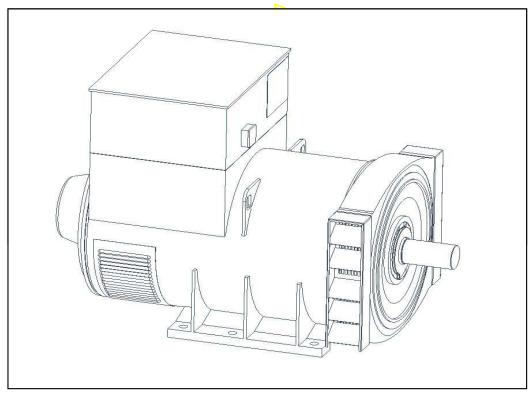
# HCM636J - Winding 07

# **Technical Data Sheet**



# HCM636J 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.

# **HCM636J**

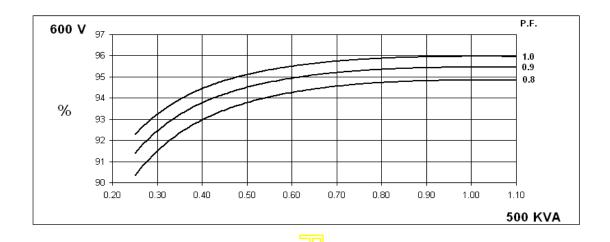
#### **WINDING 07**

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 5)		
INSULATION SYSTEM	CLASS H		
	IP23		
PROTECTION			
RATED POWER FACTOR	0.8		
STATOR WINDING	DOUBLE LAYER LAP		
WINDING PITCH	TWO THIRDS		
WINDING LEADS	6		
STATOR WDG. RESISTANCE	0.0069 Ohms PER PHASE AT 22°C STAR CONNECTED		
ROTOR WDG. RESISTANCE	1.43	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,\	/DE 0875G, VDE 0875N. refer to factory for others	
WAVEFORM DISTORTION	NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%		
MAXIMUM OVERSPEED	1500 Rev/Min		
BEARING DRIVE END	BALL. 6224 (ISO)		
BEARING NON-DRIVE END	BALL. 6317 (ISO)		
	1 BEARING	2 BEARING	
WEIGHT COMP. GENERATOR	1959 kg	2024 kg	
WEIGHT WOUND STATOR	809 <mark>kg</mark>	859 kg	
WEIGHT WOUND ROTOR	885 kg	841 kg	
WR <sup>2</sup> INERTIA	22.8732 kgm <sup>2</sup>	22.3297 kgm <sup>2</sup>	
SHIPPING WEIGHTS in a crate	2019 <b>kg</b>	2084kg	
PACKING CRATE SIZE	183 x 92 x 140(cm)	183 x 92 x 140(cm)	
TELEPHONE INTERFERENCE	THF<2%)	TIF<50	
COOLING AIR	1.961	m³/sec 4156 cfm	
VOLTAGE STAR		600V	
VOLTAGE DELTA		346V	
kVA BASE RATING FOR REACTANCE VALUES		500	
Xd DIR. AXIS SYNCHRONOUS	1.36		
X'd DIR. AXIS TRANSIENT	0.13		
X''d DIR. AXIS SUBTRANSIENT	0.12		
Xq QUAD. AXIS REACTANCE	0.85		
X"q QUAD. AXIS SUBTRANSIENT	0.12		
XLLEAKAGE REACTANCE	0.05		
X2 NEGATIVE SEQUENCE	0.12		
X <sub>0</sub> ZERO SEQUENCE	0.08		
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.	1.1s		
Ta ARMATURE TIME CONST.	0.035s		
SHORT CIRCUIT RATIO	1/Xd		

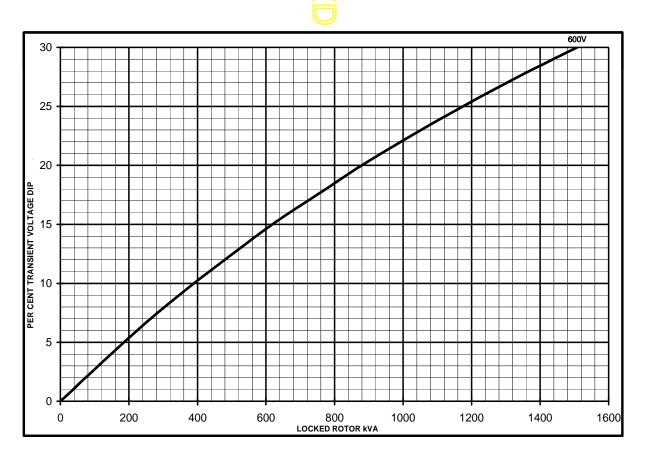


## HCM636J Winding 07

#### THREE PHASE EFFICIENCY CURVES

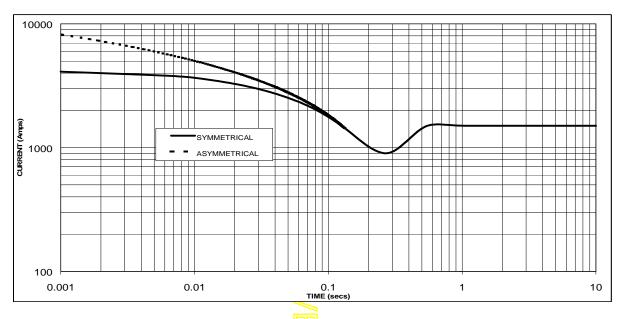


### **Locked Rotor Motor Starting Curve**



#### HCM636J Winding 07

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



Sustained Short Circuit = 1,500 Amps



#### Note

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

	3-p <mark>hase</mark>	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 1.00	x 1.50	x 2.50
Max. sustained duration	10 sec.	5 sec.	2 sec.

All other times are unchanged



# Winding 07 / 0.8 Power Factor

HCM636J

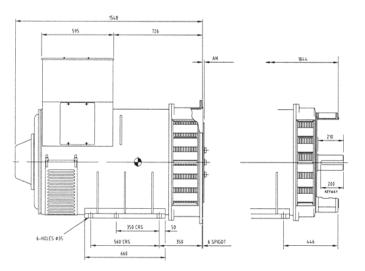
# **60**Hz

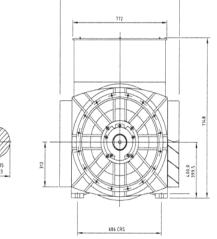
#### **RATINGS**

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	430	500	N/A
kW	344	400	N/A
Efficiency (%)	95.0	95.0	N/A
kW Input	362	421	N/A









978 LOUVRES

COUPLING DISC	AN
SAE 14	25,4
SAE 18	15,87
SAE 21	0
C 1 C 21	

# APPROVED DOCUMENT

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