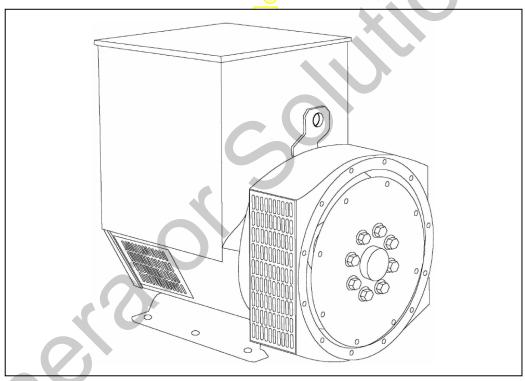
# STAMFORD

**UCI274G** - Winding 311

Technical Data Sheet



#### **STAMFORD**

# UCI274G SPECIFICATIONS & OPTIONS

#### **STANDARDS**

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.

#### **AS440 AVR**

With this self-excited system the main stator provides power via the 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 threephase 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 AS440 will support a range of electronic accessories, including a 'droop' Current Transformer (CT) to permit parallel operation with other ac generators.

#### 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 deexcites 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%.

#### **DE RATES**

All values tabulated on page 8 are subject to the following reductions

5% when air inlet filters are fitted.

3% for every 500 metres by which the operating altitude exceeds 1000 metres above mean sea level.

3% for every  $5^{\circ}C$  by which the operational ambient temperature exceeds  $40^{\circ}C.$ 

Note: Requirement for operating in an ambient exceeding 60°C must be referred to the factory.

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.



## **UCI274G**

# **WINDING 311**

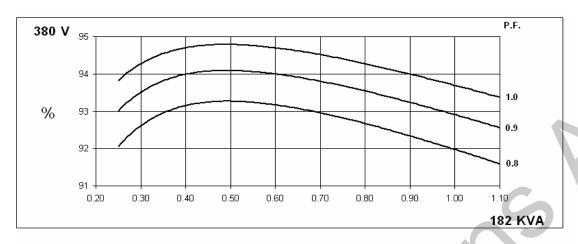
A.V.R. MX321 MX341  VOLTAGE REGULATION	WINDING 311								
VICTAGE REGULATION	CONTROL SYSTEM	SEPARATE	LY EXCITED	BY P.M.G.					
SUSTAINED SHORT CIRCUIT   REFER TO SHORT CIRCUIT DECREMENT CURVES (page 7)	A.V.R.	MX321	MX341						
SUSTAINED SHORT CIRCUIT   REFER TO SHORT CIRCUIT DECREMENT CURVES (page 7)	VOI TAGE REGULATION	+ 0.5 %	+1.0 %	With 4% FN	GINE GOVE	RNING			
SELF EXCITED									
A.V.R. SX460 AS440  VOLTAGE REGULATION ±1.0 % ±1.0 % With 4% ENGINE GOVERNING  SERIES 4 CONTROL DOES NOT SUSTAIN A SHORT CIRCUIT CURRENT  INSULATION SYSTEM  PROTECTION  IP23  RATED POWER FACTOR  0.8  STATOR WINDING  DOUBLE LAVER CONCENTRIC  WINDING PITCH  WINDING PITCH  WINDING LEADS  12  STATOR WINDING EADS  12  STATOR WINDING EADS  ROTATOR WINDING EADS  10  8 SENTATOR WINDING EADS  12  STATOR WINDING EADS  12  STATOR WINDING EADS  13  STATOR WINDING EADS  14  SEXITER STATOR ESISTANCE  15  16  17  17  18  18  19  19  10  10  10  11  10  10  11  10  10	303 TAINED SHOKT CIRCUIT	IKEI EK 10 (	SHORT OIL	DON DEGRE	IVILIVI OOK	/LO (page /)			
VOLTAGE REGULATION	CONTROL SYSTEM	SELF EXCIT	ED						
SUSTAINED SHORT CIRCUIT  INSULATION SYSTEM  CLASS H  PROTECTION  IP23  STATOR WINDING  DOUBLE LAYER CONCENTRIC  TWO THIRDS  WINDING PITCH  TWO THIRDS  STATOR WINDING  STATOR WINDING  DOUBLE LAYER CONCENTRIC  TWO THIRDS  STATOR WINDING  DOUBLE LAYER CONCENTRIC  TWO THIRDS  STATOR WINDING PITCH  TWO THIRDS  STATOR WIND RESISTANCE  SCATER STATOR RESISTANCE  SCATER STATOR RESISTANCE  EXCITER ROTOR RESISTANCE  EXCITER STATOR RESISTANCE  EXCITER STATOR RESISTANCE  EXCITER STATOR RESISTANCE  SEXITER STATOR RESISTANCE  EXCITER STATOR RESISTANCE  SEXITER STATOR RESISTANCE  EXCITER STATOR RESISTANCE  SEXITER STATOR RESISTANCE  SEXITER STATOR RESISTANCE  EXCITER STATOR RESISTANCE  SEXITER STATOR SEXITER  SEXITER STATOR SEXITER  SEXITER STATOR SEXITER  SEXITER STATOR  SEXI	A.V.R.	SX460	AS440						
NSULATION SYSTEM	VOLTAGE REGULATION	± 1.0 %	± 1.0 %	With 4% EN	GINE GOVE	RNING			
NSULATION SYSTEM	SUSTAINED SHORT CIRCUIT	SERIES 4 C	ONTROLDO	DES NOT SU	STAIN A SH	ORT CIRCUI	T CURRENT		
RATED POWER FACTOR  0.8  STATOR WINDING  DOUBLE LAYER CONCENTRIC  WINDING PITCH  TWO THIRDS  WINDING LEADS  112  STATOR WDG. RESISTANCE  ROTOR WDG. RESISTANCE  EXCITER STATOR RESISTANCE  EXCITER STATOR RESISTANCE  EXCITER STATOR RESISTANCE  EXCITER ROTOR RESISTANCE  EXCITER ROTOR RESISTANCE  BS EN 61000-6-2 & 8 65 EN 61000-6-4./VDC 08750, VDE 0875N, refer to factory for others  WAVEFORM DISTORTION  NO LOAD - 1.89%, NON-DISTORTING BALANCED LINEAR LOAD < 5.0%  WAVEFORM DISTORTION  MAXIMUM OVERSPEED  BEARING ONN-DRIVE END  BEARING NON-DRIVE END  BEARING NON-DRIVE END  BEARING NON-DRIVE END  BEARING NON-DRIVE END  BEARING S08 Ng  WEIGHT WOUND STATOR  225 kg  WEIGHT WOUND STATOR  210.35 kg  121.35 kg  129.36 fc  129.37 fc  139.38 kg  T17.69 kg  FORDING GRATE SIZE  129.37 fc  130.514 m/secs-1990 cfm  COOLING AIR  VOLTAGE SERIES STAR  380220  400/231  415/240  440/254									
ACT   Color	INSULATION SYSTEM				CLAS	SS H			
### STATOR WINDING ### TWO THIRDS  WINDING PITCH ### TWO THIRDS  WINDING LEADS 12  STATOR WOG, RESISTANCE 0.0199 Optis PER PHASE AT 22°C SERIES STAR CONNECTED  ROTOR WOG, RESISTANCE 1.69 Optis PER PHASE AT 22°C  EXCITER STATOR RESISTANCE 2.0091 Optis PER PHASE AT 22°C  EXCITER ROTOR RESISTANCE 2.0091 Optis PER PHASE AT 22°C  EXCITER ROTOR RESISTANCE 3.0091 Optis PER PHASE AT 22°C  EXCITER ROTOR RESISTANCE 3.0091 Optis PER PHASE AT 22°C  EXCITER ROTOR RESISTANCE 3.0091 Optis PER PHASE AT 22°C  EXCITER ROTOR RESISTANCE 3.0091 Optis PER PHASE AT 22°C  EXCITER ROTOR RESISTANCE 3.0091 Optis PHASE AT 22°C  EXCITER STATOR RESISTANCE 3.0091 Optis PHASE AT 22°C  EXCITER STATOR RESISTANCE 3.0091 Optis PHASE AT 22°C  EXCITER STAR 3.0091 Optis PER PHASE AT 22°C  EXCITER STAR 3.0092 Optis PER 3.0092 Optis PER 3.0093 Optis PER 3.0093 Optis PER 3.0093 Optis P	PROTECTION				IP2	23			
WINDING PITCH	RATED POWER FACTOR				0.	8			
### STATOR WDG, RESISTANCE	STATOR WINDING			DOL	JBLE LAYER	CONCENT	RIC		
### STATOR WDG, RESISTANCE	WINDING PITCH				TWO TI	HIRDS			
STATOR WDG. RESISTANCE  ROTOR RESISTANCE  ROTOR RESISTANCE  REXITER									
ROTOR WDG. RESISTANCE			0.0400.6	DED DE			STAD CONN	COTED	
EXCITER STATOR RESISTANCE  EXCITER ROTOR RESISTANCE  EXCITER ROTOR RESISTANCE  EXCITER ROTOR RESISTANCE  EXCITER ROTOR RESISTANCE  BS EN 61000-6-2 & BS EN 61000-6-4 NDE 0875G. VDE 0875N. refer to factory for others  WAVEPORM DISTORTION  NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%  WAVEPORM DISTORTION  NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%  WAVEPORM DISTORTION  NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%  BALL. 6315-2RS (ISO)  BEARING DRIVE END  BEARING DRIVE END  BEARING NON-DRIVE END  BEARING NON-			0.0199 (	JIMS PER PI	_		STAR CONN	ECTED	
EXCITER ROTOR 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 DRIVE END  BEARING NON-DRIVE END  BEARING NON-DRIVE END  BEARING OND-DRIVE END  BEARING OND-DRIVE END  BEARING STATE STA		<del>                                     </del>							
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 < 1.599 NON-DISTORTING BALANCED LINEAR LOAD < 5.0%  MAXIMUM OVERSPEED  BEARING DRIVE END  BEARING NON-DRIVE END  BEARING NON-DRIVE END  BEARING SUBJECT OF SEASON	EXCITER STATOR RESISTANCE				20 Ohms	at 22°C			
WAVEFORM DISTORTION   NO LOAD < 1.59%   NON-DISTORTING BALANCED LINEAR LOAD < 5.0%	EXCITER ROTOR RESISTANCE			0.091	Ohms PER	PHASE AT 2	22°C		
MAXIMUM OVERSPEED   2250 Rev/Min	R.F.I. SUPPRESSION	BS EN	61000-6-2 8	BS EN 6100	0-6-4,VDE 0	875G, VDE 0	875N. refer t	o factory for	others
BEARING DRIVE END  BEARING NON-DRIVE END  BEARING NON-DRIVE END  BEARING NON-DRIVE END  BEARING SHEET	WAVEFORM DISTORTION		NO LOAD <	1.5% NON-	DISTORTING	BALANCE	LINEAR LC	AD < 5.0%	
BEARING DRIVE END  BEARING NON-DRIVE END  BEARING NON-DRIVE END  BEARING SAID-2RS (ISO)  BEARING SAID-2RS (ISO)  BEARING SAID-2RS (ISO)  1 BEARING SAID-2RS (ISO)  WEIGHT COMP. GENERATOR 580 kg 588 kg  WEIGHT WOUND STATOR 225 kg 225 kg  WEIGHT WOUND ROTOR 210.35 kg 199.39 kg  WR3 INERTIA 1.7674 kgm² 1.7169 kgm² 1.7169 kgm²  SHIPPING WEIGHTS in a crate 613 kg 630 kg  PACKING CRATE SIZE 123 x67 x 103 (cm) 123 x 67 x 103 (cm)  FOR LEEPHONE INTERFERENCE THE 28 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	MAXIMUM OVERSPEED								
## BEARING NON-DRIVE END  ## BEARING ## BEA									
BEARING   2 BEARING   598 kg   598 kg   598 kg   WEIGHT COMP. GENERATOR   225 kg									
WEIGHT COMP. GENERATOR   S80 kg   S98 kg   S25 kg   WEIGHT WOUND STATOR   225 kg   S25 kg	BEARING NON-DRIVE END								
WEIGHT WOUND STATOR   225 kg   225 kg   199.39 kg   199.39 kg   199.39 kg   199.39 kg   1.7674 kgm²   1.7169 kg	WEIGHT COMP. CENERATOR								
WEIGHT WOUND ROTOR       210.35 kg       199.39 kg         WR² INERTIA       1.7674 kgm²       1.7169 kgm²         SHIPPING WEIGHTS in a crate       613 kg       630 kg         PACKING CRATE SIZE       123 x 67 x 193 (cm)       123 x 67 x 103 (cm)         FOR HEIGHTS INTERFERENCE       TIF-50         COOLING AIR       0.514 m³/sec 1990 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 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         XVA BASE RATING FOR REACTANCE       182       182       182       N/A       205       218       218       231         Xd DIR. AXIS SYNCHRONOUS       2.15       1.94       1.80       -									
WR2 INERTIA   1.7674 kgm²   1.7169 kgm²   1.7169 kgm²   SHIPPING WEIGHTS in a crate   613 kg   630 kg     PACKING CRATE SIZE   123 x 67 x 193 (cm)   123 x 67 x 103 (cm)     THF-₹%									
SHIPPING WEIGHTS in a crate 613 kg 630 kg  PACKING CRATE SIZE 123 x 67 x 103 (cm) 123 x 67 x 103 (cm) 123 x 67 x 103 (cm)  TELEPHONE INTERFERENCE THF-  TELEPHONE INTERFERENCE THF-  COOLING AIR 0.514 m³/sec 1990 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 2777/138  kVA BASE RATING FOR REACTANCE 182 182 182 N/A 205 218 218 231  Xd DIR. AXIS SYNCHRONOUS 2.15 1.94 1.80 - 2.43 2.31 2.11 2.06  X'd DIR. AXIS SYNCHRONOUS 2.15 1.94 1.80 - 0.21 0.20 0.18 0.18  X'd DIR. AXIS SUBTRANSIENT 0.19 0.17 0.16 - 0.21 0.20 0.18 0.18  X'd DIR. AXIS SUBTRANSIENT 0.13 0.12 0.11 - 0.15 0.14 0.13 0.12  Xq QUAD. AXIS REACTANCE 1.29 1.16 1.08 - 1.47 1.40 1.28 1.24  X'q QUAD. AXIS REACTANCE 1.29 1.16 1.08 - 1.47 1.40 1.28 1.24  X'q QUAD. AXIS SUBTRANSIENT 0.18 0.16 0.15 - 0.18 0.17 0.16 0.15  XL LEAKAGE REACTANCE 0.08 0.07 0.07 - 0.09 0.08 0.08 0.07  X₂ NEGATIVE SEQUENCE 0.13 0.12 0.11 - 0.16 0.15 0.13 0.13  X₀ ZERO SEQUENCE 0.08 0.07 0.07 - 0.10 0.09 0.08 0.08  REACTANCES ARE SATURATED VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  T'd SUB-TRANSITIME CONST. 0.012 s  T'd SUB-TRANSITIME CONST. 1 s  Ta ARMATURE TIME CONST. 0.001 s				<del></del>					
PACKING CRATE SIZE  123 x 67 x 103 (cm)  123 x 67 x 103 (cm)  123 x 67 x 103 (cm)  120 x 67 x 103 (cm)  120 x 67 x 103 (cm)  120 x 67 x 103 (cm)  121 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)  125 x 67 x 103 (cm)  126 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)  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)  125 x 67 x 103 (cm)  127 x 103 (cm)  128 x 67 x 103 (cm)  128 x 67 x 103 (cm)  129 x 67 x 103 (cm)  121 x 67 x 103 (cm)  121 x 67 x 103 (cm)  122 x 60 Hz  123 x 67 x 103 (cm)  123 x 67 x 103 (cm)  124 x 115 x 50 Hz  125 x 67 x 103 (cm)  125 x 105 (cm)  126 x 105 (cm)  127 x 108 x 1									
TELEPHONE INTERFERENCE  THF-2%  COOLING AIR  0.514 m³/sec 1990 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  182 182 N/A 205 218 218 231  Xd DIR. AXIS SYNCHRONOUS  2.15 1.94 1.80 - 2.43 2.31 2.11 2.06  X'd DIR. AXIS SYNCHRONOUS  X'd DIR. AXIS SUBTRANSIENT  0.19 0.17 0.16 - 0.21 0.20 0.18 0.18  X'd DIR. AXIS SUBTRANSIENT  0.13 0.12 0.11 - 0.15 0.14 0.13 0.12  Xq QUAD. AXIS REACTANCE  1.29 1.16 1.08 - 1.47 1.40 1.28 1.24  X'q QUAD. AXIS SUBTRANSIENT  0.18 0.16 0.15 - 0.18 0.17 0.16 0.15  XL LEAKAGE REACTANCE  0.08 0.07 0.07 - 0.09 0.08 0.08  0.07  X2 NEGATIVE SEQUENCE  0.08 0.07 0.07 - 0.09 0.08 0.08  0.07  Xa NEGATIVE SEQUENCE  0.08 0.07 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.  1 s  T'd SUB-TRANSTIME CONST.  1 s  Ta ARMATURE TIME CONST.  0.018 s	PACKING CRATE SIZE								
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         182         182         182         N/A         205         218         218         231           Xd DIR. AXIS SYNCHRONOUS         2.15         1.94         1.80         -         2.43         2.31         2.11         2.06           X'd DIR. AXIS TRANSIENT         0.19         0.17         0.16         -         0.21         0.20         0.18         0.18           X'd QUAD. AXIS REACTANCE         1.29         1.16         1.08         -         1.47         1.40         1.28         1.24           X'q QUAD. AXIS SUBTRANSIENT         0.18         0.16         0.15         -         0.18         0.17 <td></td> <td>X</td> <td>_</td> <td></td> <td></td> <td></td> <td></td> <td>• • •</td> <td></td>		X	_					• • •	
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         182         182         182         N/A         205         218         218         231           Xd DIR. AXIS SYNCHRONOUS         2.15         1.94         1.80         -         2.43         2.31         2.11         2.06           X'd DIR. AXIS SYNCHRONOUS         2.15         1.94         1.80         -         2.43         2.31         2.11         2.06           X'd DIR. AXIS SYNCHRONOUS         2.15         1.94         1.80         -         2.43         2.31         2.11         2.06           X'd DIR. AXIS SYNCHRONOUS         2.15         1.94         1.80         -         0.21         0.20         0.18         0.18           X''d DIR. AXIS SUBTRANSIENT         0.13         0.12<	TELEPHONE INTERFERENCE		THF	< <mark>2%</mark>			TIF<	:50	
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         182         182         182         N/A         205         218         218         231           Xd DIR. AXIS SYNCHRONOUS         2.15         1.94         1.80         -         2.43         2.31         2.11         2.06           X'd DIR. AXIS TRANSIENT         0.19         0.17         0.16         -         0.21         0.20         0.18         0.18           X"d DIR. AXIS SUBTRANSIENT         0.13         0.12         0.11         -         0.15         0.14         0.13         0.12           Xq QUAD. AXIS REACTANCE         1.29         1.16         1.08         -         1.47         1.40         1.28         1.24           X"q QUAD. AXIS SUBTRANSIENT         0.18         0.16         0.15         -         0.18         0.17         0.16         0.15           XLEAKAGE REACTANCE         0.08         0.07         0.07	COOLING AIR		0.514 m³/se	ec 1090 cfm			0.617 m³/sed	1308 cfm	
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         182         182         182         N/A         205         218         218         231           Xd DIR. AXIS SYNCHRONOUS         2.15         1.94         1.80         -         2.43         2.31         2.11         2.06           X'd DIR. AXIS TRANSIENT         0.19         0.17         0.16         -         0.21         0.20         0.18         0.18           X"d DIR. AXIS SUBTRANSIENT         0.13         0.12         0.11         -         0.15         0.14         0.13         0.12           X"q QUAD. AXIS REACTANCE         1.29         1.16         1.08         -         1.47         1.40         1.28         1.24           X"q QUAD. AXIS SUBTRANSIENT         0.18         0.16         0.15         -         0.18         0.17         0.16         0.15           XL LEAKAGE REACTANCE         0.08         0.07         0.07         -         0.09         0.08         0.08         0.07           Xo ZERO SEQUENCE         0.13         0.12         0.11         -         0.	VOLTAGE SERIES STAR	380/220	400/231	41 <mark>5</mark> /240	440/254	416/240	440/254	460/266	480/277
182   182   182   182   N/A   205   218   218   231     231   231   231   231   231   231   231   231   231     231   231   231   231   231   231   231   231   231   231     231   231   231   231   231   231   231   231   231   231   231   231   231     231   23	VOLTAGE PARALLEL STAR	190/110	200/115	208/120	220/127	208/120	220/127	230/133	240/138
VALUES         182         182         182         N/A         205         218         218         231           Xd DIR. AXIS SYNCHRONOUS         2.15         1.94         1.80         -         2.43         2.31         2.11         2.06           X'd DIR. AXIS TRANSIENT         0.19         0.17         0.16         -         0.21         0.20         0.18         0.18           X"d DIR. AXIS SUBTRANSIENT         0.13         0.12         0.11         -         0.15         0.14         0.13         0.12           Xq QUAD. AXIS REACTANCE         1.29         1.16         1.08         -         1.47         1.40         1.28         1.24           X"q QUAD. AXIS SUBTRANSIENT         0.18         0.16         0.15         -         0.18         0.17         0.16         0.15           XL LEAKAGE REACTANCE         0.08         0.07         0.07         -         0.09         0.08         0.07           X2 NEGATIVE SEQUENCE         0.13         0.12         0.11         -         0.16         0.15         0.13         0.13           X0 ZERO SEQUENCE         0.08         0.07         0.07         -         0.10         0.09         0.08         0.08 </td <td></td> <td>220/110</td> <td>230/115</td> <td>240/120</td> <td>254/127</td> <td>240/120</td> <td>254/127</td> <td>266/133</td> <td>277/138</td>		220/110	230/115	240/120	254/127	240/120	254/127	266/133	277/138
Xd DIR. AXIS SYNCHRONOUS       2.15       1.94       1.80       -       2.43       2.31       2.11       2.06         X'd DIR. AXIS TRANSIENT       0.19       0.17       0.16       -       0.21       0.20       0.18       0.18         X"d DIR. AXIS SUBTRANSIENT       0.13       0.12       0.11       -       0.15       0.14       0.13       0.12         Xq QUAD. AXIS REACTANCE       1.29       1.16       1.08       -       1.47       1.40       1.28       1.24         X"q QUAD. AXIS SUBTRANSIENT       0.18       0.16       0.15       -       0.18       0.17       0.16       0.15         XL LEAKAGE REACTANCE       0.08       0.07       0.07       -       0.09       0.08       0.08       0.07         X2 NEGATIVE SEQUENCE       0.13       0.12       0.11       -       0.16       0.15       0.13       0.13         X0 ZERO SEQUENCE       0.08       0.07       0.07       -       0.10       0.09       0.08       0.08         T'd TRANSIENT TIME CONST.       0.038 s       S         T'd SUB-TRANSTIME CONST.       0.012 s         T'do O.C. FIELD TIME CONST.       0.01 s		182	182	182	N/A	205	218	218	231
X'd DIR. AXIS TRANSIENT       0.19       0.17       0.16       -       0.21       0.20       0.18       0.18         X"d DIR. AXIS SUBTRANSIENT       0.13       0.12       0.11       -       0.15       0.14       0.13       0.12         Xq QUAD. AXIS REACTANCE       1.29       1.16       1.08       -       1.47       1.40       1.28       1.24         X"q QUAD. AXIS SUBTRANSIENT       0.18       0.16       0.15       -       0.18       0.17       0.16       0.15         XL LEAKAGE REACTANCE       0.08       0.07       0.07       -       0.09       0.08       0.07         X2 NEGATIVE SEQUENCE       0.13       0.12       0.11       -       0.16       0.15       0.13       0.13         X0 ZERO SEQUENCE       0.08       0.07       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.       0.012 s         T'd SUB-TRANSTIME CONST.       1 s         Ta ARMATURE TIME CONST.       0.01 s		2 15	1 94	1.80	-	2 43	2.31	2 11	2.06
X"d DIR, AXIS SUBTRANSIENT       0.13       0.12       0.11       -       0.15       0.14       0.13       0.12         Xq QUAD, AXIS REACTANCE       1.29       1.16       1.08       -       1.47       1.40       1.28       1.24         X"q QUAD, AXIS SUBTRANSIENT       0.18       0.16       0.15       -       0.18       0.17       0.16       0.15         XL LEAKAGE REACTANCE       0.08       0.07       0.07       -       0.09       0.08       0.08       0.07         X2 NEGATIVE SEQUENCE       0.13       0.12       0.11       -       0.16       0.15       0.13       0.13         X0ZERO SEQUENCE       0.08       0.07       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.       0.012 s         T'do O.C. FIELD TIME CONST.       1 s         Ta ARMATURE TIME CONST.       0.01 s					_				
Xq QUAD. AXIS REACTANCE       1.29       1.16       1.08       -       1.47       1.40       1.28       1.24         X"q QUAD. AXIS SUBTRANSIENT       0.18       0.16       0.15       -       0.18       0.17       0.16       0.15         XL LEAKAGE REACTANCE       0.08       0.07       0.07       -       0.09       0.08       0.08       0.07         X2 NEGATIVE SEQUENCE       0.13       0.12       0.11       -       0.16       0.15       0.13       0.13         X0ZERO SEQUENCE       0.08       0.07       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.       0.038 s         T'd SUB-TRANSTIME CONST.       0.012 s         T'do O.C. FIELD TIME CONST.       1 s         Ta ARMATURE TIME CONST.       0.01 s									
X"q QUAD. AXIS SUBTRANSIENT       0.18       0.16       0.15       -       0.18       0.17       0.16       0.15         XL LEAKAGE REACTANCE       0.08       0.07       0.07       -       0.09       0.08       0.08       0.07         X2 NEGATIVE SEQUENCE       0.13       0.12       0.11       -       0.16       0.15       0.13       0.13         X0 ZERO SEQUENCE       0.08       0.07       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.       0.038 s         T'd SUB-TRANSTIME CONST.       0.012 s         T'do O.C. FIELD TIME CONST.       1 s         Ta ARMATURE TIME CONST.       0.01 s					-				
XL LEAKAGE REACTANCE       0.08       0.07       0.07       -       0.09       0.08       0.08       0.07         X2 NEGATIVE SEQUENCE       0.13       0.12       0.11       -       0.16       0.15       0.13       0.13         X0 ZERO SEQUENCE       0.08       0.07       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.       0.038 s         T'd SUB-TRANSTIME CONST.       0.012 s         T'do O.C. FIELD TIME CONST.       1 s         Ta ARMATURE TIME CONST.       0.01 s					-				
X2 NEGATIVE SEQUENCE       0.13       0.12       0.11       -       0.16       0.15       0.13       0.13         X0 ZERO SEQUENCE       0.08       0.07       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.       0.038 s         T'd SUB-TRANSTIME CONST.       0.012 s         T'do O.C. FIELD TIME CONST.       1 s         Ta ARMATURE TIME CONST.       0.01 s					_				
X0 ZERO SEQUENCE         0.08         0.07         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.         0.038 s           T''d SUB-TRANSTIME CONST.         0.012 s           T''do O.C. FIELD TIME CONST.         1 s           Ta ARMATURE TIME CONST.         0.01 s									
REACTANCES ARE SATURATED VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED T'd TRANSIENT TIME CONST. 0.038 s T"d SUB-TRANSTIME CONST. 0.012 s T'do O.C. FIELD TIME CONST. 1 s Ta ARMATURE TIME CONST. 0.01 s					_				
T'd TRANSIENT TIME CONST.       0.038 s         T"d SUB-TRANSTIME CONST.       0.012 s         T'do O.C. FIELD TIME CONST.       1 s         Ta ARMATURE TIME CONST.       0.01 s									
T"d SUB-TRANSTIME CONST.  T'do O.C. FIELD TIME CONST.  1 s  Ta ARMATURE TIME CONST.  0.012 s  1 s  0.01 s				LOLO AILL			1D VOLINGI		
Ta ARMATURE TIME CONST. 0.01 s									
	T'do O.C. FIELD TIME CONST.				1	S			
SHORT CIRCUIT RATIO 1/Xd	Ta ARMATURE TIME CONST.				0.0	1 s			-
	SHORT CIRCUIT RATIO	<u></u>			1/>	(d			

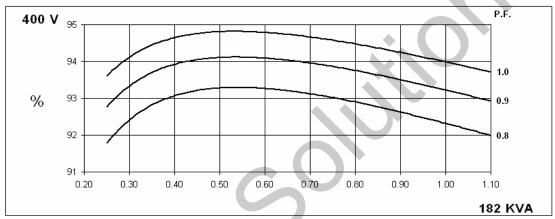
50 Hz

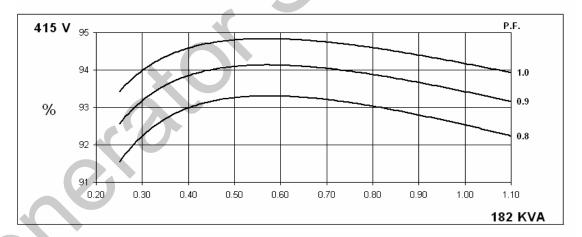
# UCI274G Winding 311

# **STAMFORD**

#### THREE PHASE EFFICIENCY CURVES





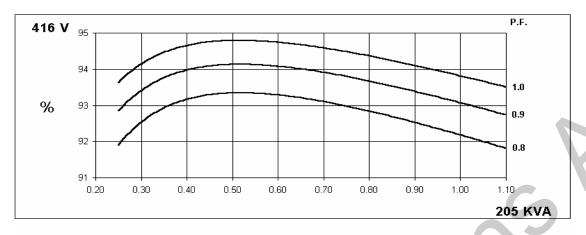


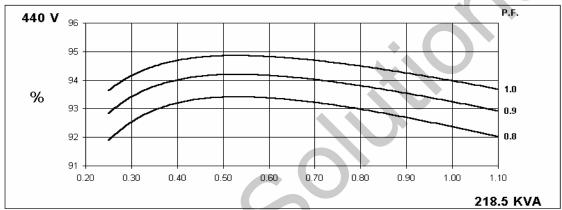
60 Hz

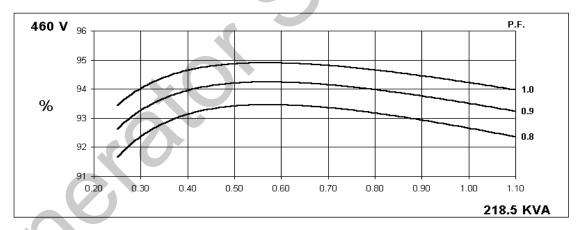
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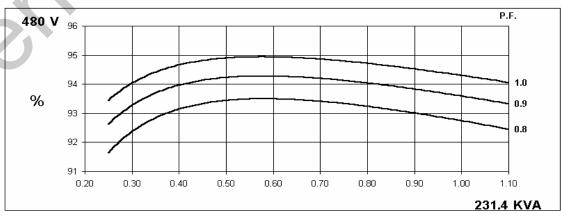
# **STAMFORD**

#### THREE PHASE EFFICIENCY CURVES





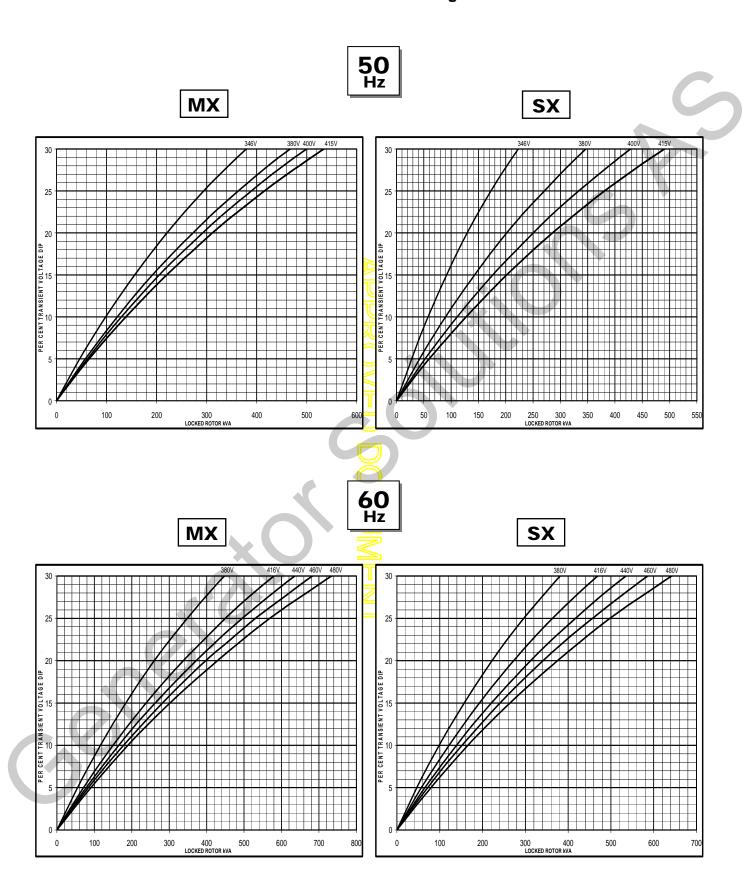






# UCI274G Winding 311

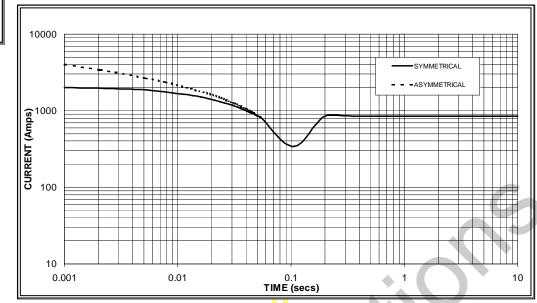
# **Locked Rotor Motor Starting Curve**





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

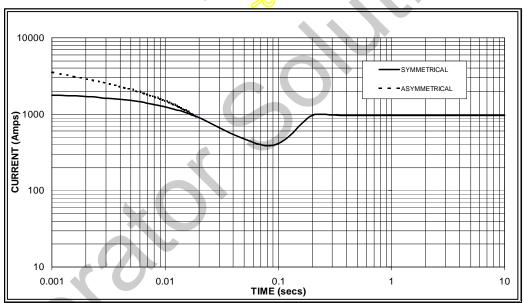
50 Hz



Sustained Short Circuit = 850 Amps



60 Hz



#### Sustained Short Circuit = 970 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						
		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



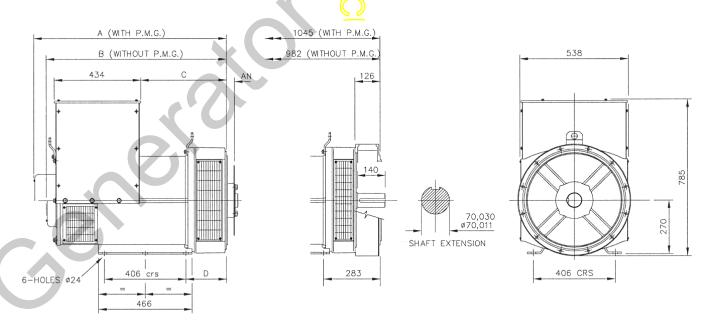
# **UCI274G**

# Winding 311 / 0.8 Power Factor

## **RATINGS**

		Class - Temp Rise	С	ont. F -	105/40	°C	Co	ont. H -	125/40	°C	Sta	andby -	150/40	°C	St	andby -	163/27	°C
	50	Series Star (V)	380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440
		Parallel Star (V)	190	200	208	220	190	200	208	220	190	200	208	220	190	200	208	220
	Hz	Series Delta (V)	220	230	240	254	220	230	240	254	220	230	240	254	220	230	240	254
ľ		kVA	164.6	164.6	164.6	N/A	182.0	182.0	182.0	N/A	187.0	187.0	187.0	N/A	200.0	200.0	200.0	N/A
		kW	131.7	131.7	131.7	N/A	145.6	145.6	145.6	N/A	149.6	149.6	149.6	N/A	160.0	160.0	160.0	N/A
		Efficiency (%)	92.3	92.6	92.8	N/A	92.0	92.3	92.5	N/A	91.9	92.2	92.5	N/A	91.6	92.0	92.2	N/A
		kW Input	142.7	142.2	141.9	N/A	158.3	157.7	157.4	N/A	162.8	162.2	161.8	N/A	174.7	173.9	173.5	N/A
			-								-							
	60	Series Star (V)	416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480
	Hz	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	192.8	199.0	199.0	212.2	205.0	218.5	218.5	231.4	213.0	228.8	228.8	250.0	218.5	234.0	234.0	253.3
		kW	154.2	159.2	159.2	169.8	164.0	174.8	174.8	185.1	170.4	183.0	183.0	200.0	174.8	187.2	187.2	202.6
		Efficiency (%)	92.4	92.7	92.9	93.0	92.2	92.4	92.7	92.7	92.0	92.2	92.5	92.5	91.9	92.1	92.4	92.5
		kW Input	166.9	171.7	171.4	182.5	177.9	189.2	188.6	199.7	185.2	198.5	197.9	216.2	190.2	203.3	202.6	219.1

# **DIMENSIONS**



SINGLE BEARING ADAPTORS						
ADAPTOR	Α	В	С	D		
SAE 1	978,3	915,3	439,3	216,3		
SAE 2	964	901	425	202		
SAE 3	964	901	425	202		

COUPLING DISCS					
DISC	AN				
SAE 10	53,98				
SAE 11,5	39,68				
SAE 14	25,40				

# APPROVED DOCUMENT

# **STAMFORD**

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