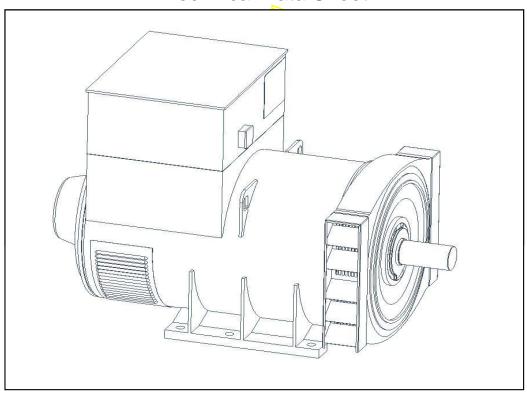
HCM636H - Winding 07

Technical Data Sheet



HCM636H 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%.

DE RATES

All values tabulated on page 6 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 50 C.

Note: Requirement for operating in an ambient exceeding 60 C must be referred to the factory.

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.

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WINDING 07

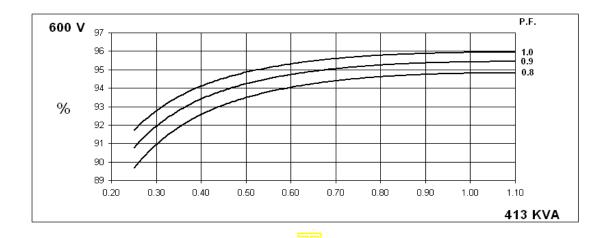
CONTROL SYSTEM	SEPARATE	LY EXCITED BY P.M.G.		
A.V.R.	MX321			
VOLTAGE REGULATION	± 0.5 %	With 4% ENGINE GOV	/ERNING	
SUSTAINED SHORT CIRCUIT	REFER TO SHORT CIRCUIT DECREMENT CURVES (page 5)			
INSULATION SYSTEM	CLASS H			
PROTECTION	IP23			
RATED POWER FACTOR	0.8			
STATOR WINDING	DOUBLE LAYER LAP			
WINDING PITCH	TWO THIRDS			
WINDING LEADS	6			
STATOR WDG. RESISTANCE		0.0102 Ohms	PER PHASE AT	22°C STAR CONNECTED
ROTOR WDG. RESISTANCE			1.27 Ohms	at 22°C
EXCITER STATOR RESISTANCE			17 Ohms	at 22°C
EXCITER ROTOR RESISTANCE	0.05 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		70	1500 Re	ev/Min
BEARING DRIVE END			BALL. 622	24 (ISO)
BEARING NON-DRIVE END	BALL. 6317 (ISO)			
		1 BEARING		2 BEARING
WEIGHT COMP. GENERATOR		1880 kg		1848 kg
WEIGHT WOUND STATOR		779 <mark>kg</mark>		720 kg
WEIGHT WOUND ROTOR		786 kg		742 kg
WR ² INERTIA		19.4923 <mark>kgm</mark> ²		18.8858 kgm²
SHIPPING WEIGHTS in a crate		1940 k g		1908kg
PACKING CRATE SIZE		183 x 92 x 140(cm)		183 x 92 x 140(cm)
TELEPHONE INTERFERENCE		THF< <mark>2</mark> %		TIF<50
COOLING AIR			1.961 m³/sec	: 4156 cfm
VOLTAGE STAR			600	V
VOLTAGE DELTA			346	V
kVA BASE RATING FOR REACTANCE VALUES			41:	3
Xd DIR. AXIS SYNCHRONOUS		<u>Z</u>	1.6	6
X'd DIR. AXIS TRANSIENT		4	0.1	7
X"d DIR. AXIS SUBTRANSIENT	0.13			
Xq QUAD. AXIS REACTANCE	1.03			
X"q QUAD. AXIS SUBTRANSIENT	0.14			
XL LEAKAGE REACTANCE	0.06			
X2 NEGATIVE SEQUENCE	0.14			
X ₀ ZERO SEQUENCE	0.10			
REACTANCES ARE SATURAT	ED VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED			
T'd TRANSIENT TIME CONST.	0.12s			
T"d SUB-TRANSTIME CONST.	0.016s			
T'do O.C. FIELD TIME CONST.	1.05s			
Ta ARMATURE TIME CONST.	0.033s 1/Xd			
SHORT CIRCUIT RATIO			1/X	0



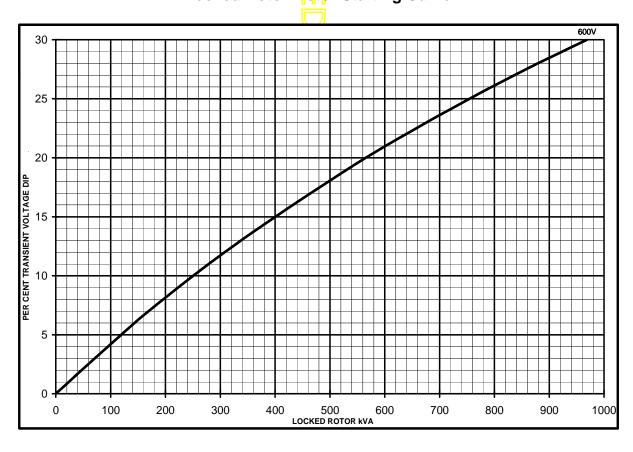
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THREE PHASE EFFICIENCY CURVES

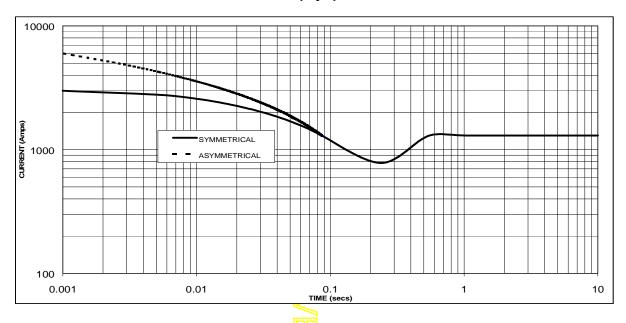


Locked Rotor Motor Starting Curve



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



Sustained Short Circuit = 1,300 Amps

Note

The following multiplication factor should be used to convert the values from curve for the various types of short circuit :

	3-phase	2-phase L-L	1-phase L-N
Instantaneous	x <mark>1.00</mark>	x 0.87	x 1.30
Minimum	x 1.00	x 1.80	x 3.20
Sustained	x <mark>1.00</mark>	x 1.50	x 2.50
Max. sustained duration	10 sec.	5 sec.	2 sec.

All other times are unchanged

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STAMFORD

Winding 07 / 0.8 Power Factor

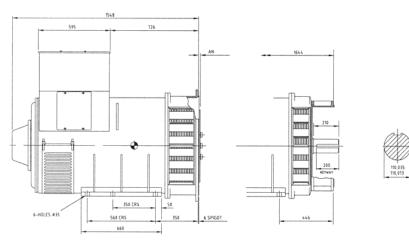
60Hz

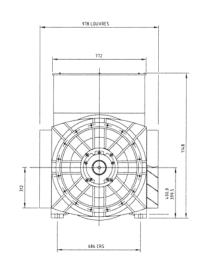
RATINGS

Class - Temp Rise	Cont. B - 70/50°C	Cont. F - 90/50°C	Cont. H - 110/50°C
Series Star (V)	600	600	600
Parallel Star (V)	300	300	300
Series Delta (V)	346	346	346
kVA	350	413	N/A
kW	280	330	N/A
Efficiency (%)	94.8	94.8	N/A
kW Input	295	348	N/A









COUPLING DISC	AN
SAE 14	25,4
SAE 18	15,87
SAE 21	0
CAC 31	

APPROVED DOCUMENT

STAMFORD

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