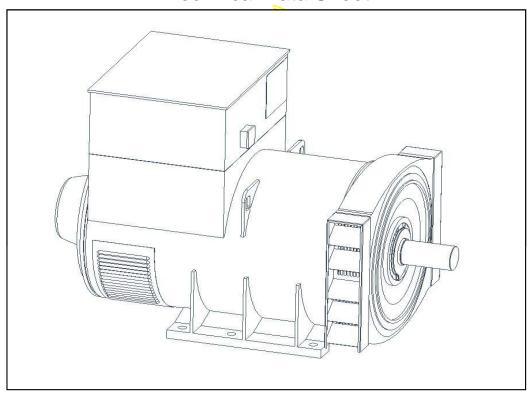
STAMFORD

HCM636G - Winding 07

Technical Data Sheet



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HCM636G 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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HCM636G

WINDING 07

| | | WINDING | <i>, </i> | |
|---|--|--|--|--|
| CONTROL SYSTEM | SEPARATE | LY EXCITED BY P.M.G | 3 . | |
| A.V.R. | MX321 | | | |
| VOLTAGE REGULATION | ± 0.5 % | With 4% ENGINE GO | VERNING | |
| SUSTAINED SHORT CIRCUIT | REFER TO | SHORT CIRCUIT DEC | REMENT CURVE | S (page 5) |
| INSULATION SYSTEM | | | CLAS | SS H |
| PROTECTION | IP23 | | | |
| RATED POWER FACTOR | 0.8 | | | |
| STATOR WINDING | DOUBLE LAYER LAP | | | |
| WINDING PITCH | TWO THIRDS | | | |
| WINDING LEADS | 6 | | | |
| STATOR WDG. RESISTANCE | 0.015 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED | | | |
| ROTOR WDG. RESISTANCE | 1.06 Ohms at 22°C | | | |
| EXCITER STATOR RESISTANCE | 17 Ohms at 22 °C | | | |
| EXCITER ROTOR RESISTANCE | | | 0.05 Ohms PER I | |
| R.F.I. SUPPRESSION | DC E | —————————————————————————————————————— | | 375G, VDE 0875N. refer to factory for others |
| WAVEFORM DISTORTION | | | , | B BALANCED LINEAR LOAD < 5.0% |
| | | NO LOAD < 1.5% N | 1500 R | |
| MAXIMUM OVERSPEED | | | | |
| BEARING DRIVE END | BALL. 6224 (ISO) | | | |
| BEARING NON-DRIVE END | | 1.05100 | BALL. 63 | |
| WEIGHT COMP. CENEDATOR | | 1 BEARING | | 2 BEARING |
| WEIGHT COMP. GENERATOR WEIGHT WOUND STATOR | | 1673 kg 588 kg | | 1641 kg 536 kg |
| WEIGHT WOUND ROTOR | | 674 kg | | 630 kg |
| WR2 INERTIA | | 15.4763 kgm ² | | 14.9328 kgm ² |
| SHIPPING WEIGHTS in a crate | | 1733/kg | | 1701 kg |
| 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/sed | |
| VOLTAGE STAR | | | 600 | • |
| VOLTAGE DELTA | <u> </u> | | 346 | SV |
| kVA BASE RATING FOR REACTANCE VALUES | | | 31 | 3 |
| Xd DIR. AXIS SYNCHRONOUS | | 7 | 1.6 | 0 |
| X'd DIR. AXIS TRANSIENT | | | 0.1 | 6 |
| X"d DIR. AXIS SUBTRANSIENT | | U | 0.1 | 2 |
| Xq QUAD. AXIS REACTANCE | | | 1.0 | 7 |
| X"q QUAD. AXIS SUBTRANSIENT | | | 0.1 | 3 |
| XL LEAKAGE REACTANCE | | | 0.0 | 6 |
| X2 NEGATIVE SEQUENCE | 0.13 | | | |
| X ₀ ZERO SEQUENCE | 0.09 | | | |
| REACTANCES ARE SATURAT | ED | VALUES A | | T RATING AND VOLTAGE INDICATED |
| T'd TRANSIENT TIME CONST. T''d SUB-TRANSTIME CONST. | 0.12s 0.016s | | | |
| T'do O.C. FIELD TIME CONST. | | | 0.9 | |
| Ta ARMATURE TIME CONST. | | | 0.02 | |
| CLIODE CIDCUIT DATIO | 1 | | 1/V | 7-1 |

1/Xd

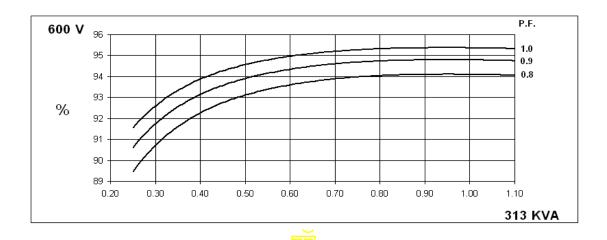
SHORT CIRCUIT RATIO



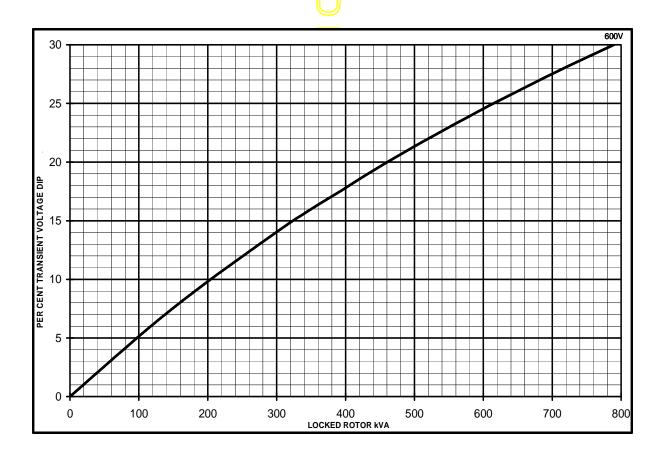
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Winding 07

THREE PHASE EFFICIENCY CURVES

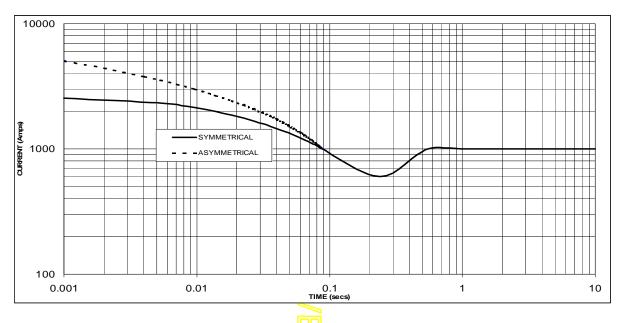


Locked Rotor Motor Starting Curve



HCM636G Winding 07

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



Sustained Short Circuit = 1,000 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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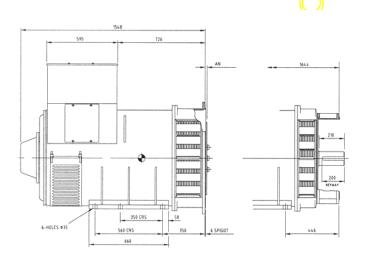
Winding 07 / 0.8 Power Factor

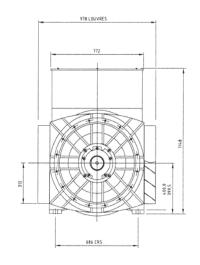
60Hz

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 | 270 | 313 | N/A |
| kW | 216 | 250 | N/A |
| Efficiency (%) | 94.1 | 94.1 | N/A |
| kW Input | 230 | 266 | N/A |







| COUPLING DISC | AN |
|---------------|------|
| SAE 14 | 25,4 |
| SAE 18 | 15,8 |
| SAE 21 | 0 |
| SAF 2L | |

APPROVED DOCUMENT

STAMFORD

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