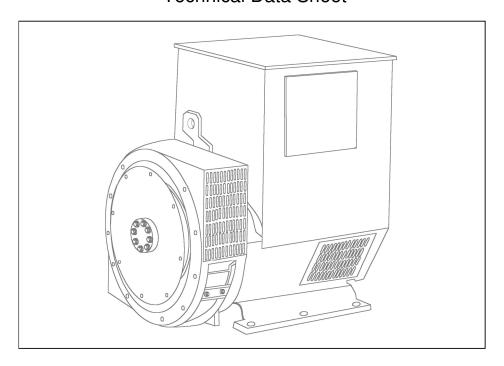
STAMFORD®

UCDI274J - Winding 14

Technical Data Sheet



UCDI274J

STAMFORD

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 - OBSOLETE

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 - STANDARD

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 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.

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 7 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°C by which the operational ambient temperature exceeds $40^{\circ}\text{C}.$

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.



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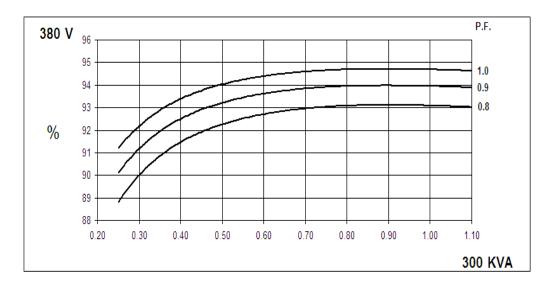
WINDING 14

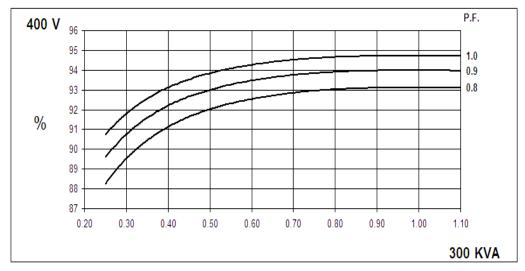
WINDING 14										
CONTROL SYSTEM	SEPARATE	LY EXCITE	D BY P.M.G.							
A.V.R.	MX341	MX321								
VOLTAGE REGULATION	± 1%	± 0.5 %	With 4% ENGINE GOVERNING	i						
SUSTAINED SHORT CIRCUIT	REFER TO SHORT CIRCUIT DECREMENT CURVES (page 6)									
CONTROL SYSTEM	SELE EXCI	SELF EXCITED								
A.V.R.	SX460 AS440									
VOLTAGE REGULATION	± 1.5 %	± 1.0 %	With 4% ENGINE GOVERNING							
SUSTAINED SHORT CIRCUIT	DOES NOT SUSTAIN A SHORT CIRCUIT CURRENT									
INSULATION SYSTEM		CLASS H								
PROTECTION	IP23									
RATED POWER FACTOR		0.8								
STATOR WINDING		DOUBLE LAYER LAP								
WINDING PITCH	 	TWO THIRDS								
WINDING LEADS		12								
MAIN STATOR RESISTANCE	1	0.0081 Ohms PER PHASE AT 22 ℃ STAR CONNECTED								
MAIN ROTOR RESISTANCE		2.08 Ohms at 22 °C								
EXCITER STATOR RESISTANCE		2.06 Onms at 22 ℃								
EXCITER ROTOR RESISTANCE		0.091 Ohms PER PHASE AT 22℃								
R.F.I. SUPPRESSION	E	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		NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0% 2250 Rev/Min								
BEARING NON-DRIVE END		BALL. 6310-2RS (ISO)								
WEIGHT COMP. GENERATOR	727 kg									
WEIGHT WOUND STATOR	<u> </u>	304 kg								
WEIGHT WOUND ROTOR		271.9 kg								
WR² INERTIA		2.3744 kgm ²								
SHIPPING WEIGHTS in a crate		740 kg								
PACKING CRATE SIZE		123 x 67 x 103(cm)								
TELEPHONE INTERFERENCE	THF<2% TIF<50									
COOLING AIR			0.617 m³/sec	1308 cfm						
VOLTAGE STAR		380	40	0	416					
kVA BASE RATING FOR REACTANCE VALUES		300	30	0	300					
Xd DIR. AXIS SYNCHRONOUS		2.27	2.0	5	1.90					
X'd DIR. AXIS TRANSIENT		0.14	0.1	3	0.12					
X"d DIR. AXIS SUBTRANSIENT		0.08	0.0	8	0.07					
Xq QUAD. AXIS REACTANCE		1.03	0.9	3	0.86					
X"q QUAD. AXIS SUBTRANSIENT		0.12	0.1	1	0.10					
XL LEAKAGE REACTANCE		0.07	0.0	6	0.06					
X2 NEGATIVE SEQUENCE		0.10	0.0	9	0.08					
X ₀ ZERO SEQUENCE		0.04	0.04 0.03							
REACTANCES ARE SATURAT	īED .		VALUES ARE PER UNIT AT	RATING AND VC	DLTAGE INDICATED					
T'd TRANSIENT TIME CONST.	0.045s									
T"d SUB-TRANSTIME CONST.	0.015s									
T'do O.C. FIELD TIME CONST.	1.27s									
Ta ARMATURE TIME CONST. SHORT CIRCUIT RATIO	0.03s									
SHORT CIRCUIT KATIO	1/Xd									

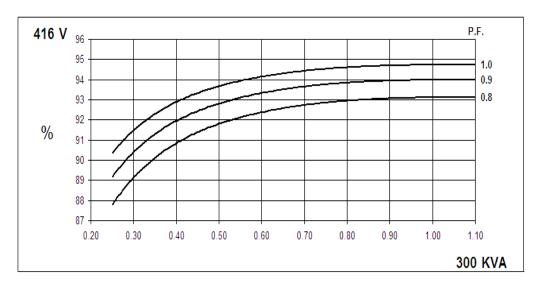


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THREE PHASE EFFICIENCY CURVES



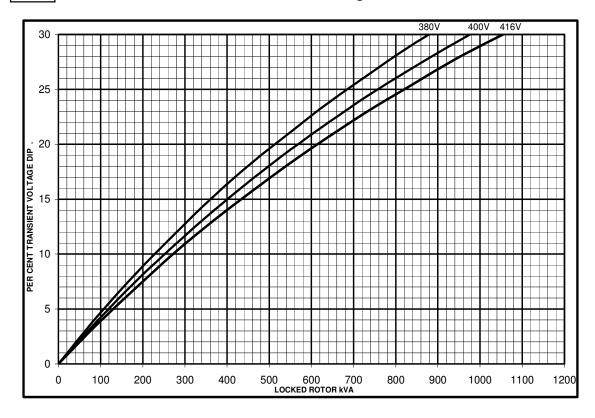




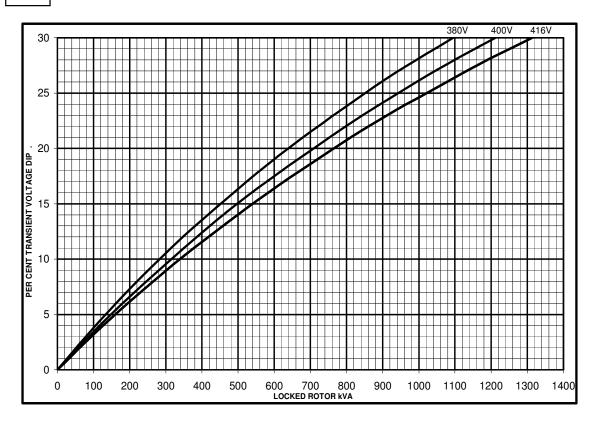
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SX

Locked Rotor Motor Starting Curves



MX

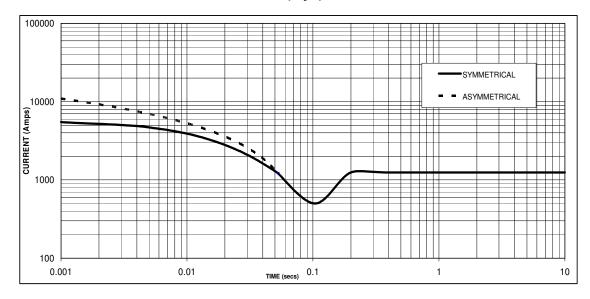


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Winding 14

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



Sustained Short Circuit = 1250 Amps

Note

The following multiplication factor should be used to convert the values from curve for 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



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Winding 14 / 0.8 Power Factor

60Hz

Class - Temp Rise	Cont. F - 105/40 ℃		Cont. H - 125/40 ℃		Standby - 150/40℃			Standby - 163/27℃				
Series Star (V)	380	400	416	380	400	416	380	400	416	380	400	416
Parallel StarStar (V)	190	200	208	190	200	208	190	200	208	190	200	208
Series Delta (V)	220	230	240	220	230	240	220	230	240	220	230	240
kVA	275.0	275.0	275.0	300.0	300.0	300.0	319.0	319.0	319.0	325.0	325.0	325.0
kW	220.0	220.0	220.0	240.0	240.0	240.0	255.2	255.2	255.2	260.0	260.0	260.0
Efficiency (%)	93.1	93.1	93.1	93.1	93.1	93.1	93.0	93.1	93.1	93.0	93.1	93.1
kW Input	236.3	236.3	236.4	257.8	257.7	257.7	274.3	274.1	274.1	279.5	279.3	279.2

Dimensional and Torsional Drawing

For dimensional and torsional information please refer to the alternator General Arrangement and rotor drawings available on our website (http://stamford-avk.com/)

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www.stamford-avk.com

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