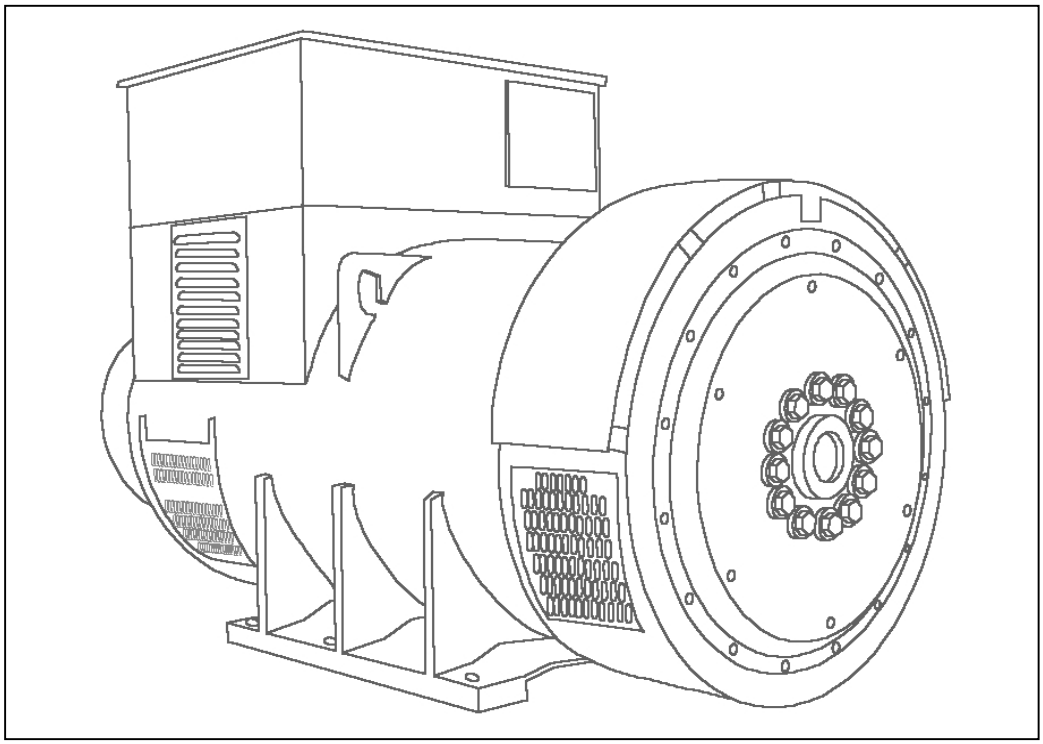
STAMFORD
power generation

LVI634D - Technical Data Sheet



LVI634D

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

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 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.

STAMFORD
power generation

LVI634D

WINDING 312

CONTROL SYSTEM SER.3	SEPARATELY EXCITED BY P.M.G.		
A.V.R.	MX341	MX321	
VOLTAGE REGULATION	± 1.0 %	± 0.5 %	With 4% Engine Governing
SUSTAINED SHORT CIRCUIT	REFER TO SHORT CIRCUIT DECREMENT CURVES (page 7)		

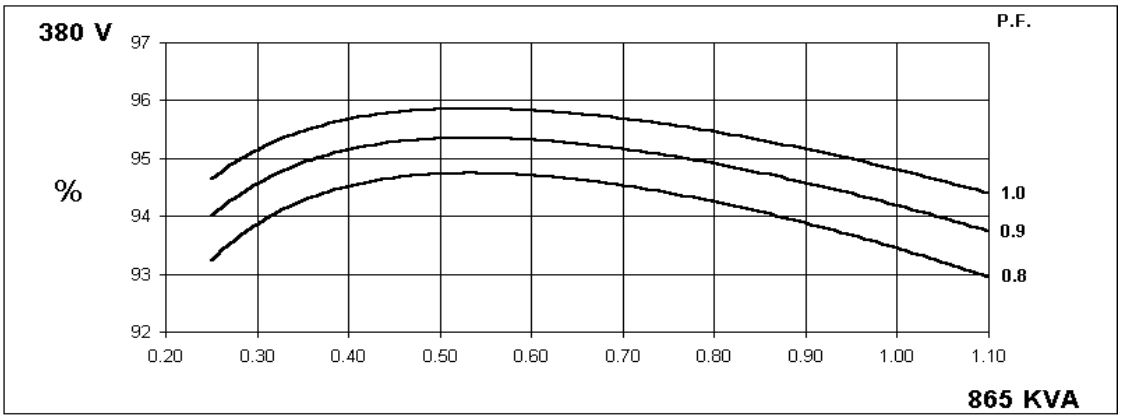
INSULATION SYSTEM	CLASS H							
PROTECTION	IP23							
RATED POWER FACTOR	0.8							
STATOR WINDING	DOUBLE LAYER LAP							
WINDING PITCH	TWO THIRDS							
WINDING LEADS	6							
STATOR WDG. RESISTANCE (L-L)	0.003 Ohms PER PHASE AT 22°C STAR CONNECTED							
ROTOR WDG. RESISTANCE	1.74 Ohms at 22°C							
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	2233 kg				2240 kg			
WEIGHT WOUND STATOR	947 kg				947 kg			
WEIGHT WOUND ROTOR	822 kg				778 kg			
WR² INERTIA	18.6963 kgm^2				18.1529 kgm^2			
SHIPPING WEIGHTS in a crate	2328 kg				2329 kg			
PACKING CRATE SIZE	183 x 92 x 140 (cm)				183 x 92 x 140 (cm)			
	50 Hz				60 Hz			
TELEPHONE INTERFERENCE	THF<2%				TIF<50			
COOLING AIR	2.18 m³/sec 4619 cfm				2.63 m³/sec 5573 cfm			
VOLTAGE STAR (Y)	380/220	400/231	415/240	440/254	416/240	440/254	460/266	480/277
kVA BASE RATING FOR REACTANCE VALUES	865	910	910	825	986	1043	1090	1138
Xd DIR. AXIS SYNCHRONOUS	2.83	2.69	2.50	2.02	3.23	3.05	2.92	2.80
X'd DIR. AXIS TRANSIENT	0.15	0.14	0.13	0.10	0.17	0.16	0.15	0.14
X"d DIR. AXIS SUBTRANSIENT	0.10	0.10	0.09	0.07	0.12	0.11	0.10	0.10
Xq QUAD. AXIS REACTANCE	2.35	2.23	2.07	1.67	2.68	2.53	2.42	2.32
X"q QUAD. AXIS SUBTRANSIENT	0.27	0.26	0.24	0.19	0.31	0.29	0.28	0.27
X_L LEAKAGE REACTANCE	0.07	0.06	0.06	0.05	0.08	0.07	0.07	0.07
X_2 NEGATIVE SEQUENCE	0.19	0.18	0.16	0.13	0.21	0.20	0.19	0.18
X_0 ZERO SEQUENCE	0.03	0.03	0.03	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.	0.092 s							
T"d SUB-TRANSTIME CONST.	0.013 s							
T'do O.C. FIELD TIME CONST.	3 s							
Ta ARMATURE TIME CONST.	0.032 s							
SHORT CIRCUIT RATIO	1/Xd							

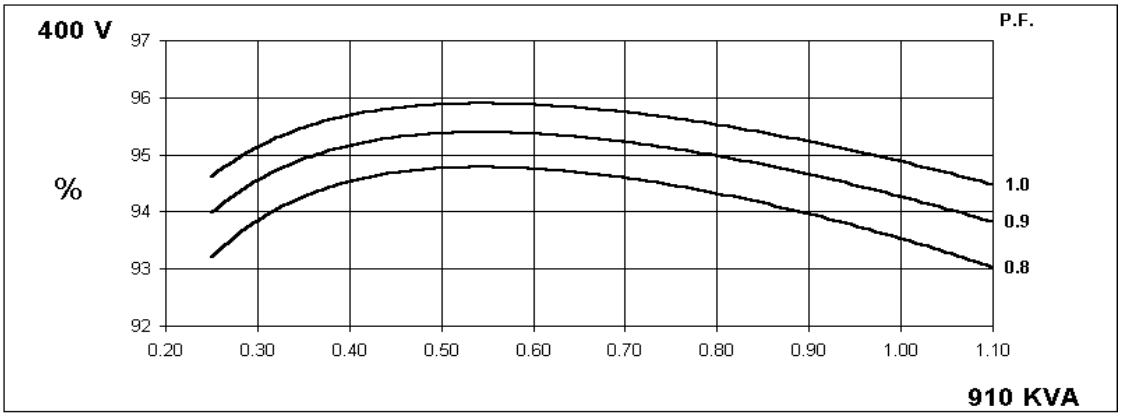
50 Hz

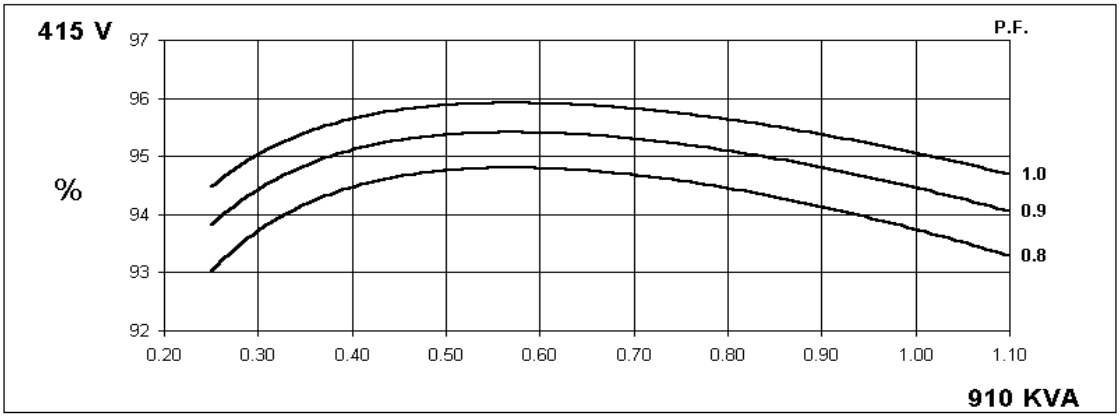
LVI634D

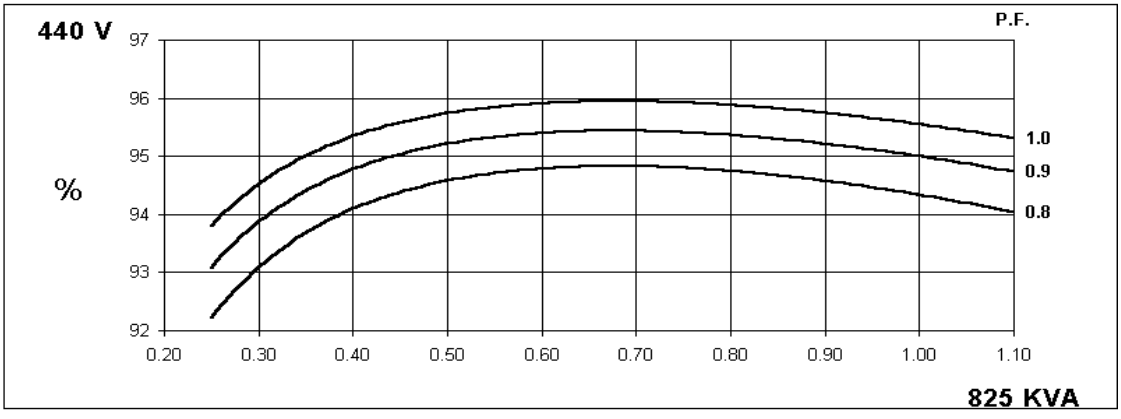
Winding 312

THREE PHASE EFFICIENCY CURVES









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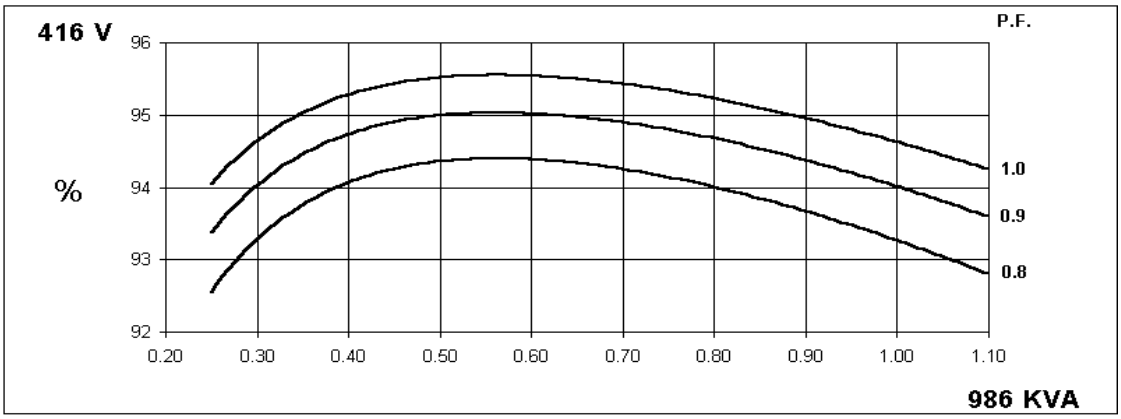
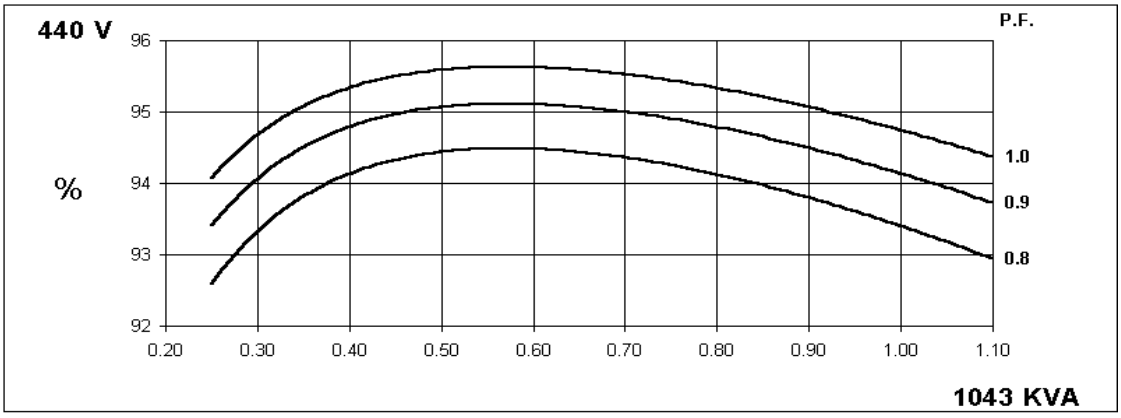
LVI634D

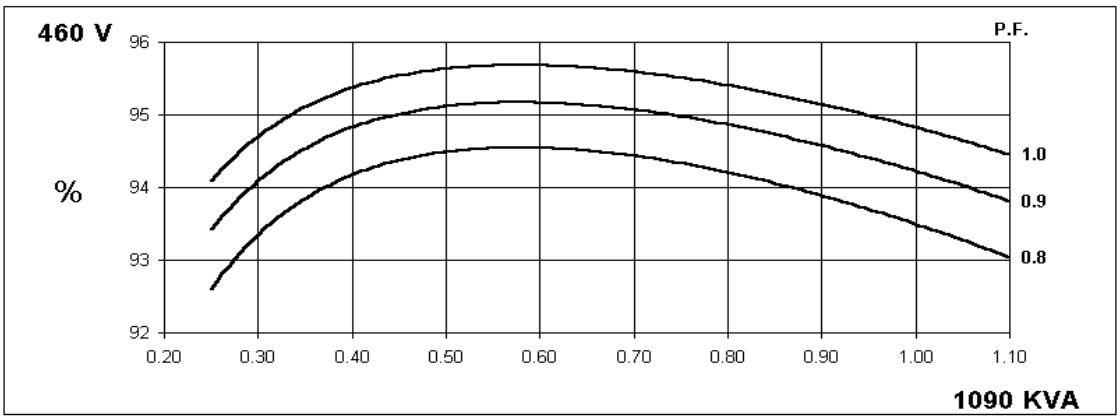
Winding 312

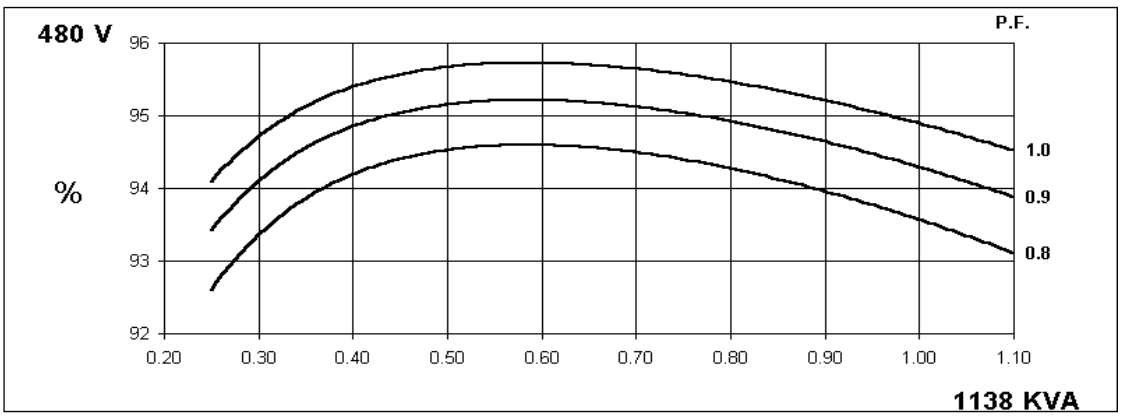
60 Hz

THREE PHASE EFFICIENCY CURVES





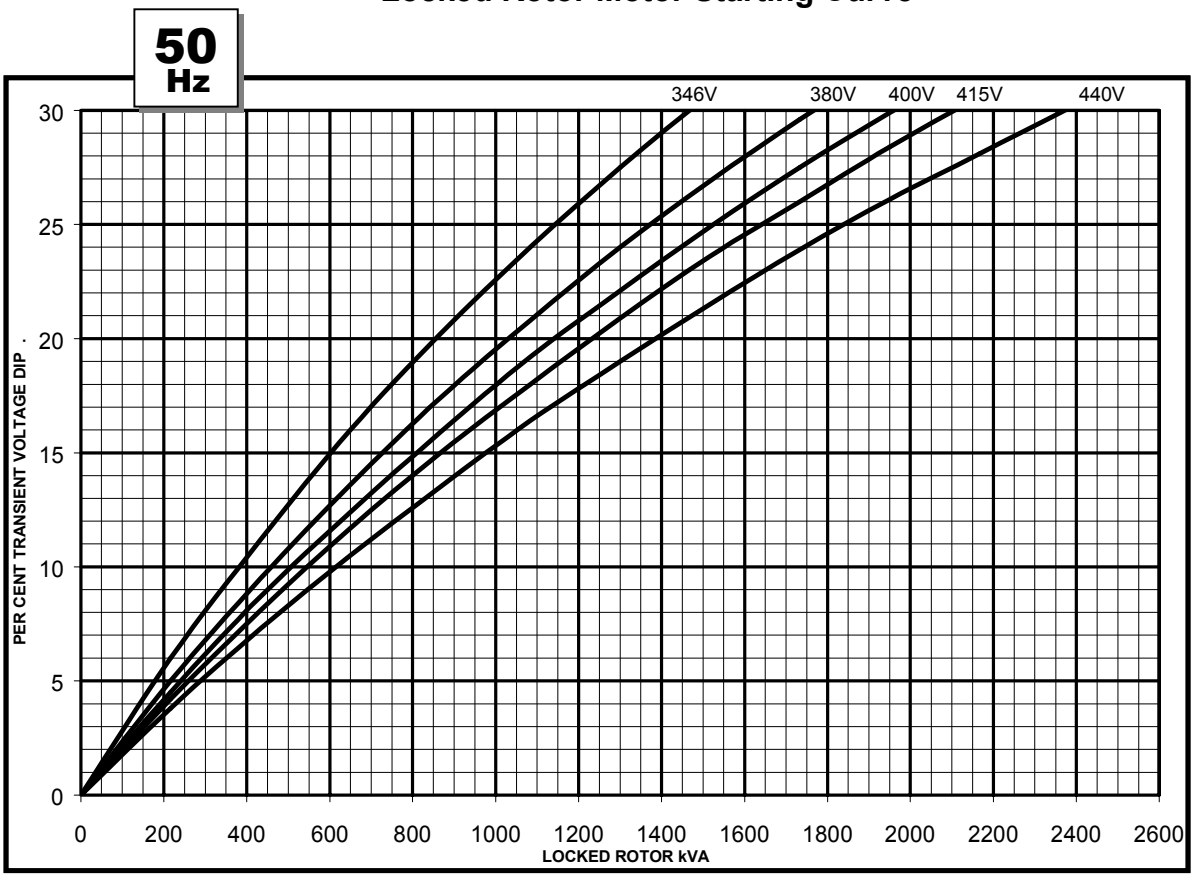


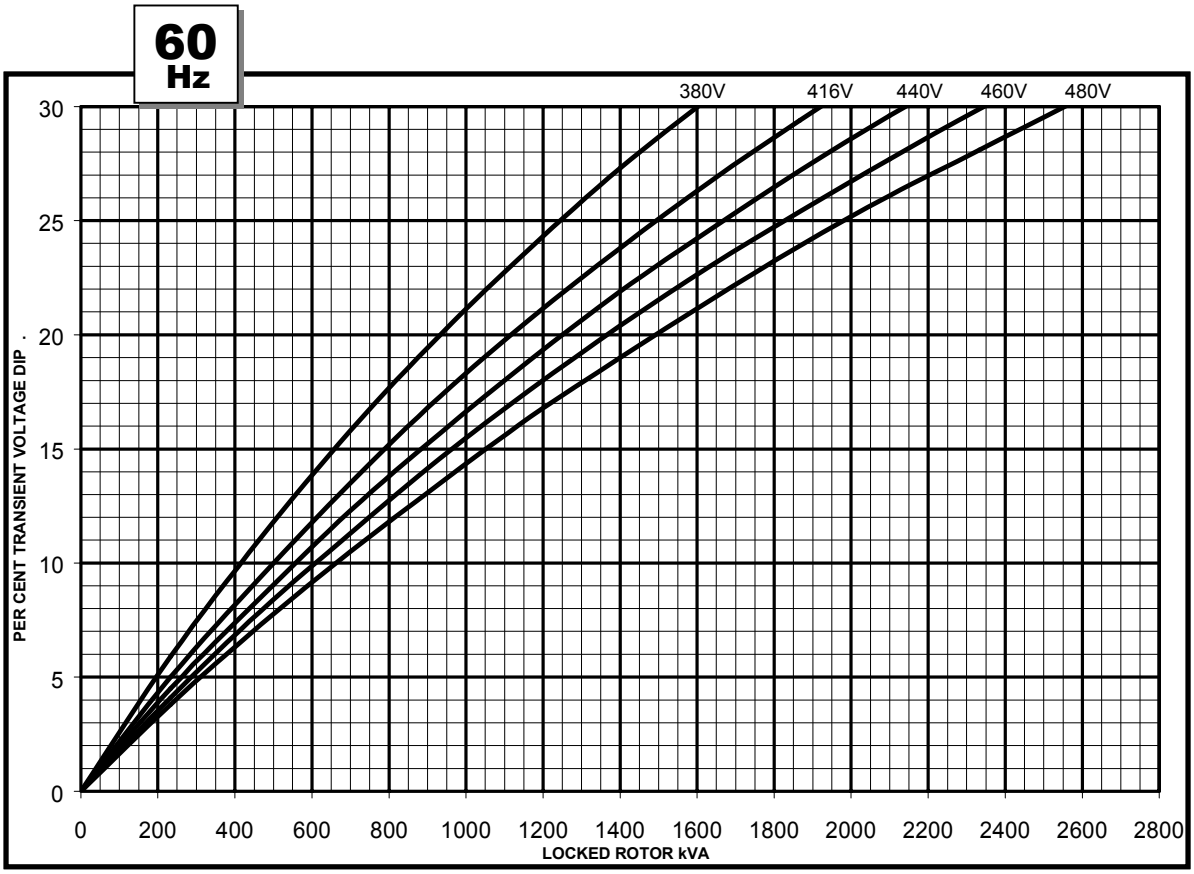


LVI634D

Winding 312

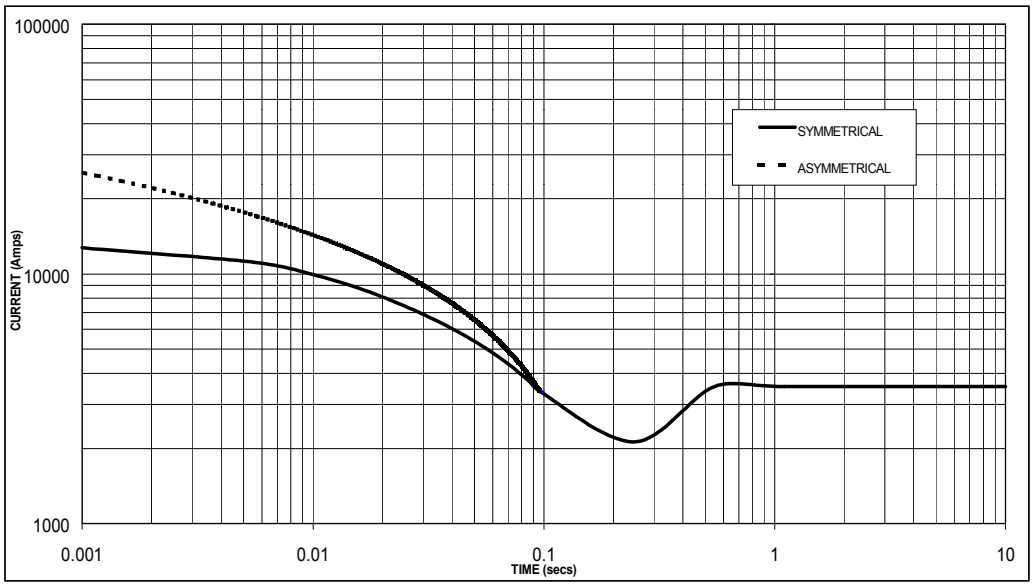
Locked Rotor Motor Starting Curve





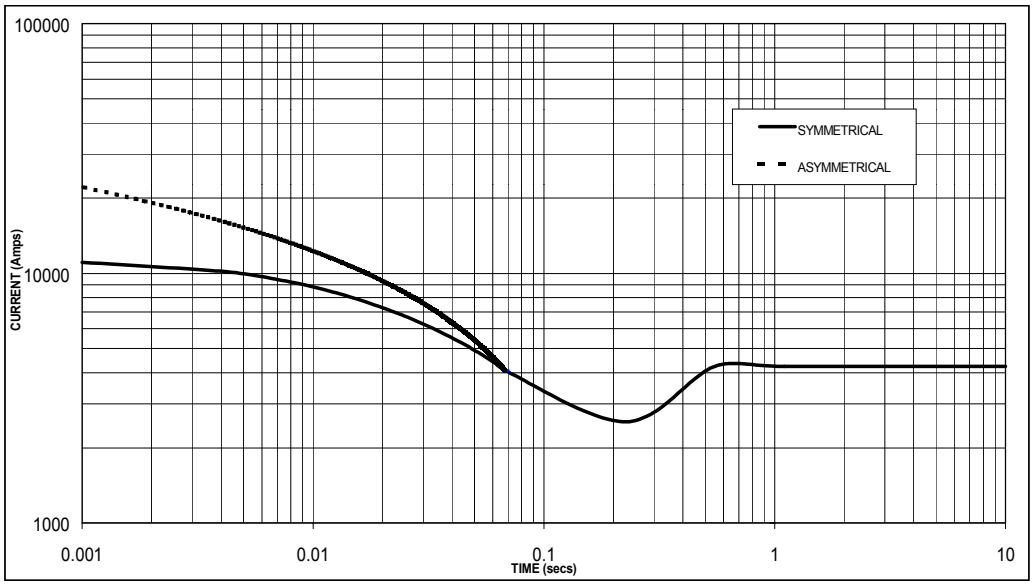
Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed
Based on star (wye) connection.

50 Hz



Sustained Short Circuit = 3,540 Amps

60 Hz



Sustained Short Circuit = 4,240 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.

LVI634D

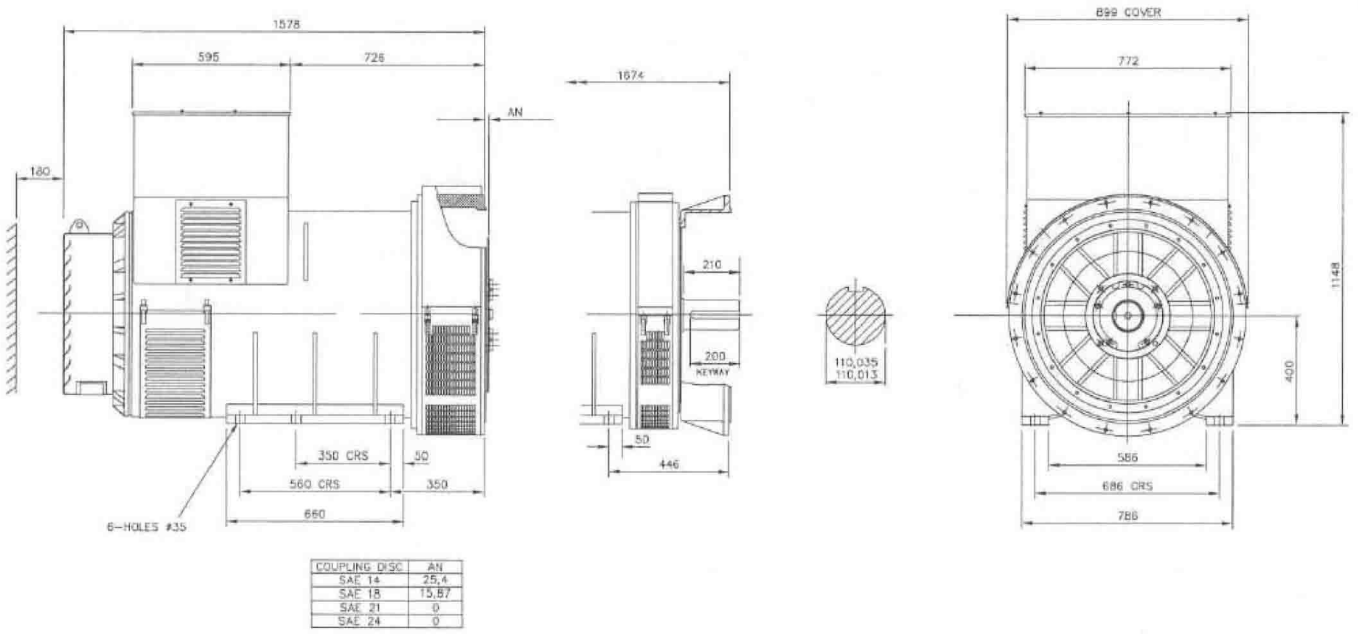
Winding 312 / 0.8 Power Factor

RATINGS

	Class - Temp Rise	Cont. F - 105/40°C				Cont. H - 125/40°C				Standby - 150/40°C				Standby - 163/27°C			
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	793	834	834	756	865	910	910	825	890	938	938	850	910	955	955	865
	kW	634	667	667	605	692	728	728	660	712	750	750	680	728	764	764	692
	Efficiency (%)	93.8	93.9	94.1	94.5	93.5	93.5	93.7	94.3	93.3	93.4	93.6	94.3	93.2	93.3	93.5	94.2
	kW Input	676	711	709	640	740	779	777	700	763	803	802	721	781	819	817	735

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	904	956	999	1043	986	1043	1090	1138	1018	1077	1126	1175	1030	1090	1140	1190
	kW	723	765	799	834	789	834	872	910	814	862	901	940	824	872	912	952
	Efficiency (%)	93.6	93.7	93.8	93.9	93.3	93.4	93.5	93.6	93.1	93.3	93.4	93.4	93.1	93.2	93.3	93.4
	kW Input	773	816	852	889	845	893	933	973	875	923	964	1006	885	936	977	1019

DIMENSIONS



COUPLING DISC	AN
SAE 14	25.4
SAE 18	15.87
SAE 21	0
SAE 24	0

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