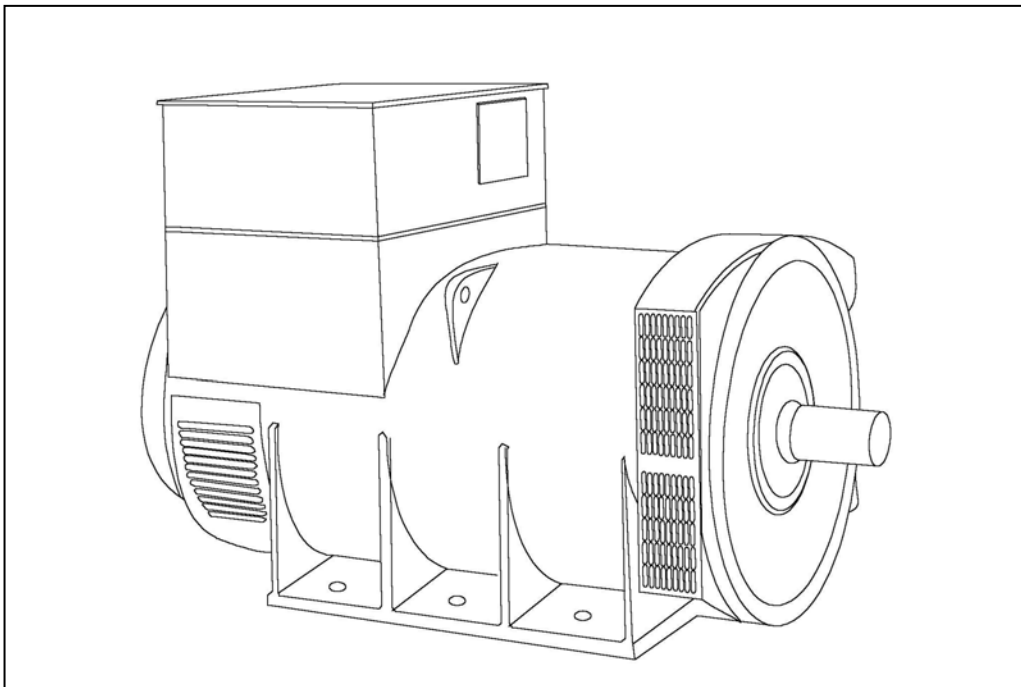


HCI734H - Technical Data Sheet



HCI734H

SPECIFICATIONS & OPTIONS



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

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 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 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.

HCI734H
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	0.00076 Ohms PER PHASE AT 22°C STAR CONNECTED
ROTOR WDG. RESISTANCE	1.77 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. 6228 (ISO)
BEARING NON-DRIVE END	BALL. 6319 (ISO)

	1 BEARING				2 BEARING			
WEIGHT COMP. GENERATOR	3781 kg				3865 kg			
WEIGHT WOUND STATOR	1976 kg				1976 kg			
WEIGHT WOUND ROTOR	1590 kg				1527 kg			
WR ² INERTIA	49.806 kgm ²				48.8052 kgm ²			
SHIPPING WEIGHTS in a crate	Gross - 3854kg				Gross - 3934kg			
PACKING CRATE SIZE	216 x 105 x 154 (cm)				216 x 105 x 154 (cm)			
	50 Hz				60 Hz			
TELEPHONE INTERFERENCE	THF<2%				TIF<50			
COOLING AIR	2.64 m ³ /sec 5600 cfm				3.17 m ³ /sec 6720 cfm			
VOLTAGE STAR	380/220	400/231	415/240	440/254	416/240	440/254	460/266	480/277
KVA BASE RATING FOR REACTANCE VALUES	2000	2000	2000	2000	2250	2375	2500	2500
X _d DIR. AXIS SYNCHRONOUS	2.34	2.11	1.96	1.74	2.64	2.49	2.40	2.20
X' _d DIR. AXIS TRANSIENT	0.19	0.17	0.16	0.14	0.22	0.20	0.20	0.18
X'' _d DIR. AXIS SUBTRANSIENT	0.14	0.13	0.12	0.11	0.17	0.16	0.15	0.14
X _q QUAD. AXIS REACTANCE	1.73	1.56	1.45	1.29	1.95	1.84	1.77	1.63
X'' _q QUAD. AXIS SUBTRANSIENT	0.25	0.23	0.21	0.19	0.29	0.27	0.26	0.24
X _L LEAKAGE REACTANCE	0.06	0.05	0.05	0.04	0.06	0.06	0.05	0.05
X ₂ NEGATIVE SEQUENCE	0.21	0.19	0.18	0.16	0.24	0.23	0.22	0.20
X ₀ ZERO SEQUENCE	0.03	0.03	0.03	0.02	0.04	0.03	0.03	0.03

REACTANCES ARE SATURATED

VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED

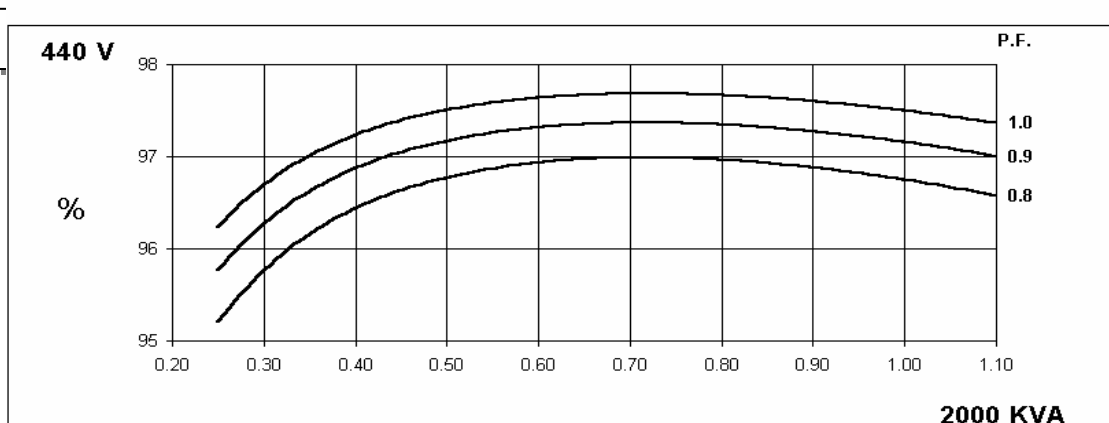
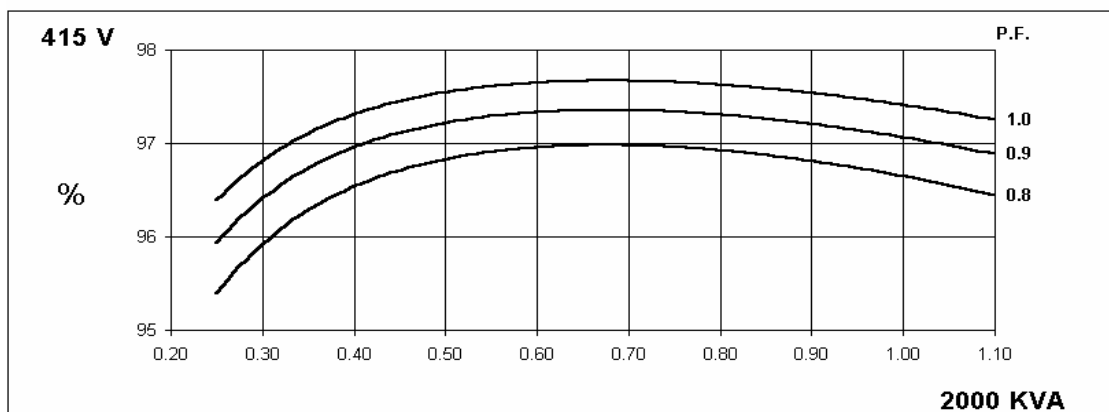
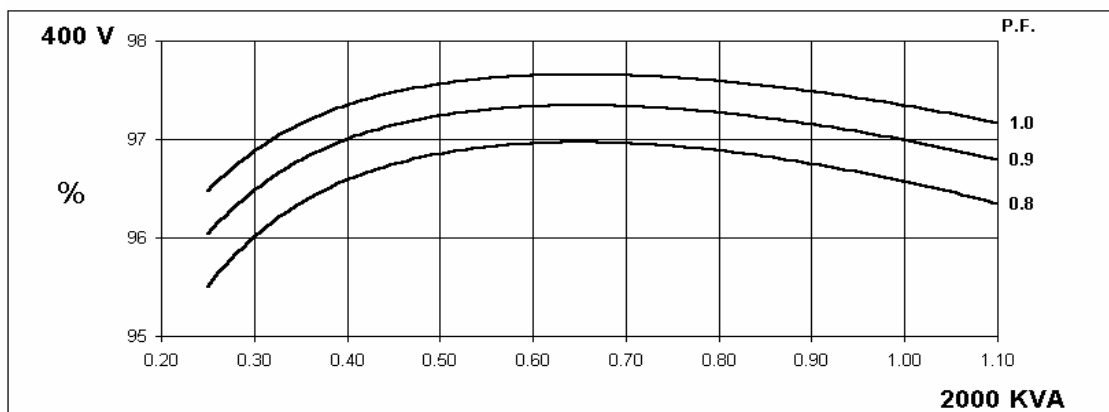
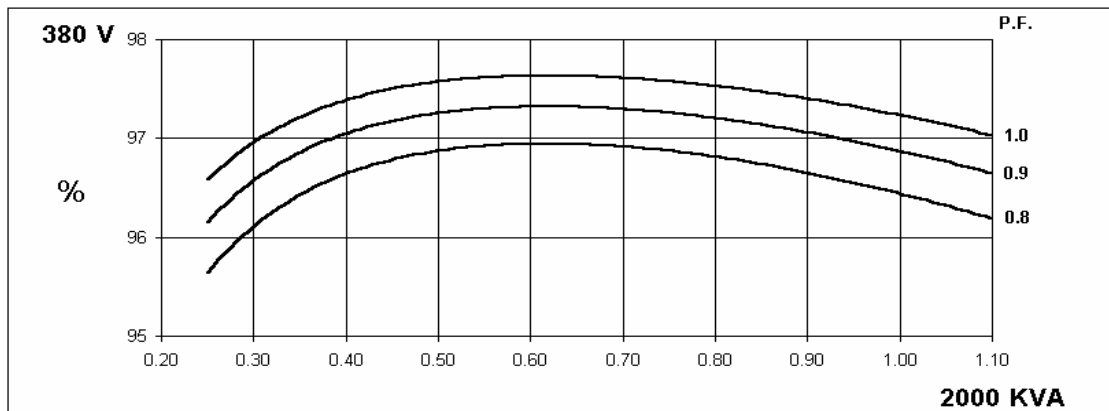
T' _d TRANSIENT TIME CONST.	0.33s
T'' _d SUB-TRANSTIME CONST.	0.03s
T' _{do} O.C. FIELD TIME CONST.	3.49s
T _a ARMATURE TIME CONST.	0.08s
SHORT CIRCUIT RATIO	1/X _d

**50
Hz**

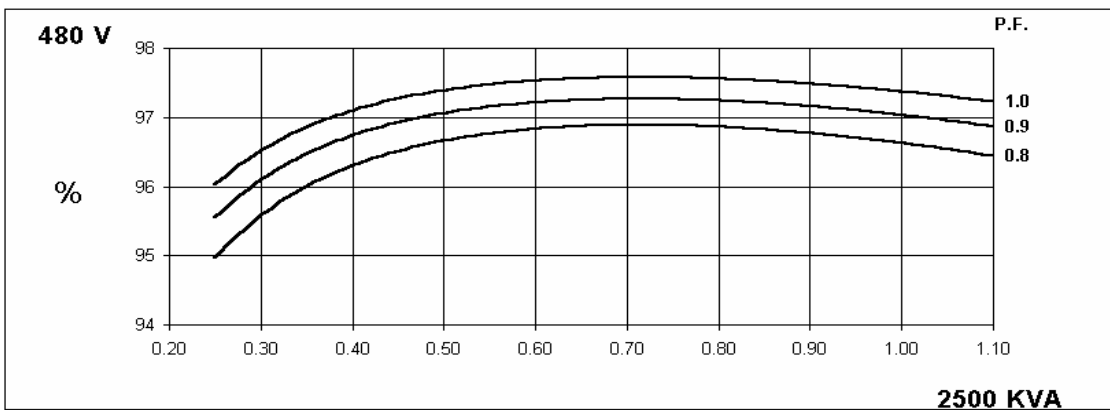
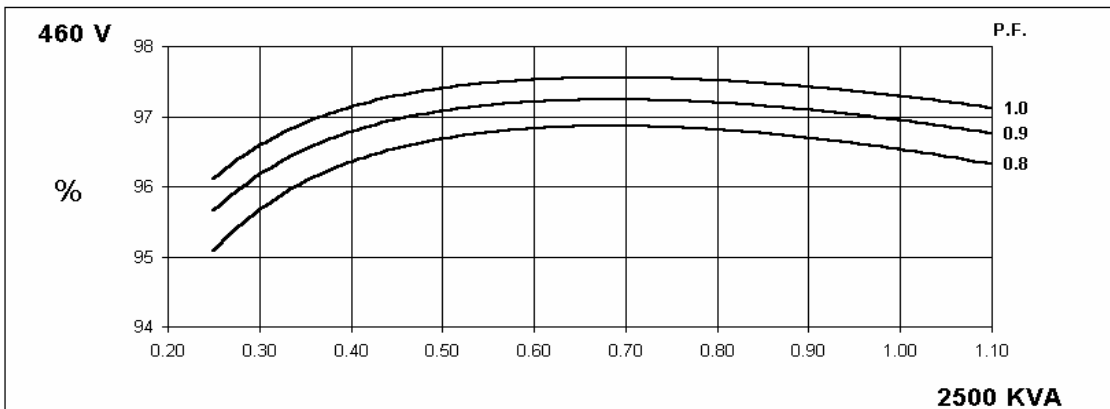
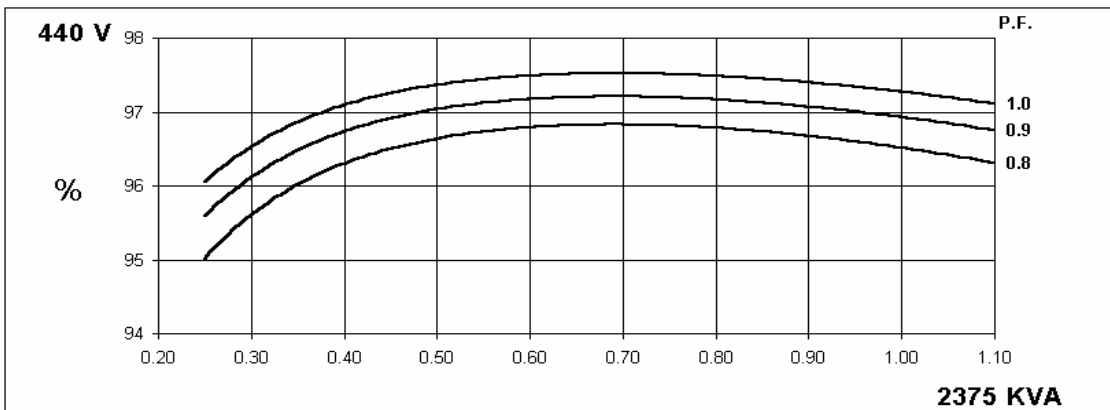
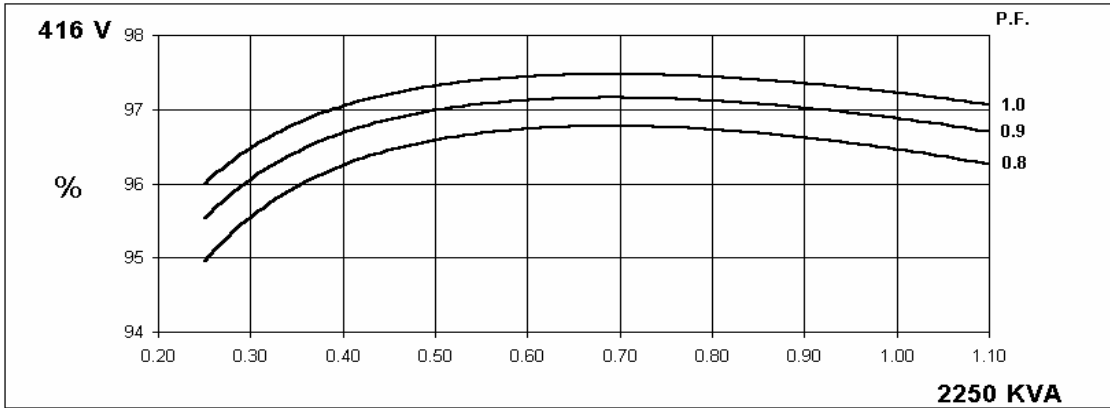
HCI734H
Winding 312



THREE PHASE EFFICIENCY CURVES



THREE PHASE EFFICIENCY CURVES

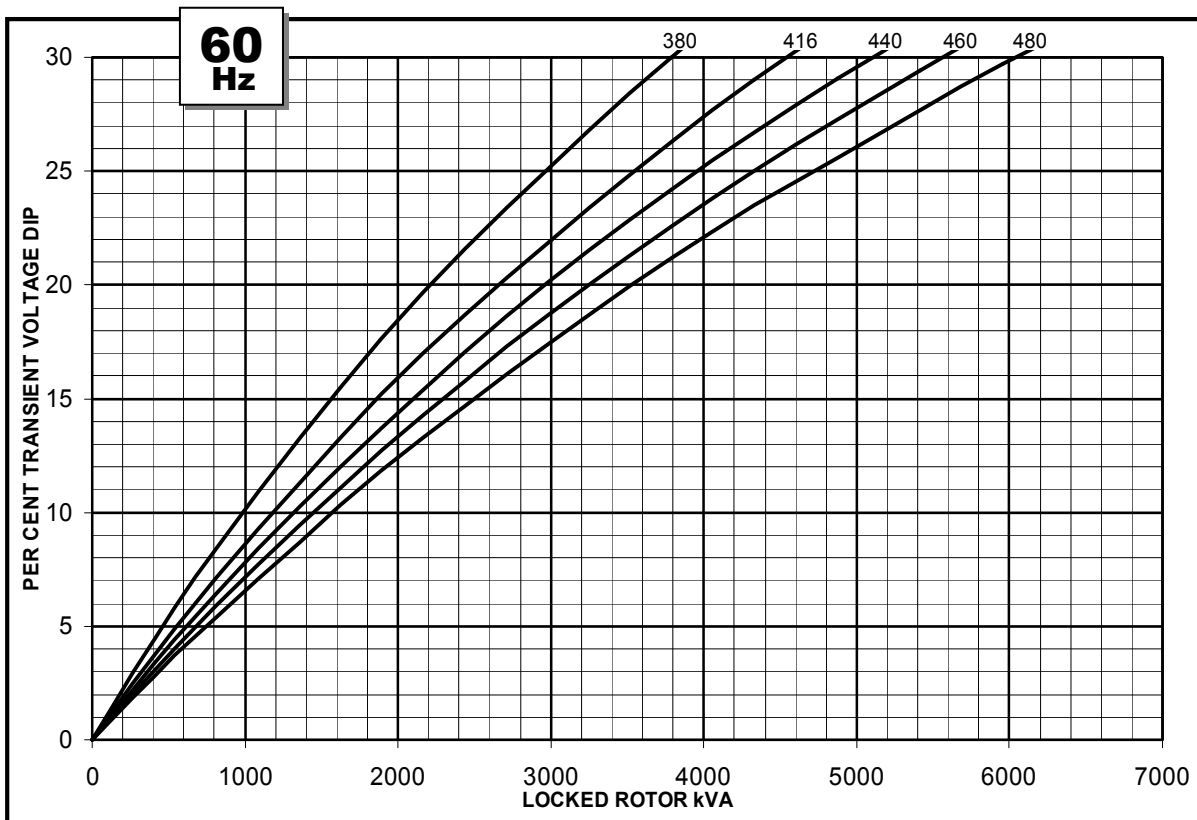
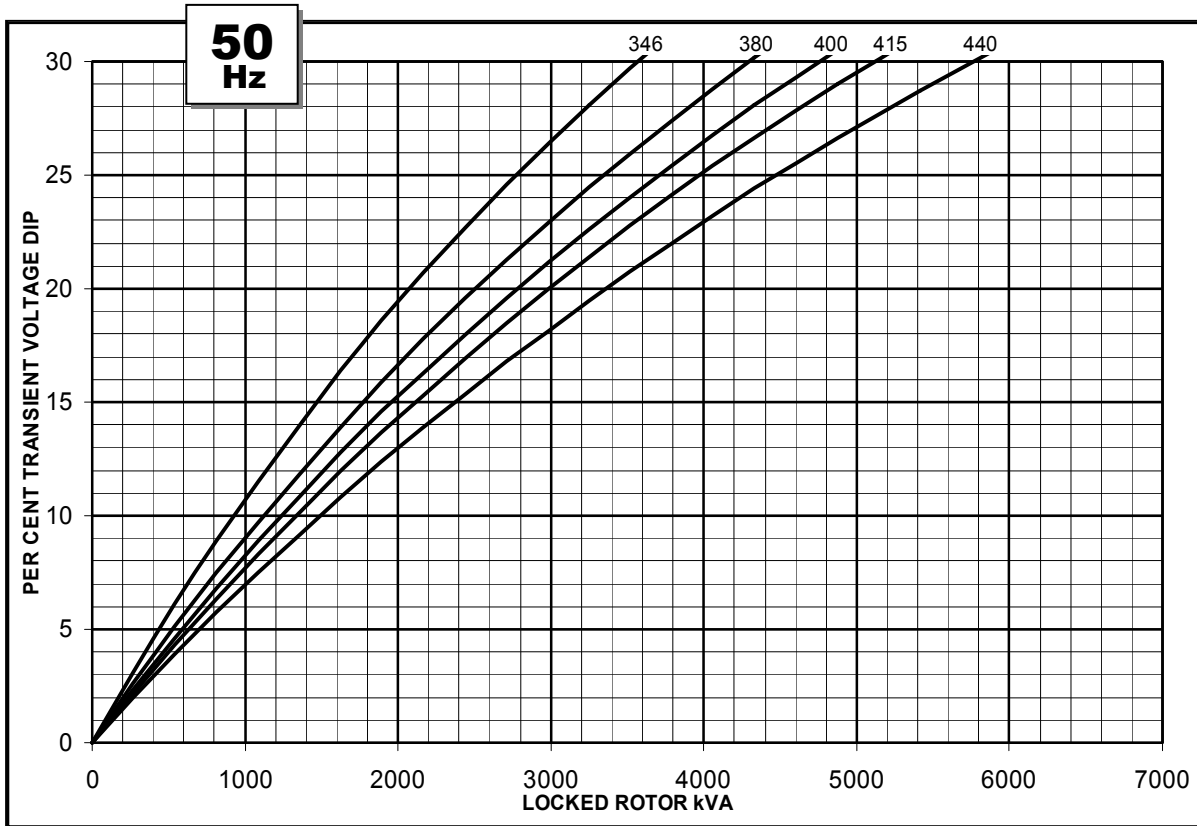


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Winding 312

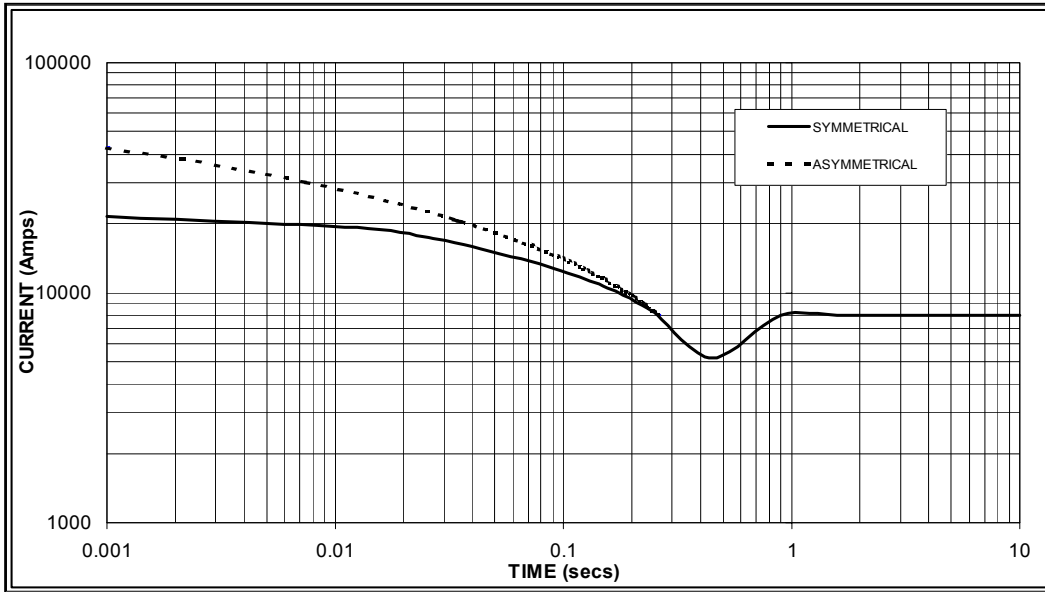


Locked Rotor Motor Starting Curve



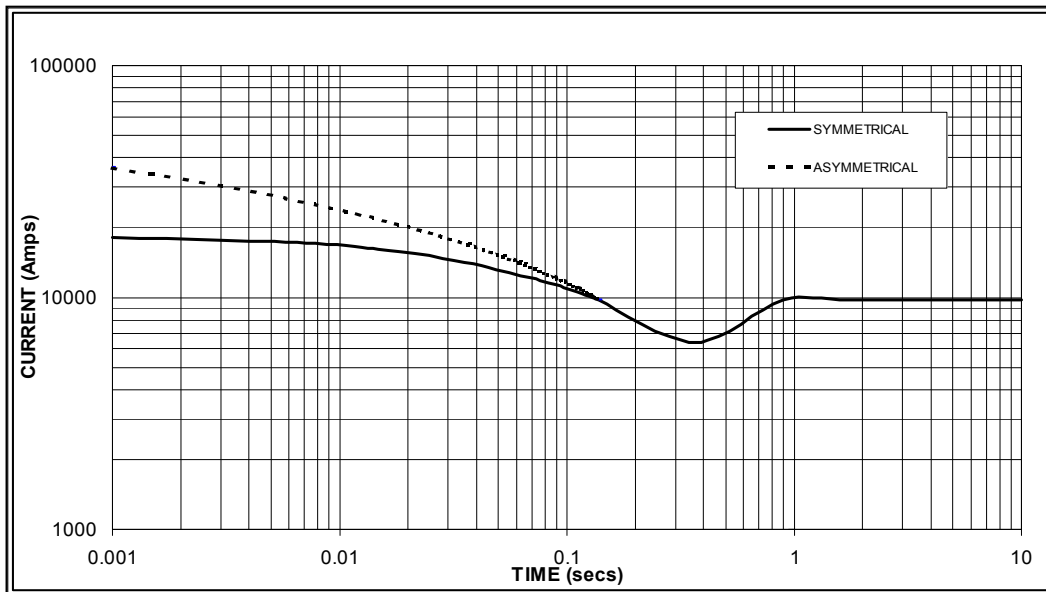
**Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed
Based on star (wye) connection.**

50Hz



Sustained Short Circuit = 8,000 Amps

60Hz



Sustained Short Circuit = 9,800 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
380	x 1.00	416v	x 1.00
400	x 1.05	440v	x 1.06
415	x 1.09	460v	x 1.10
440	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.

HCI734H

Winding 312 / 0.8 Power Factor

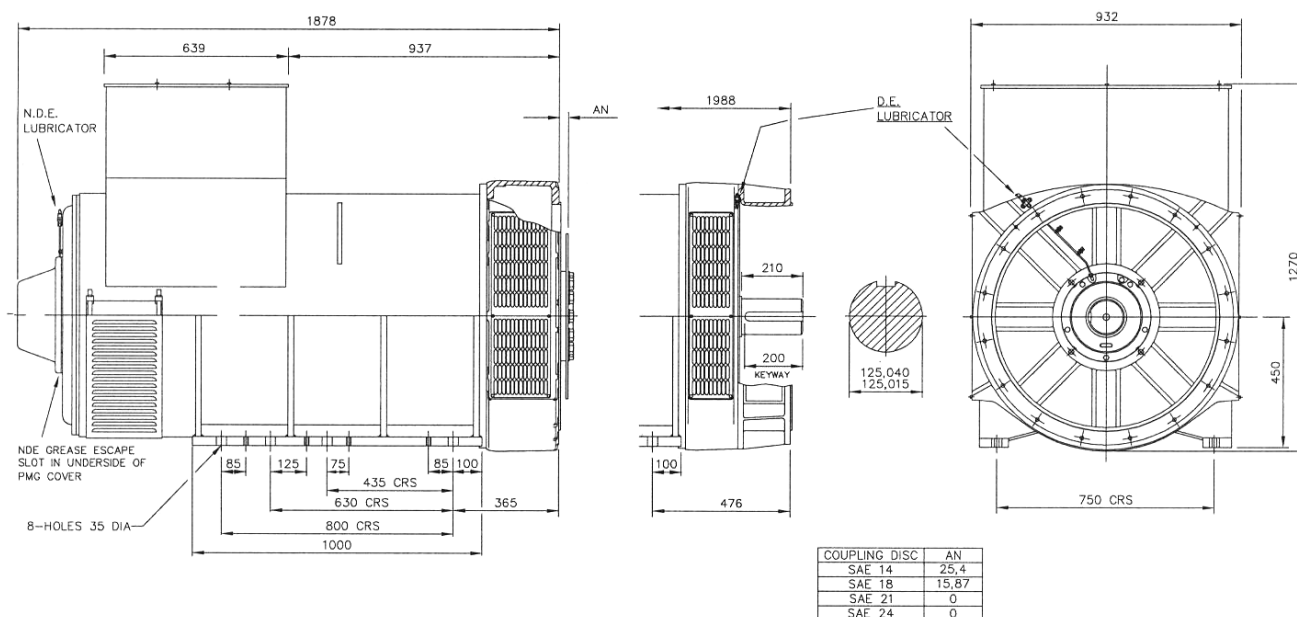


RATINGS

Class - Temp Rise		Cont. F - 105/40°C				Cont. H - 125/40°C				Standby - 150/40°C				Standby - 163/27°C			
50Hz	Star (V)	380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440
	kVA	1840	1840	1840	1840	2000	2000	2000	2000	2100	2100	2100	2100	2150	2150	2150	2150
	kW	1472	1472	1472	1472	1600	1600	1600	1600	1680	1680	1680	1680	1720	1720	1720	1720
	Efficiency (%)	96.6	96.7	96.8	96.9	96.4	96.6	96.7	96.8	96.3	96.5	96.6	96.7	96.3	96.4	96.5	96.6
	kW Input	1524	1522	1521	1519	1660	1656	1655	1653	1745	1741	1739	1737	1786	1784	1782	1781

60Hz	Star (V)	416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480
	kVA	2080	2170	2300	2300	2250	2375	2500	2500	2340	2470	2600	2600	2430	2560	2700	2700
	kW	1664	1736	1840	1840	1800	1900	2000	2000	1872	1976	2080	2080	1944	2048	2160	2160
	Efficiency (%)	96.6	96.7	96.7	96.7	96.5	96.5	96.5	96.6	96.4	96.4	96.5	96.6	96.3	96.4	96.4	96.5
	kW Input	1723	1795	1903	1903	1865	1969	2073	2070	1942	2050	2155	2153	2019	2124	2241	2238

DIMENSIONS



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