide) as standard in the color RAL 7030.

Required minimum cooling air flow in standard duty

Frame size	1LA7/1PP7	1LA5/1PP5	1LA6/1PP6	Required cooling air flow for number of poles		
				2 m ³ /min.	4 m ³ /min.	6 m ³ /min.
80	X			1.74	0.90	0.60
90	X			3.12	1.56	1.08
100	X		X	3.96	1.86	1.26
112	X		X	4.98	3.00	1.98
132	X		X	8.04	5.04	3.36
160	X		X	12.90	9.54	6.36
180		X		10.98	10.98	7.27
200		X		15.12	13.02	8.58
225		X		12.12	13.02	8.58

Frame size	1LG6/1PP6	Required cooling air flow for number of poles		
		2 m ³ /min.	4 m ³ /min.	6 m ³ /min.
180	X	12.0	13.0	8.5
200	X	20.5	17.0	11.0
225	X	20.5	18.5	12.5
250	X	25.5	22.5	17.0
280	X	24.5	28.0	21.5
315	X	47	36.0	26.5

In the motor version without an integrated fan (1PP5, 1PP6 and 1PP7), the motor is located in the air flow of the ventilator to be driven which must drive the minimum cooling air flow over the motor housing. For a faster air flow, the operating temperature of the motor can be reduced.

Admissible loading on the shaft extension

The values specified in the table "Admissible loading on shaft extension" are the tested and approved maximum values (test duration two hours, temperature in case of fire 300 or 400 °C).

In standard duty at coolant temperatures of up to 40 °C, a bearing lifetime $L_{10h} > 20000$ hours was achieved.

The values apply to all horizontal mounting positions and to all vertical mounting positions with shaft pointing downwards.

Please inquire in the case of :

- Higher force pairings
- Motors with more poles or pole-changing motors
- Vertical arrangement, depending on the rotor mass and mounting location (shaft pointing downwards or shaft pointing upwards) of the smoke-extraction motor. If necessary, higher forces can be approved.

IEC Squirrel-Cage Motors

Smoke-extraction motors

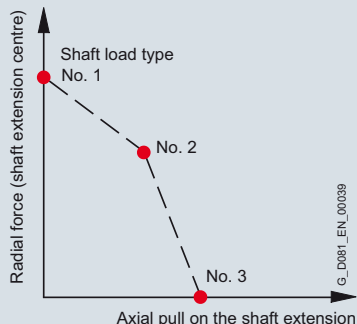
Orientation

Technical specifications (continued)

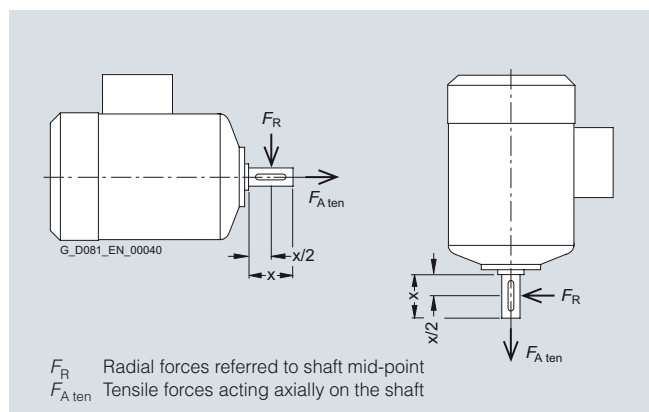
Admissible loading in the event of a fault (fire) on the shaft extension (continued)

Frame size	Bearings	Type of loading on shaft	Horizontal shaft						Shaft pointing vertically downwards					
			2-pole		4-pole		6-pole		2-pole		4-pole		6-pole	
	DE	No.	F_R N	$F_{A \text{ tens}}$ N	F_R N	$F_{A \text{ tens}}$ N	F_R N	$F_{A \text{ tens}}$ N	F_R N	$F_{A \text{ tens}}$ N	F_R N	$F_{A \text{ tens}}$ N	F_R N	$F_{A \text{ tens}}$ N
80	6004	1 Radial force	400	0	490	0	540	0	360	0	450	0	540	0
		2 Radial force + axial tensile force	150	130	170	170	190	200	40	172	40	225	40	275
		3 Axial tensile force	0	215	0	265	0	320	0	197	0	250	0	300
90	6205	1 Radial force	650	0	730	0	795	0	590	0	730	0	795	0
		2 Radial force + axial tensile force	250	205	280	260	310	305	100	259	100	330	100	390
		3 Axial tensile force	0	343	0	415	0	480	0	310	0	384	0	450
100	6206	1 Radial force	890	0	1000	0	1080	0	820	0	1000	0	1080	0
		2 Radial force + axial tensile force	400	265	500	325	600	345	300	265	300	385	300	455
		3 Axial tensile force	0	490	0	600	0	675	0	432	0	540	0	625
112	6206	1 Radial force	870	0	980	0	1055	0	760	0	970	0	1055	0
		2 Radial force + axial tensile force	400	252	500	310	600	330	250	260	250	380	250	450
		3 Axial tensile force	0	478	0	595	0	675	0	403	0	510	0	590
132	6208	1 Radial force	1070	0	1415	0	1530	0	810	0	1060	0	1220	0
		2 Radial force + axial tensile force	450	315	550	450	650	480	250	300	250	520	250	585
		3 Axial tensile force	0	580	0	775	0	850	0	450	0	640	0	820
160	6209	1 Radial force	1440	0	1630	0	1760	0	1210	0	1580	0	1780	0
		2 Radial force + axial tensile force	700	450	800	570	900	650	500	335	500	525	500	665
		3 Axial tensile force	0	824	0	1015	0	1140	0	620	0	790	0	920
180	6210	1 Radial force	1540	0	1750	0	1900	0	1020	0	1400	0	1670	0
		2 Radial force + axial tensile force	770	430	900	545	1000	630	550	218	550	420	550	575
		3 Axial tensile force	0	815	0	1040	0	1183	0	453	0	733	0	875
200	6212	1 Radial force	2050	0	2380	0	2620	0	1450	0	1700	0	2090	0
		2 Radial force + axial tensile force	1200	770	1350	970	1500	1075	500	460	500	750	500	1600
		3 Axial tensile force	0	1350	0	1650	0	1875	0	720	0	1040	0	1905
225	6213	1 Radial force	2460	0	2720	0	2970	0	1910	0	2450	0	2900	0
		2 Radial force + axial tensile force	1370	900	1500	1095	1700	1200	500	660	500	1000	500	1250
		3 Axial tensile force	0	1560	0	1910	0	2170	0	920	0	1290	0	1520
250	6215	1 Radial force	2770	0	3230	0	3500	0	1490	0	2230	0	2700	0
		2 Radial force + axial tensile force	1400	840	1600	1095	1800	1340	500	460	500	815	500	1080
		3 Axial tensile force	0	1500	0	1865	0	2130	0	710	0	1090	0	1375
280	6217 (2-pole), 6317 (4-, 6-pole)	1 Radial force	3180	0	5000	0	5500	0	3000	0	5600	0	6100	0
		2 Radial force + axial tensile force	1700	1820	2000	2000	2300	2200	600	1085	600	2300	600	2750
		3 Axial tensile force	0	2630	0	3050	0	3500	0	1380	0	2600	0	3100
315	6219 (2-pole), 6319 (4-, 6-pole)	1 Radial force	3470	0	5300	0	5900	0	1000	0	3600	0	3850	0
		2 Radial force + axial tensile force	1750	2200	2000	2170	2300	2530	200	363	1000	1150	1000	1610
		3 Axial tensile force	0	3000	0	3080	0	3560	0	463	0	1690	0	2100

Note: In the event of a fault (fire), the reduced loads provided above must be observed and ensured by appropriate measures in the ventilation system. The permitted loads in catalog part 0 from Page 0/66 must be observed for operation under standard condition (CT 40 °C).



Load types



Forces on shaft extension

Selection and ordering data

Preliminary selection of the motor according to motor type/series, speed or number of poles, frame size, rated output, rated torque, rated speed and rated current

Self-ventilated motors for temperature/time classes F200 and F300

Speed (No. of poles)	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LA7 and 1LA5, cast-iron series 1LG6 (motors with external fan)						
3000, 2-pole	80 M ... 315 L	0.75 ... 200	2830 ... 2985	2.5 ... 640	2.1 ... 325	9/8
1500, 4-pole	80 M ... 315 L	0.55 ... 200	1395 ... 1488	3.7 ... 1284	1.86 ... 345	9/8
1000, 6-pole	80 M ... 315 L	0.37 ... 160	910 ... 990	3.9 ... 1543	1.2 ... 285	9/10
1500/3000, 4/2-pole	80 M ... 160 L	The electrical data can be calculated and supplied on receipt of order.				9/12
1000/1500, 6/4-pole	80 M ... 200 L					9/12
750/1500, 8/4-pole	80 M ... 200 L					9/12

Forced-air cooled motors for temperature/time classes F200 and F300

Speed (No. of poles)	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1PP7 and 1PP5, cast-iron series 1PP6 (motors without an external fan)						
3000, 2-pole	80 M ... 315 L	0.75 ... 200	2830 ... 2985	2.5 ... 640	2.1 ... 325	9/14
1500, 4-pole	80 M ... 315 L	0.55 ... 200	1395 ... 1488	3.7 ... 1284	1.86 ... 345	9/14
1000, 6-pole	80 M ... 315 L	0.37 ... 160	910 ... 990	3.9 ... 1543	1.2 ... 285	9/16
1500/3000, 4/2-pole	80 M ... 160 L	The electrical data can be calculated and supplied on receipt of order.				9/18
1000/1500, 6/4-pole	80 M ... 200 L					9/18
750/1500, 8/4-pole	80 M ... 200 L					9/18

Self-ventilated motors for temperature/time class F400

Speed (No. of poles)	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Cast-iron series 1LA6 and 1LG6 (motors with external fan)						
3000, 2-pole	100 L ... 315 L	3 ... 190	2875 ... 2982	10 ... 608	6.5 ... 325	9/20
1500, 4-pole	100 L ... 315 L	2.2 ... 200	1410 ... 1490	15 ... 1284	5.5 ... 345	9/20
1000, 6-pole	100 L ... 315 L	1.5 ... 160	925 ... 990	15 ... 1546	4.5 ... 285	9/22
1500/3000, 4/2-pole	100 L ... 160 L	The electrical data can be calculated and supplied on receipt of order.				9/24
1000/1500, 6/4-pole	100 L ... 160 L					9/24
750/1500, 8/4-pole	100 L ... 160 L					9/24

Forced-air cooled motors for temperature/time class F400

Speed (No. of poles)	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Cast-iron series 1PP6 (motors without external fan)						
3000, 2-pole	100 L ... 315 L	3 ... 190	2875 ... 2982	10 ... 608	6.5 ... 325	9/26
1500, 4-pole	100 L ... 315 L	2.2 ... 200	1410 ... 1490	15 ... 1284	5.5 ... 345	9/26
1000, 6-pole	100 L ... 315 L	1.5 ... 160	925 ... 990	15 ... 1546	4.5 ... 285	9/28
1500/3000, 4/2-pole	100 L ... 160 M	The electrical data can be calculated and supplied on receipt of order.				9/30
1000/1500, 6/4-pole	100 L ... 160 L					9/30
750/1500, 8/4-pole	100 L ... 160 L					9/30

More information

For more information, please contact your local Siemens contact – see “Siemens Contacts Worldwide” in the Appendix.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time classes F200, F300 – Aluminum series 1LA7/5, cast-iron series 1LG6

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	$\cos\phi_{\text{rated}}$									Type of construction IM B3 approx. m kg
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	$T_{\text{LR}}/T_{\text{rated}}$	$I_{\text{LR}}/I_{\text{rated}}$	$T_{\text{B}}/T_{\text{rated}}$	CL	J kg m ²				
2-pole, 3000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
0.75	80 M	2830	2.5	63.0	0.83	2.1	2.3	5.6	2.4	16	0.00085	1LA7 080-2TA00		10.2	
1.1	80 M	2845	3.7	74.0	0.80	2.7	2.6	6.1	2.7	16	0.0011	1LA7 083-2TA00		11.9	
1.5	90 S	2860	5.0	73.0	0.80	3.7	2.4	5.5	2.7	16	0.0015	1LA7 090-2TA00		15.2	
2.2	90 L	2880	7.3	78.0	0.80	5.1	2.8	6.3	3.1	16	0.002	1LA7 096-2TA00		18	
3	100 L	2890	9.9	77.0	0.83	6.8	2.8	6.8	3.0	16	0.0038	1LA7 106-2TA00		24	
4	112 M	2905	13	82.0	0.83	8.5	2.6	7.2	2.9	16	0.0055	1LA7 113-2TA00		32	
5.5	132 S	2925	18	85.5	0.87	10.7	2.0	5.9	2.8	16	0.016	1LA7 130-2TA00		45	
7.5	132 S	2930	24	88.0	0.89	13.8	2.3	6.9	3.0	16	0.021	1LA7 131-2TA00		53	
11	160 M	2940	36	88.0	0.86	21	2.1	6.5	2.9	16	0.034	1LA7 163-2TA00		74	
15	160 M	2940	49	90.8	0.90	26.5	2.2	6.6	3.0	16	0.04	1LA7 164-2TA00		85	
18.5	160 L	2940	60	90.3	0.91	32.5	2.4	7.0	3.1	16	0.052	1LA7 166-2TA00		98	
22	180 M	2940	71	91.1	0.85	41	2.5	6.9	3.2	16	0.077	1LA5 183-2TA00		125	
30	200 L	2945	97	91.8	0.89	53	2.4	7.2	2.8	16	0.14	1LA5 206-2TA00		176	
37	200 L	2945	120	92.3	0.89	65	2.4	7.7	2.8	16	0.16	1LA5 207-2TA00		199	
45	225 M	2960	145	93.6	0.89	78	2.8	7.7	3.4	16	0.2	1LA5 223-2TA00		235	
55	250 M	2975	177	94.2	0.90	94	2.5	7.4	3.3	13	0.466	1LG6 253-2TB00		420	
75	280 S	2975	241	94.8	0.91	126	2.6	7.5	2.9	13	0.832	1LG6 280-2TB00		530	
90	280 M	2975	289	95.2	0.90	152	3.0	7.5	3.0	13	1.00	1LG6 283-2TB00		615	
110	315 S	2985	352	95.0	0.90	186	2.6	7.5	3.2	13	1.39	1LG6 310-2TB00		790	
132	315 M	2984	422	95.3	0.91	220	2.7	7.4	3.0	13	1.62	1LG6 313-2TB00		915	
160	315 L	2984	512	95.7	0.93	260	2.8	7.5	3.1	13	2.09	1LG6 316-2TB00		1055	
200	315 L	2984	640	95.9	0.93	325	2.5	7.0	2.8	13	2.46	1LG6 317-2TB00		1245	
4-pole, 1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
0.55	80 M	1395	3.7	57.0	0.75	1.85	2.2	3.9	2.2	16	0.0015	1LA7 080-4TA00		10	
0.75	80 M	1405	5.1	63.0	0.73	2.35	2.3	4.2	2.3	16	0.0018	1LA7 083-4TA00		11.4	
1.1	90 S	1415	7.4	68.0	0.74	3.15	2.3	4.6	2.4	16	0.0028	1LA7 090-4TA00		14.6	
1.5	90 L	1420	10	73.0	0.74	4.0	2.4	5.3	2.6	16	0.0035	1LA7 096-4TA00		17.9	
2.2	100 L	1420	15	75.0	0.78	5.4	2.5	5.6	2.8	16	0.0048	1LA7 106-4TA00		24	
3	100 L	1415	20	77.0	0.78	7.2	2.7	5.6	3.0	16	0.0058	1LA7 107-4TA00		27	
4	112 M	1440	27	78.0	0.78	9.2	2.7	6.5	3.0	16	0.011	1LA7 113-4TA00		34	
5.5	132 S	1450	36	88.5	0.78	12	2.5	6.3	3.1	16	0.018	1LA7 130-4TA00		47	
7.5	132 M	1455	49	84.0	0.78	16.5	2.7	6.7	3.2	16	0.024	1LA7 133-4TA00		53	
11	160 M	1455	72	89.0	0.81	23	2.2	6.2	2.7	16	0.04	1LA7 163-4TA00		73	
15	160 L	1460	98	84.5	0.80	32	2.6	6.5	3.0	16	0.052	1LA7 166-4TA00		98	
18.5	180 M	1460	121	86.5	0.79	39	2.3	7.5	3.0	16	0.13	1LA5 183-4TA00		125	
22	180 L	1475	144	88.0	0.78	46.5	2.3	7.5	3.0	16	0.15	1LA5 186-4TA00		139	
30	200 L	1465	196	89.0	0.81	60	2.6	7.0	3.2	16	0.24	1LA5 207-4TA00		184	
37	225 S	1470	241	92.1	0.84	69	2.8	7.0	3.2	16	0.32	1LA5 220-4TA00		230	
45	225 M	1470	293	92.2	0.87	80	2.8	7.7	3.3	16	0.36	1LA5 223-4TA00		256	
55	250 M	1485	354	94.7	0.86	97	2.9	7.5	3.3	16	0.856	1LG6 253-4TA00		460	
75	280 S	1486	482	94.6	0.87	132	2.6	7.3	2.8	16	1.40	1LG6 280-4TA00		575	
90	280 M	1485	579	94.6	0.88	156	2.5	7.3	2.8	16	1.70	1LG6 283-4TA00		675	
110	315 S	1488	706	95.0	0.87	192	2.6	6.9	2.8	16	2.31	1LG6 310-4TA00		810	
132	315 M	1488	847	95.3	0.87	230	2.7	7.0	2.7	16	2.88	1LG6 313-4TA00		965	
160	315 L	1488	1027	95.7	0.87	275	2.9	7.4	2.9	16	3.46	1LG6 316-4TA00		1105	
200	315 L	1488	1284	95.5	0.88	345	3.2	7.3	3.1	16	4.22	1LG6 317-4TA00		1305	

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time classes F200, F300 – Aluminum series 1LA7/5, cast-iron series 1LG6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code								
	50 Hz				Without flange	With flange			With standard flange		With special flange		
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V3 ²⁾³⁾	IM V1 without protective cover ²⁾³⁾	IM V1 with protective cover ³⁾⁴⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	0	1	1	8	4	6	2	7	3
1LA7 08 □□	○	○	○	–	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 09 □□	○	○	○	–	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LA5 20 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LA5 22 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LG6 25 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LG6 28 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LG6 310 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LG6 313 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LG6 316 □□	–	○	–	○	□ ⁶⁾	–	–	✓	✓	✓	–	–	–
1LG6 317 □□	–	○	–	○	□ ⁶⁾	–	–	✓	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

- 1) If motors frame sizes 180 M to 315 L in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 2) 1LA5 183... to 1LA5 223... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement “**Z**” and order code **K32**.
- 3) 1LG6 253... to 1LG6 317... motors (motor series 1LG6 frame sizes 250 M to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 4) The “Second shaft extension” option, order code **K16** is not possible.
- 5) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 6) Not possible for type of construction IM V6 and IM V5 without protective cover.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time classes F200, F300 – Aluminum series 1LA7/5, cast-iron series 1LG6

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	T_{LR}/T_{rated}									$I_{LR}/I_{rated}$	$T_B/T_{rated}$	Type of construction IM B3 approx.
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A				CL	J kg m ²			m kg	
6-pole, 1000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
0.37	80 M	920	3.9	62.0	0.72	1.2	1.9	3.1	2.1	16	0.0015	1LA7 080-6TAQQ		9.5	
0.55	80 M	910	5.8	67.0	0.74	1.9	2.1	3.4	2.2	16	0.0018	1LA7 083-6TAQQ		11.4	
0.75	90 S	920	7.8	68.0	0.76	2.1	2.2	3.7	2.2	16	0.0028	1LA7 090-6TAQQ		14.8	
1.1	90 L	915	11.5	71.0	0.77	2.9	2.3	3.8	2.3	16	0.0035	1LA7 096-6TAQQ		18	
1.5	100 L	925	15	74.0	0.70	4.25	2.3	4	2.3	16	0.0063	1LA7 106-6TAQQ		26	
2.2	112 M	940	22	76.0	0.70	6.0	2.2	4.6	2.5	16	0.011	1LA7 113-6TAQQ		30	
3	132 S	950	30	72.0	0.76	7.2	1.9	4.2	2.2	16	0.015	1LA7 130-6TAQQ		45	
4	132 M	950	40	81.0	0.76	9.4	2.1	4.5	2.4	16	0.019	1LA7 133-6TAQQ		50	
5.5	132 M	950	55	70.0	0.74	15.4	2.3	5	2.6	16	0.025	1LA7 134-6TAQQ		58	
7.5	160 M	960	75	83.5	0.72	18	2.1	4.6	2.5	16	0.041	1LA7 163-6TAQQ		81	
11	160 L	960	109	87.5	0.71	25.5	2.3	4.8	2.6	16	0.049	1LA7 166-6TAQQ		107	
15	180 L	970	148	89.5	0.70	34.5	2.0	5.2	2.4	16	0.15	1LA5 186-6TAQQ		139	
18.5	200 L	975	181	90.1	0.71	42.5	2.7	5.5	2.8	16	0.24	1LA5 206-6TAQQ		184	
22	200 L	975	215	93.5	0.77	45.5	2.8	5.5	2.9	16	0.28	1LA5 207-6TAQQ		204	
30	225 M	978	294	92.2	0.68	71	2.8	5.7	2.9	16	0.36	1LA5 223-6TAQQ		246	
37	250 M	984	359	92.4	0.84	69	2.7	6.4	2.4	16	0.934	1LG6 253-6TAQQ		405	
45	280 S	986	436	92.7	0.86	81	2.5	6.6	2.5	16	1.40	1LG6 280-6TAQQ		520	
55	280 M	986	533	92.6	0.87	99	2.5	6.5	2.5	16	1.60	1LG6 283-6TAQQ		570	
75	315 S	990	723	93.8	0.85	136	2.7	7.0	2.9	16	2.50	1LG6 310-6TAQQ		760	
90	315 M	990	868	94.2	0.86	160	2.7	7.3	3.0	16	3.20	1LG6 313-6TAQQ		935	
110	315 L	990	1061	94.6	0.87	192	2.6	7.4	3.0	16	4.02	1LG6 316-6TAQQ		1010	
132	315 L	988	1276	94.7	0.87	230	3.0	7.2	2.8	16	4.71	1LG6 317-6TAQQ		1180	
160	315 L	990	1543	94.9	0.86	285	3.1	7.5	3.0	16	5.39	1LG6 318-6TAQQ		1245	

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time classes F200, F300 – Aluminum series 1LA7/5, cast-iron series 1LG6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code									
	50 Hz				Without flange	With flange				With standard flange		With special flange		
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V3 ²⁾³⁾	IM V1 without protective cover ²⁾³⁾	IM V1 with protective cover ³⁾⁴⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover		
	1	6	3	5	0	1	1	8	4	6	2	7	3	
1LA7 08 □□	○	○	○	–	□	✓	✓	–	✓	✓	✓	✓	✓	
1LA7 09 □□	○	○	○	–	□	✓	✓	–	✓	✓	✓	✓	✓	
1LA7 10 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓	
1LA7 11 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓	
1LA7 13 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓	
1LA7 16 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓	
1LA5 18 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–	
1LA5 20 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–	
1LA5 22 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–	
1LG6 25 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–	
1LG6 28 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–	
1LG6 310 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–	
1LG6 313 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–	
1LG6 316 □□	–	○	–	○	□ ⁶⁾	–	–	✓	✓	✓	–	–	–	
1LG6 317 □□														
1LG6 318 □□														

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

- 1) If motors frame sizes 180 M to 315 L in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 2) 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement “**Z**” and order code **K32**.
- 3) 1LG6 253-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 250 M to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 4) The “Second shaft extension” option, order code **K16** is not possible.
- 5) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 6) Not possible for type of construction IM V6 and IM V5 without protective cover.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time classes F200, F300 – Aluminum series 1LA7/5, cast-iron series 1LG6

Selection and ordering data (continued)

Rated output at 50 Hz		Frame size	Order No.	Price	Weight for type of construction IM B3 approx. <i>m</i> kg
1500 rpm	3000 rpm				
P_{rated} kW	P_{rated} kW	FS	For Order No. supplements for voltage and type of construction, see table below		
4/2-pole, 1500/3000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with one winding in Dahlander circuit, with test certificate in accordance with EN 12101-3					
0.14	0.63	80 M	1LA7 080-0TAQQ		11.0
0.23	0.86	80 M	1LA7 083-0TAQQ		12.4
0.3	1.26	90 S	1LA7 090-0TAQQ		14.6
0.45	1.8	90 L	1LA7 096-0TAQQ		17.9
0.59	2.25	100 L	1LA7 106-0TAQQ		24.0
0.72	2.8	100 L	1LA7 107-0TAQQ		27.0
0.99	3.95	112 M	1LA7 113-0TAQQ		34.0
1.3	5.3	132 S	1LA7 130-0TAQQ		47.0
1.8	7.2	132 M	1LA7 133-0TAQQ		53.0
2.6	10.4	160 M	1LA7 163-0TAQQ		74.0
3.85	15.3	160 L	1LA7 166-0TAQQ		105.0
Rated output at 50 Hz		Frame size	Order No.	Price	Weight for type of construction IM B3 approx. <i>m</i> kg
1000 rpm	1500 rpm				
P_{rated} kW	P_{rated} kW	FS	For Order No. supplements for voltage and type of construction, see table below		
6/4-pole, 1000/1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with two windings, with test certificate in accordance with EN 12101-3					
0.11	0.36	80 M	1LA7 080-1TDQQ		10.0
0.16	0.5	80 M	1LA7 083-1TDQQ		11.4
0.26	0.72	90 S	1LA7 090-1TDQQ		14.6
0.34	0.99	90 L	1LA7 096-1TDQQ		17.9
0.54	1.53	100 L	1LA7 106-1TDQQ		24.0
0.68	1.89	100 L	1LA7 107-1TDQQ		27.0
0.81	2.7	112 M	1LA7 113-1TDQQ		34.0
1.08	3.5	132 S	1LA7 130-1TDQQ		47.0
1.53	4.85	132 M	1LA7 133-1TDQQ		53.0
2.25	6.5	160 M	1LA7 163-1TDQQ		73.0
3.35	10.8	160 L	1LA7 166-1TDQQ		98.0
4.95	14.4	180 M	1LA5 183-1TDQQ		125.0
5.9	17.1	180 L	1LA5 186-1TDQQ		139.0
8.6	23.5	200 L	1LA5 207-1TDQQ		184.0
Rated output at 50 Hz		Frame size	Order No.	Price	Weight for type of construction IM B3 approx. <i>m</i> kg
750 rpm	1500 rpm				
P_{rated} kW	P_{rated} kW	FS	For Order No. supplements for voltage and type of construction, see table below		
8/4-pole, 750/1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with one winding in Dahlander circuit, with test certificate in accordance with EN 12101-3					
0.09	0.45	80 M	1LA7 080-0TBQQ		10.0
0.14	0.63	80 M	1LA7 083-0TBQQ		11.4
0.2	0.9	90 S	1LA7 090-0TBQQ		14.6
0.3	1.35	90 L	1LA7 096-0TBQQ		17.9
0.45	1.8	100 L	1LA7 106-0TBQQ		24.0
0.59	2.25	100 L	1LA7 107-0TBQQ		27.0
0.81	3.25	112 M	1LA7 113-0TBQQ		34.0
0.99	4.25	132 S	1LA7 130-0TBQQ		47.0
1.26	5.8	132 M	1LA7 133-0TBQQ		53.0
1.98	8.6	160 M	1LA7 163-0TBQQ		73.0
3	12.6	160 L	1LA7 166-0TBQQ		98.0
4.05	14.4	180 M	1LA5 183-0TBQQ		125.0
4.5	16.7	180 L	1LA5 186-0TBQQ		139.0
6.8	25	200 L	1LA5 207-0TBQQ		184.0

The rated outputs and weights may change slightly after they have been checked.

Further electrical data can be calculated and supplied on receipt of order.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time classes F200, F300 – Aluminum series 1LA7/5, cast-iron series 1LG6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code			Final position: Type of construction code								
	50 Hz, direct online starting			Without flange	With flange				With standard flange			With special flange
	230 V	400 V	500 V	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V3 ¹⁾	IM V1 without protective cover ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35	IM B14, IM V19/18 without protective cover	IM B34	IM B14 IM V19/18 without protective cover	
	1	6	5	0	1	1	8	4	6	2	7	3
1LA7 08 .-. . . . □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 09 .-. . . . □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 10 .-. . . . □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 11 .-. . . . □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 13 .-. . . . □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 16 .-. . . . □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA5 18 .-. . . . □□	○	○	○	□	✓ ³⁾	✓	–	✓	✓	–	–	–
1LA5 20 .-. . . . □□	○	○	○	□	✓ ³⁾	✓	–	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

- 1) 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement “**Z**” and order code **K32**.
- 2) The “Second shaft extension” option, order code **K16** is not possible.
- 3) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time classes F200, F300 – Aluminum series 1PP7/5, cast-iron series 1PP6

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	$\cos\phi_{\text{rated}}$									Type of construction IM B3 approx. m kg
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	$T_{\text{LR}}/T_{\text{rated}}$	$I_{\text{LR}}/I_{\text{rated}}$	$T_{\text{B}}/T_{\text{rated}}$	CL	J kg m ²				
2-pole, 3000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
0.75	80 M	2830	2.5	63.0	0.83	2.1	2.3	5.6	2.4	16	0.00085	1PP7 080-2TAQQ		9.8	
1.1	80 M	2845	3.7	74.0	0.80	2.7	2.6	6.1	2.7	16	0.0011	1PP7 083-2TAQQ		11.5	
1.5	90 S	2860	5.0	73.0	0.80	3.7	2.4	5.5	2.7	16	0.0015	1PP7 090-2TAQQ		14.6	
2.2	90 L	2880	7.3	78.0	0.80	5.1	2.8	6.3	3.1	16	0.002	1PP7 096-2TAQQ		17.4	
3	100 L	2890	9.9	77.0	0.83	6.8	2.8	6.8	3.0	16	0.0038	1PP7 106-2TAQQ		23	
4	112 M	2905	13	82.0	0.83	8.5	2.6	7.2	2.9	16	0.0055	1PP7 113-2TAQQ		31	
5.5	132 S	2925	18	85.5	0.87	10.7	2.0	5.9	2.8	16	0.016	1PP7 130-2TAQQ		44	
7.5	132 S	2930	24	88.0	0.89	13.8	2.3	6.9	3.0	16	0.021	1PP7 131-2TAQQ		52	
11	160 M	2940	36	88.0	0.86	21	2.1	6.5	2.9	16	0.034	1PP7 163-2TAQQ		71	
15	160 M	2940	49	90.8	0.90	26.5	2.2	6.6	3.0	16	0.04	1PP7 164-2TAQQ		82	
18.5	160 L	2940	60	90.3	0.91	32.5	2.4	7.0	3.1	16	0.052	1PP7 166-2TAQQ		95	
22	180 M	2940	71	91.1	0.85	41	2.5	6.9	3.2	16	0.077	1PP5 183-2TAQQ		119	
30	200 L	2945	97	91.8	0.89	53	2.4	7.2	2.8	16	0.14	1PP5 206-2TAQQ		168	
37	200 L	2945	120	92.3	0.89	65	2.4	7.7	2.8	16	0.16	1PP5 207-2TAQQ		191	
45	225 M	2960	145	93.6	0.89	78	2.8	7.7	3.4	16	0.2	1PP5 223-2TAQQ		226	
55	250 M	2975	177	95.1	0.90	94	2.5	7.4	3.3	13	0.466	1PP6 253-2TBQQ		405	
75	280 S	2975	241	95.3	0.91	126	2.6	7.5	2.9	13	0.832	1PP6 280-2TBQQ		510	
90	280 M	2975	289	95.6	0.90	152	3.0	7.5	3.0	13	1.00	1PP6 283-2TBQQ		595	
110	315 S	2985	352	95.9	0.90	186	2.6	7.5	3.2	13	1.39	1PP6 310-2TBQQ		770	
132	315 M	2984	422	96.1	0.91	220	2.7	7.4	3.0	13	1.62	1PP6 313-2TBQQ		895	
160	315 L	2984	512	96.3	0.93	260	2.8	7.5	3.1	13	2.09	1PP6 316-2TBQQ		1035	
200	315 L	2984	640	96.4	0.93	325	2.5	7.0	2.8	13	2.46	1PP6 317-2TBQQ		1225	
4-pole, 1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
0.55	80 M	1395	3.7	57.0	0.75	1.85	2.2	3.9	2.2	16	0.0015	1PP7 080-4TAQQ		9.6	
0.75	80 M	1405	5.1	63.0	0.73	2.35	2.3	4.2	2.3	16	0.0018	1PP7 083-4TAQQ		11	
1.1	90 S	1415	7.4	68.0	0.74	3.15	2.3	4.6	2.4	16	0.0028	1PP7 090-4TAQQ		14	
1.5	90 L	1420	10	73.0	0.74	4.0	2.4	5.3	2.6	16	0.0035	1PP7 096-4TAQQ		17.3	
2.2	100 L	1420	15	75.0	0.78	5.4	2.5	5.6	2.8	16	0.0048	1PP7 106-4TAQQ		23	
3	100 L	1415	20	77.0	0.78	7.2	2.7	5.6	3.0	16	0.0058	1PP7 107-4TAQQ		26	
4	112 M	1440	27	78.0	0.78	9.2	2.7	6.5	3.0	16	0.011	1PP7 113-4TAQQ		33	
5.5	132 S	1450	36	88.5	0.78	12	2.5	6.3	3.1	16	0.018	1PP7 130-4TAQQ		46	
7.5	132 M	1455	49	84.0	0.78	16.5	2.7	6.7	3.2	16	0.024	1PP7 133-4TAQQ		52	
11	160 M	1455	72	89.0	0.81	23	2.2	6.2	2.7	16	0.04	1PP7 163-4TAQQ		70	
15	160 L	1460	98	84.5	0.80	32	2.6	6.5	3.0	16	0.052	1PP7 166-4TAQQ		95	
18.5	180 M	1460	121	86.5	0.79	39	2.3	7.5	3.0	16	0.13	1PP5 183-4TAQQ		116	
22	180 L	1475	144	88.0	0.78	46.5	2.3	7.5	3.0	16	0.15	1PP5 186-4TAQQ		130	
30	200 L	1465	196	89.0	0.81	60	2.6	7.0	3.2	16	0.24	1PP5 207-4TAQQ		173	
37	225 S	1470	241	92.1	0.84	69	2.8	7.0	3.2	16	0.32	1PP5 220-4TAQQ		218	
45	225 M	1470	293	92.2	0.87	80	2.8	7.7	3.3	16	0.36	1PP5 223-4TAQQ		244	
55	250 M	1485	354	94.9	0.86	97	2.9	7.5	3.3	16	0.856	1PP6 253-4TAQQ		445	
75	280 S	1486	482	95.0	0.87	132	2.6	7.3	2.8	16	1.39	1PP6 280-4TAQQ		555	
90	280 M	1485	579	94.9	0.88	156	2.5	7.3	2.8	16	1.71	1PP6 283-4TAQQ		655	
110	315 S	1488	706	95.3	0.87	192	2.6	6.9	2.8	16	2.31	1PP6 310-4TAQQ		790	
132	315 M	1488	847	95.5	0.87	230	2.7	7.0	2.7	16	2.88	1PP6 313-4TAQQ		945	
160	315 L	1488	1027	95.9	0.87	275	2.9	7.4	2.9	16	3.46	1PP6 316-4TAQQ		1085	
200	315 L	1488	1284	95.7	0.88	345	3.2	7.3	3.1	16	4.22	1PP6 317-4TAQQ		1285	

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time classes F200, F300 – Aluminum series 1PP7/5, cast-iron series 1PP6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange			With standard flange	With special flange		
	230 VΔ/ 400 VY	400 VΔ/ 690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6/5 without protective cover ¹⁾	IM B5, IM V3 ^{2) 3)}	IM V1 without protective cover ²⁾	IM B35	IM B14, IM V19/18 without protective cover	IM B34	IM B14, IM V19/18 without protective cover	
1	6	3	5	0	1	1	8	6	2	7	3	
1PP7 08 □□	○	○	○	–	□	✓	✓	–	✓	✓	✓	✓
1PP7 09 □□	○	○	○	–	□	✓	✓	–	✓	✓	✓	✓
1PP7 10 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 11 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 13 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 16 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP5 18 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP5 20 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP5 22 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 25 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 28 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 310 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 313 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 316 □□	–	○	–	○	□ ⁵⁾	–	–	✓	✓	–	–	–
1PP6 317 □□	–	○	–	○	□ ⁵⁾	–	–	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

¹⁾ If motors frame sizes 180 M to 315 L in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1PP5 183-... to 1PP5 223-... motors (motor series 1PP5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement “Z” and order code **K32**.

³⁾ 1PP6 253-... to 1PP6 318-... motors (motor series 1PP6 frame sizes 250 M to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

⁵⁾ Not possible for type of construction IM V6 and IM V5 without protective cover.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time classes F200, F300 – Aluminum series 1PP7/5, cast-iron series 1PP6

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	T_{LR}/T_{rated}									$I_{LR}/I_{rated}$	$T_B/T_{rated}$	Type of construction IM B3 approx.
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²			m kg	
6-pole, 1000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
0.37	80 M	920	3.9	62.0	0.72	1.2	1.9	3.1	2.1	16	0.0015	1PP7 080-6TAQQ		9.6	
0.55	80 M	910	5.8	67.0	0.74	1.9	2.1	3.4	2.2	16	0.0018	1PP7 083-6TAQQ		11	
0.75	90 S	920	7.8	68.0	0.76	2.1	2.2	3.7	2.2	16	0.0028	1PP7 090-6TAQQ		14.2	
1.1	90 L	915	11.5	71.0	0.77	2.9	2.3	3.8	2.3	16	0.0035	1PP7 096-6TAQQ		17.4	
1.5	100 L	925	15	74.0	0.70	4.25	2.3	4	2.3	16	0.0063	1PP7 106-6TAQQ		25	
2.2	112 M	940	22	76.0	0.70	6.0	2.2	4.6	2.5	16	0.011	1PP7 113-6TAQQ		29	
3	132 S	950	30	72.0	0.76	7.2	1.9	4.2	2.2	16	0.015	1PP7 130-6TAQQ		44	
4	132 M	950	40	81.0	0.76	9.4	2.1	4.5	2.4	16	0.019	1PP7 133-6TAQQ		49	
5.5	132 M	950	55	70.0	0.74	15.4	2.3	5	2.6	16	0.025	1PP7 134-6TAQQ		57	
7.5	160 M	960	75	83.5	0.72	18	2.1	4.6	2.5	16	0.041	1PP7 163-6TAQQ		78	
11	160 L	960	109	87.5	0.71	25.5	2.3	4.8	2.6	16	0.049	1PP7 166-6TAQQ		104	
15	180 L	970	148	89.5	0.70	34.5	2.0	5.2	2.4	16	0.15	1PP5 186-6TAQQ		130	
18.5	200 L	975	181	90.1	0.71	42.5	2.7	5.5	2.8	16	0.24	1PP5 206-6TAQQ		173	
22	200 L	975	215	93.5	0.77	45.5	2.8	5.5	2.9	16	0.28	1PP5 207-6TAQQ		193	
30	225 M	978	294	92.2	0.68	71	2.8	5.7	2.9	16	0.36	1PP5 223-6TAQQ		234	
37	250 M	984	359	92.6	0.84	69	2.7	6.4	2.4	16	0.934	1PP6 253-6TAQQ		390	
45	280 S	986	436	92.8	0.86	81	2.5	6.6	2.5	16	1.37	1PP6 280-6TAQQ		500	
55	280 M	986	533	92.7	0.87	99	2.5	6.5	2.5	16	1.65	1PP6 283-6TAQQ		550	
75	315 S	990	723	93.9	0.85	136	2.7	7.0	2.9	16	2.50	1PP6 310-6TAQQ		740	
90	315 M	990	868	94.3	0.86	160	2.7	7.3	3.0	16	3.20	1PP6 313-6TAQQ		915	
110	315 L	990	1061	94.7	0.87	192	2.6	7.4	3.0	16	4.02	1PP6 316-6TAQQ		990	
132	315 L	988	1276	94.8	0.87	230	3.0	7.2	2.8	16	4.71	1PP6 317-6TAQQ		1160	
160	315 L	990	1543	95.0	0.86	285	3.1	7.5	3.0	16	5.39	1PP6 318-6TAQQ		1225	

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time classes F200, F300 – Aluminum series 1PP7/5, cast-iron series 1PP6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange			With standard flange	With special flange		
	230 VΔ/ 400 VY	400 VΔ/ 690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6/5 without protective cover ¹⁾	IM B5, IM V3 ^{2) 3)}	IM V1 without protective cover ²⁾	IM B35	IM B14, IM V19/18 without protective cover	IM B34	IM B14, IM V19/18 without protective cover	
1	6	3	5	0	1	1	8	6	2	7	3	
1PP7 08 □□	○	○	○	–	□	✓	✓	–	✓	✓	✓	✓
1PP7 09 □□	○	○	○	–	□	✓	✓	–	✓	✓	✓	✓
1PP7 10 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 11 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 13 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 16 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP5 18 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP5 20 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP5 22 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 25 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 28 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 310 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 313 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 316 □□	–	○	–	○	□ ⁵⁾	–	–	✓	✓	–	–	–
1PP6 317 □□	–	○	–	○	□ ⁵⁾	–	–	✓	✓	–	–	–
1PP6 318 □□	–	○	–	○	□ ⁵⁾	–	–	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

¹⁾ If motors frame sizes 180 M to 315 L in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1PP5 183-... to 1PP5 223-... motors (motor series 1PP5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement “**Z**” and order code **K32**.

³⁾ 1PP6 253-... to 1PP6 318-... motors (motor series 1PP6 frame sizes 250 M to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

⁵⁾ Not possible for type of construction IM V6 and IM V5 without protective cover.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time classes F200, F300 – Aluminum series 1PP7/5, cast-iron series 1PP6

Selection and ordering data (continued)

Rated output at 50 Hz		Frame size	Order No.	Price	Weight for type of construction IM B3 approx.
1500 rpm	3000 rpm				
P_{rated} kW	P_{rated} kW	FS	For Order No. supplements for voltage and type of construction, see table below		
4/2-pole, 1500/3000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with one winding in Dahlander circuit, with test certificate in accordance with EN 12101-3					
0.14	0.63	80 M	1PP7 080-0TAQQ		10.6
0.23	0.86	80 M	1PP7 083-0TAQQ		12.0
0.3	1.26	90 S	1PP7 090-0TAQQ		14.0
0.45	1.8	90 L	1PP7 096-0TAQQ		17.3
0.59	2.25	100 L	1PP7 106-0TAQQ		23.0
0.72	2.8	100 L	1PP7 107-0TAQQ		26.0
0.99	3.95	112 M	1PP7 113-0TAQQ		33.0
1.3	5.3	132 S	1PP7 130-0TAQQ		46.0
1.8	7.2	132 M	1PP7 133-0TAQQ		52.0
2.6	10.4	160 M	1PP7 163-0TAQQ		70.0
3.85	15.3	160 L	1PP7 166-0TAQQ		101.0
Rated output at 50 Hz					
1000 rpm	1500 rpm				
P_{rated} kW	P_{rated} kW				
6/4-pole, 1000/1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with two windings, with test certificate in accordance with EN 12101-3					
0.11	0.36	80 M	1PP7 080-1TDQQ		9.6
0.16	0.5	80 M	1PP7 083-1TDQQ		11.0
0.26	0.72	90 S	1PP7 090-1TDQQ		14.0
0.34	0.99	90 L	1PP7 096-1TDQQ		17.3
0.54	1.53	100 L	1PP7 106-1TDQQ		23.0
0.68	1.89	100 L	1PP7 107-1TDQQ		26.0
0.81	2.7	112 M	1PP7 113-1TDQQ		33.0
1.08	3.5	132 S	1PP7 130-1TDQQ		46.0
1.53	4.85	132 M	1PP7 133-1TDQQ		52.0
2.25	6.5	160 M	1PP7 163-1TDQQ		70.0
3.35	10.8	160 L	1PP7 166-1TDQQ		95.0
4.95	14.4	180 M	1PP5 183-1TDQQ		116.0
5.9	17.1	180 L	1PP5 186-1TDQQ		130.0
8.6	23.5	200 L	1PP5 207-1TDQQ		173.0
Rated output at 50 Hz					
750 rpm	1500 rpm				
P_{rated} kW	P_{rated} kW				
8/4-pole, 750/1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with one winding in Dahlander circuit, with test certificate in accordance with EN12101-3					
0.09	0.45	80 M	1PP7 080-0TBQQ		9.6
0.14	0.63	80 M	1PP7 083-0TBQQ		11.0
0.2	0.9	90 S	1PP7 090-0TBQQ		14.0
0.3	1.35	90 L	1PP7 096-0TBQQ		17.3
0.45	1.8	100 L	1PP7 106-0TBQQ		23.0
0.59	2.25	100 L	1PP7 107-0TBQQ		26.0
0.81	3.25	112 M	1PP7 113-0TBQQ		33.0
0.99	4.25	132 S	1PP7 130-0TBQQ		46.0
1.26	5.8	132 M	1PP7 133-0TBQQ		52.0
1.98	8.6	160 M	1PP7 163-0TBQQ		70.0
3	12.6	160 L	1PP7 166-0TBQQ		95.0
4.05	14.4	180 M	1PP5 183-0TBQQ		116.0
4.5	16.7	180 L	1PP5 186-0TBQQ		130.0
6.8	25	200 L	1PP5 207-0TBQQ		173.0

The rated outputs and weights may change slightly after they have been checked.

Further electrical data can be calculated and supplied on receipt of order.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time classes F200, F300 – Aluminum series 1PP7/5, cast-iron series 1PP6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code			Final position: Type of construction code							
	50 Hz, direct online starting			Without flange	With flange			With standard flange		With special flange	
	230 V	400 V	500 V	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V3 ¹⁾	IM V 1 without protective cover	IM B35	IM B14, IM V19/18 without protective cover	IM B34	IM B14, IM V19/18 without protective cover	
	1	6	5	0	1	1	8	6	2	7	3
1PP7 08 .-. . . . □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 09 .-. . . . □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 10 .-. . . . □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 11 .-. . . . □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 13 .-. . . . □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 16 .-. . . . □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP5 18 .-. . . . □□	○	○	○	□	✓ ²⁾	✓	–	✓	–	–	–
1PP5 20 .-. . . . □□	○	○	○	□	✓ ²⁾	✓	–	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

1) 1PP5 183-... to 1PP5 223-... motors (motor series 1PP5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement “**Z**” and order code **K32**.

2) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time class F400
Cast-iron series 1LA6, 1LG6

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	$\cos\phi_{\text{rated}}$									Type of construction IM B3 approx. m kg
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	$T_{\text{LR}}/T_{\text{rated}}$	$I_{\text{LR}}/I_{\text{rated}}$	$T_{\text{B}}/T_{\text{rated}}$	CL	J kg m ²				
2-pole, 3000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
3	100 L	2875	10	78.0	0.85	6.5	2.5	6.2	2.8	16	0.0038	1LA6 106-2UAQQ		32	
4	112 M	2900	13	78.0	0.85	8.7	2.5	6.8	2.9	16	0.0055	1LA6 113-2UAQQ		41	
5.5	132 S	2920	18	82.5	0.89	10.8	1.9	5.7	2.7	16	0.016	1LA6 130-2UAQQ		51	
7.5	132 S	2930	24	84.0	0.89	14.5	2.0	6.5	2.8	16	0.021	1LA6 131-2UAQQ		56	
11	160 M	2930	36	88.0	0.85	21	1.8	6.4	2.7	16	0.034	1LA6 163-2UAQQ		93	
15	160 M	2930	49	88.5	0.89	27.5	2.0	6.5	2.80	16	0.04	1LA6 164-2UAQQ		102	
18.5	160 L	2930	60	87.5	0.90	34	2.0	7.0	2.70	16	0.05	1LA6 166-2UAQQ		112	
22	180 M	2955	71	92.6	0.88	39	2.4	7.0	3.2	16	0.086	1LG6 183-2UAQQ		180	
30	200 L	2955	97	92.2	0.88	53	2.3	6.7	3.1	16	0.151	1LG6 206-2UAQQ		225	
37	200 L	2958	119	92.5	0.89	65	2.4	7.1	3.2	16	0.182	1LG6 207-2UAQQ		255	
45	225 M	2962	145	94.6	0.89	77	2.4	7.1	3.1	16	0.266	1LG6 223-2UAQQ		330	
55	250 M	2972	177	94.3	0.90	94	2.3	6.7	2.9	16	0.466	1LG6 253-2UAQQ		420	
75	280 S	2975	241	94.5	0.89	128	2.4	6.8	2.9	13	0.832	1LG6 280-2UBQQ		530	
90	280 M	2976	289	94.9	0.90	152	2.5	7.4	3.0	13	1.00	1LG6 283-2UBQQ		615	
110	315 S	2982	352	94.7	0.91	184	2.4	6.8	2.7	13	1.39	1LG6 310-2UBQQ		790	
132	315 M	2980	423	95.2	0.91	220	2.5	6.9	2.8	13	1.62	1LG6 313-2UBQQ		915	
160	315 L	2982	512	95.6	0.92	265	2.4	7.1	2.8	13	2.09	1LG6 316-2UBQQ		1055	
190	315 L	2982	608	95.9	0.93	325	2.6	7.2	2.9	13	2.46	1LG6 317-2UBQQ		1245	
4-pole, 1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
2.2	100 L	1410	15	74.0	0.75	5.6	2.2	5.2	2.7	16	0.0048	1LA6 106-4UAQQ		32	
3	100 L	1410	20	76.0	0.80	7.1	2.5	5.0	2.6	16	0.0058	1LA6 107-4UAQQ		34	
4	112 M	1440	27	79.0	0.76	9.8	2.7	5.7	3.0	16	0.011	1LA6 113-4UAQQ		43	
5.5	132 S	1455	36	78.0	0.75	13.5	2.5	6.3	3.0	16	0.018	1LA6 130-4UAQQ		53	
7.5	132 M	1455	49	84.0	0.75	17.2	2.7	6.7	3.1	16	0.024	1LA6 133-4UAQQ		60	
11	160 M	1460	72	82.5	0.80	24	2.2	6.2	2.7	16	0.04	1LA6 163-4UAQQ		97	
15	160 L	1460	98	81.5	0.80	33.5	2.4	6.4	2.8	16	0.052	1LA6 166-4UAQQ		110	
18.5	180 M	1470	120	90.7	0.84	35	2.4	6.1	2.8	16	0.122	1LG6 183-4UAQQ		155	
22	180 L	1472	143	91.7	0.85	40.5	2.4	6.4	2.9	16	0.144	1LG6 186-4UAQQ		180	
30	200 L	1470	195	92.2	0.86	55	2.4	6.4	3.1	16	0.234	1LG6 207-4UAQQ		225	
37	225 S	1480	239	92.6	0.86	67	2.6	6.5	2.8	16	0.398	1LG6 220-4UAQQ		290	
45	225 M	1480	290	93.3	0.86	81	2.7	6.6	2.9	16	0.486	1LG6 223-4UAQQ		330	
55	250 M	1485	354	94.2	0.87	97	2.5	7.4	2.9	16	0.856	1LG6 253-4UAQQ		460	
75	280 S	1484	483	94.2	0.87	132	2.4	6.7	2.8	16	1.39	1LG6 280-4UAQQ		574	
90	280 M	1486	578	94.7	0.86	160	2.6	7.3	3.0	16	1.71	1LG6 283-4UAQQ		675	
110	315 S	1488	706	95.0	0.87	192	2.7	7.0	2.8	16	2.31	1LG6 310-4UAQQ		810	
132	315 M	1488	847	95.3	0.88	225	2.6	7.1	2.8	16	2.88	1LG6 313-4UAQQ		965	
160	315 L	1490	1025	95.6	0.88	275	2.9	7.2	2.9	16	3.46	1LG6 316-4UAQQ		1105	
200	315 L	1488	1284	95.7	0.88	345	3.1	7.5	2.9	16	4.22	1LG6 317-4UAQQ		1305	

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time class F400
Cast-iron series 1LA6, 1LG6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code								
	50 Hz				Without flange	With flange					With standard flange	With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V3 ²⁾	IM V1 without protective cover ²⁾	IM V1 with protective cover ²⁾³⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	0	1	1	8	4	6	2	7	3
1LA6 10 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 11 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 13 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 16 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 18 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 20 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 22 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 25 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 28 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 310 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 313 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 316 □□	–	○	–	○	□ ⁵⁾	–	–	✓	✓	✓	–	–	–
1LG6 317 □□	–	○	–	○	□ ⁵⁾	–	–	✓	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

- 1) If motors 1LG6 183-... to 1LG6 317-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 2) 1LG6 220-... to 1LG6 317-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 3) The “Second shaft extension” option, order code **K16** is not possible.
- 4) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 5) Not possible for type of construction IM V6 and IM V5 without protective cover.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time class F400
Cast-iron series 1LA6, 1LG6

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	$\cos\phi_{\text{rated}}$									Type of construction IM B3 approx.
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	$T_{\text{LR}}/T_{\text{rated}}$	$I_{\text{LR}}/I_{\text{rated}}$	$T_{\text{B}}/T_{\text{rated}}$	CL	J kg m ²		m kg		
6-pole, 1000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
1.5	100 L	925	15	69.0	0.70	4.5	2.3	4.0	2.3	16	0.0063	1LA6 106-6UAQQ		32	
2.2	112 M	940	22	72.0	0.74	6.1	2.1	4.4	2.3	16	0.011	1LA6 113-6UAQQ		43	
3	132 S	950	30	74.0	0.75	7.8	1.6	4.1	1.7	16	0.015	1LA6 130-6UAQQ		54	
4	132 M	950	40	76.0	0.76	10	1.7	4.6	2.1	16	0.019	1LA6 133-6UAQQ		63	
5.5	132 M	950	55	75.0	0.76	14	2.0	5.0	2.3	16	0.025	1LA6 134-6UAQQ		74	
7.5	160 M	970	75	75.0	0.72	20	2.0	5.0	2.4	16	0.041	1LA6 163-6UAQQ		110	
11	160 L	970	109	80.0	0.72	27.5	2.0	5.0	2.5	16	0.049	1LA6 166-6UAQQ		132	
15	180 L	974	147	88.7	0.82	30	2.2	5.2	2.3	16	0.203	1LG6 186-6UAQQ		175	
18.5	200 L	975	181	89.4	0.82	36.5	2.2	5.3	2.3	16	0.285	1LG6 206-6UAQQ		210	
22	200 L	975	215	90.5	0.83	42.5	2.2	5.4	2.3	16	0.362	1LG6 207-6UAQQ		240	
30	225 M	980	292	92.2	0.84	56	2.7	6.3	2.8	16	0.629	1LG6 223-6UAQQ		325	
37	250 M	984	359	92.6	0.84	69	2.8	6.5	2.4	16	0.934	1LG6 253-6UAQQ		405	
45	280 S	986	436	92.3	0.86	82	2.8	6.3	2.5	16	1.37	1LG6 280-6UAQQ		520	
55	280 M	986	533	92.8	0.86	99	3.1	6.8	2.7	16	1.65	1LG6 283-6UAQQ		570	
75	315 S	990	723	93.7	0.84	138	2.7	7.0	2.9	16	2.50	1LG6 310-6UAQQ		760	
90	315 M	988	870	94.2	0.85	162	2.6	7.1	2.8	16	3.20	1LG6 313-6UAQQ		935	
110	315 L	988	1063	94.5	0.85	198	2.8	7.2	2.8	16	4.02	1LG6 316-6UAQQ		1010	
132	315 L	990	1273	94.9	0.85	235	3.0	7.5	3.0	16	4.71	1LG6 317-6UAQQ		1180	
160	315 L	988	1546	94.9	0.86	285	3.1	7.5	3.0	16	5.39	1LG6 318-6UAQQ		1245	

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time class F400
Cast-iron series 1LA6, 1LG6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code								
	50 Hz				Without flange	With flange				With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V3 ²⁾	IM V1 without protective cover ²⁾	IM V1 with protective cover ²⁾³⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	0	1	1	8	4	6	2	7	3
1LA6 10 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 11 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 13 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 16 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LG6 18 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 20 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 22 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 25 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 28 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 310 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 313 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 316 □□	–	○	–	○	□ ⁵⁾	–	–	✓	✓	✓	–	–	–
1LG6 317 □□													
1LG6 318 □□													

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

1) If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

2) 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

3) The “Second shaft extension” option, order code **K16** is not possible.

4) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

5) Not possible for type of construction IM V6 and IM V5 without protective cover.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time class F400
Cast-iron series 1LA6, 1LG6

Selection and ordering data (continued)

Rated output at 50 Hz 1500 rpm	3000 rpm	Frame size	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight for type of construction IM B3 approx. <i>m</i> kg
P_{rated} kW	P_{rated} kW	FS			
4/2-pole, 1500/3000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with one winding in Dahlander circuit, with test certificate in accordance with EN 12101-3					
0.52	2	100 L	1LA6 106-0UAQQ		32
0.64	2.5	100 L	1LA6 107-0UAQQ		35
0.88	3.5	112 M	1LA6 113-0UAQQ		43
1.16	4.7	132 S	1LA6 130-0UAQQ		53
1.6	6.4	132 M	1LA6 133-0UAQQ		60
2.3	9.2	160 M	1LA6 163-0UAQQ		97
3.45	13.6	160 L	1LA6 166-0UAQQ		110
Rated output at 50 Hz 1000 rpm	1500 rpm				
P_{rated} kW	P_{rated} kW				
6/4-pole, 1000/1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with two windings, with test certificate in accordance with EN 12101-3					
0.48	1.36	100 L	1LA6 106-1UDQQ		32
0.6	1.68	100 L	1LA6 107-1UDQQ		35
0.72	2.4	112 M	1LA6 113-1UDQQ		43
0.96	3.1	132 S	1LA6 130-1UDQQ		53
1.36	4.3	132 M	1LA6 133-1UDQQ		60
2	5.75	160 M	1LA6 163-1UDQQ		97
2.95	9.6	160 L	1LA6 166-1UDQQ		110
Rated output at 50 Hz 750 rpm	1500 rpm				
P_{rated} kW	P_{rated} kW				
8/4-pole, 750/1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with one winding in Dahlander circuit, with test certificate in accordance with EN 12101-3					
0.3	1.6	100 L	1LA6 106-0UBQQ		32
0.52	2	100 L	1LA6 107-0UBQQ		35
0.72	2.85	112 M	1LA6 113-0UBQQ		43
0.88	3.75	132 S	1LA6 130-0UBQQ		53
1.12	5.1	132 M	1LA6 133-0UBQQ		60
1.76	7.6	160 M	1LA6 163-0UBQQ		97
2.6	11.2	160 L	1LA6 166-0UBQQ		110

The rated outputs and weights may change slightly after they have been checked.

Further electrical data can be calculated and supplied on receipt of order.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time class F400
Cast-iron series 1LA6, 1LG6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code			Final position: Type of construction code								
	50 Hz, direct online starting			Without flange	With flange				With standard flange		With special flange	
	230 V	400 V	500 V	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V3	IM V1 without protective cover	IM V1 with protective cover ¹⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	5	0	1	1	8	4	6	2	7	3
1LA6 10 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 11 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 13 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 16 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

¹⁾ The “Second shaft extension” option, order code **K16** is not possible.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time class F400
Cast-iron series 1PP6

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	$\cos\phi_{\text{rated}}$									$I_{\text{LR}}/I_{\text{rated}}$	$T_{\text{B}}/T_{\text{rated}}$	Type of construction IM B3 approx.
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	$T_{\text{LR}}/T_{\text{rated}}$	$I_{\text{LR}}/I_{\text{rated}}$	$T_{\text{B}}/T_{\text{rated}}$	CL	J kg m ²			m kg	
2-pole, 3000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
3	100 L	2875	10	78.0	0.85	6.5	2.5	6.2	2.8	16	0.0038	1PP6 106-2UAQQ		31	
4	112 M	2900	13	78.0	0.85	8.7	2.5	6.8	2.9	16	0.0055	1PP6 113-2UAQQ		40	
5.5	132 S	2920	18	82.5	0.89	10.8	1.9	5.7	2.7	16	0.016	1PP6 130-2UAQQ		49	
7.5	132 S	2930	24	84.0	0.89	14.5	2.0	6.5	2.8	16	0.021	1PP6 131-2UAQQ		54	
11	160 M	2930	36	88.0	0.85	21	1.8	6.4	2.7	16	0.034	1PP6 163-2UAQQ		91	
15	160 M	2930	49	88.5	0.89	27.5	2.0	6.5	2.80	16	0.04	1PP6 164-2UAQQ		99	
18.5	160 L	2930	60	87.5	0.90	34	2.0	7.0	2.70	16	0.052	1PP6 166-2UAQQ		109	
22	180 M	2955	71	93.1	0.88	39	2.4	7.0	3.2	16	0.086	1PP6 183-2UAQQ		175	
30	200 L	2955	97	92.8	0.88	53	2.3	6.7	3.1	16	0.151	1PP6 206-2UAQQ		215	
37	200 L	2958	119	93.0	0.89	65	2.4	7.1	3.2	16	0.182	1PP6 207-2UAQQ		245	
45	225 M	2962	145	95.0	0.89	77	2.4	7.1	3.1	16	0.266	1PP6 223-2UAQQ		320	
55	250 M	2972	177	94.9	0.90	94	2.3	6.7	2.9	16	0.466	1PP6 253-2UAQQ		405	
75	280 S	2975	241	94.9	0.89	128	2.4	6.8	2.9	13	0.832	1PP6 280-2UBQQ		510	
90	280 M	2976	289	95.2	0.90	152	2.5	7.4	3.0	13	1.00	1PP6 283-2UBQQ		595	
110	315 S	2982	352	95.3	0.91	184	2.4	6.8	2.7	13	1.39	1PP6 310-2UBQQ		770	
132	315 M	2980	423	95.7	0.91	220	2.5	6.9	2.8	13	1.62	1PP6 313-2UBQQ		895	
160	315 L	2982	512	96.0	0.92	265	2.4	7.1	2.8	13	2.09	1PP6 316-2UBQQ		1035	
190	315 L	2982	608	96.3	0.93	325	2.6	7.2	2.9	13	2.46	1PP6 317-2UBQQ		1225	
4-pole, 1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
2.2	100 L	1410	15	74.0	0.75	5.6	2.2	5.2	2.7	16	0.0048	1PP6 106-4UAQQ		31	
3	100 L	1410	20	76.0	0.80	7.1	2.5	5.0	2.6	16	0.0058	1PP6 107-4UAQQ		34	
4	112 M	1440	27	79.0	0.76	9.8	2.7	5.7	3.0	16	0.011	1PP6 113-4UAQQ		42	
5.5	132 S	1455	36	78.0	0.75	13.5	2.5	6.3	3.0	16	0.018	1PP6 130-4UAQQ		51	
7.5	132 M	1455	49	84.0	0.75	17.2	2.7	6.7	3.1	16	0.024	1PP6 133-4UAQQ		58	
11	160 M	1460	72	82.5	0.80	24	2.2	6.2	2.7	16	0.04	1PP6 163-4UAQQ		95	
15	160 L	1460	98	81.5	0.80	33.5	2.4	6.4	2.8	16	0.052	1PP6 166-4UAQQ		108	
18.5	180 M	1470	120	91.2	0.84	35	2.4	6.1	2.8	16	0.122	1PP6 183-4UAQQ		150	
22	180 L	1472	143	92.1	0.85	40.5	2.4	6.4	2.9	16	0.144	1PP6 186-4UAQQ		175	
30	200 L	1470	195	92.6	0.86	55	2.4	6.4	3.1	16	0.234	1PP6 207-4UAQQ		215	
37	225 S	1480	239	92.9	0.86	67	2.6	6.5	2.8	16	0.398	1PP6 220-4UAQQ		280	
45	225 M	1480	290	93.6	0.86	81	2.7	6.6	2.9	16	0.486	1PP6 223-4UAQQ		320	
55	250 M	1485	354	94.5	0.87	97	2.5	7.4	2.9	16	0.856	1PP6 253-4UAQQ		445	
75	280 S	1484	483	94.6	0.87	132	2.4	6.7	2.8	16	1.39	1PP6 280-4UAQQ		554	
90	280 M	1486	578	95.1	0.86	160	2.6	7.3	3.0	16	1.71	1PP6 283-4UAQQ		655	
110	315 S	1488	706	95.3	0.87	192	2.7	7.0	2.8	16	2.31	1PP6 310-4UAQQ		790	
132	315 M	1488	847	95.6	0.88	225	2.6	7.1	2.8	16	2.88	1PP6 313-4UAQQ		945	
160	315 L	1490	1025	95.8	0.88	275	2.9	7.2	2.9	16	3.46	1PP6 316-4UAQQ		1085	
200	315 L	1488	1284	95.9	0.88	345	3.1	7.5	2.9	16	4.22	1PP6 317-4UAQQ		1285	

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time class F400
Cast-iron series 1PP6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange			With standard flange	With special flange		
	230 VΔ/ 400 VY	400 VΔ/ 690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V3 ²⁾	IM V1 without protective cover	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	0	1	1	8	6	2	7	3
1PP6 10 .-. . . . □□	○	○	○	○	□	✓	✓	-	✓	✓	✓	✓
1PP6 11 .-. . . . □□	○	○	○	○	□	✓	✓	-	✓	✓	✓	✓
1PP6 13 .-. . . . □□	○	○	○	○	□	✓	✓	-	✓	✓	✓	✓
1PP6 16 .-. . . . □□	○	○	○	○	□	✓	✓	-	✓	✓	✓	✓
1PP6 18 .-. . . . □□	○	○	○	○	□	✓ ³⁾	✓	-	✓	-	-	-
1PP6 20 .-. . . . □□	○	○	○	○	□	✓ ³⁾	✓	-	✓	-	-	-
1PP6 22 .-. . . . □□	○	○	○	○	□	✓ ³⁾	✓	-	✓	-	-	-
1PP6 25 .-. . . . □□	○	○	○	○	□	✓ ³⁾	✓	-	✓	-	-	-
1PP6 28 .-. . . . □□	○	○	○	○	□	✓ ³⁾	✓	-	✓	-	-	-
1PP6 310 .-. . . . □□	○	○	○	○	□	✓ ³⁾	✓	-	✓	-	-	-
1PP6 313 .-. . . . □□	○	○	○	○	□	✓ ³⁾	✓	-	✓	-	-	-
1PP6 316 .-. . . . □□	-	○	-	○	□ ⁴⁾	-	-	✓	✓	-	-	-
1PP6 317 .-. . . . □□	-	○	-	○	□ ⁴⁾	-	-	✓	✓	-	-	-

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1PP6 183-... to 1PP6 318-... (motor series 1PP6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1PP6 220-... to 1PP6 318-... motors (motor series 1PP6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

⁴⁾ Not possible for type of construction IM V6 and IM V5 without protective cover.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time class F400
Cast-iron series 1PP6

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	$\cos\phi_{\text{rated}}$									Type of construction IM B3 approx. m kg
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	$T_{\text{LR}}/T_{\text{rated}}$	$I_{\text{LR}}/I_{\text{rated}}$	$T_{\text{B}}/T_{\text{rated}}$	CL	J kg m ²				
6-pole, 1000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
1.5	100 L	925	15	69.0	0.70	4.5	2.3	4.0	2.3	16	0.0063	1PP6 106-6UAQQ		31	
2.2	112 M	940	22	72.0	0.74	6.0	2.1	4.4	2.3	16	0.011	1PP6 113-6UAQQ		42	
3	132 S	950	30	74.0	0.75	7.8	1.6	4.1	1.7	16	0.015	1PP6 130-6UAQQ		52	
4	132 M	950	40	76.0	0.76	10	1.7	4.6	2.1	16	0.019	1PP6 133-6UAQQ		62	
5.5	132 M	950	55	75.0	0.76	14	2.0	5.0	2.3	16	0.025	1PP6 134-6UAQQ		72	
7.5	160 M	970	75	75.0	0.72	20	2.0	5.0	2.4	16	0.041	1PP6 163-6UAQQ		107	
11	160 L	970	109	80.0	0.72	27.5	2.0	5.0	2.5	16	0.049	1PP6 166-6UAQQ		129	
15	180 L	975	147	88.9	0.82	30	2.2	5.2	2.3	16	0.203	1PP6 186-6UAQQ		170	
18.5	200 L	975	181	89.8	0.82	36.5	2.2	5.3	2.3	16	0.285	1PP6 206-6UAQQ		200	
22	200 L	975	215	90.8	0.83	42.5	2.2	5.4	2.3	16	0.362	1PP6 207-6UAQQ		230	
30	225 M	980	292	92.3	0.84	56	2.7	6.3	2.8	16	0.629	1PP6 223-6UAQQ		315	
37	250 M	984	359	93.0	0.84	69	2.8	6.5	2.4	16	0.934	1PP6 253-6UAQQ		390	
45	280 S	986	436	92.6	0.86	82	2.8	6.3	2.5	16	1.37	1PP6 280-6UAQQ		500	
55	280 M	986	533	93.1	0.86	99	3.1	6.8	2.7	16	1.65	1PP6 283-6UAQQ		550	
75	315 S	990	723	94.0	0.84	138	2.7	7.0	2.9	16	2.50	1PP6 310-6UAQQ		740	
90	315 M	988	870	94.5	0.85	162	2.6	7.1	2.8	16	2.50	1PP6 313-6UAQQ		915	
110	315 L	988	1063	94.7	0.85	198	2.8	7.2	2.8	16	2.50	1PP6 316-6UAQQ		990	
132	315 L	990	1273	95.1	0.85	235	3.0	7.5	3.0	16	2.50	1PP6 317-6UAQQ		1160	
160	315 L	988	1546	95.1	0.86	285	3.1	7.5	3.0	16	2.50	1PP6 318-6UAQQ		1225	

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time class F400
Cast-iron series 1PP6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange			With standard flange		With special flange	
	230 VΔ/ 400 VY	400 VΔ/ 690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V3 ²⁾	IM V1 without protective cover	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	0	1	1	8	6	2	7	3
1PP6 10 .-. . . . □□	○	○	○	○	□	✓	✓	-	✓	✓	✓	✓
1PP6 11 .-. . . . □□	○	○	○	○	□	✓	✓	-	✓	✓	✓	✓
1PP6 13 .-. . . . □□	○	○	○	○	□	✓	✓	-	✓	✓	✓	✓
1PP6 16 .-. . . . □□	○	○	○	○	□	✓	✓	-	✓	✓	✓	✓
1PP6 18 .-. . . . □□	○	○	○	○	□	✓ ³⁾	✓	-	✓	-	-	-
1PP6 20 .-. . . . □□	○	○	○	○	□	✓ ³⁾	✓	-	✓	-	-	-
1PP6 22 .-. . . . □□	○	○	○	○	□	✓ ³⁾	✓	-	✓	-	-	-
1PP6 25 .-. . . . □□	○	○	○	○	□	✓ ³⁾	✓	-	✓	-	-	-
1PP6 28 .-. . . . □□	○	○	○	○	□	✓ ³⁾	✓	-	✓	-	-	-
1PP6 310 .-. . . . □□	○	○	○	○	□	✓ ³⁾	✓	-	✓	-	-	-
1PP6 313 .-. . . . □□	○	○	○	○	□	✓ ³⁾	✓	-	✓	-	-	-
1PP6 316 .-. . . . □□	-	○	-	○	□ ⁴⁾	-	-	✓	✓	-	-	-
1PP6 317 .-. . . . □□	-	-	-	-	-	-	-	✓	✓	-	-	-
1PP6 318 .-. . . . □□	-	-	-	-	-	-	-	✓	✓	-	-	-

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1PP6 183-... to 1PP6 318-... (motor series 1PP6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1PP6 220-... to 1PP6 318-... motors (motor series 1PP6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

⁴⁾ Not possible for type of construction IM V6 and IM V5 without protective cover.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time class F400
Cast-iron series 1PP6

Selection and ordering data (continued)

Rated output at 50 Hz 1500 rpm	3000 rpm	Frame size	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight for type of construction IM B3 approx. <i>m</i> kg
P_{rated} kW	P_{rated} kW	FS			
4/2-pole, 1500/3000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with one winding in Dahlander circuit, with test certificate in accordance with EN 12101-3					
0.52	2	100 L	1PP6 106-0UA□□		31
0.64	2.5	100 L	1PP6 107-0UA□□		34
0.88	3.5	112 M	1PP6 113-0UA□□		42
1.16	4.7	132 S	1PP6 130-0UA□□		51
1.6	6.4	132 M	1PP6 133-0UA□□		58
2.3	9.2	160 M	1PP6 163-0UA□□		95
3.45	13.6	160 M	1PP6 166-0UA□□		108
Rated output at 50 Hz 1000 rpm	1500 rpm				
P_{rated} kW	P_{rated} kW				
6/4-pole, 1000/1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with two windings, with test certificate in accordance with EN 12101-3					
0.48	1.36	100 L	1PP6 106-1UD□□		31
0.6	1.68	100 L	1PP6 107-1UD□□		34
0.72	2.4	112 M	1PP6 113-1UD□□		42
0.96	3.1	132 S	1PP6 130-1UD□□		51
1.36	4.3	132 M	1PP6 133-1UD□□		58
2	5.75	160 M	1PP6 163-1UD□□		95
2.95	9.6	160 L	1PP6 166-1UD□□		108
Rated output at 50 Hz 750 rpm	1500 rpm				
P_{rated} kW	P_{rated} kW				
8/4-pole, 750/1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with one winding in Dahlander circuit, with test certificate in accordance with EN 12101-3					
0.3	1.6	100 L	1PP6 106-0UB□□		31
0.52	2	100 L	1PP6 107-0UB□□		34
0.72	2.85	112 M	1PP6 113-0UB□□		42
0.88	3.75	132 S	1PP6 130-0UB□□		51
1.12	5.1	132 M	1PP6 133-0UB□□		58
1.76	7.6	160 M	1PP6 163-0UB□□		95
2.6	11.2	160 L	1PP6 166-0UB□□		108

The rated outputs and weights may change slightly after they have been checked.

Further electrical data can be calculated and supplied on receipt of order.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time class F400
Cast-iron series 1PP6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code			Final position: Type of construction code							
	50 Hz, direct online starting			Without flange	With flange			With standard flange		With special flange	
	230 V	400 V	500 V	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V3	IM V1 without protective cover		IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	5	0	1	1	8	6	2	7	3
1PP6 10 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP6 11 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP6 13 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP6 16 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

IEC Squirrel-Cage Motors

Smoke-extraction motors

Special versions

Selection and ordering data

Voltages

Additional order codes for other voltages or voltage codes
(without “-Z” supplement)

For some non-standard voltages at 50 or 60 Hz, order codes are specified. They are ordered by specifying the code digit 9 for voltage in the 11th position of the Order No. and the appropriate order code.

Plain text must be specified in the order:

Voltage, frequency, circuit, required rated output in kW.

Special versions	Voltage code 11th position of Order No.	Additional identification code with order code and plain text if required	Motor type frame size														
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors																	
Non-standard winding for voltages between 200 V and 690 V, (voltages outside this range are available on request) ¹⁾	9	L1Y •															
Non-standard winding for voltages between 200 V and 690 V, (voltages outside this range are available on request) ¹⁾	9	L1Y •															
Forced-air cooled motors																	
Non-standard winding for voltages between 200 V and 690 V, (voltages outside this range are available on request) ¹⁾	9	L1Y •															
Non-standard winding for voltages between 200 V and 690 V, (voltages outside this range are available on request) ¹⁾	9	L1Y •															

- ✓ With additional charge
- This order code only determines the price of the version – Additional plain text is required.

¹⁾ When ordering, specify in plain text: Voltage, frequency, circuit, required rated output in kW

IEC Squirrel-Cage Motors

Smoke-extraction motors

Special versions

Types of construction

Additional order codes for other types of construction or type of construction codes (without "-Z" supplement)

Order codes have been defined for some special types of construction. They are ordered by specifying the code digit 9 for the type of construction in the 12th position of the Order No. and the appropriate order code.

Special versions	Type of construction code 12th position of Order No.	Additional identification code with order code and plain text if required	Motor type frame size																	
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L		
Self-ventilated motors																				
									1LA7 (aluminum) temperature/time classes F200 and F300			1LA5 (aluminum) temperature/time classes F200 and F300								
With flange																				
IM V3	9	M1G	-	-	-	-	-	-	-	-	-	-	✓	✓	✓					
With special flange																				
IM B34	9	M2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-					
									1LA6 (cast-iron) temperature/time class F400			1LG6 (cast-iron) temperature/time classes F200, F300 and F400								
With flange																				
IM V3 ¹⁾	9	M1G	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓			
With special flange																				
IM B34	9	M2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-			
Forced-air cooled motors																				
									1PP7 (aluminum) temperature/time classes F200 and F300			1PP5 (aluminum) temperature/time classes F200 and F300								
With flange																				
IM V3	9	M1G	-	-	-	-	-	-	-	-	-	-	✓	✓	✓					
With special flange																				
IM B34	9	M2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-					
									1PP6 (cast-iron) temperature/time classes F200, F300 and F400											
With flange																				
IM V3 ¹⁾	9	M1G	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓			
With special flange																				
IM B34	9	M2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-			

- ✓ With additional charge
 - Not possible

¹⁾ 1LG6/1PP6 motors of frame sizes 225 S to 315 M are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1; four eyebolts (instead of two) with frame size 315 L. It is important to note that stress must not be applied perpendicular to the ring plane.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors																
					1LA7 (aluminum) temperature/time classes F200 and F300						1LA5 (aluminum) temperature/time classes F200 and F300					
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50				–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regreasing device	K40				–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Balance and vibration quantity																
Vibration quantity A					□	□	□	□	□	□	□	□	□	□	□	□
Vibration quantity B	K02				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Full key balancing	L68				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Balancing without key	M37				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heating and ventilation																
Anti-condensation heaters for 230 V	K45				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rating plate and extra rating plates																
Second lubricating plate, supplied loose	B06				–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second rating plate, loose (standard version)					□	□	□	□	□	□	□	□	□	□	□	□
Extra rating plate with identification code	Y82 • and identification code				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Packaging, safety notes and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Operating instructions German/English enclosed in print	B23				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wire-lattice pallet	L99				○	○	○	○	○	○	○	○	○	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible
- This order code only determines the price of the version – Additional plain text is required.
- . R. Possible on request

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended. Double the number of temperature sensors are required for pole-changing motors with separate windings. (Order code A11, price of A12 or order code A12, prices on request).

²⁾ No additional charge with types of construction without feet: IM B5, IM V1, IM V3.

³⁾ Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Forced-air cooled motors																	
Bearings and lubrication																	
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50																
Regreasing device	K40																
Balance and vibration quantity																	
Vibration quantity A																	
Vibration quantity B	K02																
Full key balancing	L68																
Balancing without key	M37																
Heating and ventilation																	
Anti-condensation heaters for 230 V	K45																
Anti-condensation heaters for 115 V	K46																
Rating plate and extra rating plates																	
Second lubricating plate, supplied loose	B06																
Second rating plate, loose (standard version)																	
Extra rating plate with identification code	Y82 • and identification code																
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code																
Packaging, safety notes and test certificates																	
Acceptance test certificate 3.1 according to EN 10204	B02																
Operating instructions German/English enclosed in print	B23																
Type test with heat run for horizontal motors, with acceptance	F83																
Wire-lattice pallet	L99																

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible
- This order code only determines the price of the version – Additional plain text is required.
- . R. Possible on request

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended. Double the number of temperature sensors are required for pole-changing motors with separate windings. (Order code A11, price of A12 or order code A12, prices on request).

²⁾ No additional charge with types of construction without feet: IM B5, IM V1, IM V3.

³⁾ Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Forced-air cooled motors																
1PP6 (cast-iron) temperature/time classes F200, F300 and F400																
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60						-	-	-	-	✓	✓	✓	✓	✓	✓
Installation of 6 PT 100 resistance thermometers in stator winding ¹⁾	A61						-	-	-	-	-	-	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ¹⁾	A72						-	-	-	-	✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A78						-	-	-	-	✓	✓	✓	✓	✓	✓
Motor connection and connection box																
External earthing	L13						✓	✓	✓	✓	□	□	□	□	□	□
Protruding cable ends – right side ²⁾	L51						✓	○	○	○	✓	✓	✓	✓	✓	✓
Protruding cable ends – left side ²⁾	L52						✓	○	○	○	✓	✓	✓	✓	✓	✓
Colors and paint finish																
Special finish in RAL 7030 stone gray							□	□	□	□	□	□	□	□	□	□
Special finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 0/18	Y54 • and special finish RAL						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Offshore special finish	M91						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Sea air resistant special finish	M94						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23						○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
IP65 degree of protection	K50						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Condensation drainage holes ³⁾	L12						✓	✓	✓	✓	□	□	□	□	□	□
Non-rusting screws (externally)	M27						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Smoke-extraction motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Forced-air cooled motors																	
																	1PP6 (cast-iron) temperature/time classes F200, F300 and F400
Bearings and lubrication																	
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50										✓	✓	✓	✓	✓	✓	✓
Regreasing device	K40										✓	✓	✓	✓	✓	✓	□
Balance and vibration quantity																	
Vibration quantity A											□	□	□	□	□	□	□
Vibration quantity B	K02										✓	✓	✓	✓	✓	✓	✓
Full key balancing	L68										✓	✓	✓	✓	✓	✓	✓
Balancing without key	M37										✓	✓	✓	✓	✓	✓	✓
Heating and ventilation																	
Anti-condensation heaters for 230 V	K45										✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46										✓	✓	✓	✓	✓	✓	✓
Rating plate and extra rating plates																	
Second lubricating plate, supplied loose	B06										✓	✓	✓	✓	✓	✓	✓
Second rating plate, loose (standard version)											□	□	□	□	□	□	□
Extra rating plate with identification code	Y82 • and identification code										✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label (maximum of 20 characters)	Y84 • and identification code										✓	✓	✓	✓	✓	✓	✓
Packaging, safety notes and test certificates																	
Acceptance test certificate 3.1 according to EN 10204	B02										✓	✓	✓	✓	✓	✓	✓
Operating instructions German/English enclosed in print	B23										✓	✓	✓	✓	–	–	–
Type test with heat run for horizontal motors, with acceptance	F83										✓	✓	✓	✓	✓	✓	✓
Wire-lattice pallet	L99										○	○	○	○	–	–	–

- Standard version
- Without additional charge
- ✓ With additional charge
- Not possible
- This order code only determines the price of the version – Additional plain text is required.
- O. R. Possible on request

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended. For pole-changing motors with separate windings, the number of temperature sensors must be doubled. (order code A11, price of A12 or order code A12, price available on request.)

²⁾ No additional charge with types of construction without feet: IM B5, IM V1, IM V3.

³⁾ Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Accessories

Overview

Slide rails with fixing bolts and tensioning screws to DIN 42923

Slide rails are used to tension the belt of a machine easily and conveniently when a belt tightener is not available. They are fixed to the base using stone bolts or foundation blocks.

The assignment of slide rails to motor size can be found in DIN 42923. For motors of frame sizes 355 to 450, there are no standardized slide rails (please inquire).

Available from:
Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Foundation block acc. to DIN 799

The foundation blocks are inserted into the stone foundation and embedded in concrete. They are used for fixing machines of medium size, slide rails, pedestal bearings, baseframes, etc. After the fixing bolts have been unscrewed, the machine can be dragged without it having to be lifted.

When the machine is initially installed, the foundation block that is bolted to the machine (without washers) and fitted with taper pins is not embedded with concrete until the machine has been fully aligned. In this case, the machine is positioned 2 to 3 mm lower. The difference in shaft height is compensated by inserting shims on final installation. The taper pins safeguard the exact position of the machine when it is repeatedly removed and replaced without the need for realignment.

Available from:
Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Taper pins to DIN 258 with threaded ends and constant taper lengths

Taper pins are used for components that are repeatedly removed. The drilled hole is ground conical using a conical reamer until the pin can be pushed in by hand until the cone shoulder lies 3 to 4 mm above the rim of the hole.

It can then be driven in using a hammer until it is correctly seated. The pin is removed from the drilled hole by screwing on the nut and tightening it.

Standardized taper pins are available from general engineering suppliers.

Available from:
Otto Roth GmbH & Co. KG
Rutesheimer Straße 22
70499 Stuttgart, Germany
Tel. +49 (0)7 11-1388-0
Fax +49 (0)7 11-1388-233

<http://www.ottoroth.de>
e-mail: info@ottoroth.de

Couplings

The motor from Siemens is connected to the machine or gear unit through a coupling. Flender is an important coupling manufacturer with a wide range of products. For standard applications, Siemens recommends that elastic couplings of Flender types N-Eupex and Rupex or torsionally rigid couplings of types Arpex and Zapex are used. For special applications, Fludex and Elpex couplings are recommended.

Source of supply:
Siemens contact partner – ordering from Catalog
Siemens MD 10.1 „FLENDER Standard Couplings“

or

A. Friedr. Flender AG
Kupplungswerk Mussum
Industriepark Bocholt
Schlavenhorst 100
46395 Bocholt, Germany
Tel. +49 (0)2871-922185
Fax +49 (0)2871-922579

<http://www.flender.com>
e-mail: couplings@flender.com

More information

Spare motors and repair parts

- Supply commitment for spare motors and repair parts following delivery of the motor
 - For up to 5 years, in the event of total motor failure, Siemens will supply a comparable motor with regard to the mounting dimensions and functions (the type series may vary).
 - Repair parts will be supplied for up to 5 years.
 - For up to 10 years, Siemens will provide information and will, if necessary, supply documentation for repair parts.
- When repair parts are ordered, the following details must be provided:
 - Designation and part number
 - Order No. and factory number of the motor

Example for ordering a fan cover 1LA7,
frame size 160 M, 4-pole:

**Fan cover No. 7.40,
1LA7 163-4AA60, factory number J783298901018**

- For bearing types, see the “Introduction”.
- Repair parts for 1MJ6, 1MJ7, 1MJ8, 1MJ1, 1ME8, 1ML8, 1LG8 motors and smoke-extraction motors are available on request.
- For standard components, a supply commitment does not apply.
- Support – Hotline
In Germany
Tel.: 0180/5050448

National telephone numbers can be found on the Internet page:
<http://www.siemens.com/automation/service&support>

IEC Squirrel-Cage Motors

Smoke-extraction motors

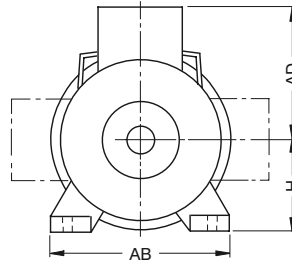
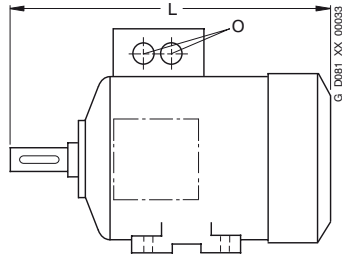
Dimensions

Overview

Overall dimensions

The overall dimensions of the smoke-extraction motors are listed below. The relevant dimensional drawings can be ordered.

Dimension O is not specified because the motors are connected to the supply by means of protruding multi-core cables.



Frame size	Type	Dimensions			
		L	AD ¹⁾	H	AB
80 M	1LA7 08.-T...	274	100	80	150
	1PP7 08.-T...	240	100	80	150
90 S/ 90 L	1LA7 09.-T...	332	107	90	165
	1PP7 09.-T...	240	107	90	165
100 L	1LA6 10.-U...	373	120	100	196
	1LA7 10.-T...	373	120	100	196
	1PP6 10.-U...	335	120	100	196
	1PP7 10.-T...	335	120	100	196
112 M	1LA6 11.-U...	394	128	112	226
	1LA7 11.-T...	394	128	112	226
	1PP6 11.-U...	354	128	112	226
	1PP7 11.-T...	354	128	112	226
132 S/ 132 M	1LA6 13.-0U...	454	148	132	256
	1LA6 13.-1UD..	454	148	132	256
	1LA6 13.-2UA..	454	148	132	256
	1LA6 13.-4UA..	454	148	132	256
	1LA6 13.-6UA..	492	148	132	256
	1LA7 13.-T...	454	148	132	256
	1PP6 13.-0U...	403	148	132	256
	1PP6 13.-1UD..	403	148	132	256
	1PP6 13.-2UA..	403	148	132	256
	1PP6 13.-4UA..	403	148	132	256
	1PP6 13.-6UA..	443	148	132	256
	1PP7 13.-T...	403	148	132	256
160 M/ 160 L	1LA6 16.-0U...	588	170	160	300
	1LA6 16.-1UD..	588	170	160	300
	1LA6 16.-2UA..	588	170	160	300
	1LA6 16.-4UA..	588	170	160	300
	1LA6 16.-6UA..	628	170	160	300
	1LA7 16.-T...	588	170	160	300
	1PP6 16.-0U...	535	170	160	300
	1PP6 16.-1UD..	535	170	160	300
	1PP6 16.-2UA..	535	170	160	300
	1PP6 16.-4UA..	535	170	160	300
	1PP6 16.-6UA..	575	170	160	300
	1PP7 16.-T...	535	170	160	300

Frame size	Type	Dimensions			
		L	AD ¹⁾	H	AB
180 M/ 180 L	1LA5 18.-T...	712	243	180	339
	1LG6 183-2UA..	720	244	180	339
	1LG6 183-4UA..	669	244	180	339
	1LG6 186-.UA..	720	244	180	339
	1PP5 18.-T...	611	243	180	339
	1PP6 183-2UA..	613	244	180	339
200 L	1PP6 183-4UA..	562	244	180	339
	1PP6 186-.UA..	613	244	180	339
	1LA5 20.-T...	770	292	200	388
	1LG6 206-.UA..	720	285	200	378
	1LG6 207-2UA..	777	285	200	378
	1LG6 207-4UA..	720	285	200	378
	1LG6 207-6UA..	777	285	200	378
	1PP5 20.-T...	675	292	200	388
	1PP6 206-.UA..	617	285	200	378
	1PP6 207-2UA..	674	285	200	378
225 S/ 225 M	1PP6 207-4UA..	617	285	200	378
	1PP6 207-6UA..	674	285	200	378
	1LA5 220-4TA..	807	292	225	426
	1LA5 223-2TA..	777	292	225	426
	1LA5 223-4TA..	807	292	225	426
	1LA5 223-6TA..	807	292	225	426
	1LG6 220-4UA..	789	310	225	436
	1LG6 223-2UA..	819	310	225	436
	1LG6 223-4UA..	849	310	225	436
	1LG6 223-6UA..	849	310	225	436
	1PP5 220-4TA..	711	292	225	426
	1PP5 223-2TA..	681	292	225	426
	1PP5 223-4TA..	711	292	225	426
	1PP5 223-6TA..	711	292	225	426
250 M	1PP6 220-4UA..	670	310	225	436
	1PP6 223-2UA..	700	310	225	436
	1PP6 223-4UA..	730	310	225	436
	1LG6 253-2.B..	887	340	250	490
	1LG6 253-4.A..	957	340	250	490
	1LG6 253-6.A..	887	340	250	490
	1PP6 253-2....	764	340	250	490
	1PP6 253-4....	834	340	250	490
	1PP6 253-6....	764	340	250	490

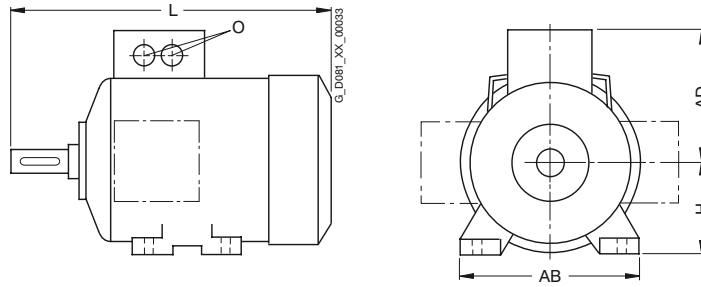
¹⁾ Dimension AD without cable gland.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Dimensions

Overview (continued)



Frame size	Type	Dimensions			
		L	AD ¹⁾	H	AB
280 S/ 280 M	1LG6 280-.....	960	378	280	540
	1LG6 283-2....	1070	378	280	540
	1LG6 283-4....	1070	378	280	540
	1LG6 283-6....	960	378	280	540
	1PP6 280-.....	830	378	280	540
	1PP6 283-2....	940	378	280	540
	1PP6 283-4....	940	378	280	540
	1PP6 283-6....	830	378	280	540
315 S/ 315 M/ 315 L	1LG6 310-2.B..	1072	440	315	610
	1LG6 310-4.A..	1102	440	315	610
	1LG6 310-6.A..	1102	440	315	610
	1LG6 313-2.B..	1232	440	315	610
	1LG6 313-4.A..	1262	440	315	610
	1LG6 313-6.A..	1262	440	315	610
	1LG6 316-2.B..	1232	440	315	610
	1LG6 316-4.A..	1262	440	315	610
	1LG6 316-4.B..	1262	440	315	610
	1LG6 316-6.A..	1262	440	315	610
	1LG6 317-2.B..	1372	440	315	610
	1LG6 317-4.A..	1402	440	315	610
	1LG6 317-6.A..	1402	440	315	610
	1LG6 318-6.A..	1402	440	315	610

Frame size	Type	Dimensions			
		L	AD ¹⁾	H	AB
315 S/ 315 M/ 315 L	1PP6 310-2.B..	925	440	315	610
	1PP6 310-4.A..	955	440	315	610
	1PP6 310-6.A..	955	440	315	610
	1PP6 313-2.B..	1085	440	315	610
	1PP6 313-4.A..	1115	440	315	610
	1PP6 313-6.A..	1115	440	315	610
	1PP6 316-2.B..	1085	440	315	610
	1PP6 316-4.A..	1115	440	315	610
	1PP6 316-6.A..	1115	440	315	610
	1PP6 317-2.B..	1225	440	315	610
	1PP6 317-4.A..	1255	440	315	610
	1PP6 317-6.A..	1255	440	315	610
	1PP6 318-6.A..	1255	440	315	610

¹⁾ Dimension AD without cable gland.

Marine motors



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10/3	Application
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10/6	Type approved standard motors up to frame size 315 L
10/6	Overview
10/7	Type approved explosion-proof motors up to frame size 315 L
10/7	Overview
10/7	Type approved fan motors
10/7	Overview
10/8	Standard motors up to frame size 315 L (individual acceptance required)
10/8	Overview
10/8	Smoke-extraction motors (individual acceptance required)
10/8	Overview
10/9	Non-standard motors frame size 315 and above (individual acceptance required)
10/9	Overview
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10/25	Overview
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IEC Squirrel-Cage Motors

Marine motors

Orientation

Overview



Low-voltage motors in the marine version can be used as main and auxiliary drives below deck on ships and in the offshore industry. The thermal utilization of the motors is matched to the generally higher ambient temperatures on board ship. If the application demands compliance with additional regulations, e.g. protection against explosion hazards, the appropriate motor series must be chosen.

The classification authorities categorize the drives on board ships into “essential services” and “non-essential services”, depending on their field of application. These include the following requirements of the classification authorities:

	Drives for “essential services”	Drives for “non-essential services”
Manufacture in accordance with regulations of the classification authorities	Required	Required
Acceptance test certificate 3.1 according to EN 10204	Required	Only required for motors with certificate
Type test certificate of the classification authority	Required up to a certain limit power	Not required
Individual acceptance test by classification authority	Required above a specific output	Only required for motors with certificate
Supervision of construction and acceptance test certificate 3.2 according to EN 10204	Required by some classification authorities above a specific output	Not required

Type test

All motors (with the exception of 1LA8, 1PQ8, 1LL8 and 1LH8 motors) are manufactured and type approved in accordance with the regulations of the following leading international classification authorities:

- GL (Germanischer Lloyd, Germany)



Germanischer Lloyd

- DNV (Det Norske Veritas, Norway)



- LR (Lloyds Register, United Kingdom)



- BV (Bureau Veritas, France)



Individual acceptance testing is required in general for motor series 1LA8, 1PQ8, 1LL8 and 1LH8.

As an option, we can manufacture motors in accordance with the following classification authorities:

- ABS (American Bureau of Shipping, USA)
- RINA (Registro Italiano Navale, Italy)
- CCS (Chinese Classification Society, China)

A type test certificate will however only be issued following individual acceptance testing.

Special versions that differ from the range defined in the Catalog are possible on request.

Individual acceptance and supervision of construction

Individual acceptance testing by a representative of the relevant classification authority is required for motors used in essential auxiliary drives, depending on their output:

- GL ≥ 50 kW
- LR ≥ 100 kW
- DNV ≥ 300 kW
- BV ≥ 100 kW

For individual acceptance testing of more than one identical motor in an order, a type test complete with heat run and the corresponding acceptance test must be performed for at least one motor.

In special cases, in addition to the acceptance test, supervision of construction may also be required. Supervision of construction involves monitoring of the separate manufacturing stages of a motor by an inspector from the classification authority.

Benefits

The marine motors offer the user a number of advantages:

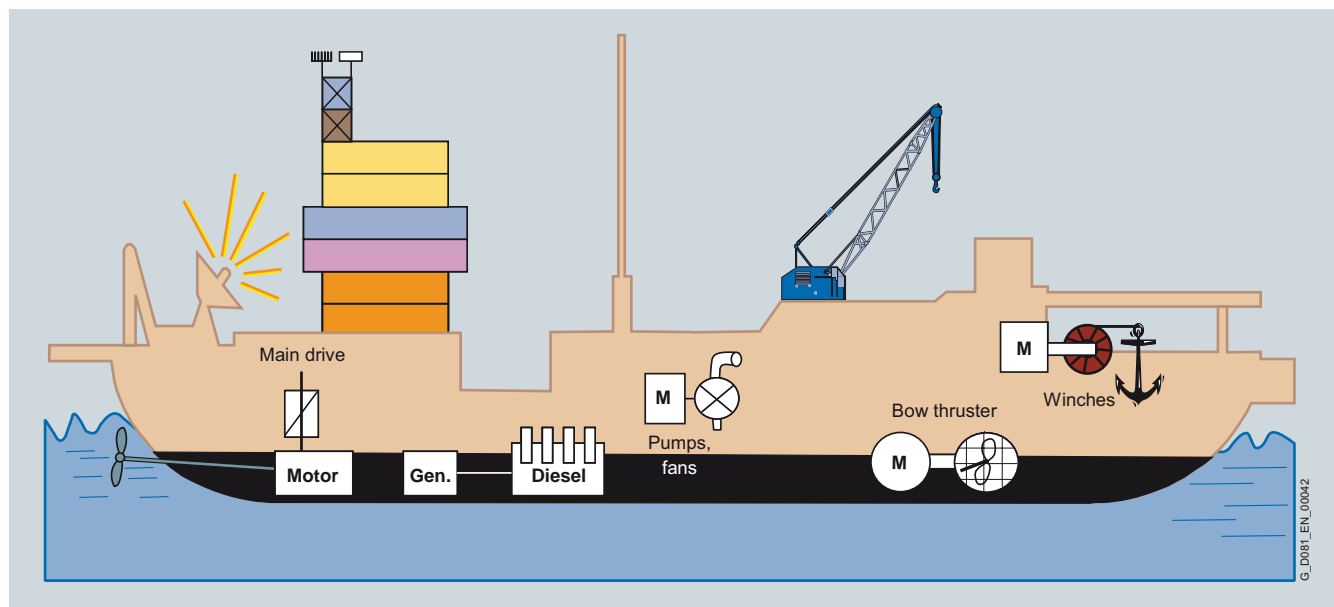
- Cast-iron versions can be supplied for corrosive atmospheres especially for high humidity levels and salty air
- Increased corrosion protection using specially designed paint finishes is available
- Certified marine motors can be supplied for use in areas to be protected against explosion

- Due to the type tests already performed, individual acceptance testing in the low-end output range is not necessary which means shorter delivery times
- Distinctive expertise for customer requirements
- Worldwide service network with 24 h service hotline for motors and converters (Tel.: +49 180 173 7373; e-mail: shipservice@siemens.com)

Application

Our type approved marine motors are specially designed for use on board ship below deck and for the offshore industry:

- Applications on board ship as main and auxiliary drives below deck, e.g.:
 - Fans (air conditioning, refrigeration plants)
 - Pumps (for fire-extinguishing water, fuels, oils)
 - Winches (anchor winches, warping winches, lifting gear)
 - Compressors
 - Bow thruster drives
 - Ex motors for areas subject to explosion hazards
- Application in the offshore industry
 - Coastal areas, e.g. production platforms, production ships



Typical areas of application

Technical specifications

Frame design

Motors can be supplied depending on the motor series in a corrosion-resistant aluminum housing and in a rugged low-vibration cast-iron version.

Motor connection

Cable glands are not included in the standard scope of supply with the exception of explosion-proof motors (see "Special versions").

All marine motors generally have an external earthing terminal.

Standards and specifications

In addition to the relevant standards and regulations, IEC 92-301 also applies for electrical installation on board ship as well as the regulations of the marine classification authorities.

Specifications of the IEC standards

	Coolant temperature CT	Admissible temperature for temperature class	
		130 (B) CI	155 (F) CI
IEC/EN 60034-1	40	80	105
IEC 92-301	50	70	90

IEC Squirrel-Cage Motors

Marine motors

Orientation

Technical specifications (continued)

Specifications of the individual classification authorities with order codes for ordering

Classification authorities	Coolant temperature CT	Admissible temperature for relevant classification authorities		Individual acceptance for "essential services" drive	Supervision of construction for "essential services" drive	Order codes for surface-cooled motors up to frame size 315L		Order codes for surface-cooled motors frame size 315 and above		
		Temperature class 130 (B)	155 (F)	Required from a rated output	Required from a rated output	With type test certificate	Without type test certificate	Without type test certificate	With type test certificate and individual acceptance	With type test certificate and individual acceptance and supervision of construction
	°C	CI	CI	kW	kW					
GL	45	75	100	≥ 50	–	E11	–	E11	E11+E10	E11+E09
LR	45	70	95	≥100	≥100	E21	–	E21	E21+E10	E21+E09
BV	45	75	100	≥100	–	E31	–	E31	E31+E10	E31+E09
DNV	45	75	100	≥300	–	E51	–	E51	E51+E10	E51+E09
ABS	50	70	95	≥100	≥100	–	E00	E61	E61+E10	E61+E09
RINA	45	75	95	≥100	–	–	E00	–	–	–
CCS	45	75	100	≥100	–	–	E00	E71	E71+E10	E71+E09

Type test certificates



Technical specifications (continued)

Temperature class and coolant temperature

Marine motors are designed in general for a coolant temperature CT 45 °C in temperature class 155 (F) – used according to 155 (F) – with thermal reserve. When used according to temperature class 130 (B), order code **C22**, derating of approximately 4 % (for order codes **E00** and **E21** approximately 8 %) necessary.

1MA and 1MJ motors as well as motors in Zones 2, 21 and 22 are designed in temperature class 155 (F) – used according to temperature class 130 (B) – with derating of approximately 4 % (for order code **E00** approximately 8 %). 1MA motors are designed for the maximum possible and certified outputs.

1LA9 motors with increased output in temperature class 155 (F) – used according to temperature class 155 (F) – are also derated by approximately 4 % (for order code **E00/E21** approximately 8 %).

If temperature class 155 (F) is used according to 130 (B), further derating of approximately 10 % (for non-standard motors 1LA8, 1PQ8 15 %) is required.

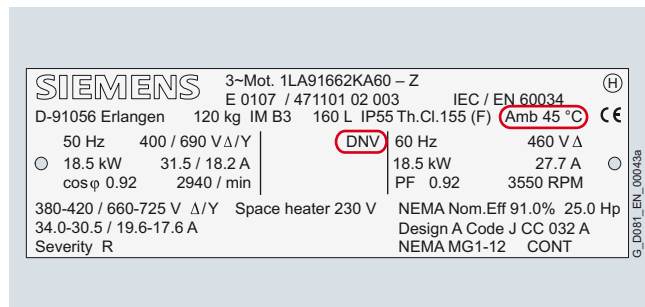
Please inquire for further details.

Coolant temperatures that exceed 45 °C require appropriate derating as shown in the table below:

Derating factor	Coolant temperature CT (for temperature class 155 (F) used according to 155 (F))			
	45 °C	50	55	60
	1.00	0.96	0.92	0.87

Rating plate and acceptance test certificate

The metal rating plate indicates the relevant classification authority and the associated coolant temperature.



Rating plate for a marine motor according to DNV

In addition, an acceptance test certificate 3.1 according to EN 10204 complete with the certificate number of the marine classification authority will be supplied.

More information

For more information, please contact your local Siemens contact – see “Siemens Contacts Worldwide” in the Appendix.

Degree of protection

The standard version is IP55 degree of protection or IP23 for motors with through ventilation (series 1LL8), IP56 (non-heavy sea) – not for 1PQ8 and 1LL8) or IP65 (not possible for “Non-standard motors frame size 315 and above”) are available optionally (see “Special versions”).

Winding and motor protection

For monitoring the winding and bearings, the motors can be equipped with thermistors, temperature sensors and resistance thermometers. Anti-condensation heaters can also be fitted to the marine motors to prevent condensation building up on the winding.

Paint finish

The standard paint finish is suitable for indoor installations or outdoor installations which are roof-protected against weathering.

When standard motors are installed in sea atmospheres or in rooms that are constantly wet, the special paint finish for the “world wide” climatic group according to DIN IEC 60721-2-1 is suitable because this ensures a higher degree of corrosion protection. Most marine motors are finished in this special paint type as standard (see “Special versions”).

The sea air resistant special finish (order code **M94**) or the Off-shore special finish (order code **M91**) are recommended for excessively aggressive atmospheres.

Special finish with thicker layers are available on request.

Converter-fed operation

The standard insulation of the marine motors is implemented such that converter-fed operation is possible without limits for mains voltages of 460 V (for motor series 1LA8, 1PQ8, 1LL8 and 1LH8 up to 500 V) +10 %; exception: 1MA motors are only certified for mains operation.

At higher voltages, the motors require greater insulation resistance.

1LA5, 1LA7 and 1LG6 standard motors as well as 1LA8 and 1PQ8 non-standard motors are also available for converter-fed operation with supply voltages of up to 690 V also with improved insulation in the winding system.

It is important to note the extent to which the converter used must also be acceptance tested by the marine classification authority.

IEC Squirrel-Cage Motors

Marine motors

Type approved standard motors up to frame size 315 L

Overview

Most standard motors of Siemens AG can be used as marine motors if the appropriate order codes are used. The following table shows the standard motor series that are available with type testing up to frame size 315 L:

Motor type	Standard degree of protection	Frame design	Motor series ¹⁾	Motor frame sizes	Output range in kW Output data for mains-fed operation 50 Hz at CT 45 °C in temperature class 155 (F), used according to 155 (F).
Self-ventilated motors with improved efficiency	IP55	Aluminum	1LA7	56 M ... 160 L	0.06 ... 18.5
			1LA5	180 M ... 225 M	11 ... 45
		Cast-iron	1LA6	100 L ... 160 L	0.75 ... 18.5
			1LG4	180 M ... 315 L	11 ... 200
Self-ventilated motors with high efficiency	IP55	Aluminum	1LA9	56 M ... 200 L	0.06 ... 37
		Cast-iron	1LG6	180 M ... 315 L	11 ... 200

The type approved and self-cooled motor series 1LP4, 1LP5, 1LP6 and 1LP7 in frame sizes 63 M to 315 L with derating without external fan and fan cover can be supplied on request.

For technical specifications and selection and ordering data, see the relevant sections of "Standard motors up to frame size 315 L".

Ordering example:

Selection criteria	Requirement	Structure of the Order No.
Motor type	Standard motor with improved efficiency, IP55 degree of protection, cast-iron version	1LG4
No. of poles/speed	4-pole/1500 rpm	1LG4253-4AA
Rated output	55 kW	
Voltage and frequency	400 VΔ/690 VY, 50 Hz	1LG4253-4AA6
Type of construction	IM B3	1LG4253-4AA60
Paint finish	Special paint finish in RAL 5007	1LG4253-4AA60-Z Y54 Plain text: RAL 5007
Marine version	Drive for "essential services" with type test certificate according to Germanischer Lloyd with coolant temperature CT 45 °C	1LG4253-4AA60-Z Y54+E11 Plain text: RAL 5007
	Individual acceptance (by marine classification society)	1LG4253-4AA60-Z Y54+E11+E10 Plain text: RAL 5007
	Type test with heat run for horizontal motors, with acceptance	1LG4253-4AA60-Z Y54+E11+E10+F83 Plain text: RAL 5007

The ordering example is valid for an order quantity of 1 item. For larger order quantities, a type test with heat run (order code **F83**) only has to be ordered for one motor. For all other identical motors, order code F83 is not required. The order must be subdivided into two order items.

Example for ordering 5 items:

Order item	Quantity (items)	Order No.
1	1	1LG4253-4AA60-Z Y54+E11+E10+F83 Plain text: RAL 5007
2	4	1LG4253-4AA60-Z Y54+E11+E10 Plain text: RAL 5007

For further information about order codes see "Special versions".

¹⁾ For 1LA9 motors with increased output, derating is necessary. Please contact your local Siemens office for advice.

IEC Squirrel-Cage Motors

Marine motors

Type approved explosion-proof motors
up to frame size 315 L

Overview

Most explosion-proof motors up to frame size 315 L from Siemens AG can be used as marine motors if ordered with the relevant order codes. The following table shows the series of explosion-proof motors that are available with type testing up to frame size 315 L:

Motor type	Standard degree of protection	Frame design	Motor series ¹⁾	Motor frame sizes	Output range in kW Output data for mains-fed operation 50 Hz at CT 45 °C in temperature class 155 (F), used according to 155 (F).
Self-ventilated motors in Zone 1 with type of protection "e" (Zone 1 Exe II T3)	IP55	Aluminum	1MA7	63 M ... 160 L	0.12 ... 16
		Cast-iron	1MA6	100 L ... 315 L	1.3 ... 165
Self-ventilated motors in Zone 1 with type of protection "d" (Zone 1 Exde IIC T4)	IP55	Cast-iron	1MJ6	71 M ... 200 L	0.25 ... 37
			1MJ7	225 S ... 315 M	30 ... 132
Self-ventilated motors in Zone 2 with type of protection "n"	IP55	Aluminum	1LA7	63 M ... 160 L	0.09 ... 18.5
			1LA9	63 M ... 160 L	0.12 ... 18.5
		Cast-iron	1LA6	100 L ... 160 L	0.75 ... 18.5
			1LG4/1LG6	180 M ... 315 L	11 ... 200
Self-ventilated motors in Zone 21 with protection against dust explosions	IP55	Aluminum	1LA7	56 M ... 160 L	0.06 ... 18.5
			1LA5	180 M ... 225 M	11 ... 45
			1LA9	56 M ... 200 L	0.06 ... 37
		Cast-iron	1LG4/1LG6	180 M ... 315 L	11 ... 200
Self-ventilated motors in Zone 22 with protection against dust explosions	IP55	Aluminum	1LA7	56 M ... 160 L	0.06 ... 18.5
			1LA5	180 M ... 225 M	11 ... 45
			1LA9	56 M ... 200 L	0.06 ... 37
		Cast-iron	1LA6	100 L ... 160 L	0.75 ... 18.5
			1LG4/1LG6	180 M ... 315 L	11 ... 200

For technical specifications and selection and ordering data, see the relevant sections of "Explosion-proof motors".

For further information about order codes see "Special versions".

Type approved fan motors

Overview

Most fan motors of Siemens AG can be used as marine motors if the appropriate order codes are used. The following table shows the series of fan motors that are available with type testing:

Motor type	Standard degree of protection	Frame design	Motor series	Motor frame sizes	Output range in kW Output data for mains-fed operation 50 Hz at CT 45 °C in temperature class 155 (F), used according to 155 (F).
Self-ventilated motors in pole-changing version	IP55	Aluminum	1LA7	80 M ... 160 L	0.15 ... 17
			1LA5	180 M ... 200 L	3 ... 28
		Cast-iron	1LG4	180 M ... 315 L	4.5 ... 175
Forced-air cooled motors without external fan and fan cover	IP55	Aluminum	1PP7	63 M ... 160 L	0.09 ... 18.5
			1PP5	180 M ... 200 L	11 ... 37
		Cast-iron	1PP4	180 M ... 315 L	11 ... 200

For technical specifications and selection and ordering data, see the relevant sections of "Fan motors".

For further information about order codes see "Special versions".

¹⁾ With explosion-proof motors, derating is necessary. Please contact your local Siemens office for advice.

IEC Squirrel-Cage Motors

Marine motors

Standard motors up to frame size 315 L (individual acceptance required)

Overview

Most standard motors of Siemens AG can be used as marine motors if the appropriate order codes are used. The following table shows the series of self-cooled standard motors that are available with derating without an external fan and without a fan cover:

Motor type	Standard degree of protection	Frame design	Motor series	Motor frame sizes	Output range in kW Output data for mains-fed operation 50 Hz at CT 45 °C in temperature class 155 (F), used according to 155 (F).
Self-cooled motors without external fan	IP55	Aluminum	1LP7	63 M ... 160 L	0.045 ... 7
			1LP5	180 M ... 200 L	5.5 ... 16.5
		Cast-iron	1LP4	180 M ... 315 L	3.7 ... 67

For technical specifications and selection and ordering data, see the relevant sections of “Standard motors up to frame size 315 L”.

For further information about order codes see “Special versions”.

Smoke-extraction motors (individual acceptance required)

Overview

Most smoke-extraction motors of Siemens AG can be used as marine motors if the appropriate order codes are used. The following table shows the available series of self-ventilated motors and forced-air cooled motors:

Motor type	Standard degree of protection	Frame design	Motor series	Motor frame sizes	Output range in kW Output data for mains-fed operation 50 Hz.
Temperature/time classes F200 and F300					
Self-ventilated motors	IP55	Aluminum	1LA7	80 M ... 160 L	0.09 ... 18.5
			1LA5	180 M ... 225 M	4.05 ... 45
		Cast-iron	1LG6	250 M ... 315 L	37 ... 200
Forced-air cooled motors	IP55	Aluminum	1PP7	80 M ... 160 L	0.09 ... 18.5
			1PP5	180 M ... 225 M	4.05 ... 45
		Cast-iron	1PP6	250 M ... 315 L	37 ... 200
Temperature/time class F400					
Self-ventilated motors	IP55	Cast-iron	1LA6	100 L ... 160 L	0.3 ... 22
			1LG6	180 M ... 315 L	15 ... 200
Forced-air cooled motors	IP55	Cast-iron	1PP6	100 L ... 315 L	0.3 ... 200

For technical specifications and selection and ordering data, see the relevant sections of “Smoke-extraction motors”.

For further information about order codes see “Special versions”.

IEC Squirrel-Cage Motors

Marine motors

Non-standard motors frame size 315 and above
(individual acceptance required)

Overview

Most non-standard motors frame size 315 and above of Siemens AG can be used as marine motors if the appropriate order codes are used. The following table shows the available series of non-standard motors frame size 315 and above (individual acceptance required):

Motor type	Standard degree of protection	Frame design	Motor series	Motor frame sizes	Output range in kW Output data for mains-fed operation 50 Hz at CT 45 °C in temperature class 155 (F), used according to 155 (F).
Self-ventilated motors for mains-fed and converter-fed operation	IP55	Cast-iron	1LA8	315 ... 450	160 ... 1000 ¹⁾
Forced-air cooled motors with mounted separately driven fan for converter-fed operation	IP55	Cast-iron	1PQ8	315 ... 450	160 ... 1000 ¹⁾
Self-ventilated motors with through ventilation for mains-fed and converter-fed operation	IP23	Cast-iron	1LL8	315 ... 450	200 ... 1250 ¹⁾
Water-cooled motors for mains-fed and converter-fed operation	IP55	Steel	1LH8	450	485 ... 1150 ¹⁾

Motor series 1LH8 (please inquire).

For technical specifications and selection and ordering data, see the relevant sections of “Non-standard motors frame size 315 and above”.

For further information about order codes see “Special versions”.

Explosion-proof motors frame size 315 and above
(individual acceptance required)

Overview

Most explosion-proof motors frame size 315 and above of Siemens AG can be used as marine motors if the appropriate order codes are used. The following table shows the available series of explosion-proof motors frame size 315 and above (individual acceptance required):

Motor type	Standard degree of protection	Frame design	Motor series	Motor frame sizes	Output range in kW Output data for mains-fed operation 50 Hz at CT 45 °C in temperature class 155 (F)
Self-ventilated motors in Zone 2 with type of protection “n”	IP55	Cast-iron	1LA8	315 ... 450	160 ... 1000 ²⁾
Self-ventilated motors in Zone 22 with protection against dust explosions	IP55	Cast-iron	1LA8	315 ... 450	160 ... 1000 ¹⁾

For technical specifications and selection and ordering data, see the relevant sections of “Explosion-proof motors”.

For further information about order codes see “Special versions”.

¹⁾ At a coolant temperature of 45 °C when used according to temperature class 155 (F), the output is reduced by 4 %.

²⁾ At a coolant temperature of 45 °C, the output is reduced by 4 %. When used according to with temperature class 130 (B), the output is reduced by a further 15 %.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Overview

Recommended special versions:

- Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping – Order code **A11**
- Mounting of PT 100 resistance thermometers for winding temperature monitoring – Order codes **A60, A61**
- Specially for motor series 1LA8, 1PQ8 and 1LL8: Mounting of 2 screw-in PT 100 resistance thermometers in basic circuit for roller bearings – Order code **A72**
- Anti-condensation heaters for 230 V – Order code **K45**
- Anti-condensation heaters for 115 V – Order code **K46**

- IP56 degree of protection (non-heavy-sea) for protection against harmful dust deposits, protection against water jets from any direction – Order code **K52**
- IP65 degree of protection for complete protection against dust deposits, protection against water jets from any direction – Order code **K50**
Not possible for non-standard motors 1LA8, 1PQ8 and 1LL8.
- Special bearing for drive-end (DE) and non-drive-end (NDE) bearing size 63 – Order code **K36**, for non-standard motors on request
- Metal external fan for self-ventilated motors – Order code **K35**

Selection and ordering data

Order information

The fees levied by the classification authorities for individual acceptance testing are included in order code **E09/E10** for motor types 1LG4, 1LG6, 1PP4, 1LA8, 1PQ8, 1LL8 and 1LH8. For the other motor types, 1LA5, 1LA6, 1LA7, 1LA9, 1MA, 1MJ, 1PP5, 1PP7, individual acceptance testing must be ordered in plain text and will be invoiced separately (please inquire).

When ordering, add the supplement “-Z” to the Order No. as well as plain text details. For 1LA8 motors, supplement the Order No. with order code **E80** and plain text.

For other special versions, see the relevant sections under “Standard motors up to frame size 315 L”, “Non-standard motors frame size 315 and above”, “Explosion-proof motors” and “Fan motors”. In addition to this, for marine motors, the following special versions are the Standard version and therefore included in the order codes for the basic marine version.

Standard version:

Description	Order code
Acceptance test certificate 3.1 according to EN 10204 (not included in order code E00)	B02
External earthing terminal	L13

Type approved standard motors up to frame size 315 L in marine version

Special versions	Additional identification code -Z with order code or plain text	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
		1LA7 (aluminum)							1LA5 (aluminum)							
Basic marine version ¹⁾																
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	E10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

For legend and footnotes, see Page 10/12.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Special versions	Additional identification code -Z with order code or plain text	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with improved efficiency																
Basic marine version ¹⁾																
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00															
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11															
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21															
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31															
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51															
Acceptance/certification																
Individual acceptance by marine classification society	E10															
	Details in plain text															
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾															
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾															
Self-ventilated energy-saving motors with high efficiency																
Basic marine version ¹⁾																
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00															
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11															
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21															
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31															
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51															
Acceptance/certification																
Individual acceptance by marine classification society	E10 ²⁾															
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾															
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾															

For legend and footnotes, see Page 10/12.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Special versions	Additional identification code -Z with order code or plain text	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated energy-saving motors with high efficiency																	
Basic marine version ¹⁾																	
1LG6 (cast-iron)																	
Without type test certificate according to ABS 50°C/CCS 45°C/RINA 45°C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00											✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11											✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21											✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31											✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51											✓	✓	✓	✓	✓	✓
Acceptance/certification																	
Individual acceptance by marine classification society	E10											✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾											✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

- ✓ With additional charge
- Not possible
- O. R. Possible on request

¹⁾ Motor for use in shipping for higher ambient temperature and/or used as 155 (F) according to 130 (B), order with details in plain text. The order codes for the basic marine version (**E00**, **E11**, **E21**, **E31**, **E51**) cannot be combined with each other. For motor series 1LA9 with increased output, the output is reduced by 4 % with order codes **E11**, **E31** and **E51** and by 8 % with order codes **E00** and **E21**.

²⁾ Option or details in plain text only necessary for one motor when ordering several motors of the same type.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Type approved explosion-proof motors up to frame size 315 L in marine version

Special versions	Additional identification code -Z with order code or plain text	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "e"																
Basic marine version ¹⁾																
1MA7 (aluminum)																
Without type test certificate according to ABS 50°C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	Details in plain text		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Type test with heat run for horizontal motors, with acceptance	Details in plain text ²⁾		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Basic marine version ¹⁾																
1MA6 (cast-iron)																
Without type test certificate according to ABS 50°C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	Details in plain text		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Type test with heat run for horizontal motors, with acceptance	Details in plain text ²⁾		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

For legend and footnotes, see Page 10/14.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Special versions	Additional identification code -Z with order code or plain text	Motor type frame size													
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection “de”															
Basic marine version ¹⁾															
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00														
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11														
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21														
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31														
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51														
Acceptance/certification															
Individual acceptance by marine classification society	Details in plain text														
Type test with heat run for horizontal motors, with acceptance	Details in plain text ²⁾														
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾														

✓ With additional charge
O. R. Possible on request

¹⁾ Motor for use in shipping for higher ambient temperature and/or used as 155 (F) according to 130 (B), order with details in plain text. In some cases motor series 1MA is supplied with reduced output, but is designed for the maximum possible and certified output. For motor series 1MJ output is reduced by 4 % for order codes **E11**, **E21**, **E31** and **E51** and by 8 % for order code **E00**. The order codes for the basic marine version (**E00**, **E11**, **E21**, **E31**, **E51**) cannot be combined with each other.

²⁾ Option or details in plain text only necessary for one motor when ordering several motors of the same type.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Special versions	Additional identification code -Z with order code or plain text	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21 and 22 with type of protection “n” or protection against dust explosions																
1LA7 (aluminum) ¹⁾																
1LA5 (aluminum) ²⁾																
Basic marine version ³⁾																
Without type test certificate according to ABS 50°C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	E10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ⁴⁾	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	Details in plain text ⁴⁾	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
1LA9 (aluminum) ⁵⁾																
Basic marine version ³⁾																
Without type test certificate according to ABS 50°C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	E10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ⁴⁾	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	Details in plain text ⁴⁾	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

For legend and footnotes, see Page 10/16.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Special versions	Additional identification code -Z with order code or plain text	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21 and 22 with type of protection “n” or protection against dust explosions																
Basic marine version ³⁾																
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	E10						–	–	–	–	✓	✓	✓	✓	✓	✓
	Details in plain text						O. R.	O. R.	O. R.	O. R.	–	–	–	–	–	–
Type test with heat run for horizontal motors, with acceptance	F83 ⁴⁾						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	Details in plain text ⁴⁾						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

- ✓ With additional charge
 – Not possible
 O. R. Possible on request

- ¹⁾ Zone 2 for 1LA7 motors not possible in frame size 56.
²⁾ Zone 2 for 1LA5 motors not possible, for Zone 2 use 1LG4 motors instead of 1LA5 motors.
³⁾ Motor for use in shipping for higher ambient temperature and/or used as 155 (F) according to 130 (B), order with details in plain text. The output of motors is reduced by 4 % for order codes **E11**, **E21**, **E31** and **E51** and by 8 % for order code **E00**. The order codes for the basic marine version (**E00**, **E11**, **E21**, **E31**, **E51**) cannot be combined with each other.

- ⁴⁾ Option or details in plain text only necessary for one motor when ordering several motors of the same type.
⁵⁾ Zone 2 not possible for 1LA9 motors in frame sizes 56, 180 and 200.
⁶⁾ Zone 21 not possible for 1LA6 motors.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Type approved fan motors in marine version

Special versions	Additional identification code -Z with order code or plain text	Motor type frame size												
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315

Self-ventilated motors in pole-changing version

		1LA7 (aluminum)						1LA5 (aluminum)	
Basic marine version ¹⁾									
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification									
Individual acceptance by marine classification society	E10	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
1LG4 (cast-iron)									
Basic marine version ¹⁾									
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification									
Individual acceptance by marine classification society	E10	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Special versions	Additional identification code -Z with order code or plain text	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Forced-air cooled motors without external fan and fan cover																	
		1PP7 (aluminum)						1PP5 (aluminum)									
Basic marine version ¹⁾																	
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Acceptance/certification																	
Individual acceptance by marine classification society	E10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	
								1PP4 (cast-iron)									
Basic marine version ¹⁾																	
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Acceptance/certification																	
Individual acceptance by marine classification society	E10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	

- ✓ With additional charge
 – Not possible
 O. R. Possible on request

¹⁾ Motor for use in shipping for higher ambient temperature and/or used as 155 (F) according to 130 (B), order with details in plain text. The order codes for the basic marine version (**E00**, **E11**, **E21**, **E31**, **E51**) cannot be combined with each other.

²⁾ Option or details in plain text only necessary for one motor when ordering several motors of the same type.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Standard motors up to frame size 315 L in marine version (individual acceptance required)

Special versions	Additional identification code -Z with order code or plain text	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-cooled motors without external fan																
Basic marine version ^{1) 2)}																
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	E10			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ³⁾			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	Details in plain text ³⁾			O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Basic marine version ^{1) 2)}																
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00											✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	E10											✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ³⁾											✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	Details in plain text ³⁾											O. R.	O. R.	O. R.	O. R.	O. R.

✓ With additional charge
O. R. Possible on request

¹⁾ Motor for use in shipping for higher ambient temperature and/or used as 155 (F) according to 130 (B), order with details in plain text. The output of motors is reduced by 8 % for order code **E00**. The order codes for the basic marine version (**E00**, **E11**, **E21**, **E31**, **E51**) cannot be combined with each other.

²⁾ Certification is possible on request according to the marine classification authorities GL, LR, BV and DNV.

³⁾ Option or details in plain text only necessary for one motor when ordering several motors of the same type.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Smoke-extraction motors as marine version (individual acceptance required)

Special versions	Additional identification code -Z with order code or plain text	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors																
Basic marine version ¹⁾																
1LA7 (aluminum)																
1LA5 (aluminum)																
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	E10				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾				O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Basic marine version ¹⁾																
1LA6 (cast-iron)																
1LG6 (cast-iron)																
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	E10				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾				O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

For legend and footnotes, see Page 10/22.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Special versions	Additional identification code -Z with order code or plain text	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Forced-air ventilated motors																
Basic marine version ¹⁾																
Without type test certificate according to ABS 50°C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	E10					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾					O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Special versions	Additional identification code -Z with order code or plain text	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Basic marine version ¹⁾		1PP6 (cast-iron)														
Without type test certificate according to ABS 50°C/CCS 45 °C/RINA 45 °C, temperature class 155 (F) used according to 155 (F) (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E11						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E21						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E31						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E51						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	E10						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

- ✓ With additional charge
- Not possible
- O. R. Possible on request

¹⁾ The order codes for the basic marine version (**E00, E11, E21, E31, E51**) cannot be combined with each other.

²⁾ Option or details in plain text only necessary for one motor when ordering several motors of the same type.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Non-standard motors frame size 315 and above in marine version (individual acceptance required)

Special versions	Additional identification code -Z with order code or plain text	Motor type frame size			
		315	355	400	450
Self-ventilated motors for mains-fed and converter-fed operation					
		1LA8 (cast-iron)			
Basic marine version ¹⁾					
Without type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F) used according to 155 (F)	E11	✓	✓	✓	✓
Without type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F) used according to 155 (F)	E21	✓	✓	✓	✓
Without type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F) used according to 155 (F)	E31	✓	✓	✓	✓
Without type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F) used according to 155 (F)	E51	✓	✓	✓	✓
Without type test certificate according to ABS (American Bureau of Shipping), USA, CT 50 °C, temperature class 155 (F), used according to 155 (F)	E61	✓	✓	✓	✓
Without type test certificate according to CCS (Chinese Classification Society), China, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E71	✓	✓	✓	✓
Motor for use in shipping, higher ambient temperature and/or used as temperature class 155 (F) according to 130 (B)	E80 + plain text details	✓	✓	✓	✓
Acceptance/certification					
Individual acceptance by marine classification society	E10	✓	✓	✓	✓
Individual acceptance by marine classification society with supervision of construction and acceptance test certificate 3.2 according to EN 10204	E09	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F93 ²⁾	✓	✓	✓	✓
Forced-air cooled motors with externally mounted fan for converter-fed operation					
		1PQ8 (cast-iron)			
Basic marine version ¹⁾					
Without type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F) used according to 155 (F)	E11	✓	✓	✓	✓
Without type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F) used according to 155 (F)	E21	✓	✓	✓	✓
Without type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F) used according to 155 (F)	E31	✓	✓	✓	✓
Without type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F) used according to 155 (F)	E51	✓	✓	✓	✓
Without type test certificate according to ABS (American Bureau of Shipping), USA, CT 50 °C, temperature class 155 (F), used according to 155 (F)	E61	✓	✓	✓	✓
Without type test certificate according to CCS (Chinese Classification Society), China, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E71	✓	✓	✓	✓
Motor for use in shipping, higher ambient temperature and/or used as temperature class 155 (F) according to 130 (B)	E80 + plain text details	✓	✓	✓	✓
Acceptance/certification					
Individual acceptance by marine classification society	E10	✓	✓	✓	✓
Individual acceptance by marine classification society with supervision of construction and acceptance test certificate 3.2 according to EN 10204	E09	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F93 ²⁾	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Marine motors

Special versions

Special versions	Additional identification code -Z with order code or plain text	Motor type frame size			
		315	355	400	450
Self-ventilated motors with through ventilation for mains-fed and converter-fed operation					
		1LL8 (cast-iron)			
Basic marine version ¹⁾					
Without type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F) used according to 155 (F)	E11	✓	✓	✓	✓
Without type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F) used according to 155 (F)	E21	✓	✓	✓	✓
Without type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F) used according to 155 (F)	E31	✓	✓	✓	✓
Without type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F) used according to 155 (F)	E51	✓	✓	✓	✓
Without type test certificate according to ABS (American Bureau of Shipping), USA, CT 50 °C, temperature class 155 (F), used according to 155 (F)	E61	✓	✓	✓	✓
Without type test certificate according to CCS (Chinese Classification Society), China, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E71	✓	✓	✓	✓
Motor for use in shipping, higher ambient temperature and/or used as temperature class 155 (F) according to 130 (B)	E80 + plain text details	✓	✓	✓	✓
Acceptance/certification					
Individual acceptance by marine classification society	E10	✓	✓	✓	✓
Individual acceptance by marine classification society with supervision of construction and acceptance test certificate 3.2 according to EN 10204	E09	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F93 ²⁾	✓	✓	✓	✓

✓ With additional charge

Explosion-proof motors frame size 315 and above in marine version (individual acceptance required)

Special versions	Order No. supplement -Z with order code and/or plain text details	Motor type frame size			
		315	355	400	450
Self-ventilated motors in Zone 22 with type of protection “n” or protection against dust explosions					
		1LA8 (cast-iron)			
Basic marine version ¹⁾					
Without type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F) used according to 155 (F)	E11	✓	✓	✓	✓
Without type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F) used according to 155 (F)	E21	✓	✓	✓	✓
Without type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F) used according to 155 (F)	E31	✓	✓	✓	✓
Without type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F) used according to 155 (F)	E51	✓	✓	✓	✓
Without type test certificate according to ABS (American Bureau of Shipping), USA, CT 50 °C, temperature class 155 (F), used according to 155 (F)	E61	✓	✓	✓	✓
Without type test certificate according to CCS (Chinese Classification Society), China, CT 45 °C, temperature class 155 (F), used according to 155 (F)	E71	✓	✓	✓	✓
Motor for use in shipping, higher ambient temperature and/or used as temperature class 155 (F) according to 130 (B)	E80 + plain text details	✓	✓	✓	✓
Acceptance/certification					
Individual acceptance by marine classification society	E10	✓	✓	✓	✓
Individual acceptance by marine classification society with supervision of construction and acceptance test certificate 3.2 according to EN 10204	E09	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F93 ²⁾	✓	✓	✓	✓

✓ With additional charge

¹⁾ The order codes for the basic marine version (**E11, E21, E31, E51, E61, E71, E80**) cannot be combined with each other.

²⁾ Option only necessary for one motor when ordering several motors of the same type. Type testing is also performed for converter-fed operation.

IEC Squirrel-Cage Motors

Marine motors

Accessories

Overview

See the relevant sections in catalog parts 2 "Standard motors up to frame size 315 L", 3 "Non-standard motors frame size 315 and above", 4 "Explosion-proof motors", 7 "Fan motors" and 9 "Smoke-extraction motors".

Dimensions

Overview

See dimensions in catalog parts 2 "Standard motors up to frame size 315 L", 3 "Non-standard motors frame size 315 and above", 4 "Explosion-proof motors" and 7 "Fan motors", 9 "Smoke-extraction motors".

IEC Squirrel-Cage Motors

Marine motors

Notes

10



Appendix



11/2	Overview of products
11/2	SIMATIC ET 200S FC/ SIMATIC ET 200pro FC
11/4	SINAMICS G110
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11/11	SD configurator selection tool
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11/19	SD Manual Collection
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11/21	Siemens Industry Automation and Drive Technologies in the WWW
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IEC Squirrel-Cage Motors

Appendix

Overview of products

Frequency converters for SIMATIC ET 200 distributed I/O

Frequency converters are available for the SIMATIC ET 200 distributed I/O that are fully system-integrated modules. Converters are available for the finely modular SIMATIC ET 200S FC system to the IP20 degree of protection as well as for the cabinet-free SIMATIC ET 200pro FC system to the IP65 degree of protection. With a broad range of possibilities, the frequency converters expand the functional scope of the modular modules that are available in both systems (e.g. inputs and outputs, technology modules, direct and soft starters). With suitable interface modules, connection to PROFIBUS and PROFINET is possible via the SIMATIC ET 200 system bus as well as integration of PLC functionality into the system. Fail-safe frequency converter functions can be activated locally or via PROFIsafe.

An overview of the features of these frequency converters is given in the tables below. The complete product spectrum including ordering data, technical data and explanations can be found in Catalog IK PI "Industrial Communication" and on the Internet at

<http://www.siemens.com/et200s-fc>

and

<http://www.siemens.com/et200pro-fc>

SIMATIC ET 200S FC	
Main features	<ul style="list-style-type: none"> • Complete embedding of a frequency converter into a distributed I/O system to IP20 degree of protection • Easy assembly and low susceptibility to errors thanks to self-assembling energy and communications bus • Space-saving assembly thanks to compact dimensions and common protection • Fast, tool-free replacement of the frequency converter for a servicing requirement (hot swapping) • Frequency control (V/f), vector control with and without encoders • Line-commutated regenerative feedback by power electronics of the latest generation • Modular structure with Control Unit (closed-loop control module) and Power Module (power section) • Frequency inverter variant with integrated, autonomous, fail-safe functions without the need for complex external wiring
Rated outputs	0.75 kW, 2.2 kW, 4.0 kW
Input voltage	380 ... 480 V 3 AC $\pm 10\%$
Overall width	Control Unit + Power Module up to 0.75 kW: 80 mm, otherwise 145 mm
Mains frequency	47 ... 63 Hz
Overload capability	<ul style="list-style-type: none"> • Overload current $1.5 \times$ rated output current (i.e. 150 % overload) over 60 s, cycle time 300 s • Overload current $2 \times$ rated output current (i.e. 200 % overload) over 3 s, cycle time 300 s
Output frequency	0 ... 650 Hz
Pulse frequency	8 kHz (standard), 2 ... 16 kHz (in steps of 2 kHz)
Frequency bands that can be skipped	1, programmable
Efficiency	$\geq 96\%$
Interfaces	<ul style="list-style-type: none"> • Connection to PROFIBUS via IM151 interface module • Connection to PROFINET via IM151-3PN interface module • Integration of PLC functionality through IM151 CPU and IM151-7 F CPU interface modules • RS232 interface with USS protocol for commissioning on the PC with the STARTER commissioning software • Slot for an optional Micro Memory Card for uploading or downloading parameter settings • PTC/KTY84 interface for motor monitoring • Speed sensor interface (Sub-D connector) for unipolar HTL incremental encoder • Activation of the integrated safety functions over PROFIsafe (using the PM-D F PROFIsafe Power Module) or terminals (using the Safety Local Power Module PM-D F X1)
Standards conformance	UL, cUL, CE and c-tick, Low-Voltage Directive 73/23/EEC, EMC Directive 89/336/EEC
Functional safety	<p>Closed-loop control module with Integral safety functions to Category 3 of EN 954-1 and SIL2 of IEC 61508:</p> <ul style="list-style-type: none"> • Safety torque off • Safely limited speed • Safe stop 1 <p>The safety functions "Safely limited speed" and "Safe stop 1" are certified for encoderless asynchronous motors. These safety functions are not approved for pull-through loads as in the case of lifting gear and winders</p>
Degree of protection	IP20



SIMATIC ET 200S FC
Control Units



SIMATIC ET 200S FC
Power Modules

SIMATIC ET 200pro FC	
Main features	<ul style="list-style-type: none"> • Complete embedding of a frequency converter into a distributed I/O system to IP65 degree of protection • Easy assembly and low susceptibility to errors thanks to self-assembling energy and communications bus • Fast replacement of the frequency converter during servicing without interruption of the bus communication to other modules within the SIMATIC ET 200pro FC • Frequency control (V/f), vector control without encoders • Line-commutated regenerative feedback by power electronics of the latest generation • Frequency converter variant with integrated, autonomous, fail-safe functions without the need for complex external wiring
Rated outputs	1.1 kW (at 0 ... 55 °C ambient temperature) 1.5 kW (at 0 ... 45 °C ambient temperature)
Input voltage	380 ... 480 V 3 AC ± 10 %
Overall width	155 mm
Mains frequency	47 ... 63 Hz
Overload capability	<ul style="list-style-type: none"> • Overload current 1.5 \times rated output current (i.e. 150 % overload) over 60 s, cycle time 300 s • Overload current 2 \times rated output current (i.e. 200 % overload) over 3 s, cycle time 300 s
Output frequency	0 ... 650 Hz
Pulse frequency	4 kHz (standard) 2 ... 16 kHz (in steps of 2 kHz)
Frequency bands that can be skipped	1, programmable
Efficiency	≥ 96 %
Interfaces	<ul style="list-style-type: none"> • Connection to PROFIBUS through IM154-1 and IM154-2 interface modules • Available soon connection to PROFINET over IM154-4PN interface modules and connection to IM154-8 CPU interface modules • Optical interface with USS protocol for fiber-optic RS232 connecting cable • Control signal for 180 V DC electromagnetic motor brake • Slot for an optional memory card (MMC) for uploading or downloading parameter settings • PTC/KTY84 interface for motor temperature monitoring • Activation of the integrated safety functions through the Safety Local Isolator Module F RSM or through F-Switch PROFIsafe
Standards conformance	UL, cUL, CE, Low-Voltage Directive 73/23/EEC, EMC Directive 89/336/EEC
Functional safety	<p>Variant with Integral safety functions to Category 3 of EN 954-1 and SIL2 of IEC 61508:</p> <ul style="list-style-type: none"> • Safety torque off • Safely limited speed • Safe stop 1 <p>The safety functions "Safely limited speed" and "Safe stop 1" are certified for encoderless asynchronous motors. These safety functions are not approved for pull-through loads as in the case of lifting gear and winders</p>
Degree of protection	IP65



SIMATIC ET 200pro FC
Standard frequency converter



SIMATIC ET 200pro FC-Failsafe
Frequency converter with integrated safety functions

IEC Squirrel-Cage Motors

Appendix

Overview of products

SINAMICS G110 chassis inverters

The SINAMICS G110 chassis inverter is a flexible drive. The table shows an overview of the features of this product. You will find the complete product spectrum with ordering data, technical specifications and descriptions in Catalog D 11.1

“SINAMICS G110/SINAMICS G120 Inverter Chassis Units and SINAMICS G120D Distributed Frequency Inverters” and on the Internet at <http://www.siemens.com/sinamics-g110>

SINAMICS G110	
Main characteristics	“ The versatile drive in the low power range ” is the frequency inverter for inverter chassis units, SINAMICS G110 which can be used for a wide range of industrial drive applications using variable speeds. The particularly compact SINAMICS G110 inverter uses voltage/frequency control (U/f) and is the ideal frequency inverter solution in the lower output and performance ranges of the SINAMICS product family. The inverter is available in three frame sizes for connection to single-phase supply systems.
Electrical Data	
Mains voltages, power range	1 AC 200 V ... 240 V, $\pm 10\%$; 0.12 kW ... 3.0 kW
Network types	IT, TN, TT
Power frequency	50/60 Hz
Output frequency	0 Hz ... 650 Hz
Control methods	U/f control, linear ($M-n$) U/f control, quadratic ($M-r^2$) U/f control, programmable
Fixed frequencies	3, programmable
Skipped frequency ranges	1, programmable
Digital inputs	3 programmable 24 V DC digital inputs
Analog input (for analog version)	1 analog input for setpoints from 0 V to 10 V, scaleable or for use as 4th digital input
Digital output	1 digital output 24 V DC
Communication interface (for USS version)	RS 485 serial interface for use with USS protocol
Software functions	<ul style="list-style-type: none"> • Automatic restart following interruptions in operation due to a power failure • Smooth connection of the converter to the rotating motor • Programmable ramp-up/ramp-down times • Ramp smoothing
Functions	
Protective functions	<ul style="list-style-type: none"> • Undervoltage • Overvoltage • Ground fault • Short-circuit • Stall prevention • Thermal motor protection I^2t • Converter overtemperature • Motor overtemperature
Connectable motors	Asynchronous motors
Mechanical data	
Degree of protection	IP20
Cooling method for	
<ul style="list-style-type: none"> • Converters ≤ 0.75 kW • Converters > 0.75 kW 	Finned heat dissipater with convection cooling; version with flat heat dissipater also available Internal air cooling (integral fan)
Norms	
Compliance with standards	CE, UL, cUL, c-tick



SINAMICS G110 Chassis inverters

SINAMICS G120 inverter chassis units

The SINAMICS G120 inverter chassis unit is a modular drive. The table provides an overview of the features of this product. The complete range of products together with ordering data, technical data and explanations are indicated in the

Catalog D 11.1 "SINAMICS G110/SINAMICS G120 Inverter Chassis Units and SINAMICS G120D Distributed Frequency Inverters" and on the Internet at: <http://www.siemens.com/sinamics-g120>

SINAMICS G120	
Main features	As "a modular single drive for low and medium outputs" , the frequency inverter of the SINAMICS G120 inverter chassis units can be used for a wide range of industrial drive applications. The SINAMICS G120 frequency inverter distinguishes itself through its modular design (Power Module and Control Unit), and the globally unique integration of numerous innovative functions in safety technology and regenerative feedback into the line supply. There are extensive system components available in the range from 0.37 to 132 kW. This means that the drive units are suitable for a multitude of drive applications.
Electrical data	
Mains voltages, output range	3 AC 380 V ... 480 V, $\pm 10\%$; 0.37 kW ... 132 kW
Network types	IT, TN, TT
Mains frequency	47 ... 63 Hz
Output frequency	0 Hz ... 650 Hz
Control method	V/f control, linear ($M \sim n$) V/f control, quadratic ($M \sim n^2$) and parameterizable sensorless vector control, vector control with encoder (closed control loop) Torque control
Fixed frequencies	16, programmable
Digital inputs	up to 9 digital inputs, depending on the Control Unit 24 V DC
Analog input (for the analog version)	up to 2 analog inputs (0 V to 10 V)
Digital output	3 digital inputs
Communication interface	RS485/USS; PROFIBUS; PROFINET
Functions	
Software functions	<ul style="list-style-type: none"> • Programmable ramp-up times 0 ... 650 s, ramp rounding • Automatic restart after interruption of operation due to supply failure • Flying restart • Signals are locally pre-processed using free function blocks • 3 selectable motor data sets • High-quality internal PID controller for simple process control • Positioning ramp down • Kinetic buffering
Protection functions	<ul style="list-style-type: none"> • Motor temperature (PTC/KTY, Pt) • Power unit and load cycle monitoring • Overvoltage and undervoltage • Earth fault • Stall prevention • System protection functions
Safety Integrated Functions	STO, SS1, SLS, SBC
Connectable motors	Asynchronous motors
Mechanical data	
Degree of protection	IP20
Cooling method	Innovative cooling concept: The power electronics are cooled by means of heat sinks with an external fan; Open-loop and closed-loop control electronics are cooled by convection
Standards	
Standards complied with	CE, UL, cUL, c-tick, Safety Integrated IEC 61508/SIL 2



SINAMICS G120 inverter chassis units

IEC Squirrel-Cage Motors

Appendix

Overview of products

SINAMICS G120D distributed frequency inverter

The SINAMICS G120D frequency inverter is a modular drive. The table provides an overview of the features of this product. The complete range of products together with ordering data, technical data and explanations are indicated in the

Catalog D 11.1 "SINAMICS G110/SINAMICS G120 Inverter Chassis Units and SINAMICS G120D Distributed Frequency Inverters" and on the Internet at:

<http://www.siemens.com/sinamics-g120d>

SINAMICS G120D	
Main features	"The modular drive for low and medium outputs" – the SINAMICS G120D distributed frequency inverter can be especially used for sophisticated conveyor applications in industry as for many other high-performance applications. The distributed SINAMICS G120D frequency inverter distinguishes itself through its modular design (Power Module and Control Unit) as well as through its extremely flat type of construction, an identical drilling template for all outputs and a high degree of safety. It offers safety functions that are unique in its class. It helps to save significant amounts of energy as a result of its line-commutated regenerative feedback capability. It goes without saying that the frequency inverter is also capable of communications.
Electrical data	
Mains voltages, output range	3 AC 380 V ... 480 V, $\pm 10\%$; 0.75 kW ... 7.5 kW
Network types	IT, TN, TT
Mains frequency	47 ... 63 Hz
Output frequency	0 Hz ... 650 Hz
Control method	V/f control, linear ($M \sim n$) V/f control, quadratic ($M \sim n^2$) and parameterizable sensorless vector control, vector control with encoder (closed control loop) Torque control
Fixed frequencies	16, programmable
Digital inputs	up to 6 digital inputs, depending on the Control Unit 24 V DC
Analog input (for the analog version)	up to 2 analog inputs (0 V to 10 V)
Digital output	3 digital inputs
Communication interface	PROFIBUS; PROFINET
Functions	
Software functions	<ul style="list-style-type: none"> • Programmable ramp-up times 0 ... 650 s, ramp rounding • Automatic restart after interruption of operation due to supply failure • Flying restart • Signals are locally pre-processed using free function blocks • 3 selectable motor data sets • High-quality internal PID controller for simple process control • Positioning ramp down • Kinetic buffering
Protection functions	<ul style="list-style-type: none"> • Motor temperature (PTC/KTY, Pt) • Power unit and load cycle monitoring • Overvoltage and undervoltage • Earth fault • Stall prevention • System protection functions
Safety Integrated Functions	STO, SS1, SLS
Connectable motors	Asynchronous motors
Mechanical data	
Degree of protection	IP65
Cooling method	Convection cooling, for higher outputs with fan
Standards	
Standards complied with	CE, UL, cUL, c-tick, Safety Integrated IEC 61508/SIL 2



SINAMICS G120D distributed frequency inverter

MICROMASTER 410/420/430/440 frequency converters

MICROMASTER converters from Siemens perfectly complement the motors. The table shows an overview of the features of these converters. For the full range of products complete with ordering data, technical details and explanations, see Catalog DA 51.2.

For up-to-date information on MICROMASTER 420/430/440 frequency converters, visit the Internet at <http://www.siemens.com/micromaster>

	MICROMASTER 410	MICROMASTER 420	MICROMASTER 430	MICROMASTER 440
Main characteristics	"The low-price solution" for variable speeds with three-phase motors on single-phase networks, e.g. with pumps, fans, billboards, barriers, gate drives and automatic machines Discontinued model¹⁾	"The universal converter" for three-phase networks and optional fieldbus interfacing, e.g. for conveyor belts, material transport, pumps, fans and machine tools	"The specialist for pumps and fans" with optimized OP (manual/automatic changeover), adapted software functionality and optimised output utilization	"The all-rounder" with advanced vector control (with and without encoder feedback) for versatile applications in sectors such as conveyor systems, textiles, lifts, lifting gear and machine construction
Output range	0.12 kW ... 0.75 kW	0.12 kW ... 11 kW	7.5 kW ... 250 kW	0.12 kW ... 250 kW
Voltage ranges	1 AC 100 V ... 120 V 1 AC 200 V ... 240 V	1 AC 200 V ... 240 V 3 AC 200 V ... 240 V 3 AC 380 V ... 480 V	3 AC 380 V ... 480 V	1 AC 200 V ... 240 V 3 AC 200 V ... 240 V 3 AC 380 V ... 480 V 3 AC 500 V ... 600 V
Closed-loop Control	<ul style="list-style-type: none"> V/f characteristic Multipoint characteristic (parameterizable V/f characteristic) FCC (Flux Current Control) 	<ul style="list-style-type: none"> V/f characteristic Multipoint characteristic (parameterizable V/f characteristic) FCC (Flux Current Control) 	<ul style="list-style-type: none"> V/f characteristic Multipoint characteristic (parameterizable V/f characteristic) FCC (Flux Current Control) 	<ul style="list-style-type: none"> V/f characteristic Multipoint characteristic (parameterizable V/f characteristic) FCC (Flux Current Control) Vector control
Process control	–	Internal PI controller	Internal PID controller	Internal PID controller (autotuning)
Inputs	3 Digital inputs 1 Analog input	3 Digital inputs 1 Analog input	6 Digital inputs 2 Analog inputs 1 PTC/KTY input	6 Digital inputs 2 Analog inputs 1 PTC/KTY input
Outputs	1 Relay output	1 Analog output 1 Relay output	2 Analog outputs 3 Relay outputs	2 Analog outputs 3 Relay outputs
Interfacing to automation system	The PLC partner for LOGO! and SIMATIC S7-200	The ideal partner for your automation tasks, whether with SIMATIC S7-200, SIMATIC S7-300/400 (TIA) or SIMOTION	The ideal partner for your automation tasks, whether with SIMATIC S7-200, SIMATIC S7-300/400 (TIA) or SIMOTION	The ideal partner for your automation tasks, whether with SIMATIC S7-200, SIMATIC S7-300/400 (TIA) or SIMOTION
Additional features	<ul style="list-style-type: none"> Self-ventilated (no fan unit) Position of connections as with conventional switching elements (e.g. contactors) Variant with flat heat sink 	<ul style="list-style-type: none"> BICO technology Compound braking for controlled rapid braking 	<ul style="list-style-type: none"> Energy-saving mode Load torque monitoring (detects dry run of pumps) Motor staging Bypass mode BICO technology 	<ul style="list-style-type: none"> 3 selectable drive data records Integrated brake chopper (up to 75 kW) Torque control BICO technology



Examples of MICROMASTER 410/420/430/440

¹⁾ The MICROMASTER 410 is a discontinued model since a fairly long time. The type cancellation has been executed as for the 1/10/07 (01.Oct.2007). For this reason, the MICROMASTER is only available as spare part.

IEC Squirrel-Cage Motors

Appendix

Overview of products

Distributed drive solutions – MICROMASTER 411/COMBIMASTER 411 converters and geared motors

The MICROMASTER 411/COMBIMASTER 411 converters from Siemens are available as a distributed drives solution. The table shows an overview of the features of this product. The complete product spectrum with ordering data, technical details and descriptions can be found in Catalog DA 51.3 MICROMASTER 411/COMBIMASTER 411.

For up-to-date information on MICROMASTER 411 and COMBIMASTER 411 as well as geared motors, visit the Internet at

<http://www.siemens.com/combimaster>

	MICROMASTER 411	COMBIMASTER 411
Main characteristics	"The distributed converter" for a wide drive range, for simple individual applications for pumps and fans through to multiple drives for conveyor systems in networked control systems.	
Output range	0.37 kW ... 3 kW	
Voltage ranges	3 AC 380 V ... 480 V	
Case/ frame sizes	CS B CS C	71 ... 100 90/100
Types of construction		IM B3 IM B5 IM V1 (without protective cover) IM V1 (with protective cover) IM B14 (with standard flange) IM B14 (with special flange) IM B35
Degree of protection	IP65	IP55
Further technical characteristics	<ul style="list-style-type: none"> • V/f characteristic • Multipoint characteristic (parameterisable V/f characteristic) • FCC (Flux Current Control) • Internal PI controller • 3 Digital inputs • 1 Analog input • 1 Relay output • Compound braking for controlled rapid braking • ECOFAST variants with plug connector for power supply, communication interfaces and motor connections to support quick and problem-free replacement. The ECOFAST variants are totally compatible with the ECOFAST technology systems. 	



Examples of MICROMASTER 411



Examples of COMBIMASTER 411

Overview of products

Customized motors

In addition to the products offered in the catalog, our range of motors also includes "Customized motors".

We can develop individual drive solutions for your special requirements, provide samples and supply them in accordance with your logistical requirements.

Our worldwide network of Siemens offices as well as our regional offices in Germany are, of course, at your disposal for advice (see "Siemens Contacts Worldwide").

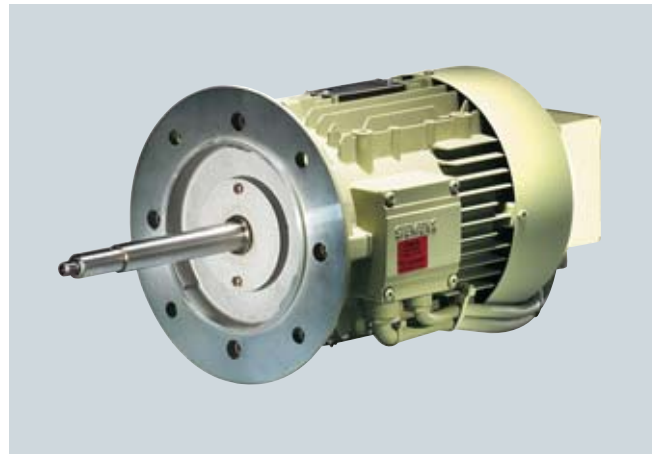
Please inquire for details.

We have listed below some of the "Customized solutions" already realized:

- High-speed motors for textile machines and compressors
- Motors with increased output/size ratio
- Liquid-cooled motors
- Synchronous generators for standby supply systems
- Motors for wood processing plants
- Built-in motors for refrigerating motors/compressors (freezer proof)
- Rolling motors for harsh conditions (e.g. roller drives)
- Pump motors with special shafts/special materials
- Single-phase motors for industrial applications
- Lifting gear motors



Built-in motor for refrigeration



Pump motor with special shaft/special materials



Roller motor for harsh conditions



Lifting gear motor

IEC Squirrel-Cage Motors

Appendix

Overview of products

NEMA motors

For compliance with the local specifications of the NAFTA markets (USA, Canada and Mexico), we manufacture low-voltage motors acc. to the NEMA standard for a wide range of different application areas. This includes motors designed in accordance with the US act, EPACT (specified minimum efficiency levels), as well as motors with NEMA premium efficiency levels: Our NEMA motor series provide the highest operating reliability and maximum service life. Designed and manufactured for rugged oper-

ation, our NEMA motors conquer even the harshest industrial conditions strictly in accordance with the ISO 9001 international quality standard; with maximum performance, reliability and efficiency.

You will find the complete product spectrum with ordering data, technical specifications and information in Catalog D 81.2 U.S./Canada on the Internet at <http://www.sea.siemens.com/motors>

NEMA motors (NEMA = National Electrical Manufacturers Association)	
Frame size	NEMA frame size 56 ... 449
Output range	0.25 HP ... 500 HP
Number of poles	2/4/6/8
Voltages	3 AC 230/460/575 V
Frequency	60 Hz, 50 Hz on request
Type of construction	Foot-mounted, D flange, C flange, P flange
Casing	Cast-iron, aluminum or steel depending on the version
Cooling method	Surface-cooling or internal ventilation depending on the version
Temperature class	F used acc. to B
Type spectrum	<p>General purpose motors</p> <ul style="list-style-type: none"> • Legally specified minimum efficiency levels or NEMA premium efficiency levels • Standard motors for general industrial use • Aluminum or cast-iron case depending on the version <p>Severe duty motors</p> <ul style="list-style-type: none"> • Legally specified minimum efficiency levels or NEMA premium efficiency levels • Cast-iron case • Motors for use under extremely difficult environmental conditions <p>Severe duty IEEE841 motors</p> <ul style="list-style-type: none"> • Efficiency levels required by IEEE that exceed the EPACT act • Motors with increased requirements for use in the petrochemical industry (according to IEEE841) • Cast-iron case <p>Explosion-proof motors</p> <ul style="list-style-type: none"> • Efficiency levels better than or equal to EPACT • Multi label according to Division 1, Class I, Group D and Class II, Groups F&G • Single label according to Division 1, Class I, Groups C&D



Example of NEMA motor, Severe Duty SD100, cast-iron case



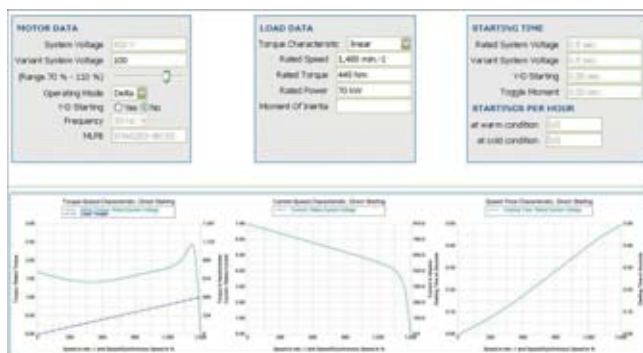
Example of NEMA motor, General Purpose GP10A, aluminum case

Overview

Product description

The SD configurator has been developed to facilitate the selection of a correct motor and/or converter from the wide spectrum of Standard Drives. It is integrated as an offline "selection tool" in the interactive catalog CA01 (DVD) and is also available online in the Mall. The SD configurator is used to find the correct drive solution and delivers both the correct order number and relevant documentation.

It can display operating instructions, factory test certificates, connection box documentation, etc. and generates data sheets, dimension drawings and a start-up calculation for the relevant products. It can also be used to identify a suitable converter for the selected motor.



3D models in a wide variety of 3D formats are also available.



The comprehensive help system not only explains the program functions, but also provides access to detailed technical background knowledge.

Product range

The SD configurator covers the product range of low-voltage motors (energy-saving and explosion-proof motors) with associated documentation and dimension drawings, low-voltage converters of the MICROMASTER 4 range, SINAMICS G110 and SINAMICS G120 inverter chassis units, SINAMICS G120D distributed frequency inverters and the frequency inverters for the SIMATIC ET 200S FC and SIMATIC ET 200pro distributed I/Os.

Hardware and software requirements

- PC with 1.5 GHz CPU or faster
- Operating systems
 - Windows 98/ME
 - Windows 2000
 - Windows XP
 - Windows NT (Service Pack 6 and higher)
 - Windows Vista
- At least 1024 Mbyte RAM user memory
- Screen resolution 1024 x 768, graphics with more than 256 colors/small fonts
- CD-ROM/DVD-drive
- Windows-compatible sound card
- Windows-compatible mouse

IEC Squirrel-Cage Motors

Appendix

SD configurator selection tool

Offline access to catalog CA01 – the Offline Mall



The interactive catalog CA 01 on DVD – the offline mall of Siemens Industry Automation and Drive Technologies – contains over 100000 products with approximately 5 million potential drive system product variants.

You can install catalog CA01 on your hard disk or network directly from the DVD as a light or full version. You find the SD configurator in the main menu of catalog CA01 under the tab "Selection tool".

Online access in the Siemens Mall

Furthermore, the SD configurator can now be used on the Internet without installation. The SD configurator can be found in the Siemens Mall under the following address:

<http://www.siemens.com/sd-configurator>



Selection and ordering data

	Order No.
Interactive Catalog CA 01 on DVD including SD configurator selection tool, English	E86060-D4001-A510-C7-7600

More information

The interactive catalog CA 01 can be ordered from the relevant Siemens sales office or via the Internet:

<http://www.siemens.com/automation/CA01>

Links to hints, tricks and downloads for functional or content updates can also be found at this address.

For technical advice and hotline support, you can also contact our hotline for Catalog CA 01:

Tel.: +49 (0) 180 50 50 22 2

e-mail: adsupport@siemens.com

Overview

The energy-saving program SinaSave is suitable for applications with motors for mains-fed operation (fixed speed) and converter-fed operation (variable speed). In mains-fed operation, you can calculate the cost savings as well as the amortization time for the additional cost of the Siemens EFF1 energy-saving motors with the three bases of comparison outlined below.

In comparison to:

- Siemens EFF2 energy-saving motors – **Case 1**
- Individually selected known motors – **Case 2**
- Known motors within an overall plant analysis – **Case 3**

The individual applications are:

Case 1

Calculation of the savings in energy costs as well as the amortization time for the additional cost of the Siemens EFF1 energy-saving motors as compared to the Siemens EFF2 energy-saving motors.

In this case, the motor data for the Siemens energy-saving motors have already been stored complete with their order numbers. In addition, you are told how long it will take until the additional cost for an energy-saving motor will pay for itself.

Case 2

Calculation of the savings in energy costs as well as the amortization time for the additional cost of the Siemens EFF1 energy-saving motors in comparison with other known motors.

The calculation, however, requires exact knowledge of the technical specifications of the motor which is to be used for comparison.

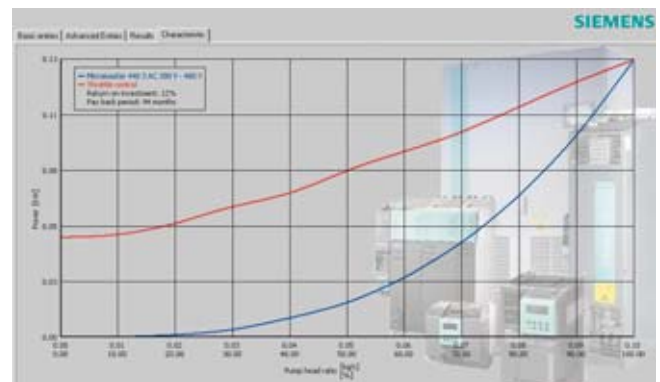
Case 3

Calculation of the savings in energy costs as well as the amortization time for the additional cost of Siemens EFF1 energy-saving motors in comparison with any number of other known motors – plant analysis.

In **converter-fed operation**, SinaSave takes into account all the necessary plant-specific parameters. Values required for the process such as pumping flowrate and height for pumps, mass flowrate and total pressure difference for fans as well as the density of the transported medium are taken into account in addition to the efficiency of the fan, pump or compressor, the electrical efficiency and the overall efficiency of the plant. Other basic data for the program include the number of working days and work shifts as well as the medium transport profile that decides the extent of the energy-saving effect throughout the day and the year.

From the entered plant-specific basic data, the program first obtains the drive system with the appropriate output and the price of the corresponding frequency converter. In a further step, the program determines the energy requirements of the variable-speed drive system for the specific application and compares it to the calculated values for all alternative concepts that can be considered for the plant in question; including for example, throttle valves, bypass, pre-forming control or pole-changing motors. The energy-saving is obtained from the difference in kilowatt hours which the program then converts into a cash saving using the currently applicable energy purchasing price for the plant.

The program calculates the amortization time from the price of the frequency converter, the decisive energy-saving and other cost-reducing effects of variable-speed operation that have also been taken into account, such as an improved power factor and smoother running of equipment.



Product range

The SinaSave program covers the product range of low-voltage motors/energy-saving motors and low-voltage converters of the MICROMASTER 430 and 440 product range, as well as the SINAMICS G150 drive converter chassis units.

More information

The program can be downloaded from the Internet using the following link:

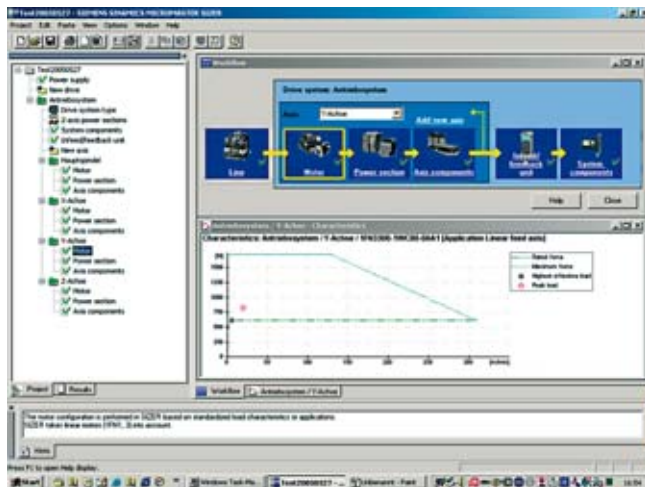
<http://www.siemens.com/energysaving>

IEC Squirrel-Cage Motors

Appendix

SIZER configuration tool

Overview



The SIZER configuration tool provides an easy-to-use means for configuring the following drives and controls:

- SINAMICS drive family
- MICROMASTER 4 drive family
- CNC control SINUMERIK solution line
- SIMOTION Motion Control
- SIMATIC technology

It provides support when setting up the technologies involved in the hardware and firmware components required for a drive task. SIZER supports the complete configuration of the drive system, from simple individual drives to complex multi-axis applications.

SIZER supports all of the engineering steps in one workflow:

- Configuring the power supply
- Motor and gearbox design, including calculation of mechanical transmission elements
- Configuring the drive components
- Selecting the required accessories
- Selecting the line-side and motor-side power options, e.g. cables, filters, and reactors

When SIZER was being designed, particular importance was placed on high usability and a universal, function-based approach to the drive task. The extensive user guidance makes using the tool easy. Status information keeps you continually informed of the progress of the configuration process.

The SIZER user interface is available in German, English, French and Italian.

The drive configuration is saved in a project. In the project, the components and functions used are displayed in a hierarchical tree structure.

The project view permits the configuration of drive systems and the copying/inserting/modifying of drives already configured.

The configuration process produces the following results:

- A parts list of the components required (export to Excel, use of the Excel data sheet for import to VSR)
- Technical specifications of the system
- Characteristic curves
- Comments on system reactions
- Location diagram of drive and control components and dimension drawings of motors

These results are displayed in a results tree and can be reused for documentation purposes.

Support is provided by the technological online help menu:

- Detailed technical data
- Information about the drive systems and their components
- Decision-making criteria for the selection of components

Online help in German, English, French, Italian, Chinese and Japanese

Minimum system requirements

PG or PC with Pentium II 400 MHz (Windows 2000), Pentium III 500 MHz (Windows XP)

512 MB RAM (1024 MB RAM recommended)

At least 2.7 GB of free hard disk space

An additional 100 MB of free hard disk space on Windows system drive

Screen resolution 1024 × 768 pixels

Windows 2000 SP4 / XP Professional SP2 / XP Home Edition SP2

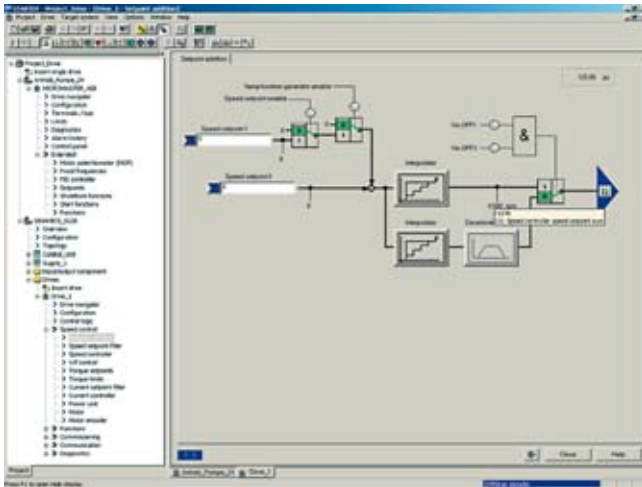
Microsoft Internet Explorer 5.5 SP2

Selection and ordering data

Order No.

SINAMICS MICROMASTER SIZER **6SL3070-0AA00-0AG0**
configuration tool
German, English, French, Italian

Overview



The easy-to-use STARTER commissioning tool can be used to:

- Start up
- Optimize and
- Diagnose

This software can be operated either as a stand-alone PC application or can be integrated into the SCOUT engineering system (on SIMOTION) or STEP 7 (with Drive ES Basic). The basic functions and handling are the same regardless.

In addition to the SINAMICS drives, the current version of STARTER also supports MICROMASTER 4 devices and inverters for the SIMATIC ET 200S FC and SIMATIC ET 200pro FC distributed I/O system.

The project wizards can be used to create the drives within the structure of the project tree.

Beginners are supported by solution-based dialog guidance, whereby a standard graphics-based display maximizes clarity when setting the drive parameters.

First commissioning is guided by wizards, which make all the basic settings in the drive. This ensures that even though only a small number of parameter settings have been made, the drive configuration has already progressed far enough to permit axis movement.

The individual settings required are made using graphics-based parameterization screen forms, which also display the mode of operation.

Examples of individual settings that can be made include:

- Terminals
- Bus interface
- Setpoint channel (e.g. fixed setpoints)
- Closed-loop speed control (e.g. ramp-function generator, limits)
- BICO interconnections
- Diagnostics

Experts can gain rapid access to the individual parameters via the Expert List and do not have to navigate dialogs.

In addition, the following functions are available for optimization purposes:

- Self-optimization (depending on drive)
- Trace (depending on drive)

Diagnostics functions provide information about:

- Control/status Words
- Parameter status
- Operating conditions
- Communication states

Performance

- Easy to use: Only a small number of settings need to be made for successful first commissioning: Axis turning
- Solution-oriented dialog-based user guidance simplifies commissioning.
- Self-optimization functions reduce manual effort for optimization.
- The built-in trace function provides optimum support during commissioning, optimization and troubleshooting

Minimum hardware and software requirements

PG device or PC with Pentium III 1 GHz (Windows 2000), Pentium III 1 GHz (Windows XP)

512 MB RAM (1 GB RAM recommended)

Screen resolution 1024 × 768 pixels, 16-bit color depth

Free hard disk memory: 1.6 GB, 2.3 GB for SCOUT stand-alone

Windows XP Professional SP2

Microsoft Internet Explorer 6.0

IEC Squirrel-Cage Motors

Appendix

STARTER commissioning tool

Integration

Depending on the system configuration, the Control Unit (CU) or the complete converter can communicate with the programming device (PG) or PC by means of a serial interface, via PROFIBUS or PROFINET.

The following accessories are available for this purpose for the respective drive system:

SINAMICS G130/G150/S120

A PROFIBUS communications board and a connection cable are required for the communication between the PG/PC and a Control Unit.

For example a PROFIBUSCP 5512 communications board (PCMCIA card type 2 + adapter with 9-pole SUB-D socket for connection to PROFIBUS. For MS Windows 2000/XP Professional and PCMCIA 32)

Order No.: 6GK1551-2AA00

and connection cable between CP 5512 and PROFIBUS

Order No.: 6ES7901-4BD00-0XA0

SINAMICS G110/G120 and MICROMASTER 4

PC inverter connection kits are available for MICROMASTER 4, SINAMICS G110 and SINAMICS G120 for a safe point-to-point connection to the PC.

Order No. for MICROMASTER 4: 6SE6400-1PC00-0AA0 (the scope of supply includes a 9-pin Sub-D connector, an RS232 standard cable (3 m))

Order No. for SINAMICS G110 and SINAMICS G120: 6SL3255-0AA00-2AA1

(the scope of supply includes a 9-pin Sub-D connector, an RS232 standard cable (3 m) and the STARTER commissioning tool on DVD)

Selection and ordering data

	Order No.
STARTER commissioning tool for SINAMICS and MICROMASTER German/English/French/Italian/Spanish	6SL3072-0AA00-0AG0
Drive Control Chart (DCC) option package for SINAMICS G130/G150/S120 German/English/French/Italian/Spanish, Single license Note: DCC can be used only if Version V4.1 SP1 or higher of the STARTER commissioning tool is installed	6AU1810-1HA20-1XA0
PROFIBUS CP 5512 communications board PCMCIA card type 2 + adapter with 9-pole SUB-D socket for connection to PROFIBUS. For MS Windows 2000/XP Professional and PCMCIA 32	6GK1551-2AA00
Connection cable between CP 5512 and PROFIBUS	6ES7901-4BD00-0XA0
PC inverter connection kit for MICROMASTER 4 the scope of supply includes a 9-pin Sub-D connector, an RS232 standard cable (3 m)	6SE6400-1PC00-0AA0
PC inverter connection kit for SINAMICS G110/G120 the scope of supply includes a 9-pin Sub-D connector, an RS232 standard cable (3 m) and the STARTER commissioning tool on DVD	6SL3255-0AA00-2AA1

Options

DRIVE CONTROL CHART (DCC)

Drive Control Chart (DCC) is an additional tool for the easy configuration of process-oriented functions for the SINAMICS G130 and SINAMICS G150 drives.

The user-friendly DCC editor enables easy graphics-based configuration, a clear representation of control loop structures as well as a high degree of reusability of existing diagrams.

The open-loop and closed-loop control functionality is defined by using multi-instance-enabled blocks (Drive Control Blocks (DCBs)) from a predefined library (DCB library) that are selected and graphically linked by dragging and dropping. Test and diagnostic functions allow verification of program behavior or the identification of causes in the event of faults.

The block library contains a large selection of control, arithmetic and logic blocks as well as extensive open-loop and closed-loop control functions.

Drive Control Chart also provides a convenient basis for SINAMICS S120 for resolving drive-level open-loop and closed-loop control tasks directly in the converter. This results in further adaptability of SINAMICS to specific tasks. On-site processing in the drive supports modular machine concepts and results in increased overall machine performance.

DCC is an add-on to the STARTER commissioning tool for the aforementioned drives SINAMICS G130, SINAMICS G150 and SINAMICS S120 and available as a supplementary option package.

More information

The STARTER commissioning tool can also be downloaded from the Internet at

<http://support.automation.siemens.com/WWW/view/en/10804985/133100>

Faster and more applicable know-how: Hands-on training from the manufacturer

SITRAIN® – the Siemens Training for Automation and Industrial Solutions – provides you with comprehensive support in solving your tasks.

Training by the market leader in automation and plant engineering enables you to make independent decisions with confidence. Especially where the optimum and efficient use of products and plants are concerned. You can eliminate deficiencies in existing plants, and exclude expensive faulty planning right from the beginning.



First-class know-how directly pays for itself: In shorter start-up times, high-quality end products, faster troubleshooting and reduced downtimes. In other words, increased profits and lower costs.

Achieve more with SITRAIN

- Shorter times for startup, maintenance and servicing
- Optimized production operations
- Reliable configuration and startup
- Minimization of plant downtimes
- Flexible plant adaptation to market requirements
- Compliance with quality standards in production
- Increased employee satisfaction and motivation
- Shorter familiarization times following changes in technology and staff

Contact

Visit our site on the Internet at:

www.siemens.com/sitrain

or let us advise you personally. You can request our latest training catalog from:

SITRAIN Customer Support Germany:

Phone: +49 (0)1805 / 23 56 11
(0.14 €/min. from the German landline network)

Fax: +49 (0)1805 / 23 56 12

SITRAIN highlights

Top trainers

Our trainers are skilled teachers with direct practical experience. Course developers have close contact with product development, and directly pass on their knowledge to the trainers.

Practical experience

The practical experience of our trainers enables them to teach theory effectively. But since theory can be pretty drab, we attach great importance to practical exercises which can comprise up to half of the course time. You can therefore immediately implement your new knowledge in practice. We train you on state-of-the-art methodically/didactically designed training equipment. This training approach will give you all the confidence you need.

Wide variety

With a total of about 300 local attendance courses, we train the complete range of A&D products as well as interaction of the products in systems. Telecourses, teach-yourself software and seminars with a presenter on the Web supplement our classic range of courses.

Tailor-made training

We are only a short distance away. You can find us at more than 50 locations in Germany, and in 62 countries worldwide. You wish to have individual training instead of one of our 300 courses? Our solution: We will provide a program tailored exactly to your personal requirements. Training can be carried out in our Training Centers or at your company.

The right mixture: Blended learning

“Blended learning” means a combination of various training media and sequences. For example, a local attendance course in a Training Center can be optimally supplemented by a teach-yourself program as preparation or follow-up. Additional effect: Reduced traveling costs and periods of absence.



IEC Squirrel-Cage Motors

Appendix

Training

Training courses for drive systems

This is intended to give you an overview of the training courses offered for three-phase motors and drive systems.

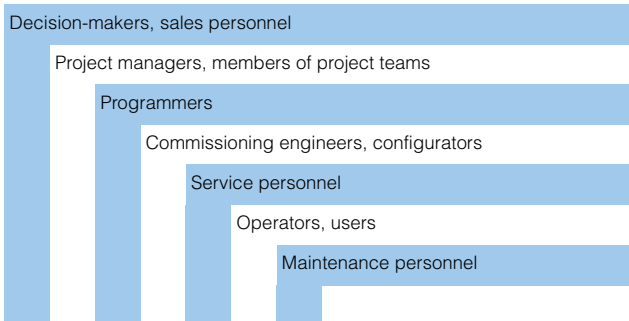
Our courses are tailored to different target groups as well as to individual customer requirements.

You can select from a range of courses on the fundamentals of drive technology and on the Micromaster drive system (converter/motor).

All courses contain as many practical exercises as possible, in order to enable intensive and direct training on the drive system and with the tools in small groups.



The courses at a glance



Title	Target group					Duration/ Medium	Course code
	Decision-makers, sales personnel	Project managers, members of project teams	Programmers	Commissioning engineers, configurators	Service personnel		
Motor workshop for service	✓	✓	✓	✓	✓	2 days	SD-MOT-WS
MICROMASTER							
MICROMASTER 4 Advanced Course, Commissioning	✓	✓	✓	✓	✓	3 days	SD-MM4-AUF
MICROMASTER MM4/G110 Compact Course	✓	✓	✓	✓	✓	1 day	SD-WSMM4
Commissioning MICROMASTER 420	✓	✓	✓	✓	✓	CD-ROM	SM-MM4
Commissioning MICROMASTER 420	✓	✓	✓	✓	✓	WBT	WT-MM4
AC converters							
Handling drive faults – AC drives					✓	3 days	SD-IHAC02
Fundamentals of drive technology	✓	✓	✓			5 days	SD-GAT

Overview

The SD Manual Collection brings together all manuals of low-voltage motors, geared motors and low-voltage converters in the smallest possible package. It is eminently suitable for startup and service, replaces the space-consuming paper version in the office and provides fast access to the information.

- Keyword search within the PDF file
- Full text search in the complete DVD
- Electronic Update Service, free of charge for 1 year
- The DVD is networkable, i. e. storage of the PDFs is on the central server

The SD Manual Collection on DVD in 5 languages (English, French, German, Italian and Spanish) contains manuals of the following motors and converters:

- Low-voltage converters
 - IEC motors
 - NEMA motors
- Geared motors
- Low-Voltage converters
 - MICROMASTER 3
 - MICROMASTER 4
 - SINAMICS G110
 - SINAMICS G120, SINAMICS G120D
 - Frequency converters SIMATIC ET200

Maintenance service for 1 year

In addition, a maintenance service can be ordered, which includes the delivery of the up-to-date SD Manual Collection as well as the three following updates. This is valid for one year. If the contract isn't canceled, it automatically is renewed for one more year.

Selection and ordering data

	Order No.
SD Manual Collection on DVD ¹⁾, 5 languages all manuals for low-voltage motors, geared motors and low-voltage convert- ers	6SL3298-0CA00-0MG0
SD Manual Collection on DVD ¹⁾, 5 languages, Update service for 1 year	6SL3298-0CA10-0MG0

¹⁾ Subject to export regulations: AL: N and ECCN: 5D992.

IEC Squirrel-Cage Motors

Appendix

Siemens Contacts Worldwide

SIEMENS

Local Partners Worldwide

Germany

Are you looking for a local contact to help you with questions regarding Siemens Automation and Drive products, solutions and services?

O.K. First, please select the city nearest to your location:

(or to select a different country click here)

Berlin

Now select the appropriate team who you would like to deal with your enquiry:

Sales

Next >

© 2003 Siemens, Automation and Drive
[Search for local sales and address](#)

At

<http://www.siemens.com/automation/partner>

you can find details of Siemens contact partners worldwide responsible for particular technologies.

You can obtain in most cases a contact partner for

- Technical Support,
- Spare parts/repairs,
- Service,
- Training,
- Sales or
- Consultation/engineering.

You start by selecting a

- Country,
- Product or
- Sector.

By further specifying the remaining criteria you will find exactly the right contact partner with his/her respective expertise.

SIEMENS

Local Partners Worldwide

Please select a sector:

Select area/sector | Select city | Your contact(s)

Sectors | Search a Sector

Which sector* is your question regarding?

ADD Sectors

- Video Systems, Visualization Solutions
- Electrical Infrastructure
- Material Flow Controlling, Distribution and Logistics
- Assembly Control
- Paper Machines
- Production Automation in the Automotive Industry and Suppliers
- Production Logistics and Control Systems
- Production Machines, Tooling, Plastics, Metal Forming, Weld, Glass, Ceramic processing, Stone processing, Packaging, Printing, Coating
- Process Control Systems
- Testing/Final Assembly

* This list contains industry sectors covered by Siemens Automation and Drive products and solutions.

Please select the team who you would like to deal with your enquiry:

Sales

Next >

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SIEMENS

Local Partners Worldwide

Please select a Siemens product group:

Select area/product | Select city | Your contact(s)

Product Catalog | Search a Product

Which product* does your question refer to?

ADD Product Catalog

- Drive Technology
- Automation systems
- Communication Networks
- Low-Voltage Controls
- Electrical Installation Technology
- Process automation
- Sensor, measuring and testing technology
- Power supplies
- Safety systems - Safety Integrated
- System solutions and products for branches

* This list contains products and solutions provided by Siemens Automation and Drive.

Please select the team who you would like to deal with your enquiry:

Sales

Next >

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[Search for local sales and address](#)

Siemens Industry Automation and Drive Technologies in the WWW



A detailed knowledge of the range of products and services available is essential when planning and configuring automation systems. It goes without saying that this information must always be fully up-to-date.

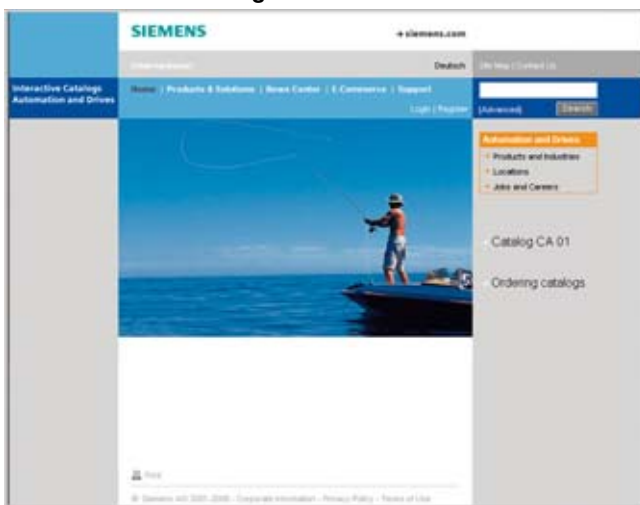
Siemens Industry Automation and Drive Technologies has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

Under the address

<http://www.siemens.com/automation>

you will find everything you need to know about products, systems and services.

Product Selection Using the Offline Mall



Detailed information together with convenient interactive functions:

The Offline Mall CA 01 covers more than 100,000 products and thus provides a full summary of the Siemens Automation and Drives product base.

Here you will find everything that you need to solve tasks in the fields of automation, switchgear, installation and drives. All information is linked into a user interface which is easy to work with and intuitive.

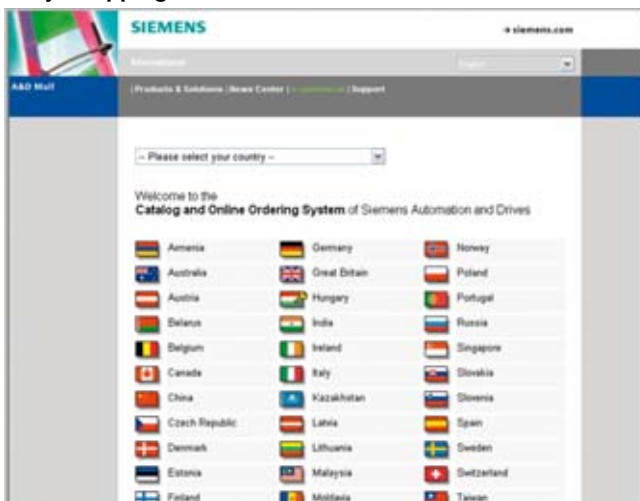
After selecting the product of your choice you can order at the press of a button, by fax or by online link.

Information on the Offline Mall CA 01 can be found in the Internet under

<http://www.siemens.com/automation/ca01>

or on DVD.

Easy Shopping with the A&D Mall



The A&D Mall is the virtual department store of Siemens AG in the Internet. Here you have access to a huge range of products presented in electronic catalogs in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure from selection through ordering to tracking of the order to be carried out online via the Internet.

Numerous functions are available to support you.

For example, powerful search functions make it easy to find the required products, which can be immediately checked for availability. Customer-specific discounts and preparation of quotes can be carried out online as well as order tracking and tracing.

Please visit the A&D Mall on the Internet under:

<http://www.siemens.com/automation/mall>

IEC Squirrel-Cage Motors

Appendix

Customer Support

Our services for every phase of your project



In the face of harsh competition you need optimum conditions to keep ahead all the time:

a strong starting position, a sophisticated strategy and team for the necessary support – in every phase.

Service & Support from Siemens provides this support with a complete range of different services for automation and drives.

In every phase: from planning and commissioning to maintenance and upgrading.

Our specialists know when and where to act to keep the productivity and cost-effectiveness of your system running in top form.

Online Support



The comprehensive information system available round the clock via Internet ranging from Product Support and Service & Support services to Support Tools in the Shop.

<http://www.siemens.com/automation/service&support>

Technical Support



Competent consulting in technical questions covering a wide range of customer-oriented services for all our products and systems.

Phone: +49 (0)180 50 50 222
Fax: +49 (0)180 50 50 223

(0.14 €/min. from the German fixed network)

E-Mail: adsupport@siemens.com

In the United States, call toll-free:

Phone: +1 800 333 7421
Fax: +1 423 262 2200

E-Mail: solutions.support@sea.siemens.com

In Canada, call:

Phone: +1 888 303 3353
E-Mail: cic@siemens.ca

In Asia:

Phone: +86 10 6475 7575
Fax: +86 10 6474 7474

E-Mail: adsupport.asia@siemens.com

Technical Consulting

Support in the planning and designing of your project from detailed actual-state analysis, target definition and consulting on product and system questions right to the creation of the automation solution. ¹⁾

Configuration and Software Engineering

Support in configuring and developing with customer-oriented services from actual configuration to implementation of the automation project. ¹⁾

Service on Site



With service on site we offer services for startup and maintenance, essential for ensuring system availability.

In Germany
Phone: +49 (0)180 50 50 444 ¹⁾
(0.14 €/min. from the German fixed network)

In the United States, call toll-free:

Phone: +1 800 333 7421

In Canada, call:

Phone: +1 888 303 3353

Repairs and Spare Parts



In the operating phase of a machine or automation system we provide a comprehensive repair and spare parts service ensuring the highest degree of operating safety and reliability.

In Germany
Phone: +49 (0)180 50 50 448 ¹⁾
(0.14 €/min. from the German fixed network)

In the United States, call toll-free:

Phone: +1 800 241 4453

In Canada, call:

Phone: +1 888 303 3353

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Order codes for 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP and 1PQ motors

All options are alphanumerically listed according to order codes in the following table.

A list of all available options according to categories can be found in catalog part 0 under "Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ", "Special versions".

Order codes	Special versions	Category	For further information, see Page
A10	With PTC thermistors for alarm for converter-fed operation in Zones 2, 21, 22	Motor protection	0/35, 4/82
A11	Motor protection through PTC thermistor with 3 embedded temperature sensors for tripping		0/34, 0/38
A12	Motor protection through PTC thermistor with 6 embedded temperature sensors for tripping and alarm		0/35
A15	Motor protection with PTC thermistors for converter-fed operation with 3 or 4 embedded temperature sensors for		0/35, 4/3, 4/82
A16	Motor protection with PTC thermistors for converter-fed operation with 6 or 8 embedded temperature sensors for		0/35, 4/3, 4/82
A23	Motor temperature detection with embedded temperature sensor KTY 84-130		0/35
A25	Motor temperature detection with embedded temperature sensors 2 x KTY 84-130		0/35
A31	Temperature detectors for tripping		0/34
A60	Installation of 3 PT 100 resistance thermometers in stator winding		0/36
A61	Installation of 6 PT 100 resistance thermometers in stator winding		0/36
A72	Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings	0/36	
A78	Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings	0/36	
A80	Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings	0/36	
B00	Without safety and commissioning note. Customer's declaration of renouncement required.	Packaging, safety notes, documentation and test certificates	0/21
B01	Complete with one set of safety and commissioning notes per wire-lattice pallet		0/21
B02	Acceptance test certificate 3.1 according to EN 10204		0/21
B06	Second lubricating plate, supplied loose	Rating plate and extra rating plates	0/30
B20	Standardline version	Standardline (only for motor series 1LA8)	3/13
B23	Operating instructions German/English enclosed in print	Packaging, safety notes, documentation and test certificates	0/21
B31	Document – Electrical data sheet		0/21, 3/52 ...
B32	Document – Order dimension drawing		0/21, 3/52 ...
B37	Document – Load characteristics		0/21, 3/52 ...
C00	Brake supply voltage 24 V DC	Modular technology - Additional versions	0/83
C01	Brake supply voltage 400 V AC		0/83
C02	Brake supply voltage 180 V DC, for operation on MM411-ECOFAST		0/83
C11	Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	Windings and insulation	0/32
C12	Temperature class 155 (F), used acc. to 155 (F), with increased power rating		0/32
C13	Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature		0/33
C18	Temperature class 180 (H) at rated output and max. CT 60 °C		0/33
C19	Increased air humidity/temperature with 30 to 60 g water per m ³ of air		0/33
C22	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %		0/33
C23	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %		0/33
C24	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %		0/33
C25	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %		0/33
C26	Increased air humidity/temperature with 60 to 100 g water per m ³ of air		0/33
C27	Stamping of Ex nA II on VIK rating plate	Design for Zones 1, 2, 21 and 22 according to ATEX	4/83
C30	Outputs T1/T2 on rating plate		4/81
D01	CCC China Compulsory Certification	Designs in accordance with standards and specifications	0/16
D02	Coolant temperature –50 to +40 °C	Coolant temperature and site altitude	0/32
D03	Coolant temperature –40 to +40 °C		0/32
D04	Coolant temperature –30 to +40 °C		0/32
D11	Coolant temperature 45 °C, derating 4 %		0/32
D12	Coolant temperature 50 °C, derating 8 %		0/32
D13	Coolant temperature 55 °C, derating 13 %		0/32
D14	Coolant temperature 60 °C, derating 18 %		0/32
D19	Coolant temperature –40 °C to + 40 °C for EX motor		4/5

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Overview of order codes 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

Order codes	Special versions	Category	For further information, see Page	
D30	Electrical according to NEMA MG1-12	Designs in accordance with standards and specifications	0/15	
D31	Design according to UL with "Recognition Mark"		0/15	
D32	Ex certification for China		4/83	
D33	Certified for Korea according to KS C4202		0/16	
D40	Canadian regulations (CSA)		0/15, 0/16	
D46	PSE Mark Japan		0/16	
E00	Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class 155 (F), used according to 155 (F)	Marine version – Basic marine version	10/4 ...	
E09	Individual acceptance by marine classification society with supervision of construction and acceptance test certificate 3.2 according to EN 10204	Marine version – Acceptance/certification	10/4 ...	
E10	Individual acceptance by marine classification society		10/4 ...	
E11	With/without type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	Marine version – Basic marine version	10/4 ...	
E21	With/without type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)		10/4 ...	
E31	With/without type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)		10/4 ...	
E51	With/without type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)		10/4 ...	
E61	With/without type test certificate according to ABS (American Bureau of Shipping), USA, CT 50 °C, temperature class 155 (F), used according to 155 (F)		10/4 ...	
E71	With/without type test certificate according to CCS (Chinese Classification Society), China, CT 45 °C, temperature class 155 (F), used according to 155 (F)		10/4 ...	
E80	Motor for use in shipping, higher ambient temperature and/or used as 155 (F) according to 130 (B)		10/10 ...	
F01	Standard test (routine test) with acceptance	Packaging, safety notes, documentation and test certificates	0/21, 3/52 ...	
F03	Visual acceptance and report handover with acceptance		0/21, 3/52 ...	
F04	Temperature-rise test, without acceptance		0/21, 3/53 ...	
F05	Temperature-rise test, with acceptance		0/21, 3/53 ...	
F28	Noise measurement during idling, no noise analysis, no acceptance		0/21, 3/53 ...	
F29	Noise measurement during idling, no noise analysis, with acceptance		0/21, 3/53 ...	
F34	Recording of current and torque curves with torque metering shaft during starting, without acceptance		0/21, 3/53 ...	
F35	Recording of current and torque curves with torque metering shaft during starting, with acceptance		0/21, 3/53 ...	
F52	Measurement of the locked-rotor torque and locked-rotor current, without acceptance		0/21, 3/53 ...	
F53	Measurement of the locked-rotor torque and locked-rotor current, with acceptance		0/21, 3/53 ...	
F62	Noise analysis, without acceptance		0/21, 3/53 ...	
F63	Noise analysis, with acceptance		0/21, 3/53 ...	
F82	Type test with heat run for horizontal motors, without acceptance		0/21, 3/53 ...	
F83	Type test with heat run for horizontal motors, with acceptance		Marine version – Acceptance/certification	10/6 ...
F83	Type test with heat run for horizontal motors, with acceptance		Packaging, safety notes, documentation and test certificates	0/21, 3/53 ...
F92	Type test with heat run for vertical motors, without acceptance			0/21, 3/53 ...
F93	Type test with heat run for vertical motors, with acceptance	Marine version – Acceptance/certification	10/23 ...	
F93	Type test with heat run for vertical motors, with acceptance	Packaging, safety notes, documentation and test certificates	0/21, 3/53 ...	
G17	Mounting of separately driven fan	Modular technology – Basic versions	0/76	
G26	Mounting of brake		0/77 ...	
G50	Measuring nipple for SPM shock pulse measurement for bearing inspection	Bearings and lubrication	0/58	
G55	ECOFAST motor plug Han-Drive 10e for 230 VΔ/400 VY	Motor connection and connection box	0/51	
G56	ECOFAST motor plug EMC Han-Drive 10e for 230 VΔ/400 VY		0/51	
H15	Prepared for mounting MMI	Special technology	0/15, 0/85	
H17	Fan cover for textile industry	Heating and ventilation	0/37	
H47	Mounting of brake NFA (Stomag)	Special technology	0/85	
H57	Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	Modular technology – Basic versions	0/75	
H58	Mounting of 1XP8 001-2 (TTL) rotary pulse encoder		0/75	
H61	Mounting of separately driven fan and 1XP8 001-1 rotary pulse encoder	Modular technology – Combinations of basic versions	0/84	
H62	Mounting of brake and 1XP8 001-1 rotary pulse encoder		0/84	
H63	Mounting of brake and separately driven fan		0/84	
H64	Mounting of brake, separately driven fan and 1XP8 001-1 rotary pulse encoder		0/84	

**Overview of order codes
1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ**

Order codes	Special versions	Category	For further information, see Page
H70	Mounting of LL 861 900 220 rotary pulse encoder	Special technology	0/85
H72	Mounting of HOG 9 D 1024 I rotary pulse encoder		0/86
H73	Mounting of HOG 10 D 1024 I rotary pulse encoder		0/87
H78	Prepared for mounting LL 861 900 220		0/85
H79	Prepared for mounting HOG 9 D 1024 I		0/86
H80	Prepared for mounting HOG 10 D 1024 I		0/87
H86	Mounting of explosion-proof rotary pulse encoder for use in Zones 2, 21, 22		4/5, 4/6
H87	Mounting of explosion-proof rotary pulse encoder for use on Ex d/de motors in Zone 1		4/5, 4/6
H97	Mounting of separately driven fan and 1XP8 001-2 rotary pulse encoder	Modular technology – Combinations of basic versions	0/84
H98	Mounting of brake and 1XP8 001-2 rotary pulse encoder		0/84
H99	Mounting of brake, separately driven fan and 1XP8 001-2 rotary pulse encoder		0/84
J15	Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against moisture	Special technology	0/87
J16	Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against dust		0/88
K02	Vibration quantity level B	Balance and vibration quantity	0/56
K04	Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors	Shaft and rotor	0/57
K06	Two-part plate on connection box	Motor connection and connection box	0/39
K09	Connection box on RHS		0/38
K10	Connection box on LHS		0/38
K11	Connection box on top, feet screwed on		0/38
K15	Connection box in cast-iron version		0/38, 0/47 ...
K16	Second standard shaft extension	Shaft and rotor	0/56
K17	Drive-end seal for flange-mounting motors with oil resistance to 0.1 bar	Mechanical design and degrees of protection	0/54
K20	Bearing design for increased cantilever forces	Bearings and lubrication	0/58, 0/62 ...
K23	Unpainted (only cast-iron parts primed)	Colors and paint finish	0/17
K24	Unpainted, only primed		0/17
K26	Special finish in RAL 7030 stone gray		0/18
K30	VIK design (comprises Zone 2 for mains-fed operation, without Ex nA II marking on rating plate)	Design for Zones 1, 2, 21 and 22 according to ATEX	4/83
K31	Second rating plate, loose	Rating plate and extra rating plates	0/30
K32	With two additional eyebolts for IM V1/IM V3	Mechanical design and degrees of protection	0/54
K34	Cast-iron fan cover	Heating and ventilation	0/37
K35	Metal external fan		0/37
K36	Special bearing for DE and NDE, bearing size 63	Bearings and lubrication	0/58, 0/63 ...
K37	Low-noise version for 2-pole motors with clockwise direction of rotation	Mechanical design and degrees of protection	0/55
K38	Low-noise version for 2-pole motors with counter-clockwise direction of rotation		0/55
K40	Regreasing device	Bearings and lubrication	0/58
K42	Shaft extension with standard dimensions, without featherkey way	Shaft and rotor	0/57
K45	Anti-condensation heaters for 230 V	Heating and ventilation	0/36
K46	Anti-condensation heaters for 115 V		0/36
K50	IP65 degree of protection	Mechanical design and degrees of protection	0/54
K52	IP56 degree of protection (non-heavy-sea)		0/54
K53	Explosion-proof connection box, Ex d IIC type of protection	Motor connection and connection box	0/38, 0/47 ...
K54	One cable gland, metal		0/39
K55	Cable gland, maximum configuration		0/39
K57	Cable gland DIN 89280, maximum configuration		0/39
K82	Manual brake release with lever	Modular technology - Additional versions	0/83
K83	Rotation of the connection box through 90°, entry from DE	Motor connection and connection box	0/39
K84	Rotation of the connection box through 90°, entry from NDE		0/39
K85	Rotation of connection box through 180°		0/39
K94	Located bearing DE	Bearings and lubrication	0/58
L00	Next larger connection box	Motor connection and connection box	0/38
L01	Undrilled entry plate		0/40
L03	Vibration-proof version	Mechanical design and degrees of protection	0/55
L04	Located bearing NDE	Bearings and lubrication	0/58
L12	Condensation drainage holes	Mechanical design and degrees of protection	0/54
L13	External earthing	Motor connection and connection box	0/38
L27	Insulated bearing cartridge	Bearings and lubrication	0/58
L36	Sheet metal fan cover	Heating and ventilation	0/37
L39	Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	Shaft and rotor	0/57

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Appendix

Overview of order codes 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

Order codes	Special versions	Category	For further information, see Page
L44	3 cables protruding, 0.5 m long	Motor connection and connection box	0/40
L45	3 cables protruding, 1.5 m long		0/40
L47	6 cables protruding, 0.5 m long		0/40
L48	6 cables protruding, 1.5 m long		0/40
L49	6 cables protruding, 3 m long		0/40
L51	Protruding cable ends – right side		0/40
L52	Protruding cable ends – left side	0/40	
L68	Full key balancing	Balance and vibration quantity	0/56
L97	Auxiliary connection box 1XB3 020	Motor connection and connection box	0/50
L99	Wire-lattice pallet	Packaging, safety notes, documentation and test certificates	0/20
M14	Anti-condensation heater, Ex. 115 V	Heating and ventilation	0/36
M15	Anti-condensation heater, Ex. 230 V		0/36
M27	Non-rusting screws (externally)	Mechanical design and degrees of protection	0/55
M32	Connected in star for dispatch	Packaging, safety notes, documentation and test certificates	0/20
M33	Connected in delta for dispatch		0/20
M34	Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for mains-fed operation	Design for Zones 1, 2, 21 and 22 according to ATEX	4/4, 4/81
M35	Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation		4/4, 4/81
M37	Balancing without key	Balance and vibration quantity	0/56
M38	Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating	Design for Zones 1, 2, 21 and 22 according to ATEX	4/4, 4/83
M39	Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating		4/4, 4/83
M44	Earth brushes for converter-fed operation	Mechanical design and degrees of protection	0/55
M46	Stud terminal for cable connection, accessories pack (3 items)	Motor connection and connection box	0/49
M47	Saddle terminal for connection without cable lug, accessories pack		0/49
M50	Auxiliary connection box 1XB9 016		0/50
M58	Next larger connection box 1XB1 621		0/38
M64	Connection box on NDE		0/38
M65	Standard shaft made of non-rusting steel	Shaft and rotor	0/57
M68	Mechanical protection for encoder	Mechanical design and degrees of protection	0/55
M69	Terminal strip for main and auxiliary terminals	Motor connection and connection box	0/49
M72	Design for Zone 2 for mains-fed operation Ex nA II T3 to IEC/EN 60079-15	Design for Zones 1, 2, 21 and 22 according to ATEX	4/4, 4/81
M73	Design for Zone 2 for converter-fed operation, derating Ex nA II T3 to IEC/EN 60079-15		4/4, 4/83
M74	Design for Zones 2 and 22, for non-conducting dust (IP55), for mains-fed operation		4/81
M75	Design for Zones 2 and 22, for non-conducting dust (IP55), for converter-fed operation, derating		4/83
M76	Design for Zones 1 and 21, as well as for Zone 22 for conducting dust (IP65), for mains-fed operation		4/81
M77	Design for Zones 1 and 21, as well as for Zone 22 for conducting dust (IP65), for converter-fed operation, derating		4/82
M88	Auxiliary connection box 1XB9 014 (aluminum)	Motor connection and connection box	0/50
M91	Offshore special finish	Colors and paint finish	0/17
M94	Sea air resistant special finish		0/17
M95	Mounting of explosion-proof separately driven fan Ex nA for use in Zone 2	Special technology	4/5, 4/8
M96	Mounting of explosion-proof separately driven fan II 2D for use in Zone 21		4/5, 4/8
M97	Mounting of explosion-proof separately driven fan II 3D for use in Zone 22		4/5, 4/8
M98	Mounting of explosion-proof separately driven fan Ex de for use in Zone 1		4/5, 4/8
Y50	Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	Windings and insulation	0/33
Y51	Special finish in special RAL colors	Colors and paint finish	0/17, 0/19
Y52	Temperature class 155 (F), used acc. to 155 (F), other requirements	Windings and insulation	0/33
Y53	Standard finish in other standard RAL colors	Colors and paint finish	0/17, 0/18
Y54	Special finish in other standard RAL colors		0/17, 0/18

**Overview of order codes
1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ**

Order codes	Special versions	Category	For further information, see Page
Y55	Non-standard cylindrical shaft extension	Shaft and rotor	0/57
Y68	Alternative converter (SIMOVERT MASTERDRIVES, SINAMICS G110, SINAMICS S120 or ET 200 S FC)	Design for Zones 1, 2, 21 and 22 according to ATEX	4/82
Y70	Mounting a special type of rotary pulse encoder	Special technology	0/85
Y74	Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against moisture		0/88
Y76	Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against dust		0/89
Y79	Mounting of rotary pulse encoder HOG 10 DN 1024 I + E SL 93, (speed rpm), connection box protection against moisture		0/89
Y80	Extra rating plate or rating plate with deviating rating plate data	Rating plate and extra rating plates	0/30
Y81	Separately driven fan with non-standard voltage and/or frequency	Heating and ventilation	0/37
Y82	Extra rating plate with identification code	Rating plate and extra rating plates	0/30
Y84	Additional information on rating plate and on package label (maximum of 20 characters)		0/30

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Appendix

Overview of order codes 1LE1, 1PC1

Order codes for 1LE1 and 1PC1 motors

All options are alphanumerically listed according to order codes in the following table.

A list of all available options according to categories can be found in catalog part 0 under "Introduction motors 1LE1, 1PC1", "Special versions".

Order codes	Special versions	Category	For further information, see Page	
B00	Without safety and commissioning note. Customer's declaration of renouncement required.	Packaging, safety notes, documentation and test certificates	0/102	
B01	Complete with one set of safety and commissioning notes per wire-lattice pallet		0/102	
B02	Acceptance test certificate 3.1 according to EN 10204		0/102	
B04	Printed operating instructions English/German enclosed		0/102	
B83	Type test with heat run for horizontal motors, with acceptance		0/102	
B99	Wire-lattice pallet		0/102	
D03	Coolant temperature -40 to +40 °C	Coolant temperature and site altitude	0/107	
D04	Coolant temperature -30 to +40 °C		0/107	
D30	Electrical according to NEMA MG1-12	Designs in accordance with standards and specifications	0/99	
D31	Design according to UL with "Recognition Mark"		0/99	
D40	Canadian regulations (CSA)		0/98, 0/99	
D46	PSE Mark Japan		0/99	
F01	Mounting of brake	Modular technology - Basic versions	0/130 ...	
F10	Brake supply voltage 24 V DC		0/133	
F11	Brake supply voltage 230 V AC, 50/60 Hz		0/133	
F12	Brake supply voltage 400 V AC		0/133	
F50	Mechanical manual brake release with lever		0/133	
F70	Mounting of separately driven fan		0/129	
F74	Sheet metal fan cover	Heating and ventilation	0/111	
F75	Fan cover for textile industry		0/111	
F76	Metal external fan		0/111	
F77	Low-noise version for 2-pole motors with clockwise direction of rotation	Mechanical design and degrees of protection	0/119	
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G01	Mounting of 1XP8012-10 (HTL) rotary pulse encoder	Modular technology - Basic versions	0/128	
G02	Mounting of 1XP8012-20 (TTL) rotary pulse encoder		0/128	
G04	Anbau des Drehimpulsgebers LL 861 900 220		Special technology	0/134
G05	Mounting of LL 861 900 220 rotary pulse encoder			0/135
G06	Mounting of HOG 10 D 1024 I rotary pulse encoder			0/136
G40	Prepared for mountings, only center hole		Mechanical design and degrees of protection	0/118
G41	Prepared for mountings with D12 shaft	0/118		
G42	Prepared for mountings with D16 shaft	0/118		
G43	Protective cover for encoder (loosely enclosed – only for mountings acc. to order codes G40, G41 and G42)	0/118		
H00	Protective cover for types of construction		0/119	
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H02	Vibration-proof version		0/119	
H03	Condensation drainage holes		0/119	
H04	External earthing	Motor connection and connection box	0/113	
H07	Non-rusting screws (externally)	Mechanical design and degrees of protection	0/119	
H08	Connection box on NDE	Motor connection and connection box	0/113	
H20	IP65 degree of protection	Mechanical design and degrees of protection	0/119	
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H23	Radial seal on DE for flange-mounting motors with oil resistance to 0.1 bar		0/118	
L00	Vibration quantity level B	Balance and vibration quantity	0/120	
L01	Balancing without fitted key		0/120	
L02	Full-key balancing		0/120	
L04	Shaft extension with standard dimensions, without featherkey way	Shaft and rotor	0/121	
L05	Second standard shaft extension		0/121	
L06	Standard shaft made of non-rusting steel		0/121	
L07	Concentricity of shaft extension in accordance with DIN 42955 Tolerance R		0/121	
L08	Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors		0/121	
L20	Located bearing at DE	Bearings and lubrication	0/122	
L21	Located bearing at NDE		0/122	
L22	Bearing design for increased cantilever forces		0/122, 0/124 ...	
L23	Regreasing device		0/122	
L25	Special bearing for DE and NDE, bearing size 63		0/122, 0/124 ...	
M01	Connected in star for dispatch		Packaging, safety notes, documentation and test certificates	0/102
M02	Connected in delta for dispatch	0/102		

Order codes	Special versions	Category	For further information, see Page
M10	Second rating plate, loose	Rating plate and extra rating plates	0/106
M11	Nirosta rating plate		0/106
N01	Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	Windings and insulation	0/108
N02	Temperature class 155 (F), used acc. to 155 (F), with increased output		0/108
N03	Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature		0/108
N05	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %		0/108
N06	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %		0/108
N07	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %		0/108
N08	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %		0/108
N11	Temperature class 180 (H) at rated power and max. CT 60 °C		0/108
N20	Increased air humidity/temperature with 30 to 60 g water per m ³ of air		0/108
N21	Increased air humidity/temperature with 60 to 100 g water per m ³ of air		0/108
Q01	Measuring nipple for SPM shock pulse measurement for bearing inspection	Bearings and lubrication	0/122
Q02	Anti-condensation heaters for 230 V	Heating and ventilation	0/111
Q03	Anti-condensation heaters for 115 V		0/111
R10	Rotation of the connection box through 90°, entry from DE	Motor connection and connection box	0/114
R11	Rotation of the connection box through 90°, entry from NDE		0/114
R12	Rotation of the connection box through 180°		0/114
R15	One cable gland, metal		0/114
R20	3 cables protruding, 0.5 m long		0/114
R21	3 cables protruding, 1.5 m long		0/114
R22	6 cables protruding, 0.5 m long		0/114
R23	6 cables protruding, 1.5 m long		0/114
R24	6 cables protruding, 3 m long		0/114
R30	Reduction piece for M cable gland in accordance with British standard, both cable entries mounted		0/114
R50	Larger connection box		0/113
S00	Unpainted (only cast iron parts primed)	Colors and paint finish	0/100
S01	Unpainted, only primed		0/100
S03	Special finish sea air resistant		0/100
Y51	Special finish in special RAL colors		0/101
Y52	Temperature class 155 (F), used acc. to 155 (F), other requirements	Windings and insulation	0/108
Y54	Special finish in other standard RAL colors	Colors and paint finish	0/101
Y55	Non-standard cylindrical shaft extension	Shaft and rotor	0/121
Y80	Extra rating plate or rating plate with deviating rating plate data	Rating plate and extra rating plates	0/106
Y82	Extra rating plate with identification codes		0/106
Y84	Additional information on rating plate and on package label (max. of 20 characters)		0/106

IEC Squirrel-Cage Motors

Appendix

Notes

IEC Squirrel-Cage Motors

Appendix

Notes

IEC Squirrel-Cage Motors

Appendix

Metal surcharges

Explanation of the metal factor

Surcharges will be added to the prices of products that contain silver, copper, aluminum, lead and/or gold if the respective basic official prices for these metals are exceeded.

The surcharges will be determined based on the following criteria:

- Official price of the metal
Official price on the day prior to receipt of the order or prior to the release order (=daily price) for
 - silver (sale price of the processed material),
 - gold (sale price of the processed material)
 Source: Umicore, Hanau
(<http://www.metalsmanagement.umicore.com>)
and for
 - copper (low DEL notation + 1 %),
 - aluminum (aluminum in cables) and
 - lead (lead in cables)
 Source: German Trade Association for Cables and Conductors
(<http://www.kabelverband.de>)
- Metal factor of the products
Certain products are assigned a metal factor. The metal factor determines the official price as of which the metal surcharges are charged and the calculation method used (weight or percentage method). An exact explanation is given below.

Structure of the metal factor

The metal factor consists of several digits; the first digit indicates whether the method of calculation refers to the list price or a discounted price (customer net price) (L = list price / N = customer net price).

The remaining digits indicate the method of calculation used for the respective metal. If no surcharge is added, a "-" is used.

1st digit	List or customer net price using the percentage method
2nd digit	for silver (AG)
3rd digit	for copper (CU)
4th digit	for aluminum (AL)
5th digit	for lead (PB)
6th digit	for gold (AU)

Weight method

The weight method uses the basic official price, the daily price and the raw material weight. In order to calculate the surcharge, the basic official price must be subtracted from the daily price. The result is then multiplied by the raw material weight.

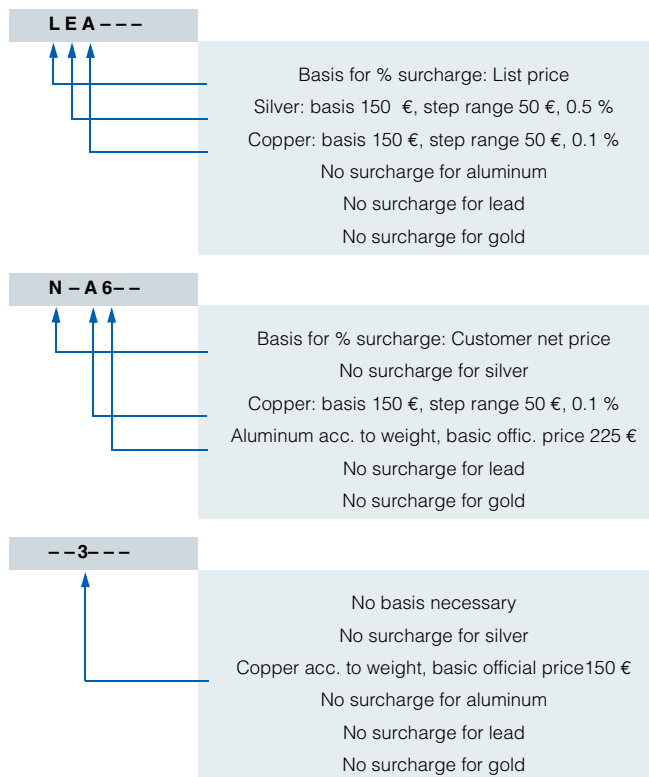
The basic official price can be found in the table below using the number (2 to 9) of the respective digit of the metal factor. The raw material weight can be found in the respective product descriptions.

Percentage method

Use of the percentage method is indicated by the letters A-Z at the respective digit of the metal factor.

The surcharge is increased – dependent on the deviation of the daily price compared with the basic official price – using the percentage method in "steps" and consequently offers surcharges that remain constant within the framework of this "step range". A higher percentage rate is charged for each new step. The respective percentage level can be found in the table below.

Metal factor examples



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Values of the metal factor

Percentage method	Basic official price	Step range	% surcharge	% surcharge	% surcharge	% surcharge	% surcharge per
			1st step	2nd step	3rd step	4th step	additional step
			Official price	Official price	Official price	Official price	
			151 € – 200 €	201 € – 250 €	251 € – 300 €	301 € – 350 €	
A	150	50	0.1	0.2	0.3	0.4	0.1
B	150	50	0.2	0.4	0.6	0.8	0.2
C	150	50	0.3	0.6	0.9	1.2	0.3
D	150	50	0.4	0.8	1.2	1.6	0.4
E	150	50	0.5	1.0	1.5	2.0	0.5
F	150	50	0.6	1.2	1.8	2.4	0.6
G	150	50	0.7	1.4	2.1	2.8	0.7
H	150	50	1.2	2.4	3.6	4.8	1.2
I	150	50	1.6	3.2	4.8	6.4	1.6
J	150	50	1.8	3.6	5.4	7.2	1.8
K	150	50	2.0	3.5	5.0	6.5	1.5
L	150	50	2.2	4.4	6.6	8.8	2.2
M	150	50	2.5	5.0	7.5	10.0	2.5
			176 € – 225 €	226 € – 275 €	276 € – 325 €	326 € – 375 €	
O	175	50	0.1	0.2	0.3	0.4	0.1
P	175	50	0.2	0.4	0.6	0.8	0.2
Q	175	50	0.3	0.6	0.9	1.2	0.3
R	175	50	0.5	1.0	1.5	2.0	0.5
			226 € – 275 €	276 € – 325 €	326 € – 375 €	376 € – 425 €	
S	225	50	0.2	0.4	0.6	0.8	0.2
T	225	50	0.5	1.0	1.5	2.0	0.5
U	225	50	1.0	2.0	3.0	4.0	1.0
V	225	50	1.0	1.5	2.0	3.0	1.0
W	225	50	1.2	2.5	3.5	4.5	1.0
			126 € – 150 €	151 € – 175 €	176 € – 200 €	201 € – 225 €	
X	125	25	1.9	3.8	5.7	7.6	1.9
			151 € – 175 €	176 € – 200 €	201 € – 225 €	226 € – 250 €	
Y	150	25	0.3	0.6	0.9	1.2	0.3
			401 € – 425 €	426 € – 450 €	451 € – 475 €	476 € – 500 €	
Z	400	25	0.1	0.2	0.3	0.4	0.1

Price basis (1st digit)

L Charged on the list price

N Charged on the customer net price or discounted list price

Weight method	Basic official price
2	100
3	150
4	175
5	200
6	225
7	300
8	400
9	555

Calculation based on raw material weight

Misc.

- No metal surcharge

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IEC Squirrel-Cage Motors

Appendix

Conditions of sale and delivery

Terms and Conditions of Sale and Delivery

By using this catalog you can acquire hardware and software products described therein from Siemens AG subject to the following terms. Please note! The scope, the quality and the conditions for supplies and services, including software products, by any Siemens entity having a registered office outside of Germany, shall be subject exclusively to the General Terms and Conditions of the respective Siemens entity. The following terms apply exclusively for orders placed with Siemens AG.

For customers with a seat or registered office in Germany

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For software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or registered Office in Germany" shall apply.

For customers with a seat or registered office outside of Germany

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For software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or registered Office outside of Germany" shall apply.

General

The dimensions are in mm. In Germany, according to the German law on units in measuring technology, data in inches only apply to devices for export.

Illustrations are not binding.

Insofar as there are no remarks on the corresponding pages, – especially with regard to data, dimensions and weights given – these are subject to change without prior notice.

The prices are in € (Euro) ex works, exclusive packaging.

The sales tax (value added tax) is not included in the prices. It shall be debited separately at the respective rate according to the applicable legal regulations.

Prices are subject to change without prior notice. We will debit the prices valid at the time of delivery.

Surcharges will be added to the prices of products that contain silver, copper, aluminum, lead and/or gold, if the respective basic official prices for these metals are exceeded. These surcharges will be determined based on the official price and the metal factor of the respective product.

The surcharge will be calculated on the basis of the official price on the day prior to receipt of the order or prior to the release order.

The metal factor determines the official price as of which the metal surcharges are charged and the calculation method used. The metal factor, provided it is relevant, is included with the price information of the respective products. An exact explanation of the metal factor can be found on the page entitled "Metal surcharges".

The texts of the Comprehensive Terms and Conditions of Sale and Delivery are available free of charge from your local Siemens business office under the following Order Nos.:

- 6ZB5310-0KR30-0BA1
(for customers based in Germany)
- 6ZB5310-0KS53-0BA1
(for customers based outside of Germany)

or download them from the Internet
<http://www.siemens.com/automation/mall>
(Germany: A&D Mall Online-Help System)

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AL	<p>Number of the <u>German Export List</u></p> <p>Products marked other than "N" require an export license.</p> <p>In the case of software products, the export designations of the relevant data medium must also be generally adhered to.</p> <p>Goods labeled with an "<u>AL" not equal to "N"</u> are subject to a European or German export authorization when being exported out of the EU.</p>
ECCN	<p><u>Export Control Classification Number</u>.</p> <p>Products marked other than "N" are subject to a reexport license to specific countries.</p> <p>In the case of software products, the export designations of the relevant data medium must also be generally adhered to.</p> <p>Goods labeled with an "<u>ECCN" not equal to "N"</u> are subject to a US re-export authorization.</p>

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Industry Automation, Drive Technologies and Electrical Installation Technology

Further information can be obtained from our branch offices listed in the appendix or at www.siemens.com/automation/partner

Automation and Drives	<i>Catalog</i>	Low-Voltage	<i>Catalog</i>
Interactive catalog on DVD	CA 01	Controls and Distribution – SIRIUS, SENTRON, SIVACON	LV 1
Drive Systems		Controls and Distribution – Technical Information SIRIUS, SENTRON, SIVACON	LV 1 T
<u>Variable-Speed Drives</u>		SIDAC Reactors and Filters	LV 60
SINAMICS G110/SINAMICS G120 Inverter Chassis Units	D 11.1	SIVENT Fans	LV 65
SINAMICS G120D		SIVACON 8PS Busbar Trunking Systems	LV 70
Distributed Frequency Inverters			
SINAMICS G130 Drive Converter Chassis Units, SINAMICS G150 Drive Converter Cabinet Units	D 11	Motion Control	
SINAMICS GM150/SINAMICS SM150 Medium-Voltage Converters	D 12	SINUMERIK & SIMODRIVE Automation Systems for Machine Tools	NC 60
SINAMICS S150 Drive Converter Cabinet Units	D 21.3	SINUMERIK & SINAMICS Automation Systems for Machine Tools	NC 61
Asynchronous Motors Standardline	D 86.1	SIMOTION, SINAMICS S120 and Motors for Production Machines	PM 21
Synchronous Motors with Permanent-Magnet Technology, HT-direct	D 86.2		
DC Motors	DA 12	Process Instrumentation and Analytics	
SIMOREG DC MASTER 6RA70 Digital Chassis Converters	DA 21.1	Field Instruments for Process Automation	FI 01
SIMOREG K 6RA22 Analog Chassis Converters	DA 21.2	Measuring Instruments for Pressure, Differential Pressure, Flow, Level and Temperature, Positioners and Liquid Meters	
<i>PDF: SIMOREG DC MASTER 6RM70 Digital Converter Cabinet Units</i>	DA 22	<i>PDF: Indicators for panel mounting</i>	MP 12
SIMOVERT PM Modular Converter Systems	DA 45	SIREC Recorders and Accessories	MP 20
SIEMOSYN Motors	DA 48	SIPART, Controllers and Software	MP 31
MICROMASTER 420/430/440 Inverters	DA 51.2	SIWAREX Weighing Systems	WT 01
MICROMASTER 411/COMBIMASTER 411	DA 51.3	Continuous Weighing and Process Protection	WT 02
SIMOVERT MASTERDRIVES Vector Control	DA 65.10	Process Analytical Instruments	PA 01
SIMOVERT MASTERDRIVES Motion Control	DA 65.11	<i>PDF: Process Analytics, Components for the System Integration</i>	PA 11
Synchronous and asynchronous servomotors for SIMOVERT MASTERDRIVES	DA 65.3		
SIMODRIVE 611 universal and POSMO	DA 65.4	SIMATIC Industrial Automation Systems	
<u>Low-Voltage Three-Phase-Motors</u>		Products for Totally Integrated Automation and Micro Automation	ST 70
IEC Squirrel-Cage Motors	D 81.1	SIMATIC PCS 7 Process Control System	ST PCS 7
MOTOX Geared Motors	D 87.1	Add-ons for the SIMATIC PCS 7 Process Control System	ST PCS 7.1
<u>Automation Systems for Machine Tools SIMODRIVE</u>	NC 60	Migration solutions with the SIMATIC PCS 7 Process Control System	ST PCS 7.2
• Motors		pc-based Automation	ST PC
• Converter Systems SIMODRIVE 611/POSMO		SIMATIC Control Systems	ST DA
<u>Automation Systems for Machine Tools SINAMICS</u>	NC 61		
• Motors		SIMATIC NET	
• Drive System SINAMICS S120		Industrial Communication	IK PI
SIMOTION, SINAMICS S120 and Motors for Production Machines	PM 21		
<u>Drive and Control Components for Hoisting Equipment</u>	HE 1	SIMATIC Sensors	
<u>Mechanical Driving Machines</u>		Sensors for Factory Automation	FS 10
Flender Standard Couplings	MD 10.1		
Electrical Installation Technology		Systems Engineering	
<i>PDF: ALPHA Small Distribution Boards and Distribution Boards, Terminal Blocks</i>	ETA 1	Power supplies SITOP power and LOGO! Power	KT 10.1
<i>PDF: ALPHA 8HP Molded-Plastic Distribution System</i>	ETA 3	System cabling SIMATIC TOP connect	KT 10.2
<i>PDF: BETA Low-Voltage Circuit Protection</i>	ET B1		
<i>PDF: DELTA Switches and Socket Outlets</i>	ET D1	System Solutions	
GAMMA Building Controls	ET G1	Applications and Products for Industry are part of the interactive catalog CA 01	
Human Machine Interface Systems SIMATIC HMI	ST 80	TELEPERM M Process Control System	
		<i>PDF: AS 488/TM automation systems</i>	PLT 112

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SIEMENS 81.1.2008 Cage Motors

Lower Operating Costs – Higher Availability.

High-Torque Motors HT-direct



Motors

Answers for industry.

SIEMENS

Significantly lower operating costs and a higher degree of availability with high-power permanent-magnet torque motors.



You are faced with lots of decisions when it comes to selecting the optimum drive solution for your various processes. You require a solution that precisely fulfils your technical specifications, has a high degree of availability – and what is really important – has low life cycle costs. Only then can important competitive advantages be achieved –no matter whether in the paper industry, steel industry or in other sectors.

Drive solutions – a comparison

Today, induction motors are mainly used for those applications where a high torque is required at low speeds. Their torque is converted to the required level using a gearbox. In some applications, induction motors with a high number of poles are used as a direct drive. However, both of these drive solutions have a number of system-related disadvantages: Gearboxes increase the operating costs as well as the amount of space required and reduce the plant availability; induction motors with a high number of poles have a low power density and are therefore large and heavy.

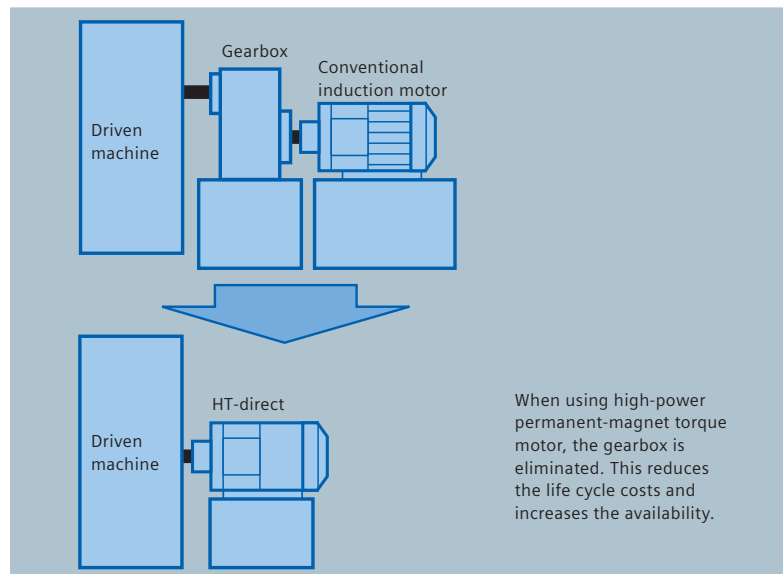
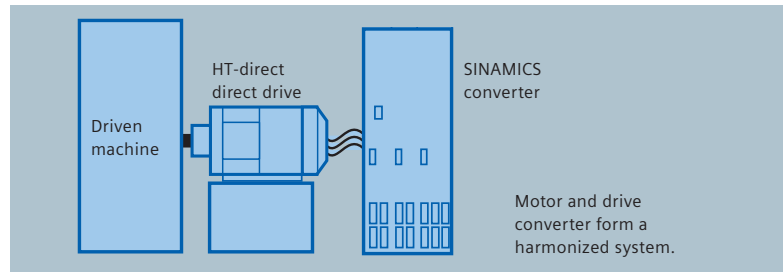


The advantages of HT-direct at a glance:

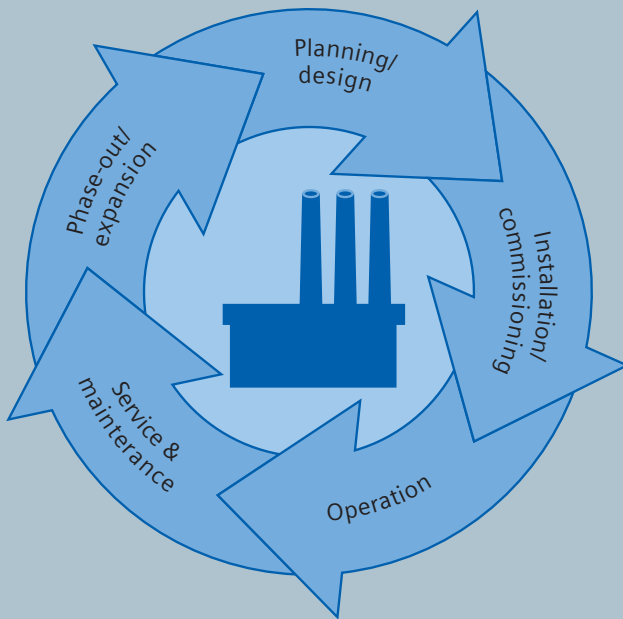
- Gearless, therefore:
 - Higher overall efficiency than drive systems with gearboxes
 - Lower service & maintenance costs
 - No failures due to gearbox damage
 - Space-saving arrangement as a result of the direct drive
 - Lower installation and commissioning costs
 - Low noise
- Low service intervals as a result of long bearing lifetimes
- Our many years of experience with permanent-magnet drive systems
- Seamless integrated range of low-voltage products up into the high power range
- Harmonized system comprising HT-direct motor and SINAMICS drive converter

An optimum fit for many applications

Permanent-magnet synchronous motors eliminate gearboxes and therefore reduce the costs over the complete life cycle of the plant or system when compared to conventional concepts: From the planning through the mounting and installation, commissioning and operation up to service & maintenance. A harmonized low-voltage system comprising SINAMICS drive converters and HT-direct motors can offer many advantages in each and every phase. Our torque motors have already proven themselves in drives for water pumps, main ships' drives and paper machines.



HT-direct – convincing in every phase.



The life cycle of a plant is subdivided into 5 phases.



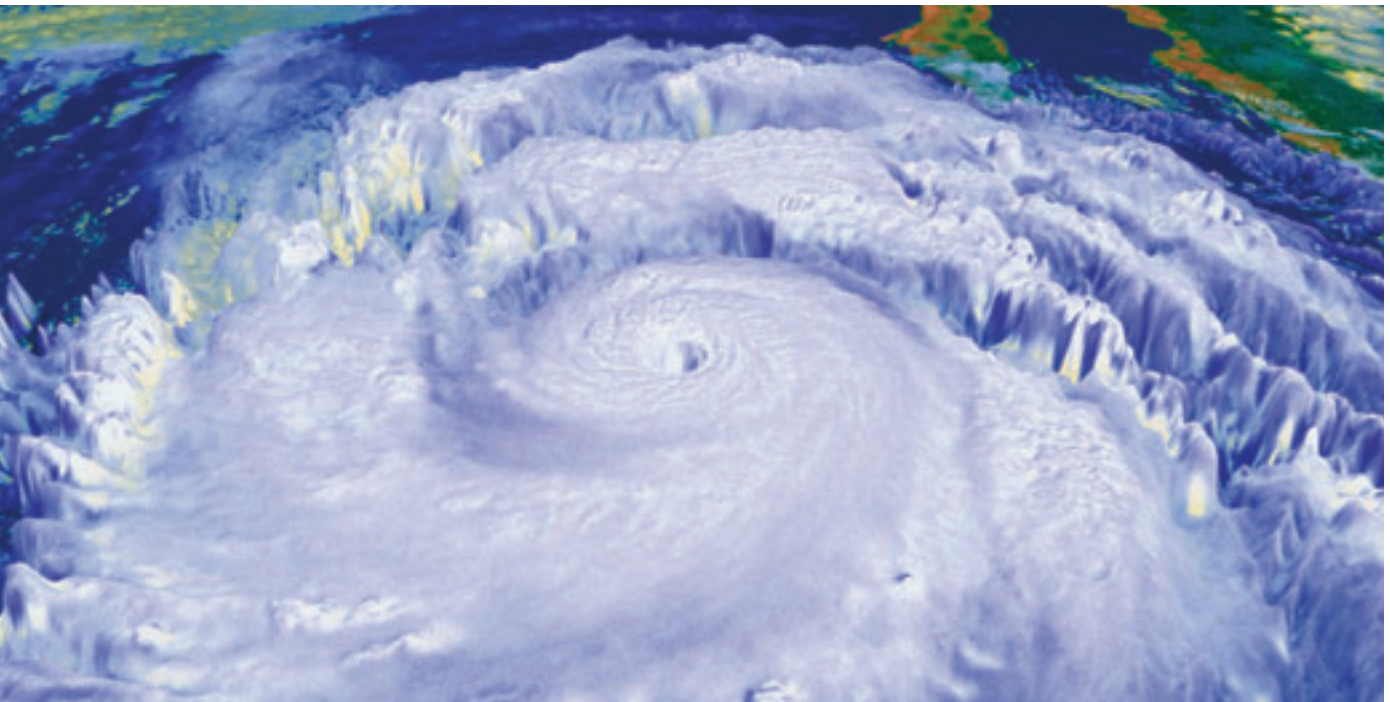
When you select a gearless high-power torque motor then you are selecting a drive with a high degree of cost-effectiveness – and that across the complete life cycle.

Advantages even in the planning phase

The elimination of the gearbox reduces the costs over the complete life cycle of the plant. This already starts in the planning phase. This is made easier as less space is required and a separate gearbox foundation is not required. The result – lower planning costs, a higher degree of flexibility and more space for new solutions.

Lower installation and commissioning costs

Mounting and installation is a lot easier thanks to the gearless concept as there are fewer components and a foundation is not required for the gearbox. The drive components are optimally harmonized with one another, which means that commissioning is faster and also more straightforward.



Energy saving thanks to direct drives

Further, energy is saved thanks to an average of 3% higher overall efficiency – depending on the plant configuration. This higher overall efficiency comes from the fact that there are no longer any gearbox losses. This cuts the operating costs. And, not only this, the procurement costs are almost identical for both systems as well as the higher motor efficiencies in the partial load range and speed setting range.

Low-maintenance and environmentally friendly with a high degree of availability

Eliminating a gearbox also eliminates time-consuming service and the use of oil. This not only means lower service & maintenance costs, but also significantly service intervals. But this isn't everything – direct drives not only reduce the costs, but also relieve the environment as there is no oil. Gearbox damage can also result in unplanned plant downtimes. With HT-direct the subsequent loss of production and the associated costs are a thing of the past. This means that the higher availability increases the productivity and cost-effectiveness of the plant.

Harmonized system solutions – HT-direct and SINAMICS.



HT-direct motors were developed for operation with SINAMICS drive converters. Motors and converters are subject to exhaustive testing in our Nuremberg system test facility – the most modern test facility worldwide. This guarantees that they work together in an optimum fashion. Sensorless operation of HT-direct motors is possible when they are fed from SINAMICS drive converters. For applications with high requirements on the dynamic performance with closed-loop torque control at low speeds, an optional closed-loop control with encoder can be used.

SINAMICS – the new family of drives

SINAMICS is the new family of drives from Siemens for innovative drive solutions that are truly fit for the future. This drive family covers the complete range regarding power rating, performance and voltage in different versions. SINAMICS distinguishes itself thanks to standard, unified engineering over all of the drive versions. Only two engineering tools are required for the complete SINAMICS family – SIZER to design and engineer the drives and STARTER to commission them.



HT-direct – technical data:	
Rated torques:	Up to 42 kNm
Rated speeds:	0–800 RPM
Rated voltages:	400 V to 690 V
Cooling:	Rib-cooled, water jacket-cooled with forced ventilation
Shaft heights:	400, 450, 500 mm with solid shafts
Degree of protection:	IP55
Frame:	Steel or grey cast iron

Permanent-magnet drive systems – the technology for gearless drives

A highly utilized, permanent-magnet synchronous motor is the core of this gearless system. This slow-running synchronous motor has a rotor with a high number of poles. Contrary to slow-running induction motors – where the magnetization requirement and the apparent power drawn increases – these motors can be easily implemented with a high number of poles. Using these motors, gearless drive concepts can be implemented even for low speeds but at the same time providing high torques. The version with the high number of poles results in short winding overhangs, thin stator yokes and therefore supports a space-saving and compact design. NdFeB magnets are used to excite the rotor. These magnets are manufactured out of a low-corrosion alloy and have additional coating to protect them against corrosion.

Examples for applications using HT-direct motors:

- Paper machines, e.g. presses, wire, roll drives and drying cylinder
- Steel, e.g. shears, edgers, treatment lines and blowers
- Shipbuilding, e.g. bow thrusters, winches, main drives
- Oil & gas, e.g. pump drives, cranes, winches
- Mining, e.g. crusher drives
- Water and wastewater, e.g. screw pumps, centrifugal pumps

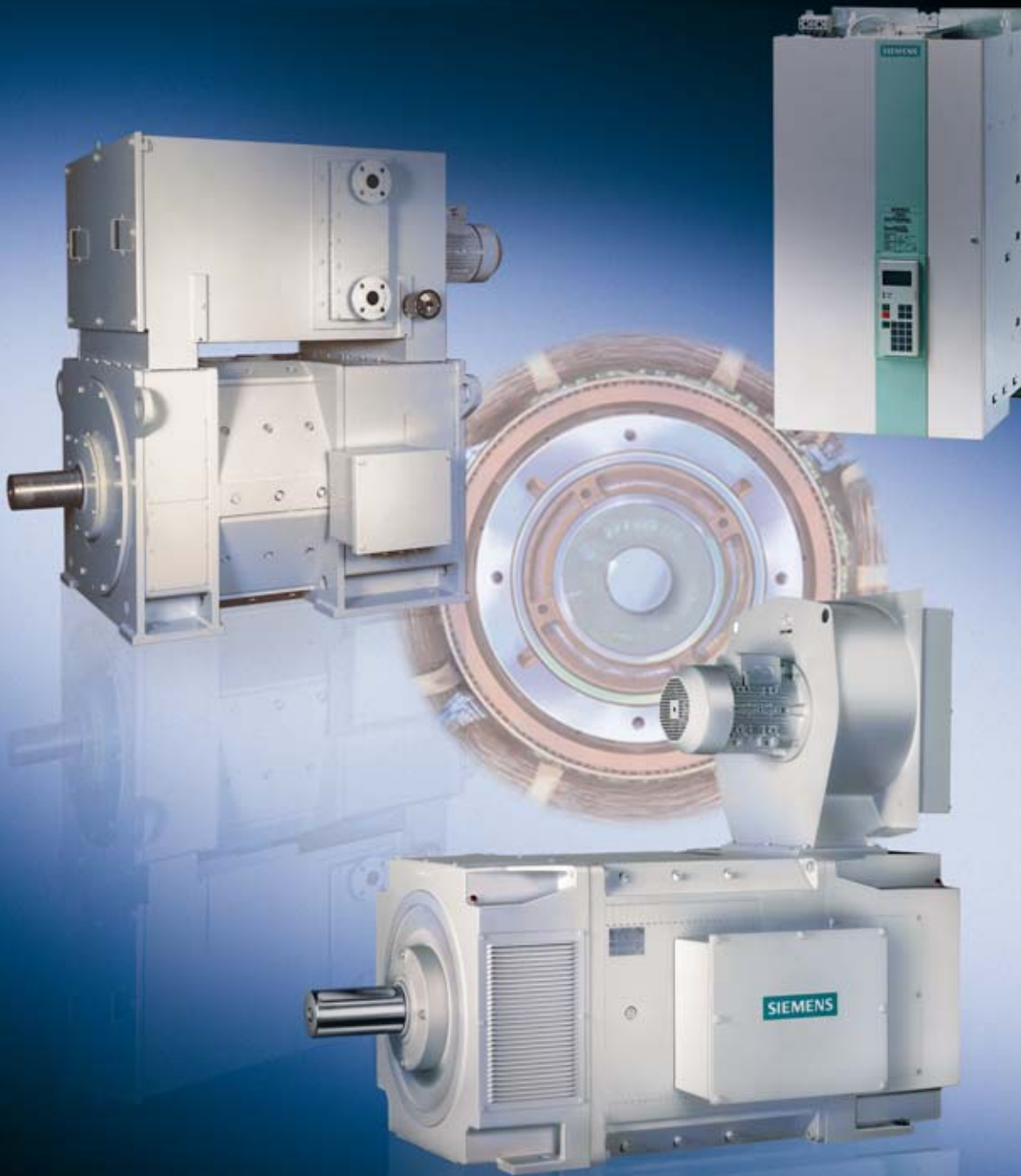
Siemens AG
Industry Sector
Large Drives
P.O. Box 47 43
90025 NÜRNBERG
GERMANY

www.siemens.com/large-drives

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Order No.: E20001-A210-P530-X-7600
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dc motors



DC motors
Sizes 160 to 630
31.5 kW to 1610 kW

SIEMENS

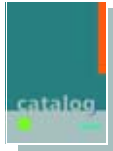


Catalogs for "Large Drives"

**SINAMICS G130/G150
Drive Converter Chassis Units
Drive Converter Cabinet Units**

D 11

Order No.:
 German: E86060-K5511-A101-A3
 English: E86060-K5511-A101-A3-7600

**SIMOREG DC-MASTER 6RA70
Digital Chassis Converters**

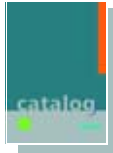
DA 21.1

Order No.:
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 English: E86060-K5321-A111-A2-7600
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**SINAMICS GM150/SM150
Medium-Voltage Converters
0.8 MVA to 28 MVA**

D 12

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 English: E86060-K5512-A101-A1-7600

**Spare Parts for SIMOREG
DC MASTER 6RA70**

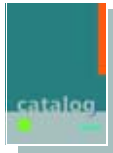
DA 21.1 E

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**SINAMICS S120
Drive System
0.12 kW to 1200 kW**

D 21.1

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 German: E86060-K5521-A111-A2
 English: E86060-K5521-A111-A2-7600

**SIMOREG K 6RA22
Analog Chassis Converters**

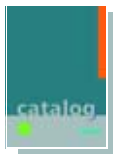
DA 21.2

Order No.:
 German: E86060-K5121-A121-A1
 English: E86060-K5121-A121-A1-7600

**SINAMICS S150
Drive Converter Cabinet Units
75 kW to 1200 kW**

D 21.3

Order No.:
 German: E86060-K5521-A131-A1
 English: E86060-K5521-A131-A1-7600

**SIMOREG DC MASTER 6RM70
Digital Converter Cabinet Units**

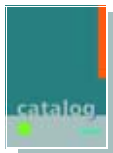
DA 22

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**Asynchronous Motors
Standardline
N-compact 1LA8/H-compact 1LA4**

D 86.1

Order No.:
 German: E86060-K5586-A111-A2
 English: E86060-K5586-A111-A2-7600

**Catalog CA 01
The Offline Mall of Automation
and Drives**

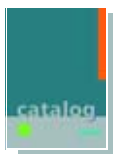
CA 01

Order No.:
 German: E86060-D4001-A100-C6 (CD-ROM)
 E86060-D4001-A500-C6 (DVD)
 English: E86060-D4001-A110-C6-7600 (CD-ROM)
 E86060-D4001-A510-C6-7600 (DVD)

**Three-phase synchronous
motors
HT-direct 1FW4**

D 86.2

Order No.:
 German: E86060-K5586-A121-A2
 English: E86060-K5586-A121-A2-7600

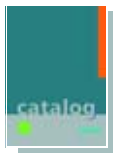
**A&D Mall**

Internet:
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**DC Motors
Sizes 160 to 630
31.5 kW to 1610 kW**

DA 12

Order No.:
 German: E86060-K5312-A101-A2
 English: E86060-K5312-A101-A2-7600

**SINAMICS MICROMASTER SIZER**

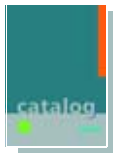
Configuration tool
 Order No.: 6SL3070-0AA00-0AGO

The configuration of DC-motors and converters is realized via SIZER LD Snap-in Suite, which has to be obtained from the regional contact partner and installed in addition to the SINAMICS MICROMASTER SIZER.

**DC Motors
Engineering information
for Catalog DA 12**

DA 12 T

Order No.:
 German: E86060-T5312-A101-A2
 English: E86060-T5312-A101-A2-7600



DC motors

Sizes 160 to 630

31.5 kW to 1610 kW

Catalog DA 12 · 2008

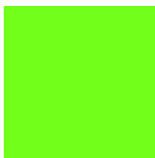


Supersedes:
Catalog DA 12 · 2004

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The products and systems described in this catalog are manufactured under application of a quality management system certified by DQS in accordance with EN ISO 9001 (Certificate Registration No. 002241 QM UM). The certificate is recognized in all IQ Net countries.



SIEMENS

Introduction

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DC technology remains of prime importance
DC motors – For what types of applications?
Why use DC motors from Siemens?

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Conditions of sale and delivery

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Welcome to Automation and Drives

We would like to welcome you to Automation and Drives and our comprehensive range of products, systems, solutions and services for production and process automation and building technology worldwide.

With Totally Integrated Automation and Totally Integrated Power, we deliver solution platforms based on standards that offer you a considerable savings potential.

Discover the world of our technology now. If you need more detailed information, please contact one of your regional Siemens partners. They will be glad to assist you.



True values endure – DC technology remains of prime importance



– even if its immediate demise has been forecast for more than fifteen years: Siemens Automation & Drives will continue to provide this simple and user-friendly technology into the future. After all, it has proved itself to be reliable in daily use for decades and therefore remains of prime importance.

With our extensive know-how and with more than 125 years of experience, we remain your reliable partner for all your DC drive requirements. We offer perfect up-to-date solutions for both new plants or retrofitting. We are constantly working on the further development of the DC technology.

The perfect examples: SIMOREG[®] DC Master, Control Module and Converter Commutation Protector, the perfect solutions for your DC drives – and the most effective method to safeguard your investments permanently.

<http://www.siemens.com/simoreg>



DC motors – For what types of application?



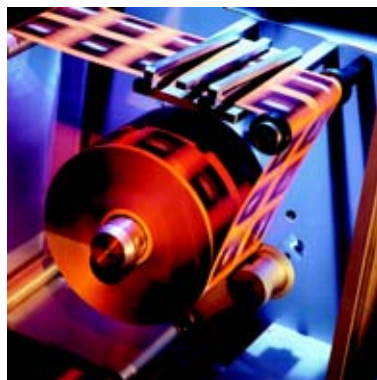
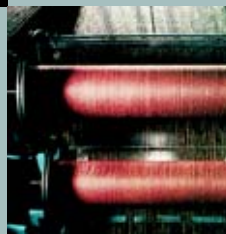
The modular DC motors are well-proven in combination with static converters as variable-speed drives in almost all industry sectors.

This secures competitive strength and efficiency – internationally as well.

Our DC drives are the optimum solution, no matter which functions have to be fulfilled in drive, power or process engineering.

For example:

- In elevators and cable cars
- In rolling mills
- For hoisting equipment
- In the textile and man-made fiber industries
- In the printing industry
- In the basic industries



Why use DC motors from Siemens?

Siemens DC drives distinguish themselves as follows:

- Their excellent static and dynamic control response
- Their wide range with high control precision
- The high efficiency of the complete drive system.

DC motors continue to be a high-quality alternative to three-phase motors. Together with SIMOREG drive converters, they form optimum, variable-speed drives for numerous branches of industry and are used wherever there is a requirement for favorably priced technology and high availability.

Outstanding features:

- High power density with small motor dimensions
- High thermal reserves for continuous duty and overload thanks to the DURIGNIT 2000[®] insulating system
- Minimal losses thanks to excellent efficiency
- High quality of smooth running and vibration
- Low noise values
- High mechanical rigidity
- Low weight
- Long brush lifetimes thanks to optimized commutation system
- High operational reliability and availability thanks to numerous diagnostic functions when fed from SIMOREG drive converters.



Explanations



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Explanations

Motor design

The DC motors up to and including Size 280 are uncompensated. From Size 355, the motors are equipped with a compensation winding.

At constant torque, the forced-cooled motors 1GH, 1GG, 1HQ and 1HS can be coasted down to 10 rpm by means of armature control.

Magnetic circuit, rate of change of current

The motors have a fully laminated magnetic circuit and are therefore suitable for being fed from converter units. In the case of dynamic processes, a rate of change of current up to $250 I_N/s$ is permissible.

Rotors

The laminated rotor packages have chamfered slots to minimize noise and torque ripple. The rotors are dynamically balanced.

Carbon brushes, commutation

Practically spark-free commutation when fed from drive converters is achieved as a result of the optimum motor design, even in the overload range. This results in extremely long brush lifetimes.

Brush wear is essentially dependent on the operating and ambient conditions of the DC motor, so the following conditions should apply in order to achieve a long brush lifetime:

- Relative air humidity 10 to 50%
- Effective load $> 50\% \cdot I_N$
- Cooling air temperature $> 10\text{ °C}$

For conditions outside these ranges, information is available on request.

Critical applications can also be mastered if the appropriate brush materials are chosen.

Supply, converter connection and armature voltage

The rated voltages listed in the selection tables are rated voltages according to DIN 40 030.

The rated data assigned to each of these rated voltages is only valid in combination with the specified converter connection and supply voltage. The inductances specified in the "Selection and ordering data" tables are applicable for 300 Hz with three-phase bridge circuits and a line frequency of 50 Hz, which is generally specified on the rating plate.

Installation and operating conditions

Condensation

If there is a risk of condensation, anti-condensation heating can be fitted to the motors. Supply voltages of 115 V and 230 V are permitted.

Overload capability

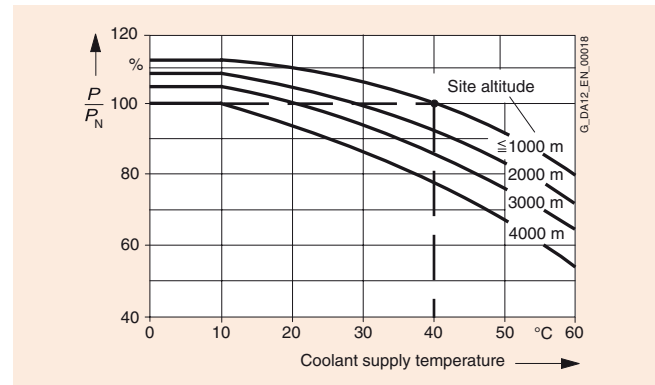
Overloading of the motors is possible in accordance with the following table. In the event of frequent overloading, it is assumed that the effective load of the motor does not exceed the rated load.

	Overload capacity (with reference to P_N and n_N) for			
	motors without compensation		motors with compensation	
	Torque	Current	Torque	Current
	M_{max}/M_N	I_{max}/I_N	M_{max}/M_N	I_{max}/I_N
15 s	1.6	~ 1.85	1.8	~ 1.85
5 s	1.8	~ 2.2	2.0	~ 2.1

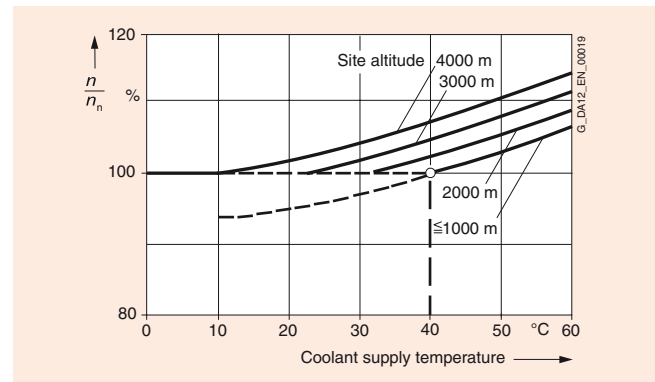
Operating conditions

The motors are designed for the following conditions of operation:

- Site altitude $\leq 1000\text{ m}$ ($> 1000\text{ m}$, see adjacent characteristics)
- Cooling air temperature up to 40 °C ($> 40\text{ °C}$, see adjacent characteristics)
- Cooling air must not contain any foreign bodies or aggressive components
- Maximum permissible vibration levels from external sources (see adjacent table).



Output changes as a function of the site altitude and the coolant supply temperature for DC motors.



Speed deviations as a function of the site altitude and the coolant supply temperature for DC motors.

Vibration frequency Hz		Vibration values	
		Frame size Up to 280	355 and above
< 6.3	Vibration displacement s mm	≤ 0.1	≤ 0.16
$6.3 - 63$	Vibration velocity V_{rms} mm/s	≤ 2.8	≤ 4.5
> 63	Vibration acceleration a m/s^2	≤ 1.6	≤ 2.55

The valuation zones A and B defined in ISO 10816 apply for the permissible vibration values measured on the end shield. With increased vibration values due to operation, special agreements have to be made (on request).

Intermittent duty

The following increases in output can be assumed with reference to the rated outputs listed in the "Selection and ordering data" for separately ventilated motors in S3 mode (intermittent duty):

S3 operating mode	Increase in output from P_N in S1 operating mode
-60%	1.15
-40%	1.3
-25%	1.5

DURIGNIT 2000 insulating system

The high-quality DURIGNIT 2000 insulating system mainly comprises plastic materials with a high temperature overload capability and track resistance. It also meets the requirements placed on motors that are operating in tropical conditions (humid and hot climate).

Temperature class 155 (F) (overtemperature limit 105 K at KT 40 °C) is implemented for 1G.5/1H.5 motors. For utilization in temperature class 130 (B), derating of 13% to 87% must be implemented.

Temperature class 180 (H) (overtemperature limit 125 K at KT 40 °C) is implemented for 1G.6/1H.6 and 1G.7/1H.7 motors. For utilization in temperature class 155 (F), derating of 8% to 92% is necessary (103% speed).

Rated output

The rated output specified in the selection tables is applicable for S1 continuous duty according to EN 60 034-1 when the motors are fed from drive converters using the applicable converter connections and supply voltages specified for the rated armature voltages.

Direction of rotation

The motors are designed for both clockwise and anti-clockwise rotation or reversing operation. The direction of rotation only has to be specified for motors of Size 500 and 630.

Field control range

The motor speed can be increased by field weakening

- At constant armature voltage and power as far as the field weakening speeds n_{Fmax} specified in the "Selection and ordering data" tables
- Beyond these values, as far as the maximum permissible mechanical limit speed n_{mech} as specified in the "Selection and ordering data" tables with reduced power P_{red} as follows:

$$P_{red} = \frac{\frac{n^*}{n_F} - 1}{\frac{n^*}{n_{Fmax}} - 1} \cdot P_N$$

n^* Fictitious reference value with units of speed from the table shown below

n_F Required field weakening speed in the range $n_{Fmax} < n_F \leq n_{mech}$

Speeds n^* (fictitious reference values only)

Motor Size	Speed n^* rpm
160	14400
180	13000
200	11700
225	10500
250	9400
280	8300
355	6400
400	5700
450	4950
500	4580
630	3580

In the speed range from n_{Fmax} to n_{mech} , the series inductances and noise values can increase; further details on request.

Speed data on the rating plate

If specified in the order, the field weakening speed will be given on the rating plate as shown in the following table.

Design	Field weakening speed n_F rpm
Standard design	$1.15 \cdot n_N$ maximum n_{Fmax} (see selection tables)
Special design in accordance with the section of the catalog "Selection and ordering" - "Options" for an additional price, with short code	C05 $1.7 \cdot n_N$ maximum n_{Fmax} (see selection tables)
	C06 $n_{Fmax} > 1.7 \cdot n_N$

If the speeds of the respective motor deviate from those specified in the "Selection and ordering data" tables, for example, due to

- Speed compensation by means of armature voltage changes and/or field weakening
- Additional, permissible field weakening speeds not specified for the standard design (without a short code or for short codes **C05** and **C06**)

the short code **Y80** "Deviating rating plate data" and information in plain text must also be specified, see "Selection and ordering" - "Options".

Sector-specific applications

Short codes are specified for the following sector-specific applications (see "Selection and ordering" - "Options").

Paint finish

The standard paint color is anthracite according to RAL 7016. Motors can be supplied with a special paint finish (short code **L53**) or with primer only (short code **K24**).

Aggressive gases and vapors

If chemically aggressive gases and vapors are expected at the installation site, additional precautions must be taken with regard to insulation, surface protection and brush types. Please inquire specifying the substance type and concentration.

Explanations

2

Noise levels

The noise levels of the motors have been determined according to ISO 1680/ISO 3744 and lie far below the values permitted according to EN 60 034-9. This has been achieved thanks to the mechanical design and by optimizing the magnetic circuit and the ventilation.

The sound pressure level L_{pA} and the acoustic power level L_{WA} (acc. to the table below, including tolerance) are applicable at full load up to 2000 rpm, for converter infeed in B6C connection and with a standard external fan at 50 Hz.

The acoustic power level L_{WA} is the sum of measuring surface size and the measuring surface sound pressure level L_{pA} .

For comparisons with the standard, a no-load/load differential of the machine noise of 3 to 5 dB can be assumed. The no-load noise values for an infeed of pure DC current lie about 3 dB below the noise values for converter infeed.

When a filter is installed, the noise values are reduced by 1 to 2 dB.

When a silencer is used (see "Selection and ordering" - "Options"), the noise values are reduced by approx. 5 dB.

Frame size	Measuring surface sound pressure level		Acoustic power level	
	L_{pA} dB (A)		L_{WA} dB (A)	
160	1GG6 and 1GH6 motors			
	73		86	
180	1G.6/ and 1H.6 motors			
	1GH6	1GG6	1GH6	1GG6
	1HS6	1HQ6	1HS6	1HQ6
	72	76	85	90
200	73	77	87	91
225	76	80	90	94
250	78	82	93	97
280	80	84	95	99

Noise values are available for larger motors on request.

Bearings

Motors up to and including Size 200 have roller bearings (grooved ball bearings) with permanent lubrication. Larger motors are provided with a regreasing device. In the case of increased lateral forces, a special version of the drive-end bearing is required (see "Selection and ordering" - "Options" and the project engineering manual).

In all motors, the fixed bearings are at the non-drive end.

For positioning angles up to the vertical, the bearings of the motors up to Size 280 can carry the weight of the rotor as well as one half of the coupling. In the case of additional axial loads, please inquire.

Cooling and ventilation

Cooling:

The cooling air is normally fed from the non-drive end (NDE) to the drive end (DE), i.e. from the commutator end to the output end, where it discharges through vents to the left and right. This direction of air flow is necessary to achieve adequate cooling for the commutator for motors operating at high speeds and outputs.

The direction of air flow can be reversed (from the drive end to the non-drive end; i.e. from the output end to the commutator end). This is recommended for motors operated with weak loads, low cooling-air intake temperature, or under harsh ambient conditions (aggressive gases, organic liquids, dust, etc.) Derating may be necessary under some circumstances (on request).

The fan unit of the 1GG motors can also be retrofitted to 1GH motors.

Frame size	Cooling air flow V m ³ /s	Permissible pressure drop in the ducts for 1GG motors Δp Pa	Required pressure for 1GH motors Δp Pa		
1GG6, 1GH6					
160	0.20	60	1300		
180	0.30	70	1350		
200	0.35	70	1250		
225	0.50	80	1600		
250	0.60	80	1500		
280	0.75	80	1600		
1GG7, 1GH7					
351	1.3	100	1800		
352			1900		
353			2000		
354			2300		
355			2500		
401			1.6	100	1800
402	1900				
403	2100				
404	2200				
405	2500				
451	2.0	100			1700
452					1800
453					2000
454					2200
455					2400
1GG5, 1GH5					
500			2.0	70	1400
630			3.0	70	1350

Duct connection

Fans are not included in the scope of supply of motors designed for use with a fan unit 1GH. The ducts should be dimensioned to ensure that the motor is provided with a cooling air flow V and pressure Δp as specified in the above table.

Fan unit

In the case of fan unit assemblies for 1GG, 1HS and 1HQ motors, three-phase induction motors with supply voltages of 50 Hz 380 V to 420 V AC are used (according to EN 60 034 ± 5%). Motors of Size 160 are provided with fan motors with a wide-range winding of 50/60 Hz 380 to 500 V AC. For other supply voltages and frequencies, a three-phase induction motor with a non-standard winding is required (short code **Y81**). Fan unit motors for cooling air temperatures of 55 °C or higher or at site altitudes above 3000 m are available on request.

Filter installation

A dry-type air filter can be mounted and even retrofitted on all 1GG motors without any derating.

Air-to-water heat exchangers for 1HS5, 1HS6 and 1HS7 motors

For 1HS5, 1HS6 and 1HS7 motors, the heated internal air is cooled down by the air-to-water heat exchangers installed in the heat exchanger assembly. The internal air is circulated by separately-driven fans.

For a cooling water inlet temperature of 25 °C, 1HS motors have the same output data as 1GH motors; output data can be supplied on request for other temperatures.

The water connections are mounted as standard on the right-hand side (viewed from the drive end).

It is only possible with coolers in special version to subsequently change over the cooler for water connection to the left.

If a water analysis is not provided when ordering the motors, a standard cooler is supplied.

The cooling water temperature rise is, for the standard version, up to 10 K and the maximum water pressure is up to 6 bar (test overpressure 9 bar).

For motors	Required cooling water flow	Pressure drop in cooler
1HS. . .	m ³ /h	bar
. . . . 186	2.3	0.1
. . . . 188	2.5	0.1
. . . . 206	2.7	0.1
. . . . 208	3.0	0.12
. . . . 226	3.5	0.15
. . . . 228	3.8	0.18
. . . . 256	4.5	0.15
. . . . 258	4.8	0.18
. . . . 286	5.7	0.22
. . . . 288	6.0	0.24
. . . . 351 - 355	5.7	0.13
. . . . 401 - 405	6.6	0.2
. . . . 451 - 455	7.5	0.26
. . . . 500 - 504	6.9	0.3
. . . . 631 - 634	9.0	0.37
. . . . 635	9.6	0.43

- Standard version
Cooler with copper ducts and copper collectors (not removable) for water that has been cleared of solid particles and that does not contain aggressive substances.
- Special version
Cooler with CuNi10Fe ducts, removable plastic coated steel chambers, suitable for brackish water. Cooling ducts can be cleaned mechanically.

Encoders

Various tachometers and pulse encoders can be mounted on the motors, see "Selection and ordering" - "Options".

Speed encoder types and variants other than those specified in the list of options can be obtained order-specifically and fitted. The possible design variants and combinations of tachometers or pulse encoders can be found in the catalog product ranges of the following manufacturers:

- Baumer Hübner
- Hübner Gießen
- Heidenhain
- Radio Energie
- Leine & Linde.

The encoder type required must be accurately described and requested in combination with the motor from the factory. When ordering, the short code **Y70** = "Tacho / pulse encoder, special version" must be specified and supplemented with the order number or type number and the manufacturer in plain text. The required encoders are then procured by the factory and fitted.

In the case of encoder types with long delivery times, it is important to note that the delivery time for the motors may be extended.

The motors can be supplied without encoders but with a mounting flange and mounting components for fitting a speed encoder. The types of speed encoders for which the mounting assembly can be prepared are listed under "Selection and ordering" – "Options".

Protection and monitoring

Thermal motor protection

The motors can be fitted with temperature sensors if required. The temperature sensors are installed in the coil end of the commutating pole winding on the air outlet side or, in the case of compensated motors, in the compensation winding. Reliable motor protection can be achieved thanks to current limiting and I^2t monitoring of the associated SIMOREG DC MASTER. Temperature sensors are connected on auxiliary terminals in the motor terminal box.

Continuous temperature monitoring can be implemented by selecting a KTY84-130 silicon sensor (short code **A23**) or a PT100 resistance thermometer (short code **A62**). For limit value monitoring (2 components are installed if both "Warning" and "Shut-down" are required), PTC thermistors are available (PTC resistors, short codes **A11** and **A12**) and bi-metal strip temperature monitors (short code **A31**).

Bearing temperature monitoring

The bearing temperature can be monitored for motors from Size 180 by means of PT100 resistance thermometers (short code **A76**). They are connected on the auxiliary terminals in the motor terminal box.

Explanations

Air flow monitor

For motors with an externally mounted fan unit, the internal air can be monitored using an air flow monitor (short code **A97**). The air flow monitor cannot be used for monitoring the air filter.

Brush monitoring

The brush length can be monitored (limit value) using a microswitch mounted on the brush holder (short code **A06**). The output signal is floating and can be evaluated by the SIMOREG DC MASTER.

For motors of Sizes 500 and 630, non-floating evaluation only is possible by means of signaling brushes (short code **A00**). For evaluation, the KM01 signaling unit can be ordered from Schunk Kohlenstofftechnik GmbH, Wettenberg, Germany.

Cooling air thermometer

In the internal air circuit of the air-to-air and air-to-water cooled motors, a PT100 cooling air thermometer can be installed for detecting the temperature of the heated air (short code **A45**). The PT100 is connected on an auxiliary terminal block mounted in the cooler assembly.

Leak warning device

Motors with an air-to-water heat exchanger assembly can be equipped with a warning electrode for monitoring water leakage (short code **H08**). The warning electrode is connected in the electrode casing.

Anti-condensation heating

For motors that are subjected to a risk of frequent condensation of the winding due to climatic conditions, e.g. motors that are at a standstill in humid ambient air or motors that are subjected to large temperature variations, anti-condensation heating can be provided (short code **K45** for 230 V). This heats the air in the motor and condensation does not form inside the motor. Anti-condensation heating must not be switched on during operation. They are connected on the auxiliary terminals in the motor terminal box.

The motor can also be heated, however, through the excitation winding. For this purpose, a current of 30% to 40% of the rated excitation current is applied to the excitation terminals of the motor with the armature circuit open (without external cooling). In this case, approximately 10% to 15% of the rated excitation output is available as heat output.

Earth brushes

To avoid bearing damages caused by ripple voltages, an earth brush (order code **A05**) for motors from shaft height 180 can be provided.

Terminal box

All motors are equipped with a terminal box to the IP55 degree of protection which houses the power connections, excitation and terminals for connecting temperature sensors, anti-condensation heating, etc.

For the size of conductor cross-sections, see DIN VDE 0298.

Terminal box design

The terminal boxes of the motors are fitted with a removable cable entry plate. This is normally supplied undrilled.

The cable entry plate can be pre-drilled for a maximum number of heavy-gauge threaded joints to DIN 46320 (short code **K55**) or with metric threads to DIN 89280 (short code **K57**). The gland is enclosed.

Shaft end

The shaft ends comply with DIN 748-1, the centering holes (60°) comply with DIN 332 and the keyways are constructed according to DIN 6885 Page 1. The featherkeys are included in the scope of supply.

If required, the motors can also be supplied with a non-standard shaft end (please inquire).

A second shaft end can be provided for the motors. For output over an elastic coupling, the full rated torque can be transferred from the non-drive shaft end. With brake assembly, a second shaft end is not possible.

Balancing

The motors of the 1G.5/1H.5 and 1G.6/1H.6 series are balanced with full-key. Balancing with half-key is possible (short code **L69**).

Motors of the 1G.7/1H.7 series are balanced with half-key. Balancing with full-key is possible (short code **L68**).

Selection and ordering



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3/3

Guideline for drive selection

Specification of motor type according to cooling method and degree of protection

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Preselection of the motor according to torque and output

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Order No. code

Order No., identification codes

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Order No. supplements

Field voltage, types of construction

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Series 1GG6, 1GH6 and 1HS6 Sizes 160 and 180

Size 160
Size 180

3/12
3/15
3/18
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Series 1GG6, 1GH6 and 1HS6 Sizes 200 to 280

Size 200
Size 225
Size 250
Size 280

3/24
3/34
3/45

Series 1GG7, 1GH7 and 1HS7 Sizes 355 to 450

Size 355
Size 400
Size 450

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Series 1GG5, 1GH5 and 1HS5 Sizes 500 and 630

Size 500
Size 630

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Series 1HQ6 Sizes 180 to 280

Size 180
Size 200

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Size 225
Size 250
Size 280

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Series 1HQ7 Sizes 355 to 450

Size 355
Size 400
Size 450

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Options

Mounted assemblies
Operation and diagnostics
Mounted equipment



Selection and ordering

Guideline for drive selection

These "Recommendations for drive selection" guide you step-by-step through this catalog to the required motor

Further notes and support with project engineering can be found in the engineering information for Catalog DA 12.


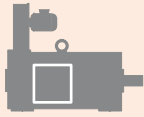

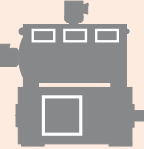
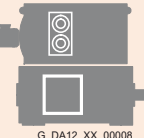
The configuration tool SIZER is also available for selecting the motor.

Details and explanations for the converters can be found in Catalogs DA 21 (Chassis Converters) and DA 22 (Converter Cabinet Units).

Step 1	Technical requirements for the motor		
Determine the required product profile	Rated supply voltage	3 AC 50/60 Hz, 400, 500 or 690 V	
	Operating mode	1Q/4Q	
	Degree of protection and type of cooling	IP.. / IC..	
	Speed	$n = \dots\dots\dots$ rpm	
	Output	$P = \dots\dots\dots$ kW	
	Torque	$M = P \cdot 9550/n = \dots\dots\dots$ Nm	
	Type of construction	IM ..	
Determine the rated armature voltage	Rated supply voltage	Operating mode	Rated armature voltage
	2 AC 50/60 Hz 400 V	4Q	280 V DC
	2 AC 50/60 Hz 400 V	1Q	310 V DC
	3 AC 50/60 Hz 400 V	4Q	420 V DC
	3 AC 50/60 Hz 400 V	1Q	470 V DC
	3 AC 50/60 Hz 500 V	4Q	520 V DC
	3 AC 50/60 Hz 500 V	1Q	600 V DC
	3 AC 50/60 Hz 690 V	4Q	720 V DC
	3 AC 50/60 Hz 690 V	1Q	810 V DC
Step 2	Environmental requirements for the motor → Page 2/2		
Determine the installation conditions	Ambient temperature	$\leq 40\text{ °C}$	$> 40\text{ °C}$
	Site altitude	$\leq 1000\text{ m}$	$> 1000\text{ m}$
	Determining the factors for output and speed change	–	For determining the factors for output and speed change (see Part 2 under "Installation and operating conditions")
Step 3	Select the motor → Pages 3/3 and 3/4		
Determine the range of possible motors	Select the size and therefore the possible motors on the basis of the following parameters: type of cooling, degree of protection, torque and output range .		
Step 4	Detailed selection of the motor → Pages 3/7 to 3/117		
Determine the motor Order No.	Determine the motor Order No. according to the following parameters: rated armature voltage, speed, torque and output from the "Selection- and ordering data" for the motors that have already been identified as possibilities.		
Step 5	Adapt the speed if necessary		
Speed adaptation and the associated parameter change	$n = n_N$	$n < n_N$	$n > n_N$
	Speed adaptation: not required	Speed adaptation: through armature control	Speed adaptation: through field weakening
		$U = U_N \cdot n / n_N$	$U = \text{constant}$
		$P = P_N \cdot n / n_N$	$P = \text{constant}$
		$M_N = \text{constant}$	$M = M_N \cdot n_N / n$
Step 6	Selection of the options → Page 3/118 to 3/121		
Complete the motor Order No.	Determine the options and the associated short codes for special versions (mounted assemblies, operation and diagnostics and mounted equipment).		
Step 7	Select the SIMOREG converter and the line-side components		
	For Order No. of the converter and the line-side components, see Catalogs DA 21 and DA 22.		

Guideline for drive selection

Determining the motor type according to type of cooling and degree of protection (for further selection according to torque and output, see overleaf)

	Cooling method	With duct connection	Degree of protection	Adapting the basic motor module	Motor type				
	Designation to DIN EN 60 034, Part 6		Designation to DIN EN 60 034, Part 5						
<p>The modular structure of the motors enables the following cooling methods and degrees of protection to be derived from one basic motor module</p>  <p>G_DA12_XX_0005</p>	Open-looped cooling circuit								
	Suitable for use in dry indoor rooms with low dust levels	Internal cooling with radially mounted fan unit	IC06	–	IP23	Fan unit	 G_DA12_XX_0002	1GG	
			Internal cooling using separately-mounted fan through duct	IC17	Single-end (cooling air inlet)	IP23	No	 G_DA12_XX_0005	1GH
				IC37	Both ends (cooling air inlet and outlet)	IP54			
	Closed-looped cooling circuit								
	Suitable for use outdoors or in extremely dusty and/or humid environments	Heat exchange through external cooling using air-to-air heat exchanger	IC A06 A66	–	IP54	Air-to-air heat exchanger, fan unit	 G_DA12_XX_0007	1HQ	
	Heat exchange through external cooling using air-to-water heat exchanger	IC W37 A86	–	IP54	Air-to-water heat exchanger, fan unit	 G_DA12_XX_0008	1HS		

Selection and ordering

Guideline for drive selection

Preselection of the motor according to torque and output

Motor type/ series	Size	Torque Nm			Output kW				Detailed selection and ordering data Page			
		100	1000	10000	10	100	1000	10000				
1GG6/1GH6	160	256	–	506	30	–	111	3/7 – 3/8				
	180	450	–	670	44.2	–	191					
	200	670	–	965	64.5	–	256					
	225	1070	–	1550	94.5	–	340					
	250	1630	–	2300	121	–	436					
	280	2400	–	3360	170	–	510					
1GG7/1GH7	355	2950	–	8280	236	–	770	3/24 – 3/33				
	400	4400	–	12920	230	–	880	3/34 – 3/44				
	450	6830	–	18400	197	–	1020	3/45 – 3/55				
1GG5/1GH5	500	5700	–	20600	288	–	1110	3/56 – 3/66				
	630	16000	–	44500	344	–	1610	3/67 – 3/77				
1HQ6	180	264	–	482	37.6	–	110	3/78 – 3/79				
	200	422	–	715	55.5	–	169	3/80 – 3/82				
	225	630	–	1180	82	–	264	3/83 – 3/85				
	250	1170	–	1780	107	–	340	3/86 – 3/88				
	280	1770	–	2750	151	–	436	3/89 – 3/91				
	1HQ7	355	2300	–	7440	220	–	645	3/92 – 3/97			
400		3400	–	11700	225	–	770	3/98 – 3/107				
450		5610	–	15800	176	–	845	3/108 – 3/117				
1HS6	180	450	–	670	44.2	–	191	3/9 – 3/11				
	200	670	–	965	64.5	–	256	3/12 – 3/14				
	225	1070	–	1550	94.5	–	340	3/15 – 3/17				
	250	1630	–	2300	121	–	436	3/18 – 3/20				
	280	2400	–	3360	170	–	510	3/21 – 3/23				
	1HS7	355	2950	–	8280	236	–	770	3/24 – 3/33			
400		4400	–	12920	230	–	880	3/34 – 3/44				
450		6830	–	18400	197	–	1020	3/45 – 3/55				
1HS5	500	5700	–	20600	288	–	1110	3/56 – 3/66				
	630	16000	–	44500	344	–	1610	3/67 – 3/77				
		Torque Nm		100	1000	10000	Output kW	10	100	1000	10000	

Order No.

The Order No. comprises a combination of characters and digits and for clarity it is subdivided into three blocks which are connected by hyphens,
e.g. **1GG6 288-0ND40-1VV1**

The first block (positions 1 to 7) identifies the machine type; further characteristics of the version are coded in the second (positions 8 to 12) and third (positions 13 to 16) blocks.
For deviations in the third block from the catalog codes, either Z or 9 should be used as appropriate.

Ordering data:

- Complete Order No. and short code(s) or plain text.
- If a quotation has been requested, please specify the quotation number in addition to the Order No.
- When ordering a complete motor as a spare part, please specify the works serial No. for the previously supplied motor as well as the Order No.

Structure of the Order No.:	Position:	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16	
Positions 1 to 3: digit, character, character	Internally cooled DC machines																			
	• Separate ventilation using radially-mounted, standard fan	1	G	G																
	• Separate ventilation using external fan (not included in scope of supply), connected via duct	1	G	H																
	Surface-cooled DC machines																			
	• Separate ventilation using mounted air-to-air heat exchanger	1	H	Q																
	• Separate ventilation using mounted air-to-water heat exchanger	1	H	S																
Position 4: digit	Series 5 Series 6 Series 7				5 6 7															
Positions 5 to 7: digits	Motor size (the size is encoded in positions 5 and 6)																			
Position 8: digit	Connection and mode of operation																			
Position 9: character	Field power level																			
Position 10: character	Armature circuit type of construction																			
Position 11: digit	Rated field voltage																			
Position 12: digit	Type of construction																			
Position 13: digit	Converter connection and terminal data																			
Position 14: character	Rated armature voltage																			
Position 15: character	Armature control range																			
Position 16: digit	Load-torque characteristic, performance data (latest edition)																			
	Special versions: coded short code also required not coded plain text also required																			- Z

Selection and ordering

Order No. supplements

Field voltage

The standard field voltage is 310 V. Other field voltages have been determined in accordance with the recommended field voltages according to DIN 40 030 and in accordance with the SIMOREG product range as "Standard versions". They can be coded using a digit at position 11 of the Order No. or using a short code.

• Standard rated field voltages:

Field voltage	Position:																Short code	
	1	2	3	4	5	6	7	8	9	10	11	12	-	13	14	15		16
110 V DC											3							
180 V DC											1							
190 V DC											9							L5C
200 V DC											9							L5A
210 V DC											6							
220 V DC											2							
310 V DC											4							
325 V DC											9							L5D
330 V DC											9							L5F
340 V DC											9							L5E
350 V DC											9							L5B
360 V DC											7							
500 V DC											5							

• Non-standard rated field voltages:

If a field voltage is required that is not covered by the "Standard versions", the digit "9" must be placed in position 11 of the Order No. The short code for the field voltage range must be specified in accordance with the table below and the required field voltage must be specified in plain text.

Field voltage	Position:																Short code *)	
	1	2	3	4	5	6	7	8	9	10	11	12	-	13	14	15		16
< 110 V DC											9							L4Y
from 110 V DC to 500 V DC											9							L3Y
> 500 V DC											9							L4Y

*) Short codes only determine the price of the versions, so plain text is also required.

Types of construction

acc. to IEC 34, Part 7; flange type of construction to DIN 42 948.

The Order No. listed in the selection tables must be supplemented with the type of construction code digit in position 12. In the case of type of construction code digit "9", the short code for the required type of construction must also be specified (see table below).

Types of construction for motor Sizes 160 to 280 ¹⁾

Type of construction	Position:																Short code	
	1	2	3	4	5	6	7	8	9	10	11	12	-	13	14	15		16
IM B 3/ IM 1001												0						
IM B 35/ IM 2001												6						
IM B 5 IM 3001											1	²⁾						
IM V 1 IM 3011											4	²⁾						
IM B 6/ IM 1051											9	³⁾						M1A
IM B 7/ IM 1061											9	³⁾						M1B
IM B 8/ IM 1071											9							M1C
IM V 15/ IM 2011											9							M1H
IM V 3/ IM 3031											9	²⁾						M1G
IM V 35/ IM 2031											9							M1J
IM V 5/ IM 1011											9	³⁾						M1D
IM V 6/ IM 1031											9	³⁾						M1E

¹⁾ DC motors in Sizes 355 to 630 are only offered in the catalog in the IM B 3 type of construction

²⁾ The motors are supplied in IM B 35 type of construction for IM B 5, in IM V 15 type of construction for IM V 1 and in IM V 35 type of construction for IM V 3. 1HQ and 1HS motors are only supplied in the types of constructions IM B 3 and IM B 35.

³⁾ For these types of construction, special support feet must be provided for relieving the strain on the fixing bolts in the transverse direction (not included in scope of supply).

Selection and ordering data

These motors are uncompensated.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
							Resistance at 120 °C R_a Ω	Inductance L_a mH	
at rated armature voltage 420 V 470 V 520 V 600 V									
Overall length 2									
995	31.5	302	2500	1G 6 162-0JC -6VV5	90	79	0.65	6.6	
1130	35.7	302	2550	-6WV5	90	81			
1270	40	301	2550	-7MV5	90	83			
1490	47	301	2550	-7NV5	90	84			
1310	41.5	303	2350	1G 6 162-0JD -6VV5	114	83	0.403	4	
1480	47	303	2350	-6WV5	115	84			
1660	52.5	302	2400	-7MV5	114	85			
1940	60.5	298	2250	-7NV5	113	87			
1660	53	305	2500	1G 6 162-0JE -6VV5	142	86	0.252	2.65	
1880	59.5	302	2500	-6WV5	141	87			
2140	63.5	283	4500	1G 6 162-0JF -6VV5	168	88	0.173	1.65	
2410	71	281	4500	-6WV5	168	88			
2690	77	273	4500	-7MV5	163	89			
3120	88.5	271	4500	-7NV5	161	90			
2750	78.5	273	4400	1G 6 162-0JG -6VV5	206	89	0.108	1	
3100	87.5	270	4450	-6WV5	204	90			
3430	92	256	4500	-7MV5	193	90			
3440	93.5	260	4500	1G 6 162-0JH -6VV5	242	90	0.0691	0.66	
Overall length 4									
725	30	395	2000	1G 6 164-0JC -6VV5	88	77	0.774	8.7	
830	34.3	395	2000	-6WV5	87.5	79			
935	38.5	393	2000	-7MV5	87.5	81			
1100	45.3	393	2000	-7NV5	87.5	83			
960	39.5	393	1850	1G 6 164-0JD -6VV5	111	81	0.479	5.3	
1090	45	394	1850	-6WV5	111	83			
1220	50	391	1900	-7MV5	111	84			
1430	59	394	1750	-7NV5	111	86			
1220	52	407	1950	1G 6 164-0JE -6VV5	142	84	0.299	3.55	
1390	58.5	402	1950	-6WV5	141	85			
1590	64.5	387	3550	1G 6 164-0JF -6VV5	173	86	0.197	2.15	
1800	72.5	385	3600	-6WV5	171	88			
2000	79	377	3650	-7MV5	168	88			
2330	91	373	3700	-7NV5	166	89			
2050	81.5	380	3400	1G 6 164-0JG -6VV5	214	88	0.122	1.35	
2310	90.5	374	3450	-6WV5	212	89			
2580	97.5	361	3550	-7MV5	204	90			
2990	111	355	3200	-7NV5	200	91			
2570	99.5	370	4000	1G 6 164-0JH -6VV5	258	90	0.0762	0.88	
2890	110	363	3750	1G 6 164-0JH -6WV5	252	91			
Fan unit	Radially mounted ————— G Separate ————— H								
Rated field voltage	310 V ————— 4								
Type of construction	IM B 3 ————— 0								
	IM B 35 ————— 6								

1) Please note remarks on field weakening on page 3/8.

Selection and ordering

1GG6, 1GH6 Size 160

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
							Resistance at 120 °C R_a Ω	Inductance L_a mH	
at rated armature voltage 420 V 470 V 520 V 600 V									
Overall length 6									
710	36	484	1650	1G 6 166-0JC -7MV5	84	78	0.932	11.5	
840	42.7	485	1650	-7NV5	84	81			
730	37.3	488	1500	1G 6 166-0JD -6VV5	107	79	0.578	7	
830	42.5	489	1500	-6WV5	107	80			
930	47.5	488	1550	-7MV5	107	83			
1100	56	486	1400	-7NV5	107	84			
935	49.5	506	1550	1G 6 166-0JE -6VV5	138	83	0.361	4.7	
1060	56	504	1550	-6WV5	138	84			
1220	61.5	481	3000	1G 6 166-0JF -6VV5	167	85	0.237	2.9	
1380	69.5	481	3000	-6WV5	167	86			
1540	77.5	481	3000	-7MV5	166	88			
1800	89	472	3050	-7NV5	164	88			
1580	79.5	480	2800	1G 6 166-0JG -6VV5	210	88	0.147	1.75	
1780	89	477	2850	-6WV5	210	88			
1990	97	465	2900	-7MV5	204	89			
2310	111	459	2500	-7NV5	200	90			
1990	98.5	473	3250	1G 6 166-0JH -6VV5	256	89	0.0914	1.15	
2240	110	469	2900	1G 6 166-0JH -6WV5	254	90			
Fan unit	Rationally mounted			G					
	Separate			H					
Rated field voltage	310 V			4					
Type of construction	IM B 3			0					
	IM B 35			6					

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1GG6 162	1.81	0.32	4500	320
1GH6 162	1.81	0.32	4500	307
1GG6 164	2.08	0.38	4500	365
1GH6 164	2.08	0.38	4500	352
1GG6 166	2.3	0.46	4500	428
1GH6 166	2.3	0.46	4500	415

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: "C05" for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and "C06" for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed n_{Fmax} .

For speeds $> n_{Fmax}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

Type of construction

For other types of construction and the associated Order No. supplement, see Page 3/6.

¹⁾ Please note remarks on field weakening.

Selection and ordering data

These motors are uncompensated.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
							Resistance at 120 °C R_a mΩ	Inductance L_a mH	
at rated armature voltage 420 V 470 V 520 V 600 V									
Overall length 6									
815		44.8	525	2150	1 6 186-0NA -1VV3	127	80	472	7.85
	930	51	525	1990	-1WV3	127	82		
	1050	57.5	525	1820	-7MV3	127	83		
	1230	67.5	525	1500	-7NV3	127	85		
995		55.5	535	1930	1 6 186-0NB -1VV3	153	83	330	5.83
	1130	63	530	1740	-1WV3	153	84		
	1270	70.5	530	1500	-7MV3	153	86		
1220		65.5	515	3400	1 6 186-0NC -1VV3	177	85	242	3.89
	1380	74	510	3400	-1WV3	176	86		
	1540	82.5	510	3400	-7MV3	176	87		
	1800	96.5	510	3400	-7NV3	176	89		
1530		83.5	520	3400	1 6 186-0ND -1VV3	220	87	156	2.72
	1730	94.5	520	3400	-1WV3	220	88		
	1920	105	520	3400	-7MV3	220	89		
	2240	122	520	3400	-7NV3	220	90		
1770		96	520	3400	1 6 186-0NE -1VV3	252	88	118	1.96
	2000	108	515	3400	-1WV3	250	89		
	2240	120	510	3400	-7MV3	250	90		
	2600	139	510	2720	-7NV3	248	91		
2140		117	520	3400	1 6 186-0NF -1VV3	302	90	82.5	1.46
	2400	132	525	3220	-1WV3	302	91		
	2680	144	515	2720	-7MV3	296	91		
2600		136	500	3400	1 6 186-0NG -1VV3	348	91	60.5	0.97
	2940	151	490	3400	-1WV3	344	91		
	3260	164	480	3400	-7MV3	335	92		
2840		139	468	3400	1 6 186-0NH -1VV3	354	91	51.5	0.84
	3200	151	450	3400	1 6 186-0NH -1VV3	342	92		
Separate ventilation									
			Fan unit, radially mounted		GG				
			Fan unit, separately-mounted		GH				
			Mounted air-to-water heat exchanger		HS				
Rated field voltage			310 V			4			
Type of construction			IM B 3			0			
			IM B 35			6			

1) Please note remarks on field weakening on page 3/11.

Selection and ordering

1GG6, 1GH6, 1HS6 Size 180

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
							Resistance at 120 °C R_a mΩ	Inductance L_a mH	
at rated armature voltage 420 V 470 V 520 V 600 V									
Overall length 8									
645	44.2	655	1730	1 6 188-0NA -1VV3	129	78	535	9.65	
735	50.5	655	1620	-1WV3	129	80			
830	57	655	1490	-7MV3	129	82			
980	67	655	1240	-7NV3	129	84			
790	55	665	1580	1 6 188-0NB -1VV3	156	81	374	7.17	
900	63	670	1410	-1WV3	157	83			
1010	70.5	665	1250	-7MV3	156	84			
970	65.5	645	2920	1 6 188-0NC -1VV3	181	83	275	4.78	
1100	74	640	3300	-1WV3	180	85			
1240	82.5	635	3320	-7MV3	178	86			
1450	96.5	635	3320	-7NV3	178	88			
1230	83.5	650	3300	1 6 188-0ND -1VV3	224	86	177	3.34	
1390	94	645	3320	-1WV3	222	87			
1550	104	640	3240	-7MV3	220	88			
1810	121	640	2980	-7NV3	220	90			
1420	96	645	3300	1 6 188-0NE -1VV3	254	87	134	2.41	
1610	108	640	3080	-1WV3	252	89			
1800	119	630	2800	-7MV3	250	89			
2100	137	625	2200	-7NV3	246	91			
1720	116	645	3020	1 6 188-0NF -1VV3	302	89	93.5	1.79	
1940	130	640	2680	-1WV3	300	90			
2160	143	630	2240	-7MV3	296	91			
2100	135	615	3400	1 6 188-0NG -1VV3	348	90	69	1.19	
2380	150	600	3400	-1WV3	342	91			
2640	162	585	3400	-7MV3	332	91			
3060	183	570	3400	-7NV3	324	92			
2300	144	600	3400	1 6 188-0NH -1VV3	370	91	58.5	1.03	
2580	158	585	3400	-1WV3	360	91			
2880	172	570	3400	-7MV3	352	92			
3340	191	545	3400	1 6 188-0NH -7NV3	336	92			
Separate ventilation	Fan unit, radially mounted — GG Fan unit, separately-mounted — GH Mounted air-to-water heat exchanger — HS								
Rated field voltage	310 V — 4								
Type of construction	IM B 3 — 0								
	IM B 35 — 6								

¹⁾ Please note remarks on field weakening on page 3/11.

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1GG6 186	2.5	0.6	3800	460
1GH6 186	2.5	0.6	3800	430
1HS6 186	2.5	0.6	3800	530
1GG6 188	2.7	0.7	3800	520
1GH6 188	2.7	0.7	3800	490
1HS6 188	2.7	0.7	3800	600

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: **"C05"** for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and **"C06"** for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed $n_{F\text{max}}$.

For speeds $> n_{F\text{max}}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

Type of construction

For other types of construction and the associated Order No. supplement, see Page 3/6.

Selection and ordering

1GG6, 1GH6, 1HS6
Size 200

Selection and ordering data

These motors are uncompensated.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
							Resistance at 120 °C R_a mΩ	Inductance L_a mH	
at rated armature voltage 420 V 470 V 520 V 600 V									
Overall length 6									
815		66.5	780	2450	1 6 206-0NA -1VV3	186	82	292	5.81
	925	76	785	2750	-1WV3	187	84		
	1040	85	780	2750	-7MV3	186	85		
	1220	100	785	2750	-7NV3	187	87		
960		80	795	2740	1 6 206-0NB -1VV3	220	85	212	4.28
	1090	91	795	2740	-1WV3	220	86		
	1220	102	800	2720	-7MV3	220	87		
	1430	119	795	2740	-7NV3	220	88		
1120		93	795	3000	1 6 206-0NC -1VV3	250	86	160	3.19
	1270	106	795	2980	-1WV3	252	87		
	1420	118	795	2980	-7MV3	250	88		
	1660	137	790	2850	-7NV3	250	90		
1340		109	775	2800	1 6 206-0ND -1VV3	288	88	117	2.29
	1510	123	780	2800	-1WV3	288	89		
	1690	137	775	2800	-7MV3	288	90		
	1970	159	770	2350	-7NV3	286	91		
1570		131	795	2680	1 6 206-0NE -1VV3	342	89	84.5	1.66
	1780	147	790	2700	-1WV3	340	90		
	1980	163	785	2300	-7MV3	338	91		
1870		152	775	3100	1 6 206-0NF -1VV3	394	90	63.5	1.2
	2120	170	765	3100	-1WV3	388	91		
	2350	186	755	3100	-7MV3	382	92		
	2720	212	745	3100	-7NV3	376	92		
2040		161	755	3100	1 6 206-0NG -1VV3	414	91	54.5	1.04
	2300	181	750	3100	-1WV3	414	91		
	2560	200	745	3100	-7MV3	410	92		
	2960	230	740	3100	-7NV3	408	92		
2480		185	710	3100	1 6 206-0NH -1VV3	472	92	38.2	0.76
	2800	202	690	3100	-1WV3	456	92		
	3100	218	670	3100	1 6 206-0NH -7MV3	444	92		
Separate ventilation			Fan unit, radially mounted	GG					
			Fan unit, separately-mounted	GH					
			Mounted air-to-water heat exchanger	HS					
Rated field voltage			310 V	4					
Type of construction			IM B 3	0					
			IM B 35	6					

¹⁾ Please note remarks on field weakening on page 3/14.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
							Resistance at 120 °C R_a mΩ	Inductance L_a mH	
at rated armature voltage 420 V 470 V 520 V 600 V									
Overall length 8									
650	64.5	950	1950	1 6 208-0NA -1VV3	184	81	334	7.18	
740	73.5	950	2220	-1VV3	184	82			
835	82.5	945	2420	-7MV3	183	84			
980	97	945	2420	-7NV3	183	86			
770	77.5	960	2320	1 6 208-0NB -1VV3	215	83	242	5.29	
875	88	960	2420	-1VV3	215	85			
980	98.5	960	2420	-7MV3	215	86			
1150	116	965	2420	-7NV3	216	88			
900	90.5	960	2650	1 6 208-0NC -1VV3	246	85	183	3.95	
1020	103	965	2640	-1VV3	248	86			
1140	115	965	2560	-7MV3	246	87			
1330	134	960	2300	-7NV3	246	89			
1080	106	935	2460	1 6 208-0ND -1VV3	282	87	134	2.84	
1220	120	940	2460	-1VV3	282	88			
1360	133	935	2300	-7MV3	280	89			
1590	155	930	1900	-7NV3	280	90			
1270	128	965	2350	1 6 208-0NE -1VV3	336	88	96.5	2.05	
1430	144	960	2150	-1VV3	336	89			
1600	160	955	1890	-7MV3	334	90			
1510	151	955	3100	1 6 208-0NF -1VV3	394	89	72.5	1.48	
1700	170	955	3100	-1VV3	394	90			
1900	186	935	3100	-7MV3	385	91			
2200	212	920	3100	-7NV3	378	92			
1650	158	915	3100	1 6 208-0NG -1VV3	408	90	62	1.28	
1860	178	915	3100	-1VV3	408	91			
2060	197	915	3100	-7MV3	406	91			
2400	228	905	3100	-7NV3	405	92			
2020	183	865	3100	1 6 208-0NH -1VV3	466	91	43.8	0.94	
2260	206	870	3100	-1VV3	468	92			
2520	228	865	3100	-7MV3	466	92			
2920	256	835	3100	1 6 208-0NH -7NV3	450	93			
Separate ventilation	Fan unit, radially mounted — GG			↑↑					
	Fan unit, separately-mounted — GH			↑↑					
	Mounted air-to-water heat exchanger — HS			↑↑					
Rated field voltage	310 V —			4					
Type of construction	IM B 3 —			0					
	IM B 35 —			6					

1) Please note remarks on field weakening on page 3/14.

Selection and ordering

1GG6, 1GH6, 1HS6 Size 200

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1GG6 206	2.8	1.2	3500	610
1GH6 206	2.8	1.2	3500	580
1HS6 206	2.8	1.2	3500	710
1GG6 208	2.9	1.3	3500	690
1GH6 208	2.9	1.3	3500	660
1HS6 208	2.9	1.3	3500	800

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: **"C05"** for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and **"C06"** for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed $n_{F\text{max}}$.

For speeds $> n_{F\text{max}}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

Type of construction

For other types of construction and the associated Order No. supplement, see Page 3/6.

Selection and ordering data

These motors are uncompensated.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit			
							Resistance at 120 °C R_a mΩ	Inductance L_a mH		
at rated armature voltage										
420 V	470 V	520 V	600 V	720 V	810 V					
Overall length 6										
745		96	1230	2020	1 6 226-0NA	-1VV3	264	85	180	4.71
	845	109	1230	2020		-1WV3	264	86		
		122	1230	2020		-7MV3	262	87		
		142	1220	2040		-7NV3	262	89		
		171	1210	2050		-2XV3	258	90		
		192	1200	1850		-2YV3	256	91		
855		110	1230	2020	1 6 226-0NB	-1VV3	296	86	139	3.56
	970	125	1230	2020		-1WV3	298	88		
		139	1230	2020		-7MV3	296	89		
		162	1220	2040		-7NV3	294	90		
		193	1200	1730		-2XV3	288	91		
1020		132	1240	1970	1 6 226-0NC	-1VV3	350	88	103	2.7
	1150	148	1230	1990		-1WV3	348	89		
		164	1220	2000		-7MV3	346	90		
		190	1210	1790		-7NV3	342	91		
1260		156	1180	2460	1 6 226-0ND	-1VV3	408	89	74	1.91
	1420	175	1180	2460		-1WV3	406	90		
		193	1160	2500		-7MV3	400	91		
		222	1150	2520		-7NV3	396	92		
		260	1110	2580		-2XV3	382	93		
		286	1080	2640		-2YV3	372	93		
1480		182	1170	2650	1 6 226-0NE	-1VV3	470	90	55	1.49
	1660	205	1180	2650		-1WV3	472	91		
		225	1160	2680		-7MV3	464	92		
		256	1140	2700		-7NV3	454	92		
		296	1090	2700		-2XV3	434	93		
1750		218	1190	2660	1 6 226-0NF	-1VV3	560	91	38.8	1.03
	1970	242	1170	2680		-1WV3	550	92		
		262	1150	2700		-7MV3	535	92		
		296	1110	2700		-7NV3	520	93		
2100		248	1130	2680	1 6 226-0NG	-1VV3	625	92	26	0.67
	2360	272	1100	2700		-1WV3	610	93		
		294	1070	2700		-7MV3	595	93		
2300		266	1100	2700	1 6 226-0NH	-1VV3	670	93	22	0.61
	2600	292	1070	2700	1 6 226-0NH	-1WV3	655	93		
Separate ventilation	Fan unit, radially mounted		GG							
	Fan unit, separately-mounted		GH							
	Mounted air-to-water heat exchanger		HS							
Rated field voltage	310 V		4							
Type of construction	IM B 3		0							
	IM B 35		6							

¹⁾ Please note remarks on field weakening on page 3/17.

Selection and ordering

1GG6, 1GH6, 1HS6 Size 225

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
							Resistance at 120 °C R_a mΩ	Inductance L_a mH	
at rated armature voltage 420 V 470 V 520 V 600 V 720 V 810 V									
Overall length 8									
585	94.5	1540	1740	1 6 228-0NA -1VV3	264	83	206	5.83	
665	107	1540	1750	-1WV3	262	85			
745	120	1540	1740	-7MV3	262	86			
875	140	1530	1750	-7NV3	260	87			
1070	169	1510	1710	-2XV3	258	89			
1220	190	1490	1500	-2YV3	254	90			
670	109	1550	1730	1 6 228-0NB -1VV3	298	85	160	4.4	
765	123	1540	1750	-1WV3	296	86			
855	137	1530	1750	-7MV3	294	87			
1000	160	1530	1730	-7NV3	294	89			
1220	191	1500	1400	-2XV3	288	90			
800	130	1550	1700	1 6 228-0NC -1VV3	350	86	118	3.34	
910	146	1530	1710	-1WV3	346	88			
1020	163	1530	1690	-7MV3	345	89			
1190	188	1510	1450	-7NV3	340	90			
995	154	1480	2140	1 6 228-0ND -1VV3	408	88	85	2.37	
1130	173	1460	2150	-1WV3	404	89			
1260	191	1450	2160	-7MV3	398	90			
1460	220	1440	2200	-7NV3	395	91			
1770	258	1390	2250	-2XV3	382	92			
2000	286	1370	2280	-2YV3	374	93			
1170	181	1480	2300	1 6 228-0NE -1VV3	472	89	63.5	1.84	
1320	202	1460	2340	-1WV3	466	90			
1470	224	1460	2340	-7MV3	464	91			
1710	255	1420	2380	-7NV3	454	92			
2060	296	1370	2460	-2XV3	435	93			
2340	325	1330	2520	-2YV3	420	93			
1390	216	1480	2320	1 6 228-0NF -1VV3	555	91	44.5	1.28	
1560	240	1470	2360	-1WV3	550	91			
1740	262	1440	2400	-7MV3	535	92			
2020	296	1400	2440	-7NV3	520	93			
2440	338	1320	2550	-2XV3	492	93			
1670	255	1460	2280	1 6 228-0NG -1VV3	650	92	29.8	0.83	
1880	282	1430	2320	-1WV3	635	92			
2080	305	1400	2360	-7MV3	620	93			
2420	340	1340	2440	-7NV3	595	94			
1840	270	1400	2380	1 6 228-0NH -1VV3	680	92	25.2	0.75	
2060	302	1400	2400	-1WV3	680	93			
2300	330	1370	2420	1 6 228-0NH -7MV3	665	93			
Separate ventilation	Fan unit, radially mounted — GG								
	Fan unit, separately-mounted — GH								
	Mounted air-to-water heat exchanger — HS								
Rated field voltage	310 V — 4								
Type of construction	IM B 3 — 0								
	IM B 35 — 6								

¹⁾ Please note remarks on field weakening on page 3/17.

Selection and ordering

1GG6, 1GH6, 1HS6
Size 225

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1GG6 226	2.9	2.2	3000	880
1GH6 226	2.9	2.2	3000	840
1HS6 226	2.9	2.2	3000	1000
1GG6 228	3.5	2.5	3000	990
1GH6 228	3.5	2.5	3000	950
1HS6 228	3.5	2.5	3000	1100

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: "C05" for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and "C06" for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed $n_{F\text{max}}$.

For speeds $> n_{F\text{max}}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

Type of construction

For other types of construction and the associated Order No. supplement, see Page 3/6.

Selection and ordering

1GG6, 1GH6, 1HS6
Size 250

Selection and ordering data

These motors are uncompensated.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
							Resistance at 120 °C R_a mΩ	Inductance L_a mH
at rated armature voltage								
420 V	470 V	520 V	600 V	720 V	810 V			
Overall length 6								
690	122	1690	1780	1 6 256-0NA -1VV1	325	87	120	4.03
780	138	1690	1780	-1WV1	325	88		
875	154	1680	1780	-7MV1	324	89		
1020	180	1690	1710	-7NV1	325	90		
1240	218	1680	1310	-2XV1	324	91		
785	141	1720	1780	1 6 256-0NB -1VV1	372	88	93.5	3.04
890	159	1710	1780	-1WV1	370	89		
990	177	1710	1730	-7MV1	370	90		
1150	206	1710	1430	-7NV1	370	91		
920	165	1710	1850	1 6 256-0NC -1VV1	430	89	69	2.32
1040	186	1710	1640	-1WV1	428	90		
1160	206	1700	1450	-7MV1	425	91		
1120	196	1670	2200	1 6 256-0ND -1VV1	505	90	50.5	1.72
1260	220	1670	2220	-1WV1	505	91		
1400	245	1670	2200	-7MV1	505	92		
1630	284	1660	2220	-7NV1	505	92		
1970	342	1660	2220	-2XV1	500	93		
2220	384	1650	2220	-2YV1	500	94		
1280	224	1670	2220	1 6 256-0NE -1VV1	575	91	38.2	1.28
1440	252	1670	2220	-1WV1	575	92		
1610	278	1650	2220	-7MV1	565	92		
1870	322	1640	2220	-7NV1	565	93		
2250	384	1630	2250	-2XV1	560	94		
1480	282	1820	1980	1 6 256-0NF -1VV1	720	92	27.5	0.92
1660	316	1820	1990	-1WV1	715	92		
1850	344	1780	2020	-7MV1	700	93		
2140	372	1660	2140	-7NV1	650	94		
1720	314	1740	2300	1 6 256-0NG -1VV1	795	92	21.2	0.69
1940	352	1730	2300	-1WV1	790	93		
2150	384	1710	2300	-7MV1	780	93		
1970	350	1700	2300	1 6 256-0NH -1VV1	880	93	16.1	0.55
2220	394	1690	2300	1 6 256-0NH -1WV1	880	93		
Separate ventilation	Fan unit, radially mounted — GG Fan unit, separately-mounted — GH Mounted air-to-water heat exchanger — HS							
Rated field voltage	310 V — 4							
Type of construction	IM B 3 — 0							
	IM B 35 — 6							

¹⁾ Please note remarks on field weakening on page 3/20.

Selection and ordering

1GG6, 1GH6, 1HS6
Size 250

Rated speed n_N rpm	Rated output						Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	at rated armature voltage 420 V 470 V 520 V 600 V 720 V 810 V	P_N kW										Resistance at 120 °C R_a mΩ	Inductance L_a mH
Overall length 8													
540						121	2140	1510	1 6 258-0NA -1VV1	328	85	138	5
	615					137	2120	1520	-1WV1	326	86		
		685				153	2140	1520	-7MV1	326	87		
			800			179	2140	1380	-7NV1	328	89		
				975		218	2140	1070	-2XV1	328	90		
615						139	2160	1530	1 6 258-0NB -1VV1	372	86	107	3.77
	700					158	2160	1530	-1WV1	372	88		
		780				176	2150	1390	-7MV1	372	89		
			910			205	2150	1180	-7NV1	370	90		
720						164	2180	1470	1 6 258-0NC -1VV1	432	88	79.5	2.87
	815					185	2160	1320	-1WV1	432	89		
		910				206	2160	1170	-7MV1	430	90		
880						195	2120	1910	1 6 258-0ND -1VV1	510	89	58.5	2.13
	995					220	2120	1910	-1WV1	505	90		
		1110				244	2100	1910	-7MV1	505	91		
			1290			284	2100	1910	-7NV1	505	92		
				1560		342	2100	1920	-2XV1	505	93		
					1760	386	2100	1920	-2YV1	505	93		
1010						222	2100	1920	1 6 258-0NE -1VV1	570	90	44	1.59
	1140					250	2100	1930	-1WV1	570	91		
		1270				278	2100	1930	-7MV1	570	92		
			1480			324	2100	1920	-7NV1	570	92		
				1780		388	2080	1930	-2XV1	570	93		
					2020	416	1970	2020	-2YV1	535	94		
1170						282	2300	1700	1 6 258-0NF -1VV1	720	91	31.6	1.15
	1310					316	2300	1710	-1WV1	720	92		
		1460				348	2280	1720	-7MV1	710	92		
			1700			394	2220	1760	-7NV1	690	93		
1360						314	2200	1990	1 6 258-0NG -1VV1	800	92	24.4	0.85
	1530					352	2200	2000	-1WV1	795	92		
		1700				390	2200	2000	-7MV1	795	93		
			1970			436	2120	2060	-7NV1	765	94		
1560						352	2150	2000	1 6 258-0NH -1VV1	890	92	18.6	0.68
	1750					395	2160	2000	-1WV1	890	93		
		1940				436	2150	2000	1 6 258-0NH -7MV1	885	93		
Separate ventilation		Fan unit, radially mounted		GG									
		Fan unit, separately-mounted		GH									
		Mounted air-to-water heat exchanger		HS									
Rated field voltage		310 V		4									
Type of construction		IM B 3		0									
		IM B 35		6									

1) Please note remarks on field weakening on page 3/20.

Selection and ordering

1GG6, 1GH6, 1HS6 Size 250

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1GG6 256	4	3.6	2600	1160
1GH6 256	4	3.6	2600	1120
1HS6 256	4	3.6	2600	1320
1GG6 258	4.7	4.2	2600	1320
1GH6 258	4.7	4.2	2600	1280
1HS6 258	4.7	4.2	2600	1500

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: "**C05**" for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and "**C06**" for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed $n_{F\text{max}}$.

For speeds $> n_{F\text{max}}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

Type of construction

For other types of construction and the associated Order No. supplement, see Page 3/6.

Selection and ordering data

These motors are uncompensated.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
							Resistance at 120 °C R_a mΩ	Inductance L_a mH
at rated armature voltage								
420 V	470 V	520 V	600 V	720 V	810 V			
Overall length 6								
605	171	2700	1330	1 6 286-0NA -1VV1	452	88	80	3.44
685	193	2700	1330	-1WV1	450	89		
765	215	2680	1290	-7MV1	450	90		
890	252	2700	1090	-7NV1	454	91		
715	197	2640	1390	1 6 286-0NB -1VV1	515	89	59.5	2.59
805	222	2640	1250	-1WV1	515	90		
900	246	2620	1110	-7MV1	510	91		
815	218	2550	1660	1 6 286-0NC -1VV1	565	90	49.4	2.19
920	246	2550	1660	-1WV1	565	91		
1020	274	2560	1660	-7MV1	565	91		
1190	318	2550	1660	-7NV1	565	92		
1440	384	2550	1660	-2XV1	565	93		
1630	434	2540	1660	-2YV1	565	94		
915	242	2520	1880	1 6 286-0ND -1VV1	620	91	39.6	1.66
1030	274	2540	1870	-1WV1	625	91		
1150	304	2520	1880	-7MV1	620	92		
1330	352	2520	1880	-7NV1	620	93		
1610	424	2520	1880	-2XV1	620	93		
1820	478	2500	1880	-2YV1	620	94		
1050	292	2660	1740	1 6 286-0NE -1VV1	745	91	29.6	1.31
1180	328	2650	1750	-1WV1	745	92		
1310	364	2650	1750	-7MV1	745	93		
1520	422	2650	1750	-7NV1	745	93		
1830	480	2500	1840	-2XV1	700	94		
1260	344	2600	1740	1 6 286-0NF -1VV1	870	92	21	1.01
1410	386	2620	1740	-1WV1	870	93		
1570	428	2600	1750	-7MV1	870	93		
1810	474	2500	1810	-7NV1	830	94		
1410	390	2640	1710	1 6 286-0NG -1VV1	985	93	16.3	0.74
1590	438	2640	1710	-1WV1	980	93		
1760	472	2560	1760	-7MV1	955	94		
1600	428	2550	1690	1 6 286-0NH -1VV1	1070	93	13	0.58
1790	448	2400	1790	1 6 286-0NH -1WV1	1000	94		
Separate ventilation	Fan unit, radially mounted — GG							
	Fan unit, separately-mounted — GH							
	Mounted air-to-water heat exchanger — HS							
Rated field voltage	310 V — 4							
Type of construction	IM B 3 — 0							
	IM B 35 — 6							

1) Please note remarks on field weakening on page 3/23.

Selection and ordering

1GG6, 1GH6, 1HS6 Size 280

Rated speed n_N rpm	Rated output						Maximum field weak- ening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Effi- ciency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V					Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH	
Overall length 8													
482						170	3360	1130	1 6 288-0NA -1VV1	455	86	91.5	4.24
	545					192	3360	1100	-1WV1	454	87		
		610				214	3350	1040	-7MV1	452	88		
			715			250	3340	890	-7NV1	452	90		
570						195	3260	1120	1 6 288-0NB -1VV1	515	88	68.5	3.19
	645					220	3260	1010	-1WV1	510	89		
		720				246	3260	905	-7MV1	515	90		
650						218	3200	1420	1 6 288-0NC -1VV1	570	89	56.5	2.7
	735					245	3180	1430	-1WV1	565	90		
		820				274	3200	1420	-7MV1	570	90		
			955			318	3180	1430	-7NV1	565	91		
				1150		384	3180	1430	-2XV1	565	93		
					1310	434	3160	1430	-2YV1	565	93		
730						242	3160	1620	1 6 288-0ND -1VV1	630	90	45.5	2.04
	825					272	3150	1630	-1WV1	625	90		
		920				304	3160	1620	-7MV1	625	91		
			1070			352	3140	1630	-7NV1	625	92		
				1300		426	3120	1630	-2XV1	625	93		
					1460	480	3140	1630	-2YV1	625	94		
840						290	3300	1510	1 6 288-0NE -1VV1	745	91	34	1.62
	945					328	3320	1510	-1WV1	750	91		
		1050				364	3320	1510	-7MV1	750	92		
			1220			422	3300	1510	-7NV1	745	93		
				1480		510	3300	1510	-2XV1	745	94		
1010						344	3250	1500	1 6 288-0NF -1VV1	875	92	24	1.24
	1130					386	3260	1510	-1WV1	875	92		
		1260				430	3260	1500	-7MV1	875	93		
			1460			498	3260	1510	-7NV1	875	93		
1130						390	3300	1480	1 6 288-0NG -1VV1	990	92	18.7	0.91
	1270					440	3300	1480	-1WV1	995	93		
		1420				488	3280	1480	-7MV1	990	93		
1280						430	3200	1450	1 6 288-0NH -1VV1	1080	93	15	0.72
	1440					482	3200	1450	1 6 288-0NH -1WV1	1080	93		

Separate ventilation

- Fan unit, radially mounted — GG
- Fan unit, separately-mounted — GH
- Mounted air-to-water heat exchanger — HS

Rated field voltage

- 310 V — 4

Type of construction

- IM B 3 — 0
- IM B 35 — 6

¹⁾ Please note remarks on field weakening on page 3/23.

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1GG6 286	4.8	6.4	2500	1560
1GH6 286	4.8	6.4	2500	1520
1HS6 286	4.8	6.4	2500	1780
1GG6 288	5.4	7.5	2500	1780
1GH6 288	5.4	7.5	2500	1740
1HS6 288	5.4	7.5	2500	2020

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: "**C05**" for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and "**C06**" for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed $n_{F_{\text{max}}}$.

For speeds $> n_{F_{\text{max}}}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

Type of construction

For other type of constructions and the associated Order No. supplement, see Page 3/6.

Selection and ordering

1GG7, 1GH7, 1HS7 Size 355

Selection and ordering data

These motors are compensated.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit					
							Resistance at 120 °C R_a mΩ	Inductance L_a mH				
at rated armature voltage												
420 V	470 V	520 V	600 V	720 V	810 V							
Overall length 1												
580		244	4000	1740	1 7 351-5NA -1VV1	635	90	50.9	0.74			
	655		274	3990	1840		-1WV1	635	90			
		730		305	3990	1850		-7MV1	635	91		
			850		355	3990	1850		-7NV1	635	92	
				1030		422	3920	1890		-2XV1	625	93
					476	3890	1900		-2YV1	620	94	
660			274	3960	1830	1 7 351-5NB -1VV1	-1VV1	715	90	43.6	0.54	
	745			310	3970	1820		-1WV1	720	91		
		835			344	3940	1850		-7MV1	715	91	
			970			400	3940	1850		-7NV1	715	92
				1180		458	3710	1920		-2XV1	675	93
					515	3700	1930		-2YV1	675	94	
735			308	4000	1810	1 7 351-5NC -1VV1	-1VV1	800	91	34.4	0.5	
	830				348	4000	1820		-1WV1	800	92	
		925				386	3990	1840		-7MV1	800	92
			1070			448	3990	1840		-7NV1	800	93
				1300		510	3740	1920		-2XV1	750	94
					565	3670	1940		-2YV1	735	94	
835			344	3940	1820	1 7 351-5ND -1VV1	-1VV1	890	91	28.4	0.35	
	940				388	3940	1810		-1WV1	890	92	
		1050				416	3780	1860		-7MV1	855	93
			1220			482	3770	1870		-7NV1	855	93
				1480		525	3390	2000		-2XV1	770	94
					590	3370	2020		-2YV1	770	94	
Separate ventilation		Fan unit, radially mounted		GG								
		Fan unit, separately-mounted		GH								
		Mounted air-to-water heat exchanger		HS								
Rated field voltage		310 V		4								
Type of construction		IM B 3		0								

¹⁾ Please note remarks on field weakening on page 3/33.

Selection and ordering

1GG7, 1GH7, 1HS7
Size 355

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage												R_a mΩ	L_a mH
420 V	470 V	520 V	600 V	720 V	810 V								
960						394	3920	1760	1 7 351-5NE -1VV1	1010	92	20.7	0.31
	1080					442	3910	1770	-1WV1	1010	93		
		1200				472	3750	1820	-7MV1	965	93		
			1400			535	3650	1850	-7NV1	940	94		
				1690		570	3220	2020	-2XV1	835	94		
					1910	620	3100	2060	-2YV1	805	94		
1060						434	3900	1780	1 7 351-5NF -1VV1	1100	93	17.2	0.24
	1200					486	3870	1780	-1WV1	1100	93		
		1330				510	3660	1860	-7MV1	1040	94		
			1550			580	3570	1880	-7NV1	1020	94		
				1880		580	2950	2100	-2XV1	850	94		
1210						488	3850	1790	1 7 351-5NG -1VV1	1230	94	12.3	0.19
	1360					540	3790	1810	-1WV1	1210	94		
		1520				555	3490	1920	-7MV1	1120	94		
			1760			625	3390	1950	-7NV1	1100	94		
1370						515	3590	1870	1 7 351-5NH -1VV1	1300	94	10.5	0.14
	1540					575	3570	1870	-1WV1	1300	94		
		1710				565	3150	2040	-7MV1	1150	94		
1600						565	3370	2100	1 7 351-5NJ -1VV1	1420	94	8.26	0.11
	1800					620	3290	2100	1 7 351-5NJ -1WV1	1390	94		
Separate ventilation						Fan unit, radially mounted — GG							
						Fan unit, separately-mounted — GH							
						Mounted air-to-water heat exchanger — HS							
Rated field voltage						310 V — 4							
Type of construction						IM B 3 — 0							

3

1) Please note remarks on field weakening on page 3/33.

Selection and ordering

1GG7, 1GH7, 1HS7 Size 355

Rated speed n_N rpm	Rated output						Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit Resistance at 120 °C R_a mΩ	Inductance L_a mH
	420 V	470 V	520 V	600 V	720 V	810 V								$P_N$ kW
Overall length 2													
492						242	4700	1480	1 7 352-5NA -1VV1	635	89	54.5	0.82
555						272	4680	1670	-1WV1	635	90		
	620					304	4680	1710	-7MV1	635	91		
		725				354	4660	1710	-7NV1	635	92		
			880			430	4670	1710	-2XV1	635	93		
				1000		485	4630	1720	-2YV1	635	93		
565						272	4590	1690	1 7 352-5NB -1VV1	715	89	46.7	0.6
635						308	4630	1690	-1WV1	715	90		
	710					344	4630	1690	-7MV1	715	91		
		830				400	4600	1690	-7NV1	715	92		
			1010			474	4480	1730	-2XV1	700	93		
				1140		535	4480	1730	-2YV1	700	94		
625						308	4710	1670	1 7 352-5NC -1VV1	800	90	36.8	0.55
705						346	4690	1680	-1WV1	800	91		
	790					386	4670	1680	-7MV1	800	92		
		915				448	4680	1680	-7NV1	800	93		
			1110			530	4560	1720	-2XV1	780	94		
				1260		595	4510	1730	-2YV1	775	94		
710						348	4680	1640	1 7 352-5ND -1VV1	900	91	30.4	0.38
805						392	4650	1640	-1WV1	900	92		
	895					430	4580	1680	-7MV1	885	92		
		1040				498	4580	1680	-7NV1	885	93		
			1270			555	4170	1790	-2XV1	815	94		
				1430		625	4170	1790	1 7 352-5ND -2YV1	810	94		
Separate ventilation	Fan unit, radially mounted						GG		↑↑				
	Fan unit, separately-mounted						GH		↑↑				
	Mounted air-to-water heat exchanger						HS		↑↑				
Rated field voltage	310 V						4		↑↑				
Type of construction	IM B 3						0		↑↑				

¹⁾ Please note remarks on field weakening on page 3/33.

Selection and ordering

1GG7, 1GH7, 1HS7
Size 355

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage												R_a mΩ	L_a mH
420 V	470 V	520 V	600 V	720 V	810 V								
820						400	4660	1590	1 7 352-5NE -1VV1	1020	92	22.2	0.35
	920					450	4670	1590	-1WV1	1020	93		
		1030				490	4550	1630	-7MV1	1000	93		
			1190			560	4500	1650	-7NV1	985	94		
				1440		615	4080	1770	-2XV1	900	94		
					1630	680	3980	1790	-2YV1	880	95		
910						445	4670	1600	1 7 352-5NF -1VV1	1140	92	18.5	0.26
	1020					500	4680	1610	-1WV1	1130	93		
		1140				535	4480	1650	-7MV1	1090	94		
			1320			615	4450	1660	-7NV1	1080	94		
				1600		645	3850	1840	-2XV1	940	95		
1030						505	4680	1610	1 7 352-5NG -1VV1	1280	93	13.2	0.21
	1160					565	4650	1620	-1WV1	1270	94		
		1300				595	4370	1680	-7MV1	1210	94		
			1500			675	4300	1710	-7NV1	1180	95		
1170						545	4450	1650	1 7 352-5NH -1VV1	1380	94	11.2	0.15
	1310					605	4410	1670	-1WV1	1360	94		
		1460				615	4020	1780	-7MV1	1240	94		
1360						605	4250	1880	1 7 352-5NJ -1VV1	1520	94	8.85	0.12
	1530					670	4180	1900	1 7 352-5NJ -1WV1	1500	94		
Separate ventilation						Fan unit, radially mounted — GG							
						Fan unit, separately-mounted — GH							
						Mounted air-to-water heat exchanger — HS							
Rated field voltage						310 V — 4							
Type of construction						IM B 3 — 0							

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1) Please note remarks on field weakening on page 3/33.

Selection and ordering

1GG7, 1GH7, 1HS7 Size 355

Rated speed n_N rpm	Rated output						Maximum field weak- ening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Effi- ciency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V					Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH	
Overall length 3													
416						240	5510	1250	1 7 353-5NA -1VV1	635	88	58.9	0.92
	472					272	5500	1420	-1WV1	635	89		
		525				302	5490	1560	-7MV1	630	90		
			615			352	5460	1560	-7NV1	630	91		
				750		428	5450	1570	-2XV1	635	92		
					845	482	5450	1570	-2YV1	635	93		
475						272	5470	1430	1 7 353-5NB -1VV1	715	89	50.5	0.66
	540					306	5420	1550	-1WV1	715	90		
		600				342	5440	1550	-7MV1	715	91		
			700			398	5430	1550	-7NV1	715	92		
				855		484	5410	1550	-2XV1	720	93		
					970	545	5370	1550	-2YV1	715	93		
530						306	5510	1540	1 7 353-5NC -1VV1	800	90	39.8	0.62
	600					345	5490	1540	-1WV1	800	91		
		670				385	5490	1540	-7MV1	800	91		
			780			448	5480	1540	-7NV1	800	92		
				945		540	5450	1550	-2XV1	795	93		
					1070	610	5440	1550	-2YV1	795	94		
605						346	5460	1510	1 7 353-5ND -1VV1	900	90	32.8	0.43
	680					390	5480	1510	-1WV1	900	91		
		760				435	5460	1510	-7MV1	900	92		
			885			505	5450	1510	-7NV1	900	93		
				1080		580	5130	1580	-2XV1	850	94		
					1220	655	5130	1580	1 7 353-5ND -2YV1	850	94		
Separate ventilation		Fan unit, radially mounted — GG							Fan unit, separately-mounted — GH				
		Mounted air-to-water heat exchanger — HS											
Rated field voltage		310 V — 4											
Type of construction		IM B 3 — 0											

¹⁾ Please note remarks on field weakening on page 3/33.

Selection and ordering

1GG7, 1GH7, 1HS7
Size 355

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage												R_a mΩ	L_a mH
420 V	470 V	520 V	600 V	720 V	810 V								
695						398	5470	1460	1 7 353-5NE -1VV1	1020	92	24	0.39
	785					448	5450	1460	-1VV1	1020	92		
		870				498	5460	1460	-7MV1	1020	93		
			1010			575	5430	1470	-7NV1	1020	94		
				1230		655	5090	1540	-2XV1	955	94		
					1390	730	5010	1560	-2YV1	945	95		
770						444	5510	1470	1 7 353-5NF -1VV1	1140	92	19.9	0.3
	870					498	5460	1470	-1VV1	1130	93		
		965				550	5440	1470	-7MV1	1120	93		
			1120			640	5450	1470	-7NV1	1130	94		
				1360		700	4920	1590	-2XV1	1020	95		
880						505	5470	1470	1 7 353-5NG -1VV1	1280	93	14.3	0.23
	990					570	5500	1470	-1VV1	1280	94		
		1100				625	5430	1480	-7MV1	1270	94		
			1280			715	5350	1500	-7NV1	1250	95		
995						555	5340	1490	1 7 353-5NH -1VV1	1400	93	12.1	0.17
	1120					625	5340	1490	-1VV1	1410	94		
		1240				660	5070	1550	-7MV1	1340	94		
1160						630	5190	1680	1 7 353-5NJ -1VV1	1580	94	9.57	0.14
	1300					705	5170	1690	1 7 353-5NJ -1VV1	1580	94		
Separate ventilation						Fan unit, radially mounted — GG							
						Fan unit, separately-mounted — GH							
						Mounted air-to-water heat exchanger — HS							
Rated field voltage						310 V — 4							
Type of construction						IM B 3 — 0							

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1) Please note remarks on field weakening on page 3/33.

Selection and ordering

1GG7, 1GH7, 1HS7 Size 355

Rated speed n_N rpm	Rated output						Maximum field weak- ening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Effi- ciency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V					Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH	
Overall length 4													
344						238	6610	1030	1 7 354-5NA -1VV1	635	87	64.8	1.06
	390					270	6610	1170	-1WV1	635	89		
		436				300	6570	1310	-7MV1	630	90		
			510			350	6550	1410	-7NV1	630	91		
				620		426	6560	1410	-2XV1	635	92		
					705	482	6530	1410	-2YV1	635	93		
392						268	6530	1180	1 7 354-5NB -1VV1	710	88	55.4	0.75
	445					304	6520	1340	-1WV1	715	89		
		498				340	6520	1390	-7MV1	715	90		
			580			396	6520	1390	-7NV1	715	91		
				710		480	6460	1400	-2XV1	715	92		
					805	545	6470	1400	-2YV1	715	93		
438						304	6630	1310	1 7 354-5NC -1VV1	800	89	43.8	0.71
	496					342	6590	1380	-1WV1	795	90		
		555				382	6570	1390	-7MV1	795	91		
			645			445	6590	1390	-7NV1	795	92		
				785		540	6570	1390	-2XV1	800	93		
					890	610	6540	1390	-2YV1	800	94		
500						344	6570	1350	1 7 354-5ND -1VV1	900	90	36	0.49
	565					388	6560	1360	-1WV1	900	91		
		630				432	6550	1360	-7MV1	900	91		
			735			505	6560	1360	-7NV1	900	92		
				895		600	6400	1380	-2XV1	885	93		
					1010	680	6430	1380	1 7 354-5ND -2YV1	885	94		
Separate ventilation		Fan unit, radially mounted						GG					
		Fan unit, separately-mounted						GH					
		Mounted air-to-water heat exchanger						HS					
Rated field voltage		310 V						4					
Type of construction		IM B 3						0					

¹⁾ Please note remarks on field weakening on page 3/33.

Selection and ordering

1GG7, 1GH7, 1HS7
Size 355

Rated speed n_N rpm	at rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V							Resistance at 120 °C R_a mΩ	Inductance L_a mH	
575							396	6580	1310	1 7 354-5NE -1VV1	1020	91	26.4	0.45	
	650						446	6550	1310	-1WV1	1020	92			
		725					496	6530	1310	-7MV1	1020	92			
			845				575	6500	1320	-7NV1	1020	93			
				1020			685	6420	1330	-2XV1	1000	94			
					1160		765	6290	1350	-2YV1	990	95			
640							440	6570	1320	1 7 354-5NF -1VV1	1130	92	21.9	0.34	
	720						496	6580	1320	-1WV1	1130	92			
		805					550	6520	1320	-7MV1	1130	93			
			935				640	6530	1320	-7NV1	1130	94			
				1130			740	6260	1370	-2XV1	1080	94			
735							505	6560	1320	1 7 354-5NG -1VV1	1280	93	15.7	0.26	
	825						565	6540	1330	-1WV1	1270	93			
		915					630	6560	1320	-7MV1	1280	94			
			1060				730	6550	1320	-7NV1	1280	94			
830							555	6410	1340	1 7 354-5NH -1VV1	1410	93	13.3	0.19	
	930						625	6410	1340	-1WV1	1410	94			
		1030					690	6370	1340	-7MV1	1400	94			
965							625	6170	1540	1 7 354-5NJ -1VV1	1580	93	10.5	0.16	
	1090						705	6190	1530	1 7 354-5NJ -1WV1	1580	94			
Separate ventilation		Fan unit, radially mounted		GG		Fan unit, separately-mounted		GH		Mounted air-to-water heat exchanger		HS			
Rated field voltage		310 V		4		Type of construction		IM B 3		0					

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1) Please note remarks on field weakening on page 3/33.

Selection and ordering

1GG7, 1GH7, 1HS7 Size 355

Rated speed n_N rpm	Rated output						Maximum field weak- ening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Effi- ciency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V					Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH	
Overall length 5													
275						236	8200	710	1 7 355-5NA -1VV1	640	86	73.5	1.25
	312					268	8200	940	-1WV1	640	87		
		350				300	8180	1050	-7MV1	640	88		
			410			352	8200	1220	-7NV1	640	90		
				498		426	8170	1230	-2XV1	640	91		
					565	482	8150	1230	-2YV1	640	92		
314						268	8150	945	1 7 355-5NB -1VV1	725	86	62.9	0.88
	355					302	8120	1070	-1WV1	720	88		
		398				338	8110	1200	-7MV1	720	89		
			465			395	8110	1210	-7NV1	720	90		
				570		482	8080	1210	-2XV1	720	91		
					645	545	8070	1210	-2YV1	720	92		
350						302	8240	1050	1 7 355-5NC -1VV1	800	88	49.7	0.85
	398					342	8210	1200	-1WV1	800	89		
		442				380	8210	1200	-7MV1	800	90		
			520			446	8190	1200	-7NV1	805	91		
				630		540	8190	1200	-2XV1	805	92		
					715	610	8150	1210	-2YV1	800	93		
400						346	8260	1170	1 7 355-5ND -1VV1	915	89	40.7	0.57
	452					392	8280	1170	-1WV1	915	90		
		505				435	8230	1170	-7MV1	910	90		
			590			505	8190	1180	-7NV1	910	92		
				715		610	8150	1180	-2XV1	905	93		
					810	690	8150	1180	1 7 355-5ND -2YV1	905	93		
Separate ventilation		Fan unit, radially mounted — GG							Fan unit, separately-mounted — GH		Mounted air-to-water heat exchanger — HS		
Rated field voltage		310 V — 4											
Type of construction		IM B 3 — 0											

¹⁾ Please note remarks on field weakening on page 3/33.

Rated speed n_N rpm							Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage 420 V 470 V 520 V 600 V 720 V 810 V													Resistance at 120 °C R_a mΩ	Inductance L_a mH
462							395	8170	1140	1 7 355-5NE -1VV1	1030	90	30	0.53
	520						446	8190	1140	-1WV1	1030	91		
		580					495	8150	1140	-7MV1	1020	92		
			675				575	8140	1140	-7NV1	1030	93		
				820			700	8150	1130	-2XV1	1030	94		
510							440	8240	1150	1 7 355-5NF -1VV1	1140	91	24.8	0.4
	575						495	8220	1140	-1WV1	1150	92		
		640					550	8210	1140	-7MV1	1130	92		
			745				640	8190	1140	-7NV1	1140	93		
				905			770	8130	1150	-2XV1	1130	94		
585							500	8160	1150	1 7 355-5NG -1VV1	1290	92	17.8	0.31
	660						565	8180	1150	-1WV1	1280	93		
		735					620	8060	1150	-7MV1	1260	93		
			855				725	8100	1150	-7NV1	1270	94		
665							550	7900	1170	1 7 355-5NH -1VV1	1400	93	15.1	0.23
	745						620	7940	1160	-1WV1	1400	93		
		830					690	7940	1160	-7MV1	1400	94		
775							625	7700	1340	1 7 355-5NJ -1VV1	1580	93	11.9	0.19
	870						705	7740	1340	1 7 355-5NJ -1WV1	1590	94		
Separate ventilation							Fan unit, radially mounted		GG					
							Fan unit, separately-mounted		GH					
							Mounted air-to-water heat exchanger		HS					
Rated field voltage							310 V		4					
Type of construction							IM B 3		0					

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1GG7 351	2.6	17	2200	2400
1GH7 351	2.6	17	2200	2200
1HS7 351	2.6	17	2200	2700
1GG7 352	3.0	20	2200	2600
1GH7 352	3.0	20	2200	2400
1HS7 352	3.0	20	2200	2900
1GG7 353	3.4	22	2200	2800
1GH7 353	3.4	22	2200	2600
1HS7 353	3.4	22	2200	3100
1GG7 354	3.8	25	2200	3000
1GH7 354	3.8	25	2200	2800
1HS7 354	3.8	25	2200	3300
1GG7 355	4.1	29	2200	3300
1GH7 355	4.1	29	2200	3100
1HS7 355	4.1	29	2200	3600

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: "C05" for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and "C06" for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed n_{Fmax} .

For speeds $> n_{Fmax}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

¹⁾ Please note remarks on field weakening.

Selection and ordering

1GG7, 1GH7, 1HS7
Size 400

Selection and ordering data

These motors are compensated.

Rated speed n_N rpm	at rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	420 V	470 V	520 V	600 V	720 V	810 V							Resistance at 120 °C R_a mΩ	Inductance L_a mH
Overall length 1														
412							242	5600	1240	1 7 401-5NA -1VV1	640	88	59.2	1.13
	466						272	5600	1400	-1WV1	635	89		
		520					304	5600	1560	-7MV1	635	90		
			610				355	5550	1650	-7NV1	640	91		
				740			430	5550	1660	-2XV1	640	92		
					835		485	5550	1660	-2YV1	635	93		
468							274	5600	1400	1 7 401-5NB -1VV1	715	89	46.3	0.73
	530						308	5550	1590	-1WV1	715	90		
		590					345	5600	1630	-7MV1	720	91		
			685				402	5600	1620	-7NV1	720	92		
				830			472	5450	1660	-2XV1	695	93		
					940		530	5400	1670	-2YV1	690	94		
530							310	5600	1600	1 7 401-5NC -1VV1	805	90	37.5	0.54
	600						350	5550	1600	-1WV1	805	91		
		665					390	5600	1600	-7MV1	805	92		
			775				454	5600	1610	-7NV1	810	92		
				940			530	5400	1660	-2XV1	780	93		
					1060		600	5400	1650	-2YV1	780	94		
590							350	5650	1600	1 7 401-5ND -1VV1	900	91	28.8	0.53
	665						394	5650	1600	-1WV1	900	92		
		745					434	5550	1630	-7MV1	890	93		
			865				505	5600	1630	-7NV1	890	93		
				1050			575	5250	1700	-2XV1	840	94		
					1180		645	5200	1710	1 7 401-5ND -2YV1	835	95		
Separate ventilation		Fan unit, radially mounted — GG Fan unit, separately-mounted — GH Mounted air-to-water heat exchanger — HS												
Rated field voltage		310 V — 4												
Type of construction		IM B 3 — 0												

¹⁾ Please note remarks on field weakening on page 3/44.

Selection and ordering

1GG7, 1GH7, 1HS7
Size 400

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage												R_a mΩ	L_a mH
420 V	470 V	520 V	600 V	720 V	810 V								
675						375	5300	1640	1 7 401-5NE -1VV1	960	92	24.5	0.34
	760					422	5300	1640	-1WV1	960	92		
		850				455	5100	1680	-7MV1	930	93		
			985			525	5100	1680	-7NV1	925	94		
				1190		585	4700	1780	-2XV1	855	94		
					1350	650	4600	1800	-2YV1	840	95		
765						448	5600	1570	1 7 401-5NF -1VV1	1140	92	19	0.27
	860					505	5600	1570	-1WV1	1140	93		
		955				540	5400	1610	-7MV1	1100	93		
			1110			625	5400	1610	-7NV1	1100	94		
				1350		675	4780	1750	-2XV1	985	95		
					1520	750	4700	1760	-2YV1	970	95		
870						492	5400	1610	1 7 401-5NG -1VV1	1240	93	14.1	0.28
	980					545	5300	1630	-1WV1	1230	94		
		1090				585	5150	1670	-7MV1	1190	94		
			1260			665	5050	1690	-7NV1	1160	94		
				1530		705	4400	1800	-2XV1	1020	95		
975						555	5450	1550	1 7 401-5NH -1VV1	1400	94	11.3	0.18
	1100					615	5350	1570	-1WV1	1380	94		
		1220				645	5050	1640	-7MV1	1300	94		
			1410			730	4950	1660	-7NV1	1270	95		
1190						630	5050	1780	1 7 401-5NJ -1VV1	1580	94	8.3	0.12
	1340					700	4980	1790	-1WV1	1570	94		
		1490				695	4450	1800	1 7 401-5NJ -7MV1	1400	94		
Separate ventilation						Fan unit, radially mounted — GG							
						Fan unit, separately-mounted — GH							
						Mounted air-to-water heat exchanger — HS							
Rated field voltage						310 V — 4							
Type of construction						IM B 3 — 0							

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1) Please note remarks on field weakening on page 3/44.

Selection and ordering

1GG7, 1GH7, 1HS7 Size 400

Rated speed n_N rpm	Rated output						Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	420 V	470 V	520 V	600 V	720 V	810 V						Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH
Overall length 2													
335						240	6850	1000	1 7 402-5NA -1VV1	640	87	64.6	1.3
380						270	6800	1140	-1WV1	635	89		
	425					302	6800	1280	-7MV1	635	89		
		496				352	6800	1490	-7NV1	635	91		
			605			428	6750	1500	-2XV1	635	92		
				685		485	6750	1500	-2YV1	635	93		
380						272	6850	1140	1 7 402-5NB -1VV1	715	89	50.4	0.82
430						306	6800	1290	-1WV1	710	90		
	482					342	6800	1450	-7MV1	715	91		
		560				398	6800	1470	-7NV1	715	92		
			680			482	6750	1480	-2XV1	715	93		
				770		545	6750	1480	-2YV1	715	93		
432						308	6800	1300	1 7 402-5NC -1VV1	805	89	40.8	0.6
488						348	6800	1460	-1WV1	805	90		
	545					388	6800	1460	-7MV1	805	91		
		635				452	6800	1460	-7NV1	805	92		
			770			545	6750	1470	-2XV1	805	93		
				870		615	6750	1470	-2YV1	800	94		
484						348	6850	1460	1 7 402-5ND -1VV1	900	91	31.4	0.6
545						392	6850	1450	-1WV1	900	91		
	610					436	6850	1470	-7MV1	900	92		
		705				508	6900	1460	-7NV1	900	93		
			855			600	6700	1500	-2XV1	880	94		
				970		670	6600	1510	1 7 402-5ND -2YV1	870	94		
Separate ventilation		Fan unit, radially mounted — GG							Fan unit, separately-mounted — GH		Mounted air-to-water heat exchanger — HS		
Rated field voltage		310 V — 4											
Type of construction		IM B 3 — 0											

¹⁾ Please note remarks on field weakening on page 3/44.

Selection and ordering

1GG7, 1GH7, 1HS7
Size 400

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage												R_a mΩ	L_a mH
420 V	470 V	520 V	600 V	720 V	810 V								
555						382	6580	1460	1 7 402-5NE -1VV1	985	91	26.6	0.39
	625					430	6580	1460	-1WV1	985	92		
		695				466	6400	1490	-7MV1	955	93		
			810			540	6350	1500	-7NV1	955	93		
				980		610	5950	1570	-2XV1	890	94		
					1110	690	5950	1570	-2YV1	890	95		
625						450	6900	1410	1 7 402-5NF -1VV1	1150	92	20.7	0.3
	705					505	6850	1410	-1WV1	1150	92		
		785				555	6750	1430	-7MV1	1135	93		
			910			645	6750	1430	-7NV1	1135	94		
				1100		720	6250	1520	-2XV1	1050	95		
					1250	805	6150	1530	-2YV1	1040	95		
715						505	6750	1430	1 7 402-5NG -1VV1	1280	93	15.4	0.33
	805					565	6700	1440	-1WV1	1270	93		
		895				610	6500	1470	-7MV1	1240	94		
			1040			695	6400	1490	-7NV1	1210	94		
				1250		765	5850	1590	-2XV1	1110	95		
800						565	6750	1390	1 7 402-5NH -1VV1	1430	93	12.3	0.21
	900					635	6750	1390	-1WV1	1430	94		
		1000				680	6500	1430	-7MV1	1370	94		
			1160			775	6400	1450	-7NV1	1350	95		
980						655	6400	1580	1 7 402-5NJ -1VV1	1640	94	9	0.13
	1100					735	6400	1580	-1WV1	1640	94		
		1220				755	5900	1680	1 7 402-5NJ -7MV1	1520	95		
Separate ventilation						Fan unit, radially mounted — GG			↑↑				
						Fan unit, separately-mounted — GH			↑↑				
						Mounted air-to-water heat exchanger — HS			↑↑				
Rated field voltage						310 V — 4			↑↑				
Type of construction						IM B 3 — 0			↑↑				

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1) Please note remarks on field weakening on page 3/44.

Selection and ordering

1GG7, 1GH7, 1HS7 Size 400

Rated speed n_N rpm	Rated output						Maximum field weak- ening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Effi- ciency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V					Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH	
Overall length 3													
284						240	8100	850	1 7 403-5NA -1VV1	645	86	70.4	1.48
	322					270	8030	970	-1WV1	640	88		
		360				302	8030	1080	-7MV1	640	89		
			420			354	8070	1260	-7NV1	645	90		
				510		430	8070	1350	-2XV1	645	91		
					580	485	8030	1360	-2YV1	640	92		
320						270	8060	960	1 7 403-5NB -1VV1	715	88	54.9	0.93
	362					306	8070	1090	-1WV1	715	89		
		404				342	8080	1210	-7MV1	720	90		
			472			402	8150	1330	-7NV1	725	91		
				570		485	8100	1340	-2XV1	720	92		
					650	550	8120	1340	-2YV1	720	93		
364						310	8130	1090	1 7 403-5NC -1VV1	815	89	44.4	0.67
	412					350	8130	1240	-1WV1	815	90		
		458				390	8130	1320	-7MV1	815	91		
			535			452	8080	1330	-7NV1	810	92		
				650		550	8120	1330	-2XV1	815	93		
					730	625	8150	1320	-2YV1	815	93		
406						348	8190	1220	1 7 403-5ND -1VV1	905	90	34.2	0.68
	460					392	8160	1330	-1WV1	900	91		
		510				436	8150	1330	-7MV1	900	92		
			595			505	8110	1330	-7NV1	900	93		
				720		605	8030	1350	-2XV1	890	94		
					815	680	7980	1360	1 7 403-5ND -2YV1	885	94		
Separate ventilation		Fan unit, radially mounted						GG					
		Fan unit, separately-mounted						GH					
		Mounted air-to-water heat exchanger						HS					
Rated field voltage		310 V						4					
Type of construction		IM B 3						0					

¹⁾ Please note remarks on field weakening on page 3/44.

Selection and ordering

1GG7, 1GH7, 1HS7
Size 400

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage												R_a mΩ	L_a mH
420 V	470 V	520 V	600 V	720 V	810 V								
464						382	7860	1330	1 7 403-5NE -1VV1	990	91	29	0.43
	525					432	7890	1320	-1VV1	990	91		
		585				470	7690	1350	-7MV1	970	92		
			680			545	7670	1350	-7NV1	970	93		
				825		625	7250	1410	-2XV1	915	94		
					930	705	7240	1410	-2YV1	915	94		
525						450	8200	1280	1 7 403-5NF -1VV1	1160	91	22.5	0.33
	590					510	8240	1270	-1VV1	1160	92		
		660				565	8210	1280	-7MV1	1160	93		
			765			655	8190	1280	-7NV1	1160	93		
				930		740	7620	1350	-2XV1	1080	94		
					1050	835	7620	1350	-2YV1	1080	95		
600						500	7970	1310	1 7 403-5NG -1VV1	1270	92	16.8	0.37
	675					570	8080	1290	-1VV1	1290	93		
		750				620	7900	1320	-7MV1	1260	93		
			870			710	7790	1330	-7NV1	1250	94		
				1050		800	7260	1400	-2XV1	1160	95		
670						570	8100	1250	1 7 403-5NH -1VV1	1440	93	13.4	0.23
	755					640	8090	1250	-1VV1	1440	93		
		840				695	7900	1270	-7MV1	1410	94		
			975			800	7840	1280	-7NV1	1400	95		
820						670	7780	1430	1 7 403-5NJ -1VV1	1690	94	9.8	0.15
	925					750	7750	1430	-1VV1	1680	94		
		1030				785	7290	1500	1 7 403-5NJ -7MV1	1580	94		
Separate ventilation						Fan unit, radially mounted — GG							
						Fan unit, separately-mounted — GH							
						Mounted air-to-water heat exchanger — HS							
Rated field voltage						310 V — 4							
Type of construction						IM B 3 — 0							

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1) Please note remarks on field weakening on page 3/44.

Selection and ordering

1GG7, 1GH7, 1HS7 Size 400

Rated speed n_N rpm	Rated output						Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	420 V	470 V	520 V	600 V	720 V	810 V						Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH
Overall length 4													
225						235	9970	680	1 7 404-5NA -1VV1	640	85	78.5	1.74
	256					266	9930	770	-1WV1	640	87		
		286				298	9950	860	-7MV1	640	88		
			336			348	9900	1010	-7NV1	640	89		
				410		425	9900	1220	-2XV1	640	91		
					466	470	9840	1220	-2YV1	640	92		
256						266	9930	770	1 7 404-5NB -1VV1	715	87	61.2	1.07
	292					302	9880	880	-1WV1	715	88		
		326				338	9900	980	-7MV1	715	89		
			380			394	9900	1140	-7NV1	715	90		
				464		480	9880	1190	-2XV1	720	92		
					525	545	9910	1190	-2YV1	720	92		
292						304	9950	880	1 7 404-5NC -1VV1	805	88	49.3	0.77
	330					344	9950	990	-1WV1	805	89		
		370				384	9910	1110	-7MV1	810	90		
			432			448	9910	1180	-7NV1	810	91		
				525		545	9910	1180	-2XV1	810	92		
					595	615	9880	1180	-2YV1	810	93		
328						345	10050	980	1 7 404-5ND -1VV1	905	89	38.2	0.8
	370					385	9950	1110	-1WV1	895	90		
		414				430	9930	1190	-7MV1	895	91		
			482			505	10010	1190	-7NV1	905	92		
				585		615	10040	1180	-2XV1	910	93		
					660	690	9980	1190	1 7 404-5ND -2YV1	900	94		
Separate ventilation		Fan unit, radially mounted — GG							Fan unit, separately-mounted — GH		Mounted air-to-water heat exchanger — HS		
Rated field voltage		310 V — 4											
Type of construction		IM B 3 — 0											

¹⁾ Please note remarks on field weakening on page 3/44.

Selection and ordering

1GG7, 1GH7, 1HS7
Size 400

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage												R_a mΩ	L_a mH
420 V	470 V	520 V	600 V	720 V	810 V								
375						384	9780	1130	1 7 404-5NE -1VV1	1010	90	32.3	0.5
	424					432	9740	1170	-1VV1	1000	91		
		474				475	9570	1180	-7MV1	985	91		
			550			555	9640	1180	-7NV1	990	92		
				670		640	9120	1230	-2XV1	940	93		
					755	725	9170	1220	-2YV1	945	94		
424						445	10030	1140	1 7 404-5NF -1VV1	1150	91	25	0.38
	478					500	9990	1150	-1VV1	1150	91		
		535				560	10000	1140	-7MV1	1150	92		
			620			650	10010	1150	-7NV1	1150	93		
				755		760	9620	1170	-2XV1	1120	94		
					850	860	9670	1170	-2YV1	1120	94		
485						498	9810	1170	1 7 404-5NG -1VV1	1280	92	18.8	0.44
	545					560	9820	1170	-1VV1	1280	92		
		610				625	9790	1160	-7MV1	1280	93		
			710			720	9690	1170	-7NV1	1270	94		
				855		830	9280	1210	-2XV1	1210	95		
545						565	9910	1120	1 7 404-5NH -1VV1	1440	92	15	0.27
	615					635	9870	1110	-1VV1	1440	93		
		685				710	9900	1110	-7MV1	1450	94		
			795			820	9850	1110	-7NV1	1440	94		
670						675	9620	1270	1 7 404-5NJ -1VV1	1710	93	10.9	0.17
	750					760	9680	1270	-1VV1	1710	94		
		835				810	9270	1310	1 7 404-5NJ -7MV1	1640	94		
Separate ventilation						Fan unit, radially mounted — GG			↑↑				
						Fan unit, separately-mounted — GH			↑↑				
						Mounted air-to-water heat exchanger — HS			↑↑				
Rated field voltage						310 V — 4			↑↑				
Type of construction						IM B 3 — 0			↑↑				

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1) Please note remarks on field weakening on page 3/44.

Selection and ordering

1GG7, 1GH7, 1HS7 Size 400

Rated speed n_N rpm	Rated output						Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	420 V	470 V	520 V	600 V	720 V	810 V						Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH
Overall length 5													
171						230	12850	510	1 7 405-5NA -1VV1	640	83	91.7	2.16
195						260	12730	590	-1WV1	635	85		
	220					292	12680	660	-7MV1	635	86		
		258				342	12670	770	-7NV1	635	88		
			316			420	12700	950	-2XV1	640	90		
				360		475	12600	1050	-2YV1	640	91		
196						262	12770	590	1 7 405-5NB -1VV1	715	85	71.3	1.31
	224					300	12790	670	-1WV1	720	86		
		250				335	12800	750	-7MV1	720	88		
			294			390	12680	880	-7NV1	715	89		
				358		475	12680	1010	-2XV1	715	91		
					406	540	12700	1010	-2YV1	720	92		
224						300	12790	670	1 7 405-5NC -1VV1	810	86	57.4	0.92
	254					338	12710	760	-1WV1	805	88		
		284				380	12780	850	-7MV1	810	89		
			332			445	12800	990	-7NV1	810	90		
				405		540	12730	1000	-2XV1	810	91		
					460	610	12670	1000	-2YV1	805	92		
252						340	12890	760	1 7 405-5ND -1VV1	905	88	44.6	0.98
	285					385	12900	860	-1WV1	905	89		
		318				425	12760	950	-7MV1	895	90		
			372			498	12790	1010	-7NV1	900	91		
				452		605	12780	1010	-2XV1	900	92		
					515	685	12700	1010	1 7 405-5ND -2YV1	900	93		
Separate ventilation		Fan unit, radially mounted — GG							Fan unit, separately-mounted — GH		Mounted air-to-water heat exchanger — HS		
Rated field voltage		310 V — 4											
Type of construction		IM B 3 — 0											

¹⁾ Please note remarks on field weakening on page 3/44.

Selection and ordering

1GG7, 1GH7, 1HS7
Size 400

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage												R_a mΩ	L_a mH
420 V	470 V	520 V	600 V	720 V	810 V								
288						382	12670	860	1 7 405-5NE -1VV1	1010	88	37.5	0.6
	326					432	12660	980	-1WV1	1010	89		
		365				476	12460	990	-7MV1	1000	90		
			426			555	12450	990	-7NV1	1000	91		
				520		655	12040	1010	-2XV1	970	93		
					585	740	12080	1020	-2YV1	970	93		
326						440	12900	960	1 7 405-5NF -1VV1	1150	90	29.1	0.46
	368					498	12920	960	-1WV1	1150	90		
		412				555	12870	960	-7MV1	1150	91		
			480			645	12840	970	-7NV1	1150	92		
				585		780	12730	965	-2XV1	1150	93		
					660	880	12730	970	-2YV1	1150	94		
375						495	12610	980	1 7 405-5NG -1VV1	1280	91	21.9	0.54
	424					555	12500	980	-1WV1	1270	92		
		472				620	12550	980	-7MV1	1280	92		
			550			720	12500	980	-7NV1	1270	93		
				665		855	12280	970	-2XV1	1250	94		
420						555	12620	940	1 7 405-5NH -1VV1	1420	92	17.4	0.33
	474					630	12700	940	-1WV1	1430	92		
		530				700	12620	940	-7MV1	1430	93		
			615			810	12580	940	-7NV1	1430	94		
520						670	12300	1090	1 7 405-5NJ -1VV1	1700	92	12.7	0.2
	585					755	12330	1080	-1WV1	1700	93		
		650				835	12270	1090	1 7 405-5NJ -7MV1	1700	94		
Separate ventilation						Fan unit, radially mounted — GG							
						Fan unit, separately-mounted — GH							
						Mounted air-to-water heat exchanger — HS							
Rated field voltage						310 V — 4							
Type of construction						IM B 3 — 0							

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1) Please note remarks on field weakening on page 3/44.

Selection and ordering

1GG7, 1GH7, 1HS7 Size 400

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1GG7 401	3.2	23	2000	3000
1GH7 401	3.2	23	2000	2800
1HS7 401	3.2	23	2000	3300
1GG7 402	3.8	26	2000	3300
1GH7 402	3.8	26	2000	3100
1HS7 402	3.8	26	2000	3600
1GG7 403	4.1	30	2000	3700
1GH7 403	4.1	30	2000	3500
1HS7 403	4.1	30	2000	4000
1GG7 404	5.0	34	2000	4100
1GH7 404	5.0	34	2000	3900
1HS7 404	5.0	34	2000	4400
1GG7 405	5.4	41	2000	4800
1GH7 405	5.4	41	2000	4600
1HS7 405	5.4	41	2000	5100

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: "C05" for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and "C06" for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed n_{Fmax} .

For speeds $> n_{Fmax}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

Selection and ordering data

These motors are compensated.

Rated speed n_N rpm	at rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	420 V	470 V	520 V	600 V	720 V	810 V							Resistance at 120 °C R_a mΩ	Inductance L_a mH
Overall length 1														
254							210	7900	1020	1 7 451-5NA -1VV1	580	85	93.1	1.53
	290						238	7870	1160	-1WV1	575	86		
		324					266	7840	1300	-7MV1	575	88		
			380				312	7840	1350	-7NV1	575	89		
				464			375	7720	1370	-2XV1	565	91		
					525		426	7740	1370	-2YV1	565	92		
288							238	7890	1150	1 7 451-5NB -1VV1	640	87	70.9	1.32
	326						268	7850	1300	-1WV1	635	88		
		365					300	7850	1340	-7MV1	635	89		
			426				350	7850	1340	-7NV1	635	91		
				520			420	7730	1360	-2XV1	625	92		
					590		476	7730	1350	-2YV1	625	93		
322							266	7870	1290	1 7 451-5NC -1VV1	710	88	58.5	0.93
	365						302	7900	1340	-1WV1	710	89		
		408					334	7820	1350	-7MV1	705	90		
			476				390	7810	1350	-7NV1	705	91		
				580			465	7660	1370	-2XV1	690	93		
					655		525	7630	1370	-2YV1	690	93		
364							304	8000	1310	1 7 451-5ND -1VV1	810	88	49.1	0.76
	412						344	8000	1310	-1WV1	810	90		
		460					380	7890	1320	-7MV1	800	91		
			535				444	7900	1320	-7NV1	800	92		
				655			525	7680	1350	-2XV1	780	93		
					740		595	7690	1340	1 7 451-5ND -2YV1	780	94		
Separate ventilation	Fan unit, radially mounted — GG Fan unit, separately-mounted — GH Mounted air-to-water heat exchanger — HS													
Rated field voltage	310 V — 4													
Type of construction	IM B 3 — 0													

1) Please note remarks on field weakening on page 3/55.

Selection and ordering

1GG7, 1GH7, 1HS7 Size 450

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage	420 V	470 V	520 V	600 V	720 V							810 V	Resistance at 120 °C R_a mΩ	Inductance $L_a$ mH
418						350	8000	1320	1 7 451-5NE -1VV1	910	90	35.5	0.66
	472					394	7960	1320	-1WV1	910	91		
		525				435	7890	1330	-7MV1	900	92		
			615			505	7860	1330	-7NV1	900	93		
				745		595	7640	1360	-2XV1	875	94		
					840	670	7600	1360	-2YV1	870	94		
505						420	7960	1290	1 7 451-5NF -1VV1	1080	92	25	0.49
	570					472	7940	1290	-1WV1	1080	92		
		635				520	7850	1300	-7MV1	1070	93		
			735			600	7790	1310	-7NV1	1060	94		
				890		695	7440	1350	-2XV1	1010	95		
					1010	780	7390	1360	-2YV1	1010	95		
610						500	7800	1040	1 7 451-5NG -1VV1	1270	93	17.2	0.35
	690					560	7760	1170	-1WV1	1270	93		
		765				610	7600	1290	-7MV1	1240	94		
			890			705	7560	1300	-7NV1	1240	95		
				1080		795	7050	1370	-2XV1	1150	95		
					1220	885	6950	1380	-2YV1	1140	96		
765						605	7550	1270	1 7 451-5NH -1VV1	1530	93	12.3	0.19
	860					680	7540	1280	-1WV1	1530	94		
		960				725	7210	1320	-7MV1	1470	94		
			1110			830	7120	1330	-7NV1	1450	95		
880						680	7360	1290	1 7 451-5NJ -1VV1	1710	94	9	0.17
	985					760	7400	1290	-1WV1	1700	95		
		1100				800	6960	1350	-7MV1	1610	95		
			1270			910	6830	1360	1 7 451-5NJ -7NV1	1580	96		
Separate ventilation						Fan unit, radially mounted — GG			↑↑				
						Fan unit, separately-mounted — GH			↑↑				
						Mounted air-to-water heat exchanger — HS			↑↑				
Rated field voltage						310 V — 4			↑↑				
Type of construction						IM B 3 — 0			↑↑				

¹⁾ Please note remarks on field weakening on page 3/55.

Selection and ordering

1GG7, 1GH7, 1HS7
Size 450

Rated speed n_N rpm	Rated output						Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	420 V	470 V	520 V	600 V	720 V	810 V						Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH
Overall length 2													
210						208	9460	840	1 7 452-5NA -1VV1	580	84	101	1.7
	240					238	9510	960	-1WV1	585	85		
		268				265	9450	1070	-7MV1	580	87		
			315			310	9400	1240	-7NV1	575	88		
				385		376	9330	1250	-2XV1	570	90		
					438	428	9360	1240	-2YV1	575	91		
238						236	9470	950	1 7 452-5NB -1VV1	640	86	76.7	1.47
	270					268	9480	1080	-1WV1	640	87		
		302				300	9490	1210	-7MV1	645	88		
			354			350	9440	1220	-7NV1	640	90		
				432		422	9350	1230	-2XV1	635	91		
					490	478	9340	1230	-2YV1	635	92		
268						266	9520	1070	1 7 452-5NC -1VV1	715	87	63.1	1.03
	302					302	9520	1210	-1WV1	715	88		
		338				335	9440	1230	-7MV1	710	89		
			396			392	9460	1230	-7NV1	710	91		
				482		468	9280	1250	-2XV1	700	92		
					545	530	9260	1250	-2YV1	700	93		
302						304	9650	1190	1 7 452-5ND -1VV1	815	88	52.9	0.84
	342					344	9640	1190	-1WV1	815	89		
		382				382	9550	1200	-7MV1	810	90		
			446			446	9550	1200	-7NV1	810	91		
				545		530	9320	1220	-2XV1	790	92		
					615	600	9320	1220	1 7 452-5ND -2YV1	790	93		
Separate ventilation	Fan unit, radially mounted						GG		↑↑				
	Fan unit, separately-mounted						GH		↑↑				
	Mounted air-to-water heat exchanger						HS		↑↑				
Rated field voltage	310 V						4		↑				
Type of construction	IM B 3						0		↑				

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1) Please note remarks on field weakening on page 3/55.

Selection and ordering

1GG7, 1GH7, 1HS7 Size 450

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage	420 V	470 V	520 V	600 V	720 V							810 V	Resistance at 120 °C R_a mΩ	Inductance $L_a$ mH
348						350	9640	1200	1 7 452-5NE -1VV1	920	90	38.4	0.74
	392					395	9600	1200	-1WV1	920	91		
		438				438	9550	1210	-7MV1	910	91		
			510			510	9550	1210	-7NV1	910	92		
				620		605	9320	1230	-2XV1	890	93		
					700	680	9270	1240	-2YV1	890	94		
418						420	9580	1180	1 7 452-5NF -1VV1	1090	91	27	0.55
	472					475	9610	1180	-1WV1	1090	92		
		525				525	9530	1180	-7MV1	1080	92		
			615			605	9430	1190	-7NV1	1070	93		
				745		710	9130	1220	-2XV1	1040	94		
					840	795	9040	1230	-2YV1	1030	95		
510						505	9480	1150	1 7 452-5NG -1VV1	1290	92	18.6	0.39
	575					565	9400	1160	-1WV1	1280	92		
		640				620	9270	1170	-7MV1	1270	94		
			740			715	9200	1170	-7NV1	1260	94		
				900		820	8720	1220	-2XV1	1190	95		
					1010	915	8620	1230	-2YV1	1180	95		
640						615	9210	1150	1 7 452-5NH -1VV1	1560	93	13.3	0.21
	720					690	9180	1150	-1WV1	1560	94		
		800				740	8840	1190	-7MV1	1500	94		
			930			850	8740	1190	-7NV1	1490	95		
730						685	8940	1170	1 7 452-5NJ -1VV1	1730	94	9.74	0.19
	825					770	8940	1170	-1WV1	1730	94		
		915				825	8610	1200	-7MV1	1660	95		
			1060			945	8510	1220	1 7 452-5NJ -7NV1	1640	95		
Separate ventilation						Fan unit, radially mounted — GG			↑↑				
						Fan unit, separately-mounted — GH			↑↑				
						Mounted air-to-water heat exchanger — HS			↑↑				
Rated field voltage						310 V — 4			↑↑				
Type of construction						IM B 3 — 0			↑↑				

¹⁾ Please note remarks on field weakening on page 3/55.

Selection and ordering

1GG7, 1GH7, 1HS7
Size 450

Rated speed n_N rpm	Rated output						Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V						Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH	
Overall length 3														
173						206	11400	690	1 7 453-5NA -1VV1	585	83	110	1.92	
	197					236	11400	790	-1WV1	585	84			
		222				265	11400	890	-7MV1	585	86			
			260			310	11400	1040	-7NV1	580	87			
				318		378	11300	1110	-2XV1	580	89			
					362	430	11300	1110	-2YV1	580	90			
196						236	11500	785	1 7 453-5NB -1VV1	650	85	84.2	1.68	
	224					268	11500	895	-1WV1	650	86			
		250				300	11500	1000	-7MV1	650	87			
			294			350	11400	1100	-7NV1	645	89			
				358		425	11300	1100	-2XV1	645	91			
					406	482	11300	1100	-2YV1	645	92			
220						266	11500	880	1 7 453-5NC -1VV1	725	86	69.1	1.16	
	250					302	11500	1000	-1WV1	725	87			
		280				336	11400	1100	-7MV1	720	88			
			328			394	11500	1100	-7NV1	720	90			
				400		472	11300	1110	-2XV1	710	91			
					454	535	11300	1110	-2YV1	710	92			
248						304	11700	990	1 7 453-5ND -1VV1	825	87	57.8	0.93	
	282					345	11700	1060	-1WV1	825	88			
		316				384	11600	1070	-7MV1	820	89			
			370			448	11600	1070	-7NV1	820	90			
				452		535	11300	1090	-2XV1	800	92			
					510	610	11400	1080	1 7 453-5ND -2YV1	805	93			
Separate ventilation	Fan unit, radially mounted						GG							
	Fan unit, separately-mounted						GH							
	Mounted air-to-water heat exchanger						HS							
Rated field voltage	310 V						4							
Type of construction	IM B 3						0							

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1) Please note remarks on field weakening on page 3/55.

Selection and ordering

1GG7, 1GH7, 1HS7 Size 450

Rated speed n_N rpm	at rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V							Resistance at 120 °C R_a mΩ	Inductance L_a mH	
288							350	11600	1080	1 7 453-5NE -1VV1	925	89	42.1	0.83	
	326						396	11600	1080	-1WV1	925	90			
		364					440	11500	1080	-7MV1	925	91			
			424				515	11600	1080	-7NV1	925	92			
				515			615	11400	1100	-2XV1	910	93			
					585		690	11300	1100	-2YV1	900	94			
348							420	11500	1050	1 7 453-5NF -1VV1	1100	90	29.6	0.63	
	392						474	11500	1050	-1WV1	1100	91			
		438					525	11500	1060	-7MV1	1090	92			
			510				615	11500	1060	-7NV1	1100	93			
				620			725	11200	1080	-2XV1	1070	94			
					700		815	11100	1090	-2YV1	1060	94			
424							510	11500	1020	1 7 453-5NG -1VV1	1310	92	20.4	0.45	
	478						575	11500	1020	-1WV1	1310	92			
		530					630	11300	1040	-7MV1	1290	93			
			620				730	11300	1040	-7NV1	1290	94			
				750			845	10800	1080	-2XV1	1230	95			
					845		950	10700	1080	-2YV1	1230	95			
530							625	11300	1020	1 7 453-5NH -1VV1	1600	93	14.5	0.23	
	595						700	11200	1020	-1WV1	1590	93			
		665					760	10900	1040	-7MV1	1550	94			
			775				880	10900	1050	-7NV1	1550	94			
610							685	10700	1060	1 7 453-5NJ -1VV1	1730	94	10.7	0.21	
	685						770	10700	1060	-1WV1	1730	94			
		765					855	10700	1060	-7MV1	1730	95			
			885				985	10600	1060	1 7 453-5NJ -7NV1	1720	95			
Separate ventilation		Fan unit, radially mounted		GG											
		Fan unit, separately-mounted		GH											
		Mounted air-to-water heat exchanger		HS											
Rated field voltage		310 V		4											
Type of construction		IM B 3		0											

¹⁾ Please note remarks on field weakening on page 3/55.

Selection and ordering

1GG7, 1GH7, 1HS7
Size 450

Rated speed n_N rpm	Rated output						Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V						Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH	
Overall length 4														
138						204	14100	550	1 7 454-5NA -1VV1	595	80	123	2.21	
	158					232	14000	630	-1WV1	585	83			
		178				262	14100	710	-7MV1	590	84			
			210			308	14000	840	-7NV1	590	86			
				258		376	13900	980	-2XV1	585	88			
					294	428	13900	980	-2YV1	585	89			
158						232	14000	630	1 7 454-5NB -1VV1	650	83	94.2	1.95	
	180					265	14100	720	-1WV1	655	85			
		202				298	14100	810	-7MV1	655	86			
			238			348	14000	950	-7NV1	650	88			
				290		424	13900	970	-2XV1	650	90			
					330	482	14000	970	-2YV1	650	91			
178						264	14200	710	1 7 454-5NC -1VV1	730	84	77	1.33	
	202					300	14200	810	-1WV1	730	86			
		226				334	14100	905	-7MV1	725	87			
			266			392	14100	970	-7NV1	725	89			
				325		474	13900	975	-2XV1	720	91			
					370	540	14000	975	-2YV1	720	91			
200						298	14200	800	1 7 454-5ND -1VV1	820	85	64.4	1.06	
	228					338	14100	910	-1WV1	820	87			
		256				380	14200	940	-7MV1	820	88			
			300			445	14200	940	-7NV1	820	89			
				366		540	14100	950	-2XV1	815	91			
					416	610	14000	955	1 7 454-5ND -2YV1	810	92			
Separate ventilation	Fan unit, radially mounted						GG							
	Fan unit, separately-mounted						GH							
	Mounted air-to-water heat exchanger						HS							
Rated field voltage	310 V						4							
Type of construction	IM B 3						0							

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1) Please note remarks on field weakening on page 3/55.

Selection and ordering

1GG7, 1GH7, 1HS7 Size 450

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage	420 V	470 V	520 V	600 V	720 V							810 V	Resistance at 120 °C R_a mΩ	Inductance $L_a$ mH
232						345	14100	930	1 7 454-5NE -1VV1	925	88	47.1	0.97
264						390	14100	950	-1WV1	920	89		
	264					390	14100	950	-1WV1	920	89		
		295				436	14100	955	-7MV1	920	90		
			345			510	14100	950	-7NV1	925	91		
				420		615	14000	965	-2XV1	915	92		
					476	695	13900	970	-2YV1	915	93		
282						415	14000	935	1 7 454-5NF -1VV1	1090	89	33.1	0.73
	318					470	14000	930	-1WV1	1100	90		
		356				525	14100	930	-7MV1	1100	91		
			415			610	14000	935	-7NV1	1090	92		
				505		735	13900	945	-2XV1	1090	93		
					570	825	13800	955	-2YV1	1080	94		
344						510	14200	900	1 7 454-5NG -1VV1	1320	91	22.8	0.53
	388					575	14200	900	-1WV1	1320	92		
		432				635	14000	905	-7MV1	1310	92		
			505			735	13900	910	-7NV1	1300	93		
				610		865	13500	935	-2XV1	1260	94		
					690	970	13400	940	-2YV1	1250	95		
430						625	13900	895	1 7 454-5NH -1VV1	1600	92	16.2	0.27
	486					705	13900	895	-1WV1	1600	93		
		540				770	13600	910	-7MV1	1580	93		
			630			895	13600	910	-7NV1	1570	94		
496						705	13600	905	1 7 454-5NJ -1VV1	1790	93	12	0.25
	560					790	13500	910	-1WV1	1780	94		
		620				875	13500	915	-7MV1	1780	94		
			720			1010	13400	915	1 7 454-5NJ -7NV1	1770	95		
Separate ventilation						Fan unit, radially mounted — GG			↑↑				
						Fan unit, separately-mounted — GH			↑↑				
						Mounted air-to-water heat exchanger — HS			↑↑				
Rated field voltage						310 V — 4			↑↑				
Type of construction						IM B 3 — 0			↑↑				

¹⁾ Please note remarks on field weakening on page 3/55.

Selection and ordering

1GG7, 1GH7, 1HS7
Size 450

Rated speed n_N rpm	Rated output						Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	420 V	470 V	520 V	600 V	720 V	810 V						Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH
Overall length 5													
103						197	18300	412	1 7 455-5NA -1VV1	595	78	143	2.68
	119					226	18100	476	-1WV1	590	80		
		134				255	18200	535	-7MV1	590	82		
			159			302	18100	635	-7NV1	590	84		
				196		372	18100	785	-2XV1	590	86		
					224	424	18100	825	-2YV1	590	88		
119						226	18100	476	1 7 455-5NB -1VV1	655	81	110	2.38
	136					260	18300	545	-1WV1	660	82		
		153				292	18200	610	-7MV1	660	84		
			181			344	18200	725	-7NV1	655	86		
				222		420	18100	815	-2XV1	650	88		
					252	478	18100	815	-2YV1	650	89		
134						258	18400	535	1 7 455-5NC -1VV1	735	82	89.6	1.6
	153					294	18400	610	-1WV1	735	84		
		172				330	18300	690	-7MV1	730	85		
			202			388	18300	810	-7NV1	730	87		
				248		470	18100	825	-2XV1	725	89		
					282	535	18100	825	-2YV1	725	90		
151						290	18300	605	1 7 455-5ND -1VV1	815	83	74.8	1.27
	173					330	18200	690	-1WV1	815	85		
		194				370	18200	775	-7MV1	815	86		
			228			436	18200	800	-7NV1	815	88		
				280		530	18100	800	-2XV1	810	90		
					318	605	18100	800	1 7 455-5ND -2YV1	815	91		
Separate ventilation	Fan unit, radially mounted						GG		↑↑				
	Fan unit, separately-mounted						GH		↑↑				
	Mounted air-to-water heat exchanger						HS		↑↑				
Rated field voltage	310 V						4		↑				
Type of construction	IM B 3						0		↑				

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1) Please note remarks on field weakening on page 3/55.

Selection and ordering

1GG7, 1GH7, 1HS7 Size 450

Rated speed n_N rpm	at rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V							Resistance at 120 °C R_a mΩ	Inductance L_a mH	
177							338	18200	720	1 7 455-5NE -1VV1	920	86	54.9	1.18	
	202						384	18200	805	-1WV1	920	87			
		225					430	18300	805	-7MV1	925	88			
			264				505	18300	805	-7NV1	925	90			
				322			615	18200	815	-2XV1	925	91			
					365		695	18200	815	-2YV1	920	92			
215							408	18100	790	1 7 455-5NF -1VV1	1090	88	38.5	0.9	
	244						464	18200	790	-1WV1	1090	89			
		272					515	18100	800	-7MV1	1090	90			
			318				605	18200	795	-7NV1	1090	91			
				388			735	18100	795	-2XV1	1090	92			
					440		835	18100	795	-2YV1	1100	93			
264							505	18300	755	1 7 455-5NG -1VV1	1330	90	26.6	0.64	
	298						570	18300	760	-1WV1	1320	91			
		332					635	18300	760	-7MV1	1320	91			
			388				735	18100	765	-7NV1	1310	92			
				470			875	17800	775	-2XV1	1290	94			
					535		985	17600	780	-2YV1	1280	94			
330							625	18100	750	1 7 455-5NH -1VV1	1620	91	18.9	0.32	
	372						710	18200	745	-1WV1	1640	92			
		416					775	17800	760	-7MV1	1600	92			
			484				905	17900	755	-7NV1	1610	93			
382							695	17400	770	1 7 455-5NJ -1VV1	1780	92	14	0.3	
	430						785	17400	770	-1WV1	1780	93			
		478					875	17500	770	-7MV1	1790	93			
			555				1020	17600	770	1 7 455-5NJ -7NV1	1790	94			
Separate ventilation		Fan unit, radially mounted		GG											
		Fan unit, separately-mounted		GH											
		Mounted air-to-water heat exchanger		HS											
Rated field voltage		310 V		4											
Type of construction		IM B 3		0											

¹⁾ Please note remarks on field weakening on page 3/55.

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1GG7 451	2.3	39	1800	3800
1GH7 451	2.3	39	1800	3600
1HS7 451	2.3	39	1800	4100
1GG7 452	3.0	44	1800	4100
1GH7 452	3.0	44	1800	3900
1HS7 452	3.0	44	1800	4400
1GG7 453	3.2	50	1800	4600
1GH7 453	3.2	50	1800	4400
1HS7 453	3.2	50	1800	4900
1GG7 454	3.6	57	1800	5300
1GH7 454	3.6	57	1800	5100
1HS7 454	3.6	57	1800	5600
1GG7 455	4.2	70	1800	6200
1GH7 455	4.2	70	1800	6000
1HS7 455	4.2	70	1800	6500

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: "C05" for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and "C06" for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed $n_{F\text{max}}$.

For speeds $> n_{F\text{max}}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

Selection and ordering

1GG5, 1GH5, 1HS5 Size 500

Selection and ordering data

These motors are compensated.

Rated speed n_N rpm	at rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	420 V	470 V	520 V	600 V	720 V	810 V							Resistance at 120 °C R_a mΩ	Inductance L_a mH
Overall length 0														
345							302	8350	1170	1 5 500-5EA -1VV5	805	88	49	0.7
	392						340	8300	1170	-1WV5	800	89		
		438					375	8200	1180	-7MV5	790	90		
			510				435	8150	1190	-7NV5	785	91		
				620			510	7850	1220	-2XV5	760	92		
					705		570	7700	1230	-2YV5	745	93		
382							335	8400	1150	1 5 500-5EC -1VV5	885	89	39.8	0.6
	432						378	8350	1160	-1WV5	880	90		
		482					418	8300	1160	-7MV5	875	91		
			565				484	8200	1170	-7NV5	865	92		
				685			560	7800	1210	-2XV5	825	93		
					775		625	7700	1220	-2YV5	815	93		
450							360	7650	1280	1 5 500-5EE -1VV5	935	90	31.6	0.48
	510						406	7600	1280	-1WV5	930	91		
		565					448	7550	1290	-7MV5	925	92		
			660				520	7500	1290	-7NV5	925	92		
				795			620	7450	1300	-2XV5	910	93		
					900		690	7300	1320	-2YV5	895	94		
470							398	8100	1380	1 5 500-5EG -1VV5	1030	91	26.5	0.43
	530						450	8100	1380	-1WV5	1030	91		
		590					496	8050	1390	-7MV5	1020	92		
			685				570	7950	1400	-7NV5	1010	93		
				835			645	7400	1470	-2XV5	940	94		
					940		725	7350	1470	-2YV5	940	94		
525							448	8150	1300	1 5 500-5EJ -1VV5	1150	91	21.8	0.32
	590						505	8150	1300	-1WV5	1150	92		
		660					540	7800	1340	-7MV5	1100	93		
			765				625	7800	1340	-7NV5	1100	93		
				930			685	7050	1440	-2XV5	995	94		
					1050		770	7000	1440	1 5 500-5EJ -2YV5	990	94		
Separate ventilation		Fan unit, radially mounted — GG												
		Fan unit, separately-mounted — GH												
		Mounted air-to-water heat exchanger — HS												
Rated field voltage		310 V — 4												
Type of construction		IM B 3 — 0												

¹⁾ Please note remarks on field weakening on page 3/66.

Selection and ordering

1GG5, 1GH5, 1HS5
Size 500

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage												Resistance at 120 °C R_a mΩ	Inductance L_a mH
420 V	470 V	520 V	600 V	720 V	810 V								
595						510	8200	1470	1 5 500-5EL -1VV5	1300	92	16.8	0.27
	670					570	8100	1480	-1WV5	1290	93		
		745				605	7750	1530	-7MV5	1230	93		
			865			695	7650	1540	-7NV5	1220	94		
				1050		750	6800	1650	-2XV5	1090	94		
					1190	835	6700	1670	-2YV5	1070	95		
700						565	7700	1490	1 5 500-5EN -1VV5	1430	93	12.7	0.18
	785					630	7650	1500	-1WV5	1420	93		
		875				660	7200	1560	-7MV5	1340	94		
			1020			760	7100	1560	-7NV5	1320	94		
				1230		755	5850	1700	-2XV5	1090	94		
					1390	850	5850	1700	-2YV5	1090	95		
765						620	7750	1470	1 5 500-5EQ -1VV5	1560	93	10.5	0.17
	860					685	7600	1490	-1WV5	1540	94		
		955				715	7150	1550	-7MV5	1440	94		
			1110			810	6950	1570	-7NV5	1410	94		
				1340		800	5700	1700	-2XV5	1160	94		
850						670	7550	1470	1 5 500-5ES -1VV5	1690	93	8.6	0.13
	960					745	7400	1480	-1WV5	1660	94		
		1070				750	6700	1580	-7MV5	1510	94		
			1240			865	6650	1580	-7NV5	1500	94		
995						735	7050	1510	1 5 500-5EV -1VV5	1840	94	6.6	0.12
	1120					810	6900	1520	-1WV5	1800	94		
		1240				815	6300	1620	-7MV5	1640	94		
			1440			925	6150	1640	1 5 500-5EV -7NV5	1620	94		
Separate ventilation						Fan unit, radially mounted — GG			↑↑				
						Fan unit, separately-mounted — GH			↑↑				
						Mounted air-to-water heat exchanger — HS			↑↑				
Rated field voltage						310 V — 4			↑↑				
Type of construction						IM B 3 — 0			↑↑				

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1) Please note remarks on field weakening on page 3/66.

Selection and ordering

1GG5, 1GH5, 1HS5 Size 500

Rated speed n_N rpm	Rated output						Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	420 V	470 V	520 V	600 V	720 V	810 V						Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH
Overall length 1													
256						300	11200	985	1 5 501-5EA -1VV5	810	86	56	0.84
	290					340	11200	985	-1WV5	810	88		
		325				380	11200	985	-7MV5	810	89		
			380			444	11200	985	-7NV5	810	90		
				464		530	10900	1000	-2XV5	795	91		
					525	600	10900	1000	-2YV5	795	92		
284						334	11200	970	1 5 501-5EC -1VV5	890	88	45.6	0.73
	322					378	11200	970	-1WV5	890	89		
		360				420	11100	975	-7MV5	885	90		
			420			490	11100	975	-7NV5	885	91		
				510		590	11000	980	-2XV5	880	92		
					580	665	10900	985	-2YV5	875	93		
335						360	10300	1090	1 5 501-5EE -1VV5	945	89	36	0.57
	380					406	10200	1090	-1WV5	940	90		
		422				450	10200	1090	-7MV5	935	91		
			492			525	10200	1090	-7NV5	940	92		
				595		625	10000	1110	-2XV5	925	93		
					675	710	10000	1100	-2YV5	925	93		
350						400	10900	1180	1 5 501-5EG -1VV5	1040	90	30.4	0.53
	396					450	10900	1190	-1WV5	1040	91		
		440				500	10900	1190	-7MV5	1040	91		
			515			580	10800	1190	-7NV5	1030	92		
				620		695	10700	1200	-2XV5	1020	93		
					705	780	10600	1200	-2YV5	1010	94		
390						464	11400	1080	1 5 501-5EJ -1VV5	1210	90	24.8	0.38
	440					525	11400	1070	-1WV5	1210	91		
		490				570	11100	1100	-7MV5	1180	92		
			570			660	11100	1100	-7NV5	1170	93		
				695		750	10300	1160	-2XV5	1100	94		
					785	840	10200	1160	1 5 501-5EJ -2YV5	1090	94		
Separate ventilation		Fan unit, radially mounted — GG Fan unit, separately-mounted — GH Mounted air-to-water heat exchanger — HS											
Rated field voltage		310 V — 4											
Type of construction		IM B 3 — 0											

¹⁾ Please note remarks on field weakening on page 3/66.

Selection and ordering

1GG5, 1GH5, 1HS5
Size 500

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage												R_a mΩ	L_a mH
420 V	470 V	520 V	600 V	720 V	810 V								
448						525	11200	1260	1 5 501-5EL -1VV5	1350	91	19.3	0.33
	505					595	11300	1250	-1WV5	1360	92		
		565				645	10900	1280	-7MV5	1320	93		
			655			740	10800	1290	-7NV5	1300	93		
				795		830	9950	1360	-2XV5	1210	94		
					895	925	9850	1370	-2YV5	1190	95		
520						600	11000	1230	1 5 501-5EN -1VV5	1530	92	14.5	0.22
	590					670	10800	1240	-1WV5	1510	93		
		655				715	10400	1280	-7MV5	1450	93		
			760			825	10400	1290	-7NV5	1450	94		
				925		885	9150	1400	-2XV5	1280	95		
					1040	995	9150	1400	-2YV5	1280	95		
570						660	11100	1220	1 5 501-5EQ -1VV5	1680	93	12	0.21
	640					740	11000	1220	-1WV5	1670	93		
		715				785	10500	1260	-7MV5	1590	94		
			830			895	10300	1280	-7NV5	1560	94		
				1000		950	9050	1400	-2XV5	1380	95		
635						705	10600	1220	1 5 501-5ES -1VV5	1780	93	9.8	0.16
	715					790	10600	1230	-1WV5	1780	94		
		795				840	10100	1270	-7MV5	1700	94		
			925			970	10000	1270	-7NV5	1690	95		
745						755	9700	1290	1 5 501-5EV -1VV5	1890	94	7.6	0.15
	835					850	9700	1280	-1WV5	1900	94		
		930				925	9500	1300	-7MV5	1860	94		
			1080			1060	9350	1310	1 5 501-5EV -7NV5	1840	95		
Separate ventilation						Fan unit, radially mounted — GG			↑↑				
						Fan unit, separately-mounted — GH			↑↑				
						Mounted air-to-water heat exchanger — HS			↑↑				
Rated field voltage						310 V — 4			↑↑				
Type of construction						IM B 3 — 0			↑↑				

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1) Please note remarks on field weakening on page 3/66.

Selection and ordering

1GG5, 1GH5, 1HS5 Size 500

Rated speed n_N rpm	Rated output						Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V						Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH	
Overall length 2														
199						296	14200	795	1 5 502-5EA	-1VV5	810	85	63	0.98
226						336	14200	855		-1WV5	810	86		
	254					376	14100	855		-7MV5	810	87		
		298				440	14100	855		-7NV5	810	89		
			362			535	14100	855		-2XV5	810	91		
				412		605	14000	855		-2YV5	805	91		
222						330	14200	840	1 5 502-5EC	-1VV5	890	86	51.5	0.86
	252					374	14200	840		-1WV5	890	87		
		282				416	14100	845		-7MV5	885	89		
			330			486	14100	845		-7NV5	885	90		
				400		590	14100	845		-2XV5	885	91		
					454	665	14000	850		-2YV5	880	92		
262						356	13000	950	1 5 502-5EE	-1VV5	940	88	40.5	0.67
	296					402	13000	955		-1WV5	940	89		
		332				448	12900	955		-7MV5	940	90		
			386			520	12900	955		-7NV5	935	91		
				468		625	12800	965		-2XV5	925	92		
					530	710	12800	960		-2YV5	930	93		
274						402	14000	1030	1 5 502-5EG	-1VV5	1060	88	34.2	0.62
	310					454	14000	1030		-1WV5	1060	90		
		345				505	14000	1030		-7MV5	1060	90		
			402			585	13900	1030		-7NV5	1050	91		
				488		705	13800	1040		-2XV5	1040	93		
					555	795	13700	1040		-2YV5	1040	93		
305						460	14400	945	1 5 502-5EJ	-1VV5	1210	89	28	0.45
	345					520	14400	940		-1WV5	1210	90		
		384				575	14300	950		-7MV5	1200	91		
			448			670	14300	950		-7NV5	1200	92		
				545		770	13500	990		-2XV5	1130	93		
					615	865	13400	995	1 5 502-5EJ	-2YV5	1130	94		
Separate ventilation		Fan unit, radially mounted — GG Fan unit, separately-mounted — GH Mounted air-to-water heat exchanger — HS												
Rated field voltage		310 V — 4												
Type of construction		IM B 3 — 0												

¹⁾ Please note remarks on field weakening on page 3/66.

Selection and ordering

1GG5, 1GH5, 1HS5
Size 500

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage												R_a mΩ	L_a mH
420 V	470 V	520 V	600 V	720 V	810 V								
352						530	14400	1100	1 5 502-5EL -1VV5	1380	90	21.6	0.39
	398					595	14300	1110	-1WV5	1370	91		
		442				655	14200	1120	-7MV5	1350	92		
			515			755	14000	1130	-7NV5	1340	93		
				625		855	13100	1190	-2XV5	1250	94		
					710	955	12800	1200	-2YV5	1230	94		
408						605	14200	1080	1 5 502-5EN -1VV5	1560	91	16.3	0.26
	460					680	14100	1080	-1WV5	1550	92		
		515				730	13500	1110	-7MV5	1490	93		
			595			845	13600	1110	-7NV5	1490	93		
				725		930	12300	1200	-2XV5	1350	94		
					820	1050	12200	1200	-2YV5	1350	95		
446						670	14300	1060	1 5 502-5EQ -1VV5	1710	92	13.5	0.25
	505					755	14300	1060	-1WV5	1710	93		
		560				810	13800	1090	-7MV5	1650	93		
			650			925	13600	1100	-7NV5	1620	94		
				790		1010	12200	1190	-2XV5	1460	95		
500						705	13500	1080	1 5 502-5ES -1VV5	1790	93	11	0.18
	565					795	13400	1070	-1WV5	1790	93		
		625				870	13300	1090	-7MV5	1770	94		
			725			1010	13300	1090	-7NV5	1770	94		
585						765	12500	1120	1 5 502-5EV -1VV5	1920	93	8.5	0.17
	660					860	12400	1120	-1WV5	1920	94		
		730				950	12400	1130	-7MV5	1920	94		
			845			1100	12400	1130	1 5 502-5EV -7NV5	1920	95		
Separate ventilation						Fan unit, radially mounted — GG			↑↑				
						Fan unit, separately-mounted — GH			↑↑				
						Mounted air-to-water heat exchanger — HS			↑↑				
Rated field voltage						310 V — 4			↑↑				
Type of construction						IM B 3 — 0			↑↑				

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1) Please note remarks on field weakening on page 3/66.

Selection and ordering

1GG5, 1GH5, 1HS5 Size 500

Rated speed n_N rpm	Rated output					Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit			
	420 V	470 V	520 V	600 V	720 V						810 V	Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH	
Overall length 3														
164						292	17000	655	1 5 503-5EA	-1VV5	810	83	70	1.12
	186					332	17000	745		-1WV5	810	85		
		208				372	17100	755		-7MV5	815	86		
			245			436	17000	755		-7NV5	810	88		
				300		530	16900	755		-2XV5	805	90		
					340	605	17000	750		-2YV5	810	91		
182						326	17100	730	1 5 503-5EC	-1VV5	895	85	57	0.98
	208					370	17000	740		-1WV5	890	86		
		232				414	17000	740		-7MV5	890	87		
			272			485	17000	740		-7NV5	890	89		
				332		590	17000	740		-2XV5	890	91		
					376	665	16900	745		-2YV5	885	91		
216						354	15700	800	1 5 503-5EE	-1VV5	945	87	45	0.77
	245					400	15600	800		-1WV5	945	88		
		274				446	15500	805		-7MV5	940	89		
			320			520	15500	805		-7NV5	940	90		
				388		630	15500	805		-2XV5	940	92		
					440	710	15400	810		-2YV5	935	92		
225						400	17000	900	1 5 503-5EG	-1VV5	1070	87	38.2	0.72
	255					454	17000	910		-1WV5	1070	89		
		285				505	16900	910		-7MV5	1060	90		
			332			590	17000	910		-7NV5	1070	91		
				404		710	16800	915		-2XV5	1060	92		
					458	805	16800	915		-2YV5	1060	93		
252						458	17400	835	1 5 503-5EJ	-1VV5	1210	88	31	0.51
	285					520	17400	830		-1WV5	1220	89		
		318				575	17300	840		-7MV5	1210	90		
			370			675	17400	830		-7NV5	1220	91		
				452		785	16600	865		-2XV5	1160	93		
					510	885	16600	865	1 5 503-5EJ	-2YV5	1160	93		
Separate ventilation		Fan unit, radially mounted — GG Fan unit, separately-mounted — GH Mounted air-to-water heat exchanger — HS												
Rated field voltage		310 V — 4												
Type of construction		IM B 3 — 0												

¹⁾ Please note remarks on field weakening on page 3/66.

Selection and ordering

1GG5, 1GH5, 1HS5
Size 500

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage												R_a mΩ	L_a mH
420 V	470 V	520 V	600 V	720 V	810 V								
290						530	17500	985	1 5 503-5EL -1VV5	1390	89	24.2	0.44
	328					600	17500	980	-1WV5	1390	90		
		366				660	17200	995	-7MV5	1370	91		
			426			765	17100	995	-7NV5	1370	92		
				520		880	16200	1040	-2XV5	1290	93		
					585	985	16100	1050	-2YV5	1280	94		
338						610	17200	955	1 5 503-5EN -1VV5	1580	91	18.2	0.3
	380					685	17200	955	-1WV5	1570	91		
		425				745	16700	975	-7MV5	1530	92		
			495			860	16600	980	-7NV5	1520	93		
				600		965	15400	1040	-2XV5	1410	94		
					680	1090	15300	1040	-2YV5	1410	94		
368						675	17500	935	1 5 503-5EQ -1VV5	1740	91	15	0.29
	416					760	17400	935	-1WV5	1740	92		
		464				825	17000	955	-7MV5	1690	93		
			540			945	16700	970	-7NV5	1660	93		
				655		1060	15500	1030	-2XV5	1540	94		
415						710	16300	955	1 5 503-5ES -1VV5	1810	92	12.2	0.21
	468					795	16200	960	-1WV5	1800	93		
		520				875	16100	965	-7MV5	1780	93		
			605			1020	16100	960	-7NV5	1790	94		
485						765	15100	1010	1 5 503-5EV -1VV5	1930	93	9.5	0.2
	545					860	15100	1010	-1WV5	1930	93		
		605				955	15100	1010	-7MV5	1930	94		
			705			1110	15000	1000	1 5 503-5EV -7NV5	1930	94		
Separate ventilation						Fan unit, radially mounted — GG			↑↑				
						Fan unit, separately-mounted — GH			↑↑				
						Mounted air-to-water heat exchanger — HS			↑↑				
Rated field voltage						310 V — 4			↑↑				
Type of construction						IM B 3 — 0			↑↑				

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1) Please note remarks on field weakening on page 3/66.

Selection and ordering

1GG5, 1GH5, 1HS5 Size 500

Rated speed n_N rpm	Rated armature voltage					Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	420 V	470 V	520 V	600 V	720 V							810 V	Resistance at 120 °C R_a mΩ	Inductance $L_a$ mH
Overall length 4													
137						288	20000	550	1 5 504-5EA -1VV5	815	82	76.5	1.26
156						328	20000	625	-1WV5	815	83		
	175					368	20000	675	-7MV5	815	85		
		206				432	20000	675	-7NV5	810	87		
			252			525	19900	680	-2XV5	805	89		
				286		600	20000	675	-2YV5	810	90		
153						322	20000	610	1 5 504-5EC -1VV5	895	83	62.5	1.11
174						366	20000	665	-1WV5	895	85		
	195					410	20000	665	-7MV5	890	86		
		228				480	20200	665	-7NV5	890	88		
			280			585	20000	665	-2XV5	890	90		
				318		665	20000	665	-2YV5	890	91		
182						350	18400	730	1 5 504-5EE -1VV5	945	86	49.4	0.87
206						398	18500	755	-1WV5	950	87		
	230					444	18400	755	-7MV5	945	88		
		270				520	18400	755	-7NV5	945	89		
			328			625	18200	760	-2XV5	935	91		
				372		710	18200	760	-2YV5	940	92		
190						398	20000	760	1 5 504-5EG -1VV5	1070	86	42	0.81
215						450	20000	820	-1WV5	1070	87		
	240					500	19900	825	-7MV5	1060	89		
		280				585	20000	825	-7NV5	1060	90		
			342			710	19800	825	-2XV5	1060	91		
				388		805	19800	825	-2YV5	1060	92		
212						455	20500	750	1 5 504-5EJ -1VV5	1220	87	34	0.57
240						515	20500	750	-1WV5	1220	88		
	268					575	20500	750	-7MV5	1220	89		
		312				670	20500	750	-7NV5	1210	91		
			382			790	19800	770	-2XV5	1170	92		
				432		890	19700	775	1 5 504-5EJ -2YV5	1170	93		
Separate ventilation		Fan unit, radially mounted — GG Fan unit, separately-mounted — GH Mounted air-to-water heat exchanger — HS											
Rated field voltage		310 V — 4											
Type of construction		IM B 3 — 0											

¹⁾ Please note remarks on field weakening on page 3/66.

Selection and ordering

1GG5, 1GH5, 1HS5
Size 500

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage												R_a mΩ	L_a mH
420 V	470 V	520 V	600 V	720 V	810 V								
244						525	20500	890	1 5 504-5EL -1VV5	1390	88	26.6	0.5
	276					595	20600	890	-1WV5	1390	89		
		308				660	20500	895	-7MV5	1380	90		
			360			765	20200	900	-7NV5	1370	91		
				438		890	19400	930	-2XV5	1310	93		
					496	995	19200	940	-2YV5	1300	93		
285						610	20400	855	1 5 504-5EN -1VV5	1590	90	20	0.33
	322					685	20400	860	-1WV5	1580	91		
		360				745	19800	880	-7MV5	1540	91		
			418			865	19800	880	-7NV5	1540	92		
				510		985	18400	925	-2XV5	1440	94		
					575	1110	18400	930	-2YV5	1440	94		
312						675	20600	840	1 5 504-5EQ -1VV5	1750	90	16.5	0.33
	352					760	20600	845	-1WV5	1740	91		
		392				830	20200	860	-7MV5	1710	92		
			456			955	20000	865	-7NV5	1690	93		
				555		1080	18600	915	-2XV5	1570	94		
350						705	19200	865	1 5 504-5ES -1VV5	1810	91	13.4	0.23
	395					795	19200	865	-1WV5	1810	92		
		440				880	19100	865	-7MV5	1800	93		
			510			1020	19100	870	-7NV5	1800	93		
410						760	17700	915	1 5 504-5EV -1VV5	1930	92	10.5	0.23
	462					855	17700	915	-1WV5	1920	93		
		515				950	17600	915	-7MV5	1920	93		
			595			1100	17700	915	1 5 504-5EV -7NV5	1920	94		
Separate ventilation						Fan unit, radially mounted — GG			↑↑				
						Fan unit, separately-mounted — GH			↑↑				
						Mounted air-to-water heat exchanger — HS			↑↑				
Rated field voltage						310 V — 4			↑↑				
Type of construction						IM B 3 — 0			↑↑				

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1) Please note remarks on field weakening on page 3/66.

Selection and ordering

1GG5, 1GH5, 1HS5 Size 500

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1GG5 500	5	55	1800	4150
1GH5 500	5	55	1800	3950
1HS5 500	5	55	1800	4550
1GG5 501	5.5	65	1800	4650
1GH5 501	5.5	65	1800	4450
1HS5 501	5.5	65	1800	5050
1GG5 502	6.8	75	1800	5100
1GH5 502	6.8	75	1800	4900
1HS5 502	6.8	75	1800	5500
1GG5 503	7.6	85	1700	5800
1GH5 503	7.6	85	1700	5600
1HS5 503	7.6	85	1700	6200
1GG5 504	9.3	94	1700	6300
1GH5 504	9.3	94	1700	6100
1HS5 504	9.3	94	1700	6700

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: "C05" for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and "C06" for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed n_{Fmax} .

For speeds $> n_{Fmax}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

Selection and ordering data

These motors are compensated.

Rated speed n_N rpm	at rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit Resistance at 120 °C R_a mΩ	Inductance L_a mH
	420 V	470 V	520 V	600 V	720 V	810 V								
Overall length 1														
186							358	18400	745	1 5 631-5EA -1VV5	965	87	46.4	0.96
	210						405	18400	840	-1WV5	965	88		
		236					452	18300	925	-7MV5	960	89		
			276				530	18300	920	-7NV5	965	90		
				335			640	18200	925	-2XV5	955	92		
					380		725	18200	925	-2YV5	955	92		
206							418	19400	825	1 5 631-5EC -1VV5	1120	88	36.8	0.72
	234						472	19300	880	-1WV5	1110	89		
		262					525	19100	880	-7MV5	1110	90		
			305				615	19300	880	-7NV5	1110	91		
				372			735	18900	890	-2XV5	1090	92		
					420		830	18900	890	-2YV5	1090	93		
230							462	19200	920	1 5 631-5EE -1VV5	1220	89	30.8	0.58
	260						520	19100	965	-1WV5	1220	90		
		290					575	18900	975	-7MV5	1210	91		
			340				670	18800	975	-7NV5	1200	92		
				412			785	18200	1000	-2XV5	1160	93		
					466		885	18100	1000	-2YV5	1160	93		
252							492	18600	895	1 5 631-5EG -1VV5	1290	89	26.5	0.5
	285						555	18600	895	-1WV5	1290	90		
		318					615	18500	900	-7MV5	1280	91		
			370				720	18600	895	-7NV5	1290	92		
				448			855	18200	910	-2XV5	1260	93		
					510		960	18000	915	-2YV5	1250	94		
284							575	19300	985	1 5 631-5EJ -1VV5	1490	90	20.2	0.38
	320						645	19200	990	-1WV5	1480	91		
		356					705	18900	1010	-7MV5	1460	92		
			415				815	18800	1010	-7NV5	1450	93		
				505			945	17900	1040	-2XV5	1380	94		
					570	1060	17800	1050	1 5 631-5EJ -2YV5	1370	94			
Separate ventilation	Fan unit, radially mounted — GG													
	Fan unit, separately-mounted — GH													
	Mounted air-to-water heat exchanger — HS													
Rated field voltage	310 V — 4													
Type of construction	IM B 3 — 0													

1) Please note remarks on field weakening on page 3/77.

Selection and ordering

1GG5, 1GH5, 1HS5 Size 630

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage	420 V	470 V	520 V	600 V	720 V							810 V	Resistance at 120 °C R_a mΩ	Inductance $L_a$ mH
306						605	18900	1010	1 5 631-5EL -1VV5	1570	91	17.9	0.31
	346					685	18900	1010	-1WV5	1570	92		
		385				755	18700	1020	-7MV5	1550	92		
			448			870	18500	1020	-7NV5	1540	93		
				545		995	17400	1070	-2XV5	1450	94		
					615	1120	17400	1070	-2YV5	1450	95		
338						675	19100	980	1 5 631-5EN -1VV5	1730	92	14.4	0.3
	382					760	19000	980	-1WV5	1730	92		
		425				830	18700	995	-7MV5	1700	93		
			494			955	18500	1000	-7NV5	1680	94		
				600		1080	17200	1050	-2XV5	1570	95		
					675	1210	17100	1060	-2YV5	1560	95		
374						725	18500	970	1 5 631-5EQ -1VV5	1850	92	12.5	0.23
	422					815	18400	970	-1WV5	1850	93		
		470				880	17900	990	-7MV5	1790	93		
			545			1010	17700	1000	-7NV5	1770	94		
				660		1120	16200	1060	-2XV5	1620	95		
					745	1250	16000	1070	-2YV5	1610	95		
410						805	18800	980	1 5 631-5ES -1VV5	2050	92	10.5	0.21
	462					900	18600	985	-1WV5	2040	93		
		515				965	17900	1010	-7MV5	1960	94		
			600			1110	17700	1020	-7NV5	1940	94		
				725		1220	16100	1090	-2XV5	1760	95		
464						890	18300	1060	1 5 631-5EV -1VV5	2250	93	8.2	0.15
	520					995	18300	1060	-1WV5	2240	94		
		580				1060	17500	1090	-7MV5	2140	94		
			675			1220	17300	1100	1 5 631-5EV -7NV5	2120	95		
Separate ventilation						Fan unit, radially mounted — GG			↑↑				
						Fan unit, separately-mounted — GH			↑↑				
						Mounted air-to-water heat exchanger — HS			↑↑				
Rated field voltage						310 V —			4				
Type of construction						IM B 3 —			0				

¹⁾ Please note remarks on field weakening on page 3/77.

Selection and ordering

1GG5, 1GH5, 1HS5
Size 630

Rated speed n_N rpm	at rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit Resistance at 120 °C R_a mΩ	Inductance L_a mH
	420 V	470 V	520 V	600 V	720 V	810 V								
Overall length 2														
146							356	23200	585	1 5 632-5EA -1VV5	970	85	51.5	1.11
	166						405	23200	665	-1WV5	970	87		
		185					452	23400	740	-7MV5	970	88		
			216				530	23400	810	-7NV5	975	89		
				264			640	23200	815	-2XV5	965	91		
					300		730	23200	810	-2YV5	970	92		
162							416	24500	650	1 5 632-5EC -1VV5	1130	86	41.2	0.84
	184						472	24500	735	-1WV5	1130	88		
		205					530	24600	765	-7MV5	1130	89		
			240				615	24500	775	-7NV5	1120	90		
				292			750	24500	770	-2XV5	1130	91		
					332		850	24500	770	-2YV5	1120	92		
180							468	24800	720	1 5 632-5EE -1VV5	1260	87	34.2	0.66
	204						530	24800	815	-1WV5	1260	88		
		228					585	24500	850	-7MV5	1240	89		
			266				680	24400	850	-7NV5	1230	91		
				325			810	23800	865	-2XV5	1210	92		
					368		915	23800	870	-2YV5	1200	93		
198							488	23500	790	1 5 632-5EG -1VV5	1290	88	29.5	0.58
	224						550	23400	795	-1WV5	1290	89		
		250					615	23500	795	-7MV5	1290	90		
			292				715	23400	795	-7NV5	1290	91		
				355			865	23200	800	-2XV5	1280	93		
					402		975	23200	800	-2YV5	1280	93		
222							585	25200	865	1 5 632-5EJ -1VV5	1540	89	22.5	0.43
	252						655	24800	870	-1WV5	1520	90		
		282					725	24600	875	-7MV5	1510	91		
			328				840	24500	880	-7NV5	1500	92		
				398			980	23500	905	-2XV5	1440	93		
					450	1100	1100	23400	910	1 5 632-5EJ -2YV5	1430	94		
Separate ventilation		Fan unit, radially mounted — GG Fan unit, separately-mounted — GH Mounted air-to-water heat exchanger — HS												
Rated field voltage		310 V — 4												
Type of construction		IM B 3 — 0												

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1) Please note remarks on field weakening on page 3/77.

Selection and ordering

1GG5, 1GH5, 1HS5 Size 630

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage												R_a mΩ	L_a mH
420 V	470 V	520 V	600 V	720 V	810 V								
242						605	23800	900	1 5 632-5EL -1VV5	1570	90	19.9	0.35
	274					685	23800	900	-1WV5	1580	91		
		304				755	23800	905	-7MV5	1560	92		
			354			880	23800	905	-7NV5	1570	93		
				430		1040	23000	925	-2XV5	1520	94		
					486	1170	23000	925	-2YV5	1520	94		
266						680	24400	865	1 5 632-5EN -1VV5	1760	91	16.1	0.34
	302					770	24400	865	-1WV5	1760	92		
		335				855	24400	865	-7MV5	1760	92		
			390			985	24200	870	-7NV5	1740	93		
				474		1140	23000	900	-2XV5	1660	94		
					535	1270	22600	910	-2YV5	1640	95		
295						745	24200	840	1 5 632-5EQ -1VV5	1920	91	13.9	0.26
	332					840	24200	840	-1WV5	1920	92		
		370				910	23500	860	-7MV5	1870	93		
			432			1050	23200	865	-7NV5	1850	93		
				525		1190	21600	910	-2XV5	1730	94		
					590	1330	21500	915	-2YV5	1710	95		
324						815	24000	865	1 5 632-5ES -1VV5	2080	92	11.7	0.24
	365					920	24000	860	-1WV5	2100	92		
		406				1010	23800	870	-7MV5	2060	93		
			472			1160	23500	880	-7NV5	2040	94		
				575		1310	21800	925	-2XV5	1900	95		
365						920	24000	925	1 5 632-5EV -1VV5	2340	93	9.1	0.18
	412					1030	23800	930	-1WV5	2320	93		
		458				1110	23200	950	-7MV5	2250	94		
			530			1280	23000	955	-7NV5	2240	94		
				645		1400	20800	670	1 5 632-5EV -2XV5	2020	95		
Separate ventilation						Fan unit, radially mounted — GG							
						Fan unit, separately-mounted — GH							
						Mounted air-to-water heat exchanger — HS							
Rated field voltage						310 V — 4							
Type of construction						IM B 3 — 0							

¹⁾ Please note remarks on field weakening on page 3/77.

Selection and ordering

1GG5, 1GH5, 1HS5
Size 630

Rated speed n_N rpm	at rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit Resistance at 120 °C R_a mΩ	Inductance L_a mH
	420 V	470 V	520 V	600 V	720 V	810 V								
Overall length 3														
121						356	28000	484	1 5 633-5EA	-1VV5	985	84	57	1.27
	137					404	28200	550		-1WV5	985	85		
		154				452	28000	615		-7MV5	980	87		
			180			530	28200	720		-7NV5	985	88		
				220		645	28000	725		-2XV5	980	90		
					250	735	28000	720		-2YV5	985	91		
134						416	29600	535	1 5 633-5EC	-1VV5	1140	85	45.4	0.95
	152					474	29800	610		-1WV5	1150	86		
		170				530	29800	680		-7MV5	1150	88		
			200			620	29600	685		-7NV5	1140	89		
				244		755	29600	685		-2XV5	1140	91		
					276	855	29600	685		-2YV5	1140	92		
149						470	30200	595	1 5 633-5EE	-1VV5	1280	86	37.6	0.75
	169					530	30000	675		-1WV5	1270	87		
		189				590	29800	755		-7MV5	1260	88		
			222			690	29600	755		-7NV5	1260	90		
				270		825	29200	765		-2XV5	1240	91		
					306	930	29000	770		-2YV5	1230	92		
165						484	28000	660	1 5 633-5EG	-1VV5	1290	87	32.4	0.65
	187					550	28000	710		-1WV5	1300	89		
		208				610	28000	715		-7MV5	1290	90		
			244			715	28000	710		-7NV5	1290	91		
				296		865	28000	715		-2XV5	1290	92		
					336	975	27800	715		-2YV5	1280	93		
185						585	30200	740	1 5 633-5EJ	-1VV5	1550	88	24.8	0.49
	210					665	30200	770		-1WV5	1560	89		
		234				735	30000	780		-7MV5	1540	90		
			272			850	29800	785		-7NV5	1530	92		
				332		1010	29000	800		-2XV5	1490	93		
					376	1130	28800	805	1 5 633-5EJ	-2YV5	1480	94		
Separate ventilation		Fan unit, radially mounted — GG												
		Fan unit, separately-mounted — GH												
		Mounted air-to-water heat exchanger — HS												
Rated field voltage		310 V — 4												
Type of construction		IM B 3 — 0												

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1) Please note remarks on field weakening on page 3/77.

Selection and ordering

1GG5, 1GH5, 1HS5 Size 630

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage 420 V 470 V 520 V 600 V 720 V 810 V												Resistance at 120 °C R_a mΩ	Inductance L_a mH
202						600	28400	810	1 5 633-5EL -1VV5	1570	89	21.8	0.39
	228					680	28500	815	-1WV5	1580	90		
		254				755	28400	820	-7MV5	1570	91		
			296			880	28400	815	-7NV5	1570	92		
				358		1060	28200	820	-2XV5	1560	93		
					406	1200	28200	820	-2YV5	1560	94		
222						685	29500	775	1 5 633-5EN -1VV5	1790	90	17.8	0.39
	250					775	29600	770	-1WV5	1790	91		
		280				860	29400	775	-7MV5	1780	92		
			325			1000	29400	775	-7NV5	1780	93		
				395		1180	28500	790	-2XV5	1730	94		
					446	1320	28200	800	-2YV5	1710	94		
246						745	29000	755	1 5 633-5EQ -1VV5	1930	91	15.3	0.29
	278					840	28800	755	-1WV5	1930	91		
		308				930	28800	760	-7MV5	1920	92		
			360			1080	28600	760	-7NV5	1910	93		
				436		1240	27200	795	-2XV5	1810	94		
					494	1400	27000	795	-2YV5	1810	95		
272						815	28600	780	1 5 633-5ES -1VV5	2100	91	12.4	0.22
	306					920	28800	780	-1WV5	2100	92		
		340				1020	28600	780	-7MV5	2080	93		
			395			1180	28500	785	-7NV5	2080	94		
				480		1340	26600	825	-2XV5	1950	95		
304						940	29500	820	1 5 633-5EV -1VV5	2400	92	10	0.2
	344					1050	29200	825	-1WV5	2380	93		
		382				1140	28500	845	-7MV5	2320	93		
			445			1320	28400	845	-7NV5	2320	94		
				540		1480	26200	620	1 5 633-5EV -2XV5	2140	95		
Separate ventilation						Fan unit, radially mounted — GG							
						Fan unit, separately-mounted — GH							
						Mounted air-to-water heat exchanger — HS							
Rated field voltage						310 V — 4							
Type of construction						IM B 3 — 0							

¹⁾ Please note remarks on field weakening on page 3/77.

Selection and ordering

1GG5, 1GH5, 1HS5
Size 630

Rated speed n_N rpm	at rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit Resistance at 120 °C R_a mΩ	Inductance L_a mH
	420 V	470 V	520 V	600 V	720 V	810 V								
Overall length 4														
102							350	32800	408	1 5 634-5EA -1VV5	985	83	62.5	1.43
	117						398	32500	468	-1WV5	980	84		
		131					446	32500	525	-7MV5	980	86		
			154				525	32600	615	-7NV5	980	87		
				188			640	32500	655	-2XV5	980	89		
					214		725	32400	660	-2YV5	975	90		
114							410	34400	456	1 5 634-5EC -1VV5	1140	84	49.6	1.06
	130						466	34200	520	-1WV5	1140	85		
		145					525	34600	580	-7MV5	1140	87		
			171				615	34400	620	-7NV5	1140	88		
				208			745	34200	625	-2XV5	1130	90		
					236		850	34400	620	-2YV5	1140	91		
126							468	35500	505	1 5 634-5EE -1VV5	1290	85	41.2	0.84
	144						535	35500	575	-1WV5	1300	86		
		161					595	35200	645	-7MV5	1290	87		
			189				695	35200	675	-7NV5	1280	89		
				230			835	34600	685	-2XV5	1270	91		
					262		945	34400	690	-2YV5	1260	92		
141							480	32500	565	1 5 634-5EG -1VV5	1290	86	35.4	0.73
	159						545	32800	635	-1WV5	1300	88		
		178					610	32800	645	-7MV5	1300	89		
			208				710	32600	645	-7NV5	1290	90		
				254			860	32400	650	-2XV5	1290	92		
					288		975	32400	650	-2YV5	1290	92		
157							590	35800	630	1 5 634-5EJ -1VV5	1590	87	27.2	0.55
	178						670	36000	695	-1WV5	1590	89		
		199					740	35500	700	-7MV5	1570	90		
			232				865	35600	700	-7NV5	1570	91		
				284			1030	34600	715	-2XV5	1530	92		
					322		1160	34400	715	1 5 634-5EJ -2YV5	1520	93		
Separate ventilation														
Rated field voltage		310 V ————— 4												
Type of construction		IM B 3 ————— 0												

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1) Please note remarks on field weakening on page 3/77.

Selection and ordering

1GG5, 1GH5, 1HS5 Size 630

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage	420 V	470 V	520 V	600 V	720 V							810 V	Resistance at 120 °C R_a mΩ	Inductance $L_a$ mH
172						600	33400	690	1 5 634-5EL -1VV5	1590	89	23.8	0.43
	195					675	33000	745	-1WV5	1570	90		
		218				755	33000	745	-7MV5	1580	91		
			254			880	33000	745	-7NV5	1580	92		
				308		1060	32800	750	-2XV5	1570	93		
					348	1200	33000	750	-2YV5	1570	93		
190						680	34200	705	1 5 634-5EN -1VV5	1780	89	19.4	0.44
	215					765	34000	710	-1WV5	1770	90		
		240				855	34000	705	-7MV5	1780	91		
			278			995	34200	705	-7NV5	1780	92		
				338		1200	34000	710	-2XV5	1770	93		
					382	1360	34000	710	-2YV5	1770	94		
210						740	33600	690	1 5 634-5EQ -1VV5	1930	90	16.7	0.32
	238					840	33800	685	-1WV5	1940	91		
		264				930	33600	690	-7MV5	1930	92		
			308			1080	33500	690	-7NV5	1920	93		
				374		1290	33000	700	-2XV5	1890	94		
					422	1450	32800	705	-2YV5	1880	94		
232						810	33400	710	1 5 634-5ES -1VV5	2100	91	13.6	0.24
	262					915	33400	710	-1WV5	2100	92		
		292				1010	33000	715	-7MV5	2080	92		
			340			1180	33200	715	-7NV5	2080	93		
				410		1390	32400	730	-2XV5	2040	94		
					465	1580	32400	472	-2YV5	2040	95		
260						935	34400	750	1 5 634-5EV -1VV5	2400	91	11	0.22
	294					1060	34400	750	-1WV5	2420	92		
		328				1170	34000	755	-7MV5	2400	93		
			380			1360	34200	755	-7NV5	2400	94		
				462		1550	32000	735	1 5 634-5EV -2XV5	2250	95		
Separate ventilation						Fan unit, radially mounted — GG Fan unit, separately-mounted — GH Mounted air-to-water heat exchanger — HS							
Rated field voltage						310 V — 4							
Type of construction						IM B 3 — 0							

¹⁾ Please note remarks on field weakening on page 3/77.

Selection and ordering

1GG5, 1GH5, 1HS5
Size 630

Rated speed n_N rpm	at rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit Resistance at 120 °C R_a mΩ	Inductance L_a mH
	420 V	470 V	520 V	600 V	720 V	810 V								
Overall length 5														
81						344	40400	326	1 5 635-5EA	-1VV5	985	80	70.5	1.66
	93					392	40000	374		-1WV5	980	82		
		105				442	40200	420		-7MV5	985	84		
			124			520	40000	496		-7NV5	985	86		
				151		635	40200	575		-2XV5	985	88		
					172	725	40200	575		-2YV5	985	89		
91						404	42400	364	1 5 635-5EC	-1VV5	1140	82	56	1.23
	104					460	42200	416		-1WV5	1140	84		
		117				515	42000	468		-7MV5	1140	85		
			137			605	42200	545		-7NV5	1140	87		
				168		740	42000	545		-2XV5	1140	89		
					191	845	42200	540		-2YV5	1140	90		
101						460	43500	404	1 5 635-5EE	-1VV5	1290	83	46.4	0.97
	115					525	43600	460		-1WV5	1300	85		
		129				590	43600	515		-7MV5	1300	86		
			152			690	43400	595		-7NV5	1290	88		
				186		845	43400	595		-2XV5	1290	90		
					212	955	43000	595		-2YV5	1280	91		
113						474	40000	452	1 5 635-5EG	-1VV5	1300	85	39.8	0.84
	128					540	40200	510		-1WV5	1300	86		
		144				600	39800	570		-7MV5	1290	88		
			168			705	40000	565		-7NV5	1300	89		
				205		855	39800	570		-2XV5	1290	91		
					232	970	40000	570		-2YV5	1290	92		
126						585	44400	505	1 5 635-5EJ	-1VV5	1600	86	30.6	0.63
	143					665	44400	570		-1WV5	1600	87		
		160				745	44500	610		-7MV5	1600	88		
			187			870	44400	610		-7NV5	1600	90		
				228		1040	43600	620		-2XV5	1570	91		
					260	1180	43400	620	1 5 635-5EJ	-2YV5	1560	92		
Separate ventilation														
Rated field voltage		310 V												
Type of construction		IM B 3												

3

1) Please note remarks on field weakening on page 3/77.

Selection and ordering

1GG5, 1GH5, 1HS5 Size 630

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
420 V	470 V	520 V	600 V	720 V	810 V							Resistance at 120 °C R_a mΩ	Inductance L_a mH
139						595	40800	555	1 5 635-5EL -1VV5	1590	87	26.8	0.5
	157					670	40800	630	-1WV5	1580	88		
		175				750	41000	655	-7MV5	1590	89		
			205			875	40800	660	-7NV5	1580	91		
				248		1060	40800	660	-2XV5	1580	92		
					282	1200	40600	660	-2YV5	1580	93		
153						675	42200	610	1 5 635-5EN -1VV5	1790	88	22	0.51
	173					765	42200	620	-1WV5	1790	89		
		193				850	42000	625	-7MV5	1790	90		
			226			990	41800	625	-7NV5	1780	91		
				274		1200	41800	625	-2XV5	1780	93		
					310	1360	41800	625	-2YV5	1780	93		
169						735	41500	605	1 5 635-5EQ -1VV5	1940	89	18.7	0.37
	192					835	41500	605	-1WV5	1940	90		
		214				925	41200	610	-7MV5	1930	91		
			250			1080	41200	605	-7NV5	1930	92		
				302		1300	41200	610	-2XV5	1920	93		
					342	1470	41000	610	-2YV5	1920	94		
187						805	41200	625	1 5 635-5ES -1VV5	2100	90	15.9	0.35
	210					910	41400	625	-1WV5	2120	91		
		235				1010	41000	625	-7MV5	2100	91		
			274			1180	41200	625	-7NV5	2100	92		
				332		1420	40800	630	-2XV5	2080	93		
					376	1610	40800	500	-2YV5	2100	94		
210						930	42200	665	1 5 635-5EV -1VV5	2420	91	12.3	0.25
	238					1050	42200	665	-1WV5	2420	91		
		265				1170	42200	665	-7MV5	2420	92		
			308			1360	42200	665	-7NV5	2420	93		
				374		1610	41200	680	1 5 635-5EV -2XV5	2350	94		
Separate ventilation						Fan unit, radially mounted — GG Fan unit, separately-mounted — GH Mounted air-to-water heat exchanger — HS							
Rated field voltage						310 V — 4							
Type of construction						IM B 3 — 0							

¹⁾ Please note remarks on field weakening on page 3/77.

Selection and ordering

1GG5, 1GH5, 1HS5
Size 630

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1GG5 631	5.6	174	1500	7450
1GH5 631	5.6	174	1500	7200
1HS5 631	5.6	174	1500	7950
1GG5 632	6.8	199	1500	8250
1GH5 632	6.8	199	1500	8000
1HS5 632	6.8	199	1500	8750
1GG5 633	7.1	226	1300	9350
1GH5 633	7.1	226	1300	9100
1HS5 633	7.1	226	1300	9850
1GG5 634	7.4	251	1300	10150
1GH5 634	7.4	251	1300	9900
1HS5 634	7.4	251	1300	10650
1GG5 635	9.2	289	1300	11500
1GH5 635	9.2	289	1300	11250
1HS5 635	9.2	289	1300	12000

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: **"C05"** for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and **"C06"** for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed n_{Fmax} .

For speeds $> n_{Fmax}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

Selection and ordering

1HQ6 Size 180

Selection and ordering data

These motors are uncompensated.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
							Resistance at 120 °C R_a mΩ	Inductance L_a mH	
at rated armature voltage 420 V 470 V 520 V 600 V									
Overall length 6									
930	37.6	386	2540	1HQ6 186-0NA -1VV1	104	84	472	7.85	
1060	42.8	386	2280	-1WV1	104	85			
1190	47.8	384	2020	-7MV1	103	86			
1390	56	385	1570	-7NV1	103	88			
1140	46.2	388	2180	1HQ6 186-0NB -1VV1	124	86	330	5.83	
1290	52.5	388	1880	-1WV1	125	87			
1440	58	385	1570	-7MV1	123	88			
1390	53.5	368	3400	1HQ6 186-0NC -1VV1	141	87	242	3.89	
1570	60.5	368	3400	-1WV1	141	88			
1750	66.5	362	3400	-7MV1	139	89			
2040	76.5	358	3400	-7NV1	137	90			
1730	62	342	3400	1HQ6 186-0ND -1VV1	159	90	156	2.72	
1950	69	338	3400	-1WV1	157	90			
2180	75.5	330	3400	-7MV1	156	91			
2520	86	326	3400	-7NV1	153	92			
2000	75	358	3400	1HQ6 186-0NE -1VV1	192	90	118	1.96	
2260	84.5	358	3400	-1WV1	194	91			
2520	93	352	3400	-7MV1	192	92			
2400	81.5	324	3400	1HQ6 186-0NF -1VV1	208	91	82.5	1.46	
2700	91.5	324	3400	-1WV1	208	92			
2920	85.5	280	3400	1HQ6 186-0NG -1VV1	216	92	60.5	0.97	
3280	96	280	3400	-1WV1	218	92			
3160	87.5	264	3400	1HQ6 186-0NH -1VV1	222	92	51.5	0.84	
Rated field voltage	310 V			4					
Type of construction	IM B 3			0					
	IM B 35			6					

¹⁾ Please note remarks on field weakening on page 3/79.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
							Resistance at 120 °C R_a mΩ	Inductance L_a mH	
at rated armature voltage 420 V 470 V 520 V 600 V									
Overall length 8									
745	37.6	482	2000	1HQ6 188-0NA -1VV1	106	82	535	9.65	
850	42.8	480	1840	-1WV1	106	83			
955	47.8	478	1660	-7MV1	105	85			
1120	56	478	1290	-7NV1	105	87			
915	46.2	482	1760	1HQ6 188-0NB -1VV1	127	84	374	7.17	
1040	52.5	482	1550	-1WV1	127	86			
1160	58.5	482	1290	-7MV1	126	87			
1120	54.5	465	3360	1HQ6 188-0NC -1VV1	146	86	275	4.78	
1270	61.5	462	3400	-1WV1	146	87			
1420	68	458	3400	-7MV1	144	88			
1650	78.5	454	3400	-7NV1	142	90			
1400	64	436	3400	1HQ6 188-0ND -1VV1	167	89	177	3.34	
1590	72	432	3400	-1WV1	165	90			
1770	79.5	428	3400	-7MV1	164	90			
2060	91.5	424	3400	-7NV1	164	91			
1620	76.5	450	3400	1HQ6 188-0NE -1VV1	197	90	134	2.41	
1830	86	448	3400	-1WV1	197	90			
2040	95.5	448	3160	-7MV1	198	91			
1940	83.5	412	3400	1HQ6 188-0NF -1VV1	212	91	93.5	1.79	
2180	94	412	3020	-1WV1	212	92			
2360	88	356	3400	1HQ6 188-0NG -1VV1	222	92	69	1.19	
2660	98.5	354	3400	-1WV1	222	92			
2960	109	352	3400	-7MV1	222	92			
2580	92	340	3400	1HQ6 188-0NH -1VV1	234	92	58.5	1.03	
2900	102	336	3400	-1WV1	230	92			
3220	110	326	3400	1HQ6 188-0NH -7MV1	224	92			
Rated field voltage	310 V								
Type of construction	IM B 3								
	IM B 35								

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1HQ6 186	1.5	0.6	3800	540
1HQ6 188	1.6	0.7	3800	610

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: "C05" for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and "C06" for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed n_{Fmax} .

For speeds $> n_{Fmax}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

Type of construction

For other types of construction and the associated Order No. supplement, see Page 3/6.

¹⁾ Please note remarks on field weakening.

Selection and ordering

1HQ6 Size 200

Selection and ordering data

These motors are uncompensated.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
							Resistance at 120 °C R_a mΩ	Inductance L_a mH	
at rated armature voltage 420 V 470 V 520 V 600 V									
Overall length 6									
935	56.5	575	2800	1HQ6 206-0NA -1VV1	154	85	292	5.81	
1060	64	575	3100	-1VV1	154	86			
1190	71.5	575	3100	-7MV1	153	88			
1390	83.5	575	3100	-7NV1	153	89			
1100	66	575	3100	1HQ6 206-0NB -1VV1	176	87	212	4.28	
1250	75	575	3100	-1VV1	176	88			
1390	83.5	575	3100	-7MV1	176	89			
1630	97	570	3100	-7NV1	175	90			
1270	72	540	3100	1HQ6 206-0NC -1VV1	188	89	160	3.19	
1440	80.5	535	3100	-1VV1	185	90			
1600	88.5	530	3100	-7MV1	183	90			
1860	102	525	3100	-7NV1	181	91			
1520	87.5	550	3100	1HQ6 206-0ND -1VV1	226	90	117	2.29	
1710	98	545	3100	-1VV1	225	90			
1910	107	535	3100	-7MV1	222	91			
2220	122	525	2540	-7NV1	218	92			
1770	95.5	515	3100	1HQ6 206-0NE -1VV1	242	91	84.5	1.66	
1990	106	510	3100	-1VV1	242	92			
2220	116	500	2600	-7MV1	238	92			
2100	102	464	3100	1HQ6 206-0NF -1VV1	260	92	63.5	1.2	
2360	113	458	3100	-1VV1	256	92			
2620	122	445	3100	-7MV1	248	93			
3040	136	428	3100	-7NV1	240	93			
2280	116	486	3100	1HQ6 206-0NG -1VV1	295	92	54.5	1.04	
2580	130	482	3100	-1VV1	294	92			
2860	144	480	3100	-7MV1	294	93			
2760	122	422	3100	1HQ6 206-0NH -1VV1	308	92	38.2	0.76	
Rated field voltage	310 V								
Type of construction	IM B 3								
	IM B 35								

¹⁾ Please note remarks on field weakening on page 3/82.

Rated speed n_N rpm	at rated armature voltage 420 V 470 V 520 V 600 V				Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	Resistance at 120 °C R_a mΩ		Inductance L_a mH									
Overall length 8												
745					55.5	710	2240	1HQ6 208-0NA -1VV1	154	84	334	7.18
	850				63	710	2550	-1VV1	153	85		
		950			70.5	710	2780	-7MV1	153	86		
			1110		82.5	710	2780	-7NV1	153	88		
880					66	715	2640	1HQ6 208-0NB -1VV1	178	86	242	5.29
	995				74.5	715	2800	-1VV1	178	87		
		1120			83.5	710	2800	-7MV1	178	88		
			1310		97.5	710	2800	-7NV1	177	89		
1020					72.5	680	3060	1HQ6 208-0NC -1VV1	191	88	183	3.95
	1150				81.5	675	3100	-1VV1	190	89		
		1290			90.5	670	3100	-7MV1	189	90		
			1500		105	670	2700	-7NV1	188	91		
1220					89	695	2850	1HQ6 208-0ND -1VV1	232	89	134	2.84
	1380				100	690	2860	-1VV1	232	90		
		1540			110	680	2640	-7MV1	228	90		
			1790		127	680	2060	-7NV1	226	91		
1420					97.5	655	2960	1HQ6 208-0NE -1VV1	250	90	96.5	2.05
	1600				110	655	2520	-1VV1	250	91		
		1790			121	645	2060	-7MV1	250	92		
1690					103	580	3100	1HQ6 208-0NF -1VV1	260	91	72.5	1.48
	1900				116	585	3100	-1VV1	260	92		
		2120			128	575	3100	-7MV1	262	92		
			2450		146	570	3100	-7NV1	258	93		
1840					118	610	3100	1HQ6 208-0NG -1VV1	298	92	62	1.28
	2080				132	605	3100	-1VV1	300	92		
		2300			146	605	3100	-7MV1	298	93		
			2680		169	600	3100	-7NV1	298	93		
2220					124	535	3100	1HQ6 208-0NH -1VV1	310	92	43.8	0.94
	2500				139	530	3100	-1VV1	314	93		
		2780			154	530	3100	1HQ6 208-0NH -7MV1	314	93		
Rated field voltage		310 V										
Type of construction		IM B 3										
		IM B 35										

1) Please note remarks on field weakening on page 3/82.

Selection and ordering

1HQ6 Size 200

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1HQ6 206	1.7	1.2	3500	720
1HQ6 208	1.9	1.3	3500	810

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: **"C05"** for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and **"C06"** for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed $n_{F\text{max}}$.

For speeds $> n_{F\text{max}}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

Type of construction

For other types of construction and the associated Order No. supplement, see Page 3/6.

Selection and ordering data

These motors are uncompensated.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
							Resistance at 120 °C R_a mΩ	Inductance L_a mH
at rated armature voltage								
420 V	470 V	520 V	600 V	720 V	810 V			
Overall length 6								
850	82.5	925	2320	1HQ6 226-0NA -1VV1	220	87	180	4.71
960	93	925	2320	-1WV1	220	88		
1070	104	930	2320	-7MV1	220	89		
1260	120	910	2340	-7NV1	216	90		
1530	143	895	2300	-2XV1	214	91		
1730	160	885	1970	-2YV1	212	92		
970	94.5	930	2320	1HQ6 226-0NB -1VV1	250	88	139	3.56
1100	106	920	2340	-1WV1	246	89		
1220	118	925	2340	-7MV1	248	90		
1430	136	910	2360	-7NV1	244	91		
1730	161	890	1850	-2XV1	238	92		
1150	111	920	2300	1HQ6 226-0NC -1VV1	290	89	103	2.7
1300	124	910	2320	-1WV1	286	90		
1450	137	900	2320	-7MV1	284	91		
1690	157	885	1890	-7NV1	282	92		
1420	127	855	2700	1HQ6 226-0ND -1VV1	326	91	74	1.91
1610	142	840	2700	-1WV1	326	91		
1790	156	830	2700	-7MV1	322	92		
2080	178	815	2700	-7NV1	316	93		
2500	208	795	2700	-2XV1	306	93		
1650	136	785	2700	1HQ6 226-0NE -1VV1	344	92	55	1.49
1860	153	785	2700	-1WV1	344	92		
2080	169	775	2700	-7MV1	345	93		
2400	195	775	2700	-7NV1	344	93		
1950	156	765	2700	1HQ6 226-0NF -1VV1	395	93	38.8	1.03
2200	175	760	2700	-1WV1	395	93		
2440	193	755	2700	-7MV1	392	93		
2320	164	675	2700	1HQ6 226-0NG -1VV1	412	93	26	0.67
2600	184	675	2700	-1WV1	412	94		
2540	167	630	2700	1HQ6 226-0NH -1VV1	420	93	22	0.61
Rated field voltage	310 V ————— 4							
Type of construction	IM B 3 ————— 0							
	IM B 35 ————— 6							

1) Please note remarks on field weakening on page 3/85.

Selection and ordering

1HQ6 Size 225

Rated speed n_N rpm							Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit Resistance at 120 °C R_a mΩ	Inductance L_a mH
420 V	470 V	520 V	600 V	720 V	810 V									
Overall length 8														
665						82	1180	1990	1HQ6 228-0NA -1VV1	224	85	206	5.83	
	755					93	1180	1990	-1VV1	222	87			
		845				103	1160	2000	-7MV1	220	88			
			985			120	1160	2020	-7NV1	220	89			
				1200		144	1150	1860	-2XV1	216	91			
					1360	162	1140	1580	-2YV1	214	91			
760						94	1180	1990	1HQ6 228-0NB -1VV1	252	87	160	4.4	
	860					106	1180	2000	-1VV1	250	88			
		960				118	1170	2000	-7MV1	250	89			
			1120			136	1160	1920	-7NV1	246	90			
				1370		162	1130	1480	-2XV1	240	92			
905						111	1170	1960	1HQ6 228-0NC -1VV1	292	88	118	3.34	
	1020					125	1170	1970	-1VV1	292	89			
		1140				138	1160	1890	-7MV1	288	90			
			1330			159	1140	1540	-7NV1	284	91			
1120						129	1100	2480	1HQ6 228-0ND -1VV1	335	90	85	2.37	
	1270					145	1090	2500	-1VV1	332	91			
		1410				161	1090	2500	-7MV1	332	91			
			1640			185	1080	2520	-7NV1	328	92			
				1990		215	1030	2600	-2XV1	316	93			
					2240	236	1010	2660	-2YV1	308	93			
1300						137	1010	2700	1HQ6 228-0NE -1VV1	350	91	63.5	1.84	
	1470					154	1000	2700	-1VV1	348	92			
		1640				171	995	2700	-7MV1	350	92			
			1900			198	995	2700	-7NV1	346	93			
				2300		238	990	2700	-2XV1	348	94			
					2600	264	970	2700	-2YV1	344	94			
1540						158	980	2700	1HQ6 228-0NF -1VV1	398	92	44.5	1.28	
	1730					177	975	2700	-1VV1	396	93			
		1930				196	970	2700	-7MV1	398	93			
			2240			226	965	2700	-7NV1	398	94			
1830						167	870	2700	1HQ6 228-0NG -1VV1	415	93	29.8	0.83	
	2060					187	865	2700	-1VV1	418	93			
		2280				206	865	2700	-7MV1	416	94			
			2660			238	855	2700	-7NV1	416	94			
2000						168	800	2700	1HQ6 228-0NH -1VV1	416	93	25.2	0.75	
	2260					189	800	2700	-1VV1	422	94			
		2500				208	795	2700	1HQ6 228-0NH -7MV1	420	94			
Rated field voltage						310 V								
Type of construction						IM B 3								
						IM B 35								

¹⁾ Please note remarks on field weakening on page 3/85.

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1HQ6 226	1.9	2.2	3000	1020
1HQ6 228	2.3	2.5	3000	1030

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: "**C05**" for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and "**C06**" for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed $n_{F\text{max}}$.

For speeds $> n_{F\text{max}}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

Type of construction

For other types of construction and the associated Order No. supplement, see Page 3/6.

Selection and ordering

1HQ6 Size 250

Selection and ordering data

These motors are uncompensated.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit						
							Resistance at 120 °C R_a mΩ	Inductance L_a mH					
at rated armature voltage													
420 V	470 V	520 V	600 V	720 V	810 V								
Overall length 6													
765				107	1340	1990	1HQ6 256-0NA	-1VV1	282	88	120	4.03	
	865			121	1340	1990		-1VV1	282	89			
		965		134	1330	2000		-7MV1	280	90			
			1130	156	1320	1860		-7NV1	278	91			
870				123	1350	2000	1HQ6 256-0NB	-1VV1	320	89	93.5	3.04	
	985			138	1340	2020		-1VV1	318	90			
		1100		153	1330	1910		-7MV1	315	91			
			1280	178	1330	1520		-7NV1	315	92			
1020				143	1340	2050	1HQ6 256-0NC	-1VV1	368	90	69	2.32	
	1150			161	1340	1800		-1VV1	366	91			
		1280		178	1330	1530		-7MV1	364	92			
1240				168	1290	2300	1HQ6 256-0ND	-1VV1	428	91	50.5	1.72	
	1400			189	1290	2300		-1VV1	428	92			
		1560		208	1270	2300		-7MV1	426	92			
			1810	240	1270	2300		-7NV1	425	93			
			2180	285	1250	2300		-2XV1	418	94			
1420				191	1280	2300	1HQ6 256-0NE	-1VV1	484	92	38.2	1.28	
	1600			214	1280	2300		-1VV1	480	93			
		1780		236	1270	2300		-7MV1	482	93			
			2060	270	1250	2300		-7NV1	476	93			
1640				230	1340	2300	1HQ6 256-0NF	-1VV1	585	93	27.5	0.92	
	1840			252	1310	2300		-1VV1	570	93			
		2040		270	1260	2300		-7MV1	550	94			
1900				240	1210	2300	1HQ6 256-0NG	-1VV1	605	93	21.2	0.69	
	2120			262	1180	2300		-1VV1	590	94			
2160				265	1170	2300	1HQ6 256-0NH	-1VV1	665	94	16.1	0.55	
Rated field voltage	310 V												
Type of construction	IM B 3												
	IM B 35												

¹⁾ Please note remarks on field weakening on page 3/88.

Selection and ordering

1HQ6
Size 250

Rated speed n_N rpm	Rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	420 V	470 V	520 V	600 V	720 V	810 V							Resistance at 120 °C R_a mΩ	Inductance L_a mH
Overall length 8														
600						107	1700	1700	1HQ6 258-0NA -1VV1	285	87	138	5	
	675					121	1710	1700	-1WV1	285	88			
		755				135	1710	1700	-7MV1	285	89			
			885			157	1690	1480	-7NV1	284	90			
				1070		189	1690	1110	-2XV1	282	91			
680						123	1730	1710	1HQ6 258-0NB -1VV1	324	88	107	3.77	
	770					139	1720	1690	-1WV1	324	89			
		860				154	1710	1530	-7MV1	322	90			
			1000			179	1710	1240	-7NV1	320	91			
795						144	1730	1640	1HQ6 258-0NC -1VV1	375	89	79.5	2.87	
	900					162	1720	1450	-1WV1	374	90			
		1000				180	1720	1230	-7MV1	372	91			
975						170	1670	2140	1HQ6 258-0ND -1VV1	438	90	58.5	2.13	
	1100					191	1660	2140	-1WV1	435	91			
		1220				212	1660	2150	-7MV1	435	92			
			1420			245	1650	2150	-7NV1	432	93			
				1720		292	1620	2180	-2XV1	425	93			
					1950	328	1610	2180	-2YV1	428	94			
1120						193	1650	2160	1HQ6 258-0NE -1VV1	490	91	44	1.59	
	1260					218	1650	2150	-1WV1	492	92			
		1400				240	1640	2160	-7MV1	488	92			
			1630			276	1620	2180	-7NV1	488	93			
				1970		330	1600	2200	-2XV1	484	94			
1290						240	1780	1950	1HQ6 258-0NF -1VV1	610	92	31.6	1.15	
	1450					266	1750	1980	-1WV1	600	93			
		1610				290	1720	2000	-7MV1	585	93			
			1870			326	1660	2060	-7NV1	575	94			
1500						256	1630	2300	1HQ6 258-0NG -1VV1	640	93	24.4	0.85	
	1690					282	1590	2300	-1WV1	635	93			
		1870				305	1560	2300	-7MV1	620	94			
			2160			340	1500	2300	-7NV1	595	94			
1700						268	1510	2300	1HQ6 258-0NH -1VV1	675	93	18.6	0.68	
	1910					294	1470	2300	-1WV1	660	94			
		2120				315	1420	2300	1HQ6 258-0NH -7MV1	635	94			
Rated field voltage						310 V			4					
Type of construction						IM B 3			0					
						IM B 35			6					

1) Please note remarks on field weakening on page 3/88.

Selection and ordering

1HQ6 Size 250

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1HQ6 256	2.6	3.6	2600	1340
1HQ6 258	3.2	4.2	2600	1520

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: "**C05**" for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and "**C06**" for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed $n_{F\text{max}}$.

For speeds $> n_{F\text{max}}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

Type of construction

For other types of construction and the associated Order No. supplement, see Page 3/6.

Selection and ordering data

These motors are uncompensated.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit					
							Resistance at 120 °C R_a mΩ	Inductance L_a mH				
at rated armature voltage												
420 V	470 V	520 V	600 V	720 V	810 V							
Overall length 6												
665				151	2160	1490	1HQ6 286-0NA	-1VV1	394	89	80	3.44
	750			170	2160	1490		-1VV1	394	90		
		840		189	2150	1390		-7MV1	392	91		
			980	220	2140	1150		-7NV1	390	92		
785				173	2100	1520	1HQ6 286-0NB	-1VV1	445	90	59.5	2.59
	885			195	2100	1340		-1VV1	445	91		
		985		216	2100	1160		-7MV1	444	92		
890				192	2060	1850	1HQ6 286-0NC	-1VV1	492	91	49.4	2.19
	1010			216	2040	1850		-1VV1	490	92		
		1120		238	2020	1860		-7MV1	485	92		
			1300	276	2020	1860		-7NV1	485	93		
			1580	330	1990	1880		-2XV1	484	94		
			1780	370	1990	1890		-2YV1	480	94		
1000				212	2020	2100	1HQ6 286-0ND	-1VV1	540	91	39.6	1.66
	1130			238	2020	2100		-1VV1	535	92		
		1260		264	2000	2100		-7MV1	535	93		
			1460	305	2000	2100		-7NV1	535	93		
			1770	364	1960	2120		-2XV1	530	94		
			2000	406	1940	2140		-2YV1	525	94		
1150				252	2100	1970	1HQ6 286-0NE	-1VV1	635	92	29.6	1.31
	1290			282	2080	1970		-1VV1	635	93		
		1440		312	2060	1980		-7MV1	635	93		
			1670	356	2040	2000		-7NV1	625	94		
			2000	400	1910	2120		-2XV1	585	94		
1370				282	1970	2040	1HQ6 286-0NF	-1VV1	710	93	21	1.01
	1540			308	1910	2080		-1VV1	690	93		
		1700		332	1870	2140		-7MV1	670	94		
			1960	364	1770	2200		-7NV1	635	94		
1540				328	2040	1970	1HQ6 286-0NG	-1VV1	820	93	16.3	0.74
	1730			358	1980	2020		-1VV1	805	94		
		1920		384	1910	2060		-7MV1	775	94		
1740				335	1840	2050	1HQ6 286-0NH	-1VV1	840	94	13	0.58
	1950			364	1780	2100	1HQ6 286-0NH	-1VV1	815	94		
Rated field voltage				310 V								
Type of construction				IM B 3								
				IM B 35								

1) Please note remarks on field weakening on page 3/91.

Selection and ordering

1HQ6 Size 280

Rated speed n_N rpm	Rated output						Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	420 V	470 V	520 V	600 V	720 V	810 V						Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH
Overall length 8													
525						151	2750	1270	1HQ6 288-0NA -1VV1	400	88	91.5	4.24
	595					170	2720	1210	-1WV1	398	89		
		665				190	2720	1110	-7MV1	398	90		
			775			220	2720	925	-7NV1	395	91		
620						174	2680	1220	1HQ6 288-0NB -1VV1	454	89	68.5	3.19
	705					196	2660	1080	-1WV1	452	90		
		785				218	2650	950	-7MV1	450	91		
710						193	2600	1580	1HQ6 288-0NC -1VV1	498	90	56.5	2.7
	800					216	2580	1590	-1WV1	494	91		
		890				240	2580	1600	-7MV1	494	91		
			1040			280	2580	1590	-7NV1	494	92		
				1260		335	2540	1610	-2XV1	492	93		
					1420	378	2540	1610	-2YV1	488	94		
795						214	2580	1800	1HQ6 288-0ND -1VV1	550	91	45.5	2.04
	900					240	2550	1810	-1WV1	545	91		
		1000				268	2560	1800	-7MV1	550	92		
			1160			310	2550	1810	-7NV1	545	93		
				1410		370	2500	1830	-2XV1	540	94		
					1590	416	2500	1830	-2YV1	540	94		
915						255	2660	1690	1HQ6 288-0NE -1VV1	650	91	34	1.62
	1030					286	2650	1690	-1WV1	645	92		
		1150				316	2620	1700	-7MV1	640	93		
			1330			366	2620	1700	-7NV1	640	93		
				1610		436	2580	1720	-2XV1	640	94		
1090						296	2600	1710	1HQ6 288-0NF -1VV1	745	92	24	1.24
	1230					328	2550	1730	-1WV1	735	93		
		1360				356	2500	1760	-7MV1	715	93		
			1580			400	2420	1810	-7NV1	700	94		
1230						338	2620	1670	1HQ6 288-0NG -1VV1	850	93	18.7	0.91
	1390					380	2620	1670	-1WV1	855	93		
		1540				414	2560	1700	-7MV1	840	94		
1390						356	2450	1700	1HQ6 288-0NH -1VV1	885	94	15	0.72
	1560					392	2400	1730	1HQ6 288-0NH -1VV1	875	94		
Rated field voltage						310 V			4				
Type of construction						IM B 3			0				
						IM B 35			6				

¹⁾ Please note remarks on field weakening on page 3/91.

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1HQ6 286	3.3	6.4	2500	1800
1HQ6 288	3.9	7.5	2500	2040

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: "**C05**" for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and "**C06**" for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed $n_{F\text{max}}$.

For speeds $> n_{F\text{max}}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

Type of construction

For other types of construction and the associated Order No. supplement, see Page 3/6.

Selection and ordering

1HQ7 Size 355

Selection and ordering data

These motors are compensated.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
							Resistance at 120 °C R_a mΩ	Inductance L_a mH	
at rated armature voltage									
420 V	470 V	520 V	600 V	720 V	810 V				
Overall length 1									
590		222	3590	1970	1HQ7 351-5NA -1VV1	580	90	50.9	0.74
	670	250	3560	1970	-1WV1	580	91		
		274	3510	2000	-7MV1	570	91		
		316	3470	2000	-7NV1	565	92		
		362	3290	2080	-2XV1	535	93		
		405	3250	2100	-2YV1	530	94		
675		244	3450	1980	1HQ7 351-5NB -1VV1	635	90	43.6	0.54
	765	275	3430	1990	-1WV1	635	91		
		298	3350	2020	-7MV1	620	92		
		345	3330	2040	-7NV1	615	93		
		384	3030	2100	-2XV1	565	93		
		428	3000	2100	-2YV1	560	94		
755		276	3490	1980	1HQ7 351-5NC -1VV1	710	91	34.4	0.5
	850	310	3480	1980	-1WV1	710	92		
		335	3380	2020	-7MV1	690	93		
		384	3330	2040	-7NV1	680	93		
		422	3030	2100	-2XV1	620	94		
		464	2930	2100	-2YV1	605	94		
860		302	3350	1970	1HQ7 351-5ND -1VV1	775	92	28.4	0.35
	965	338	3340	1980	-1WV1	770	92		
		358	3170	2050	-7MV1	735	93		
		410	3130	2060	-7NV1	725	94		
		424	2660	2100	-2XV1	620	94		
		466	2590	2100	-2YV1	605	94		
980		335	3260	1970	1HQ7 351-5NE -1VV1	850	93	20.7	0.31
	1100	376	3250	1970	-1WV1	850	93		
		396	3080	2050	-7MV1	805	94		
		446	2980	2080	-7NV1	785	94		
		442	2440	2100	-2XV1	645	94		
		470	2300	2100	-2YV1	610	94		
1090		368	3220	1960	1HQ7 351-5NF -1VV1	930	93	17.2	0.24
	1230	408	3170	1980	-1WV1	920	94		
		418	2910	2100	-7MV1	850	94		
		470	2820	2100	-7NV1	825	94		
1240		402	3100	2040	1HQ7 351-5NG -1VV1	1010	94	12.3	0.19
	1390	445	3050	2060	-1WV1	1000	94		
		440	2710	2100	-7MV1	890	94		
		484	2570	2100	-7NV1	850	94		
1400		415	2830	2100	1HQ7 351-5NH -1VV1	1040	94	10.5	0.14
	1580	456	2760	2100	-1WV1	1020	94		
1640		440	2560	2100	1HQ7 351-5NJ -1VV1	1100	94	8.26	0.11
	1840	472	2450	2100	1HQ7 351-5NJ -1VV1	1060	94		
Rated field voltage		310 V							
Type of construction		IM B 3							

¹⁾ Please note remarks on field weakening on page 3/97.

Selection and ordering


1HQ7
Size 355

Rated speed n_N rpm	Rated output						Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	at rated armature voltage 420 V 470 V 520 V 600 V 720 V 810 V	P_N kW										Resistance at 120 °C R_a mΩ	Inductance L_a mH
Overall length 2													
505						224	4250	1800	1HQ7 352-5NA -1VV1	590	89	54.5	0.82
	570					252	4220	1810	-1WV1	590	90		
		635				278	4180	1820	-7MV1	580	91		
			740			322	4150	1830	-7NV1	580	92		
				900		375	3980	1880	-2XV1	555	93		
					1020	420	3930	1900	-2YV1	550	94		
575						246	4080	1820	1HQ7 352-5NB -1VV1	645	90	46.7	0.6
	650					278	4080	1820	-1WV1	645	90		
		725				305	4020	1840	-7MV1	635	91		
			845			354	4000	1840	-7NV1	630	92		
				1030		402	3720	1930	-2XV1	590	93		
					1170	450	3680	1940	-2YV1	585	94		
640						282	4200	1800	1HQ7 352-5NC -1VV1	730	91	36.8	0.55
	725					316	4160	1800	-1WV1	725	92		
		810				344	4060	1830	-7MV1	710	92		
			940			396	4020	1850	-7NV1	700	93		
				1140		446	3730	1940	-2XV1	650	94		
					1290	496	3670	1960	-2YV1	645	94		
730						308	4030	1800	1HQ7 352-5ND -1VV1	790	92	30.4	0.38
	825					346	4000	1800	-1WV1	790	92		
		920				372	3860	1840	-7MV1	760	93		
			1070			428	3820	1860	-7NV1	755	93		
				1300		462	3390	2020	-2XV1	675	94		
					1470	515	3340	2020	-2YV1	665	94		
840						335	3810	1820	1HQ7 352-5NE -1VV1	850	93	22.2	0.35
	945					376	3800	1820	-1WV1	850	93		
		1050				415	3770	1830	-7MV1	845	94		
			1220			474	3710	1850	-7NV1	830	94		
				1480		498	3220	2040	-2XV1	725	95		
					1670	540	3090	2100	-2YV1	700	95		
935						382	3900	1760	1HQ7 352-5NF -1VV1	970	93	18.5	0.26
	1050					426	3880	1780	-1WV1	960	93		
		1170				445	3630	1860	-7MV1	905	94		
			1360			505	3540	1880	-7NV1	885	94		
				1650		496	2870	2100	-2XV1	720	94		
1060						405	3650	1880	1HQ7 352-5NG -1VV1	1020	94	13.2	0.21
	1190					454	3640	1880	-1WV1	1020	94		
		1320				482	3480	1940	-7MV1	975	94		
			1540			540	3350	1980	-7NV1	945	95		
1200						428	3410	1950	1HQ7 352-5NH -1VV1	1080	94	11.2	0.15
	1350					480	3400	1950	-1WV1	1070	94		
		1500				480	3050	2080	-7MV1	970	94		
1400						485	3300	2100	1HQ7 352-5NJ -1VV1	1210	94	8.85	0.12
	1570					530	3230	2100	1HQ7 352-5NJ -1VV1	1190	94		
Rated field voltage						310 V		4					
Type of construction						IM B 3		0					

1) Please note remarks on field weakening on page 3/97.

Selection and ordering

1HQ7 Size 355

Rated speed n_N rpm						Rated output	Rated torque	Maximum field weakening speed ¹⁾	Order No.	Rated current	Efficiency	Armature circuit Resistance at 120 °C	Inductance
at rated armature voltage 420 V 470 V 520 V 600 V 720 V 810 V						P_N kW	M_N Nm	n_{Fmax} rpm		I_N A	η %	R_a mΩ	L_a mH
Overall length 3													
426						225	5040	1640	1HQ7 353-5NA -1VV1	600	88	58.9	0.92
	482					255	5050	1630	-1WV1	600	89		
		540				282	4980	1640	-7MV1	595	90		
			630			328	4970	1650	-7NV1	590	91		
				765		385	4800	1690	-2XV1	570	93		
					870	434	4770	1700	-2YV1	570	93		
490						244	4750	1670	1HQ7 353-5NB -1VV1	645	89	50.5	0.66
	555					275	4730	1680	-1WV1	640	90		
		620				304	4680	1690	-7MV1	635	91		
			720			354	4680	1690	-7NV1	635	92		
				875		416	4540	1730	-2XV1	615	93		
					990	468	4520	1730	-2YV1	610	93		
545						285	5000	1630	1HQ7 353-5NC -1VV1	740	90	39.8	0.62
	615					322	5000	1630	-1WV1	740	91		
		685				352	4900	1650	-7MV1	730	92		
			800			406	4850	1660	-7NV1	720	93		
				970		466	4590	1730	-2XV1	685	94		
					1100	520	4510	1740	-2YV1	675	94		
620						312	4800	1620	1HQ7 353-5ND -1VV1	805	91	32.8	0.43
	700					352	4800	1620	-1WV1	805	92		
		780				382	4680	1660	-7MV1	785	92		
			910			442	4640	1660	-7NV1	785	93		
				1110		492	4230	1770	-2XV1	720	94		
					1250	550	4200	1780	-2YV1	710	94		
715						332	4430	1680	1HQ7 353-5NE -1VV1	845	92	24	0.39
	805					372	4410	1690	-1WV1	840	93		
		895				412	4400	1690	-7MV1	835	93		
			1040			476	4370	1690	-7NV1	835	94		
				1260		540	4100	1770	-2XV1	785	95		
					1420	595	4000	1800	-2YV1	770	95		
795						380	4560	1620	1HQ7 353-5NF -1VV1	965	93	19.9	0.3
	895					428	4560	1620	-1WV1	965	93		
		995				468	4490	1640	-7MV1	950	94		
			1160			535	4400	1660	-7NV1	940	94		
				1400		560	3820	1840	-2XV1	815	95		
905						406	4290	1720	1HQ7 353-5NG -1VV1	1020	93	14.3	0.23
	1020					456	4270	1720	-1WV1	1020	94		
		1130				500	4220	1740	-7MV1	1010	94		
			1310			580	4220	1730	-7NV1	1010	95		
1020						430	4020	1780	1HQ7 353-5NH -1VV1	1080	94	12.1	0.17
	1150					484	4020	1780	-1WV1	1080	94		
		1280				525	3920	1810	-7MV1	1060	94		
1190						490	3930	2020	1HQ7 353-5NJ -1VV1	1230	94	9.57	0.14
	1340					550	3920	2020	1HQ7 353-5NJ -1VV1	1230	94		
Rated field voltage						310 V 							
Type of construction						IM B 3							

¹⁾ Please note remarks on field weakening on page 3/97.

Selection and ordering

1HQ7
Size 355

Rated speed n_N rpm	Rated output						Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V					Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH	
Overall length 4													
354						225	6070	1420	1HQ7 354-5NA -1VV1	605	87	64.8	1.06
	402					255	6050	1460	-1WV1	605	89		
		450				282	6000	1470	-7MV1	600	90		
			525			330	6000	1470	-7NV1	600	91		
				640		390	5810	1500	-2XV1	580	92		
					725	440	5800	1510	-2YV1	580	93		
408						240	5620	1520	1HQ7 354-5NB -1VV1	640	88	55.4	0.75
	462					270	5580	1530	-1WV1	635	89		
		515				300	5560	1530	-7MV1	630	90		
			600			350	5560	1530	-7NV1	630	91		
				730		416	5430	1550	-2XV1	620	93		
					830	472	5430	1550	-2YV1	620	93		
455						282	5920	1470	1HQ7 354-5NC -1VV1	740	90	43.8	0.71
	515					318	5900	1470	-1WV1	740	91		
		575				354	5880	1470	-7MV1	735	91		
			670			412	5870	1470	-7NV1	735	92		
				810		478	5630	1530	-2XV1	705	93		
					920	535	5560	1540	-2YV1	700	94		
520						310	5700	1460	1HQ7 354-5ND -1VV1	805	90	36	0.49
	585					350	5700	1460	-1WV1	805	91		
		655				386	5640	1470	-7MV1	800	92		
			760			448	5630	1480	-7NV1	795	93		
				925		510	5260	1550	-2XV1	750	94		
					1040	575	5260	1550	-2YV1	745	94		
595						334	5350	1500	1HQ7 354-5NE -1VV1	855	92	26.4	0.45
	675					376	5320	1500	-1WV1	850	93		
		750				416	5300	1510	-7MV1	850	93		
			870			482	5290	1510	-7NV1	845	94		
				1050		570	5180	1530	-2XV1	830	94		
					1190	635	5100	1550	-2YV1	820	95		
665						384	5510	1440	1HQ7 354-5NF -1VV1	980	92	21.9	0.34
	750					432	5500	1440	-1WV1	980	93		
		835				476	5440	1450	-7MV1	970	93		
			965			550	5440	1460	-7NV1	965	94		
				1170		605	4930	1570	-2XV1	880	95		
755						406	5130	1550	1HQ7 354-5NG -1VV1	1020	93	15.7	0.26
	850					456	5120	1550	-1WV1	1020	94		
		945				500	5050	1570	-7MV1	1010	94		
			1100			580	5050	1570	-7NV1	1010	95		
855						432	4820	1600	1HQ7 354-5NH -1VV1	1090	93	13.3	0.19
	960					485	4820	1600	-1WV1	1090	94		
		1070				530	4730	1620	-7MV1	1070	94		
995						492	4720	1830	1HQ7 354-5NJ -1VV1	1230	94	10.5	0.16
	1120					550	4690	1840	1HQ7 354-5NJ -1VV1	1230	94		
Rated field voltage						310 V		4					
Type of construction						IM B 3		0					

1) Please note remarks on field weakening on page 3/97.

Selection and ordering

1HQ7 Size 355

Rated speed n_N rpm	Rated output					Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V						810 V	Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH
Overall length 5													
282						220	7440	1130	1HQ7 355-5NA -1VV1	600	86	73.5	1.25
	322					250	7410	1280	-1WV1	600	87		
		360				278	7370	1280	-7MV1	595	89		
			420			326	7400	1280	-7NV1	595	90		
				515		390	7250	1300	-2XV1	585	91		
					585	440	7180	1310	-2YV1	585	92		
326						232	6800	1300	1HQ7 355-5NB -1VV1	620	87	62.9	0.88
	370					262	6760	1350	-1WV1	620	89		
		414				292	6730	1350	-7MV1	620	90		
			484			340	6700	1360	-7NV1	615	91		
				590		408	6600	1370	-2XV1	610	92		
					665	462	6620	1370	-2YV1	610	93		
365						275	7190	1300	1HQ7 355-5NC -1VV1	725	89	49.7	0.85
	412					310	7180	1300	-1WV1	725	90		
		460				345	7160	1300	-7MV1	720	91		
			535			402	7160	1300	-7NV1	720	92		
				650		482	7080	1320	-2XV1	715	93		
					740	545	7030	1320	-2YV1	715	93		
416						302	6930	1290	1HQ7 355-5ND -1VV1	790	90	40.7	0.57
	470					342	6940	1290	-1WV1	790	91		
		525				378	6880	1300	-7MV1	785	91		
			610			440	6880	1300	-7NV1	785	92		
				745		520	6670	1320	-2XV1	770	93		
					840	590	6700	1320	-2YV1	770	94		
480						330	6570	1310	1HQ7 355-5NE -1VV1	850	91	30	0.53
	540					372	6560	1310	-1WV1	850	92		
		605				412	6500	1320	-7MV1	845	93		
			700			478	6520	1320	-7NV1	845	93		
				850		570	6410	1330	-2XV1	830	94		
					960	645	6420	1330	-2YV1	835	95		
535						378	6750	1260	1HQ7 355-5NF -1VV1	970	92	24.8	0.4
	600					426	6750	1260	-1WV1	970	92		
		670				472	6720	1270	-7MV1	965	93		
			780			550	6740	1260	-7NV1	970	94		
				945		635	6420	1310	-2XV1	925	94		
610						402	6300	1360	1HQ7 355-5NG -1VV1	1020	93	17.8	0.31
	685					452	6300	1360	-1WV1	1020	93		
		760				500	6280	1370	-7MV1	1010	94		
			885			580	6260	1360	-7NV1	1010	94		
690						430	5950	1400	1HQ7 355-5NH -1VV1	1090	93	15.1	0.23
	775					482	5940	1410	-1WV1	1080	94		
		860				530	5880	1420	-7MV1	1070	94		
805						490	5820	1630	1HQ7 355-5NJ -1VV1	1230	94	11.9	0.19
	905					550	5810	1630	1HQ7 355-5NJ -1VV1	1230	94		
Rated field voltage					310 V								
Type of construction					IM B 3								

¹⁾ Please note remarks on field weakening on page 3/97.

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1HQ7 351	3.8	17	2200	2700
1HQ7 352	4.1	20	2200	2900
1HQ7 353	4.5	22	2200	3100
1HQ7 354	5.1	25	2200	3300
1HQ7 355	5.7	29	2200	3600

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: "C05" for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and "C06" for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed $n_{F\text{max}}$.

For speeds $> n_{F\text{max}}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

Selection and ordering

1HQ7 Size 400

Selection and ordering data

These motors are compensated.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit						
							Resistance at 120 °C R_a mΩ	Inductance L_a mH					
at rated armature voltage													
420 V	470 V	520 V	600 V	720 V	810 V								
Overall length 1													
426				230	5150	1700	1HQ7 401-5NA	-1VV1	600	90	59.2	1.13	
	482			260	5150	1730		-1VV1	600	91			
		540		288	5100	1740		-7MV1	595	91			
			625	334	5100	1740		-7NV1	595	92			
			760	394	4950	1780		-2XV1	580	93			
			860	440	4900	1790		-2YV1	570	94			
478				258	5150	1710	1HQ7 401-5NB	-1VV1	670	90	46.3	0.73	
	540			292	5150	1700		-1VV1	670	91			
		605		320	5050	1720		-7MV1	660	92			
			700	370	5050	1730		-7NV1	655	93			
			850	430	4820	1780		-2XV1	630	94			
			960	482	4800	1790		-2YV1	625	94			
545				285	5000	1720	1HQ7 401-5NC	-1VV1	735	91	37.5	0.54	
	610			322	5050	1720		-1VV1	740	92			
		685		350	4880	1750		-7MV1	720	92			
			795	404	4850	1760		-7NV1	715	93			
			965	460	4560	1840		-2XV1	670	94			
			1090	515	4500	1850		-2YV1	665	94			
605				324	5100	1720	1HQ7 401-5ND	-1VV1	830	92	28.8	0.53	
	685			364	5100	1720		-1VV1	825	93			
		760		396	4980	1750		-7MV1	805	93			
			885	455	4920	1760		-7NV1	795	94			
			1070	515	4600	1840		-2XV1	745	95			
			1210	570	4500	1870		-2YV1	730	95			
695				358	4920	1700	1HQ7 401-5NE	-1VV1	910	93	24.5	0.34	
	780			400	4900	1710		-1VV1	900	93			
		870		428	4700	1760		-7MV1	860	94			
			1010	492	4650	1770		-7NV1	860	94			
			1220	530	4150	1900		-2XV1	765	95			
				1380	590	4080	1900	1HQ7 401-5NE	-2YV1	755	95		
Rated field voltage		310 V											
Type of construction		IM B 3											

¹⁾ Please note remarks on field weakening on page 3/107.

Selection and ordering

1HQ7
Size 400



Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
at rated armature voltage												R_a mΩ	L_a mH
420 V	470 V	520 V	600 V	720 V	810 V								
780						382	4680	1770	1HQ7 401-5NF -1VV1	965	93	19	0.27
	880					428	4650	1770	-1WV1	960	94		
		980				468	4560	1790	-7MV1	945	94		
			1140			535	4500	1810	-7NV1	930	95		
				1380		555	3840	1900	-2XV1	800	95		
					1550	615	3780	1900	-2YV1	790	95		
890						444	4760	1730	1HQ7 401-5NG -1VV1	1110	94	14.1	0.28
	1000					492	4700	1750	-1WV1	1100	94		
		1110				515	4420	1820	-7MV1	1030	95		
			1290			580	4290	1850	-7NV1	1000	95		
				1560		595	3640	1900	-2XV1	855	95		
1000						464	4440	1770	1HQ7 401-5NH -1VV1	1160	94	11.3	0.18
	1120					520	4420	1780	-1WV1	1160	95		
		1250				540	4120	1860	-7MV1	1080	95		
			1450			610	4020	1890	-7NV1	1060	95		
1220						515	4030	1900	1HQ7 401-5NJ -1VV1	1280	94	8.3	0.12
	1370					575	4000	1900	-1WV1	1280	95		
		1530				545	3400	1900	1HQ7 401-5NJ -7MV1	1090	95		
Rated field voltage						310 V							
Type of construction						IM B 3							

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1) Please note remarks on field weakening on page 3/107.

Selection and ordering

1HQ7 Size 400

Rated speed n_N rpm	Rated output						Maximum field weak- ening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Effi- ciency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V					Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH	
Overall length 2													
350						234	6400	1400	1HQ7 402-5NA -1VV1	615	89	64.6	1.3
	396					264	6350	1550	-1WV1	615	90		
		442				292	6300	1560	-7MV1	610	91		
			515			338	6250	1570	-7NV1	605	92		
				625		402	6140	1600	-2XV1	595	93		
					710	452	6100	1600	-2YV1	590	94		
394						260	6300	1530	1HQ7 402-5NB -1VV1	680	90	50.4	0.82
	445					294	6300	1530	-1WV1	680	91		
		496				324	6250	1550	-7MV1	670	91		
			580			376	6200	1550	-7NV1	670	92		
				700		440	6000	1590	-2XV1	645	93		
					795	496	5950	1590	-2YV1	645	94		
446						288	6150	1550	1HQ7 402-5NC -1VV1	750	90	40.8	0.6
	505					325	6150	1550	-1WV1	750	91		
		565				356	6000	1570	-7MV1	735	92		
			655			412	6000	1580	-7NV1	730	93		
				795		475	5700	1630	-2XV1	695	94		
					900	535	5700	1640	-2YV1	695	94		
500						322	6150	1570	1HQ7 402-5ND -1VV1	825	92	31.4	0.6
	565					362	6120	1570	-1WV1	825	92		
		625				402	6120	1570	-7MV1	820	93		
			730			465	6080	1580	-7NV1	820	94		
				885		535	5800	1630	-2XV1	780	94		
					1000	595	5700	1650	-2YV1	765	95		
570						364	6100	1520	1HQ7 402-5NE -1VV1	930	92	26.6	0.39
	645					408	6050	1530	-1WV1	925	93		
		715				440	5900	1570	-7MV1	895	93		
			830			510	5860	1570	-7NV1	895	94		
				1010		565	5350	1670	-2XV1	820	95		
					1140	630	5280	1680	1HQ7 402-5NE -2YV1	810	95		
Rated field voltage						310 V 							
Type of construction						IM B 3 							

¹⁾ Please note remarks on field weakening on page 3/107.

Selection and ordering

1HQ7
Size 400



Rated speed n_N rpm	at rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V							Resistance at 120 °C R_a mΩ	Inductance L_a mH	
645							380	5620	1610	1HQ7 402-5NF	-1VV1	965	93	20.7	0.3
	725						428	5620	1610		-1VV1	965	93		
		810					472	5580	1620		-7MV1	955	94		
			940				545	5550	1620		-7NV1	950	94		
				1140			600	5020	1730		-2XV1	865	95		
					1280		670	5000	1750		-2YV1	860	95		
735							444	5770	1580	1HQ7 402-5NG	-1VV1	1120	94	15.4	0.33
	825						498	5750	1580		-1VV1	1110	94		
		920					545	5650	1600		-7MV1	1100	95		
			1070				620	5550	1620		-7NV1	1080	95		
				1290			670	4980	1750		-2XV1	965	95		
825							450	5200	1650	1HQ7 402-5NH	-1VV1	1120	94	12.3	0.21
	930						505	5200	1580		-1VV1	1120	94		
		1030					555	5150	1660		-7MV1	1110	95		
			1190				640	5130	1670		-7NV1	1110	95		
1010							515	4880	1880	1HQ7 402-5NJ	-1VV1	1280	94	9	0.13
	1130						580	4880	1880		-1VV1	1290	95		
		1260					615	4660	1900	1HQ7 402-5NJ	-7MV1	1230	95		
Rated field voltage						310 V						4			
Type of construction						IM B 3						0			

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1) Please note remarks on field weakening on page 3/107.

Selection and ordering

1HQ7 Size 400

Rated speed n_N rpm	Rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	420 V	470 V	520 V	600 V	720 V	810 V							Resistance at 120 °C R_a mΩ	Inductance L_a mH
Overall length 3														
294						232	7540	1180	1HQ7 403-5NA	-1VV1	615	88	70.4	1.48
	332					262	7540	1330		-1WV1	615	89		
		372				292	7500	1420		-7MV1	615	90		
			434			338	7450	1430		-7NV1	610	91		
				525		404	7350	1450		-2XV1	600	93		
					595	455	7300	1450		-2YV1	595	93		
332						255	7340	1330	1HQ7 403-5NB	-1VV1	670	89	54.9	0.93
	375					290	7400	1390		-1WV1	675	90		
		418				320	7300	1400		-7MV1	665	91		
			488			372	7300	1410		-7NV1	665	92		
				590		442	7150	1430		-2XV1	650	93		
					670	498	7100	1440		-2YV1	650	94		
375						288	7340	1400	1HQ7 403-5NC	-1VV1	755	90	44.4	0.67
	424					324	7300	1410		-1WV1	750	91		
		474				356	7200	1430		-7MV1	740	91		
			550			414	7200	1430		-7NV1	740	92		
				670		482	6870	1470		-2XV1	710	93		
					760	545	6850	1470		-2YV1	710	94		
420						320	7260	1430	1HQ7 403-5ND	-1VV1	825	91	34.2	0.68
	475					362	7280	1430		-1WV1	825	92		
		530				400	7220	1440		-7MV1	820	93		
			615			466	7240	1430		-7NV1	825	93		
				745		545	7000	1470		-2XV1	795	94		
					840	610	6940	1480		-2YV1	790	95		
480						364	7250	1380	1HQ7 403-5NE	-1VV1	935	92	29	0.43
	540					410	7250	1380		-1WV1	935	92		
		600				446	7100	1410		-7MV1	910	93		
			700			515	7050	1420		-7NV1	905	94		
				850		585	6600	1480		-2XV1	850	95		
					960	655	6500	1490	1HQ7 403-5NE	-2YV1	845	95		
Rated field voltage						310 V 								
Type of construction						IM B 3 								

¹⁾ Please note remarks on field weakening on page 3/107.

Selection and ordering

1HQ7
Size 400

Rated speed n_N rpm	at rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V							Resistance at 120 °C R_a mΩ	Inductance L_a mH	
545							384	6740	1460	1HQ7 403-5NF	-1VV1	980	92	22.5	0.33
	610						432	6750	1460		-1VV1	980	93		
		680					478	6700	1460		-7MV1	975	93		
			790				555	6700	1460		-7NV1	975	94		
				955			630	6300	1530		-2XV1	915	95		
					1080		705	6230	1540		-2YV1	905	95		
620							455	7000	1410	1HQ7 403-5NG	-1VV1	1150	93	16.8	0.37
	695						510	7000	1420		-1VV1	1150	94		
		775					560	6900	1430		-7MV1	1130	94		
			900				635	6750	1450		-7NV1	1110	95		
				1080			705	6250	1550		-2XV1	1020	95		
695							465	6400	1470	1HQ7 403-5NH	-1VV1	1170	94	13.4	0.23
	780						520	6350	1480		-1VV1	1160	94		
		870					575	6300	1480		-7MV1	1160	95		
			1010				660	6250	1480		-7NV1	1150	95		
850							520	5850	1720	1HQ7 403-5NJ	-1VV1	1300	94	9.8	0.15
	955						580	5800	1730		-1VV1	1290	95		
		1060					635	5720	1750	1HQ7 403-5NJ	-7MV1	1280	95		
Rated field voltage						310 V						4			
Type of construction						IM B 3						0			

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1) Please note remarks on field weakening on page 3/107.

Selection and ordering

1HQ7 Size 400

Rated speed n_N rpm	Rated speed					Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	420 V	470 V	520 V	600 V	720 V							810 V	Resistance at 120 °C R_a mΩ	Inductance $L_a$ mH
Overall length 4													
240						228	9100	950	1HQ7 404-5NA -1VV1	615	87	78.5	1.74
	270					255	9000	1080	-1WV1	600	88		
		302				286	9000	1210	-7MV1	605	89		
			354			336	9050	1260	-7NV1	610	91		
				430		402	8900	1280	-2XV1	600	92		
					488	455	8900	1280	-2YV1	600	93		
268						255	9050	1270	1HQ7 404-5NB -1VV1	680	88	61.2	1.07
	305					288	9000	1220	-1WV1	675	89		
		340				320	8950	1240	-7MV1	675	90		
			398			376	9000	1240	-7NV1	680	91		
				484		448	8850	1260	-2XV1	665	93		
					550	505	8800	1270	-2YV1	660	93		
306						285	8900	1220	1HQ7 404-5NC -1VV1	755	89	49.3	0.77
	345					322	8900	1250	-1WV1	750	90		
		386				356	8800	1260	-7MV1	745	91		
			450			415	8800	1260	-7NV1	745	92		
				550		485	8450	1290	-2XV1	715	93		
					620	550	8450	1290	-2YV1	720	94		
344						310	8600	1270	1HQ7 404-5ND -1VV1	800	90	38.2	0.8
	388					350	8600	1280	-1WV1	805	91		
		432				400	8800	1270	-7MV1	825	92		
			505			456	8620	1280	-7NV1	810	93		
				610		545	8520	1280	-2XV1	800	94		
					690	615	8500	1280	-2YV1	795	94		
392						365	8900	1220	1HQ7 404-5NE -1VV1	945	91	32.3	0.5
	442					412	8900	1220	-1WV1	945	92		
		492				450	8750	1240	-7MV1	925	92		
			575			520	8650	1250	-7NV1	920	93		
				695		600	8250	1290	-2XV1	875	94		
					785	675	8200	1300	1HQ7 404-5NE -2YV1	870	95		
Rated field voltage					310 V								
Type of construction					IM B 3								

¹⁾ Please note remarks on field weakening on page 3/107.

Selection and ordering

1HQ7
Size 400



Rated speed n_N rpm	at rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V							Resistance at 120 °C R_a mΩ	Inductance L_a mH	
445							378	8100	1310	1HQ7 404-5NF	-1VV1	965	92	25	0.38
	500						426	8100	1310		-1VV1	970	92		
		555					475	8150	1300		-7MV1	970	93		
			650				555	8150	1300		-7NV1	975	94		
				785			655	8000	1320		-2XV1	950	95		
					885		740	8000	1320		-2YV1	950	95		
505							454	8550	1260	1HQ7 404-5NG	-1VV1	1150	93	18.8	0.44
	570						510	8550	1260		-1VV1	1150	93		
		635					565	8500	1260		-7MV1	1140	94		
			735				655	8500	1260		-7NV1	1140	94		
				890			740	7940	1260		-2XV1	1070	95		
570							465	7800	1310	1HQ7 404-5NH	-1VV1	1170	93	15	0.27
	640						525	7800	1300		-1VV1	1170	94		
		715					575	7700	1320		-7MV1	1160	94		
			825				670	7750	1310		-7NV1	1170	95		
700							520	7100	1550	1HQ7 404-5NJ	-1VV1	1300	94	10.9	0.17
	785						585	7100	1550		-1VV1	1300	94		
		870					640	7000	1570	1HQ7 404-5NJ	-7MV1	1290	95		
Rated field voltage						310 V						4			
Type of construction						IM B 3						0			

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1) Please note remarks on field weakening on page 3/107.

Selection and ordering

1HQ7 Size 400

Rated speed n_N rpm	Rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit Resistance at 120 °C R_a mΩ	Inductance L_a mH
	420 V	470 V	520 V	600 V	720 V	810 V								
Overall length 5														
183						225	11700	730	1HQ7 405-5NA	-1VV1	620	85	91.7	2.16
208						256	11700	830		-1WV1	620	87		
	234					285	11600	935		-7MV1	615	88		
		274				334	11600	1070		-7NV1	615	89		
			334			404	11500	1080		-2XV1	610	91		
				380		456	11500	1080		-2YV1	605	92		
206						250	11600	825	1HQ7 405-5NB	-1VV1	675	86	71.3	1.31
235						284	11500	940		-1WV1	680	88		
	262					316	11500	1050		-7MV1	675	89		
		308				370	11500	1050		-7NV1	675	90		
			375			448	11400	1060		-2XV1	670	92		
				425		505	11300	1070		-2YV1	670	92		
235						282	11500	940	1HQ7 405-5NC	-1VV1	760	87	57.4	0.92
266						320	11500	1050		-1WV1	760	88		
	298					354	11300	1060		-7MV1	750	89		
		348				414	11300	1060		-7NV1	750	91		
			424			492	11100	1090		-2XV1	735	92		
				480		555	11000	1090		-2YV1	730	93		
266						314	11300	1060	1HQ7 405-5ND	-1VV1	825	89	44.6	0.98
300						354	11200	1090		-1WV1	825	90		
	335					394	11200	1090		-7MV1	820	91		
		390				460	11200	1090		-7NV1	820	92		
			474			555	11200	1090		-2XV1	820	93		
				535		630	11200	1090		-2YV1	820	94		
302						360	11300	1040	1HQ7 405-5NE	-1VV1	940	90	37.5	0.6
342						408	11400	1030		-1WV1	945	91		
	382					450	11300	1040		-7MV1	935	92		
		444				525	11300	1040		-7NV1	935	92		
			540			615	11000	1070		-2XV1	900	94		
				610		695	10900	1070	1HQ7 405-5NE	-2YV1	900	94		
Rated field voltage						310 V 								
Type of construction						IM B 3 								

¹⁾ Please note remarks on field weakening on page 3/107.

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
420 V	470 V	520 V	600 V	720 V	810 V							Resistance at 120 °C R_a mΩ	Inductance L_a mH
344						386	10700	1080	1HQ7 405-5NF -1VV1	1000	91	29.1	0.46
	388					435	10700	1080	-1WV1	1000	92		
		432				482	10600	1090	-7MV1	995	92		
			500			560	10600	1090	-7NV1	995	93		
				610		670	10500	1100	-2XV1	980	94		
					685	760	10500	1100	-2YV1	985	95		
394						450	10900	1070	1HQ7 405-5NG -1VV1	1150	92	21.9	0.54
	444					505	10800	1070	-1WV1	1150	93		
		494				560	10800	1080	-7MV1	1140	93		
			575			655	10900	1070	-7NV1	1150	94		
				695		770	10600	995	-2XV1	1120	95		
444						460	9900	1110	1HQ7 405-5NH -1VV1	1160	93	17.4	0.33
	498					520	9950	1110	-1WV1	1170	93		
		555				575	9900	1120	-7MV1	1160	94		
			645			670	9900	1110	-7NV1	1170	94		
540						520	9200	1340	1HQ7 405-5NJ -1VV1	1310	93	12.7	0.2
	610					585	9200	1340	-1WV1	1310	94		
		675				645	9100	1340	1HQ7 405-5NJ -7MV1	1300	94		
Rated field voltage						310 V			4				
Type of construction						IM B 3			0				

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1HQ7 401	4.3	23	2000	3300
1HQ7 402	4.8	26	2000	3600
1HQ7 403	5.2	30	2000	4000
1HQ7 404	6.1	34	2000	4400
1HQ7 405	6.6	41	2000	5100

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: "C05" for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and "C06" for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed n_{Fmax} .

For speeds $> n_{Fmax}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

¹⁾ Please note remarks on field weakening.

Selection and ordering

1HQ7 Size 450

Selection and ordering data

These motors are compensated.

Rated speed n_N rpm	Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit						
							Resistance at 120 °C R_a mΩ	Inductance L_a mH					
at rated armature voltage													
420 V	470 V	520 V	600 V	720 V	810 V								
Overall length 1													
262				189	6890	1050	1HQ7 451-5NA	-1VV1	515	86	93.1	1.53	
	298			214	6860	1190		-1WV1	510	88			
		334		238	6800	1340		-7MV1	510	89			
			390	278	6810	1480		-7NV1	510	90			
			476	334	6700	1490		-2XV1	500	92			
			540	378	6680	1490		-2YV1	500	92			
296				214	6900	1180	1HQ7 451-5NB	-1VV1	570	88	70.9	1.32	
	336			242	6880	1340		-1WV1	570	89			
		375		268	6820	1460		-7MV1	565	90			
			438	314	6840	1460		-7NV1	565	91			
			530	374	6740	1480		-2XV1	555	93			
			605	422	6680	1480		-2YV1	555	93			
332				240	6900	1330	1HQ7 451-5NC	-1VV1	635	89	58.5	0.93	
	375			270	6880	1460		-1WV1	630	90			
		418		300	6840	1460		-7MV1	625	91			
			488	348	6800	1470		-7NV1	625	92			
			595	412	6610	1500		-2XV1	610	93			
			670	464	6610	1500		-2YV1	605	94			
375				270	6880	1440	1HQ7 451-5ND	-1VV1	710	90	49.1	0.76	
	424			305	6870	1440		-1WV1	710	91			
		474		336	6770	1450		-7MV1	700	91			
			550	392	6800	1450		-7NV1	700	92			
			670	460	6560	1480		-2XV1	680	93			
			760	515	6470	1500		-2YV1	670	94			
430				310	6890	1450	1HQ7 451-5NE	-1VV1	800	91	35.5	0.66	
	486			350	6880	1440		-1WV1	800	92			
		540		384	6790	1460		-7MV1	790	93			
			630	444	6730	1470		-7NV1	785	93			
			765	515	6430	1510		-2XV1	750	94			
			865	580	6410	1520	1HQ7 451-5NE	-2YV1	750	95			
Rated field voltage		310 V											
Type of construction		IM B 3											

¹⁾ Please note remarks on field weakening on page 3/117.

Selection and ordering

1HQ7
Size 450



Rated speed n_N rpm							Rated output P_N kW	Rated torque M_N Nm	Maximum field weak- ening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Effi- ciency η %	Armature circuit		
at rated armature voltage													Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH	
420 V	470 V	520 V	600 V	720 V	810 V										
520						370	6800	1420	1HQ7 451-5NF	-1VV1	945	92	25	0.49	
	585					415	6770	1430		-1WV1	940	93			
		650				454	6660	1440		-7MV1	925	94			
			755			520	6580	1460		-7NV1	915	94			
				915		595	6210	1520		-2XV1	865	95			
					1030	665	6160	1530		-2YV1	855	95			
630						432	6550	1420	1HQ7 451-5NG	-1VV1	1090	93	17.2	0.35	
	705					485	6570	1420		-1WV1	1090	94			
		785				530	6440	1440		-7MV1	1070	94			
			915			605	6310	1450		-7NV1	1050	95			
				1100		670	5810	1540		-2XV1	965	96			
					1240	740	5700	1570		-2YV1	945	96			
790						510	6170	1450	1HQ7 451-5NH	-1VV1	1280	94	12.3	0.19	
	885					575	6200	1450		-1WV1	1280	94			
		985				605	5860	1500		-7MV1	1220	95			
			1140			690	5770	1520		-7NV1	1200	95			
900						575	6100	1460	1HQ7 451-5NJ	-1VV1	1430	95	9	0.17	
	1010					645	6100	1460		-1WV1	1430	95			
		1130				665	5610	1540	1HQ7 451-5NJ	-7MV1	1330	95			
Rated field voltage						310 V									
Type of construction						IM B 3									

3

1) Please note remarks on field weakening on page 3/117.

Selection and ordering

1HQ7 Size 450

Rated speed n_N rpm	Rated output					Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	420 V	470 V	520 V	600 V	720 V						810 V	Resis- tance at 120 °C R_a mΩ	Induc- tance $L_a$ mH
Overall length 2												
216					187	8270	865	1HQ7 452-5NA -1VV1	515	85	101	1.7
	246				212	8230	985	-1WV1	510	87		
		276			238	8230	1100	-7MV1	515	88		
			324		278	8190	1300	-7NV1	510	89		
				395	334	8080	1370	-2XV1	505	91		
					448	378	8060	1370	-2YV1	500	92	
245					212	8260	980	1HQ7 452-5NB -1VV1	570	87	76.7	1.47
	278				240	8240	1110	-1WV1	570	88		
		310			268	8260	1240	-7MV1	570	89		
			362		312	8230	1340	-7NV1	565	91		
				442	375	8100	1350	-2XV1	560	92		
					500	424	8100	1350	-2YV1	560	93	
274					238	8300	1100	1HQ7 452-5NC -1VV1	635	88	63.1	1.03
	310				270	8300	1240	-1WV1	635	89		
		348			298	8180	1350	-7MV1	630	90		
			405		348	8200	1350	-7NV1	625	91		
				494	414	8000	1370	-2XV1	615	93		
					560	468	7980	1370	-2YV1	615	93	
310					270	8320	1240	1HQ7 452-5ND -1VV1	715	89	52.9	0.84
	352				305	8270	1310	-1WV1	715	90		
		392			336	8180	1330	-7MV1	705	91		
			458		392	8170	1330	-7NV1	705	92		
				555	462	7950	1360	-2XV1	685	93		
					630	520	7880	1360	-2YV1	680	94	
356					310	8320	1320	1HQ7 452-5NE -1VV1	805	90	38.4	0.74
	402				350	8320	1320	-1WV1	805	91		
		448			385	8200	1340	-7MV1	795	92		
			525		446	8120	1340	-7NV1	790	93		
				635	525	7900	1370	-2XV1	770	94		
					715	590	7880	1380	1HQ7 452-5NE -2YV1	765	94	
Rated field voltage					310 V 							
Type of construction					IM B 3 							

¹⁾ Please note remarks on field weakening on page 3/117.

Selection and ordering

1HQ7
Size 450



Rated speed n_N rpm							Rated output P_N kW	Rated torque M_N Nm	Maximum field weak- ening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Effi- ciency η %	Armature circuit		
at rated armature voltage													Resis- tance at 120 °C R_a mΩ		Induc- tance L_a mH
420 V	470 V	520 V	600 V	720 V	810 V										
430						370	8210	1300	1HQ7 452-5NF	-1VV1	950	92	27	0.55	
	484					416	8210	1310		-1VV1	950	92			
		540				456	8060	1320		-7MV1	935	93			
			625			525	8020	1330		-7NV1	925	94			
				760		610	7670	1370		-2XV1	885	95			
					860	680	7560	1380		-2YV1	875	95			
520						440	8080	1280	1HQ7 452-5NG	-1VV1	1120	93	18.6	0.39	
	585					494	8060	1280		-1VV1	1110	94			
		655				535	7800	1310		-7MV1	1090	94			
			760			615	7720	1320		-7NV1	1070	95			
				915		695	7260	1380		-2XV1	1000	95			
					1040	770	7070	1400		-2YV1	985	96			
655						525	7660	1300	1HQ7 452-5NH	-1VV1	1320	94	13.3	0.21	
	735					585	7600	1310		-1VV1	1310	94			
		820				620	7220	1360		-7MV1	1250	95			
			950			715	7190	1360		-7NV1	1240	95			
750						570	7260	1350	1HQ7 452-5NJ	-1VV1	1420	94	9.74	0.19	
	840					640	7270	1350		-1VV1	1420	95			
		935				690	7050	1380	1HQ7 452-5NJ	-7MV1	1380	95			
Rated field voltage						310 V									
Type of construction						IM B 3									

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1) Please note remarks on field weakening on page 3/117.

Selection and ordering

1HQ7 Size 450

Rated speed n_N rpm	Rated output						Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
	420 V	470 V	520 V	600 V	720 V	810 V						Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH
Overall length 3													
179						186	9920	715	1HQ7 453-5NA -1VV1	520	84	110	1.92
	204					212	9920	815	-1WV1	520	86		
		228				236	9880	910	-7MV1	515	87		
			268			276	9840	1070	-7NV1	510	89		
				328		335	9750	1230	-2XV1	510	90		
					372	380	9760	1230	-2YV1	510	91		
202						212	10000	810	1HQ7 453-5NB -1VV1	580	86	84.2	1.68
	230					240	9960	920	-1WV1	575	87		
		258				268	9920	1030	-7MV1	575	89		
			302			312	9870	1210	-7NV1	570	90		
				368		376	9760	1220	-2XV1	565	92		
					418	426	9730	1220	-2YV1	565	92		
228						238	9970	910	1HQ7 453-5NC -1VV1	640	87	69.1	1.16
	258					270	9990	1030	-1WV1	640	88		
		288				298	9880	1150	-7MV1	635	90		
			338			348	9840	1210	-7NV1	630	91		
				410		418	9740	1230	-2XV1	625	92		
					465	472	9690	1230	-2YV1	620	93		
258						268	9920	1030	1HQ7 453-5ND -1VV1	720	88	57.8	0.93
	292					304	9940	1170	-1WV1	720	89		
		326				338	9900	1190	-7MV1	715	90		
			382			394	9850	1190	-7NV1	710	91		
				464		468	9630	1210	-2XV1	695	93		
					525	530	9640	1210	-2YV1	695	93		
296						312	11000	1180	1HQ7 453-5NE -1VV1	820	90	42.1	0.83
	335					352	10000	1190	-1WV1	815	91		
		374				388	9900	1200	-7MV1	805	91		
			436			450	9860	1210	-7NV1	805	92		
				530		535	9640	1220	-2XV1	785	94		
					600	600	9550	1230	1HQ7 453-5NE -2YV1	780	94		
Rated field voltage						310 V 							
Type of construction						IM B 3 							

¹⁾ Please note remarks on field weakening on page 3/117.

Selection and ordering

1HQ7
Size 450


Rated speed n_N rpm							Rated output P_N kW	Rated torque M_N Nm	Maximum field weak- ening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Effi- ciency η %	Armature circuit	
at rated armature voltage	420 V	470 V	520 V	600 V	720 V	810 V							Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH
358							372	9920	1170	1HQ7 453-5NF -1VV1	960	91	29.6	0.63
	404						420	9920	1170	-1WV1	960	92		
		450					462	9800	1180	-7MV1	950	93		
			525				535	9730	1190	-7NV1	945	93		
				635			625	9400	1220	-2XV1	910	94		
					715		700	9350	1230	-2YV1	905	95		
435							446	9790	1140	1HQ7 453-5NG -1VV1	1140	92	20.4	0.45
	490						500	9740	1150	-1WV1	1130	93		
		545					545	9550	1170	-7MV1	1110	94		
			635				630	9470	1170	-7NV1	1100	94		
				765			725	9050	1220	-2XV1	1050	95		
					865		805	8890	1230	-2YV1	1030	95		
545							535	9370	1160	1HQ7 453-5NH -1VV1	1350	93	14.5	0.23
	615						600	9320	1160	-1WV1	1350	94		
		685					645	9000	1190	-7MV1	1300	94		
			795				740	8900	1200	-7NV1	1290	95		
625							590	9010	1190	1HQ7 453-5NJ -1VV1	1480	94	10.7	0.21
	705						665	9000	1190	-1WV1	1480	95		
		780					720	8810	1210	1HQ7 453-5NJ -7MV1	1450	95		
Rated field voltage						310 V	4							
Type of construction						IM B 3	0							

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1) Please note remarks on field weakening on page 3/117.

Selection and ordering

1HQ7 Size 450

Rated speed n_N rpm	Rated output						Maximum field weak- ening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Effi- ciency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V					Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH	
Overall length 4													
144						183	12100	575	1HQ7 454-5NA -1VV1	520	82	123	2.21
	164					208	12100	655	-1WV1	520	84		
		185				234	12100	740	-7MV1	520	86		
			218			274	12000	870	-7NV1	515	87		
				266		334	12000	1060	-2XV1	515	89		
					302	378	12000	1090	-2YV1	510	90		
164						208	12100	655	1HQ7 454-5NB -1VV1	575	85	94.2	1.95
	186					238	12200	745	-1WV1	580	86		
		208				265	12200	830	-7MV1	575	87		
			245			310	12100	980	-7NV1	575	89		
				298		376	12100	1070	-2XV1	570	91		
					340	426	12000	1080	-2YV1	570	92		
184						235	12200	735	1HQ7 454-5NC -1VV1	640	86	77	1.33
	208					266	12200	830	-1WV1	640	87		
		234				298	12200	935	-7MV1	640	88		
			274			348	12100	1070	-7NV1	640	90		
				334		418	12000	1090	-2XV1	630	91		
					378	474	12000	1090	-2YV1	630	92		
208						266	12200	830	1HQ7 454-5ND -1VV1	720	87	64.4	1.06
	236					302	12200	945	-1WV1	720	88		
		265				336	12100	1050	-7MV1	720	89		
			310			392	12100	1060	-7NV1	715	90		
				378		470	11900	1070	-2XV1	705	92		
					428	530	11800	1070	-2YV1	700	93		
240						308	12300	960	1HQ7 454-5NE -1VV1	815	89	47.1	0.97
	272					348	12200	1060	-1WV1	815	90		
		304				386	12100	1070	-7MV1	810	91		
			354			450	12100	1070	-7NV1	810	92		
				430		535	11900	1090	-2XV1	790	93		
					488	605	11800	1090	1HQ7 454-5NE -2YV1	790	94		
Rated field voltage						310 V 							
Type of construction						IM B 3							

¹⁾ Please note remarks on field weakening on page 3/117.

Selection and ordering

1HQ7
Size 450

Rated speed n_N rpm	at rated armature voltage						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V							Resistance at 120 °C R_a mΩ	Inductance L_a mH	
290							372	12300	1030	1HQ7 454-5NF	-1VV1	970	90	33.1	0.73
	328						420	12200	1030		-1WV1	970	91		
		366					462	12100	1050		-7MV1	955	92		
			426				535	12000	1050		-7NV1	950	93		
				520			635	11700	1070		-2XV1	930	94		
					585		715	11700	1070		-2YV1	925	94		
354							446	12000	1010	1HQ7 454-5NG	-1VV1	1150	92	22.8	0.53
	400						500	11900	1010		-1WV1	1140	93		
		445					550	11800	1020		-7MV1	1130	93		
			515				635	11800	1030		-7NV1	1120	94		
				625			740	11300	1060		-2XV1	1080	95		
					705		830	11200	1010		-2YV1	1070	95		
444							535	11500	1020	1HQ7 454-5NH	-1VV1	1360	93	16.2	0.27
	500						605	11600	1020		-1WV1	1370	93		
		555					655	11300	1040		-7MV1	1330	94		
			645				760	11300	1040		-7NV1	1330	95		
510							590	11100	1050	1HQ7 454-5NJ	-1VV1	1490	94	12	0.25
		575					660	11000	1060		-1WV1	1480	94		
			640				730	10900	1060	1HQ7 454-5NJ	-7MV1	1470	95		
Rated field voltage						310 V						4			
Type of construction						IM B 3						0			

3

1) Please note remarks on field weakening on page 3/117.

Selection and ordering

1HQ7 Size 450

Rated speed n_N rpm	Rated output						Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit		
	420 V	470 V	520 V	600 V	720 V	810 V						Resis- tance at 120 °C R_a mΩ	Induc- tance L_a mH	
Overall length 5														
108						176	15600	432	1HQ7 455-5NA	-1VV1	515	80	143	2.68
	124					202	15600	496		-1WV1	515	82		
		140				228	15600	560		-7MV1	515	84		
			165			268	15500	660		-7NV1	515	86		
				204		328	15400	815		-2XV1	510	88		
					232	372	15300	930		-2YV1	510	89		
124						202	15600	496	1HQ7 455-5NB	-1VV1	575	83	110	2.38
	141					232	15700	565		-1WV1	575	84		
		159				260	15600	635		-7MV1	575	86		
			187			305	15600	750		-7NV1	575	87		
				230		370	15400	915		-2XV1	570	89		
					260	420	15400	915		-2YV1	565	90		
139						230	15800	555	1HQ7 455-5NC	-1VV1	645	84	89.6	1.6
	159					260	15600	635		-1WV1	640	86		
		178				292	15700	710		-7MV1	640	87		
			210			342	15600	840		-7NV1	635	88		
				256		414	15400	920		-2XV1	630	90		
					290	470	15500	920		-2YV1	630	91		
158						260	15700	630	1HQ7 455-5ND	-1VV1	720	85	74.8	1.27
	180					295	15700	720		-1WV1	720	86		
		202				330	15600	810		-7MV1	715	88		
			236			386	15600	900		-7NV1	715	89		
				290		466	15400	910		-2XV1	705	91		
					328	530	15400	905		-2YV1	705	92		
183						302	15800	730	1HQ7 455-5NE	-1VV1	815	87	54.9	1.18
	208					344	15800	830		-1WV1	820	88		
		232				382	15700	905		-7MV1	815	89		
			272			446	15700	905		-7NV1	810	91		
				332		535	15400	920		-2XV1	800	92		
					376	605	15400	920	1HQ7 455-5NE	-2YV1	800	93		
Rated field voltage						310 V								
Type of construction						IM B 3								

¹⁾ Please note remarks on field weakening on page 3/117.

Rated speed n_N rpm						Rated output P_N kW	Rated torque M_N Nm	Maximum field weakening speed ¹⁾ n_{Fmax} rpm	Order No.	Rated current I_N A	Efficiency η %	Armature circuit	
420 V	470 V	520 V	600 V	720 V	810 V							Resistance at 120 °C R_a mΩ	Inductance L_a mH
222						366	15800	880	1HQ7 455-5NF -1VV1	970	89	38.5	0.9
	252					414	15700	880	-1WV1	970	90		
		282				460	15600	885	-7MV1	965	91		
			328			535	15600	890	-7NV1	960	92		
				398		635	15200	905	-2XV1	940	93		
					452	720	15200	905	-2YV1	940	94		
272						442	15500	855	1HQ7 455-5NG -1VV1	1150	91	26.6	0.64
	306					498	15500	855	-1WV1	1150	92		
		342				550	15400	865	-7MV1	1140	92		
			398			640	15400	865	-7NV1	1140	93		
				484		750	14800	890	-2XV1	1100	94		
					545	845	14800	810	-2YV1	1090	95		
342						530	14800	870	1HQ7 455-5NH -1VV1	1360	92	18.9	0.32
	385					595	14800	870	-1WV1	1360	93		
		430				660	14700	875	-7MV1	1350	93		
			500			770	14700	870	-7NV1	1350	94		
394						580	14100	905	1HQ7 455-5NJ -1VV1	1470	93	14	0.3
	442					655	14200	900	-1WV1	1470	94		
		492				725	14100	905	1HQ7 455-5NJ -7MV1	1470	94		
Rated field voltage						310 V			4				
Type of construction						IM B 3			0				

Motor type	Field power approx. P_{field} kW	Moment of inertia J kgm ²	Mechanical limit speed n_{mech} rpm	Weight, net approx. kg
1HQ7 451	2.9	39	1800	4200
1HQ7 452	3.2	44	1800	4500
1HQ7 453	3.3	50	1800	5000
1HQ7 454	3.6	57	1800	5700
1HQ7 455	4.2	70	1800	6600

Armature control

Speed can be coasted down by means of armature control to approx. 10 rpm at constant torque of the motor.

Field weakening

The order numbers for the motors are valid for field weakening speeds n_F up to $1.15 \cdot n_N$. At higher field weakening speeds supplementary short codes are required: "C05" for $n_F > 1.15 \cdot n_N$ to $1.7 \cdot n_N$ and "C06" for $n_F > 1.7 \cdot n_N$ (short codes: from Page 3/118).

The motors can be operated at rated output P_N up to the field weakening speed n_{Fmax} .

For speeds $> n_{Fmax}$, the output must be reduced (see Catalog Part 2 under "Field control range" and "Speed data on the rating plate").

Rated field voltage

For other rated field voltages and the associated Order No. supplement, see Page 3/6.

¹⁾ Please note remarks on field weakening.

Selection and ordering

Options

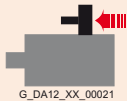
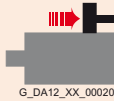

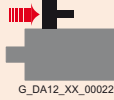
Selection and ordering data

When ordering, the Order No. must be supplemented with "-Z" and with one or more 3-character short codes.

Ordering example:

1GG7 352-5NA40-1WV1-Z
K10 + K55

Mounted assemblies

	Option Description	Short code
Terminal box	Terminal box position when viewing DE	• Right K09
		• Left K10
		• Top K11 ¹⁾
Cable infeed into terminal box	Cable infeed into terminal box for horizontal types of construction: From below (with terminal box on left or right)	•
	From the right (terminal box at top and viewing at DE)	•
	For vertical types of construction: From the right	•
	From DE (terminal box rotated by 90°)	K83
	From NDE (terminal box rotated by 90°)	K84
	Terminal box rotated by 180°	K85
	Cable entry plate drilled for maximum number of components (see Part 2 "Terminal boxes")	With heavy-gauge threaded joints to DIN 46320 K55 With metric glands to DIN 89280 K57
Fan unit mounting and air inlet for 1GG	Fan unit at NDE and air entry into the fan unit from NDE Mounting of fan unit  G_DA12_XX_00021	• Top G04 ³⁾
		• Right G02
		• Left G00
	Fan unit at NDE and air entry into the fan unit from DE Mounting of fan unit  G_DA12_XX_00020	• Top G05 ⁴⁾
		• Right G03
		• Left G01
	Fan unit at DE and air entry into the fan unit from NDE (possibly derating required). Mounting of fan unit  G_DA12_XX_00023	• Top G10
		• Right G08
		• Left G06
	Fan unit at DE and air entry into the fan unit from DE (possibly derating required). Mounting of fan unit  G_DA12_XX_00022	• Top G11
		• Right G09
		• Left G07
		Intermediate socket required when terminal box and mounted fan are located in the same position	L50
Air filter/silencer for 1GG	Dry-type filter	G14
	Silencer	G15 ²⁾⁵⁾
	Combined silencer and filter assembly (for 1G.6 Sizes 180 to 280 only)	H42

• Standard version

1) Not possible for 1H.. motors.

2) From Size 180 upwards.

3) Standard up to Size 450.

4) Standard with 1GG5 50. and 63..

5) For arrangement above motor casing only.

	Option Description	Short code	
Duct connection for 1GH	On one end (IP23/IC17 degree of protection)	•	
	Both ends (IP54/IC37 degree of protection)	K48	
	Air flow from DE to NDE (possibly derating required)	K64	
	Duct connection at NDE	• Top	K71
		• Right	K69
		• Left	K70
	Duct connection at DE	• Top	K67
• Right		K65	
• Left		K66	
Degree of protection	IP55	K49	
Paint finish	Standard paint finish in RAL 7016	•	
	Primer only	K24	
	Non-standard paint finish in RAL 7016	L53	
	Standard paint finish in RAL	Y53 ¹⁾	
	Non-standard paint finish in RAL	Y54 ¹⁾	
Bearings	Bearing for high lateral forces	K20 ²⁾	
	Bearing with regreasing device	K40 ³⁾	
Shaft ends	Second standard shaft end	K16	
	Non-standard shaft end on DE diameter less than or equal to standard, perm. length max. 2 x l	Y55 ¹⁾	
	Standard shaft end without keyway	K42	
	Shaft constructed from high-grade steel	L72 ⁴⁾	

• Standard version

1) Plain text is necessary.

2) Cannot be used with Sizes 355 to 630.

3) From Size 225 upwards standard version.

4) Only possible for Sizes 180 to 280.

Selection and ordering

Options

Operation and diagnostics

	Option Description	Short code
Extended field control range	$\eta_F > 1.15\eta_N$ to $1.7\eta_N$ (to max. η_{Fmax})	C05
	$\eta_F > 1.7\eta_N = \eta_{Fmax}$	C06
Sector-specific applications	Paper machine drives	C34
	Extruder drives	C35
	Pump motors for water treatment plants	C36
	Press motors	C37
	Motors for lifts and cable railways	C38
	Printing machine drives	C40
	Rolling mill drives	C41
	Hoisting equipment	C42
	Flexible commutator infeed	C49 ⁵⁾
Direction of rotation	Both directions of rotation for motors of Sizes 160 to 450	•
	Both directions of rotation for motors of Sizes 500 to 630	K99
Anti-condensation heating	230 V AC	K45
	115 V AC	K46
Visual brush inspection	Servicing covers with inspection window	L73
Brush length limit value	Microswitch, floating signal (for motors up to Size 450)	A06
	Signaling brushes (for motors from Size 500 upwards)	A00
Earth brush	Earthbrush on DE	A05
Overtemperature limit value	Thermistor motor protection with PTC thermistor	
	• for tripping	A11
	• for warning and tripping	A12
	Bimetal strip temperature monitor for tripping	A31
Overtemperature, continuous	Measurement with KTY84-130 temperature sensor	A23
	Measurement with PT100 resistance thermometer	A62
Air flow for 1GG/1HS/1HQ	Vent captor air-flow monitoring	
	• $U_B = 230$ V AC relay output	A09
	• $U_B = 24$ V DC transistor output	A97
Cooling air temperature for 1HS/1HQ	Resistance thermometer in cooling air circuit	A45
Leak warning for 1HS	Humidity sensor in cooler unit	H08
Bearing monitoring	2 PT100 resistance thermometers	A76 ¹⁾
	Measuring fitting Type 32000 at DE and NDE for shock pulse measurement with mobile units	G50 ¹⁾
	Shock pulse sensor Type 40000 at DE and NDE for fixed connection of an SPM alarm box	H60 ¹⁾
Rating plate	Deviating rating plate data	Y80 ²⁾
	Supply 2nd rating plate loose	K31
	Additional rating plate	Y82 ²⁾
Balancing	Half-key balancing	L69 ³⁾
	Full-key balancing	L68 ⁴⁾
Vibration quantity level	acc. to EN 60 034-14	• Level A •
		• Level B K02
	Flange accuracy R acc. to DIN 42 955	K04

- Standard version

1) From Size 180 upwards.

2) Plain text is necessary.

3) Standard with 1G.7/1H.7.

4) Standard with 1G.5/1H.5/1G.6/1H.6

5) Only for 1G.7/1H.1.

Mounted equipment

	Option Description	Short code
Fan unit	Non-standard voltage and/or frequency of the fan unit	Y81 ⁴⁾
Brakes	Mounting of a DC spring-operated brake	G40 ¹⁾
	• Supply voltage 230 V, 50 Hz	C00 ²⁾
	• Supply voltage 24 V DC	K82 ³⁾
	Manual release	K82 ³⁾
	Combined mounting of brake and tacho/pulse encoder	G92
Tachometers	TD 3 AE 4 KAEM (Thalheim)	G20
	0.075 W, 30 V DC, non-standard type of construction (for single-quadrant drives only)	
	TDP 0.09 LT-3 (Baumer Hübner) 0.4 W, 40 V DC, IM B 10	G30
	REO 444 R (Radio Energie) 4 W, 60 V DC, IM B 5	G39
	GMP 1.0 LT-4 (Baumer Hübner)	G37
	30 W, 100 V DC, IM B 5 n, IP55	
	GTB 9.06 L/420 (Baumer Hübner)	G28
	0.06 W, 20 V DC, hollow shaft type of construction	
	TDP 0.2 LT-4 (Baumer Hübner)	H14
	4 W, 60 V DC, IM B 10, IP55	
Pulse encoders	POG 9 D 500 (Baumer Hübner)	G16
	2 x 500 pulses per revolution, offset by 90°	
	POG 9 D 600 (Baumer Hübner)	H48
	2 x 600 pulses per revolution, offset by 90°	
	POG 9 D 1024 (Baumer Hübner)	H55
	2 x 1024 pulses per revolution, offset by 90°	
	POG 10 D 1024 (Baumer Hübner)	H56
	2 x 1024 pulses per revolution, offset by 90°	
	ROD 436.001E (Heidenhain)	H54
	2 x 1024 pulses per revolution, offset by 90°	
Tacho or pulse encoder, special versions	The device will be obtained by the factory to order. For further information, see Part 2 "Encoders"	Y70 ⁴⁾
Tacho or pulse encoder mounting prepared for	TDP 0.2 LT; OG 9; POG 9; POG 10; REO 444R; FG4; L&L 850	G75
	TDP 0.09	G76
	TDP 1.2; GMP 1.0 L (Type of construction B5n)	G77
	ROD 436	G78
Air-to-water heat exchanger for 1HS	Special version heat exchanger, suitable for brackish water	M10

1) Not possible for Sizes 355 to 630.

2) Only possible for Size 160.

3) From Size 180 upwards standard version.

4) Plain text is necessary.

Selection and ordering

Notes

3



Dimensions



Series 1G.6 and 1H.6 Sizes 160 to 280

- 4/2 1GG6 162 - 1GG6 288
- 4/4 1GH6 162 - 1GH6 288
- 4/6 Types of construction IM B 5, IM B 35, IM V 1 and IM V 15 for 1G.6 motors
- 4/8 1HS6 186 - 1HS6 288
- 4/10 1HQ6 186 - 1HQ6 288
- 4/12 Speed encoder assembly, foot niche dimensions and brake assembly for 1G.6 and 1H.6 motors

Series 1G.7 and 1H.7 Sizes 355 to 450

- 4/14 1GG7 351 - 1GG7 355
- 4/15 1GG7 401 - 1GG7 405
- 4/16 1GG7 451 - 1GG7 455
- 4/17 1GH7 351 - 1GH7 355
- 4/18 1GH7 401 - 1GH7 405
- 4/19 1GH7 451 - 1GH7 455
- 4/20 1HS7 351 - 1HS7 355
- 4/21 1HS7 401 - 1HS7 405
- 4/22 1HS7 451 - 1HS7 455
- 4/23 1HQ7 351 - 1HQ7 355
- 4/24 1HQ7 401 - 1HQ7 405
- 4/25 1HQ7 451 - 1HQ7 455

Series 1G.5 and 1H.5 Sizes 500 and 630

- 4/26 1GG5 500 - 1GG5 635
- 4/28 1GH5 500 - 1GH5 635
- 4/30 1HS5 500 - 1HS5 635

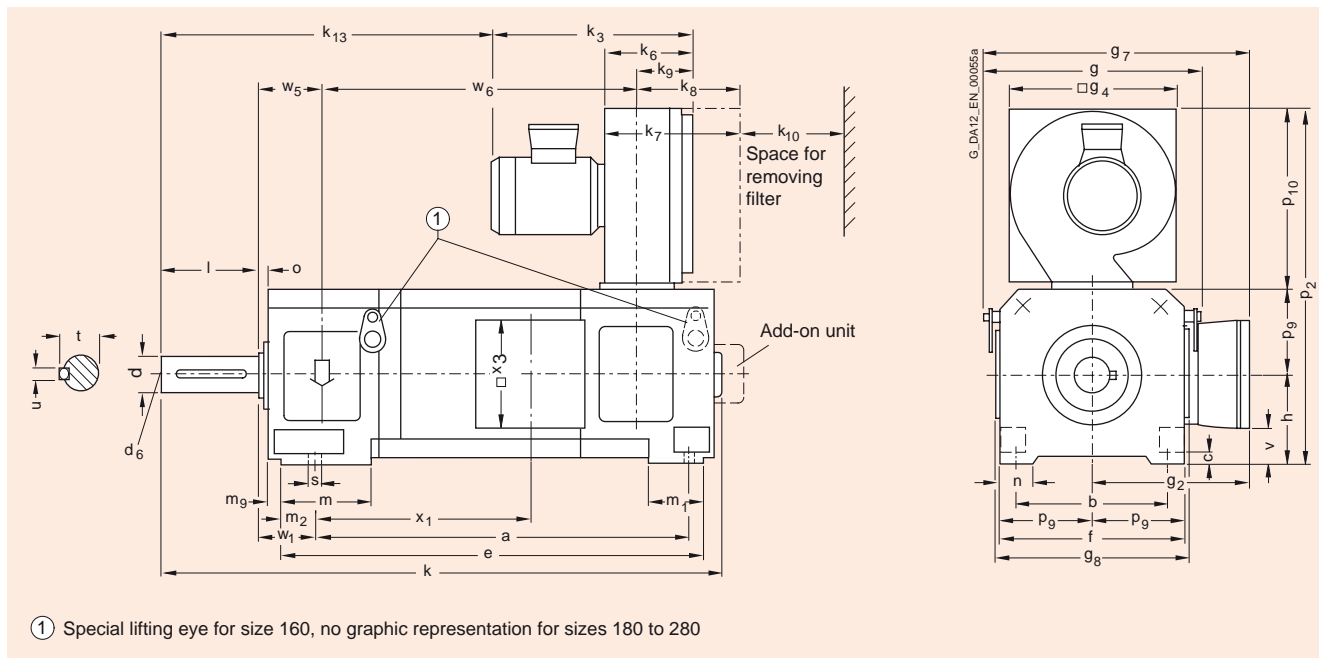


Dimensions

1GG6 162 - 1GG6 288

Dimension drawings

- Air inlet to the fan assembly from the non-drive end
- Terminal box on right (standard version)



Type of construction IM B 3
IP23 degree of protection

For dimensions of foot niches and assemblies, see "Speed encoder assemblies, foot niche dimensions and brake assemblies for 1G.6 and 1H.6 motors", for flange dimensions, see "Types of construction IM B 5, IM B 35, IM V 1 and IM V 15 for 1G.6 motors".

Type of construction IM B 3

For motors		Dimensions acc. to																		
Size	Type 1GG6 ...	a IEC B	b A	c HA	e -	f AB	g AC	g ₂ AD	g ₄ -	g ₇ -	g ₈ -	h H	k L	k ₃ -	k ₆ -	k ₇ -	k ₈ -	k ₉ -	k ₁₀ -	k ₁₃ -
160	... 162	590	254	12	691	316	379	302	310	492	339	160	858	334	121	232	184	74	135	436
	... 164	660	254	12	761	316	379	302	310	492	339	160	928	334	121	232	184	74	135	506
	... 166	750	254	12	851	316	379	302	310	492	339	160	1018	334	121	232	184	74	135	596
180	... 186	600	279	14	730	360	460	350	350	580	382	180	1020	470	185	310	250	130	130	522
	... 188	670	279	14	800	360	460	350	350	580	382	180	1090	470	185	310	250	130	130	592
200	... 206	645	318	18	815	400	500	370	350	620	422	200	1090	470	185	310	250	130	130	558
	... 208	725	318	18	895	400	500	370	350	620	422	200	1170	470	185	310	250	130	130	638
225	... 226	735	356	18	925	450	550	430	430	705	475	225	1290	530	215	380	305	140	170	675
	... 228	825	356	18	1015	450	550	430	430	705	475	225	1380	530	215	380	305	140	170	765
250	... 256	785	406	22	1015	500	620	455	430	765	525	250	1420	530	215	380	305	140	170	774
	... 258	885	406	22	1115	500	620	455	430	765	525	250	1520	530	215	380	305	140	170	874
280	... 286	850	457	22	1100	560	680	485	430	825	585	280	1500	530	215	380	305	140	170	846
	... 288	960	457	22	1210	560	680	485	430	825	585	280	1610	530	215	380	305	140	170	956

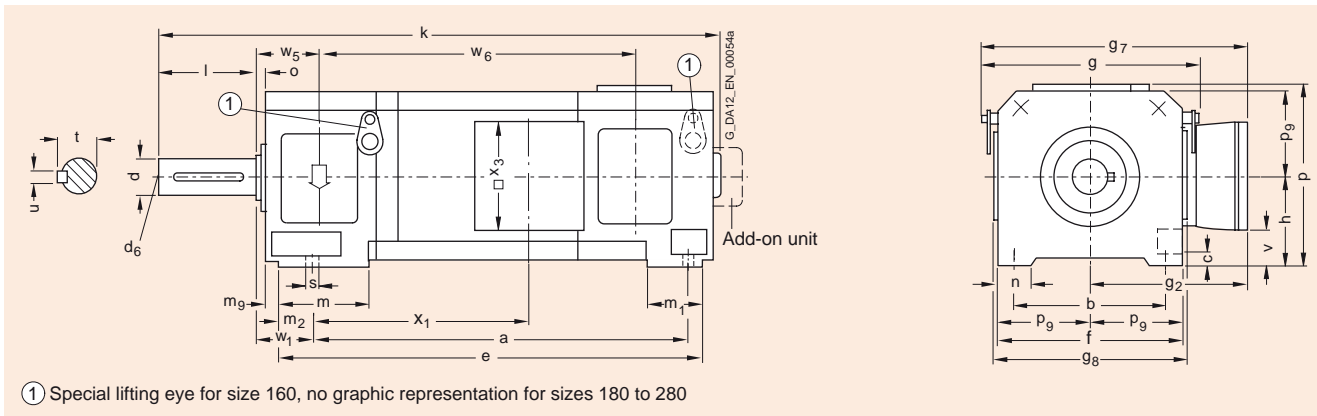
For motors		Dimensions acc. to																Drive end shaft extension				
Size	Type 1GG6 ...	m BA	m ₁ -	m ₂ -	m ₉ -	n AA	o -	p ₂ -	p ₉ -	p ₁₀ -	s K	v -	w ₁ C	w ₅ -	w ₆ -	x ₁ -	x ₃ -	d D	l E	d ₆ -	t GA	u F
160	... 162	140	125	58	-	55	12	655	158	337	14	55	70	87	470	304	210	60	140	M 20	64	18
	... 164	140	125	58	-	55	12	655	158	337	14	55	70	87	540	374	210	60	140	M 20	64	18
	... 166	140	125	58	-	55	12	655	158	337	14	55	70	87	630	464	210	60	140	M 20	64	18
180	... 186	110	130	50	51	70	20	740	180	380	15	30	121	130	592	370	310	65	140	M 20	69	18
	... 188	110	130	50	51	70	20	740	180	380	15	30	121	130	662	440	310	65	140	M 20	69	18
200	... 206	120	180	70	43	80	20	780	200	380	19	50	133	133	625	390	310	70	140	M 20	74.5	20
	... 208	120	180	70	43	80	20	780	200	380	19	50	133	133	705	470	310	70	140	M 20	74.5	20
225	... 226	140	200	50	49	85	50	965	225	515	19	50	149	175	720	475	360	80	170	M 20	85	22
	... 228	140	200	50	49	85	50	965	225	515	19	50	149	175	810	565	360	80	170	M 20	85	22
250	... 256	150	240	50	58	95	60	1030	250	530	24	75	168	183	811	530	360	90	170	M 24	95	25
	... 258	150	240	50	58	95	60	1030	250	530	24	75	168	183	911	630	360	90	170	M 24	95	25
280	... 286	160	230	80	50	100	60	1090	280	530	24	105	190	183	883	585	360	95	170	M 24	100	25
	... 288	160	230	80	50	100	60	1090	280	530	24	105	190	183	993	695	360	95	170	M 24	100	25

Dimensions

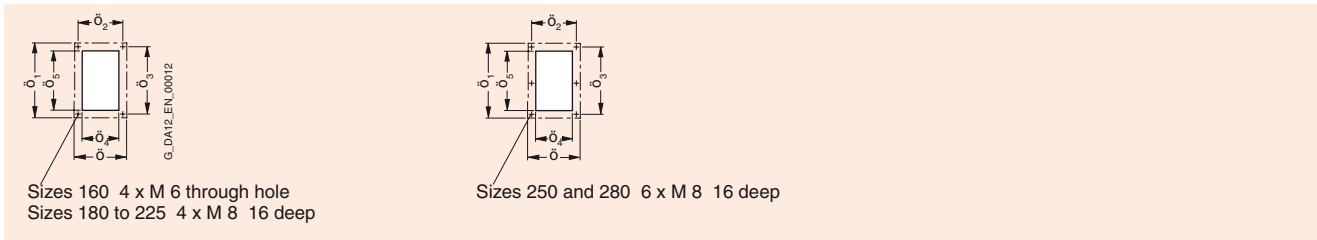
1GH6 162 - 1GH6 288

Dimension drawings

- Terminal box on right (standard version)



Type of construction IM B 3
IP23 degree of protection



Flange for air inlet or outlet

For dimensions of foot niches and assemblies, see "Speed encoder assemblies, foot niche dimensions and brake assemblies for 1G.6 and 1H.6 motors", for flange dimensions, see "Types of construction IM B 5, IM B 35, IM V 1 and IM V 15 for 1G.6 motors".

Type of construction IM B 3

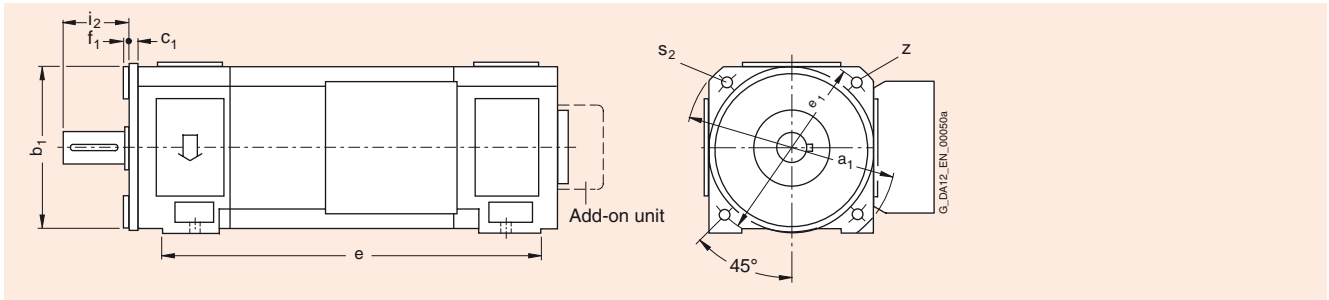
For motors		Dimensions acc. to																				
Size	Type 1GH6...	IEC	a B	b A	c HA	e -	f AB	g AC	g ₂ AD	g ₇ -	g ₈ -	h H	k L	m BA	m ₁ -	m ₂ -	m ₉ -	n AA	o -	p HD	p ₉ -	s K
160	... 162		590	254	12	691	316	379	302	492	339	160	858	140	125	58	-	55	12	326	158	14
	... 164		660	254	12	761	316	379	302	492	339	160	928	140	125	58	-	55	12	326	158	14
	... 166		750	254	12	851	316	379	302	492	339	160	1018	140	125	58	-	55	12	326	158	14
180	... 186		600	279	14	730	360	460	350	580	382	180	1020	110	130	50	51	70	20	370	180	15
	... 188		670	279	14	800	360	460	350	580	382	180	1090	110	130	50	51	70	20	370	180	15
200	... 206		645	318	18	815	400	500	370	620	422	200	1090	120	180	70	43	80	20	410	200	19
	... 208		725	318	18	895	400	500	370	620	422	200	1170	120	180	70	43	80	20	410	200	19
225	... 226		735	356	18	925	450	550	430	705	475	225	1290	140	200	50	49	85	50	460	225	19
	... 228		825	356	18	1015	450	550	430	705	475	225	1380	140	200	50	49	85	50	460	225	19
250	... 256		785	406	22	1015	500	620	455	765	525	250	1420	150	240	50	58	95	60	510	250	24
	... 258		885	406	22	1115	500	620	455	765	525	250	1520	150	240	50	58	95	60	510	250	24
280	... 286		850	457	22	1100	560	680	485	825	585	280	1500	160	230	80	50	100	60	570	280	24
	... 288		960	457	22	1210	560	680	485	825	585	280	1610	160	230	80	50	100	60	570	280	24

For motors		Dimensions acc. to													Drive end shaft extension				
Size	Type 1GH6...	IEC	v -	w ₁ C	w ₅ -	w ₆ -	x ₁ -	x ₃ -	ø -	ø ₁ -	ø ₂ -	ø ₃ -	ø ₄ -	ø ₅ -	d D	l E	d ₆ -	t GA	u F
160	... 162		55	70	87	470	304	210	130	196	110	175	105	170	60	140	M 20	64	18
	... 164		55	70	87	540	374	210	130	196	110	175	105	170	60	140	M 20	64	18
	... 166		55	70	87	630	464	210	130	196	110	175	105	170	60	140	M 20	64	18
180	... 186		30	121	130	592	370	310	155	220	135	200	115	190	65	140	M 20	69	18
	... 188		30	121	130	662	440	310	155	220	135	200	115	190	65	140	M 20	69	18
200	... 206		50	133	133	625	390	310	155	220	135	200	115	190	70	140	M 20	74.5	20
	... 208		50	133	133	705	470	310	155	220	135	200	115	190	70	140	M 20	74.5	20
225	... 226		50	149	175	720	475	360	185	265	165	245	135	230	80	170	M 20	85	22
	... 228		50	149	175	810	565	360	185	265	165	245	135	230	80	170	M 20	85	22
250	... 256		75	168	183	811	530	360	230	300	210	280	180	265	90	170	M 24	95	25
	... 258		75	168	183	911	630	360	230	300	210	280	180	265	90	170	M 24	95	25
280	... 286		105	190	183	883	585	360	230	300	210	280	180	265	95	170	M 24	100	25
	... 288		105	190	183	993	695	360	230	300	210	280	180	265	95	170	M 24	100	25

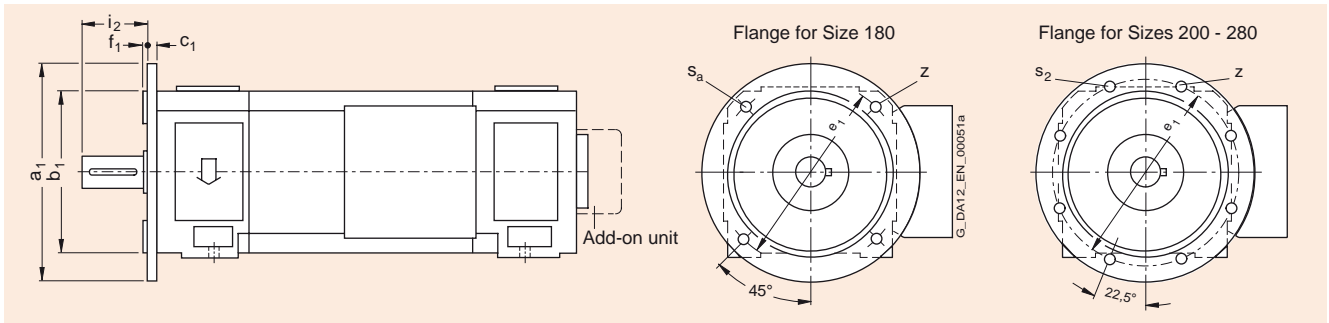
Dimensions

Types of construction IM B 5, IM B 35, IM V 1 and IM V 15 for 1G.6

Dimension drawings



Types of construction IM B 5, IM B 35, IM V 1 and IM V 15
Size 160



Types of construction IM B 5, IM B 35, IM V 1 and IM V 15
Sizes 180 to 280

For type of construction IM B 5 or IM V 1, motors of type of construction IM B 35 or IM V 15 will be supplied.

Types of construction
IM B 5, IM B 35, IM V 1 and IM V 15 for 1G.6

Mounting flange acc. to DIN 42 948

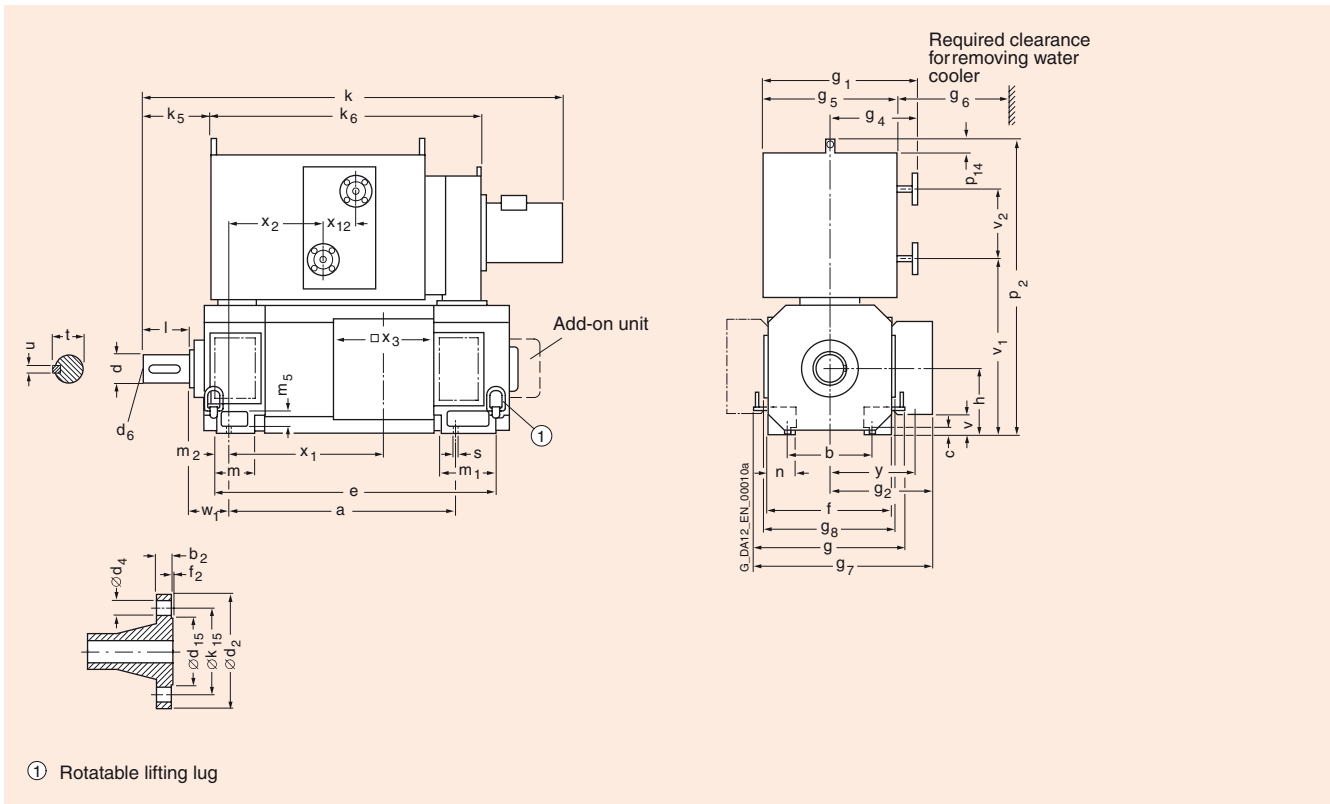
For motors		Dimensions acc. to								
Size	Type 1GF6... 1GG6... 1GH6...	IEC Size	a ₁ P	b ₁ N	c ₁ LA	e ₁ M	f ₁ T	i ₂ –	s ₂ S	z –
160	... 162 ... 164 ... 166	A 400	400 ¹⁾	300	21	350	5	140	18	4
180	... 186 ... 188	A 400	400	300	15	350	5	140	19	4
200	... 206 ... 208	A 450	450	350	16	400	5	140	19	8
225	... 226 ... 228	A 550	550	450	18	500	5	170	19	8
250	... 256 ... 258	A 660	660	550	22	600	6	170	24	8
280	... 286 ... 288	A 660	660	550	22	600	6	170	24	8

¹⁾ External flange contour matches casing. Diagonal edge-to-edge dimension only 395 mm.

Dimensions

1HS6 186 - 1HS6 288

Dimension drawings



Type of construction IM B 3
IP54 degree of protection

For dimensions of the foot niches and device assemblies, see "Speed encoder assembly, foot niche dimensions and brake assembly for 1G.6 and 1H.6 motors".

Type of construction IM B 3

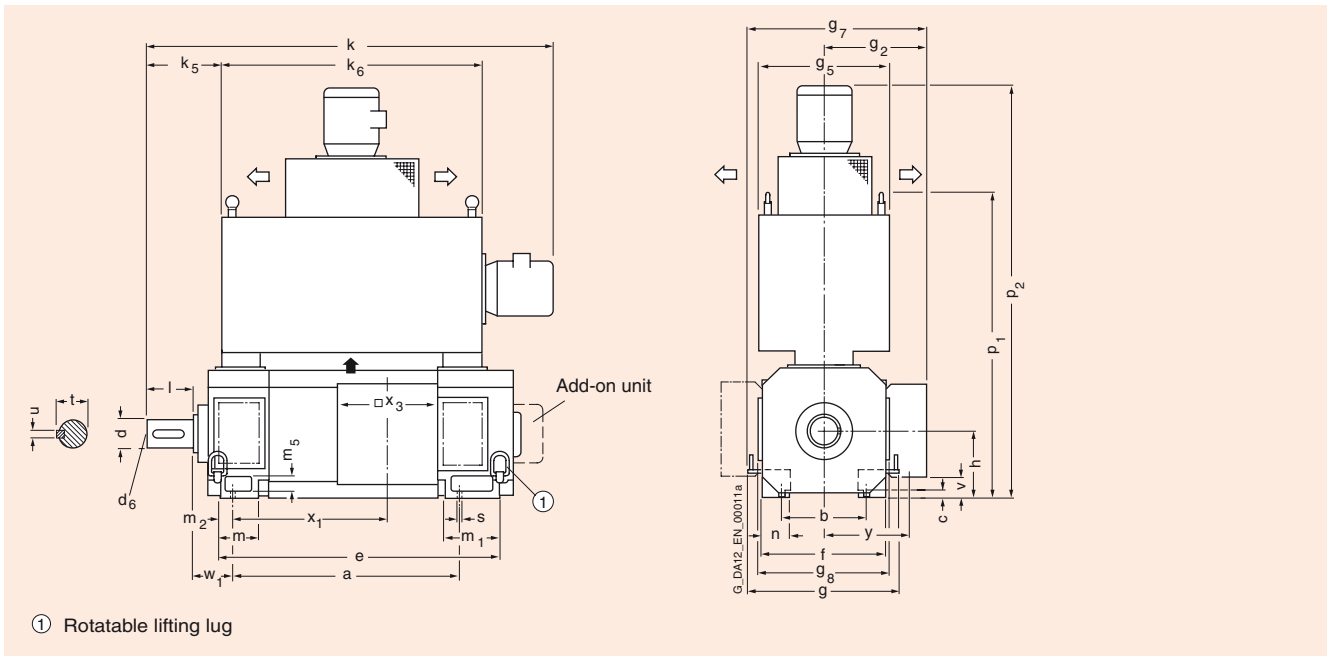
For motors		Dimensions acc. to																						
Size	Type 1HS6...	IEC	a B	b A	c HA	e BB	f AB	g -	g ₁ -	g ₂ AD	g ₄ -	g ₅ -	g ₆ -	g ₇ -	g ₈ -	h H	k L	k ₅ -	k ₆ -	m BA	m ₁ -	m ₂ -	m ₅ -	n AA
180	.... 186		600	279	14	730	360	460	732	350	462	540	750	580	382	180	1202	150	770	110	130	50	55	70
	.... 188		670	279	14	800	360	460	732	350	462	540	750	580	382	180	1272	150	840	110	130	50	55	70
200	.... 206		645	318	18	815	400	500	732	370	462	540	750	620	422	200	1238	160	800	120	180	70	65	80
	.... 208		725	318	18	895	400	500	732	370	462	540	750	620	422	200	1318	160	880	120	180	70	65	80
225	.... 226		735	356	18	925	450	550	732	430	462	540	750	705	475	225	1455	230	910	140	200	50	65	85
	.... 228		825	356	18	1015	450	550	732	430	462	540	750	705	475	225	1545	230	1000	140	200	50	65	85
250	.... 256		785	406	22	1015	500	620	845	455	505	640	840	765	525	250	1554	240	1000	150	240	50	80	95
	.... 258		885	406	22	1115	500	620	845	455	505	640	840	765	525	250	1654	240	1100	150	240	50	80	95
280	.... 286		850	457	22	1100	560	680	845	485	505	640	840	825	585	280	1626	210	1100	160	230	80	85	100
	.... 288		960	457	22	1210	560	680	845	485	505	640	840	825	585	280	1736	210	1190	160	230	80	85	100

For motors		Dimensions acc. to													Mounting flange acc. to DIN 2633					Drive end shaft extension						
Size	Type 1HS6...	IEC	p ₂ -	p ₁₄ -	s K	v -	v ₁ -	v ₂ -	w ₁ C	x ₁ -	x ₂ -	x ₃ -	x ₁₂ -	y -	Size	b ₂ -	d ₂ -	d ₄ -	d ₁₅ -	f ₂ -	k ₁₅ -	d D	l E	t GA	u F	d ₆ -
180	.... 186		980	60	15	30	505	270	121	370	250	310	56	260	DN 20	16	105	14	58	2	75	65	140	69	18	M 20
	.... 188		980	60	15	30	505	270	121	440	320	310	56	260	DN 20	16	105	14	58	2	75	65	140	69	18	M 20
200	.... 206		1020	60	19	50	545	270	133	390	273	310	56	280	DN 20	16	105	14	58	2	75	70	140	74.5	20	M 20
	.... 208		1020	60	19	50	545	270	133	470	353	310	56	280	DN 20	16	105	14	58	2	75	70	140	74.5	20	M 20
225	.... 226		1070	60	19	50	595	270	149	475	380	360	56	320	DN 20	16	105	14	58	2	75	80	170	85	22	M 20
	.... 228		1070	60	19	50	595	270	149	565	470	360	56	320	DN 20	16	105	14	58	2	75	80	170	85	22	M 20
250	.... 256		1240	60	24	75	655	370	168	530	460	360	56	350	DN 32	16	140	18	78	2	100	90	170	95	25	M 24
	.... 258		1240	60	24	75	655	370	168	630	560	360	56	350	DN 32	16	140	18	78	2	100	90	170	95	25	M 24
280	.... 286		1300	60	24	105	715	370	190	585	570	360	56	380	DN 32	16	140	18	78	2	100	95	170	100	25	M 24
	.... 288		1300	60	24	105	715	370	190	695	620	360	56	380	DN 32	16	140	18	78	2	100	95	170	100	25	M 24

Dimensions

1HQ6 186 - 1HQ6 288

Dimension drawings



Type of construction IM B 3
IP54 degree of protection

For dimensions of the foot niches and device assembly, see
"Speed encoder assembly, foot niche dimensions and brake
assembly for 1G.6 and 1H.6 motors".

Type of construction IM B 3

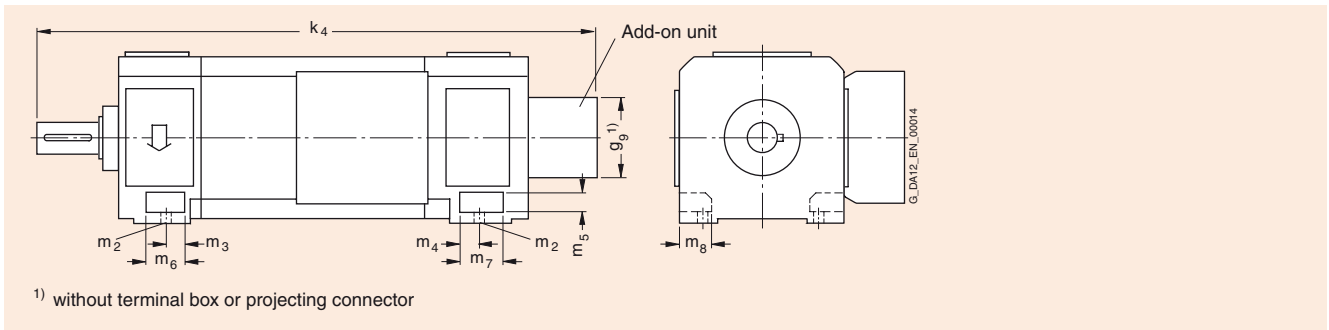
For motors		Dimensions acc. to																		
Size	Type 1HQ6...	IEC B	a B	b A	c HA	e BB	f AB	g AC	g ₂ AD	g ₅ -	g ₇ -	g ₈ -	h H	k L	k ₅ -	k ₆ -	m BA	m ₁ -	m ₂ -	m ₅ -
180	.... 186		600	279	14	730	360	460	350	440	580	382	180	1310	210	780	110	130	50	55
	.... 188		670	279	14	800	360	460	350	440	580	382	180	1380	210	850	110	130	50	55
200	.... 206		645	318	18	815	400	500	370	460	620	422	200	1330	210	800	120	180	70	65
	.... 208		725	318	18	895	400	500	370	460	620	422	200	1410	210	880	120	180	70	65
225	.... 226		735	356	18	925	450	550	430	500	705	475	225	1480	275	860	140	200	50	65
	.... 228		825	356	18	1015	450	550	430	500	705	475	225	1560	275	950	140	200	50	65
250	.... 256		785	406	22	1015	500	620	455	550	765	525	250	1640	260	1000	150	240	50	80
	.... 258		885	406	22	1115	500	620	455	550	765	525	250	1740	260	1100	150	240	50	80
280	.... 286		850	457	22	1100	560	680	485	600	825	585	280	1710	260	1070	160	230	80	85
	.... 288		960	457	22	1210	560	680	485	600	825	585	280	1820	260	1180	160	230	80	85

For motors		Dimensions acc. to										Drive end shaft extension			
Size	Type 1HQ6...	IEC n AA	p ₁ -	p ₂ -	s K	v -	w ₁ C	x ₁ -	x ₃ -	y -	d D	l E	t GA	u F	d ₆ -
180	.... 186	70	950	1320	15	30	121	370	310	260	65	140	69	18	M 20
	.... 188	70	950	1320	15	30	121	440	310	260	65	140	69	18	M 20
200	.... 206	80	1020	1455	19	50	133	390	310	280	70	140	74.5	20	M 20
	.... 208	80	1020	1455	19	50	133	470	310	280	70	140	74.5	20	M 20
225	.... 226	85	1110	1545	19	50	149	475	360	320	80	170	85	22	M 20
	.... 228	85	1110	1545	19	50	149	565	360	320	80	170	85	22	M 20
250	.... 256	95	1210	1695	24	75	168	530	360	350	90	170	95	25	M 24
	.... 258	95	1210	1695	24	75	168	630	360	350	90	170	95	25	M 24
280	.... 286	100	1280	1765	24	105	190	585	360	380	95	170	100	25	M 24
	.... 288	100	1280	1765	24	105	190	695	360	380	95	170	100	25	M 24

Dimensions

Speed encoder assembly, foot niche dimensions and brake assembly for 1G.6/1H.6 motors

Dimension drawings



Encoder and brake assemblies and foot niches

Speed encoder assembly, foot niche dimensions and brake assembly for 1G.6/1H.6 motors

Speed encoder assembly

For motors		Tacho assembly with										Pulse encoder assembly													
Size	Type 1G.6 1H.6	GTB 9.06L		TD3 A4 KAEM		TDP 0.09LT		TDP 0.2LT		REO 444R		TDP 1.2		GMP 1.0L		KPG 503		KPG 506		POG 9D		POG 10 D		ROD 436	
		g ₉	k ₄	g ₉	k ₄	g ₉	k ₄	g ₉	k ₄	g ₉	k ₄	g ₉	k ₄	g ₉	k ₄	g ₉	k ₄	g ₉	k ₄	g ₉	k ₄	g ₉	k ₄	g ₉	k ₄
160	. . . . 162	95	881	56	914	83	1022	103	1046	94	1040	135	1135	110	1120	127	1090	127	1134	103	1008	58	936		
	. . . . 164		951		984		1092		1116		1110		1205		1190		1160		1204		1078		1006		
	. . . . 166		1041		1074		1182		1206		1200		1295		1280		1250		1294		1168		1096		
180	. . . . 186		1080		1080		1180		1205		1200		1290		1265		1245		1290		1165		1100		
	. . . . 188		1150		1150		1250		1275		1270		1360		1335		1315		1360		1235		1170		
200	. . . . 206		1155		1155		1255		1280		1275		1365		1340		1320		1365		1240		1175		
	. . . . 208		1235		1235		1335		1360		1355		1445		1420		1400		1445		1320		1255		
225	. . . . 226		1350		1350		1450		1475		1470		1560		1535		1515		1560		1435		1370		
	. . . . 228		1440		1440		1540		1565		1560		1650		1625		1605		1650		1525		1460		
250	. . . . 256		1485		1485		1585		1610		1605		1695		1670		1650		1695		1570		1505		
	. . . . 258		1585		1585		1685		1710		1705		1795		1770		1750		1795		1670		1605		
280	. . . . 286		1560		1560		1660		1685		1680		1770		1745		1725		1770		1645		1580		
	. . . . 288		1670		1670		1770		1795		1790		1880		1885		1835		1880		1755		1690		

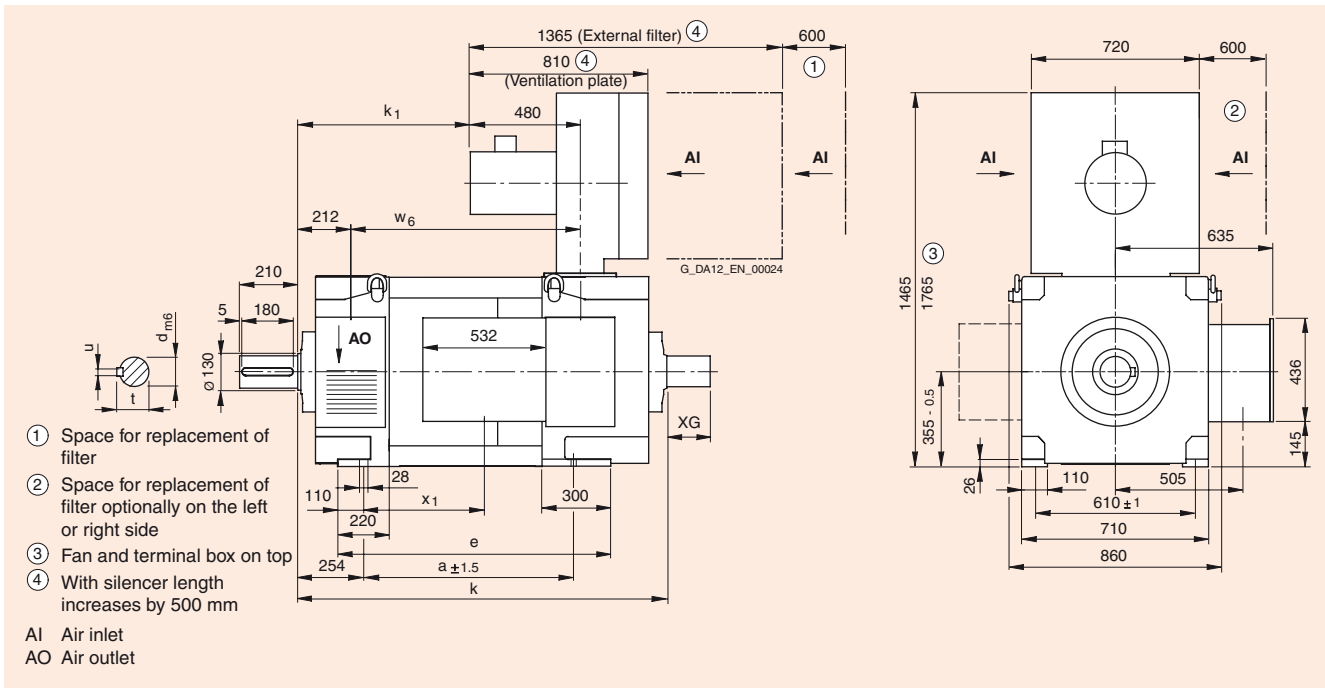
Foot niche dimensions and brake assembly

For motors		Dimensions acc. to										Dimensions for brake and speed encoder on request	
Size	Type 1G.6 1H.6	Foot niches									Brake assembly		Dimensions for brake and speed encoder on request
		Largest machine foot screws that can be used											
		IEC	m ₂	m ₃	m ₄	m ₅	m ₆	m ₇	m ₈	g ₉	k ₄		
160	. . . . 162		M12 x 35	39	38	46	88	72	56	258	997	
	. . . . 164										1067	
	. . . . 166										1157	
180	. . . . 186		M12 x 40	35	25	55	80	95	65	280	1180	
	. . . . 188									320	1250	
200	. . . . 206		M16 x 50	25	55	65	80	140	70	320	1260	
	. . . . 208									320	1340	
225	. . . . 226		M16 x 50	70	45	65	115	170	75	360	1470	
	. . . . 228									360	1560	
250	. . . . 256		M20 x 60	80	35	80	115	200	80	450	1620	
	. . . . 258									450	1720	
280	. . . . 286		M20 x 60	60	35	85	120	190	85	500	1710	
	. . . . 288									500	1820	

Dimensions

1GG7 351 - 1GG7 355

Dimension drawings



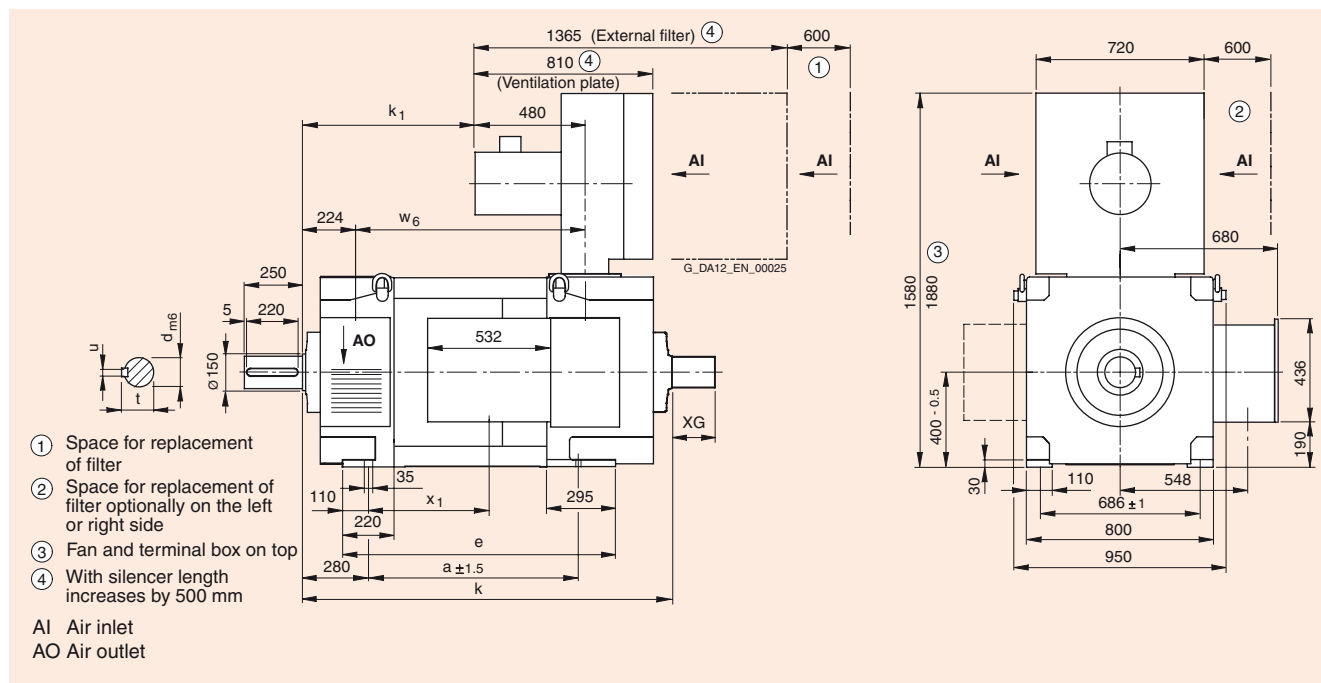
Type of construction IM B 3

Type of construction IM B 3

For motors		Dimensions acc. to						Drive end shaft extension			Tacho	Dimensions
Size	Type 1GG7 ...	a IEC B	e -	k L	k ₁ LC	w ₆ -	x ₁ -	d D	t GA	u F	- XG	
355	... 351	770	1065	1450	582	850	415	110	116	28	ROD 436	85
	... 352	870	1115	1500	632	900	465	110	116	28	POG 9 D / POG 10 D	150
	... 353	930	1175	1560	692	960	525	120	127	32	REO 444 R	180
	... 354	1000	1255	1640	772	1040	605	120	127	32	TDP 0.09	195
	... 355	1120	1375	1760	992	1160	725	120	127	32	TDP 0.2 T	185

4

Dimension drawings



Type of construction IM B 3

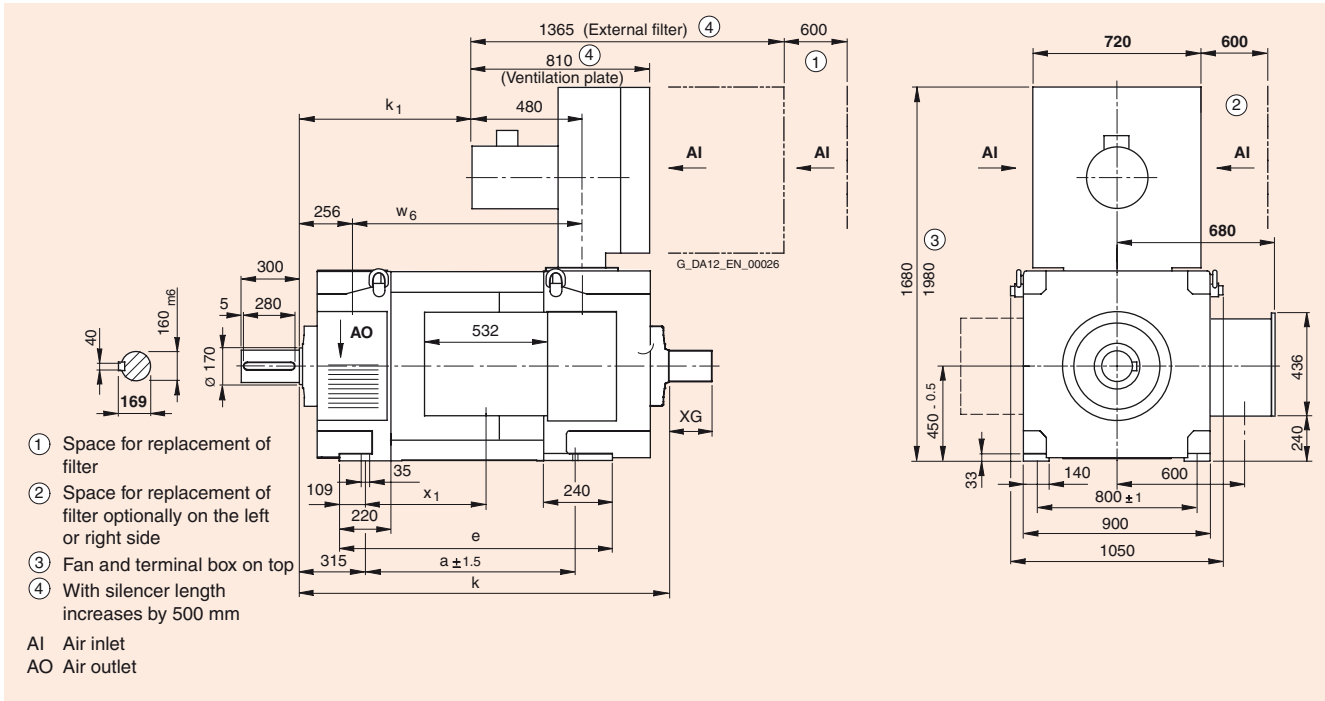
Type of construction IM B 3

Size	Type 1GG7 ...	Dimensions acc. to						Drive end shaft extension			Tacho	Dimen- sions - XG
		a IEC B	e	k L	k ₁ LC	w ₆	x ₁	d D	t GA	u F		
400	... 401	830	1100	1515	659	915	450	130	137	32	ROD 436	85
	... 402	900	1170	1585	729	985	520	130	137	32	POG 9 D / POG 10 D	150
	... 403	1000	1245	1660	804	1060	595	130	137	32	REO 444 R	180
	... 404	1105	1350	1765	909	1165	700	140	148	36	TDP 0.09	195
	... 405	1275	1520	1935	1079	1335	870	140	148	36	TDP 0.2 T	185

Dimensions

1GG7 451 - 1GG7 455

Dimension drawings



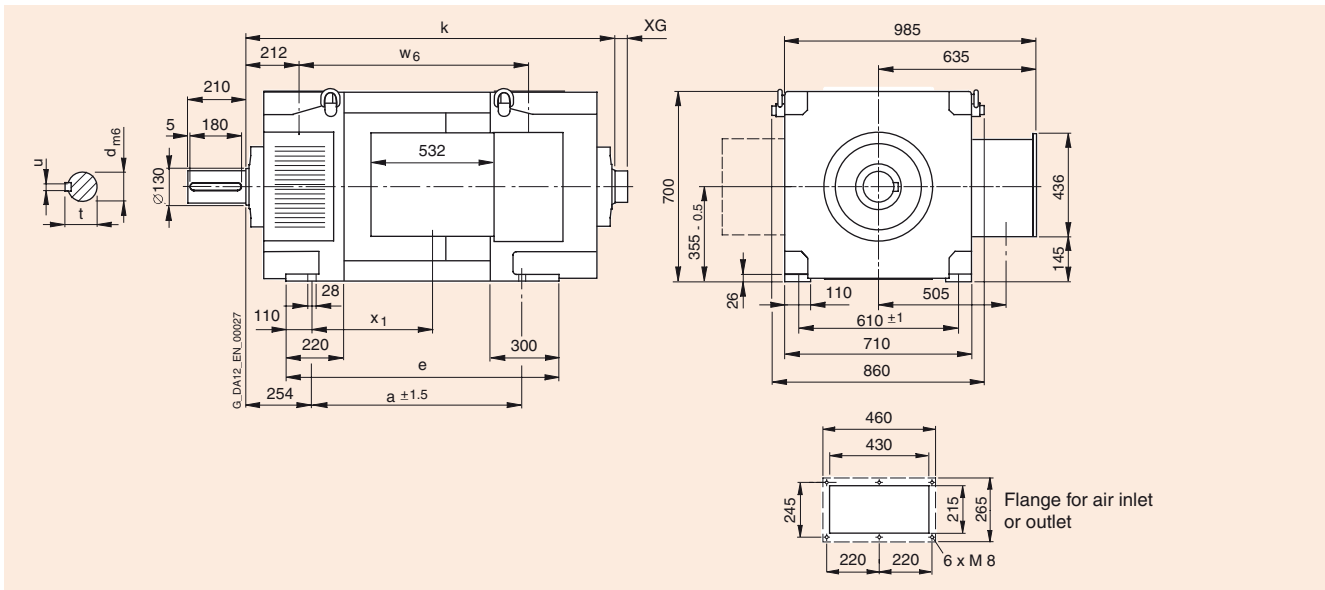
Type of construction IM B 3

Type of construction IM B 3

Size	Type 1GG7 ...	Dimensions acc. to						Tacho	Dimen- sions - XG
		IEC B	a	e	k L	k ₁ LC	w ₆			x_{1}
450	... 451	930	1125	1660	781	1005	520	ROD 436	85
	... 452	1000	1195	1730	851	1075	590	POG 9 D / POG 10 D	150
	... 453	1090	1285	1820	941	1165	680	REO 444 R	180
	... 454	1210	1405	1940	1061	1285	800	TDP 0.09	195
	... 455	1400	1595	2130	1251	1475	990	TDP 0.2 T	185

4

Dimension drawings



Type of construction IM B 3

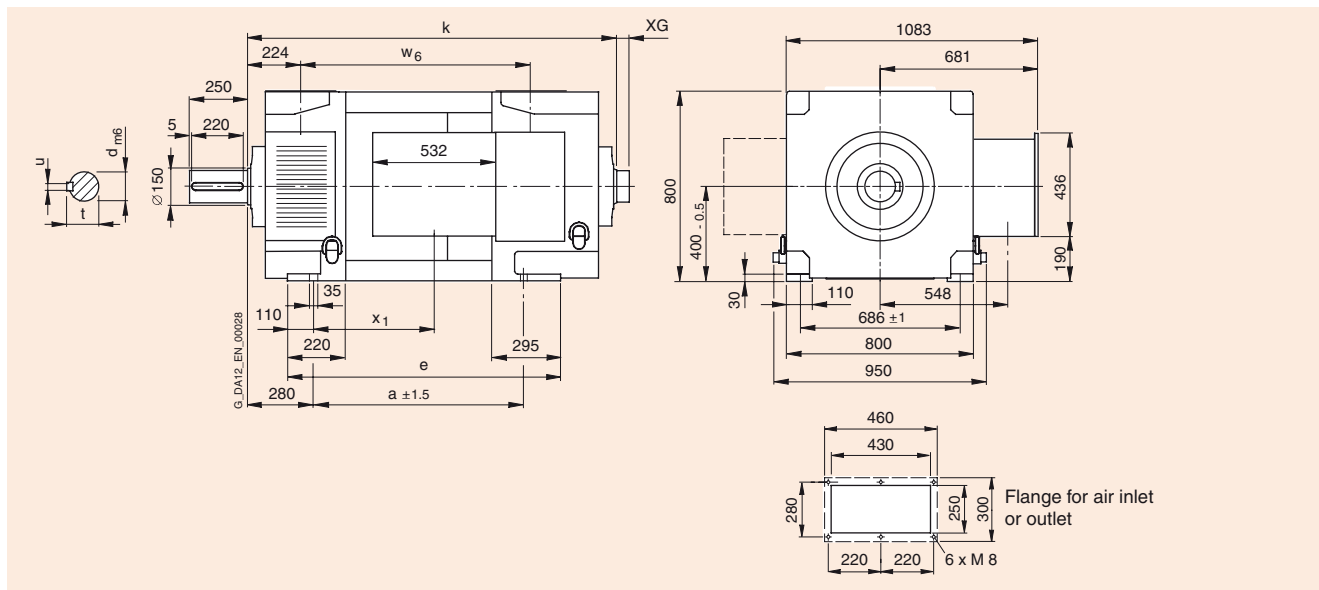
Type of construction IM B 3

For motors		Dimensions acc. to					Drive end shaft extension			Tacho	Dimen- sions
Size	Type 1GH7 ...	a IEC B	e -	k L	w ₆ -	x ₁ -	d D	t GA	u F		- XG
355	... 351	770	1065	1450	850	415	110	116	28	ROD 436	85
	... 352	870	1115	1500	900	465	110	116	28	POG 9 D / POG 10 D	150
	... 353	930	1175	1560	960	525	120	127	32	REO 444 R	180
	... 354	1000	1255	1640	1040	605	120	127	32	TDP 0.09	195
	... 355	1120	1375	1760	1160	725	120	127	32	TDP 0.2 T	185

Dimensions

1GH7 401 - 1GH7 405

Dimension drawings

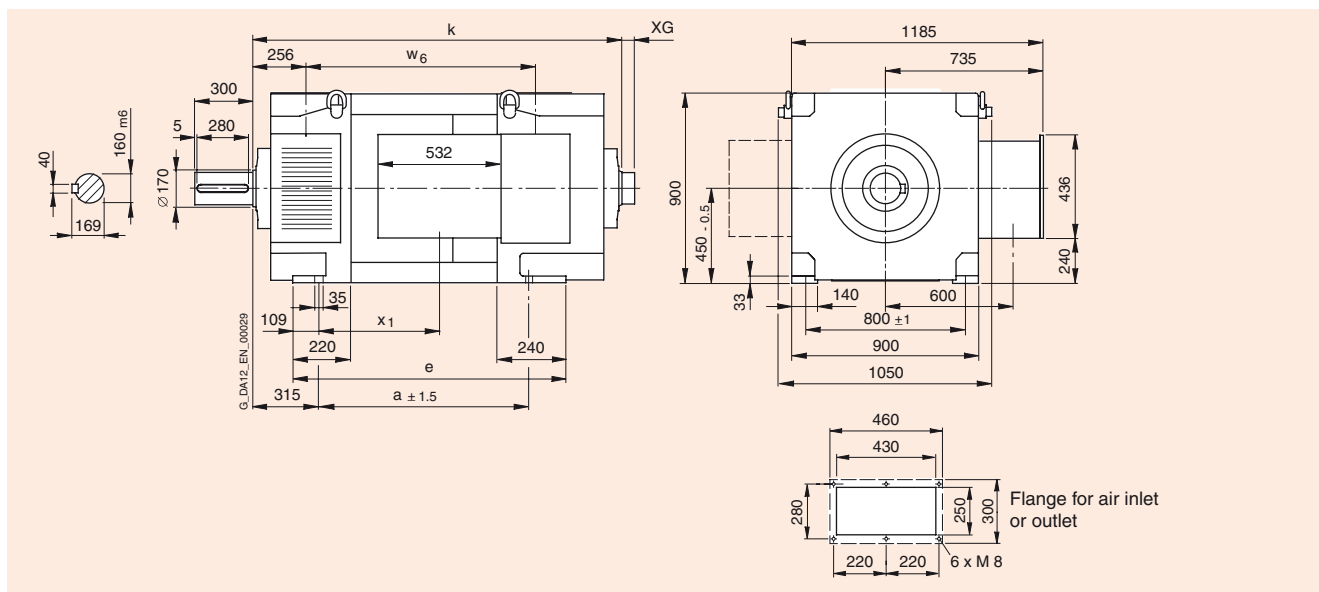


Type of construction IM B 3

Type of construction IM B 3

For motors		Dimensions acc. to					Drive end shaft extension			Tacho	Dimensions
Size	Type 1GH7 ...	a IEC B	e -	k L	w ₆ -	x ₁ -	d D	t GA	u F		- XG
400	... 401	830	1100	1515	915	450	130	137	32	ROD 436	85
	... 402	900	1170	1585	985	520	130	137	32	POG 9 D / POG 10 D	150
	... 403	1000	1245	1660	1060	595	130	137	32	REO 444 R	180
	... 404	1105	1350	1765	1165	700	140	148	36	TDP 0.09	195
	... 405	1275	1520	1935	1335	870	140	148	36	TDP 0.2 T	185

Dimension drawings



Type of construction IM B 3

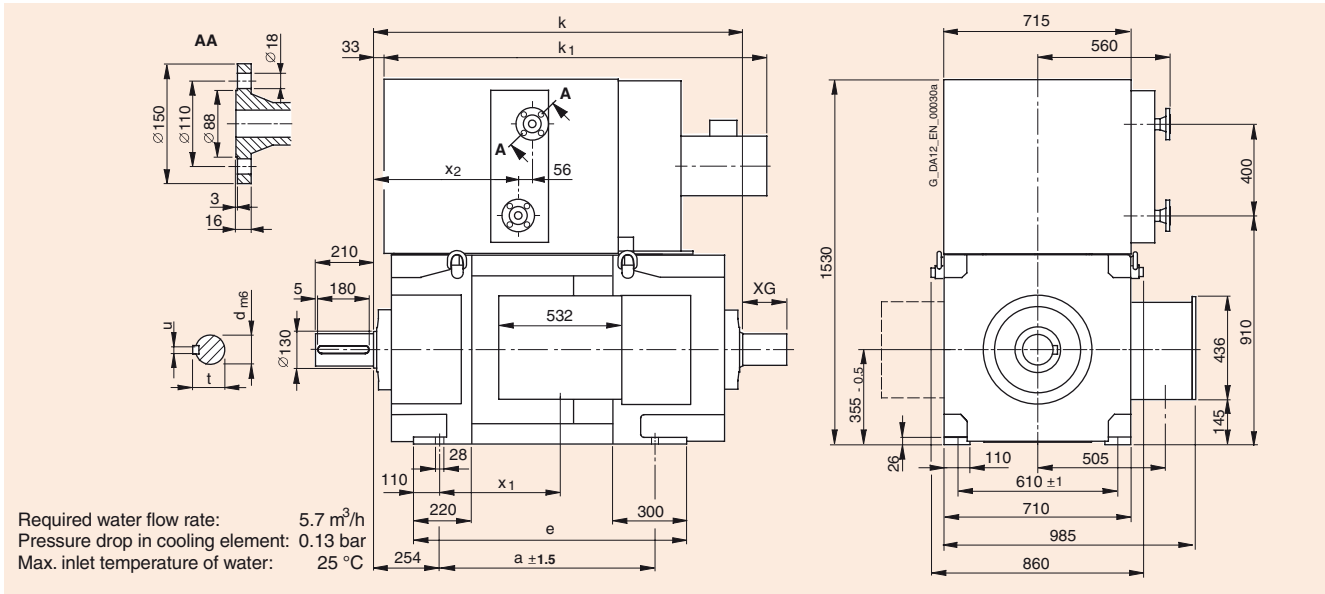
Type of construction IM B 3

For motors		Dimensions acc. to					Tacho	Dimen- sions
Size	Type 1GH7 ...	a IEC B	e -	k L	w ₆ -	x ₁ -	- XG	
450	... 451	930	1125	1660	1005	520	ROD 436 85	
	... 452	1000	1195	1730	1075	590	POG 9 D / POG 10 D 150	
	... 453	1090	1285	1820	1165	680	REO 444 R 180	
	... 454	1210	1405	1940	1285	800	TDP 0.09 195	
	... 455	1400	1595	2130	1475	990	TDP 0.2 T 185	

Dimensions

1HS7 351 - 1HS7 355

Dimension drawings



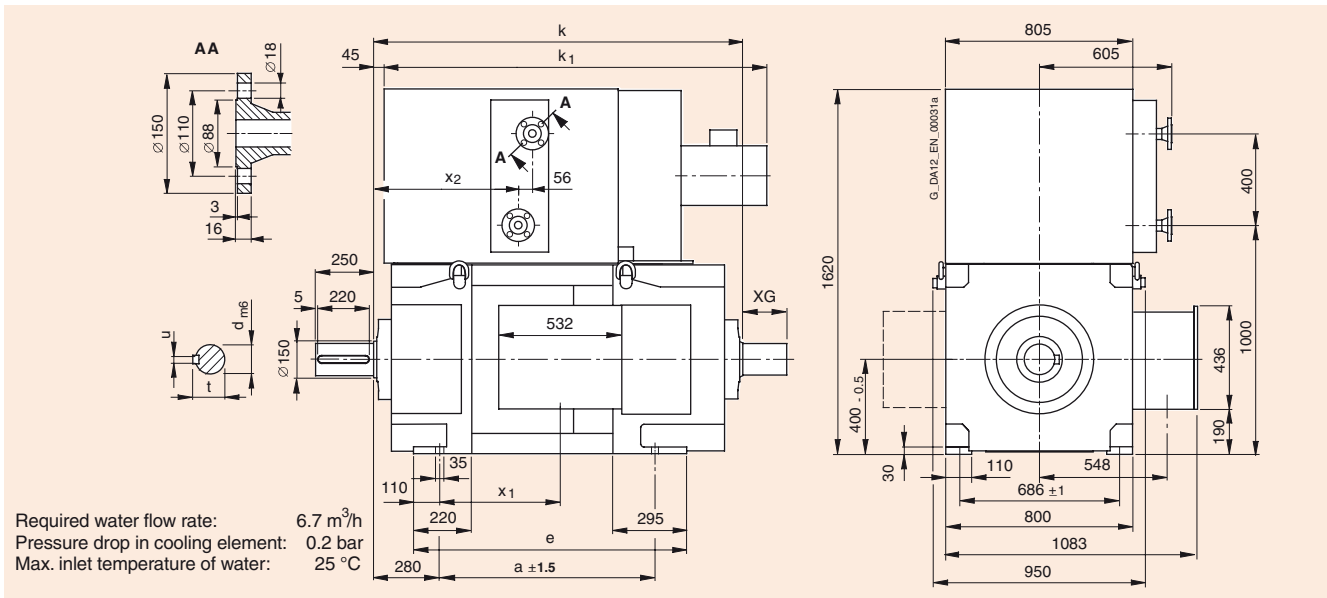
Type of construction IM B 3

Type of construction IM B 3

Size	Type 1HS7 ...	Dimensions acc. to						Drive end shaft extension			Tacho	Dimen- sions - XG
		a IEC B	e -	k L	k ₁ LC	x ₁ -	x ₂ -	d D	t GA	u F		
355	... 351	770	1065	1450	1520	415	550	110	116	28	ROD 436	85
	... 352	870	1115	1500	1570	465	600	110	116	28	POG 9 D / POG 10 D	150
	... 353	930	1175	1560	1630	525	660	120	127	32	REO 444 R	180
	... 354	1000	1255	1640	1710	605	740	120	127	32	TDP 0.09	195
	... 355	1120	1375	1760	1830	725	860	120	127	32	TDP 0.2 T	185

4

Dimension drawings



Type of construction IM B 3

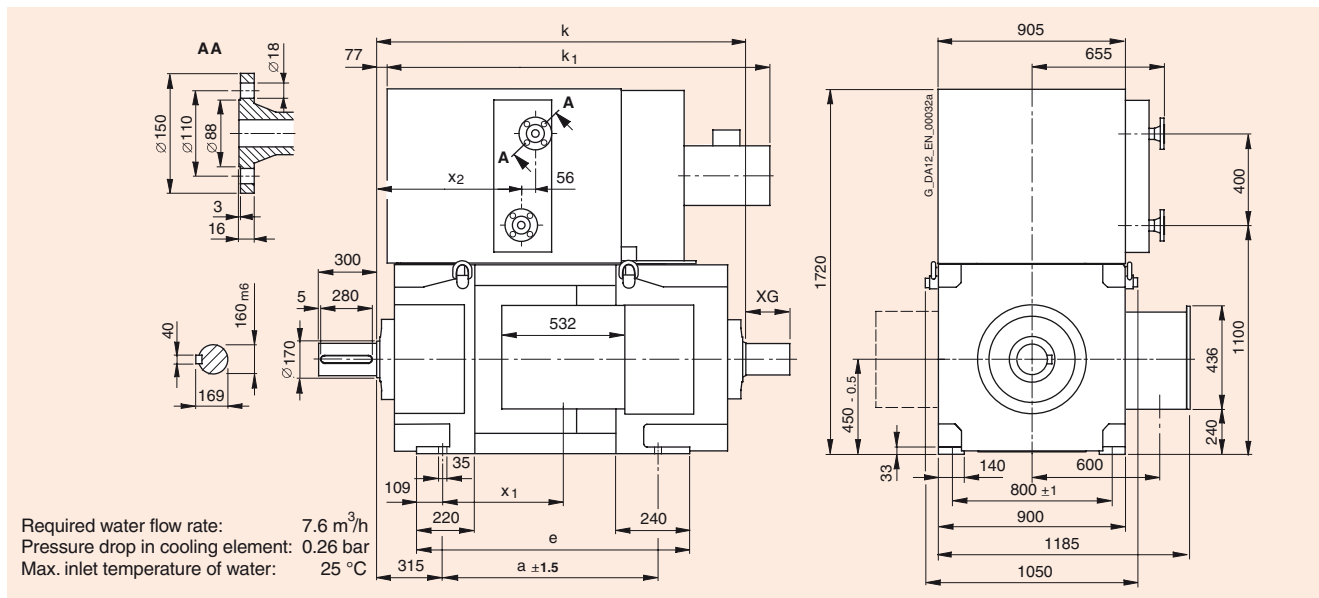
Type of construction IM B 3

Size	Type 1HS7...	Dimensions acc. to IEC B						Drive end shaft extension			Tacho - XG	Dimen- sions - XG
		a	e	k L	k ₁ LC	x ₁	x ₂	d D	t GA	u F		
400	... 401	830	1100	1515	1580	450	630	130	137	32	ROD 436	85
	... 402	900	1170	1585	1650	520	700	130	137	32	POG 9 D / POG 10 D	150
	... 403	1000	1245	1660	1725	595	775	130	137	32	REO 444 R	180
	... 404	1105	1350	1765	1830	700	880	140	148	36	TDP 0.09	195
	... 405	1275	1520	1935	2000	870	1050	140	148	36	TDP 0.2 T	185

Dimensions

1HS7 451 - 1HS7 455

Dimension drawings

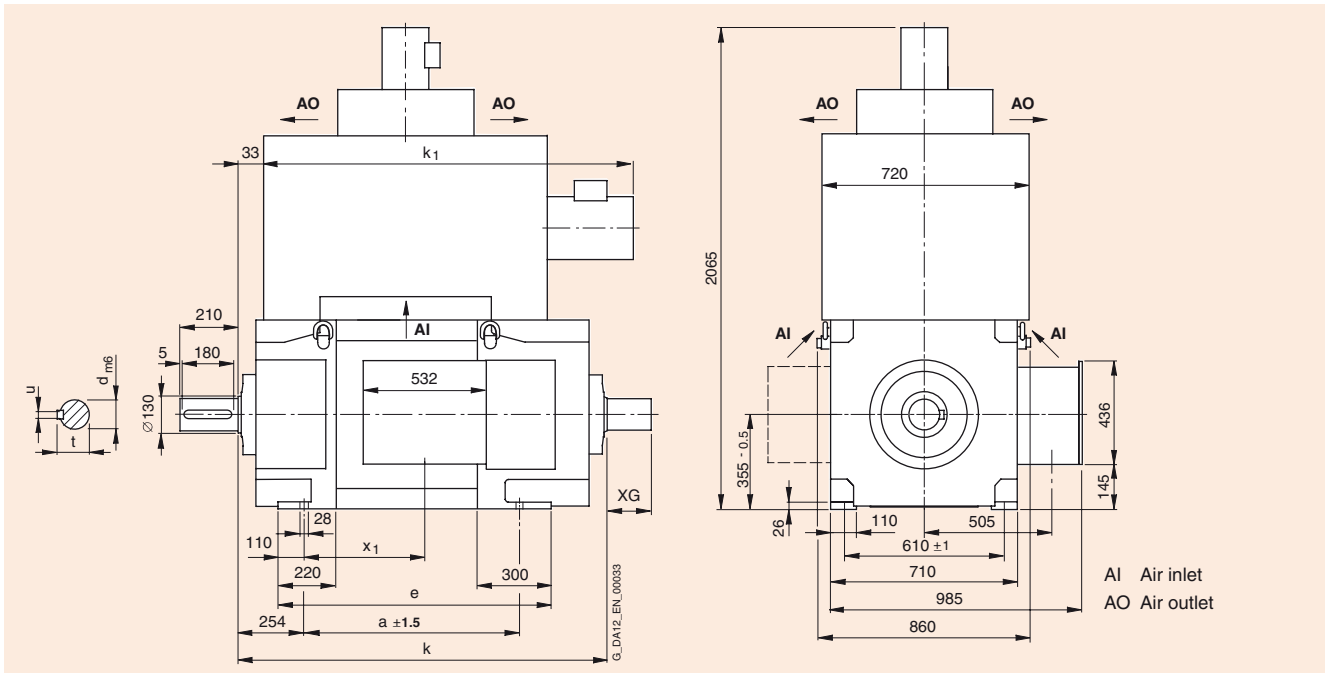


Type of construction IM B 3

Type of construction IM B 3

For motors		Dimensions acc. to						Tacho	Dimen- sions
Size	Type 1HS7...	a IEC B	e	k L	k ₁ LC	x ₁	x ₂		- XG
450	... 451	930	1125	1660	1670	520	750	ROD 436	85
	... 452	1000	1195	1730	1740	590	820	POG 9 D / POG 10 D	150
	... 453	1090	1285	1820	1830	680	910	REO 444 R	180
	... 454	1210	1405	1940	1950	800	1030	TDP 0.09	195
	... 455	1400	1595	2130	2140	990	1220	TDP 0.2 T	185

Dimension drawings



Type of construction IM B 3

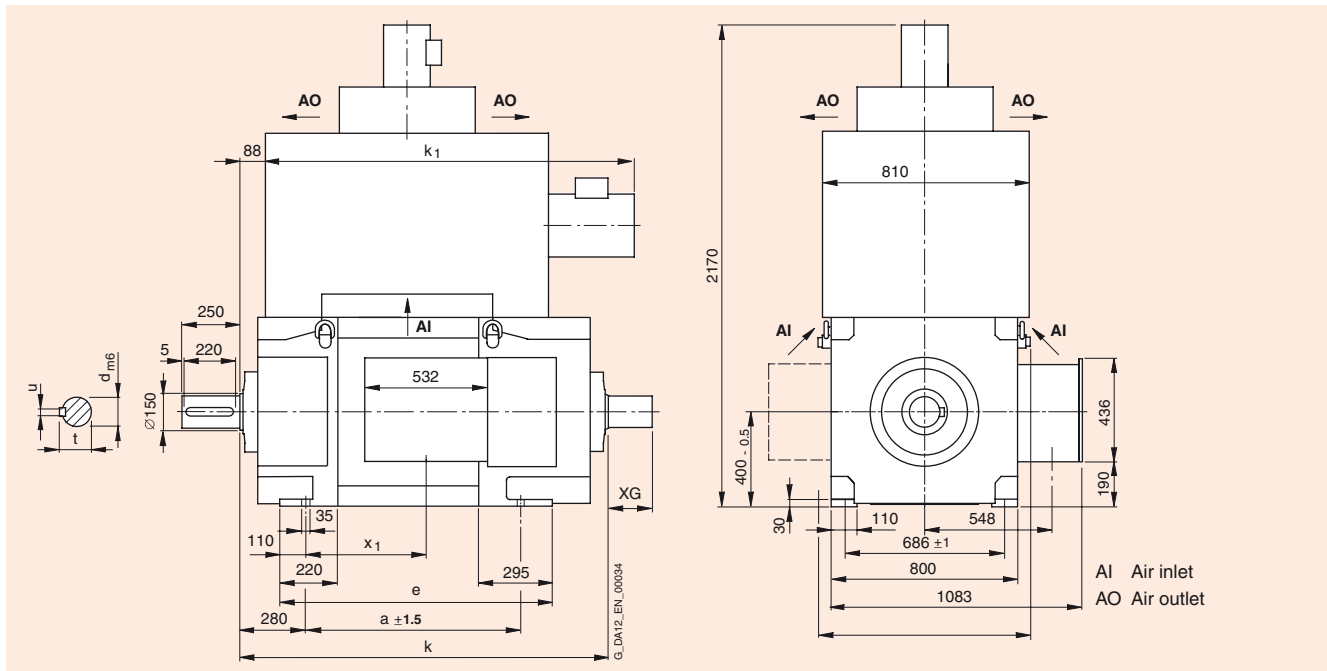
Type of construction IM B 3

Size	Type 1HQ7 ...	Dimensions acc. to					Drive end shaft extension			Tacho	Dimen- sions - XG
		IEC B	a	e	k L	k ₁ LC	x ₁	d D	t GA			u F
355	... 351	770	1065	1450	1510	415	110	116	28	ROD 436	85
	... 352	870	1115	1500	1560	465	110	116	28	POG 9 D / POG 10 D	150
	... 353	930	1175	1560	1620	525	120	127	32	REO 444 R	180
	... 354	1000	1255	1640	1700	605	120	127	32	TDP 0.09	195
	... 355	1120	1375	1760	1820	725	120	127	32	TDP 0.2 T	185

Dimensions

1HQ7 401 - 1HQ7 405

Dimension drawings



Type of construction IM B 3

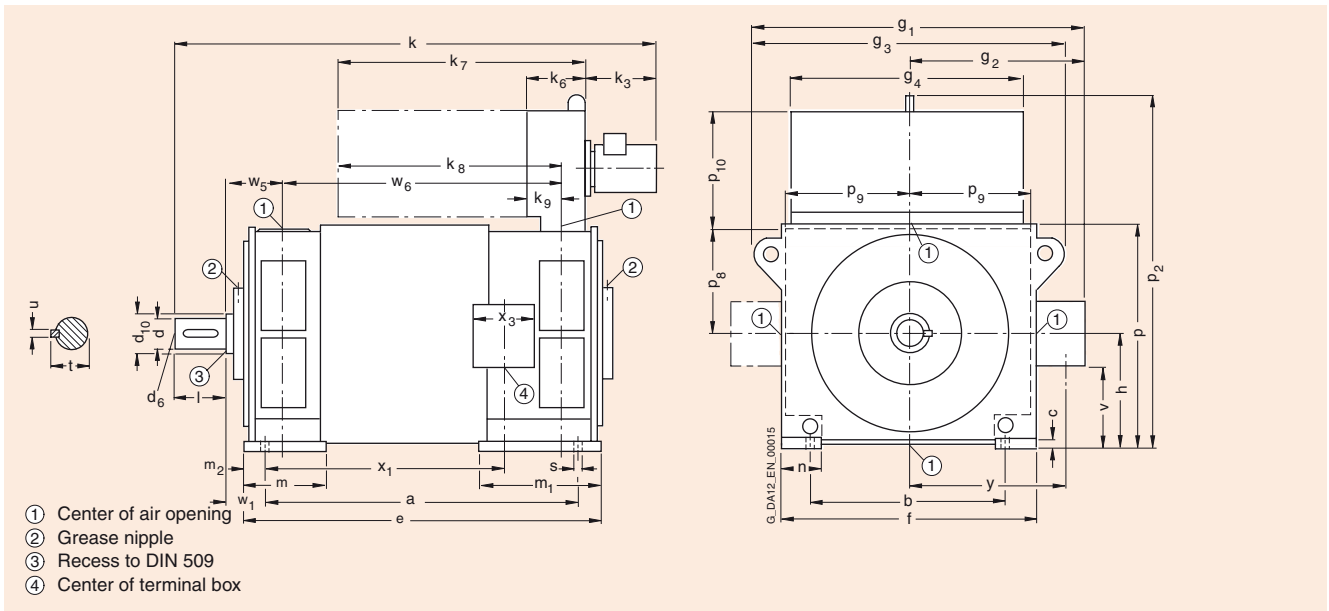
Type of construction IM B 3

Size	Type 1HQ7...	For motors					Dimensions acc. to			Drive end shaft extension			Tacho	Dimen- sions - XG
		IEC B	a	e	k L	k ₁ LC	x ₁	d D	t GA	u F				
400	... 401	830	1100	1515	1530	450	130	137	32	ROD 436	85			
	... 402	900	1170	1585	1600	520	130	137	32	POG 9 D / POG 10 D	150			
	... 403	1000	1245	1660	1675	595	130	137	32	REO 444 R	180			
	... 404	1105	1350	1765	1780	700	140	148	36	TDP 0.09	195			
	... 405	1275	1520	1935	1950	870	140	148	36	TDP 0.2 T	185			

Dimensions

1GG5 500 - 1GG5 635

Dimension drawings



Type of construction IM B 3

Type of construction IM B 3

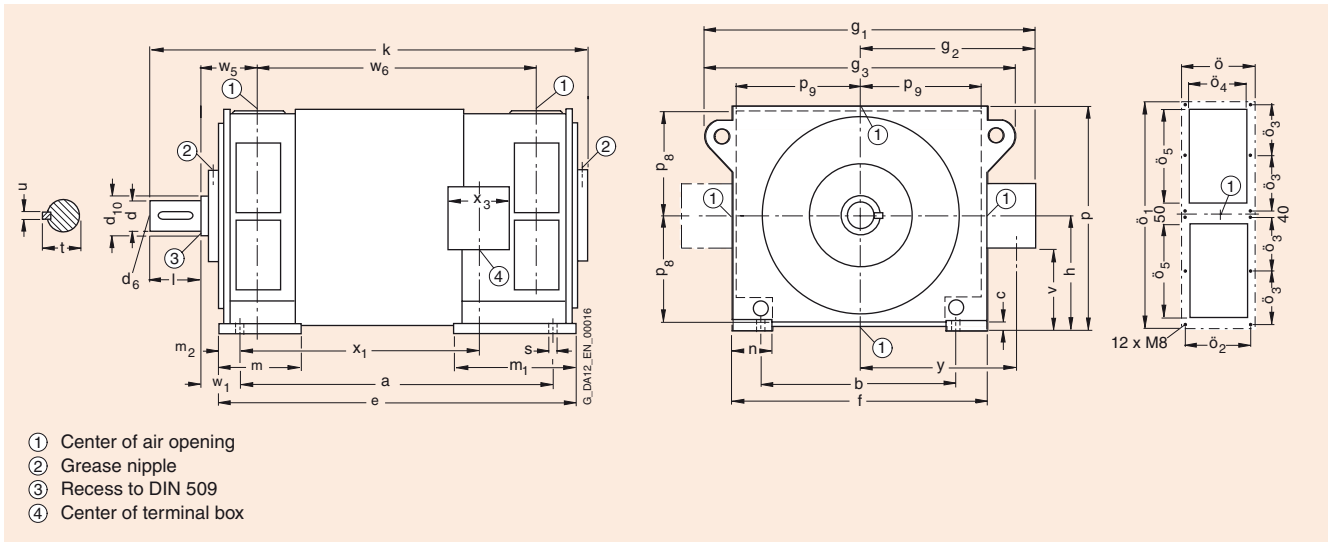
For motors			Dimensions acc. to																					
Size	Type 1GG5 ...	Terminal box type	a IEC B	b A	c HA	e BB	f AB	g ₁	g ₂	g ₃	g ₄	h H	k L	k ₃	k ₆	k ₇	k ₈	k ₉	m BA	m ₁	m ₂	n AA	p	p ₂
500	... 500	1XB7 710 1XB7 942	1210	850	30	1455	1072	1420 1560	770 910	1300	940	500	2115	425	280	1000	905	185	560	635	125	170	1000	1680
	... 501	1XB7 710 1XB7 942	1210	850	30	1455	1072	1420 1560	770 910	1300	940	500	2115	425	280	1000	905	185	460	635	125	170	1000	1680
	... 502	1XB7 710 1XB7 942	1210	850	30	1455	1072	1420 1560	770 910	1300	940	500	2115	425	280	1000	905	185	360	635	125	170	1000	1680
	... 503	1XB7 710 1XB7 942	1410	850	30	1655	1072	1420 1560	770 910	1300	940	500	2365	425	280	1000	905	185	460	635	125	170	1000	1680
	... 504	1XB7 710 1XB7 942	1410	850	30	1655	1072	1420 1560	770 910	1300	940	500	2365	425	280	1000	905	185	360	635	125	170	1000	1680
630	... 631	1XB7 710 1XB7 942	1280	1060	34	1565	1354	1730 1870	910 1050	1640	1255	630	2270	425	330	1070	960	220	515	700	145	210	1260	1940
	... 632	1XB7 710 1XB7 942	1280	1060	34	1565	1354	1730 1870	910 1050	1640	1255	630	2270	425	330	1070	960	220	415	700	145	210	1260	1940
	... 633	1XB7 710 1XB7 942	1480	1060	34	1765	1354	1730 1870	910 1050	1640	1255	630	2520	425	330	1070	960	220	515	700	145	210	1260	1940
	... 634	1XB7 710 1XB7 942	1480	1060	34	1765	1354	1730 1870	910 1050	1640	1255	630	2520	425	330	1070	960	220	415	700	145	210	1260	1940
	... 635	1XB7 710 1XB7 942	1630	1060	34	1915	1354	1730 1870	910 1050	1640	1255	630	2670	425	330	1070	960	220	415	700	145	210	1260	1940

For motors			Dimensions acc. to													Drive end shaft extension					
Size	Type 1GG5 ...	Terminal box type	ρ ₈ IEC	ρ ₉	ρ ₁₀	s K	v	w ₁ C	w ₅	w ₆	x ₁	x ₃	y	d D	l E	t GA	u F	d ₆	d ₁₀		
500	... 500	1XB7 710 1XB7 942	485	526	645	35	320	200	255	1090	830 800	360 480	670 755	140	250	148	36	M 30	150		
	... 501	1XB7 710 1XB7 942	485	526	645	35	320	200	255	1090	830 800	360 480	670 755	140	250	148	36	M 30	150		
	... 502	1XB7 710 1XB7 942	485	526	645	35	320	200	255	1090	830 800	360 480	670 755	150	250	158	36	M 30	160		
	... 503	1XB7 710 1XB7 942	485	526	645	35	320	200	255	1290	1030 1000	360 480	670 755	160	300	169	40	M 30	170		
	... 504	1XB7 710 1XB7 942	485	526	645	35	320	200	255	1290	1030 1000	360 480	670 755	160	300	169	40	M 30	170		
630	... 631	1XB7 710 1XB7 942	615	667	645	42	450	224	286	1150	880 850	360 480	810 895	160	300	169	40	M 30	170		
	... 632	1XB7 710 1XB7 942	615	667	645	42	450	224	286	1150	880 850	360 480	810 895	170	300	179	40	M 30	180		
	... 633	1XB7 710 1XB7 942	615	667	645	42	450	224	286	1350	1080 1050	360 480	810 895	190	350	200	45	M 30	200		
	... 634	1XB7 710 1XB7 942	615	667	645	42	450	224	286	1350	1080 1050	360 480	810 895	190	350	200	45	M 30	200		
	... 635	1XB7 710 1XB7 942	615	667	645	42	450	224	286	1500	1230 1200	360 480	810 895	200	350	210	45	M 30	220		

Dimensions

1GH5 500 - 1GH5 635

Dimension drawings



Type of construction IM B 3

Type of construction IM B 3

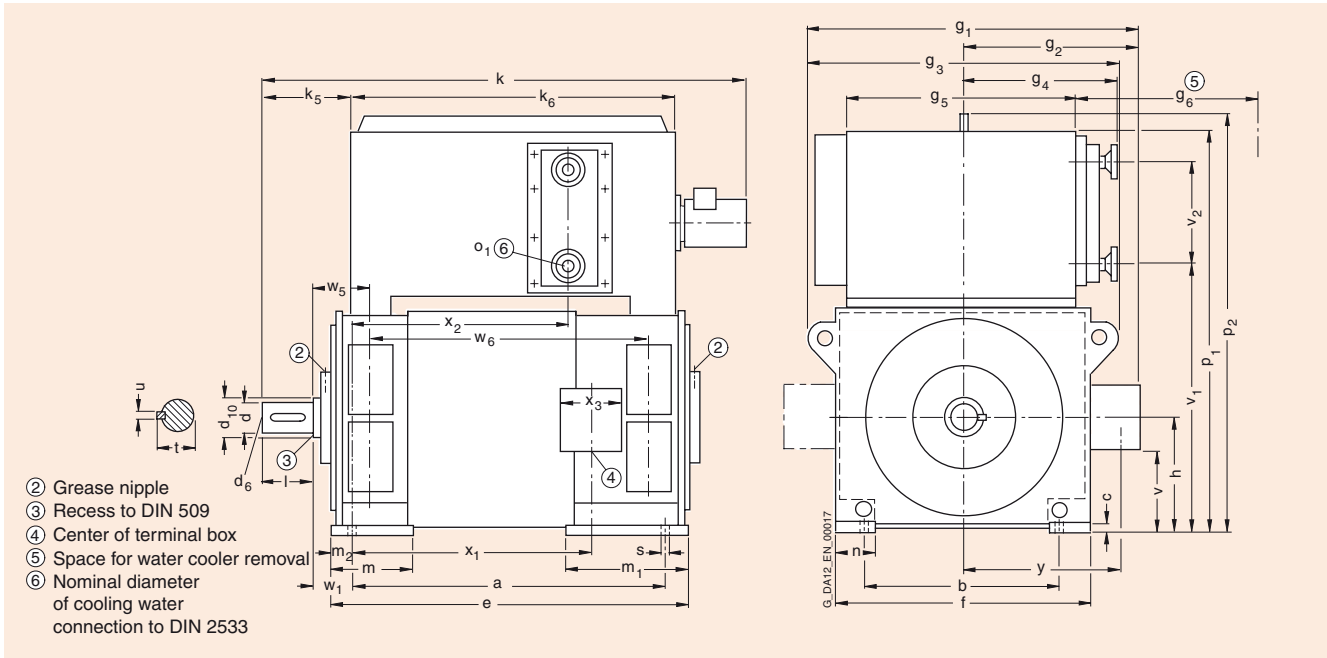
For motors			Dimensions acc. to																						
Size	Type 1GH5 ...	Terminal box type	IEC B	a A	b A	c HA	e BB	f AB	g ₁ -	g ₂ -	g ₃ -	h H	k L	m BA	m ₁ -	m ₂ -	n AA	ö -	ö ₁ -	ö ₂ -	ö ₃ -	ö ₄ -	ö ₅ -	p -	p ₈ -
500	.... 500	1XB7 710 1XB7 942		1210	850	30	1455	1072	1420 1560	770 910	1300	500	1850	560	635	125	170	230	620	210	140	180	270	1000	485
	.... 501	1XB7 710 1XB7 942		1210	850	30	1455	1072	1420 1560	770 910	1300	500	1850	460	635	125	170	230	620	210	140	180	270	1000	485
	.... 502	1XB7 710 1XB7 942		1210	850	30	1455	1072	1420 1560	770 910	1300	500	1850	360	635	125	170	230	620	210	140	180	270	1000	485
	.... 503	1XB7 710 1XB7 942		1410	850	30	1655	1072	1420 1560	770 910	1300	500	2100	460	635	125	170	230	620	210	140	180	270	1000	485
	.... 504	1XB7 710 1XB7 942		1410	850	30	1655	1072	1420 1560	770 910	1300	500	2100	360	635	125	170	230	620	210	140	180	270	1000	485
630	.... 631	1XB7 710 1XB7 942		1280	1060	34	1565	1354	1730 1870	910 1050	1640	630	2010	515	700	145	210	265	840	245	195	215	380	1260	615
	.... 632	1XB7 710 1XB7 942		1280	1060	34	1565	1354	1730 1870	910 1050	1640	630	2010	515	700	145	210	265	840	245	195	215	380	1260	615
	.... 633	1XB7 710 1XB7 942		1480	1060	34	1765	1354	1730 1870	910 1050	1640	630	2260	515	700	145	210	265	840	245	195	215	380	1260	615
	.... 634	1XB7 710 1XB7 942		1480	1060	34	1765	1354	1730 1870	910 1050	1640	630	2260	415	700	145	210	265	840	245	195	215	380	1260	615
	.... 635	1XB7 710 1XB7 942		1630	1060	34	1915	1354	1730 1870	910 1050	1640	630	2410	415	700	145	210	265	840	245	195	215	380	1260	615

For motors			Dimensions acc. to										Drive end shaft extension					
Size	Type 1GH5 ...	Terminal box type	IEC	ρ ₉ -	s K	v -	w ₁ C	w ₅ -	w ₆ -	x ₁ -	x ₃ -	y -	d D	l E	t GA	u F	d ₆ -	d ₁₀ -
500	.... 500	1XB7 710 1XB7 942		526	35	320	200	255	1090	830 800	360 480	670 755	140	250	148	36	M 30	150
	.... 501	1XB7 710 1XB7 942		526	35	320	200	255	1090	830 800	360 480	670 755	140	250	148	36	M 30	150
	.... 502	1XB7 710 1XB7 942		526	35	320	200	255	1090	830 800	360 480	670 755	150	250	158	36	M 30	160
	.... 503	1XB7 710 1XB7 942		526	35	320	200	255	1290	1030 1000	360 480	670 755	160	300	169	40	M 30	170
	.... 504	1XB7 710 1XB7 942		526	35	320	200	255	1290	1030 1000	360 480	670 755	160	300	169	40	M 30	170
630	.... 631	1XB7 710 1XB7 942		667	42	450	224	286	1150	880 850	360 480	810 895	160	300	169	40	M 30	170
	.... 632	1XB7 710 1XB7 942		667	42	450	224	286	1150	880 850	360 480	810 895	170	300	179	40	M 30	180
	.... 633	1XB7 710 1XB7 942		667	42	450	224	286	1350	1080 1050	360 480	810 895	190	350	200	45	M 30	200
	.... 634	1XB7 710 1XB7 942		667	42	450	224	286	1350	1080 1050	360 480	810 895	190	350	200	45	M 30	200
	.... 635	1XB7 710 1XB7 942		667	42	450	224	286	1500	1230 1200	360 480	810 895	200	350	210	45	M 30	220

Dimensions

1HS5 500 - 1HS5 635

Dimension drawings



Type of construction IM B 3

Type of construction IM B 3¹⁾

For motors			Dimensions acc. to																		
Size	Type 1HS5...	Terminal box type	IEC B	b A	c HA	e BB	f AB	g ₁	g ₂	g ₃	g ₄	g ₅	g ₆	h H	k L	k ₅	k ₆	m BA	m ₁	m ₂	n AA
500	.... 500	1XB7 710 1XB7 942	1210	850	30	1455	1072	1420 1560	770 910	1300	666	995	1250	500	2115	410	1280	560	635	125	170
	.... 501	1XB7 710 1XB7 942	1210	850	30	1455	1072	1420 1560	770 910	1300	666	995	1250	500	2115	410	1280	460	635	125	170
	.... 502	1XB7 710 1XB7 942	1210	850	30	1455	1072	1420 1560	770 910	1300	666	995	1250	500	2115	410	1280	360	635	125	170
	.... 503	1XB7 710 1XB7 942	1410	850	30	1655	1072	1420 1560	770 910	1300	666	995	1250	500	2365	460	1480	460	635	125	170
	.... 504	1XB7 710 1XB7 942	1410	850	30	1655	1072	1420 1560	770 910	1300	666	995	1250	500	2365	460	1480	360	635	125	170
630	.... 631	1XB7 710 1XB7 942	1280	1060	34	1565	1354	1730 1870	910 1050	1640	796	1255	1470	630	2270	475	1370	515	700	145	210
	.... 632	1XB7 710 1XB7 942	1280	1060	34	1565	1354	1730 1870	910 1050	1640	796	1255	1470	630	2270	475	1370	415	700	145	210
	.... 633	1XB7 710 1XB7 942	1480	1060	34	1765	1354	1730 1870	910 1050	1640	796	1255	1470	630	2520	525	1570	515	700	145	210
	.... 634	1XB7 710 1XB7 942	1480	1060	34	1765	1354	1730 1870	910 1050	1640	796	1255	1470	630	2520	525	1570	415	700	145	210
	.... 635	1XB7 710 1XB7 942	1630	1060	34	1915	1354	1730 1870	910 1050	1640	796	1255	1470	630	2670	525	1720	415	700	145	210

For motors			Dimensions acc. to													Drive end shaft extension					
Size	Type 1HS5...	Terminal box type	IEC	o ₁	p ₁	p ₂	s K	v	v ₁	v ₂	w ₁ C	x ₁	x ₂	x ₃	y	d D	l E	t GA	u F	d ₆	d ₁₀
500	.... 500	1XB7 710 1XB7 942	50	1800	1860	35	320	1226	440	200	830 800	715	360 480	670 755	140	250	148	36	M 30	150
	.... 501	1XB7 710 1XB7 942	50	1800	1860	35	320	1226	440	200	830 800	715	360 480	670 755	140	250	148	36	M 30	150
	.... 502	1XB7 710 1XB7 942	50	1800	1860	35	320	1226	440	200	830 800	715	360 480	670 755	150	250	158	36	M 30	160
	.... 503	1XB7 710 1XB7 942	50	1800	1860	35	320	1226	440	200	1030 1000	915	360 480	670 755	160	300	169	40	M 30	170
	.... 504	1XB7 710 1XB7 942	50	1800	1860	35	320	1226	440	200	1030 1000	915	360 480	670 755	160	300	169	40	M 30	170
630	.... 631	1XB7 710 1XB7 942	65	2200	2260	42	450	1505	540	224	880 850	762	360 480	810 895	160	300	169	40	M 30	170
	.... 632	1XB7 710 1XB7 942	65	2200	2260	42	450	1505	540	224	880 850	762	360 480	810 895	170	300	179	40	M 30	180
	.... 633	1XB7 710 1XB7 942	65	2200	2260	42	450	1505	540	224	1080 1050	962	360 480	810 895	190	350	200	45	M 30	200
	.... 634	1XB7 710 1XB7 942	65	2200	2260	42	450	1505	540	224	1080 1050	962	360 480	810 895	190	350	200	45	M 30	200
	.... 635	1XB7 710 1XB7 942	65	2200	2260	42	450	1505	540	224	1230 1200	1112	360 480	810 895	200	350	210	45	M 30	220

¹⁾ The dimensions are valid for special versions 1 and 2 of the heat exchanger.
Please request dimensions of the standard heat exchanger.

Dimensions

Notes

4



Appendix



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Appendix

Further information

Regulations, standards and specifications

The motors comply with the appropriate standards and regulations, see table below.

As a result of the fact that in many countries the national regulations have been completely harmonized with the international

IEC 60 034-1 recommendation, there are no longer any differences with respect to coolant temperatures, temperature classes and maximum temperature rises.

Title	DIN/EN	IEC
General specifications for rotating electrical machines	EN 60 034-1	IEC 60 034-1 IEC 60 085
Terminal designations and direction of rotation for electrical machines	EN 60 034-8	IEC 60 034-8
Types of construction and installation	EN 60 034-7	IEC 60 034-7
Built-in thermal protection	–	IEC 60 034-11
Cooling methods for rotating electrical machines	EN 60 034-6	IEC 60 034-6
Degrees of protection of rotating electrical machines	EN 60 034-5	IEC 60 034-5
Vibration severity of rotating electrical machines	EN 60 034-14	IEC 60 034-14
Vibration limits	DIN ISO 10 816	–
Noise limit values for rotating electrical machines	EN 60 034-9	IEC 60 034-9

Appendix

Siemens contacts worldwide

SIEMENS Find (Home) | Personalization | Help us | English

Local Partners Worldwide

Germany

Are you looking for a local contact to help you with questions on Automation and Drives products?

No problem. First select the city nearest to your location:

Select other country ...

City:

And to be able to name the best contact to deal with your questions we need to know the area your question refers to:

Area:

Next >

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SIEMENS Find (Home) | Personalization | Help us | English

Local Partners Worldwide

Please select a sector:

Select areaproduct | Select city | Your contact(s)

Sectors | Search a Sector

On which sector* is your question focused mainly?

Video Systems, Visualization Systems
 Electrical/Powercable
 Material Flow Control, Distribution and Logistics
 Assembly Control
 Paper Machines
 Production Automation in the Automotive Industry and Suppliers
 Production Logistics and Control Systems
 Production Machines, Textiles, Plastics, Metal Forming, Welding, Glass, Ceramic processing, Stone processing, Packaging, Printing, Lithography
 Process Control Systems
 Testing/Final Assembly

* This list contains only Siemens sectors from the range of sectors of Automation and Drive Systems.

Which area does your question concern?

Area:

Next >

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SIEMENS Find (Home) | Personalization | Help us | English

Local Partners Worldwide

Please select a Siemens product group:

Select areaproduct | Select city | Your contact(s)

Product Catalog | Search a Product

To which product* does your question refer to mainly?

Drive Technology
 Automation systems
 Communication/Networks
 Low-voltage switching technology
 Electrical installation Technology
 Process automation
 Sensor technology, measuring and test engineering
 Power supplies
 Safety systems - Safety Integrated
 System solutions and products for branches

* This list only contains Siemens products from the Automation and Drives line of products.

Which area does your question concern?

Area:

Next >

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At

<http://www.siemens.com/automation/partner>

you can find details of Siemens contact partners worldwide responsible for particular technologies.

You can obtain in most cases a contact partner for

- Technical Support,
- Spare parts/repairs,
- Service,
- Training,
- Sales or
- Consultation/engineering.

You start by selecting a

- Country,
- Product or
- Sector.

By further specifying the remaining criteria you will find exactly the right contact partner with his/her respective expertise.

Appendix

A&D online services

Information and ordering in the Internet and on CD-ROM

A&D in the WWW



A detailed knowledge of the range of products and services available is essential when planning and configuring automation systems. It goes without saying that this information must always be fully up-to-date.

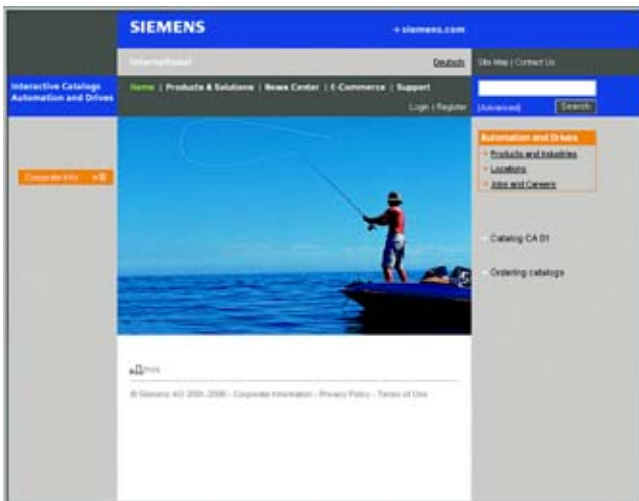
The Siemens Automation and Drives Group (A&D) has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

Under the address

<http://www.siemens.com/automation>

you will find everything you need to know about products, systems and services.

Product Selection Using the Offline Mall of Automation and Drives



Detailed information together with convenient interactive functions:

The Offline Mall CA 01 covers more than 80,000 products and thus provides a full summary of the Siemens Automation and Drives product base.

Here you will find everything that you need to solve tasks in the fields of automation, switchgear, installation and drives.

All information is linked into a user interface which is easy to work with and intuitive.

After selecting the product of your choice you can order at the press of a button, by fax or by online link.

Information on the Offline Mall CA 01 can be found in the Internet under

<http://www.siemens.com/automation/ca01>

or on CD-ROM or DVD.

Easy Shopping with the A&D Mall



The A&D Mall is the virtual department store of Siemens AG in the Internet. Here you have access to a huge range of products presented in electronic catalogs in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure from selection through ordering to tracking of the order to be carried out online via the Internet.

Numerous functions are available to support you.

For example, powerful search functions make it easy to find the required products, which can be immediately checked for availability. Customer-specific discounts and preparation of quotes can be carried out online as well as order tracking and tracing.

Please visit the A&D Mall on the Internet under:

<http://www.siemens.com/automation/mall>

Our services for every phase of the project



In the face of harsh competition you need optimum conditions to keep ahead all the time:

A strong starting position. A sophisticated strategy and team for the necessary support - in every phase.

Service & Support from Siemens provides this support with a complete range of different services for automation and drives.

In every phase: from planning and startup to maintenance and upgrading.

Our specialists know when and where to act to keep the productivity and cost-effectiveness of your system running in top form.

Configuration and Software Engineering



Support in configuring and developing with customer-oriented services from actual configuration to implementation of the automation project. ¹⁾

Service On Site



With Service On Site we offer services for startup and maintenance, essential for ensuring system availability.

In Germany
0180 50 50 444 ¹⁾
(0.14 €/min from the German fixed network)

Repairs and Spare Parts



In the operating phase of a machine or automation system we provide a comprehensive repair and spare parts service ensuring the highest degree of operating safety and reliability.

In Germany
0180 50 50 446 ¹⁾
(0.14 €/min from the German fixed network)

Online Support



The comprehensive information system available round the clock via Internet ranging from Product Support and Service & Support services to Support Tools in the Shop.

<http://www.siemens.com/automation/service&support>

Technical Support



Competent consulting in technical questions covering a wide range of customer-oriented services for all our products and systems.

Tel.: +49 (0)180 50 50 222
Fax: +49 (0)180 50 50 223
(0.14 €/min from the German fixed network)

<http://www.siemens.com/automation/support-request>

Technical Consulting



Support in the planning and designing of your project from detailed actual-state analysis, target definition and consulting on product and system questions right to the creation of the automation solution. ¹⁾

Optimization and Upgrading



To enhance productivity and save costs in your project we offer high-quality services in optimization and upgrading. ¹⁾

¹⁾ For country-specific telephone numbers go to our Internet site at: <http://www.siemens.com/automation/service&support>

Appendix

Customer support

Knowledge base and Automation Value Card

Knowledge Base on CD-ROM



For locations without online connections to the Internet there are excerpts of the free part of the information sources available on CD-ROM (Service & Support Knowledge Base). This CD-ROM contains all the latest product information at the time of production (FAQs, Downloads, Tips and Tricks, Updates) as well as general information on Service and Technical Support.

The CD-ROM also includes a full-text search and our Knowl-

edge Manager for targeted searches for solutions. The CD-ROM will be updated every 4 months.

Just the same as our online offer in the Internet, the Service & Support Knowledge Base on CD comes complete in 5 languages (German, English, French, Italian, Spanish).

You can order the **Service & Support Knowledge Base** CD from your Siemens contact.

Order no. **6ZB5310-0EP30-0BA2**

Orders via the Internet (with Automation Value Card or credit card) at:

<http://www.siemens.com/automation/service&support>

in the Shop domain.

Automation Value Card



Small card - great support

The Automation Value Card is an integral component of the comprehensive service concept with which Siemens Automation and Drives will accompany you in each phase of your automation project.

It doesn't matter whether you want just specific services from our Technical Support or want to purchase high-quality Support Tools in our Online Shop, you can always pay with your Automation Value Card. No invoicing, transparent and safe. With your personal card number and associated PIN you can view the state of your account and all transactions at any time.

Services on card. This is how it's done.

Card number and PIN are on the back of the Automation Value Card. When delivered, the PIN is covered by a scratch field, guaranteeing that the full credit is on the card.

By entering the card number and PIN you have full access to the Service & Support services being offered. The charge for the services procured is debited from the credits on your Automation Value Card.

All the services offered are marked in currency-neutral credits, so you can use the Automation Value Card worldwide.

Automation Value Card order numbers

Credits	Order no.
200	6ES7 997-0BA00-0XA0
500	6ES7 997-0BB00-0XA0
1000	6ES7 997-0BC00-0XA0
10000	6ES7 997-0BG00-0XA0

Detailed information on the services offered is available on our Internet site at:

<http://www.siemens.com/automation/service&support>

Service & Support à la Card: Examples

Technical Support

"Priority"	Priority processing for urgent cases
"24 h"	Availability round the clock
„Extended“	Technical consulting for complex questions

Support Tools in the Support Shop

"System Utilities"	Tools that can be used directly for configuration, analysis and testing
"Applications"	Complete topic solutions including ready-tested software
"Functions & Samples"	Adaptable blocks for accelerating your developments

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1GH6 164	3/7	1HQ7 402	3/100 ... 3/101
1GH6 166	3/8	1HQ7 403	3/102 ... 3/103
1GH6 186	3/9	1HQ7 404	3/104 ... 3/105
1GH6 188	3/10	1HQ7 405	3/106 ... 3/107
1GH6 206	3/12	1HQ7 451	3/108 ... 3/109
1GH6 208	3/13	1HQ7 452	3/110 ... 3/111
1GH6 226	3/15	1HQ7 453	3/112 ... 3/113
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1GH6 256	3/18	1HQ7 455	3/116 ... 3/117
1GH6 258	3/19	1HS5	
1GH6 286	3/21	1HS5 500	3/56 ... 3/57
1GH6 288	3/22	1HS5 501	3/58 ... 3/59
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1GH7 403	3/38 ... 3/39	1HS6 208	3/13
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1HQ6 188	3/79	1HS7 352	3/26 ... 3/27
1HQ6 206	3/80	1HS7 353	3/28 ... 3/29
1HQ6 208	3/81	1HS7 354	3/30 ... 3/31
1HQ6 226	3/83	1HS7 355	3/32 ... 3/33
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1HQ6 256	3/86	1HS7 402	3/36 ... 3/37
1HQ6 258	3/87	1HS7 403	3/38 ... 3/39
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		1HS7 451	3/45 ... 3/46
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Appendix

Conditions of sale and delivery Export regulations

Terms and Conditions of Sale and Delivery

By using this catalog you can acquire hardware and software products described therein from Siemens AG subject to the following terms. Please note! The scope, the quality and the conditions for supplies and services, including software products, by any Siemens entity having a registered office outside of Germany, shall be subject exclusively to the General Terms and Conditions of the respective Siemens entity. The following terms apply exclusively for orders placed with Siemens AG.

For customers with a seat or registered office in Germany

The "General Terms of Payment" as well as the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry" shall apply.

For software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or registered Office in Germany" shall apply.

For customers with a seat or registered office outside of Germany

The "General Terms of Payment" as well as the "General Conditions for Supplies of Siemens Automation and Drives for Customers with a Seat or registered Office outside of Germany" shall apply.

For software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or registered Office outside of Germany" shall apply.

General

The dimensions are in mm. In Germany, according to the German law on units in measuring technology, data in inches only apply to devices for export.

Illustrations are not binding.

Insofar as there are no remarks on the corresponding pages, - especially with regard to data, dimensions and weights given - these are subject to change without prior notice.

The prices are in € (Euro) ex works, exclusive packaging.

The sales tax (value added tax) is not included in the prices. It shall be debited separately at the respective rate according to the applicable legal regulations.

Prices are subject to change without prior notice. We will debit the prices valid at the time of delivery.

Surcharges will be added to the prices of products that contain silver, copper, aluminum, lead and/or gold if the respective basic official prices for these metals are exceeded. These surcharges will be determined based on the official price and the metal factor of the respective product.

The surcharge will be calculated on the basis of the official price on the day prior to receipt of the order or prior to the release order.

The metal factor determines the official price as of which the metal surcharges are charged and the calculation method used. The metal factor, provided it is relevant, is included with the price information of the respective products.

An exact explanation of the metal factor and the text of the Comprehensive Terms and Conditions of Sale and Delivery are available free of charge from your local Siemens business office under the following Order Nos.:

- 6ZB5310-0KR30-0BA1
(for customers based in Germany)
- 6ZB5310-0KS53-0BA1
(for customers based outside Germany)

or download them from the Internet
<http://www.siemens.com/automation/mail>
(Germany: A&D Mall Online-Help System)

Export regulations

The products listed in this catalog / price list may be subject to European / German and/or US export regulations.

Therefore, any export requiring a license is subject to approval by the competent authorities.

According to current provisions, the following export regulations must be observed with respect to the products featured in this catalog / price list:

AL	<p>Number of the <u>German Export List</u></p> <p>Products marked other than "N" require an export license.</p> <p>In the case of software products, the export designations of the relevant data medium must also be generally adhered to.</p> <p>Goods labeled with an "<u>AL" not equal to "N"</u> are subject to a European or German export authorization when being exported out of the EU.</p>
ECCN	<p><u>Export Control Classification Number</u></p> <p>Products marked other than "N" are subject to a reexport license to specific countries.</p> <p>In the case of software products, the export designations of the relevant data medium must also be generally adhered to.</p> <p>Goods labeled with an "<u>ECCN" not equal to "N"</u> are subject to a US re-export authorization.</p>

Even without a label or with an "AL: N" or "ECCN: N", authorization may be required due to the final destination and purpose for which the goods are to be used.

The deciding factors are the AL or ECCN export authorization indicated on order confirmations, delivery notes and invoices.

Errors excepted and subject to change without prior notice.

A&D/VuL_ohne MZ/En 05.09.06

Catalogs of the Automation and Drives Group (A&D)

Further information can be obtained from our branch offices listed in the appendix or at www.siemens.com/automation/partner

Automation and Drives	<i>Catalog</i>	Industrial Communication for Automation and Drives	<i>Catalog</i> IK PI
Interactive catalog on CD-ROM and on DVD			
• The Offline Mall of Automation and Drives	CA 01		
Automation Systems for Machine Tools		Low-Voltage	
SINUMERIK & SIMODRIVE	NC 60	Controls and Distribution – SIRIUS, SENTRON, SIVACON	LV 1
SINUMERIK & SINAMICS	NC 61	Controls and Distribution – Technical Information	LV 1 T
		SIRIUS, SENTRON, SIVACON	
		SIDAC Reactors and Filters	LV 60
		SIVENT Fans	LV 65
		SIVACON 8PS Busbar Trunking Systems	LV 70
Drive Systems		Motion Control System SIMOTION	PM 10
<u>Variable-Speed Drives</u>			
SINAMICS G110/SINAMICS G120	D 11.1	Process Instrumentation and Analytics	
Inverter Chassis Units		Field Instruments for Process Automation	FI 01
SINAMICS G120D		Measuring Instruments for Pressure, Differential Pressure, Flow, Level and Temperature, Positioners and Liquid Meters	
Distributed Frequency Inverters		<i>PDF: Indicators for panel mounting</i>	MP 12
SINAMICS G130 Drive Converter Chassis Units, SINAMICS G150 Drive Converter Cabinet Units	D 11	SIREC Recorders and Accessories	MP 20
SINAMICS GM150/SINAMICS SM150 Medium-Voltage Converters	D 12	SIPART, Controllers and Software	MP 31
SINAMICS S120 Drive Converter Systems	D 21.1	SIWAREX Weighing Systems	WT 01
SINAMICS S150 Drive Converter Cabinet Units	D 21.3	Continuous Weighing and Process Protection	WT 02
Asynchronous Motors Standardline	D 86.1	Process Analytical Instruments	PA 01
Synchronous Motors with Permanent-Magnet Technology, HT-direct	D 86.2	<i>PDF: Process Analytics, Components for the System Integration</i>	PA 11
DC Motors	DA 12		
SIMOREG DC MASTER 6RA70 Digital Chassis Converters	DA 21.1	SIMATIC Industrial Automation Systems	
SIMOREG K 6RA22 Analog Chassis Converters	DA 21.2	SIMATIC PCS Process Control System	ST 45
<i>PDF: SIMOREG DC MASTER 6RM70 Digital Converter Cabinet Units</i>	DA 22	Products for Totally Integrated Automation and Micro Automation	ST 70
SIMOVERT PM Modular Converter Systems	DA 45	SIMATIC PCS 7 Process Control System	ST PCS 7
SIEMOSYN Motors	DA 48	Add-ons for the SIMATIC PCS 7 Process Control System	ST PCS 7.1
MICROMASTER 410/420/430/440 Inverters	DA 51.2	Migration solutions with the SIMATIC PCS 7 Process Control System	ST PCS 7.2
MICROMASTER 411/COMBIMASTER 411	DA 51.3	pc-based Automation	ST PC
SIMOVERT MASTERDRIVES Vector Control	DA 65.10	SIMATIC Control Systems	ST DA
SIMOVERT MASTERDRIVES Motion Control	DA 65.11		
Synchronous and asynchronous servomotors for SIMOVERT MASTERDRIVES	DA 65.3		
SIMODRIVE 611 universal and POSMO	DA 65.4		
<u>Low-Voltage Three-Phase-Motors</u>			
IEC Squirrel-Cage Motors	D 81.1		
IEC Squirrel-Cage Motors · New Generation 1LE1	D 81.1 N		
<i>PDF: Geared Motors</i>	M 15		
<u>Automation Systems for Machine Tools SIMODRIVE</u>	NC 60		
• Main Spindle/Feed Motors			
• Converter Systems SIMODRIVE 611/POSMO			
<u>Automation Systems for Machine Tools SINAMICS</u>	NC 61		
• Main Spindle/Feed Motors			
• Drive System SINAMICS S120			
<u>Drive and Control Components for Hoisting Equipment</u>	HE 1		
Electrical Installation Technology		SIMATIC Sensors	
<i>PDF: ALPHA Small Distribution Boards and Distribution Boards, Terminal Blocks</i>	ETA 1	Sensors for Factory Automation	FS 10
<i>PDF: ALPHA 8HP Molded-Plastic Distribution System</i>	ETA 3		
<i>PDF: BETA Low-Voltage Circuit Protection</i>	ET B1		
<i>PDF: DELTA Switches and Socket Outlets</i>	ET D1	Systems Engineering	
GAMMA Building Controls	ET G1	Power supplies SITOP power	KT 10.1
		System cabling SIMATIC TOP connect	KT 10.2
Human Machine Interface Systems SIMATIC HMI	ST 80	System Solutions	
		Applications and Products for Industry are part of the interactive catalog CA 01	
		TELEPERM M Process Control System	
		<i>PDF: AS 488/TM automation systems</i>	PLT 112

PDF: These catalogs are only available as pdf files.

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