# MITSUBISHI MGS SERIES

**DIESEL GENERATOR**

**SET 50Hz/1500 rpm/380V**

# MGS0600B

| POWER RATING (0.8 P.F.) | | MODEL CODE |
|---|---|---|
| **STAND-BY** | **690 kVA** | **5S-H5F** |
| **PRIME** | **625 kVA** | **5P-H5F** |

MGS0600B with typical options

## Voltage Variation

■ Standard Voltage 3Phase 4 Wires
380V

■ Voltages Available 3Phase 4 Wires
380, 400, 415, 440, 190, 200, 208 and 220V

Note: Outputs for optional voltages may differ from standard output mentioned above.

## CONDITIONS & DEFINITIONS

**Stand-by:** Code: S

Applicable for supplying emergency power at varying load in the event of the normal utility power interruption. Fuel stop power in accordance with ISO15550, ISO3046/1, JISB8002-1, DIN6271 and BS5514.
Overload: not allowed

**Prime:** Code: P

Applicable for supplying emergency power at varying load in the event of normal utility power interruption. + 10% overload in accordance with ISO3046/1. Overload power in accordance with ISO15550, ISO3046/1, JIS8002-1, DIN6271 and BS5514.

**Conditions:**

Engine ratings are based on SAE J1349 standard conditions and also apply at ISO3046/1, DIN6271 & BS5514 standard conditions.
Fuel rates: based on ASTM D975, BS2869 and on fuel oil of 35° API (16°C or 60° F) gravity having a LHV of 42,780 kJ/kg (18,390 Btu/lb.) when used at 29°C (85° F) and weighing 838.9 g/liter (7.001lbs./U.S. gal.).

Note: * For conditions of prime power (P.R.P.) and additional rating requirements, please consult your nearest Mitsubishi MGS dealer.

## DIMENSION (Reference Data)

| | | | |
|---|---|---|---|
| Overall dimensions | L : Length | mm | 3600 |
| | W : Width | mm | 1710 |
| | H : Height | mm | 1935 |
| Total Weight (Dry) | | kg | 5000 |
| Total Weight (Wet) | | kg | 5300 |

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## MGS SERIES DIESEL ENGINE: MITSUBISHI S6R-PTA-S

**L-6, 4 stroke-cycle water-cooled, turbocharged and aftercooled**

## ENGINE SPECIFICATIONS & TECHNICAL DATA

| | | |
|---|---|---|
| Bore | mm | 170 |
| Stroke | mm | 180 |
| Displacement | L | 24.5 |
| Piston speed | m/sec. | 9.0 |
| Compression ratio | | 14 |
| Lubricating oil capacity | L | 100 |
| Coolant capacity without radiator | L | 50 |
| Coolant pump external resistance | m water | 5.0 |
| Coolant pump flow rate | L/min | 670 |
| Cooling fan airflow rate | $m^3$/min | 582 |
| Cooling fan air flow restriction | kPa | 0.1 |
| Ambient air temperature | ℃ | 40 |
| Allowable exhaust back pressure | kPa | 6.0 |
| Exhaust flange size (internal diameter) | mm | 200 |

## ENGINE OPERATING DATA

| | | STAND-BY 690 kVA | PRIME 625 kVA |
|---|---|---|---|
| Gross Engine Power* | kWm | 584 | 529 |
| Brake mean effective pressure | MPa | 2.0 | 1.8 |
| Regenerative absorption | kW | 53 | 53 |
| Noise Level at 1 m (excluding: intake, exhaust & fan) | dB(A) | 107 | 105 |
| Fuel consumption load 100%* | L/hr. | 147 | 132 |
| Fuel consumption load 75%* | L/hr. | 109 | 100 |
| Combustion air inlet flow rate | $m^3$/min | 51 | 46 |
| Exhaust gas flow rate | $m^3$ /min | 133 | 120 |
| Exhaust gas temperature | ℃ | 520 | 510 |
| Heat rejection to coolant | kW | 366 | 329 |
| Heat rejection to exhaust | kW | 454 | 402 |
| Heat rejection to atmosphere from engine | kW | 44 | 39 |
| Heat rejection to atmosphere from generator | kW | 34 | 30 |

. WITH FAN basis.

Deration for engine
Altitude: 2.5% per 300m (1000ft) above 1,500m
Temperature: 2% per 5℃ (9° F) above 40℃

## ENGINE STANDARD EQUIPMENT

Aftercooler
Turbocharger filter
Structure steel base
Crankcase breather
Charging alternator
Lubricating oil cooler
Fuel filters, full flow paper element
Fuel transfer pump, gear driven, plunger type
Electronic type governor
Jacket water pump, gear driven
Lubricating oil filter, full flow paper
element Lubricating oil pump, gear driven
Exhaust dry manifold
Radiator, blower fan, fan
drive Manual shutoff
24V DC electric starting motor

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## MGS SERIES 7310 GENERATOR CONTROL PANEL

### Type & Design

MGS standard 7310 programmable microprocessor control-automatic start/stop panel, generator breaker control, indicating the operational status and fault conditions; automatically shutting down the engine and indicating the engine failure by means of LCD display and LEDs on the front panel.

### Controls & Monitoring

- ◆ Mode selection & start engine button with interlock key switch system
- ◆ Menu navigation button
- ◆ LCD display for: AC amperage -each phase and earth current, AC voltage-each phase and neutral, Frequency Hz, Operation hours run, Lub. Oil pressure, Cooling water temperature, Generator Load kW/kVA/kVar, Generator Load kWh/kVAh/kVarh
- ◆ Operation status LED indicators
- ◆ CB control buttons
- ◆ Mute/Lamp test button
- ◆ Voltage adjuster
- ◆ Speed adjuster
- ◆ Emergency stop pushbutton
- ◆ Provided 5 outputs for status as standard equipment (Programmable 8 outputs available as option)

### Safety Shutdown Protection and LED Indicators

High engine temperature, Low oil pressure, Fail to start, Generator Over Speed/Frequency,
Generator Under Speed/Frequency
Generator High Voltage, Generator Low Voltage, Oil pressure sender circuit, Loss of Speed signal , Emergency stop,

### Mounting

Fabricated cubicle mounted on individual bracket with anti-vibration isolator

### Electrical Design

In accordance with BS EN 60950 Low Voltage Directive, BS EN 61006-2 and 61006-4 EMC Directive. The optional interface can provide real time diagnostic facilities.

## Generator Control Panel Description

■ 3 position operation mode control key switch
(ACTIVE, PANEL LOCK, STOP/RESET)

■ Manual button
■ Auto button
■ CB open button (Manual only)
■ CB close button (Manual only)
■ Start engine button (Manual only)
■ Stop/Reset button (Manual only)
■ Mute/Lamp test button (Manual only)
■ Voltage adjusting trimmer
■ Speed adjusting trimmer
■ Emergency stop pushbutton

■ LCD display accessed by scroll pushbutton

Generator volts L1-N, L2-N, L3-N
Generator volts L1-L2, L2-L3, L3-L1
Generator amps L1, L2, L3
Generator Earth Current
Generator Frequency Hz
Engine speed RPM
Engine oil pressure (PSI & Bar)
Engine cooling water temperature (°C & °F)
Battery volts
Engine hours run
Generator Load kW, kVA, kVar
Generator Load kWh, kVAh, kVarh
Power Factor
Generator Phase Sequence

■ Visual indicators on LCD display

Shutdown alarm
Warning alarm
High coolant temperature
Low oil pressure
Charge fail
Over-speed
Under-speed
Electrical trip
Fail to stop
Generator high current
Over voltage (AC)
Under voltage (AC)
Over voltage (DC)
Under voltage (DC)
Auxiliary indication
Auxiliary alarm (warning or shutdown)
Common alarm
Over frequency
Under frequency

■ Visual indication alarm and automatically shutdown

High engine temperature
Low oil pressure
Fail to start
Over-speed
High voltage
Low voltage
Over frequency
Under frequency
Oil pressure sender open circuit
Loss of speed signal
High Crankcase internal pressure (MGS-C Continuous only)
Emergency Stop

■ Operation status indicated by LED

Remote start present
Generator ready
Lubrication oil filter clogged
Electrical trip

■ Pre-Programmed Starting Unit
Automatic start/stop sequence timing and delay systems configured via MS-Windows based software.

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## MGS SERIES AC GENERATOR MODEL: MG-HC5F

### Type & Design

MGS original design, single bearing, 4 pole, screen protected, selfexciting, self regulating and brushless with fully connected damper windings, salient pole rotors, A.C. exciter and rotating rectifier unit. Direct coupled to engine and pre-lubricated maintenance free bearing, direct drive centrifugal blower.

Enclosure: Drip-proof IP23

### Winding System

Standard 12 wire reconnectable winding provides a wide range of 3 phase voltage. All windings are impregnated in vacuum pressure impregnated with a special polyester resin.

Overspeed capability: 125% for 2 minutes
Insulation: Class 'H' of IEC
Temperature rise: Class 'H'

### Voltage Regulator

Fully sealed, RMS sensing AVR with built-in protection against sustained over-excitation. This de-excites the generator after a minimum of 5 seconds.

Voltage regulation: Less than +/- 0.5% from no load to full load at any power factor between 0.8 lagging and 1.0 allowing for a 4% engine speed variation
Voltage adjustment: +/- 6%
Wave form: Less than 5% deviation

### Permanent Magnet Generator (PMG)

Electrically isolated from the main alternator stator windings powers AVR - sustaining approx. 250～300% of short circuit current at the AC generator output terminals for not more than 10 seconds by means of excitation voltage via AVR

### Electrical Design

In accordance with BS5000 Part 3, VDE0530, UTE51100, NEMA MG1-22, CEMA, IEC34-1, CSA22.2, AS1359 and JEC2100.

Telephone Influence Factor (TIF): Less than 50
Telephone Harmonic factor (THF): Less than 2%
Radio interference: Suppression is in line with the provision of BS800 and VDE Class G and N

## Gen Set Option Features

■ ENGINE
Air Cleaner, paper element dry type
Battery Kit
Battery Charger
Anchor Bolts

■ FUEL
Fuel Day Service Tank

■ COOLING Oversize
radiator Heat
Exchanger
Expansion Tank
Jacket Water Heater
Removal STD Radiator, Fan & Fan Drive

■ LUBRICATION
Lub. Oil Priming Pump

■ EXHAUST
Exhaust Silencer
Exhaust Flexible Pipe

■ GENERATOR
Space Heater
1 phase Sensing Auto Voltage
Regulator Power Factor Regulator

■ CONTROL PANEL
Diesel Generator Integrated Communication Synthesizer (DGICS-MII)
Auxiliary Control Panel
Remote Monitor Interface

■ SWITCHGEAR
Circuit Breaker MCCB & ACB
Reverse Power Relay

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