

UCI274H - Technical Data Sheet	
	JCI274H - Technical Data Sheet





#### **STANDARDS**

Newage Stamford industrial generators meet the requirements of BS EN 60034 and the relevant section of other international standards such as BS5000, VDE 0530, NEMA MG1-32, IEC34, CSA C22.2-100, AS1359. Other standards and certifications can be considered on request.

### **VOLTAGE REGULATORS**

### **SX460 AVR - STANDARD**

With this self excited control system the main stator supplies power via the Automatic Voltage Regulator (AVR) to the exciter stator. The high efficiency semiconductors of the AVR ensure positive build-up from initial low levels of residual voltage.

The exciter rotor output is fed to the main rotor through a three phase full wave bridge rectifier. This rectifier is protected by a surge suppressor against surges caused, for example, by short circuit.

#### SX440 AVR

With this self-excited system the main stator provides power via the AVR to the exciter stator. The high efficiency semi-conductors of the AVR ensure positive build-up from initial low levels of residual voltage.

The exciter rotor output is fed to the main rotor through a three-phase full-wave bridge rectifier. The rectifier is protected by a surge suppressor against surges caused, for example, by short circuit or out-of-phase paralleling.

The SX440 will support a range of electronic accessories, including a 'droop' Current Transformer (CT) to permit parallel operation with other ac generators.

If 3-phase sensing is required with the self-excited system, the SX421 AVR must be used.

### SX421AVR

This AVR also operates in a self-excited system. It combines all the features of the SX440 with, additionally, three-phase rms sensing for improved regulation and performance. Over voltage protection is provided via a separate circuit breaker. An engine relief load acceptance feature is built in as standard.

### MX341 AVR

This sophisticated AVR is incorporated into the Stamford Permanent Magnet Generator (PMG) control system.

The PMG provides power via the AVR to the main exciter, giving a source of constant excitation power independent of generator output. The main exciter output is then fed to the main rotor, through a full wave bridge, protected by a surge suppressor. The AVR has in-built protection against sustained over-excitation, caused by internal or external faults. This de-excites the machine after a minimum of 5 seconds.

An engine relief load acceptance feature can enable full load to be applied to the generator in a single step.

If three-phase sensing is required with the PMG system the MX321 AVR must be used.

We recommend three-phase sensing for applications with greatly unbalanced or highly non-linear loads.

### MX321 AVR

The most sophisticated of all our AVRs combines all the features of the MX341 with, additionally, three-phase rms sensing, for improved regulation and performance. Over voltage protection is built-in and short circuit current level adjustments is an optional facility.

### **WINDINGS & ELECTRICAL PERFORMANCE**

All generator stators are wound to 2/3 pitch. This eliminates triplen (3rd, 9th, 15th ...) harmonics on the voltage waveform and is found to be the optimum design for trouble-free supply of non-linear loads. The 2/3 pitch design avoids excessive neutral currents sometimes seen with higher winding pitches, when in parallel with the mains. A fully connected damper winding reduces oscillations during paralleling. This winding, with the 2/3 pitch and carefully selected pole and tooth designs, ensures very low waveform distortion.

#### **TERMINALS & TERMINAL BOX**

Standard generators are 3-phase reconnectable with 12 ends brought out to the terminals, which are mounted on a cover at the non-drive end of the generator. A sheet steel terminal box contains the AVR and provides ample space for the customers' wiring and gland arrangements. It has removable panels for easy access

### **SHAFT & KEYS**

All generator rotors are dynamically balanced to better than BS6861:Part 1 Grade 2.5 for minimum vibration in operation. Two bearing generators are balanced with a half key.

### INSULATION/IMPREGNATION

The insulation system is class 'H'.

All wound components are impregnated with materials and processes designed specifically to provide the high build required for static windings and the high mechanical strength required for rotating components.

### **QUALITY ASSURANCE**

Generators are manufactured using production procedures having a quality assurance level to BS EN ISO 9001.

The stated voltage regulation may not be maintained in the presence of certain radio transmitted signals. Any change in performance will fall within the limits of Criteria 'B' of EN 61000-6-2:2001. At no time will the steady-state voltage regulation exceed 2%.

NB Continuous development of our products entitles us to change specification details without notice, therefore they must not be regarded as binding.

Front cover drawing typical of product range.



# **WINDING 311**

AV.R. MX321 MX341  VOLTAGE REGULATION	CONTROL SYSTEM	CEDADATEL	V EVOITED	DVDMC										
SUSTAINED SHORT CIRCUIT   SELFER TO SHORT CIRCUIT DECREMENT CURVES (page 7)		SEPARATELY EXCITED BY P.M.G.												
SUSTAINED SHORT CIRCUIT   REFER TO SHORT CIRCUIT DECREMENT CURVES (page 7)														
A.V.R.   SELF EXCITED	VOLTAGE REGULATION	± 0.5 %	± 1.0 %	With 4% EN	GINE GOVER	RNING								
AVR.	SUSTAINED SHORT CIRCUIT	REFER TO SHORT CIRCUIT DECREMENT CURVES (page 7)												
VOLTAGE REGULATION	CONTROL SYSTEM	SELF EXCITED												
SERIES 4 CONTROL DOES NOT SUSTAIN A SHORT CIRCUIT CURRENT  INSULATION SYSTEM  CLASS H  PROTECTION  IP23  RATED POWER FACTOR  0.8  DOUBLE LAYER CONCENTRIC  WINDING PITCH  WINDING PITCH  WINDING PITCH  WINDING STATOR WINDINS  12  STATOR WINDINS  12  STATOR WINDING STATOR WINDING  ROTOR WOG, RESISTANCE  ROTOR WOG, ROTOR WOG, RESISTANCE  ROTOR WOG, ROTOR WOG, ROTOR WOG	A.V.R.	SX460	SX440	SX421										
SERIES 4 CONTROL DOES NOT SUSTAIN A SHORT CIRCUIT CURRENT  INSULATION SYSTEM  CLASS H  PROTECTION  IP23  RATED POWER FACTOR  0.8  DOUBLE LAYER CONCENTRIC  WINDING PITCH  WINDING PITCH  WINDING PITCH  WINDING STATOR WINDINS  12  STATOR WINDINS  12  STATOR WINDING STATOR WINDING  ROTOR WOG, RESISTANCE  ROTOR WOG, ROTOR WOG, RESISTANCE  ROTOR WOG, ROTOR WOG, ROTOR WOG	VOLTAGE REGULATION	+ 1 5 %												
RATED POWER FACTOR  RATED POWER FACTOR  STATOR WINDING  DOUBLE LAYER CONCENTRIC  TWO THIRDS  WINDING PITCH  TWO THIRDS  WINDING LEADS  STATOR WOG, RESISTANCE  0.0155 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED  1.82 Ohms at 22°C  ROTOR WOG, RESISTANCE  1.82 Ohms at 22°C  ROTOR WOG, RESISTANCE  BS EN 61000-6-2 & BS EN 61000-6-4, VIDE 08756, VIDE 0875N, refer to factory for others  WAVEFORM DISTORTION  NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%  MAXIMUM OVERSPEED  BEARING DRIVE END  BEARING NON-DRIVE END  BEARING NON-DRIVE END  BEARING NON-DRIVE END  BEARING NON-DRIVE END  BEARING SERIES STAR CONNECTED  1 BEARING  WEIGHT COMP, GENERATOR  2250 kg  BEARING  WEIGHT COMP, GENERATOR  227.53 kg  216.57 kg  WEIGHT WOUND STATOR  227.53 kg  216.57 kg  WEIGHT WOUND ROTOR  228.58 kg  241.57 kg  258.60 kg  268.78 kg  276.78 k														
RATED POWER FACTOR  RATED POWER FACTOR  STATOR WINDING  DOUBLE LAYER CONCENTRIC  TWO THIRDS  WINDING PITCH  TWO THIRDS  WINDING LEADS  STATOR WOG, RESISTANCE  0.0155 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED  1.82 Ohms at 22°C  ROTOR WOG, RESISTANCE  1.82 Ohms at 22°C  ROTOR WOG, RESISTANCE  BS EN 61000-6-2 & BS EN 61000-6-4, VIDE 08756, VIDE 0875N, refer to factory for others  WAVEFORM DISTORTION  NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%  MAXIMUM OVERSPEED  BEARING DRIVE END  BEARING NON-DRIVE END  BEARING NON-DRIVE END  BEARING NON-DRIVE END  BEARING NON-DRIVE END  BEARING SERIES STAR CONNECTED  1 BEARING  WEIGHT COMP, GENERATOR  2250 kg  BEARING  WEIGHT COMP, GENERATOR  227.53 kg  216.57 kg  WEIGHT WOUND STATOR  227.53 kg  216.57 kg  WEIGHT WOUND ROTOR  228.58 kg  241.57 kg  258.60 kg  268.78 kg  276.78 k	INSULATION SYSTEM	CLASS H												
RATED POWER FACTOR 0.8  STATOR WINDING DOUBLE LAYER CONCENTRIC WINDING PITCH TWO THIRDS  WINDING PITCH 12  STATOR WIND. SESISTANCE 0.0155 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED  ROTOR WIDG. RESISTANCE 1.82 Ohms at 22°C  RF.I. SUPPRESSION BS EN 61000-6-2 & BS EN 61000-6-4 VIDE 0875G, VID	PROTECTION													
### STATOR WINDING ### STATOR WINDING PITCH ### TWO THIRDS  WINDING PITCH ### TWO THIRDS  ### STATOR WIND. RESISTANCE ### O.0155 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED  ### STATOR WIDG. RESISTANCE ### STATOR WIND. RESISTANCE ### STATOR RESISTANCE ###														
WINDING PITCH		<del>                                     </del>		DO			NC .							
WINDING LEADS   12   STATOR WDG. RESISTANCE   0.0155 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED				DO			NIC .							
STATOR WDG. RESISTANCE   0.0165 Ohms PER PHASE AT 22"C SERIES STAR CONNECTED														
ROTOR WDG. RESISTANCE R.F.I. SUPPRESSION BS EN 61000-6-2 & BS EN 61000-6-4, VDE 0875G, VDE 0875N. refer to factory for others  WAVEFORM DISTORTION NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%  MAXIMUM OVERSPEED  BEARING DRIVE END BEARING BEARING BEARING NON-DRIVE END BEARING NON-DRIVE END BEARING NON-DRIVE END BEARING SUPPRESSION	WINDING LEADS													
R.F.I. SUPPRESSION  BS EN 61000-6-2 & BS EN 61000-6-4, VDE 0875G, VDE 0875N. refer to factory for others  WAVEFORM DISTORTION  NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%  MAXIMUM OVERSPEED  BEARING DRIVE END  BALL 6310-2RS (ISO)  BEARING NON-DRIVE END  BALL 6310-2RS (ISO)  BEARING MON-DRIVE END  BALL 6310-2RS (ISO)  BEARING MON-DRIVE END  BALL 6310-2RS (ISO)  1 BEARING  Q BEARING  WEIGHT COMP. GENERATOR  626 kg  641 kg  WEIGHT WOUND STATOR  253 kg  WEIGHT WOUND ROTOR  27.53 kg  216.57 kg  WR' INERTIA  1.9349 kgm²  1.8843 kgm²  518PPING WEIGHTS in a crate  659 kg  673 kg  PACKING CRATE SIZE  123 x 67 x 103 (cm)  123 x 67 x 103 (cm)  1174 50 Hz  1175 50  COOLING AIR  0.514 m³ysec 1090 cfm  0.617 m³ysec 1308 cfm  VOLTAGE SERIES STAR  380/220  400/231  415/240  440/254  440	STATOR WDG. RESISTANCE		0.0155	Ohms PER P	HASE AT 22	°C SERIES S	STAR CONNE	ECTED						
WAVEFORM DISTORTION  MAXIMUM OVERSPEED  2250 Rev/Min  BEARING DRIVE END  BEARING NON-DRIVE END  BEARING SEARING  WEIGHT COMP, GENERATOR  628 kg  641 kg  WEIGHT WOUND STATOR  253 kg  253 kg  WEIGHT WOUND ROTOR  227.53 kg  216.57 kg  WEIGHT WOUND ROTOR  227.53 kg  218.843 kgm²  5HIPPING WEIGHTS in a crate  659 kg  6673 kg  PACKING CRATE SIZE  123 x 67 x 103 (cm)  124 x 67 x 103 (cm)  125 x 67 x 103 (cm)  127 x 60 Hz  11F<50  COOLING AIR  0.514 m²/sec 1990 cfm  0.617 m²/sec 1308 cfm  VOLTAGE SERIES STAR  380/220 400/231 415/240 440/254 416/240 440/254 460/266 480/277  VOLTAGE PARALLEL STAR  190/110 200/115 208/120 220/127 208/120 220/127 230/133 240/138  VOLTAGE PARALLEL STAR  190/110 200/115 240/120 254/127 240/120 254/127 266/133 277/138  KVA BASE RATING FOR REACTANCE  VALUES  200 200 200 n/a 237.5 245 245 255  VALUES  Xd DIR. AXIS SYNCHRONOUS  2.111 1.91 1.77 - 2.50 2.31 2.11 2.02  Xd DIR. AXIS SUBTRANSIENT  0.18 0.16 0.15 - 0.21 0.19 0.18 0.17  X'd DIR. AXIS SUBTRANSIENT  0.19 0.11 0.10 - 0.14 0.13 0.12 0.11  XG QUAD. AXIS REACTANCE  1.28 1.15 1.07 - 1.53 1.41 1.29 1.23  X'q QUAD. AXIS SUBTRANSIENT  0.17 0.15 0.14 - 0.20 0.18 0.17 0.16  X'Q QUAD. AXIS SUBTRANSIENT  0.19 0.19 0.08 0.08  X NEGATIVE SEQUENCE  0.08 0.08 0.07 - 0.10 0.09 0.08 0.08  X NEGATIVE SEQUENCE  0.08 0.08 0.07 - 0.10 0.09 0.08 0.08  X NEGATIVE SEQUENCE  0.08 0.08 0.07 - 0.10 0.09 0.08 0.08  THE TRANSIENT TIME CONST.  T'd SUB-TRANSTIME CONST.	ROTOR WDG. RESISTANCE				1.82 Ohm	s at 22°C								
MAXIMUM OVERSPEED   2250 Rev/Min   BALL 6315-2RS (ISO)	R.F.I. SUPPRESSION	BS EN	N 61000-6-2	& BS EN 610	00-6-4,VDE 0	875G, VDE 0	875N. refer to	o factory for o	thers					
BEARING DRIVE END BEARING NON-DRIVE END BEARING BEARICH BEARING BEARING BEARING BEARING BEARING BEARING BEARING BEARI	WAVEFORM DISTORTION		NO LOAD ·	< 1.5% NON-	DISTORTING	G BALANCED	LINEAR LO	AD < 5.0%						
BEARING NON-DRIVE END  1 BEARING  1 BEARING  2 BEARING  WEIGHT COMP. GENERATOR  626 kg  WEIGHT WOUND STATOR  253 kg  216.57 kg  WRIGHT WOUND ROTOR  227.53 kg  216.57 kg  WRIGHT WOUND ROTOR  227.53 kg  RWF INERTIA  1.9349 kgm²  1.8843 kgm²  SHIPPING WEIGHTS in a crate  659 kg  661 kg  673 kg  PACKING CRATE SIZE  123 x 67 x 103 (cm)  124 x 67 x 103 (cm)  125 x 67 x 103 (cm)  127 x 60 x 103 cm)  128 x 67 x 103 (cm)  129 x 67 x 103 (cm)  120 x 67 x 103 (cm)  121 x 67 x 103 (cm)  122 x 67 x 103 (cm)  123 x 67 x 103 (cm)  123 x 67 x 103 (cm)  123 x 67 x 103 (cm)  124 x 67 x 103 (cm)  125 x 67 x 103 (cm)  127 x 60 x 2 x 2 x 2 x 2 x 2 x 2 x 2 x 2 x 2 x	MAXIMUM OVERSPEED				2250 R	tev/Min								
BEARING NON-DRIVE END  1 BEARING  1 BEARING  2 BEARING  WEIGHT COMP. GENERATOR  626 kg  WEIGHT WOUND STATOR  253 kg  216.57 kg  WRIGHT WOUND ROTOR  227.53 kg  216.57 kg  WRIGHT WOUND ROTOR  227.53 kg  RWF INERTIA  1.9349 kgm²  1.8843 kgm²  SHIPPING WEIGHTS in a crate  659 kg  6673 kg  PACKING CRATE SIZE  123 x 67 x 103 (cm)  124 x 67 x 103 (cm)  125 x 67 x 103 (cm)  127 x 67 x 103 (cm)  128 x 67 x 103 (cm)  129 x 67 x 103 (cm)  120 x 67 x 103 (cm)  121 x 67 x 103 (cm)  122 x 67 x 103 (cm)  123 x 67 x 103 (cm)  124 x 67 x 103 (cm)  125 x 67 x 103 (cm)  127 x 60 x 2 x 60 x 60	BEARING DRIVE END				BALL. 6315	-2RS (ISO)								
1 BEARING														
WEIGHT COMP. GENERATOR  ### WEIGHT WOUND STATOR  ### WEIGHT WOUND ROTOR  ### WEIGHT SING A GRAPH  ### WEIGHT WOUND ROTOR  ### ### ### WEIGHT ROTOR  ### ### WEIGHT WOUND ROTOR  ### ### WEIGHT WOUND ROTOR  ### ### ### WEIGHT ROTOR  ### ### ### WEIGHT ROTOR  ### ### ### ### ### WEIGHT ROTOR  ### ### ### ### ### ### ### ### ### #	BEFAULT BLAVE END		1 BF/	ARING	27 122. 00.0	1	2 BFA	RING						
WEIGHT WOUND STATOR   253 kg   253 kg   216.57 kg   WEIGHT WOUND ROTOR   227.53 kg   216.57 kg   WEIGHT WOUND ROTOR   1.9349 kgm²   1.8843	WEIGHT COMP. GENERATOR													
WEIGHT WOUND ROTOR  227.53 kg  WR² INERTIA  1.9349 kgm²  1.8843 kgm²  1.8843 kgm²  SHIPPING WEIGHTS in a crate  659 kg  FACKING CRATE SIZE  123 x 67 x 103 (cm)  125 x 67 x 103 (cm)  125 x 67 x 103 (cm)  126 do Hz  TIF<50  COOLING AIR  0.514 m³/sec 1090 cfm  0.617 m³/sec 1308 cfm  VOLTAGE SERIES STAR  380/220 400/231 415/240 440/254 416/240 440/254 460/266 480/277  VOLTAGE PARALLEL STAR  190/110 200/115 208/120 220/127 208/120 220/127 230/133 240/138  VOLTAGE SERIES DELTA  220/110 230/115 240/120 254/127 240/120 254/127 266/133 277/138  KVA BASE RATING FOR REACTANCE  200 200 200 n/a 237.5 245 245 255  Xd DIR. AXIS SYNCHRONOUS  2.11 1.91 1.77 - 2.50 2.31 2.11 2.02  X'd DIR. AXIS SYNCHRONOUS  2.11 1.91 1.77 - 2.50 2.31 2.11 2.02  X'd DIR. AXIS SUBTRANSIENT  0.18 0.16 0.15 - 0.21 0.19 0.18 0.17  X'd DIR. AXIS SUBTRANSIENT  0.19 0.11 0.10 - 0.14 0.13 0.12 0.11  Xq QUAD. AXIS REACTANCE  1.28 1.15 1.07 - 1.53 1.41 1.29 1.23  X'q QUAD. AXIS SUBTRANSIENT  0.17 0.15 0.14 - 0.20 0.18 0.17 0.16  XL LEAKAGE REACTANCE  0.08 0.08 0.07 - 0.10 0.09 0.08 0.08  X2 NEGATIVE SEQUENCE  0.13 0.12 0.11 - 0.16 0.15 0.13 0.13  Xo ZERO SEQUENCE  0.08 0.08 0.07 - 0.10 0.09 0.08 0.08  REACTANCES ARE SATURATED  VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  T'd TRANSIENT TIME CONST.  0.042 s	WEIGHT WOUND STATOR													
SHIPPING WEIGHTS in a crate       659 kg       673 kg         PACKING CRATE SIZE       123 x 67 x 103 (cm)       123 x 67 x 103 (cm)         TELEPHONE INTERFERENCE       THF<2%	<td>WEIGHT WOUND ROTOR</td> <td></td> <td>227.</td> <td>53 kg</td> <td></td> <td></td> <td>216.5</td> <td>57 kg</td> <td></td>					WEIGHT WOUND ROTOR		227.	53 kg			216.5	57 kg	
PACKING CRATE SIZE  123 x 67 x 103 (cm)  50 Hz  60 Hz  TIF<50  COOLING AIR  0.514 m³/sec 1090 cfm  0.617 m³/sec 1308 cfm  VOLTAGE SERIES STAR  380/220 400/231 415/240 440/254 416/240 440/254 460/266 480/277  VOLTAGE PARALLEL STAR  190/110 200/115 208/120 220/127 208/120 220/127 230/133 240/138  VOLTAGE SERIES DELTA  220/110 230/115 240/120 254/127 240/120 254/127 266/133 277/138  KVA BASE RATING FOR REACTANCE VALUES  XVA DIR. AXIS SYNCHRONOUS  2.11 1.91 1.77 - 2.50 2.31 2.11 2.02  X'd DIR. AXIS SYNCHRONOUS  2.11 1.91 1.77 - 2.50 2.31 2.11 2.02  X'd DIR. AXIS SUBTRANSIENT  0.18 0.16 0.15 - 0.21 0.19 0.18 0.17  X'd DIR. AXIS SUBTRANSIENT  0.12 0.11 0.10 - 0.14 0.13 0.12 0.11  XQ QUAD. AXIS REACTANCE  1.28 1.15 1.07 - 1.53 1.41 1.29 1.23  X'q QUAD. AXIS SUBTRANSIENT  0.17 0.15 0.14 - 0.20 0.18 0.17 0.16  XL LEAKAGE REACTANCE  0.08 0.08 0.08 0.07 - 0.10 0.09 0.08 0.08  X2 NEGATIVE SEQUENCE  0.08 0.08 0.08 0.07 - 0.10 0.09 0.08 0.08  REACTANCES ARE SATURATED  VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  T'd TRANSIENT TIME CONST.  T'd SUB-TRANSTIME CONST.	WR² INERTIA		1.934	9 kgm²			1.8843	3 kgm <sup>2</sup>						
S0 Hz	SHIPPING WEIGHTS in a crate		659	9 kg			673	kg						
TELEPHONE INTERFERENCE  COOLING AIR  0.514 m³/sec 1090 cfm  0.617 m³/sec 1308 cfm  VOLTAGE SERIES STAR  380/220 400/231 415/240 440/254 416/240 440/254 460/266 480/277  VOLTAGE PARALLEL STAR  190/110 200/115 208/120 220/127 208/120 220/127 230/133 240/138  VOLTAGE SERIES DELTA  220/110 230/115 240/120 254/127 240/120 254/127 266/133 277/138  kVA BASE RATING FOR REACTANCE VALUES  VALUES AREACTANCE  1.28 1.15 1.07 - 1.53 1.41 1.29 1.23  X"q QUAD. AXIS REACTANCE  1.28 1.15 1.07 - 1.53 1.41 1.29 1.23  X"q QUAD. AXIS SUBTRANSIENT  0.17 0.15 0.14 - 0.20 0.18 0.17 0.16  XL LEAKAGE REACTANCE  0.08 0.08 0.08 0.07 - 0.10 0.09 0.08 0.08  VALUES ARE SATURATED  VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  T'd TRANSIENT TIME CONST.  T'd SUB-TRANSTIME CONST.  0.012 s	PACKING CRATE SIZE		123 x 67	x 103 (cm)			123 x 67 x	(103 (cm)						
COOLING AIR  O.514 m³/sec 1090 cfm  O.617 m³/sec 1308 cfm  VOLTAGE SERIES STAR  380/220 400/231 415/240 440/254 416/240 440/254 460/266 480/277  VOLTAGE PARALLEL STAR  190/110 200/115 208/120 220/127 208/120 220/127 230/133 240/138  VOLTAGE SERIES DELTA  220/110 230/115 240/120 254/127 240/120 254/127 266/133 277/138  kVA BASE RATING FOR REACTANCE  VALUES  VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  T'd TRANSIENT TIME CONST.  T'd SUB-TRANSTIME CONST.														
VOLTAGE SERIES STAR         380/220         400/231         415/240         440/254         416/240         440/254         460/266         480/277           VOLTAGE PARALLEL STAR         190/110         200/115         208/120         220/127         208/120         220/127         230/133         240/138           VOLTAGE SERIES DELTA         220/110         230/115         240/120         254/127         240/120         254/127         266/133         277/138           KVA BASE RATING FOR REACTANCE VALUES         200         200         200         n/a         237.5         245         245         255           Xd DIR. AXIS SYNCHRONOUS         2.11         1.91         1.77         -         2.50         2.31         2.11         2.02           X'd DIR. AXIS SYNCHRONOUS         2.11         1.91         1.77         -         2.50         2.31         2.11         2.02           X'd DIR. AXIS SUBTRANSIENT         0.18         0.16         0.15         -         0.21         0.19         0.18         0.17           X'd QUAD. AXIS REACTANCE         1.28         1.15         1.07         -         1.53         1.41         1.29         1.23           X"q QUAD. AXIS SUBTRANSIENT         0.17         0.						1 11 44								
VOLTAGE PARALLEL STAR         190/110         200/115         208/120         220/127         208/120         220/127         230/133         240/138           VOLTAGE SERIES DELTA         220/110         230/115         240/120         254/127         240/120         254/127         266/133         277/138           KVA BASE RATING FOR REACTANCE VALUES         200         200         200         n/a         237.5         245         245         255           Xd DIR. AXIS SYNCHRONOUS         2.11         1.91         1.77         -         2.50         2.31         2.11         2.02           X'd DIR. AXIS TRANSIENT         0.18         0.16         0.15         -         0.21         0.19         0.18         0.17           X'd DIR. AXIS SUBTRANSIENT         0.12         0.11         0.10         -         0.14         0.13         0.12         0.11           Xq QUAD. AXIS REACTANCE         1.28         1.15         1.07         -         1.53         1.41         1.29         1.23           X"q QUAD. AXIS SUBTRANSIENT         0.17         0.15         0.14         -         0.20         0.18         0.17         0.16           XL LEAKAGE REACTANCE         0.08         0.08         0.07		ļ			T	<u> </u>								
VOLTAGE SERIES DELTA         220/110         230/115         240/120         254/127         240/120         254/127         266/133         277/138           KVA BASE RATING FOR REACTANCE VALUES         200         200         200         n/a         237.5         245         245         255           Xd DIR. AXIS SYNCHRONOUS         2.11         1.91         1.77         -         2.50         2.31         2.11         2.02           X'd DIR. AXIS TRANSIENT         0.18         0.16         0.15         -         0.21         0.19         0.18         0.17           X"d DIR. AXIS SUBTRANSIENT         0.12         0.11         0.10         -         0.14         0.13         0.12         0.11           Xq QUAD. AXIS REACTANCE         1.28         1.15         1.07         -         1.53         1.41         1.29         1.23           X"q QUAD. AXIS SUBTRANSIENT         0.17         0.15         0.14         -         0.20         0.18         0.17         0.16           XL LEAKAGE REACTANCE         0.08         0.08         0.09         0.09         0.08         0.08           X2 NEGATIVE SEQUENCE         0.13         0.12         0.11         -         0.16         0.15														
kVA BASE RATING FOR REACTANCE VALUES         200         200         200         n/a         237.5         245         245         255           Xd DIR. AXIS SYNCHRONOUS         2.11         1.91         1.77         -         2.50         2.31         2.11         2.02           X'd DIR. AXIS TRANSIENT         0.18         0.16         0.15         -         0.21         0.19         0.18         0.17           X"d DIR. AXIS SUBTRANSIENT         0.12         0.11         0.10         -         0.14         0.13         0.12         0.11           Xq QUAD. AXIS REACTANCE         1.28         1.15         1.07         -         1.53         1.41         1.29         1.23           X"q QUAD. AXIS SUBTRANSIENT         0.17         0.15         0.14         -         0.20         0.18         0.17         0.16           XL LEAKAGE REACTANCE         0.08         0.08         0.07         -         0.10         0.09         0.08         0.08           X2 NEGATIVE SEQUENCE         0.13         0.12         0.11         -         0.16         0.15         0.13         0.13           X0 ZERO SEQUENCE         0.08         0.08         0.07         -         0.10         0.09 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>														
VALUES         200         200         200         n/a         237.5         245         245         255           Xd DIR. AXIS SYNCHRONOUS         2.11         1.91         1.77         -         2.50         2.31         2.11         2.02           X'd DIR. AXIS TRANSIENT         0.18         0.16         0.15         -         0.21         0.19         0.18         0.17           X"d DIR. AXIS SUBTRANSIENT         0.12         0.11         0.10         -         0.14         0.13         0.12         0.11           Xq QUAD. AXIS REACTANCE         1.28         1.15         1.07         -         1.53         1.41         1.29         1.23           X"q QUAD. AXIS SUBTRANSIENT         0.17         0.15         0.14         -         0.20         0.18         0.17         0.16           XL LEAKAGE REACTANCE         0.08         0.08         0.07         -         0.10         0.09         0.08         0.08           X2 NEGATIVE SEQUENCE         0.13         0.12         0.11         -         0.16         0.15         0.13         0.13           X0 ZERO SEQUENCE         0.08         0.08         0.07         -         0.10         0.09         0.08			230/115	240/120	254/12/	240/120	254/12/	200/133						
X'd DIR. AXIS TRANSIENT       0.18       0.16       0.15       -       0.21       0.19       0.18       0.17         X"d DIR. AXIS SUBTRANSIENT       0.12       0.11       0.10       -       0.14       0.13       0.12       0.11         Xq QUAD. AXIS REACTANCE       1.28       1.15       1.07       -       1.53       1.41       1.29       1.23         X"q QUAD. AXIS SUBTRANSIENT       0.17       0.15       0.14       -       0.20       0.18       0.17       0.16         XL LEAKAGE REACTANCE       0.08       0.08       0.07       -       0.10       0.09       0.08       0.08         X2 NEGATIVE SEQUENCE       0.13       0.12       0.11       -       0.16       0.15       0.13       0.13         X0 ZERO SEQUENCE       0.08       0.08       0.07       -       0.10       0.09       0.08       0.08         REACTANCES ARE SATURATED       VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED         T'd TRANSIENT TIME CONST.       0.042 s         T''d SUB-TRANSTIME CONST.       0.012 s	VALUES	200	200	200	n/a	237.5	245	245	255					
X"d DIR. AXIS SUBTRANSIENT         0.12         0.11         0.10         -         0.14         0.13         0.12         0.11           Xq QUAD. AXIS REACTANCE         1.28         1.15         1.07         -         1.53         1.41         1.29         1.23           X"q QUAD. AXIS SUBTRANSIENT         0.17         0.15         0.14         -         0.20         0.18         0.17         0.16           XL LEAKAGE REACTANCE         0.08         0.08         0.07         -         0.10         0.09         0.08         0.08           X2 NEGATIVE SEQUENCE         0.13         0.12         0.11         -         0.16         0.15         0.13         0.13           X0 ZERO SEQUENCE         0.08         0.08         0.07         -         0.10         0.09         0.08         0.08           REACTANCES ARE SATURATED         VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED         T'd TRANSIENT TIME CONST.         0.042 s         0.012 s	Xd DIR. AXIS SYNCHRONOUS	2.11	1.91	1.77	-	2.50	2.31	2.11	2.02					
Xq QUAD. AXIS REACTANCE       1.28       1.15       1.07       -       1.53       1.41       1.29       1.23         X"q QUAD. AXIS SUBTRANSIENT       0.17       0.15       0.14       -       0.20       0.18       0.17       0.16         XL LEAKAGE REACTANCE       0.08       0.08       0.07       -       0.10       0.09       0.08       0.08         X2 NEGATIVE SEQUENCE       0.13       0.12       0.11       -       0.16       0.15       0.13       0.13         X0 ZERO SEQUENCE       0.08       0.08       0.07       -       0.10       0.09       0.08       0.08         REACTANCES ARE SATURATED       VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED         T'd TRANSIENT TIME CONST.       0.042 s         T"d SUB-TRANSTIME CONST.       0.012 s	X'd DIR. AXIS TRANSIENT	0.18	0.16	0.15	-	0.21	0.19	0.18	0.17					
X"q QUAD. AXIS SUBTRANSIENT       0.17       0.15       0.14       -       0.20       0.18       0.17       0.16         XL LEAKAGE REACTANCE       0.08       0.08       0.07       -       0.10       0.09       0.08       0.08         X2 NEGATIVE SEQUENCE       0.13       0.12       0.11       -       0.16       0.15       0.13       0.13         X0ZERO SEQUENCE       0.08       0.08       0.07       -       0.10       0.09       0.08       0.08         REACTANCES ARE SATURATED       VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED         T'd TRANSIENT TIME CONST.       0.042 s         T"d SUB-TRANSTIME CONST.       0.012 s	X"d DIR. AXIS SUBTRANSIENT	0.12	0.11	0.10	-	0.14	0.13	0.12	0.11					
XL LEAKAGE REACTANCE         0.08         0.08         0.07         -         0.10         0.09         0.08         0.08           X2 NEGATIVE SEQUENCE         0.13         0.12         0.11         -         0.16         0.15         0.13         0.13           X0 ZERO SEQUENCE         0.08         0.08         0.07         -         0.10         0.09         0.08         0.08           REACTANCES ARE SATURATED         VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED           T'd TRANSIENT TIME CONST.         0.042 s           T"d SUB-TRANSTIME CONST.         0.012 s	Xq QUAD. AXIS REACTANCE	1.28	1.15	1.07	-	1.53	1.41	1.29	1.23					
X2 NEGATIVE SEQUENCE       0.13       0.12       0.11       -       0.16       0.15       0.13       0.13         X0 ZERO SEQUENCE       0.08       0.08       0.07       -       0.10       0.09       0.08       0.08         REACTANCES ARE SATURATED       VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED         T'd TRANSIENT TIME CONST.       0.042 s         T''d SUB-TRANSTIME CONST.       0.012 s	X"q QUAD. AXIS SUBTRANSIENT	0.17	0.15	0.14	-	0.20	0.18	0.17	0.16					
X0ZERO SEQUENCE 0.08 0.08 0.07 - 0.10 0.09 0.08 0.08  REACTANCES ARE SATURATED VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  T'd TRANSIENT TIME CONST. 0.042 s  T"d SUB-TRANSTIME CONST. 0.012 s	XL LEAKAGE REACTANCE	0.08	0.08 0.07		-	- 0.10		0.08	0.08					
REACTANCES ARE SATURATED VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  T'd TRANSIENT TIME CONST. 0.042 s  T"d SUB-TRANSTIME CONST. 0.012 s	X2 NEGATIVE SEQUENCE	0.13	0.12	.12 0.11		0.16	0.15	0.13	0.13					
T'd TRANSIENT TIME CONST. 0.042 s T"d SUB-TRANSTIME CONST. 0.012 s	X <sub>0</sub> ZERO SEQUENCE	0.08	0.08	0.07	-	0.10	0.09	0.08	0.08					
T"d SUB-TRANSTIME CONST. 0.012 s														
	T'd TRANSIENT TIME CONST.	<u> </u>												
		<del>                                     </del>												
	Ta ARMATURE TIME CONST.	<del>                                     </del>												
SHORT CIRCUIT RATIO 1/Xd														

50 Hz

# UCI274H Winding 311



# THREE PHASE EFFICIENCY CURVES



Winding 311

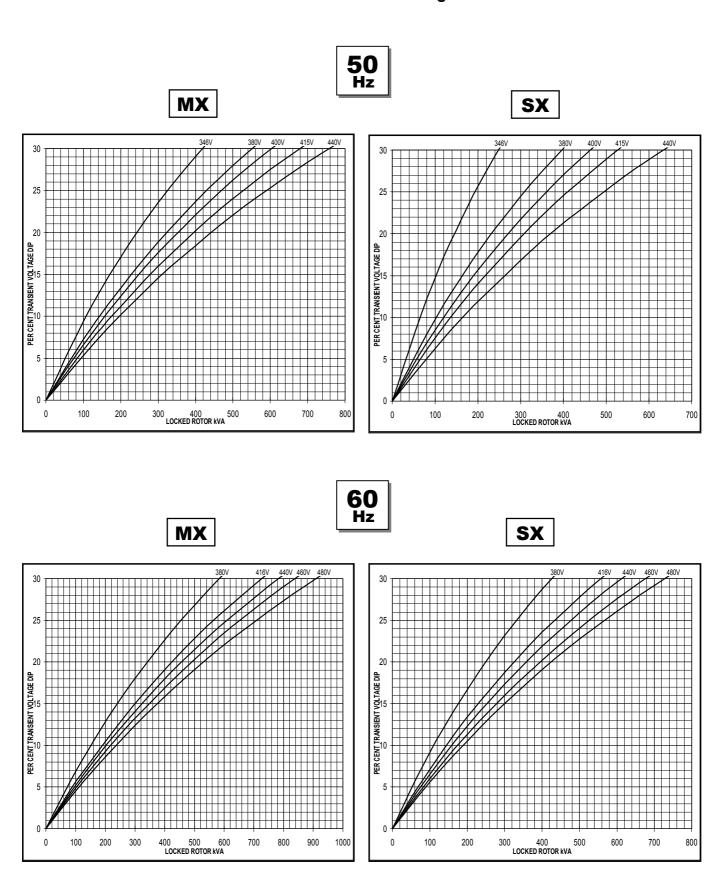
# 60 Hz

# THREE PHASE EFFICIENCY CURVES

# UCI274H Winding 311



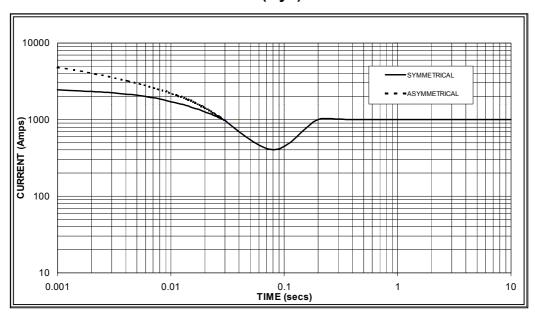
## **Locked Rotor Motor Starting Curve**





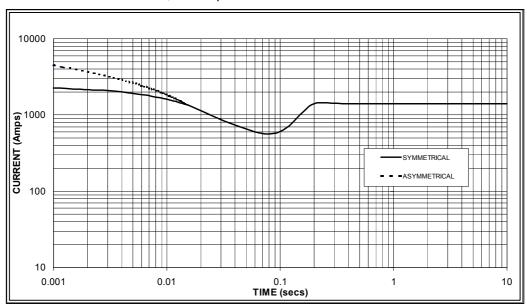
# Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed Based on star (wye) connection.

50 Hz



Sustained Short Circuit = 1,000 Amps

60 Hz



### Sustained Short Circuit = 1,400 Amps

### Note 1

The following multiplication factors should be used to adjust the values from curve between time 0.001 seconds and the minimum current point in respect of nominal operating voltage :

50	Hz	60Hz						
Voltage	Factor	Voltage	Factor					
380v	X 1.00	416v	X 1.00					
400v	X 1.07	440v	X 1.06					
415v	X 1.12	460v	X 1.12					
440v	X 1.18	480v	X 1.17					

The sustained current value is constant irrespective of voltage level

### Note 2

The following multiplication factor should be used to convert the values calculated in accordance with NOTE 1 to those applicable to the various types of short circuit:

	3-phase	2-phase L-L	1-phase L-N
Instantaneous	x 1.00	x 0.87	x 1.30
Minimum	x 1.00	x 1.80	x 3.20
Sustained	x 1.00	x 1.50	x 2.50
Max. sustained duration	10 sec.	5 sec.	2 sec.

All other times are unchanged

### Note 3

Curves are drawn for Star (Wye) connected machines. For other connection the following multipliers should be applied to current values as shown:

Parallel Star = Curve current value X 2

Series Delta = Curve current value X 1.732



## Winding 311 / 0.8 Power Factor

### **RATINGS**

						-													
	C	Class - Temp Rise	C	Cont. F - 105/40°C				Cont. H - 125/40°C				Standby - 150/40°C				Standby - 163/27°C			
5	<b>n</b>	Series Star (V)	380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440	
H	_	Parallel Star (V)	190	200	208	220	190	200	208	220	190	200	208	220	190	200	208	220	
	_	Series Delta (V)	220	230	240	254	220	230	240	254	220	230	240	254	220	230	240	254	
		kVA	182.0	182.0	182.0	n/a	200.0	200.0	200.0	n/a	212.0	212.0	212.0	n/a	220.0	220.0	220.0	n/a	
		kW	145.6	145.6	145.6	n/a	160.0	160.0	160.0	n/a	169.6	169.6	169.6	n/a	176.0	176.0	176.0	n/a	
		Efficiency (%)	93.3	93.5	93.6	n/a	93.0	93.3	93.4	n/a	92.8	93.1	93.3	n/a	92.7	93.0	93.2	n/a	
		kW Input	156.1	155.7	155.6	n/a	172.0	171.5	171.3	n/a	182.8	182.2	181.8	n/a	189.9	189.2	188.8	n/a	
		•				•					•								
6	0	Series Star (V)	416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480	
Н	_	Parallel Star (V)	208	220	230	240	208	220	230	240	208	220	230	240	208	220	230	240	
''	_	Series Delta (V)	240	254	266	277	240	254	266	277	240	254	266	277	240	254	266	277	
		kVA	218.8	225.0	225.0	235.0	237.5	245.0	245.0	255.0	250.0	258.8	258.8	275.0	256.3	265.0	265.0	280.0	
		kW	175.0	180.0	180.0	188.0	190.0	196.0	196.0	204.0	200.0	207.0	207.0	220.0	205.0	212.0	212.0	224.0	
		Efficiency (%)	93.2	93.4	93.6	93.7	93.0	93.2	93.5	93.6	92.8	93.1	93.3	93.4	92.7	93.0	93.3	93.3	
		kW Input	187.8	192.7	192.3	200.6	204.3	210.3	209.6	217.9	215.5	222.4	221.9	235.5	221.2	228.0	227.2	240.1	

### **DIMENSIONS**

PO Box 17 • Barnack Road • Stamford • Lincolnshire • PE9 2NB Tel: 00 44 (0)1780 484000 • Fax: 00 44 (0)1780 484100 Website: www.newage-avkseg.com