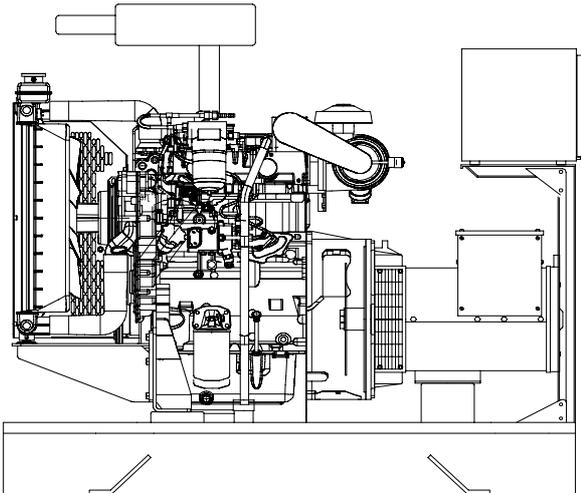




Perkins 1103A-33G diesel engine

Mecc Alte ECO 28-VL/4 alternator



Standard Generator Features

- ◊ AMF, Automatic mains failure unit
- ◊ Heavy duty type, 3 cylinder, water cooled engine
- ◊ 50°C tropical type radiator
- ◊ Starter motor
- ◊ Lead acid battery
- ◊ Charging alternator
- ◊ Battery charge redressor
- ◊ Heavy duty, brushless type alternator
- ◊ Base frame with anti-vibration units
- ◊ Industrial type silencers
- ◊ Flexible exhaust compensator
- ◊ Block water heater unit
- ◊ Control panel with digital-automatic main control module
- ◊ Fan, fan drive, charging alternator drive and all rotating parts covered
- ◊ Radiator matrix covered by metal mesh against the mechanical damages
- ◊ Fabricated and welded steel base frame
- ◊ Anti-vibration mountings
- ◊ Engine and alternator manufacturer test reports
- ◊ Factory load, performance and function tests

Optional Features

- ◊ Automatic load transfer panel
- ◊ Automatic synchronization and power sharing systems
- ◊ Soundproof canopy
- ◊ Container type enclosures
- ◊ Road trailer
- ◊ Job-site trailer
- ◊ Protection circuit breaker
- ◊ Air start
- ◊ Remote type radiator
- ◊ Base fuel tank
- ◊ External type fuel tank
- ◊ Automatic fuel transfer system
- ◊ Residential silencer



| Model | Standby | | Prime | |
|---------------|-----------|-----------|-----------|-----------|
| | kVA | kW | kVA | kW |
| CJ33PC | 32 | 26 | 30 | 24 |

Perkins 1103A-33G Engine

Standard Features

Compact, efficient power

- ◊1100 Series is the result of an intensive period of customer research that has guided the development of the range.
- ◊The new 3.3 litre cylinder block ensures bore roundness is maintained under the pressures of operation. It also ensures combustion and mechanical noise is lowered.
- ◊A new cylinder head has re-established Perkins mastery of air control.

Quality by Design

- ◊Product design and Class A manufacturing improvements enhance product reliability while maintaining Perkins legendary reputation for durability.

Cost Effective Power

- ◊Compact size and low noise.
- ◊Lower fuel consumption and oil use.
- ◊500 hour service intervals.

Product Support

- ◊ Total worldwide service is provided through a network of 4,000 distributors and dealers.
- ◊ TIPSS - The Integrated Parts and Support System enables customers to specify and order parts electronically as well as service engines with on-line guides and service tools.

Technical Specifications

| | |
|---|--------------------------------------|
| Manufacturer | PERKINS |
| Model | 1103A-33G |
| Type | 4 cycle, water-cooled, diesel engine |
| Number of cylinders | 3 |
| Cylinder arrangement | Vertical in-line |
| Displacement, Liters | 3.3 |
| Bore X Stroke, mm | 105 X 127 |
| Compression Ratio | 19.25:1 |
| Combustion System | Direct injection |
| Aspiration | Natural aspiration |
| Rotation | Clockwise viewed from front |
| Gross engine power, kWb | 31 |
| Fan Power, kWm | 0.6 |
| BMEP gross, bar | 7.52 |
| Combustion air flow, m ³ / min | 2.15 |
| Exhaust gas temp.(after turbo), °C | 520 |
| Exhaust gas flow (after turbo),m ³ / min | 5.8 |
| Mean piston speed, m / s | 6.35 |

Cooling System

| | |
|--|---------------------------|
| Type | Tropical, heavy duty type |
| Ambient temperature, °C | 50 |
| Engine+Radiator coolant cap., Liters | 10.2 |
| Pressure cap setting, kPa | 107 |
| ◊Thermostatically-controlled system with belt driven circulating pump and pusher fan | |
| ◊Mounted radiator piping and guards | |

| Model | Standby kW | | Prime kW | |
|------------------|------------|-------------|-------------|-------------|
| | Gross | Net | Gross | Net |
| 1103A-33G | 31 | 30.4 | 28.2 | 27.7 |

Lubricating System

| | |
|------------------------------------|-------------|
| Type | Pressurized |
| Capacity, Liters | 8.3 |
| Lub oil pressure (min), kPa | 415-470 |
| ◊Wet sump with filler and dipstick | |
| ◊Spin-on full-flow lub oil filter | |

Fuel System

| | |
|--|---------------------------|
| Type of injection system | Direct injection |
| Fuel atomiser | Multi-hole |
| Fuel injection Pump | Rotary |
| Delivery/hour at 1500rev/min, Liters | 120-150 |
| Governor type | Electronic, Woodward LCG2 |
| ◊Electronic governor speed control to ISO8528-G2 | |
| ◊Rotary type pump | |
| ◊Ecoplus fuel filter | |

Electrical System

| | |
|---|-----------------|
| Alternator | 12 Volt, 65 Amp |
| Starter motor (DC) | 12 Volt |
| Starter motor power | 3 kW |
| ◊Oil pressure and coolant temperature switches | |
| ◊12 volt shut off solenoid energised to run | |
| ◊Glow plug cold start aid and heater/starter switch | |

Fuel Consumption

| | | |
|-----------------|-----------|-----------|
| liters per hour | %110 Load | 7.9 L |
| | %100 Load | 7.1 L |
| | %75 Load | 5.4 L |
| | %50 Load | 3.9 L |
| grams per kWh | %110 Load | 214 g/kWh |
| | %100 Load | 211 g/kWh |
| | %75 Load | 214 g/kWh |
| | %50 Load | 232 g/kWh |

Mecc Alte ECO 28-VL/4

Standard Features

Range

The ECO generators are available with a 50/60 Hz frequency, either with 2 poles ranging from 8 to 114 KVA or with 4 poles ranging from 6.5 to 3,000 KVA, with a single or double support. In order to couple them with the prime mover it is possible to choose among a wide range of flanges and couplings.

Mechanical Structure

The robust mechanical structure permits easy access to the connections and components during routine and extraordinary maintenance check-ups. The materials used for the manufacture of the mechanical structure are the following: FeP12 steel for the frame, C45 steel for the shaft and cast iron for the end-brackets.

The standard degree of protection is IP21 or IP23; upon the customer's request, other higher degrees of protection, such as IP45, IP54, etc., are available.

Insulation And Impregnation

Insulation is of class H standard. Impregnation is made with tropicalized epoxy resins by dipping and dripping, whilst for the high voltage parts by vacuum, so that the insulation level is always very good. In the highpower models, the stator windings undergo a further insulation. Special treatments for particular environmental conditions are available on request.

Regulation

The self-regulation is obtained through an electronic regulator. The regulator is fed by an auxiliary winding which guarantees an almost constant supply under any possible operating condition of the generator. The ECO series can be equipped with the new interchangeable U.V.R.6-F or S.R.7/2-G regulator, ensuring the same performance.

Voltage Accuracy

The voltage accuracy is $\pm 1\%$ in static condition with any power factor and with speed variation between 5% and +30% with reference to the rated speed.

Voltage Regulation

The voltage can be regulated by the "VOLT" potentiometer of the electronic regulator. By connecting a 100K potentiometer in the proper terminals it is also possible to obtain a remote voltage regulation in a range of 5% of the rated voltage.

Standards

The entire series is manufactured according to and complies with the most common specifications such as CEI 2-3, IEC 34-1, EN 60034-1, VDE 0530, BS 4999-5000, CAN/CSA-C22.2 N°14-95 – N°100-95; special versions are available on request to meet specific specifications and regulations.

| Model | Standby | | Prime | |
|--------------------|-----------|-----------|-----------|-----------|
| | kVA | kW | kVA | kW |
| ECO 28-VL/4 | 32 | 26 | 30 | 24 |

Technical Specifications

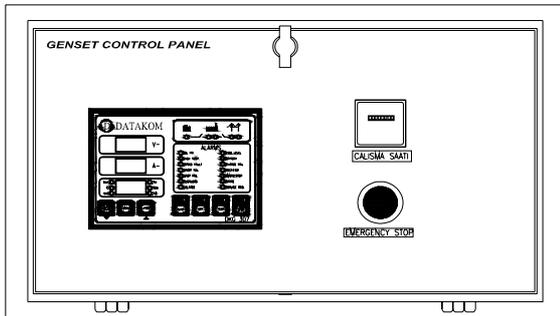
| | |
|--|--|
| Manufacturer | Mecc Alte |
| Model | ECO 28-VL/4 |
| Type | 4-Poles, Rotating Field, Brushless |
| Standby power at rated voltage, kVA | 32 |
| Efficiency, % | 87,9 |
| Power factor | 0.8 |
| Phase | 3 |
| Frequency, Hz | 50 |
| Speed, Rpm | 1500 |
| Voltage, V | 380/415 |
| Excitation | Self excited |
| Stator winding | 12 ends |
| Regulation | Simplified Regulator, seventh generation |
| Voltage Regulator | SR7/2 |
| Voltage Regulation, % | $\pm 1,5$ |
| R.F.I Suppression | EN60034-1 |
| | For others standards apply to factory |
| Waveform Distors.at f. load LL/LN % | 2,1 / 2 |
| Waveform Distors.at no load LL/LN % | 3,3 / 3,1 |
| Rotor | without damping cage |
| Overspeed, Rpm | 2250 |
| Short circuit current | >300% |
| TIF Telephone Interference | THF < 2% |
| Insultion class | H |
| Stator Winding Resistance (20°C), Ω | 0,106 |
| Rotor Winding Resistance (20°C), Ω | 1,86 |
| DE bearing | 6309.2RS |
| NDE bearing | 6207.2RS |
| Protection class | IP 23 (other protection on request) |

Optional Equipment

- ◊Anti Condensation Heaters
- ◊Air Filters
- ◊Temperature Indication RTD's
- ◊Winding Protection Thermistors
- ◊SR7/2 AVR Simplified Regulator, seventh generation

Control Panel

Standard Equipments



- ◊Datakom DKG307 digital automatic control module
- ◊Hourmeter
- ◊Emergency stop button

Datakom DKG307 Control Module

Description

◊The DKG-307 is a comprehensive AMF unit for a single generating set operating in standby mode.

◊In AUTOMATIC position, DKG-307 monitors mains phase voltages and controls the automatic starting, stopping and load transfer of the generating set in case of a mains failure and once the generator is running, it monitors internal protections and external fault inputs. If a fault condition occurs, the unit shuts down the engine automatically and indicates the failure source with the corresponding red led lamp.

◊The DKG-307 provides a comprehensive set of digitally adjustable timers, threshold levels, input and output configurations and operating sequences. The unauthorized access to program parameters is prevented by the program lock input. All programs may be modified via front panel pushbuttons, and do not require an external unit.

◊The fault conditions are considered in 2 categories as Warnings and Alarms. Measured values have separate programmable limits for warning and alarm conditions.

◊The service request indicator lamp turns on at the expiration of either engine hours or time limits.

◊It is possible to monitor the operation of the system locally or remotely with the WINDOWS based PC utility program.

◊The unit is designed for front panel mounting. It is fitted into the cut-out with the steel spring removed. Connections are made with 2 part plug and socket connectors.

Pushbutton Controls

STOP / START
 AUTO, TEST, MANUAL
 LCD PAGE

Features

- Automatic mains failure with genset control and protection
- Remote Start operation capability
- Analogue temperature and oil pressure inputs
- Genset KW and Power Factor measurement
- Engine hours run counter
- Periodic maintenance request display
- 165 programmable parameters
- Battery backed-up real time clock
- Weekly operation schedule programs
- Daily, weekly, monthly exerciser
- Event logging with time stamp
- Statistical counters
- Serial RS-232 data output for telemetry on PC
- Free MS-Windows remote monitoring SW
- Configurable analogue inputs: 2
- Configurable digital inputs: 7
- Configurable relay outputs: 2
- Output expansion capability
- Small dimensions (155x115x48mm)

Input Functions display on LCD

| | |
|------------------------|---------------------------|
| Generator Volts | Volts L1-N, L2-N, L3-N |
| Generator Volts | Volts L1-L2, L2-L3, L3-L1 |
| Generator Amps | Amps L1, L2, L3 |
| Generator Frequency | Hz |
| Mains Volts | Volts L1-N, L2-N, L3-N |
| Mains Volts | Volts L1-L2, L2-L3, L3-L1 |
| Mains Frequency | Hz |
| Engine Speed | RPM |
| Plant Battery Volts | Volts |
| Engine Hours Run | Hour |
| Generator total power | kVA L1, L2, L3,total |
| Generator total power | kW L1, L2, L3,total |
| Generator power factor | Cosφ L1, L2, L3,total |

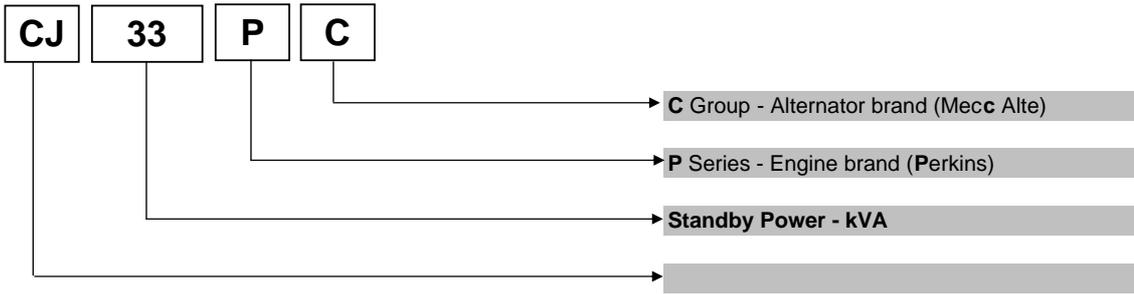
Optional Input Functions

| | |
|---------------------|-----|
| Engine Oil pressure | kPa |
| Fuel level | % |
| Engine Temperature | °C |

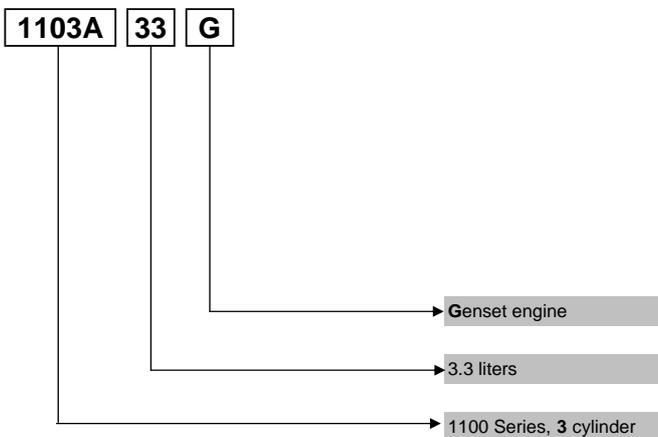
Alarm Channels

- Under/over generator voltage
- Over-current
- Under/over generator frequency
- Under/over speed
- Charge fail
- Emergency stop
- Low oil pressure
- High engine temperature
- Fail to start
- Low/high DC battery voltage
- Reverse power
- Generator phase rotation error
- Generator short-circuit protection
- Loss of speed sensing signal
- Mains out of limits

Model Codes and General Information



Perkins 1100 Series Diesel Engine



Information

Power Ratings

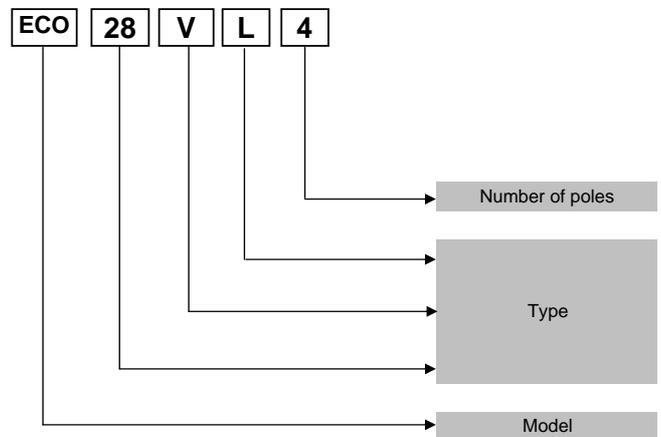
Standby power rating is for the supply of emergency power at variable load for the duration of the non-availability of the mains power supply. No overload capacity is available at this rating. A standby rated engine should be sized for an average load factor of 80% based on published standby rating for 500 operating hours per year. Standby ratings should never be applied except in true emergency power failure conditions.

Prime power rating is available for unlimited hours per year with a variable load of which the average engine load factor is 80% of the published power rating, incorporation of a 10% overload for 1 hour in every 12 hours of operation which permitted

Continuous power rating is available for continuous full load operation. No overload is permitted.

Acc. to ISO 3046/1, BS 5514, DIN6271

Mecc Alte Alternator



Electric Formulas

| Values | Formula | |
|-----------|---|---------------------------------------|
| kWe | $kW_m \times E$ | |
| kWe | $(U \times I \times 1.73 \times pf) / 1000$ | kVA x pf |
| kVA | $(U \times I \times 1.73) / 1000$ | kWe / pf |
| I (Amp) | $(kWe \times 1000) / (U \times 1.73 \times pf)$ | $(kVA \times 1000) / (U \times 1.73)$ |
| Frequency | $(Rpm \times N^\circ Pole) / (2 \times 60)$ | |
| Rpm | $(2 \times 60 \times Frequency) / N^\circ Pole$ | |

kW_m: Mechanical Power

kW_e: Electrical Power

pf: Power factor

E: Alternator efficiency

I: Current (A)

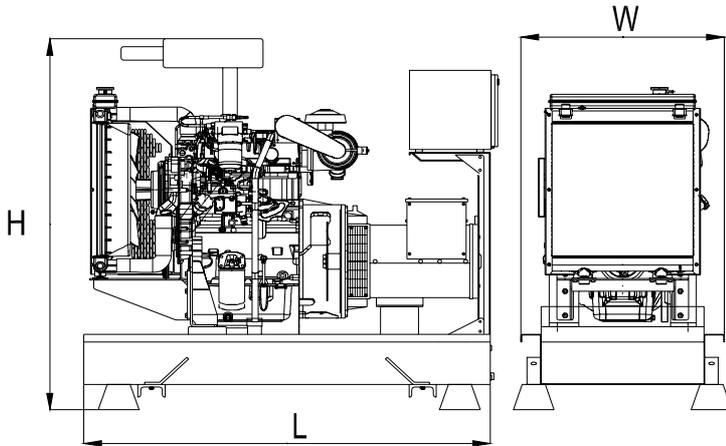
U: Voltage (V)

kVA: Power

Rpm: Revolutions per minute

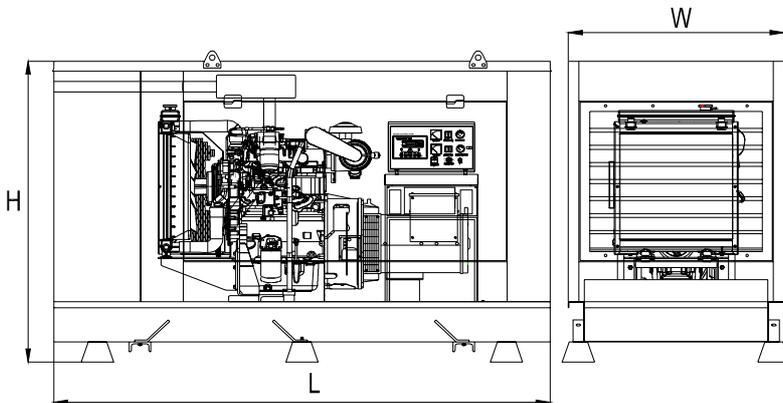
General Dimensions

Standard Generator



| | |
|----------------------|--------|
| Length, L | 1,5 m |
| Height, H | 1,5 m |
| Width, W | 0,75 m |
| Weight, Total | 850 kg |

Generator with Soundproof Canopy



| | |
|----------------------|---------|
| Length, L | 2,3 m |
| Height, H | 1,55 m |
| Width, W | 1 m |
| Weight, Total | 1200 kg |

Generator Room Layout

