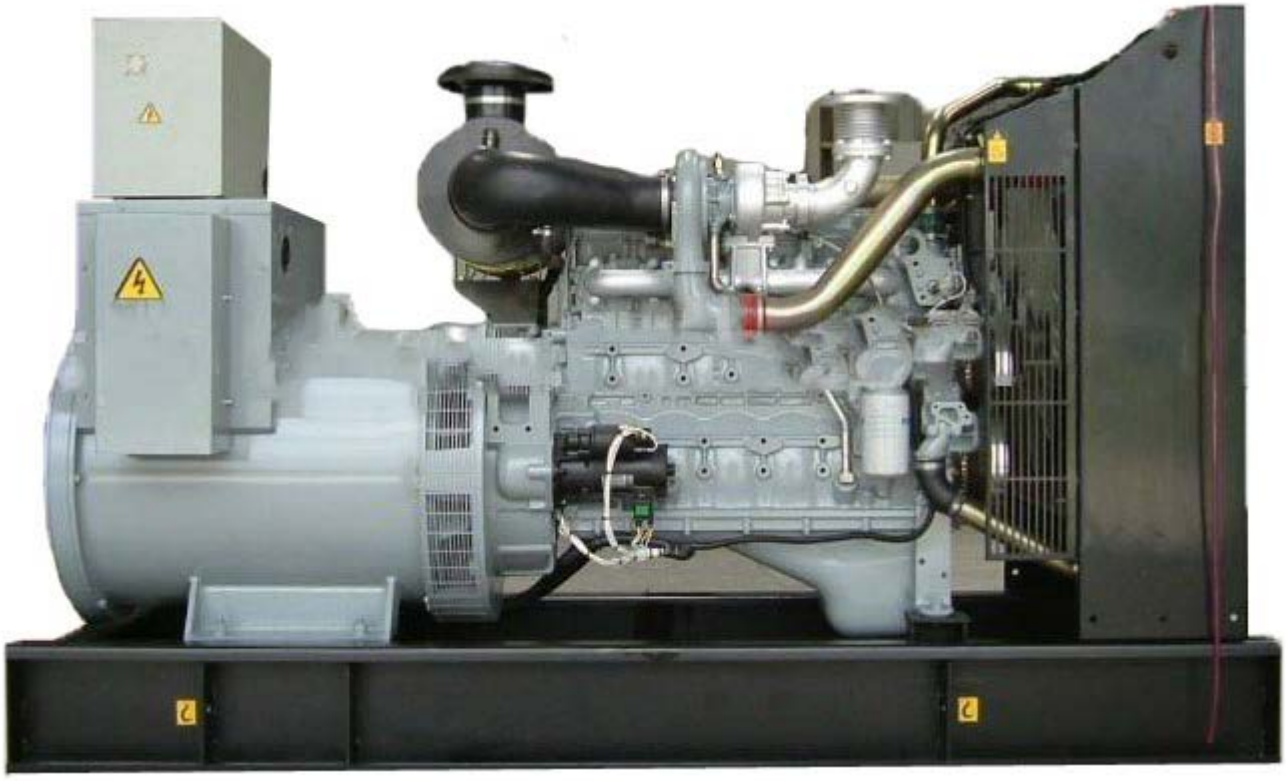
موتور دیزل : IVECO

ژنراتور : Stamford

	Prime		Standby	
	KVA	KW	KVA	KW
دیزل ژنراتور	320	400	352	440



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موتور دیزل		
Manufacturer	IVECO	تولید کننده
Type	C13TE3A	تیپ
Number of cylinders	6	تعداد سیلندر ها
Cylinder arrangement	inline	آرایش سیلندر ها
Displacement , Liters	12,9	جا به جایی
Bore × Stroke , mm	135x150	قطر سیلندر × کورس پیستون

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ژنراتور		
Manufacturer	Stamford	تولید کننده
Type	HCI444F	تیپ
Frequency, Hz	50	فرکانس
Speed, Rpm	1500	سرعت
Voltage, V	380	ولتاژ
Excitation	Brushless	سیستم تحریک
Stator windings	12	سیم پیچ استاتور
Rotor	with damping cage	روتور
Over speed, Rpm	2250	حداکثر سرعت مجاز
Insulation class	H	کلاس عایق
Protection class	IP 23	کلاس حفاظتی
Cooling air volume,m^3 / sec	0.486 m^3/sec 1030 cfm	دبی هوای خنک کننده

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C13 TE3A 387kW 398kW

387 kW @ 1500 rpm
398 kW @ 1800 rpm
Stage II

SPECIFICATIONS

Thermodynamic Cycle	Diesel 4 stroke	
Air Handling	TAA	
Arrangement	6L	
Bore x Stroke (mm)	135 X 150	
Total Displacement (L)	12,9	
Valves per cylinder (n°)	4	
InjectionSystem	EUI	
Speed governor	Electronic	
Cooling System	liquid (water - paraflu 50%)	
Direction of Rotation (viewed facing flywheel)	CCW	
Oil specifications	ACEA E3-E5	
Oil consumption	<0.1% of fuel consumption	
Fuel specifications	EN 590	
Oil and oil filter maintenance interval for replacement [**] (hours)	600	
Specific fuel consumption at:	**1500**	**1800**
- Stand-By l/h (g/kWh)	-	-
- 100% load l/h (g/kWh)	85,8 (197)	98,1 (214,3)
- 80% load l/h (g/kWh)	70,4 (199,7)	82,5 (222,1)
- 50% load l/h (g/kWh)	42,8 (196,7)	55 (222,1)
ATB (without canopy) (°C)	50	49
Coolant capacity: engine + radiator (l)	~ 67	
Coolant capacity: engine only (l)	~ 19,5	
Lube oil total system capacity including pipes, filters etc. (l)	~ 35	
Electric system (isolated return)	24	
Starting batteries: recommended capacity (Ah)	2 x 185	
Discharge Current (EN50342) A	1200	
Cold starting: without preheating (°C)	-10	
Cold starting: with preheating (°C)	-25	

WEIGHT AND DIMENSIONS

Dimensions (LxWxH)	2324 X 1268 X 1464
Dry Weight	Kg 1228

PERFORMANCE

Ratings [1]	1500 rpm		1800 rpm	
	PRIME	STAND-BY	PRIME	STAND-BY
Rated Power kVA (kWe) [2]	352	387	360	398

FEATURES	BENEFITS
PERFORMANCE Class G3 of ISO 8528 standard certification of excellent performance related to load acceptance.	EXCELLENT TRANSIENT LOAD RESPONSE FOR SEVERAL POWER GENERATION APPLICATIONS
INJECTION SYSTEM Accurate fuel delivery to achieve top performance terms of load response and top power with the minimum fuel consumption: C87 with very compact 2nd generation Common Rail SystemC10 & C13 with electronic controlled unit injectors.	HIGH ENGINE THERMODYNAMIC PERFORMANCE WITH LOW FUEL CONSUMPTION
DUAL SPEED MODE Possibility to switch from 1500 rpm to 1800 rpm. User friendly thanks to interface card.	ENGINE ADAPTABLE TO MARKET REQUEST
SPECIFIC FEATURES Minimum cold starting temperature without auxiliaries down to -10°C (with grid heater down to -25°) Tier 3 performance achieved without external EGR or VGT.	HIGH PERFORMANCES GUARANTEED IN ALL CONDITIONS
AIR HANDLING Turbocharged with air-to-air charge cooled air system with 4 valves per cylinder to increase the engine efficiency by the optimization of thermodynamic performance in terms of load response & fuel consumption.	HIGH ENGINE POWER DENSITY AND FAST LOAD RESPONSE TIME WITH THE LOWEST FUEL CONSUMPTION
600h OIL INTERVAL CHANGE CURSOR family engines adopt combustion chambers and high pressure injection system optimized to reduce oil dilution. Optimum engine design in terms of mechanical clearances, piston rings and oil system calculation.	REDUCED MAINTENANCE NEEDS AND OPERATING COST
SERVICEABILITY & MAINTAINABILITY Worldwide service network. Engine ECU (Electronic Control Unit) with CAN-BUS control & monitoring interfaces could be used for advanced real time diagnosis.	QUICK SERVICE SUPPORT AND FAST MAINTENANCE ACTIVITIES
ENGINE DESIGN Multiple injections, balancer counterweights incorporated in crankshaft webs, rear gear train layout, camshaft in crankcase, suspended oil pan, ladder frame cylinder block.	VIBRATION & NOISE REDUCTION
COMPONENTS INTEGRATION Integrated CCV (Closed Crankcase Ventilation) system and engine design oriented to high component integration. Water-oil cooler, oil and water pumps are completely integrated in the engine block.	LEAKAGE PREVENTION

STANDARD CONFIGURATION

FPT engine C13 TE3A equipped with:
- Mounted radiator incorporating air-to-air charge cooler
- Front radiator guard
- Oil drain pump
- Mounted belt driven pusher fan
- Fan guard
- Mounted air filter with replaceable cartridges
- Fuel filter
- Primary fuel filter / writer separator
- Replaceable oil filter
- Electronic engine control unit, pump injector unit with wiring loom and sensors
- Box relais
- WT and OP sensors for gauges
- HWT and LOP sensors
- Front engine mounting brackets
- Flywheel housing SAE1 and flywheel 14''
- Re-directable exhaust gas elbow
- Recirculed oil breather system
- Oil dipstick
- 24 Vdc electrical system
- User's handbook

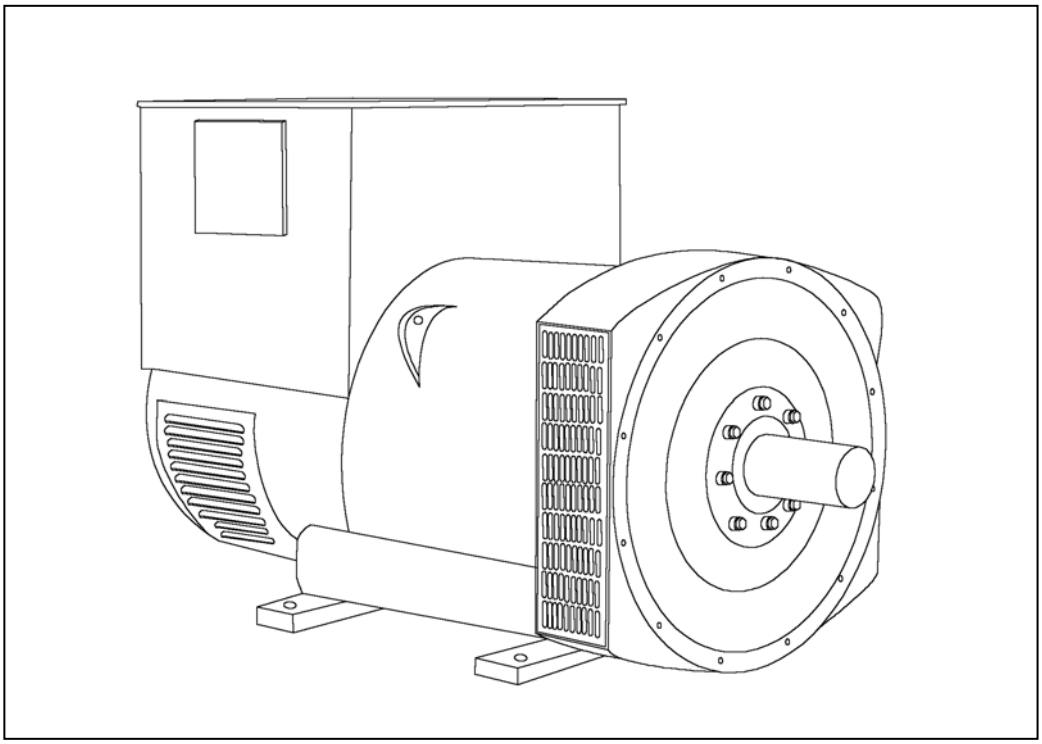
THE ENGINE IS SUPPLIED WITHOUT LIQUIDS

OPTIONAL EQUIPMENT

On request the engine can be supplied with:
- 230 Volt water jacket heater
- Turbo and exhaust gas guards
- Exhaust gas flexible joint
- Low water level sensors

STAMFORD
power generation

HCI 434F/444F - Technical Data Sheet



STANDARDS

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

VOLTAGE REGULATORS

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

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

SX421 AVR

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

MX341 AVR

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

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

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

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

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

MX321 AVR

The most sophisticated of all our AVRs combines all the features of the MX341 with, additionally, three-phase rms sensing, for improved regulation and performance.

Over voltage protection is built-in and short circuit current level adjustments is an optional facility.

WINDINGS & ELECTRICAL PERFORMANCE

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

TERMINALS & TERMINAL BOX

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

SHAFT & KEYS

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

INSULATION/IMPREGNATION

The insulation system is class 'H'.

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

QUALITY ASSURANCE

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

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

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

Front cover drawing typical of product range.

STAMFORD
power generation

HCI434F/444F

WINDING 311

CONTROL SYSTEM	SEPARATELY EXCITED BY P.M.G.							
A.V.R.	MX321	MX341						
VOLTAGE REGULATION	± 0.5 %	± 1.0 %	With 4% ENGINE GOVERNING					
SUSTAINED SHORT CIRCUIT	REFER TO SHORT CIRCUIT DECREMENT CURVES (page 7)							
CONTROL SYSTEM	SELF EXCITED							
A.V.R.	SX440	SX421						
VOLTAGE REGULATION	± 1.0 %	± 0.5 %	With 4% ENGINE GOVERNING					
SUSTAINED SHORT CIRCUIT	WILL NOT SUSTAIN A SHORT CIRCUIT							
INSULATION SYSTEM	CLASS H							
PROTECTION	IP23							
RATED POWER FACTOR	0.8							
STATOR WINDING	DOUBLE LAYER LAP							
WINDING PITCH	TWO THIRDS							
WINDING LEADS	12							
STATOR WDG. RESISTANCE	0.0073 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED							
ROTOR WDG. RESISTANCE	1.37 Ohms at 22°C							
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	2250 Rev/Min							
BEARING DRIVE END	BALL. 6317 (ISO)							
BEARING NON-DRIVE END	BALL. 6314 (ISO)							
	1 BEARING				2 BEARING			
WEIGHT COMP. GENERATOR	1160 kg				1160 kg			
WEIGHT WOUND STATOR	535 kg				535 kg			
WEIGHT WOUND ROTOR	463 kg				440 kg			
WR² INERTIA	5.4292 kgm^2				5.2304 kgm^2			
SHIPPING WEIGHTS in a crate	1775 kg				1780 kg			
PACKING CRATE SIZE	155 x 87 x 107(cm)				156 x 87 x 107(cm)			
	50 Hz				60 Hz			
TELEPHONE INTERFERENCE	THF<2%				TIF<50			
COOLING AIR	0.486 m³/sec 1030 cfm				0.580 m³/sec 1240 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	380	380	380	380	444	456	463	475
Xd DIR. AXIS SYNCHRONOUS	2.59	2.34	2.17	1.93	3.21	2.95	2.74	2.58
X'd DIR. AXIS TRANSIENT	0.17	0.15	0.14	0.12	0.18	0.17	0.15	0.14
X"d DIR. AXIS SUBTRANSIENT	0.12	0.11	0.10	0.09	0.13	0.12	0.11	0.10
Xq QUAD. AXIS REACTANCE	2.23	2.01	1.87	1.66	2.84	2.61	2.42	2.28
X"q QUAD. AXIS SUBTRANSIENT	0.30	0.27	0.25	0.22	0.42	0.39	0.36	0.34
X_L LEAKAGE REACTANCE	0.06	0.05	0.05	0.04	0.07	0.06	0.06	0.06
X_2 NEGATIVE SEQUENCE	0.21	0.19	0.18	0.16	0.28	0.26	0.24	0.22
X_0 ZERO SEQUENCE	0.08	0.08	0.07	0.06	0.10	0.09	0.09	0.08
REACTANCES ARE SATURATED	VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED							
T'd TRANSIENT TIME CONST.	0.08s							
T"d SUB-TRANSTIME CONST.	0.019s							
T'do O.C. FIELD TIME CONST.	1.7s							
Ta ARMATURE TIME CONST.	0.018s							
SHORT CIRCUIT RATIO	1/Xd							

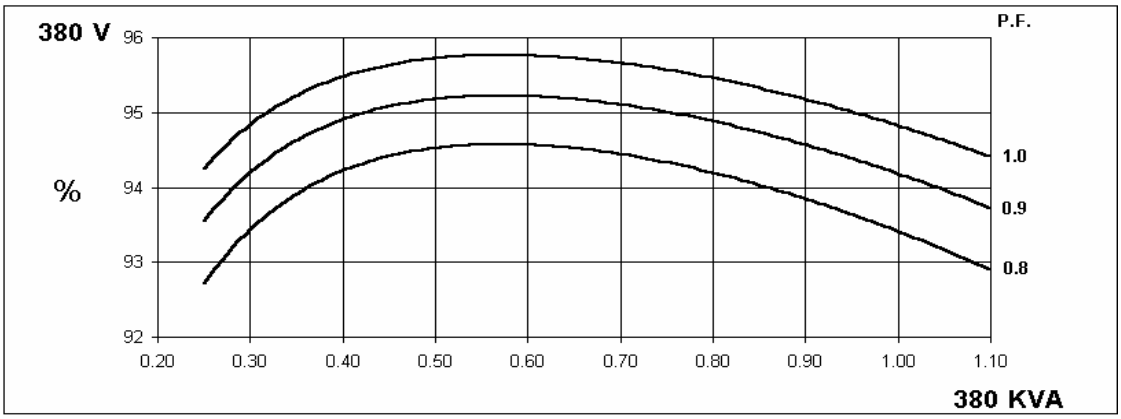
50 Hz

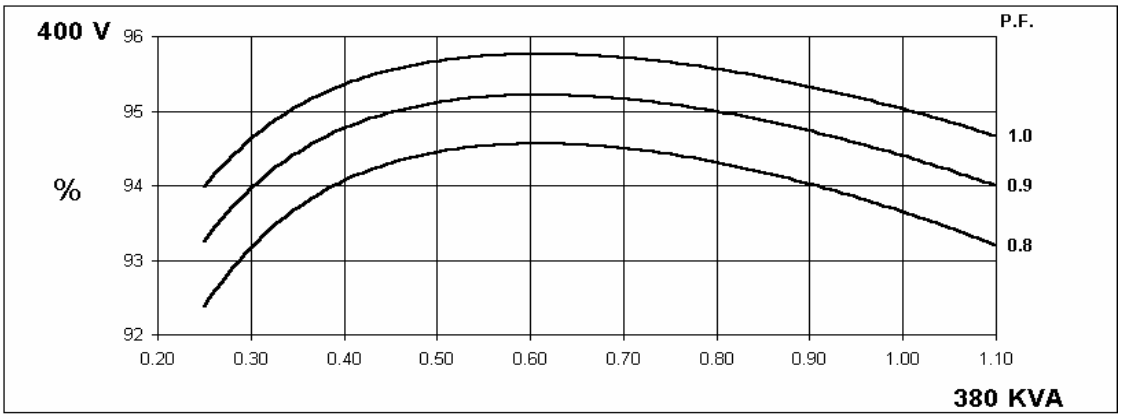
HCI434F/444F

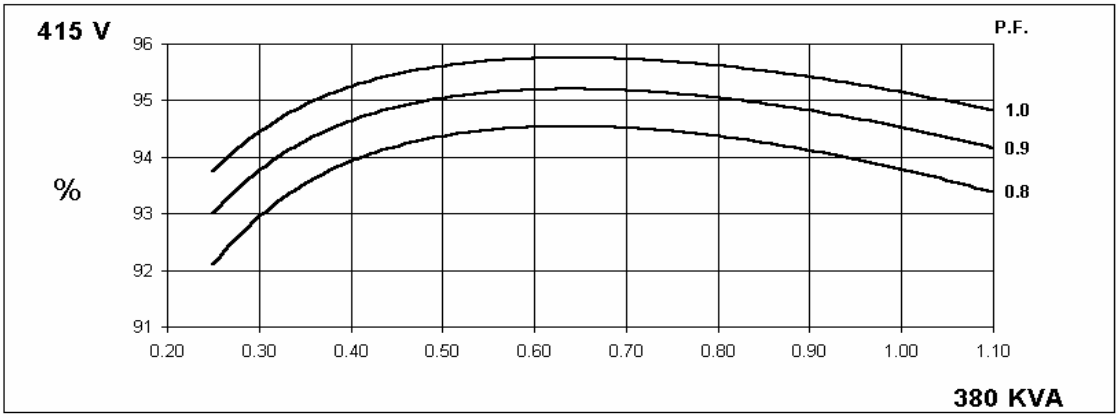
Winding 311

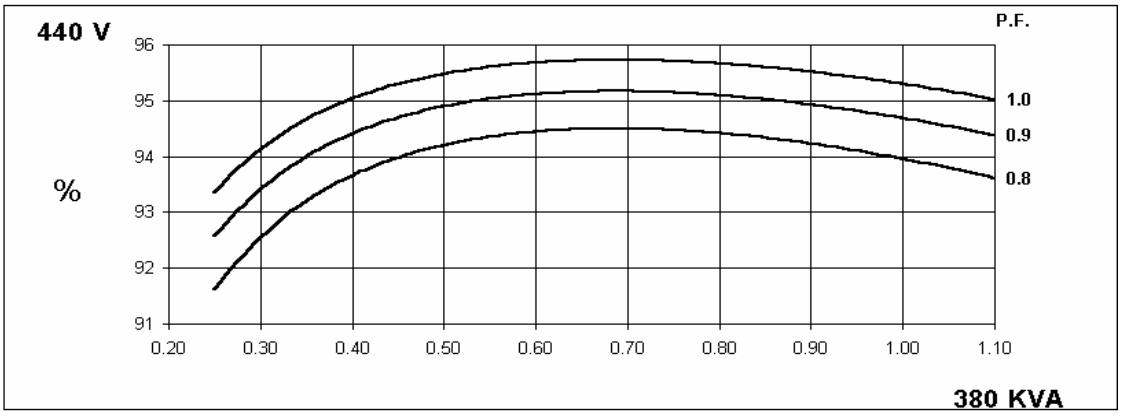
STAMFORD power generation

THREE PHASE EFFICIENCY CURVES









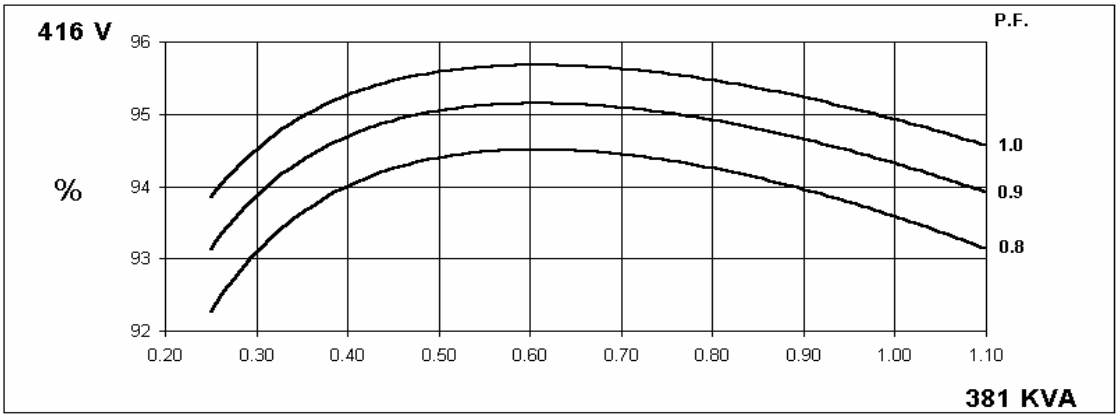
STAMFORD
power generation

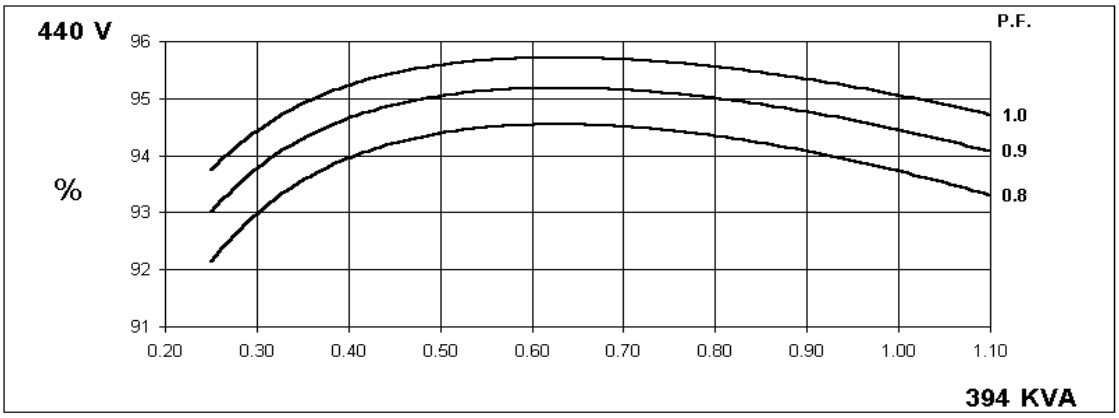
HCI434F/444F

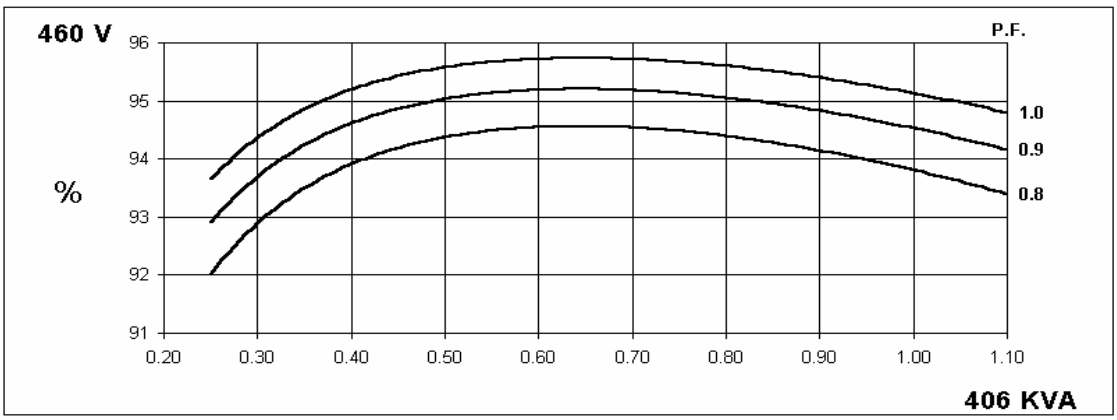
Winding 311

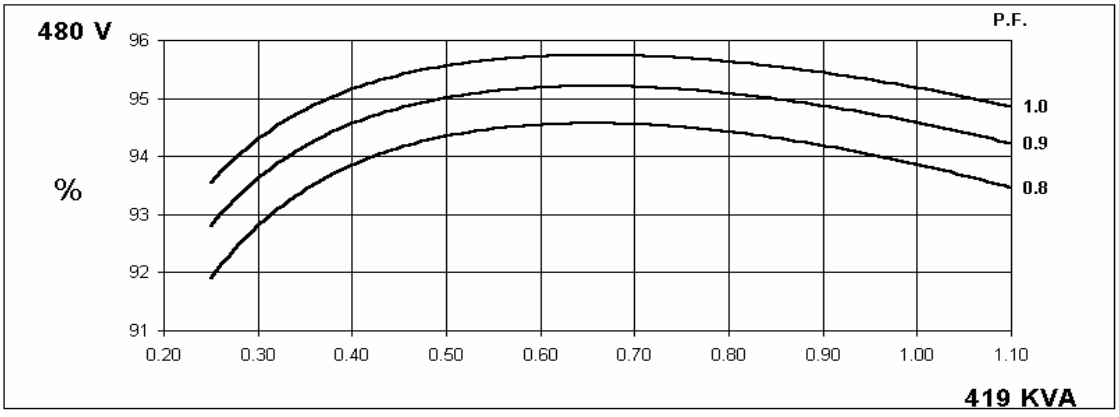
60 Hz

THREE PHASE EFFICIENCY CURVES









HCI434F/444F

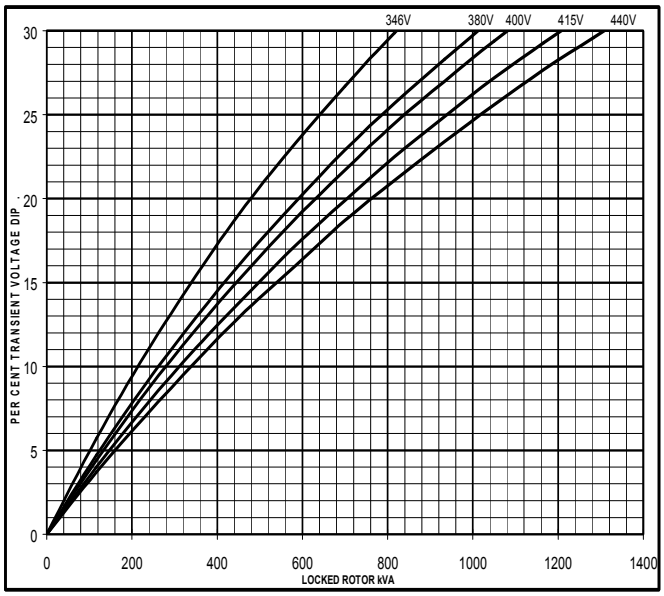
Winding 311

STAMFORD power generation

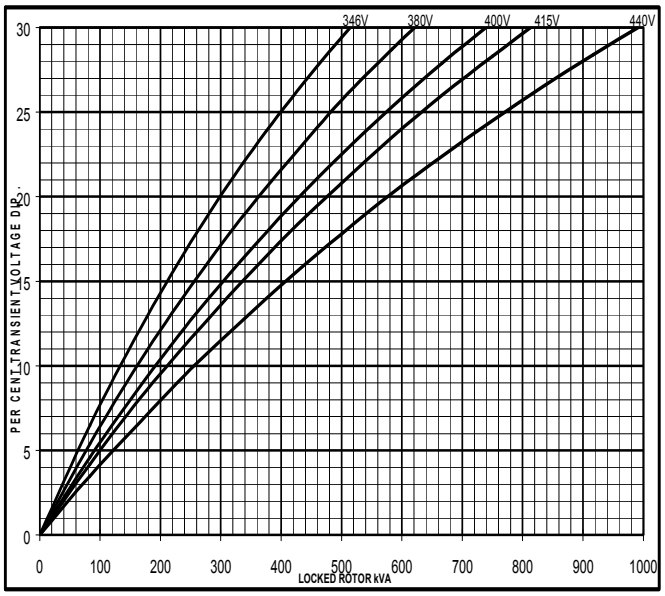
Locked Rotor Motor Starting Curve

50 Hz

MX

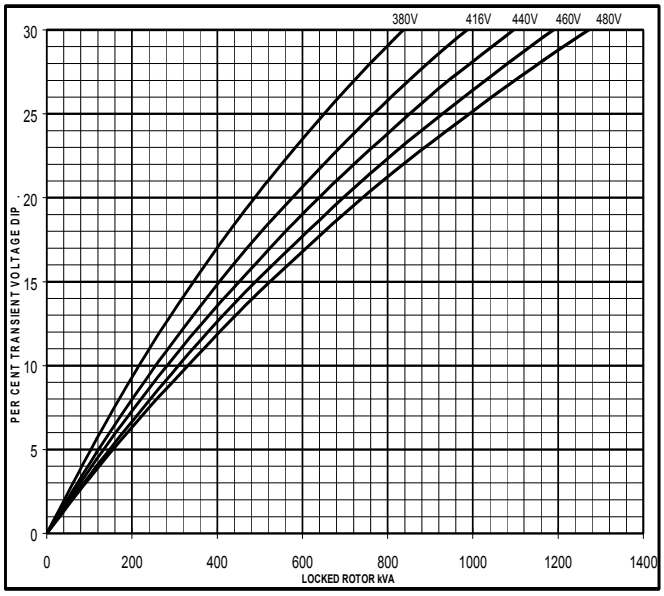


SX

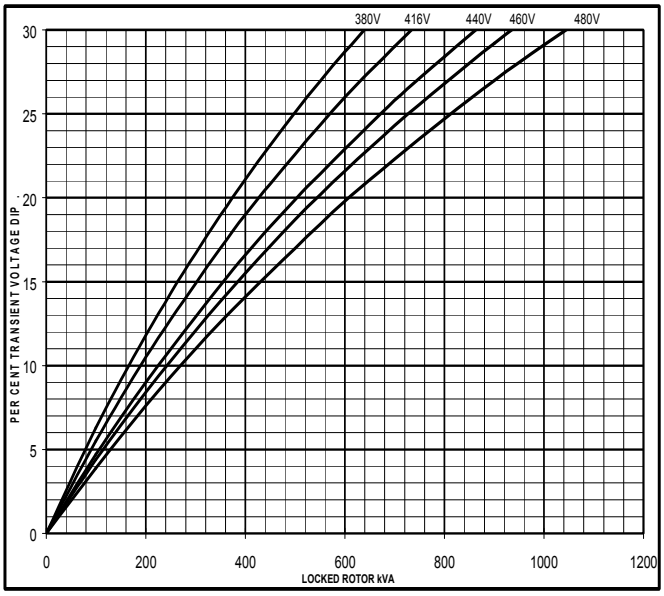


60 Hz

MX

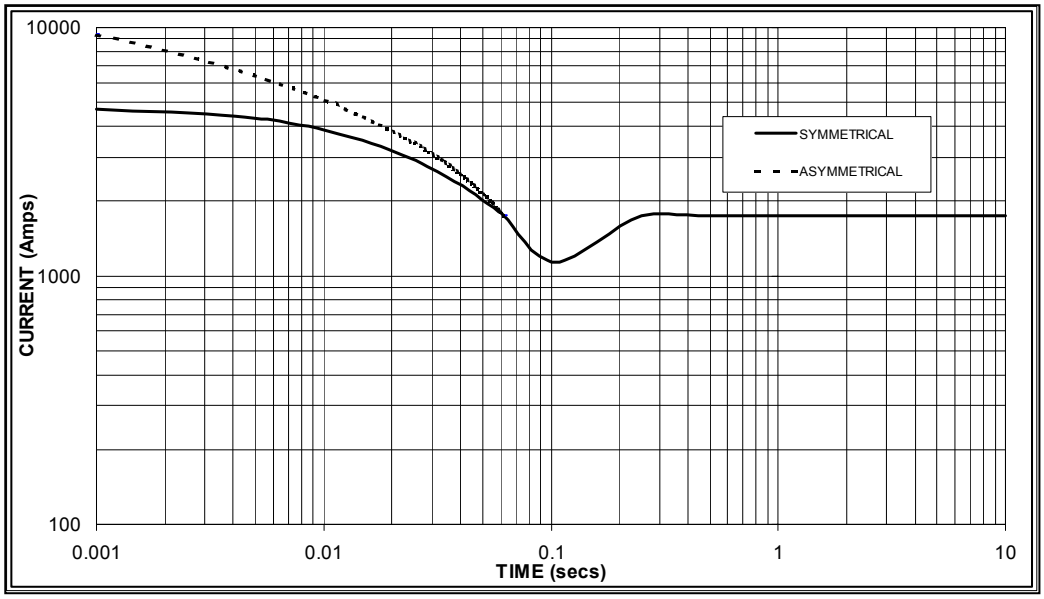


SX



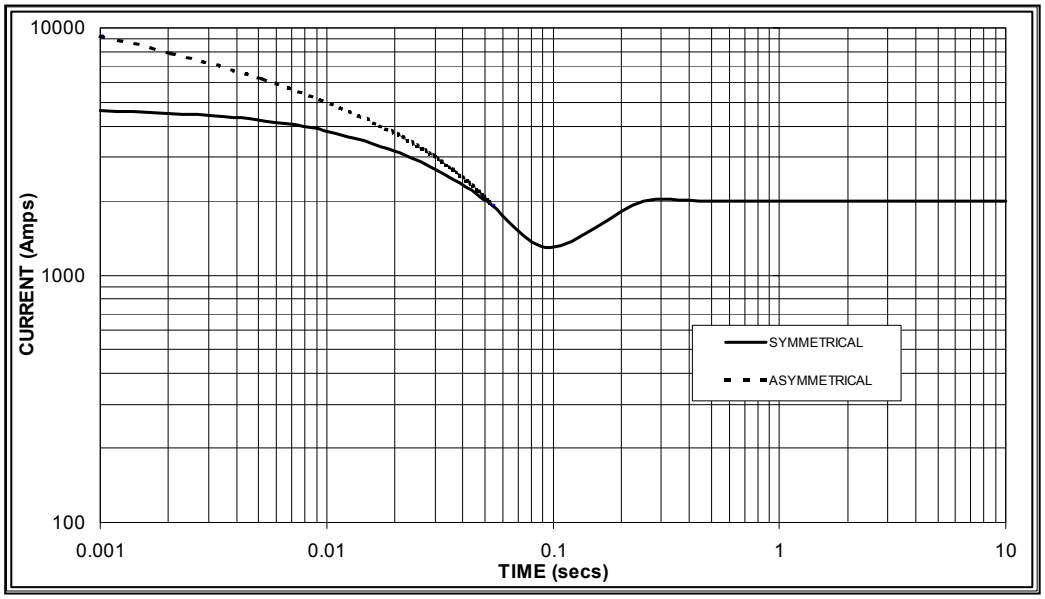
Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed
Based on star (wye) connection.

50 Hz



Sustained Short Circuit = 1,750 Amps

60 Hz



Sustained Short Circuit = 2,000 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 :

50Hz		60Hz	
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. 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

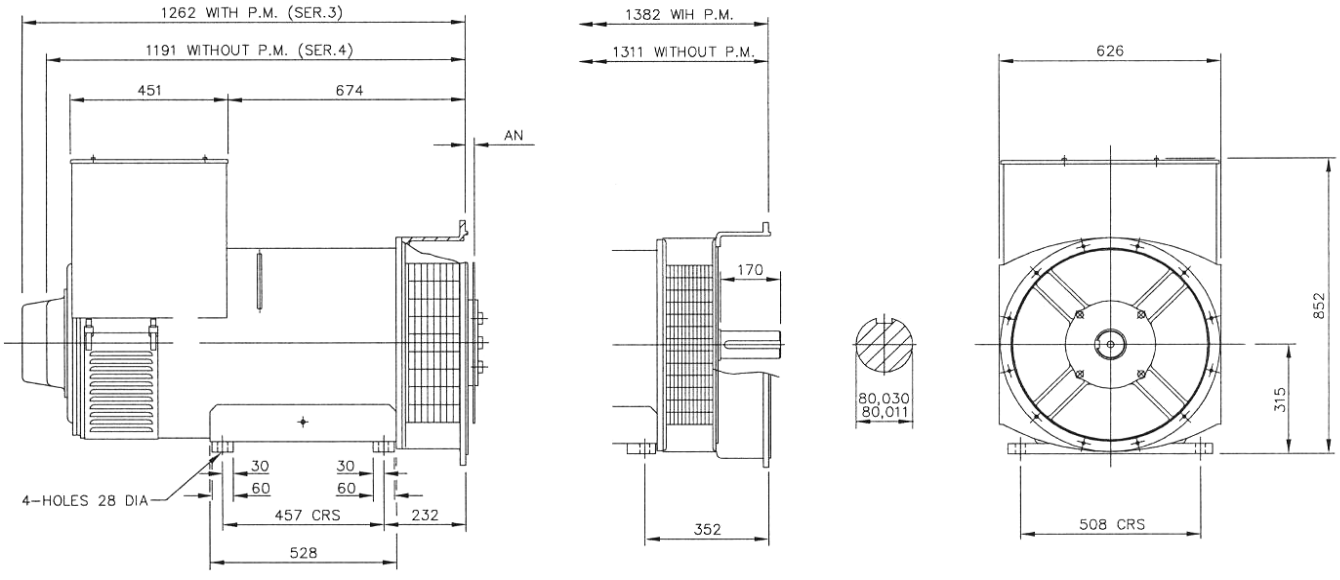
HCI434F/444F

Winding 311 / 0.8 Power Factor

RATINGS

	Class - Temp Rise	Cont. F - 105/40°C				Cont. H - 125/40°C				Standby - 150/40°C				Standby - 163/27°C			
50 Hz	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
	Series Delta (V)	220	230	240	254	220	230	240	254	220	230	240	254	220	230	240	254
	kVA	350	350	350	350	380	380	380	380	390	390	390	390	404	404	404	404
	kW	280	280	280	280	304	304	304	304	312	312	312	312	323	323	323	323
	Efficiency (%)	93.8	94.0	94.1	94.2	93.4	93.7	93.8	94.0	93.3	93.5	93.7	93.9	93.1	93.4	93.5	93.7
	kW Input	299	298	298	297	325	324	324	323	334	334	333	332	347	346	346	345
60 Hz	Series Star (V)	416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480
	Parallel Star (V)	208	220	230	240	208	220	230	240	208	220	230	240	208	220	230	240
	Delta (V)	240	254	266	277	240	254	266	277	240	254	266	277	240	254	266	277
	kVA	405	420	425	438	444	456	463	475	475	483	488	500	488	500	506	519
	kW	324	336	340	350	355	365	370	380	380	386	390	400	390	400	405	415
	Efficiency (%)	93.9	94.0	94.1	94.1	93.5	93.7	93.8	93.9	93.2	93.4	93.6	93.7	93.0	93.2	93.4	93.5
	kW Input	345	357	361	372	380	389	395	405	408	414	417	427	420	429	433	444

DIMENSIONS



COUPLING DISC	AN
SAE 11,5	39,68
SAE 14	25,4
SAE 18	15,87

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