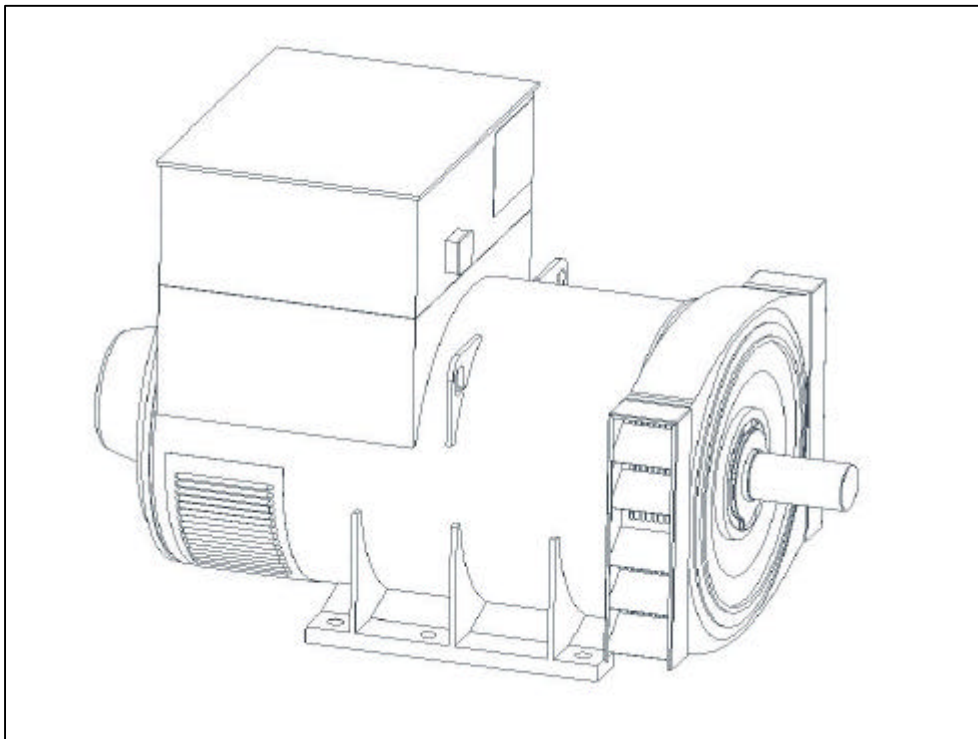


HCM634K - Technical Data Sheet



HCM634K

SPECIFICATIONS & OPTIONS



STANDARDS

Marine generators may be certified to Lloyds, DnV, Bureau Veritas, ABS, Germanischer-Lloyd or RINA. Other standards and certifications can be considered on request.

VOLTAGE REGULATORS

MX321 AVR - STANDARD

This sophisticated Automatic Voltage Regulator (AVR) is incorporated into the Stamford Permanent Magnet Generator (PMG) system and is fitted as standard to generators of this type.

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.

Over voltage protection is built-in and short circuit current level adjustment 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 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'.

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.

HCM634K
WINDING 312

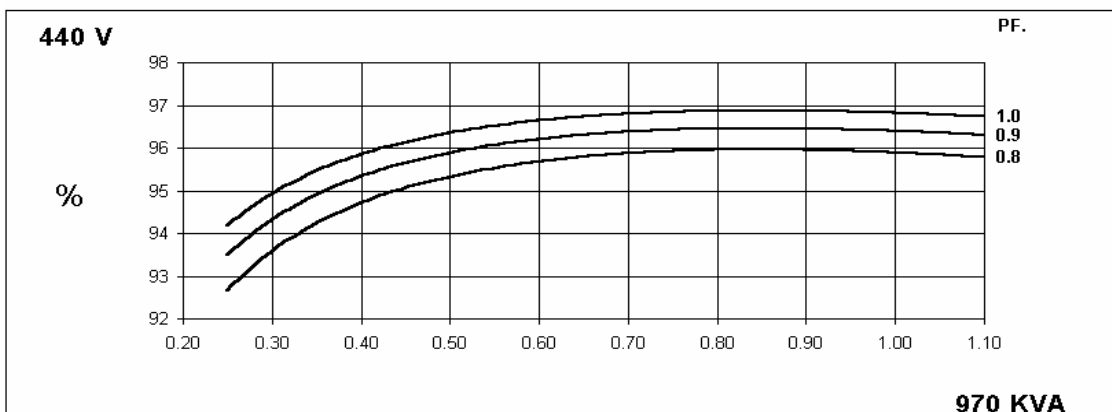
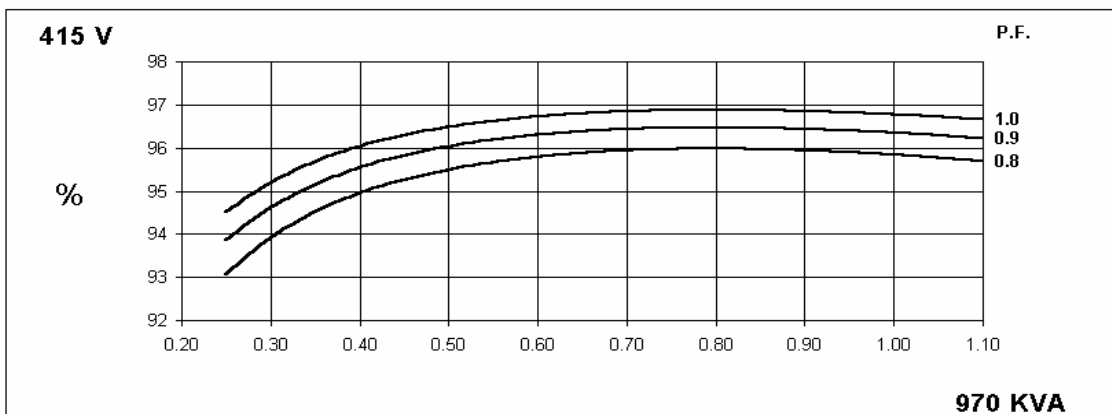
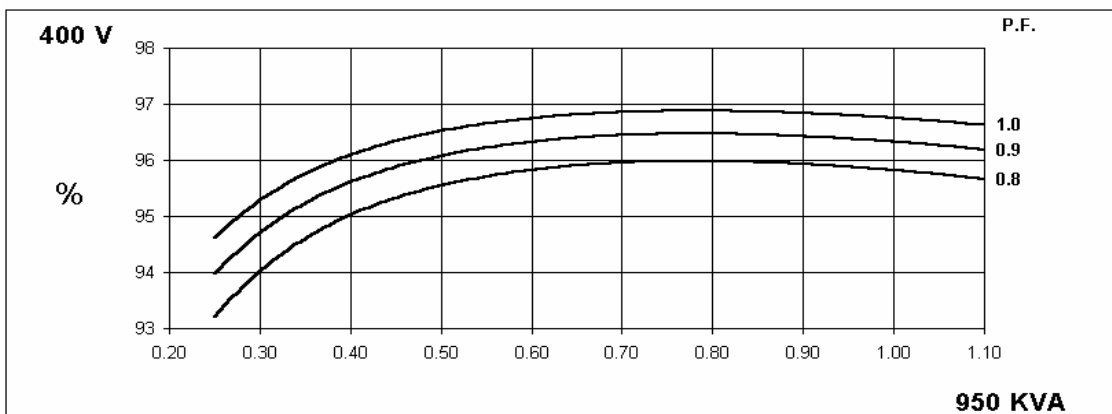
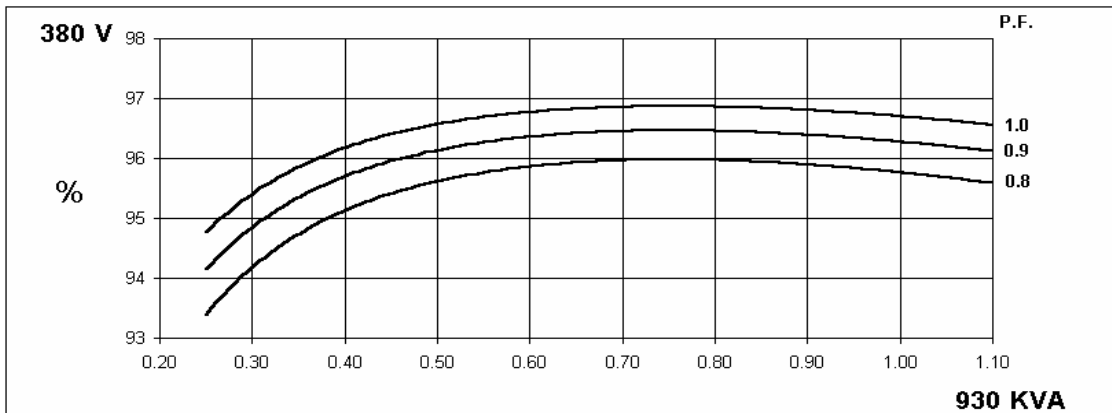
CONTROL SYSTEM	SEPARATELY EXCITED BY P.M.G.							
A.V.R.	MX321							
VOLTAGE REGULATION	± 0.5 % With 4% ENGINE GOVERNING							
SUSTAINED SHORT CIRCUIT	REFER TO SHORT CIRCUIT DECREMENT CURVES (page 7)							
INSULATION SYSTEM	CLASS H							
PROTECTION	IP23							
RATED POWER FACTOR	0.8							
STATOR WINDING	DOUBLE LAYER LAP							
WINDING PITCH	TWO THIRDS							
WINDING LEADS	6							
STATOR WDG. RESISTANCE	0.0017 Ohms PER PHASE AT 22°C STAR CONNECTED							
ROTOR WDG. RESISTANCE	2.36 Ohms at 22°C							
EXCITER STATOR RESISTANCE	17 Ohms at 22°C							
EXCITER ROTOR RESISTANCE	0.079 Ohms PER PHASE 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. 6224 (ISO)							
BEARING NON-DRIVE END	BALL. 6317 (ISO)							
	1 BEARING				2 BEARING			
WEIGHT COMP. GENERATOR	2541 kg				2581 kg			
WEIGHT WOUND STATOR	1294 kg				1294 kg			
WEIGHT WOUND ROTOR	1093 kg				1408 kg			
WR ² INERTIA	26.5295 kgm ²				25.9823 kgm ²			
SHIPPING WEIGHTS in a crate	2601 kg				2622 kg			
PACKING CRATE SIZE	194 x 92 x 147(cm)				194 x 92 x 147(cm)			
	50 Hz				60 Hz			
TELEPHONE INTERFERENCE	THF<2%				TIF<50			
COOLING AIR	1.614 m ³ /sec 3420 cfm				1.961 m ³ /sec 4156 cfm			
VOLTAGE SERIES STAR	380/220	400/231	415/240	440/254	416/240	440/254	460/266	480/277
kVA BASE RATING FOR REACTANCE VALUES	930	950	970	970	1150	1200	1238	1275
X _d DIR. AXIS SYNCHRONOUS	2.33	2.15	2.04	1.81	2.89	2.69	2.54	2.40
X' _d DIR. AXIS TRANSIENT	0.18	0.17	0.17	0.15	0.23	0.22	0.21	0.20
X'' _d DIR. AXIS SUBTRANSIENT	0.13	0.12	0.11	0.10	0.16	0.15	0.14	0.13
X _q QUAD. AXIS REACTANCE	1.37	1.26	1.20	1.06	1.70	1.58	1.49	1.41
X'' _q QUAD. AXIS SUBTRANSIENT	0.19	0.18	0.17	0.15	0.24	0.22	0.21	0.20
X _L LEAKAGE REACTANCE	0.07	0.06	0.05	0.05	0.08	0.07	0.07	0.06
X ₂ NEGATIVE SEQUENCE	0.18	0.17	0.17	0.15	0.23	0.22	0.21	0.20
X ₀ ZERO SEQUENCE	0.03	0.02	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.	0.185 s							
T'' _d SUB-TRANSTIME CONST.	0.025 s							
T' _{do} O.C. FIELD TIME CONST.	3.4s							
T _a ARMATURE TIME CONST.	0.049 s							
SHORT CIRCUIT RATIO	1/X _d							

**50
Hz**

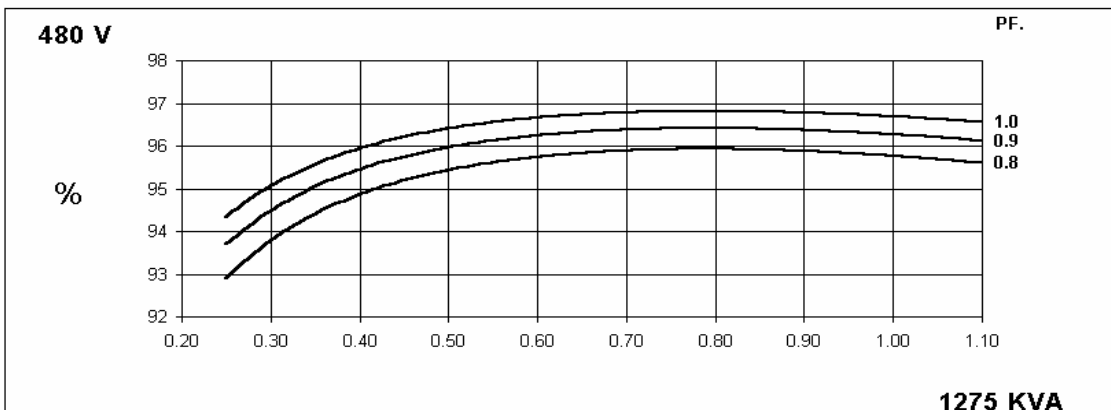
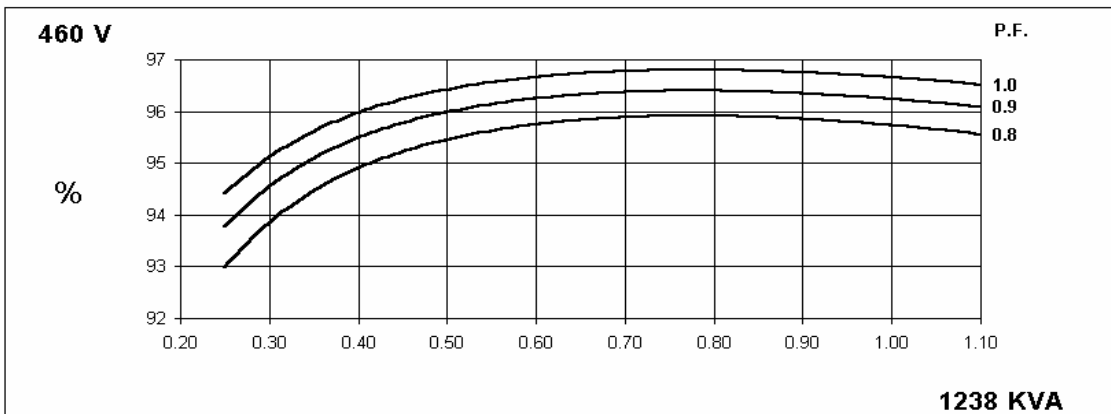
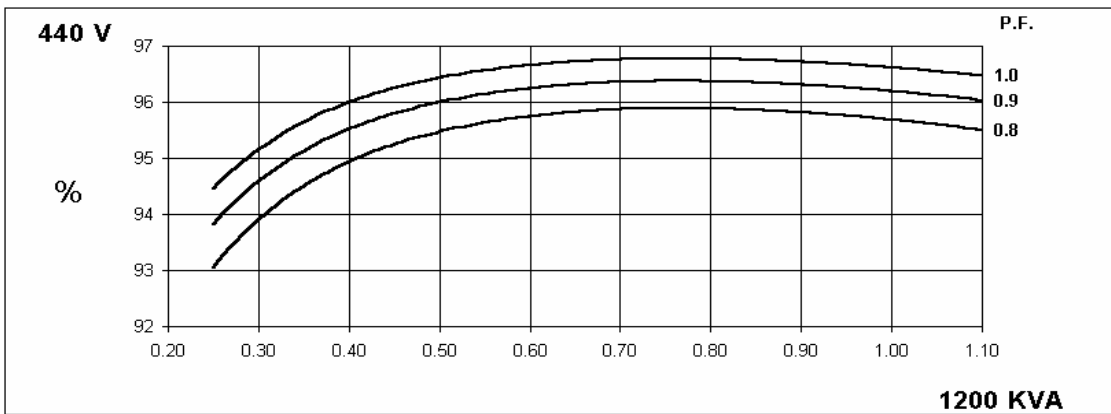
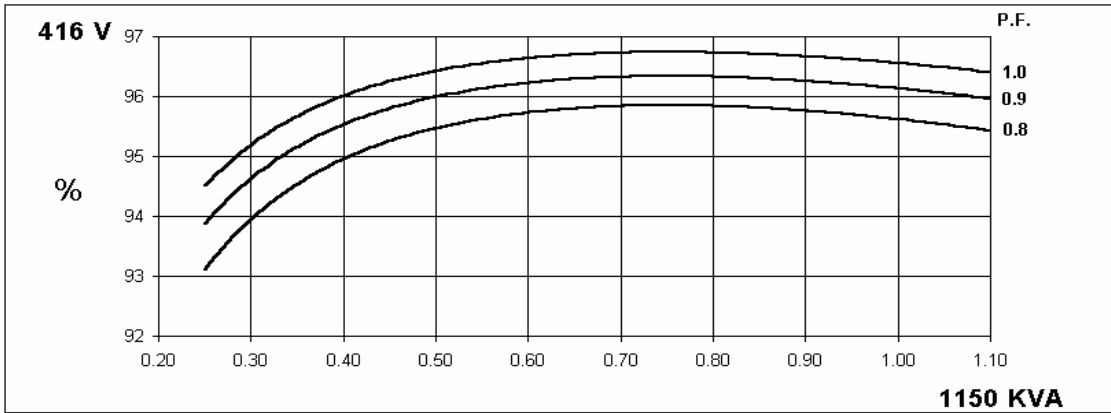
HCM634K
Winding 312



THREE PHASE EFFICIENCY CURVES



THREE PHASE EFFICIENCY CURVES

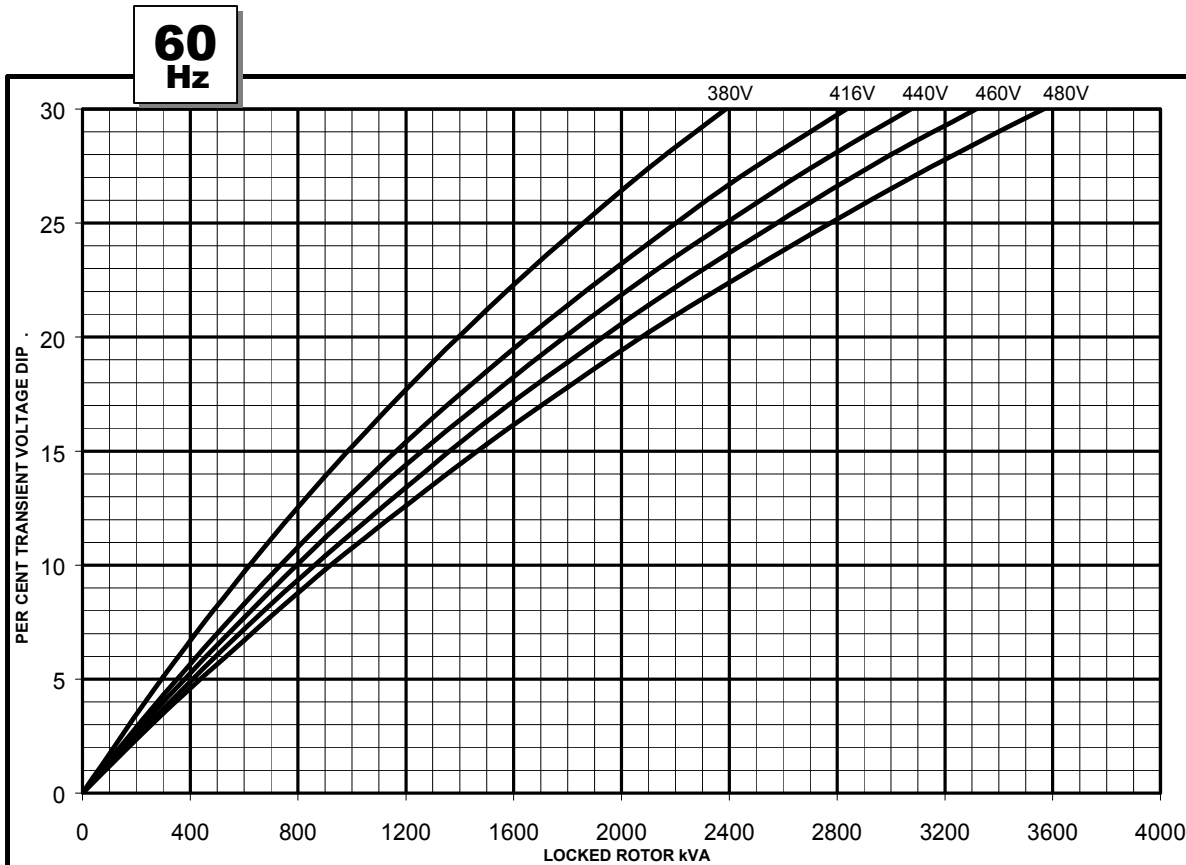
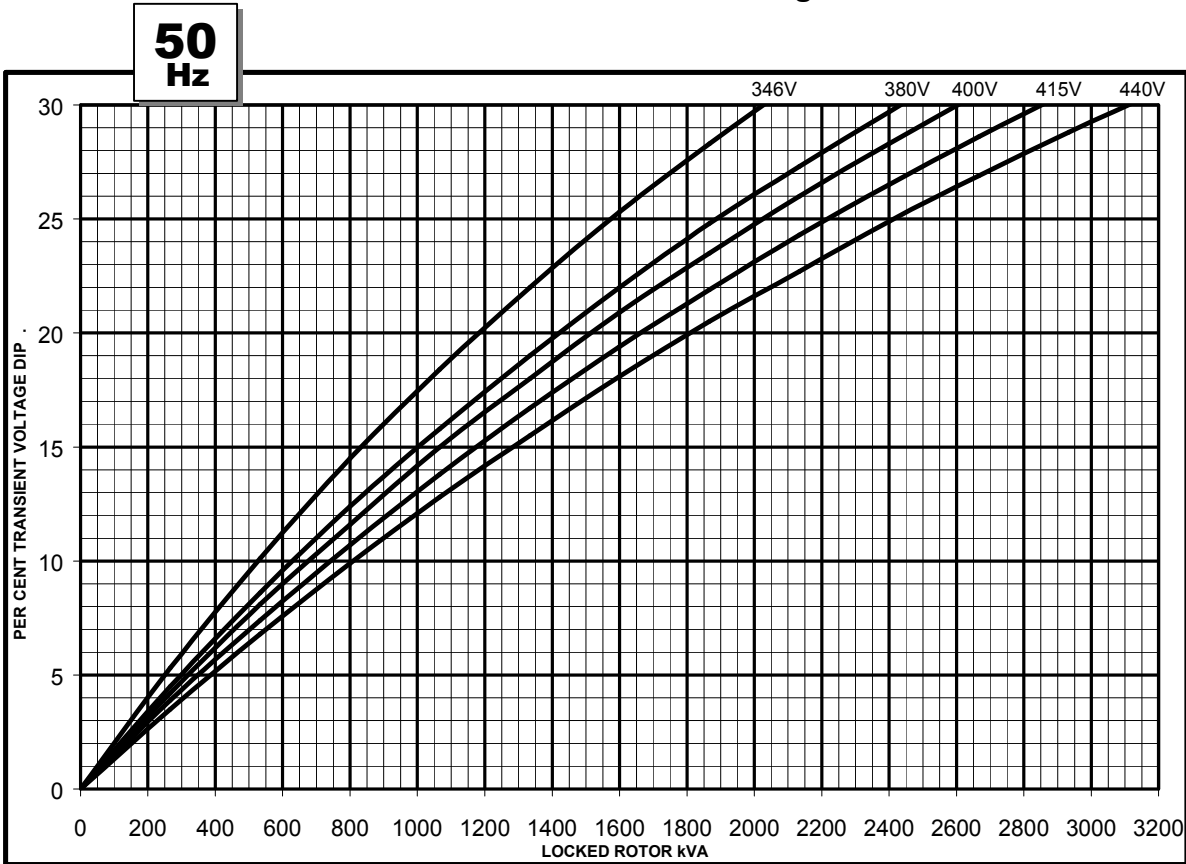


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Winding 312

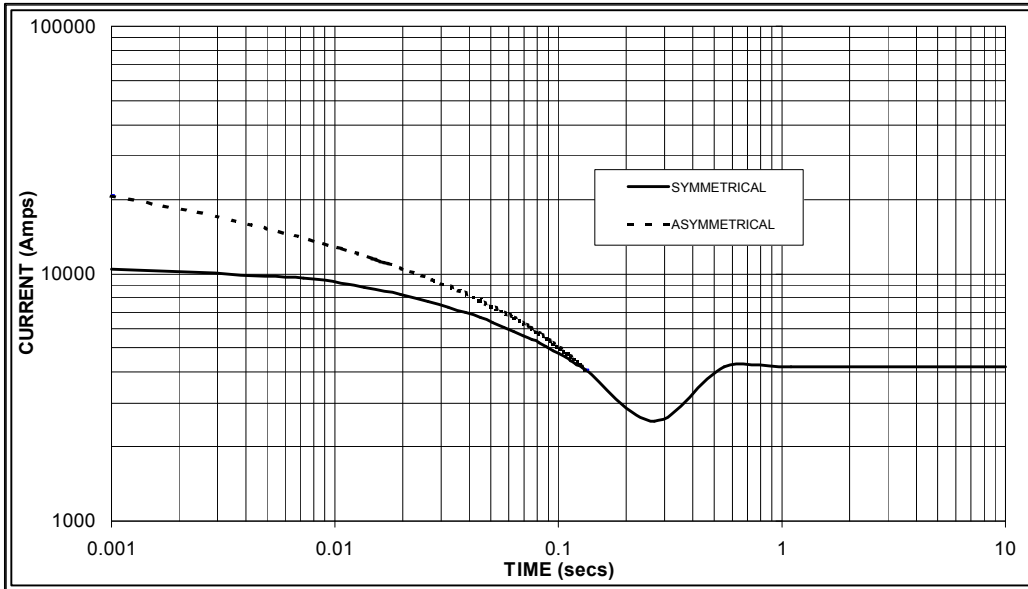


Locked Rotor Motor Starting Curve



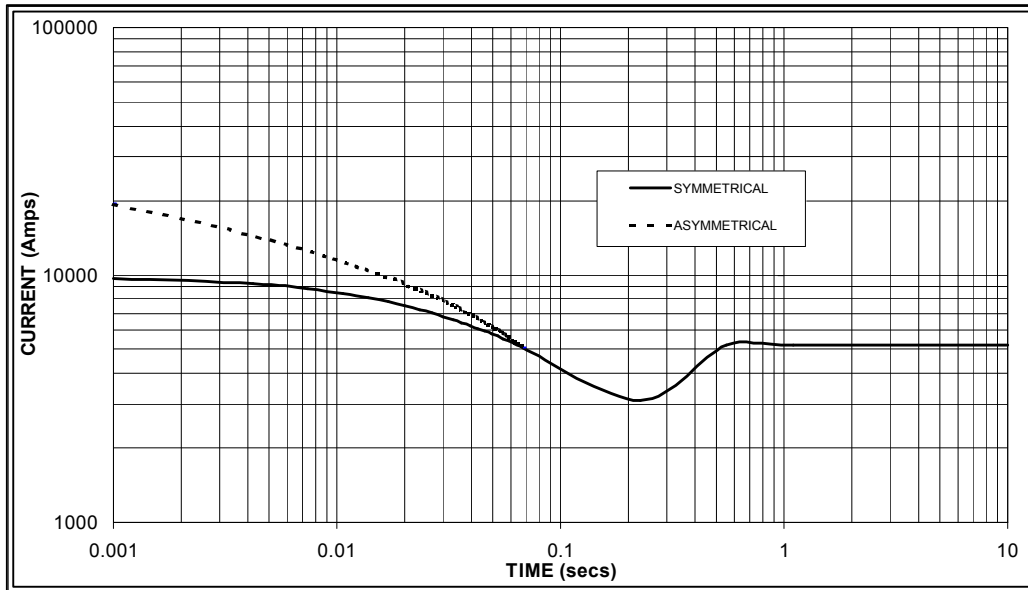
**Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed
Based on star (wye) connection.**

**50
Hz**



Sustained Short Circuit = 4,200 Amps

**60
Hz**



Sustained Short Circuit = 5,200 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 1.07	440v	X 1.06
415v	X 1.12	460v	X 1.12
440v	X 1.18	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 Delta connection the following multiplier should be used:

Delta = Curve current X 1.732

HCM634K

Winding 312 / 0.8 Power Factor

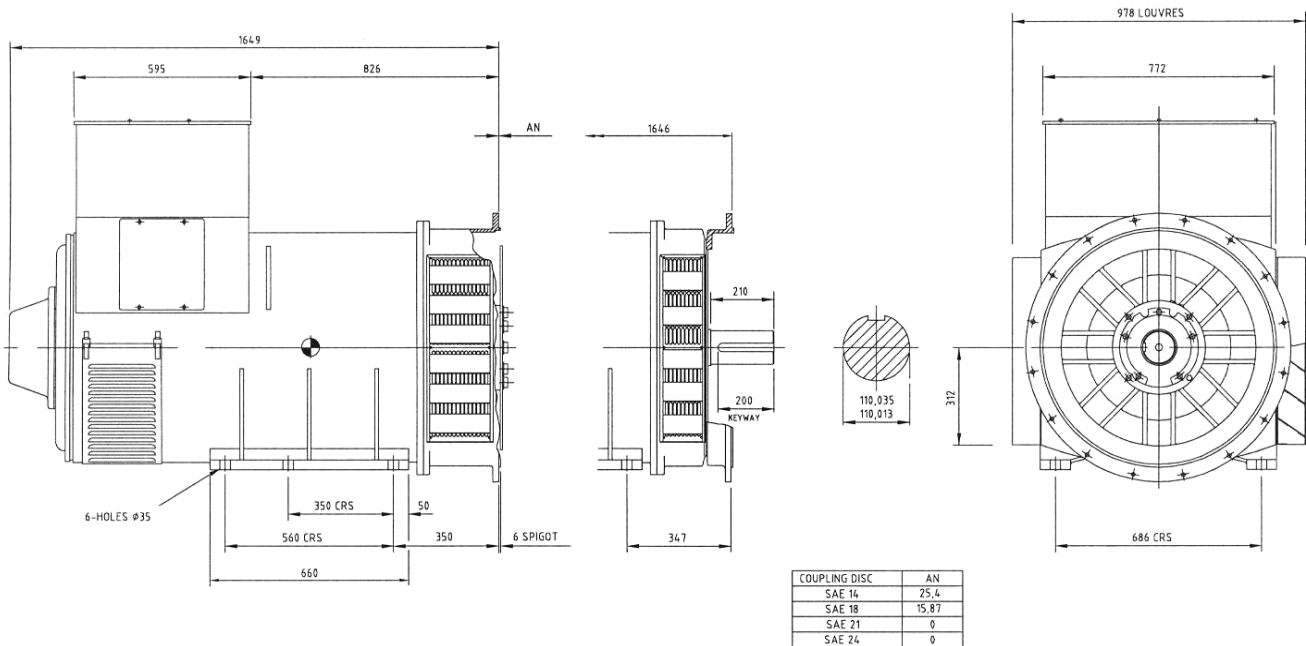


RATINGS

Class - Temp Rise		Cont. E - 65/50°C				Cont. B - 70/50°C				Cont. F - 90/50°C				Cont. H - 110/50°C			
50 Hz	Star (V)	380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440
	Delta (V)	220	230	240	254	220	230	240	254	220	230	240	254	220	230	240	254
	kVA	750	770	790	790	790	800	820	820	900	920	940	940	930	950	970	970
	kW	600	616	632	632	632	640	656	656	720	736	752	752	744	760	776	776
	Efficiency (%)	96.0	96.0	96.0	96.0	95.9	96.0	96.0	96.0	95.8	95.9	95.9	95.9	95.8	95.8	95.8	95.9
	kW Input	625	642	658	658	659	667	683	683	752	767	784	784	777	793	810	809

60 Hz	Star (V)	416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480
	Delta (V)	240	254	266	277	240	254	266	277	240	254	266	277	240	254	266	277
	kVA	888	931	963	988	925	965	1000	1010	1063	1113	1150	1181	1150	1200	1238	1275
	kW	710	745	770	790	740	772	800	808	850	890	920	945	920	960	990	1020
	Efficiency (%)	95.8	95.9	95.9	95.9	95.8	95.9	95.9	95.9	95.7	95.8	95.8	95.9	95.6	95.7	95.7	95.8
	kW Input	742	777	803	824	772	805	834	843	889	929	960	985	962	1003	1035	1065

DIMENSIONS



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