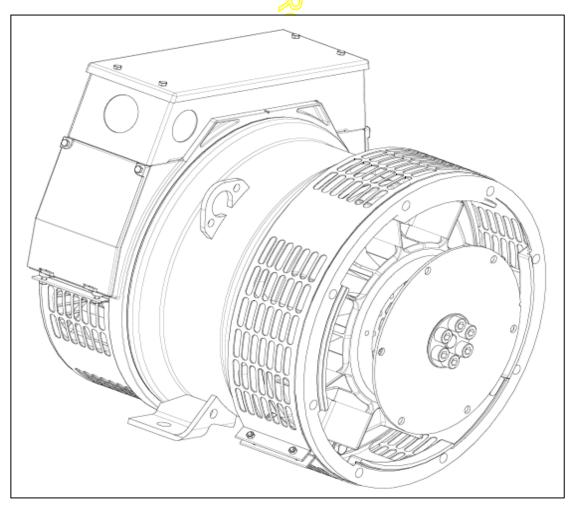
STAMFORD

PI042E - Winding 05
Technical Data Sheet



STAMFORD

PIO42E 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 REGULATOR

AS480 AVR fitted as STANDARD

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 AS480 will support limited accessories, RFI suppession remote voltage trimmer and for the P1 range only a 'droop' Current Transformer (CT) to permit parallel operation with other ac generators.

The AVR is can be fitted to either side of the generator in its own housing in the non-drive end bracket.

Excitation Boost System (EBS) (OPTIONAL)

The EBS is a single, self-contained unit, attached to the non-drive end of the generator.

The EBS unit consists of the Excitation Boost Controller (EBC) and an Excitation Boost Generator (EBG). Under fault conditions, or when the generator is subjected to a large impact load such as a motor starting, the generator voltage will drop. The EBC senses the drop in voltage and engages the output power of the EBG. This additional power feeds the generator's excitation system, supporting the load until breaker discrimination can remove the fault or enable the generator to pick up a motor and drive the voltage recovery.

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

Dedicated Single Phase generators have 4 ends brought out to the terminals, which are mounted at the non-drive end of the generator. A sheet steel terminal box contains provides ample space for the customers' wiring and gland arrangements. Alternative terminal boxes are available for customers who want to fit additional components in the terminal box.

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 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°C.

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

5% For reverse rotation

(Standard rotation CW when viewed from DE)

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.



PI042E

WINDING 05

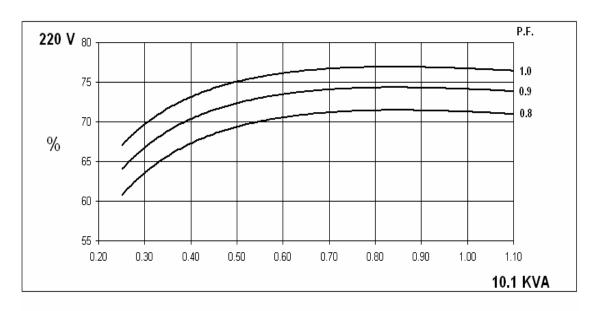
SUBSTAINED SHORT CIRCUIT SELF EXCITED MACHINES DO NOT SUSTAIN A SHORT CIRCUIT CURRENT	CONTROL SYSTEM		CELEEV	CITED					
SELF EXCITED MACHINES DO NOT SUSTAIN A SHORT CIRCUIT CURRENT CONTROL SYSTEM		,	SELF EX	CITED)					
ASI80 AVR WITH OPTIONAL EXCITATION BOOST SYSTEM (EBS)									
REFER TO SHORT CIRCUIT REFER TO SHORT CIRCUIT DECREMENT CURVE (page 6)	303 TAINED SHOKT CIRCUIT	AINED SHORT CIRCUIT SELF EXCITED MACHINES DO NOT SUSTAIN A SHORT CIRCUIT CURRENT							
NEULATION SYSTEM CLASS H	CONTROL SYSTEM								
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ARTED POWER FACTOR	INSULATION SYSTEM			CLAS	SS H				
SINGLE LAYER CONCENTRIC WINDING PITCH WINDING ILEADS 5TATOR WIDG, RESISTANCE 8TATOR WIDG, RESISTANCE 8TATOR WIDG, RESISTANCE 8TATOR RESISTANCE 8TATOR RESISTANCE 8TATOR RESISTANCE 8TATOR RESISTANCE 8TATOR RESISTANCE 8TATOR RESISTANCE 12.9 Ohms at 22°C 12.9 Ohms at 22°C	PROTECTION			IP	23				
TWO THIRDS A	RATED POWER FACTOR			0.	.8				
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STATOR WIDG. RESISTANCE	WINDING PITCH			TWO T	HIRDS				
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EXCITER ROTOR RESISTANCE EBS STATOR RESISTANCE 12.9 Ohms at 22°C 12	ROTOR WDG. RESISTANCE			0.895 Ohm	ns at 22°C				
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WAVEFORM DISTORTION NO LOAD 1.5% NON-DISTORTING LINEAR LOAD < 5.0% MAXIMUM OVERSPEED #4500 RewMin BEARLING DRIVE END #BALL 6309-2RS (ISO) BEARLING NON-DRIVE END #BALL 6309-2RS (ISO) #BALL 6	EBS STATOR RESISTANCE			12.9 Ohm	s at 22°C				
## ## ## ## ## ## ## ## ## ## ## ## ##	R.F.I. SUPPRESSION	BS EN 61000-6-2	& BS EN	61000-6-4,VDE 0	9875G, VDE 0875N	l. refer to	factory for others		
BEARING DRIVE END BEARING NON-DRIVE END WITH EBS WITHOUT EBS ### ### ### ### ### ### ### ### ### #	WAVEFORM DISTORTION	NO	LOAD <	1.5% NON-DISTO	DRTING LINEAR L	OAD < 5	.0%		
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BEARING	BEARING DRIVE END	BALL. 6309-2RS (ISO)							
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WEIGHT WOUND ROTOR 25.89 kg 24.19 kg 26.95 kg 25.25 kg WR2 INERTIA 0.0686 kgm² 0.0669 kgm² 0.0668 kgm² 0.06671 kgm² SHIPPING WEIGHTS in a crate 100 kg 98.3 kg 109 kg 107.3 kg PACKING CRATE SIZE 71 x 51 x 67 cm 71 x 51 x 67 (cm) TELEPHONE INTERFERENCE THF	WEIGHT COMP. GENERATOR	84 kg		82.3 kg	87 kg	85.3 kg			
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SHIPPING WEIGHTS in a crate 100 kg 98.3 kg 109 kg 107.3 kg PACKING CRATE SIZE 71 x 51 x 67 (cm) 71 x 51 x 67 (cm) TELEPHONE INTERFERENCE THF-22 1 TIF-50 COOLING AIR 0.205 m³/sec 434 cfm VOLTAGE SERIES 220 230 240 VOLTAGE PARALLEL 110 115 120 KWA BASE RATING FOR REACTANCE VALUES 243 2.13 1.96 XVA DIR. AXIS SYNCHRONOUS 2.33 2.13 1.96 XVA DIR. AXIS SYNCHRONOUS 2.33 2.13 1.96 XVA DIR. AXIS SUBTRANSIENT 0.24 0.22 0.20 X'd DIR. AXIS SUBTRANSIENT 0.15 0.14 0.13 XQ QUAD. AXIS REACTANCE 1.15 1.06 0.97 X'Q QUAD. AXIS SUBTRANSIENT 0.26 0.24 0.22 XL LEAKAGE REACTANCE 0.10 0.09 0.08 XZ NEGATIVE SEQUENCE 0.21 0.20 0.18 XQ ZERO SEQUENCE 0.10 0.09 0.08 REACTANCES ARE SATURATED VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED T'd TRANSIENT TIME CONST. 0.002 s T'd SUB-TRANSTIME CONST. 0.002 s T'd SUB-TRANSTIME CONST. 0.004 s SHORT CIRCUIT RATIO 1/Xd	WEIGHT WOUND ROTOR	25.89 kg 26.95 kg							
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TELEPHONE INTERFERENCE COOLING AIR VOLTAGE SERIES 220 230 240 VOLTAGE PARALLEL 110 115 120 KVA BASE RATING FOR REACTANCE VALUES VAL	SHIPPING WEIGHTS in a crate	100 kg		98.3 kg	109 kg		107.3 kg		
COOLING AIR	PACKING CRATE SIZE	71 x 51 >	x 67 (cm)		-	71 x 51 x	(67 (cm)		
VOLTAGE SERIES 220	TELEPHONE INTERFERENCE	THF	<2 <mark>% </mark>			TIF	<50		
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X"q QUAD. AXIS SUBTRANSIENT 0.26 0.24 0.22 XL LEAKAGE REACTANCE 0.10 0.09 0.08 X2 NEGATIVE SEQUENCE 0.21 0.20 0.18 X0 ZERO SEQUENCE 0.10 0.09 0.08 REACTANCES ARE SATURATED VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED T'd TRANSIENT TIME CONST. 0.008 s T"d SUB-TRANSTIME CONST. 0.002 s T'do O.C. FIELD TIME CONST. 0.15 s Ta ARMATURE TIME CONST. 0.004 s SHORT CIRCUIT RATIO 1/Xd	X"d DIR. AXIS SUBTRANSIENT	0.15		0.	14		0.13		
XL LEAKAGE REACTANCE 0.10 0.09 0.08 X2 NEGATIVE SEQUENCE 0.21 0.20 0.18 X0 ZERO SEQUENCE 0.10 0.09 0.08 REACTANCES ARE SATURATED VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED T'd TRANSIENT TIME CONST. 0.008 s T''d SUB-TRANSTIME CONST. 0.002 s T'do O.C. FIELD TIME CONST. 0.15 s Ta ARMATURE TIME CONST. 0.004 s SHORT CIRCUIT RATIO 1/Xd	Xq QUAD. AXIS REACTANCE	1.15		1.0	06		0.97		
X2 NEGATIVE SEQUENCE 0.21 0.20 0.18 X0 ZERO SEQUENCE 0.10 0.09 0.08 REACTANCES ARE SATURATED VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED T'd TRANSIENT TIME CONST. 0.008 s T'd SUB-TRANSTIME CONST. 0.002 s T'do O.C. FIELD TIME CONST. 0.15 s Ta ARMATURE TIME CONST. 0.004 s SHORT CIRCUIT RATIO 1/Xd	X"q QUAD. AXIS SUBTRANSIENT	0.26		0.:	24		0.22		
X0 ZERO SEQUENCE 0.10 0.09 0.08 REACTANCES ARE SATURATED VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED T'd TRANSIENT TIME CONST. 0.008 s T'd SUB-TRANSTIME CONST. 0.002 s T'do O.C. FIELD TIME CONST. 0.15 s Ta ARMATURE TIME CONST. 0.004 s SHORT CIRCUIT RATIO 1/Xd	XL LEAKAGE REACTANCE	0.10 0.09 0.08							
REACTANCES ARE SATURATED VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED 1'd TRANSIENT TIME CONST. 0.008 s 1'd SUB-TRANSTIME CONST. 0.002 s 1'do O.C. FIELD TIME CONST. 0.15 s TA ARMATURE TIME CONST. 0.004 s SHORT CIRCUIT RATIO	X2 NEGATIVE SEQUENCE	0.21 0.20 0.18					0.18		
T'd TRANSIENT TIME CONST. 0.008 s T'd SUB-TRANSTIME CONST. 0.002 s T'do O.C. FIELD TIME CONST. 0.15 s Ta ARMATURE TIME CONST. 0.004 s SHORT CIRCUIT RATIO 1/Xd	X ₀ ZERO SEQUENCE	0.10 0.09 0.08							
T"d SUB-TRANSTIME CONST. 0.002 s T'do O.C. FIELD TIME CONST. 0.15 s Ta ARMATURE TIME CONST. 0.004 s SHORT CIRCUIT RATIO 1/Xd	REACTANCES ARE SATURATED VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED								
T'do O.C. FIELD TIME CONST. 10.15 s 11. ARMATURE TIME CONST. 11. ARMATURE TIME CONST. 11. ARMATURE TIME CONST. 11. ARMATURE TIME CONST.	T'd TRANSIENT TIME CONST. 0.008 s								
Ta ARMATURE TIME CONST. 0.004 s SHORT CIRCUIT RATIO 1/Xd	T"d SUB-TRANSTIME CONST.	0.002 s							
SHORT CIRCUIT RATIO 1/Xd	T'do O.C. FIELD TIME CONST.	0.15 s							
	Ta ARMATURE TIME CONST.			0.00	04 s				
3	SHORT CIRCUIT RATIO			1/2	Xd				

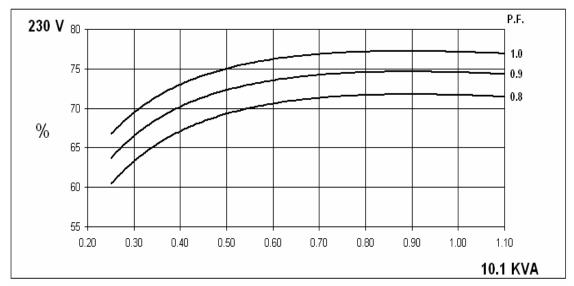


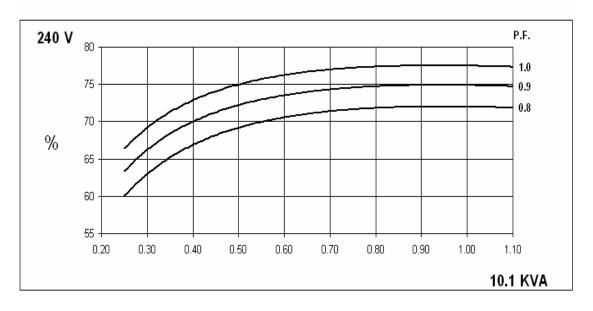
PI042E

Winding 05

SINGLE PHASE EFFICIENCY CURVES





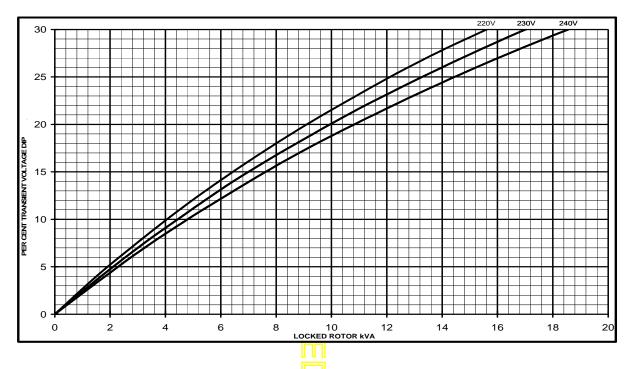




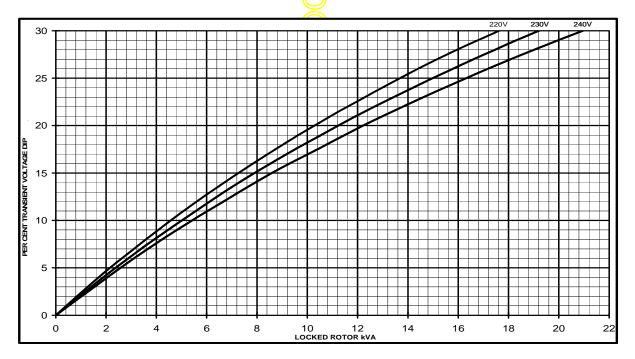
PI042E

Winding 05 Locked Rotor Motor Starting Curves

AS480 AVR Without EBS



AS480 AVR With EBS

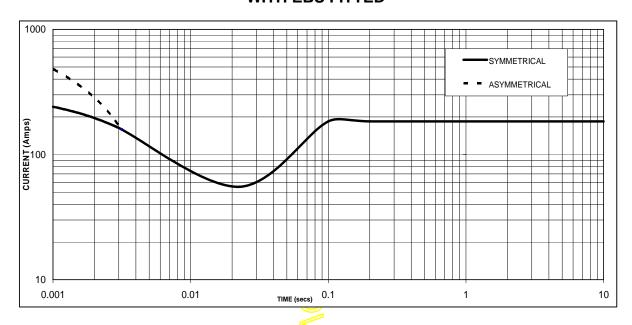


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STAMFORD

Winding 05

Short Circuit Decrement Curve. No-load Excitation at Rated Speed Based on series connection. WITH EBS FITTED



Sustained Short Circuit = 184 Amps

Note

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:

	(())
Voltage	Factor
220V	X 1.00
230V	X 1 <mark>.05</mark>
240V	X 1.09

The sustained current value is constant irrespective of voltage level

STAMFORD

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Winding 05

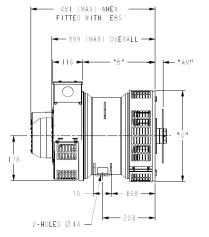
50Hz

RATINGS

Class Town Bios Cont. F - 105/40°C		Cont. H - 125/40°C			Standby - 150/40°C			Standby - 163/27°C				
Class - Temp Rise	Class - Temp Rise 0.8pf		0.8pf			0.8pf			0.8pf			
Series (V)	220	230	240	220	230	240	220	230	240	220	230	240
Parallel (V)	110	115	120	110	115	120	110	115	120	110	115	120
kVA	9.0	9.0	9.0	10.1	10.1	10.1	10.9	10.9	10.9	12.0	12.0	12.0
kW	7.2	7.2	7.2	8.1	8.1	8.1	8.7	8.7	8.7	9.6	9.6	9.6
Efficiency (%)	71.4	71.8	72.0	71.3	71.7	72.0	71.0	71.5	71.9	70.6	71.2	71.6
kW Input	10.1	10.0	10.0	11.4	11.3	11.3	12.3	12.2	12.1	13.6	13.5	13.4

Class Tamp Bias Cont. F - 105/40°C		Cont. H - 125/40°C			Standby - 150/40°C			Standby - 163/27°C				
Class - Temp Rise		1.0pf			1 <mark>.0pf</mark>		1.0pf			1.0pf		
Series (V)	220	230	240	220	230	240	220	230	240	220	230	240
Parallel (V)	110	115	120	110	115	120	110	115	120	110	115	120
kVA	9.0	9.0	9.0	10.1	10.1	10.1	10.9	10.9	10.9	12.0	12.0	12.0
kW	9.0	9.0	9.0	10.1	10.1	10.1	10.9	10.9	10.9	12.0	12.0	12.0
Efficiency (%)	76.9	77.2	77.5	76.7	77.1	77.5	76.5	77.0	77.4	76.1	76.7	77.1
kW Input	11.7	11.7	11.6	13.2	13.1	13.0	14.2	14.2	14.1	15.8	15.6	15.6

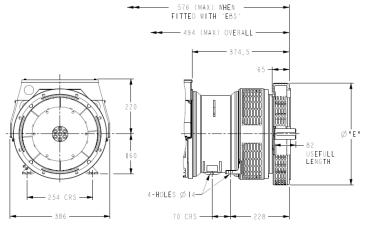
DIMENSIONS



SAE

10

NG DISC	I-BRG ADAPTORS					
"AN"	SAE	D				
30.2	5	361				
30.2	4	405				
62	3	45 I				
53.8	2	489				
20.6						



Z-BRG A	DAPTORS
SAE	Ø "E"
5	359
4	406
3	455
2	493

-Ø42,018 42,009

APPROVED DOCUMENT

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