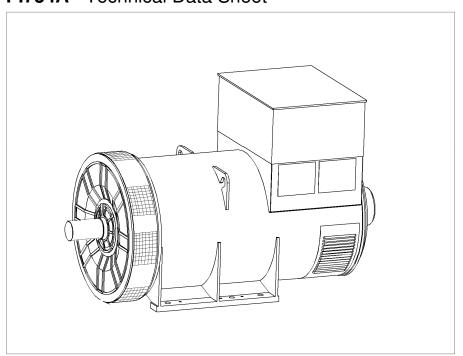
# STAMFORD

PI734A - Technical Data Sheet



### STAMFORD

### PI734A

#### **SPECIFICATIONS & OPTIONS**

#### **STANDARDS**

STAMFORD AC generators are designed to meet the performance requirements of IEC EN 60034-1. Other international standards, including BS5000, VDE 0530, NEMA MG1-32, AS1359, CSA C22.2, UL and CE; as well as a wide range of international Marine Certification Approvals, can be met on request. For clarification regarding compliance please contact Cummins Generator Technologies.

#### **VOLTAGE REGULATORS**

#### **AS440 AVR - STANDARD**

With this self-excited system the main stator provides power via the Automatic Voltage Regulator (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 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.

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

Standard generators feature a main stator with 6 ends brought out to the terminals, which are mounted on the frame 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', and meets the requirements of UL1446.

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.

#### **NOTE ON REGULATION**

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. 10% when IP44 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 temperature exceeding 60°C must be referred to the factory.

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

Front cover drawing is typical of the product range.

## **STAMFORD**

## **PI734A**

## **WINDING 312**

CONTROL SYSTEM	SEPARATEL	SEPARATELY EXCITED BY P.M.G.							
A.V.R.	MX341	MX321							
VOLTAGE REGULATION	± 1%	± 0.5 %	With 4% ENGINE GOVERNING						
SUSTAINED SHORT CIRCUIT	REFER TO S	EFER TO SHORT CIRCUIT DECREMENT CURVES (page 7)							

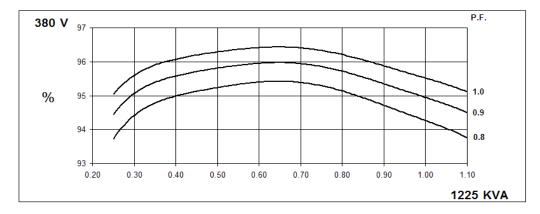
kVA BASE RATING FOR REACTANCE VALUES       1225       1260       1260       1235       1375       1500       1510       152         Xd DIR. AXIS SYNCHRONOUS       3.51       3.26       3.02       2.64       4.24       4.14       3.81       3.5         X'd DIR. AXIS TRANSIENT       0.21       0.20       0.18       0.16       0.26       0.25       0.23       0.2         X"d DIR. AXIS SUBTRANSIENT       0.16       0.15       0.14       0.12       0.19       0.19       0.17       0.11         Xq QUAD. AXIS REACTANCE       2.26       2.10       1.95       1.70       2.74       2.67       2.46       2.2         X"q QUAD. AXIS SUBTRANSIENT       0.32       0.29       0.27       0.24       0.38       0.37       0.34       0.3         XL LEAKAGE REACTANCE       0.04       0.04       0.03       0.03       0.05       0.05       0.04       0.0         X2 NEGATIVE SEQUENCE       0.22       0.21       0.19       0.17       0.27       0.26       0.24       0.2														
### RATED POWER FACTOR   0.8  STATOR WINDING   DOUBLE LAYER LAP   WINDING PITCH   TWO THIRDS   WINDING LEADS   6  MAIN STATOR RESISTANCE   0.0016 Ohms PER PHASE AT 22 °C STAR CONNECTED   MAIN ROTOR RESISTANCE   1.67 Ohms at 22 °C   EXCITER STATOR RESISTANCE   1.75 Ohms at 22 °C   EXCITER ROTOR RESISTANCE   1.50 Ohm PER PHASE AT 22 °C   EXCITER ROTOR RESISTANCE   1.50 Ohm PER PHASE AT 22 °C   EXCITER ROTOR RESISTANCE   1.50 Ohm PER PHASE AT 22 °C   EXCITER ROTOR RESISTANCE   1.50 Ohm PER PHASE AT 22 °C   EXCITER ROTOR RESISTANCE   1.50 Ohm PER PHASE AT 22 °C   EXCITER ROTOR RESISTANCE   1.50 Ohm PER PHASE AT 22 °C   EXCITER ROTOR RESISTANCE   1.50 Ohm PER PHASE AT 22 °C   EXCITER ROTOR RESISTANCE   1.50 Ohm PER PHASE AT 22 °C   EXCITER STATOR RESISTANCE   1.50 Ohm PER PHASE AT 22 °C   EXCITER STATOR RESISTANCE   1.50 Ohm PER PHASE AT 22 °C   EXCITER STATOR RESISTANCE   1.50 Ohm PER PHASE AT 22 °C   EXCITER STATOR RESISTANCE   1.50 Ohm PER PHASE AT 22 °C   EXCITER STATOR RESISTANCE   1.50 Ohm PER PHASE AT 22 °C   EXCITER STATOR PER PHASE AT 22 °C	INSULATION SYSTEM				CLAS	SS H								
STATOR WINDING	PROTECTION				IP	23								
WINDING PITCH	RATED POWER FACTOR				0.	8								
WINDING LEADS   6	STATOR WINDING				DOUBLE L	AYER LAP								
MAIN STATOR RESISTANCE  MAIN ROTOR RESISTANCE  EXCITER STATOR RESISTANCE  EXCITER ROTOR RESISTANCE  BS EN 61000-6-2 & BS EN 61000-6-4, VDE 0875G, VDE 0875G, refer to factory for others  WAVEFORM DISTORTION  MAXIMUM OVERSPEED  EXCITER ROTOR RESISTANCE  BS EN 61000-6-2 & BS EN 61000-6-4, VDE 0875G, VDE 0875G, refer to factory for others  WAVEFORM DISTORTION  MAXIMUM OVERSPEED  EXCITER ROTOR RESISTANCE  BS EN 61000-6-2 & BS EN 61000-6-4, VDE 0875G, VDE 0875G, NDE 10 totory for others  WAVEFORM DISTORTION  MAXIMUM OVERSPEED  EXCITER ROTOR ROTOR BALANCED LINEAR LOAD < 5.0%  MAXIMUM OVERSPEED  EXCITER STATOR ROTOR BALANCED LINEAR LOAD < 5.0%  MAXIMUM OVERSPEED  EXCITER STATOR ROTOR BALANCED LINEAR LOAD < 5.0%  MAXIMUM OVERSPEED  EXCITER STATOR ROTOR BALANCED LINEAR LOAD < 5.0%  MAXIMUM OVERSPEED  EXEMPTION  BEARING  EXEMPTION  BEARING  EXEMPTION  BEARING  EXEMPTION  EXEMPTION  BEARING  EXEMPTION  EXEMPTION  BEARING  EXEMPTION  EXEMP	WINDING PITCH		TWO THIRDS											
MAIN ROTOR RESISTANCE  EXCITER STATOR RESISTANCE  EXCITER ROTOR RESISTANCE  EXCITER ROTOR RESISTANCE  EXCITER ROTOR RESISTANCE  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  BALL. 6228 C3  BEARING DRIVE END  BALL. 6228 C3  BEARING NON-DRIVE END  BALL. 6319 C3  WEIGHT COMP. GENERATOR  2760 kg  2710 kg  WEIGHT WOUND STATOR  1139 kg  1077 kg  WRINERTIA  32.7498 kgm²  31.7489 kgm²  SHIPPING WEIGHTS in a crate  2833kg  2779kg  PACKING CRATE SIZE  194 x 105 x 154(cm)  194 x 105 x 154(cm)  ELEPHONE INTERFERENCE  COOLING AIR  VOLTAGE STAR  380/220 400/231 415/240 440/254 416/240 440/254 460/266 480/2  XVA BASE RATING FOR  REACTANCE VALUES  XD IR. AXIS SYNCHRONOUS  3.51 3.26 3.02 2.64 4.24 4.14 3.81 3.5  Xd DIR. AXIS SYNCHRONOUS  3.51 3.26 3.02 2.64 4.24 4.14 3.81 3.5  Xd DIR. AXIS SYNCHRONOUS  3.51 3.26 3.02 2.64 4.24 4.14 3.81 3.5  Xd DIR. AXIS SYNCHRONOUS  3.51 3.26 3.02 2.64 4.24 4.14 3.81 3.5  Xd DIR. AXIS SYNCHRONOUS  3.51 3.26 3.02 2.64 4.24 4.14 3.81 3.5  Xd DIR. AXIS SYNCHRONOUS  3.51 3.26 3.02 2.64 4.24 4.14 3.81 3.5  Xd DIR. AXIS SYNCHRONOUS  3.51 3.26 3.02 2.64 4.24 4.14 3.81 3.5  Xd DIR. AXIS SUBTRANSIENT  0.21 0.20 0.18 0.16 0.26 0.25 0.23 0.22  Xd DIR. AXIS SUBTRANSIENT  0.21 0.20 0.18 0.16 0.26 0.25 0.23 0.22  Xd DIR. AXIS SUBTRANSIENT  0.21 0.20 0.18 0.16 0.26 0.25 0.23 0.22  Xd DIR. AXIS SUBTRANSIENT  0.21 0.20 0.18 0.16 0.26 0.25 0.23 0.22  Xd DIR. AXIS SUBTRANSIENT  0.21 0.20 0.18 0.16 0.26 0.25 0.23 0.24  XL LEAKAGE REACTANCE  2.26 2.10 1.95 1.70 2.74 2.67 2.46 2.2  Xd QUAD. AXIS REACTANCE  0.04 0.04 0.03 0.03 0.05 0.05 0.04 0.04  Xz NEGATIVE SEQUENCE  0.03 0.03 0.03 0.02 0.02 0.03 0.03 0.03	WINDING LEADS		6											
EXCITER STATOR RESISTANCE EXCITER ROTOR RESISTANCE EXCITER ROTOR RESISTANCE  0.063 Ohms PER PHASE AT 2°C  R.F.I. SUPPRESSION BS EN 61000-6-2 & BS EN 61000-6-4, VDE 08750, VDE 0875N. refer to factory for others  WAVEFORM DISTORTION NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%  MAXIMUM OVERSPEED  2250 Rev/Min  BEARING DRIVE END BALL 6219 C3  BEARING NON-DRIVE END BALL 6319 C3  WEIGHT COMP, GENERATOR 2760 kg 2710 kg  WEIGHT WOUND STATOR 1306 kg 1306 kg 1077 kg  WEIGHT WOUND ROTOR 1139 kg 1077 kg  WEIGHT WOUND ROTOR 1139 kg 2779kg  PACKING CRATE SIZE 194 x 105 x 154(cm) 194 x 105 x 154(cm)  FIF-250  COOLING AIR 2.69 m³/sec 5700 cfm 3.45 m³/sec 7300 cfm  VOLTAGE STAR 380/220 400/231 415/240 440/254 416/240 440/254 460/266 480/2  XI VIB JIR AXIS SYNCHRONOUS 3.51 3.26 3.02 2.64 4.24 4.14 3.81 3.5  XI DIR. AXIS SYNCHRONOUS 3.51 3.26 3.02 2.64 4.24 4.14 3.81 3.5  XI DIR. AXIS SYNCHRONOUS 3.51 3.26 3.02 2.64 4.24 4.14 3.81 3.5  XI DIR. AXIS SYNCHRONOUS 3.51 3.26 3.02 2.64 4.24 4.14 3.81 3.5  XI DIR. AXIS SUBTRANSIENT 0.21 0.20 0.18 0.16 0.26 0.25 0.23 0.2  XI DIR. AXIS SUBTRANSIENT 0.21 0.20 0.18 0.16 0.26 0.25 0.23 0.2  XI QUAD. AXIS REACTANCE 2.26 2.10 1.95 1.70 2.74 2.67 2.46 2.2  XI QUAD. AXIS SUBTRANSIENT 0.21 0.20 0.71 0.71 0.71 0.71 0.71  XI QUAD. AXIS SUBTRANSIENT 0.22 0.29 0.27 0.24 0.38 0.37 0.34 0.3  XI LEAKAGE REACTANCE 0.04 0.04 0.03 0.03 0.05 0.05 0.04 0.04  XI NEGATIVE SEQUENCE 0.03 0.03 0.03 0.02 0.02 0.03 0.03 0.03	MAIN STATOR RESISTANCE													
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 NON-DRIVE END  BEARING NON-DRIVE END  BEARING ON-DRIVE END  1 BEARING  2 BEARING  WEIGHT WOUND STATOR  1306 kg  1306 kg  1077 kg  WEIGHT WOUND ROTOR  1139 kg  1077 kg  WEIGHT WOUND ROTOR  1139 kg  1077 kg  WEIGHTS in a crate  2833kg  2779kg  PACKING CRATE SIZE  194 x 105 x 154(cm)  TIF-50  COOLING AIR  2.69 m³/sec 5700 cfm  3.45 m³/sec 7300 cfm  VOLTAGE STAR  380/220 400/231 415/240 440/254 416/240 440/254 460/266 480/2  XVA BASE RATING FOR  REACTANCE VALUES  1225 1260 1260 1235 1375 1500 1510 152  XZ DIR. AXIS SYNCHRONOUS  3.51 3.26 3.02 2.64 4.24 4.14 3.81 3.5  XZ DIR. AXIS SYNCHRONOUS  3.51 3.26 3.02 2.64 4.24 4.14 3.81 3.5  XZ DIR. AXIS SYNCHRONOUS  3.51 3.26 3.02 2.64 4.24 4.14 3.81 3.5  XZ DIR. AXIS SUBTRANSIENT  0.21 0.20 0.18 0.16 0.12 0.19 0.19 0.17 0.17 0.17  XZ QUAD. AXIS REACTANCE  2.26 2.10 1.95 1.70 2.74 2.67 2.46 2.22  XZ QUAD. AXIS SUBTRANSIENT  0.32 0.29 0.27 0.24 0.38 0.37 0.34 0.3  XL LEAKAGE REACTANCE  0.04 0.04 0.04 0.03 0.03 0.05 0.05 0.05 0.04 0.0  XZ NEGATIVE SEQUENCE  0.02 0.02 0.02 0.03 0.03 0.03 0.03 0.03  0.03 0.03 0.0	MAIN ROTOR RESISTANCE				1.67 Ohm:	s at 22℃								
R.F.I. SUPPRESSION  BS EN 61000-6-2 & BS EN 61000-6-4, VDE 08750, VDE 0875N. refer to factory for others WAVEFORM DISTORTION  NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%  MAXIMUM OVERSPEED  2250 Rev/Min  BEARING DRIVE END  BALL. 6228 C3  BEARING NON-DRIVE END  BALL. 6319 C3  The EARING PRIVE END  BALL. 6328 C3  BEARING PRIVE END  BALL. 6319 C3  BEARING PRIV	EXCITER STATOR RESISTANCE				17.5 Ohm:	s at 22℃								
WAVEFORM DISTORTION         NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%           MAXIMUM OVERSPEED         2250 Rev/Min           BEARING DRIVE END         BALL. 6228 C3           BEARING NON-DRIVE END         BALL. 6319 C3           WEIGHT COMP. GENERATOR         2760 kg         2710 kg           WEIGHT WOUND STATOR         1306 kg         1306 kg         1306 kg           WEIGHT WOUND ROTOR         1139 kg         1077 kg         WRIP INERTIA         32.7498 kgm²         31.7489 kgm²         2779kg           SHIPPING WEIGHTS in a crate         2833kg         2779kg         2779kg         2779kg         2779kg           PACKING CRATE SIZE         194 x 105 x 154(cm)           VOLTAGE STAR         380/220         400/231         415/240         440/254         416/240         440/254         460/266         480/2           KVA BASE RATING FOR REACTANCE VALUES         1225         1260         1260         1235         1375         1500         1510         152           X'd DIR. AXIS SYNCHRONOUS         3.51         3.26         3.02         2.64         4.24         4.14         3.81         3.5           X'd DIR. AXIS SUBT	EXCITER ROTOR RESISTANCE			0.06	3 Ohms PER	PHASE AT 2	22℃							
MAXIMUM OVERSPEED         2250 Rev/Min           BEARING DRIVE END         BALL. 6228 C3           BEARING NON-DRIVE END         BALL. 6319 C3           WEIGHT COMP. GENERATOR         2760 kg         2710 kg           WEIGHT WOUND STATOR         1306 kg         1306 kg           WEIGHT WOUND ROTOR         1139 kg         1077 kg           WR* INERTIA         32.7498 kgm²         31.7489 kgm²           SHIPPING WEIGHTS in a crate         2833kg         2779kg           PACKING CRATE SIZE         194 x 105 x 154(cm)         194 x 105 x 154(cm)           TELEPHONE INTERFERENCE         THF-29%         TIF-50           COOLING AIR         2.69 m²/sec 5700 cfm         3.45 m³/sec 7300 cfm           VOLTAGE STAR         380/220         400/231         415/240         440/254         460/266         480/26           KVA BASE RATING FOR REACTANCE VALUES         1225         1260         1260         1235         1375         1500         1510         152           X'd DIR. AXIS STRANSIENT         0.21         0.20         0.18         0.16         0.26         0.25         0.23         0.2           X'd DIR. AXIS SUBTRANSIENT         0.16         0.15         0.14         0.12         0.19         0.19	R.F.I. SUPPRESSION	BS EI	N 61000-6-2 8	& BS EN 610	00-6-4,VDE 0	875G, VDE 0	875N. refer to	factory for c	thers					
BEARING DRIVE END BEARING NON-DRIVE END BEARING NON-DRIVE END BEARING NON-DRIVE END  1 BEARING 2 BEARING WEIGHT COMP. GENERATOR 2760 kg 2710 kg WEIGHT WOUND STATOR 1306 kg 1306 kg WEIGHT WOUND ROTOR 1139 kg 1077 kg WR³ INERTIA 32.7498 kgm² 31.7489 kgm² SHIPPING WEIGHTS in a crate 2833kg 2779kg PACKING CRATE SIZE 194 x 105 x 154(cm) 194 x 105 x 154(cm) 194 x 105 x 154(cm)  TELEPHONE INTERFERENCE THF-2% TIF-50 COOLING AIR 2.69 m³/sec 5700 cfm 3.45 m³/sec 7300 cfm VOLTAGE STAR 380/220 400/231 415/240 440/254 416/240 440/254 460/266 480/2 kVA BASE RATING FOR REACTANCE VALUES 1225 1260 1260 1235 1375 1500 1510 152 X'd DIR. AXIS TRANSIENT 0.21 0.20 0.18 0.16 0.26 0.25 0.23 0.2 X'd DIR. AXIS SUBTRANSIENT 0.16 0.15 0.14 0.12 0.19 0.19 0.17 0.17 Xq QUAD. AXIS REACTANCE 2.26 2.10 1.95 1.70 2.74 2.67 2.46 2.2 X'q QUAD. AXIS SUBTRANSIENT 0.32 0.29 0.27 0.24 0.38 0.37 0.34 0.3 XL LEAKAGE REACTANCE 0.04 0.04 0.04 0.03 0.03 0.05 0.05 0.04 0.0 X₂ NEGATIVE SEQUENCE 0.02 NAIS ARE PER UNIT AT RATING AND VOLTAGE INDICATED T'd TRANSIENT TIME CONST. 0.01s	WAVEFORM DISTORTION		NO LOAD «	< 1.5% NON	-DISTORTING	3 BALANCE	LINEAR LO	AD < 5.0%						
BEARING NON-DRIVE END  1 BEARING  2 BEARING  WEIGHT COMP. GENERATOR  2760 kg  2710 kg  WEIGHT WOUND STATOR  1306 kg  WEIGHT WOUND ROTOR  1139 kg  1077 kg  WR² INERTIA  32.7498 kgm²  31.7489 kgm²  31.7489 kgm²  SHIPPING WEIGHTS in a crate  2833kg  2779kg  PACKING CRATE SIZE  194 x 105 x 154(cm)  TIF-≤50  COOLING AIR  2.69 m³/sec 5700 cfm  3.45 m³/sec 7300 cfm  VOLTAGE STAR  380/220 400/231 415/240 440/254 416/240 440/254 460/266 480/2 KVA BASE RATING FOR REACTANCE VALUES  Xd DIR. AXIS SYNCHRONOUS  3.51 3.26 3.02 2.64 4.24 4.14 3.81 3.5  Xd DIR. AXIS TRANSIENT  0.21 0.20 0.18 0.16 0.26 0.25 0.23 0.2  X⁻d DIR. AXIS SUBTRANSIENT  0.16 0.15 0.14 0.12 0.19 0.19 0.17 0.17  Xq QUAD. AXIS REACTANCE  2.26 2.10 1.95 1.70 2.74 2.67 2.46 2.2  X⁻q QUAD. AXIS SUBTRANSIENT  0.32 0.29 0.27 0.24 0.38 0.37 0.34 0.3  XL LEAKAGE REACTANCE  0.04 0.04 0.03 0.03 0.05 0.05 0.04 0.04  X₂ NEGATIVE SEQUENCE  0.02 ZERO SEQUENCE  0.03 0.03 0.00 0.00 0.00 0.00 0.00 0.0	MAXIMUM OVERSPEED				2250 R	ev/Min								
1 BEARING	BEARING DRIVE END				BALL. 6	228 C3								
WEIGHT COMP. GENERATOR         2760 kg         2710 kg           WEIGHT WOUND STATOR         1306 kg         1306 kg           WEIGHT WOUND ROTOR         1139 kg         1077 kg           WR² INERTIA         32.7498 kgm²         31.7489 kgm²           SHIPPING WEIGHTS in a crate         2833kg         2779kg           PACKING CRATE SIZE         194 x 105 x 154(cm)         194 x 105 x 154(cm)           FOOLING AIR         2.69 m³/sec 5700 cfm         3.45 m³/sec 7300 cfm           VOLTAGE STAR         380/220         400/231         415/240         440/254         416/240         440/254         460/266         480/2           KVA BASE RATING FOR REACTANCE VALUES         1225         1260         1260         1235         1375         1500         1510         152           Xd DIR. AXIS SYNCHRONOUS         3.51         3.26         3.02         2.64         4.24         4.14         3.81         3.5           X'd DIR. AXIS SYNCHRONOUS         3.51         3.26         3.02         2.64         4.24         4.14         3.81         3.5           X'd DIR. AXIS SYNCHRONOUS         3.51         3.26         3.02         2.64         4.24         4.14         3.81         3.5           X'd DIR. AXIS SYNCHRONOU	BEARING NON-DRIVE END				BALL. 6	319 C3								
WEIGHT WOUND STATOR         1306 kg         1306 kg           WEIGHT WOUND ROTOR         1139 kg         1077 kg           WR² INERTIA         32.7498 kgm²         31.7499 kgm²           SHIPPING WEIGHTS in a crate         2833kg         2779kg           PACKING CRATE SIZE         194 x 105 x 154(cm)         194 x 105 x 154(cm)           FOOLING INTERFERENCE         THF         60 Hz           COOLING AIR         2.69 m³/sec 5700 cfm         3.45 m³/sec 7300 cfm           VOLTAGE STAR         380/220         400/231         415/240         440/254         460/266         480/2           kVA BASE RATING FOR REACTANCE VALUES         1225         1260         1260         1235         1375         1500         1510         152           Xd DIR. AXIS SYNCHRONOUS         3.51         3.26         3.02         2.64         4.24         4.14         3.81         3.5           X'd DIR. AXIS SYNCHRONOUS         3.51         0.20         0.18         0.16         0.26         0.25         0.23         0.2           X'd DIR. AXIS SYNCHRONOUS         3.51         3.26         3.02         2.64         4.24         4.14         3.81         3.5           X'd DIR. AXIS SYNCHRONOUS         3.51         3.26			1 BE/	ARING			2 BEA	RING						
WEIGHT WOUND ROTOR         1139 kg         1077 kg           WR² INERTIA         32.7498 kgm²         31.7489 kgm²           SHIPPING WEIGHTS in a crate         2833kg         2779kg           PACKING CRATE SIZE         194 x 105 x 154(cm)         194 x 105 x 154(cm)           TELEPHONE INTERFERENCE         THF<2%	WEIGHT COMP. GENERATOR		276	0 kg			2710	) kg	-					
WR² INERTIA         32.7498 kgm²         31.7489 kgm²           SHIPPING WEIGHTS in a crate         2833kg         2779kg           PACKING CRATE SIZE         194 x 105 x 154(cm)         194 x 105 x 154(cm)           TELEPHONE INTERFERENCE         THF<2%	WEIGHT WOUND STATOR		130	6 kg			1306	kg						
SHIPPING WEIGHTS in a crate         2833kg         2779kg           PACKING CRATE SIZE         194 x 105 x 154(cm)         194 x 105 x 154(cm)           TELEPHONE INTERFERENCE         THF<2%	WEIGHT WOUND ROTOR		113	9 kg			1077	7 kg						
SHIPPING WEIGHTS in a crate         2833kg         2779kg           PACKING CRATE SIZE         194 x 105 x 154(cm)         194 x 105 x 154(cm)           TELEPHONE INTERFERENCE         THF<2%	WR² INERTIA		32.749	98 kgm²			31.748	9 kgm²						
TELEPHONE INTERFERENCE  THF~2%  TIF~50  COOLING AIR  2.69 m³/sec 5700 cfm  3.45 m³/sec 7300 cfm  VOLTAGE STAR  380/220 400/231 415/240 440/254 416/240 440/254 460/266 480/2 400/231 415/240 440/254 416/240 440/254 460/266 480/2 400/231 415/240 440/254 416/240 440/254 460/266 480/2 400/231 415/240 440/254 416/240 440/254 460/266 480/2 400/231 415/240 440/254 416/240 440/254 460/266 480/2 40 40/2 40/2 40/2 40/2 40/2 40/2 40/	SHIPPING WEIGHTS in a crate						277	9kg						
TELEPHONE INTERFERENCE  THF<2%  TIF<50  COOLING AIR  2.69 m³/sec 5700 cfm  3.45 m³/sec 7300 cfm  VOLTAGE STAR  380/220 400/231 415/240 440/254 416/240 440/254 460/266 480/2 80 80 80 80 80 80 80 80 80 80 80 80 80	PACKING CRATE SIZE		194 x 105	x 154(cm)			194 x 105	x 154(cm)						
COOLING AIR         2.69 m³/sec 5700 cfm         3.45 m³/sec 7300 cfm           VOLTAGE STAR         380/220         400/231         415/240         440/254         416/240         440/254         460/266         480/2           kVA BASE RATING FOR REACTANCE VALUES         1225         1260         1260         1235         1375         1500         1510         152           Xd DIR. AXIS SYNCHRONOUS         3.51         3.26         3.02         2.64         4.24         4.14         3.81         3.5           X'd DIR. AXIS TRANSIENT         0.21         0.20         0.18         0.16         0.26         0.25         0.23         0.2           X"d DIR. AXIS SUBTRANSIENT         0.16         0.15         0.14         0.12         0.19         0.19         0.17         0.1           Xq QUAD. AXIS REACTANCE         2.26         2.10         1.95         1.70         2.74         2.67         2.46         2.2           X"q QUAD. AXIS SUBTRANSIENT         0.32         0.29         0.27         0.24         0.38         0.37         0.34         0.3           XL LEAKAGE REACTANCE         0.04         0.04         0.03         0.03         0.05         0.05         0.04         0.0			50	Hz			60	Hz						
VOLTAGE STAR         380/220         400/231         415/240         440/254         416/240         440/254         460/266         480/2           kVA BASE RATING FOR REACTANCE VALUES         1225         1260         1260         1235         1375         1500         1510         152           Xd DIR. AXIS SYNCHRONOUS         3.51         3.26         3.02         2.64         4.24         4.14         3.81         3.5           X'd DIR. AXIS TRANSIENT         0.21         0.20         0.18         0.16         0.26         0.25         0.23         0.2           X''d DIR. AXIS SUBTRANSIENT         0.16         0.15         0.14         0.12         0.19         0.19         0.17         0.11           Xq QUAD. AXIS REACTANCE         2.26         2.10         1.95         1.70         2.74         2.67         2.46         2.2           X"q QUAD. AXIS SUBTRANSIENT         0.32         0.29         0.27         0.24         0.38         0.37         0.34         0.3           XL LEAKAGE REACTANCE         0.04         0.04         0.03         0.03         0.05         0.05         0.04         0.0           X2 NEGATIVE SEQUENCE         0.22         0.21         0.19         0.17 <td>TELEPHONE INTERFERENCE</td> <td></td> <td>THE</td> <td>&lt;2%</td> <td></td> <td></td> <td>TIF</td> <td>&lt;50</td> <td></td>	TELEPHONE INTERFERENCE		THE	<2%			TIF	<50						
RVA BASE RATING FOR REACTANCE VALUES   1260   1260   1235   1375   1500   1510   152     Xd DIR. AXIS SYNCHRONOUS   3.51   3.26   3.02   2.64   4.24   4.14   3.81   3.5     X'd DIR. AXIS TRANSIENT   0.21   0.20   0.18   0.16   0.26   0.25   0.23   0.2     X"d DIR. AXIS SUBTRANSIENT   0.16   0.15   0.14   0.12   0.19   0.19   0.17   0.11     Xq QUAD. AXIS REACTANCE   2.26   2.10   1.95   1.70   2.74   2.67   2.46   2.2     X"q QUAD. AXIS SUBTRANSIENT   0.32   0.29   0.27   0.24   0.38   0.37   0.34   0.3     XL LEAKAGE REACTANCE   0.04   0.04   0.03   0.03   0.05   0.05   0.04   0.0     X2 NEGATIVE SEQUENCE   0.22   0.21   0.19   0.17   0.27   0.26   0.24   0.2     X0 ZERO SEQUENCE   0.03   0.03   0.02   0.02   0.03   0.03   0.03   0.05     REACTANCES ARE SATURATED   VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED     T'd TRANSIENT TIME CONST.   0.13s     T"d SUB-TRANSTIME CONST.   0.01s	COOLING AIR		2.69 m³/se	c 5700 cfm			3.45 m³/sec	7300 cfm						
REACTANCE VALUES  Xd DIR. AXIS SYNCHRONOUS  3.51  3.26  3.02  2.64  4.24  4.14  3.81  3.5  X'd DIR. AXIS TRANSIENT  0.21  0.20  0.18  0.16  0.26  0.25  0.23  0.2  X"d DIR. AXIS SUBTRANSIENT  0.16  0.15  0.14  0.12  0.19  0.19  0.17  0.11  Xq QUAD. AXIS REACTANCE  2.26  2.10  1.95  1.70  2.74  2.67  2.46  2.2  X"q QUAD. AXIS SUBTRANSIENT  0.32  0.29  0.27  0.24  0.38  0.37  0.34  0.3  XL LEAKAGE REACTANCE  0.04  0.04  0.04  0.03  0.03  0.05  0.05  0.04  0.0  X2 NEGATIVE SEQUENCE  0.02  0.03	VOLTAGE STAR	380/220	400/231	415/240	440/254	416/240	440/254	460/266	480/277					
X'd DIR. AXIS TRANSIENT       0.21       0.20       0.18       0.16       0.26       0.25       0.23       0.2         X"d DIR. AXIS SUBTRANSIENT       0.16       0.15       0.14       0.12       0.19       0.19       0.17       0.11         Xq QUAD. AXIS REACTANCE       2.26       2.10       1.95       1.70       2.74       2.67       2.46       2.2         X"q QUAD. AXIS SUBTRANSIENT       0.32       0.29       0.27       0.24       0.38       0.37       0.34       0.3         XL LEAKAGE REACTANCE       0.04       0.04       0.03       0.03       0.05       0.05       0.04       0.0         X2 NEGATIVE SEQUENCE       0.22       0.21       0.19       0.17       0.27       0.26       0.24       0.2         X0 ZERO SEQUENCE       0.03       0.03       0.02       0.02       0.03       0.03       0.03       0.03         REACTANCES ARE SATURATED         VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED         T'd TRANSIENT TIME CONST.       0.13s         T'd SUB-TRANSTIME CONST.       0.01s		1225	1260	1260	1235	1375	1500	1510	1525					
X"d DIR. AXIS SUBTRANSIENT       0.16       0.15       0.14       0.12       0.19       0.19       0.17       0.10         Xq QUAD. AXIS REACTANCE       2.26       2.10       1.95       1.70       2.74       2.67       2.46       2.20         X"q QUAD. AXIS SUBTRANSIENT       0.32       0.29       0.27       0.24       0.38       0.37       0.34       0.3         XL LEAKAGE REACTANCE       0.04       0.04       0.03       0.03       0.05       0.05       0.04       0.0         X2 NEGATIVE SEQUENCE       0.22       0.21       0.19       0.17       0.27       0.26       0.24       0.2         X0 ZERO SEQUENCE       0.03       0.03       0.02       0.02       0.03       0.03       0.03       0.0         REACTANCES ARE SATURATED       VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED         T'd TRANSIENT TIME CONST.       0.13s         T'd SUB-TRANSTIME CONST.       0.01s	Xd DIR. AXIS SYNCHRONOUS	3.51	3.26	3.02	2.64	4.24	4.14	3.81	3.53					
Xq QUAD. AXIS REACTANCE       2.26       2.10       1.95       1.70       2.74       2.67       2.46       2.2         X"q QUAD. AXIS SUBTRANSIENT       0.32       0.29       0.27       0.24       0.38       0.37       0.34       0.3         XL LEAKAGE REACTANCE       0.04       0.04       0.03       0.03       0.05       0.05       0.04       0.0         X2 NEGATIVE SEQUENCE       0.22       0.21       0.19       0.17       0.27       0.26       0.24       0.2         X0 ZERO SEQUENCE       0.03       0.03       0.02       0.02       0.03       0.03       0.03         REACTANCES ARE SATURATED       VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED         T'd TRANSIENT TIME CONST.       0.13s         T'd SUB-TRANSTIME CONST.       0.01s	X'd DIR. AXIS TRANSIENT	0.21	0.20	0.18	0.16	0.26	0.25	0.23	0.22					
X"q QUAD. AXIS SUBTRANSIENT 0.32 0.29 0.27 0.24 0.38 0.37 0.34 0.33  XL LEAKAGE REACTANCE 0.04 0.04 0.03 0.03 0.05 0.05 0.04 0.04  X2 NEGATIVE SEQUENCE 0.22 0.21 0.19 0.17 0.27 0.26 0.24 0.22  X0 ZERO SEQUENCE 0.03 0.03 0.02 0.02 0.03 0.03 0.03 0.03	X"d DIR. AXIS SUBTRANSIENT	0.16	0.15	0.14	0.12	0.19	0.19	0.17	0.16					
XL LEAKAGE REACTANCE       0.04       0.04       0.03       0.03       0.05       0.05       0.04       0.00         X2 NEGATIVE SEQUENCE       0.22       0.21       0.19       0.17       0.27       0.26       0.24       0.2         X0 ZERO SEQUENCE       0.03       0.03       0.02       0.02       0.03       0.03       0.03       0.03         REACTANCES ARE SATURATED       VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED         T'd TRANSIENT TIME CONST.       0.13s         T''d SUB-TRANSTIME CONST.       0.01s	Xq QUAD. AXIS REACTANCE	2.26	2.10	1.95	1.70	2.74	2.67	2.46	2.28					
X2 NEGATIVE SEQUENCE       0.22       0.21       0.19       0.17       0.27       0.26       0.24       0.2         X0 ZERO SEQUENCE       0.03       0.03       0.02       0.02       0.03       0.03       0.03       0.03         REACTANCES ARE SATURATED       VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED         T'd TRANSIENT TIME CONST.       0.13s         T''d SUB-TRANSTIME CONST.       0.01s	X"q QUAD. AXIS SUBTRANSIENT	0.32	0.29	0.27	0.24	0.38	0.37	0.34	0.32					
X0 ZERO SEQUENCE         0.03         0.03         0.02         0.02         0.03         0.03         0.03         0.03           REACTANCES ARE SATURATED         VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED           T'd TRANSIENT TIME CONST.         0.13s           T"d SUB-TRANSTIME CONST.         0.01s	XL LEAKAGE REACTANCE	0.04	0.04	0.03	0.05	0.05	0.04	0.04						
REACTANCES ARE SATURATED VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED  T'd TRANSIENT TIME CONST. 0.13s  T"d SUB-TRANSTIME CONST. 0.01s	X2 NEGATIVE SEQUENCE	0.22	0.21	0.26	0.24	0.23								
T'd TRANSIENT TIME CONST.         0.13s           T"d SUB-TRANSTIME CONST.         0.01s	X₀ ZERO SEQUENCE	0.03	0.03	0.02	0.02	0.03	0.03	0.03	0.03					
T"d SUB-TRANSTIME CONST. 0.01s	REACTANCES ARE SATURA	TED	٧	'ALUES ARE	PER UNIT A	T RATING AI	ND VOLTAGI	E INDICATEI	)					
1 00 O.C. FIELD THIS CONST. 2.148														
Ta ARMATURE TIME CONST. 0.02s		-												
SHORT CIRCUIT RATIO 1/Xd														

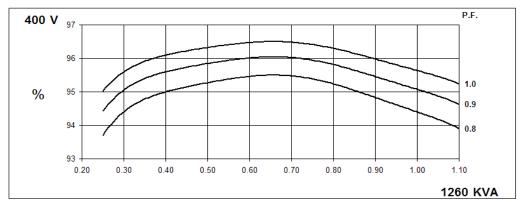


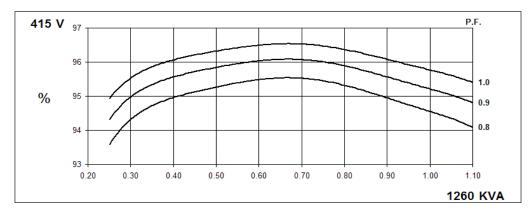
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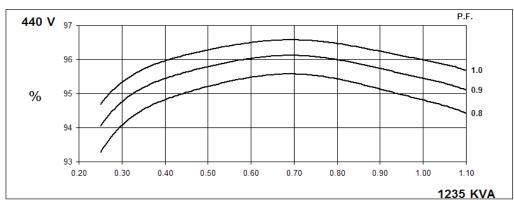
## **STAMFORD**

## THREE PHASE EFFICIENCY CURVES







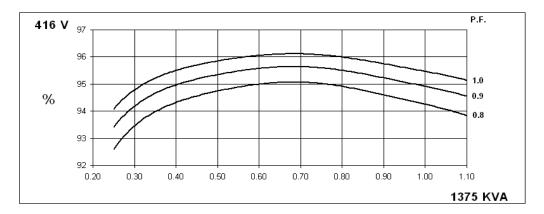


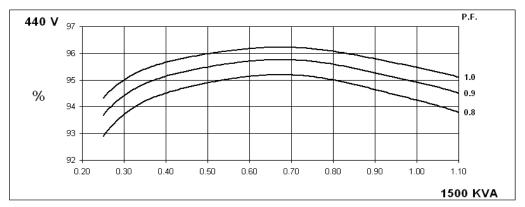


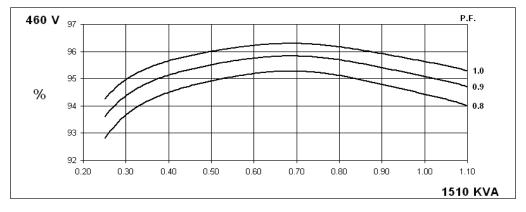
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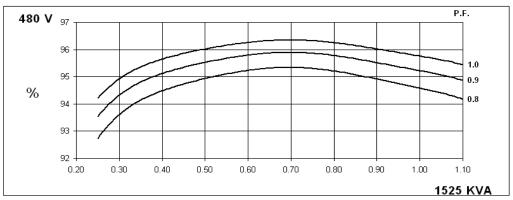
## **STAMFORD**

## THREE PHASE EFFICIENCY CURVES





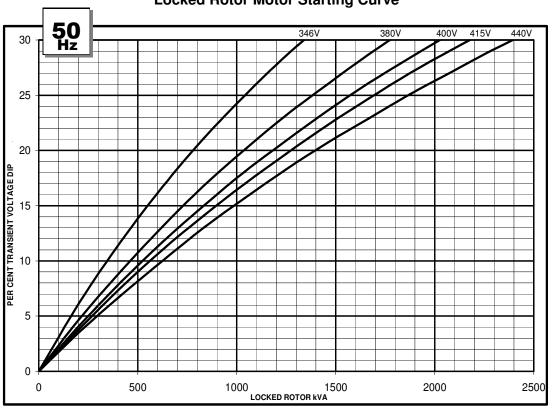


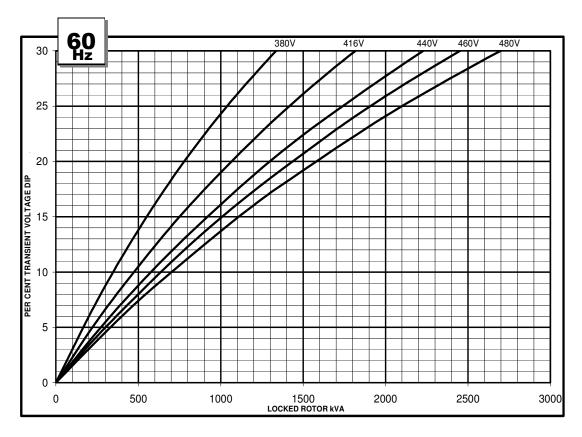




PI734A Winding 312



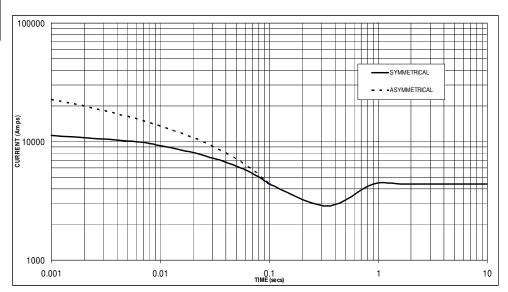




## Winding 312

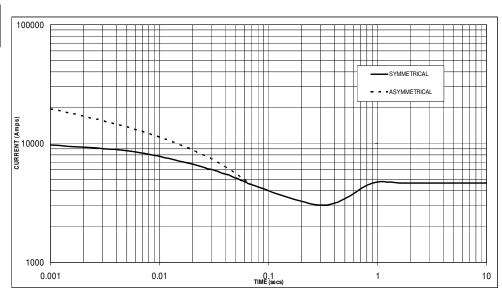
Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed Based on star (wye) connection.





Sustained Short Circuit = 4,400 Amps





Sustained Short Circuit = 4,650 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	60	Hz
Voltage	Factor	Voltage	Factor
380v	x 1.00	416v	x 1.00
400v	x 1.05	440v	x 1.06
415v	x 1.09	460v	x 1.10
440v	x 1.16	480v	x 1.15

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.

## **PI734A**

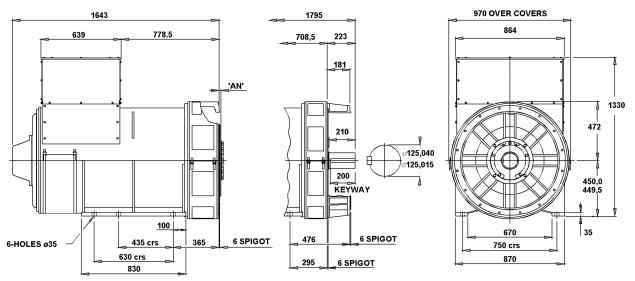
## Winding 312 / 0.8 Power Factor

## **RATINGS**

	Class - Temp Rise	Cont. F - 105/40 ℃			Cont. H - 125/40 ℃				Standby - 150/40 ℃				Standby - 163/27℃				
50	Hz Star (V)	380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440
	kVA	1140	1175	1175	1150	1225	1260	1260	1235	1275	1315	1315	1290	1310	1350	1350	1325
	kW	912	940	940	920	980	1008	1008	988	1020	1052	1052	1032	1048	1080	1080	1060
	Efficiency (%)	94.5	94.6	94.8	95.0	94.3	94.4	94.6	94.8	94.1	94.2	94.4	94.7	94.0	94.1	94.3	94.6
	kW Input	965	994	992	968	1039	1068	1066	1042	1084	1117	1114	1090	1115	1148	1145	1121

<b>60</b> Hz	Star (V)	416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480
	kVA	1275	1395	1405	1415	1375	1500	1510	1525	1425	1560	1570	1585	1465	1605	1615	1630
	kW	1020	1116	1124	1132	1100	1200	1208	1220	1140	1248	1256	1268	1172	1284	1292	1304
Effic	iency (%)	94.5	94.5	94.6	94.8	94.3	94.2	94.4	94.6	94.1	94.1	94.3	94.5	94.0	94.0	94.2	94.4
	kW Input	1079	1181	1188	1194	1167	1274	1280	1290	1211	1326	1332	1342	1247	1366	1372	1381

## **DIMENSIONS**



COUPLING DISC	'AN'
S.A.E No 18	15,7
S.A.E No 21	0
SAFNo 24	n

1-BRG ADAPTORS						
S.A.E No 0						
S.A.E No 00						

2-BRG ADAPTORS S.A.E No 0 S.A.E No 00

## **STAMFORD**

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