MITSUBISHI MGS SERIES
DIESEL GENERATOR SET
60Hz/1800 rpm/480V

MITSUBISHI MGS SERIES

MGS2000B

POWER RATING (0.8 P.F.) MODEL CODE
STAND-BY 1900 kW 6S-7PE
PRIME 1730 kW 6P-7PE

Voltage Variation

<table>
<thead>
<tr>
<th>Standard Voltage</th>
<th>3Phase 4 Wires</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>480V</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Voltages Available</th>
<th>3Phase 4 Wires</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>480, 460, 450, 440 and 416V</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>Overall dimensions</th>
<th>L : Length mm</th>
<th>W : Width mm</th>
<th>H : Height mm</th>
<th>Total Weight (Dry) kg</th>
<th>Total Weight (Wet) kg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5450</td>
<td>2200</td>
<td>2835</td>
<td>12500</td>
<td>13200</td>
</tr>
</tbody>
</table>
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MGS2000B

MGS SERIES DIESEL ENGINE: MITSUBISHI S16R-PTA2-S

V-16, 4 stroke-cycle water-cooled, turbocharged and aftercooled

ENGINE SPECIFICATIONS & TECHNICAL DATA

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bore</td>
<td>170 mm</td>
</tr>
<tr>
<td>Stroke</td>
<td>180 mm</td>
</tr>
<tr>
<td>Displacement</td>
<td>65.4 L</td>
</tr>
<tr>
<td>Piston speed</td>
<td>10.8 m/sec.</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>13.5</td>
</tr>
<tr>
<td>Lubricating oil capacity</td>
<td>230 L</td>
</tr>
<tr>
<td>Coolant capacity without radiator</td>
<td>170 L</td>
</tr>
<tr>
<td>Coolant pump external resistance</td>
<td>5.0 m water</td>
</tr>
<tr>
<td>Coolant pump flow rate</td>
<td>1850 L/min</td>
</tr>
<tr>
<td>Cooling fan airflow rate</td>
<td>2040 m³/min</td>
</tr>
<tr>
<td>Cooling fan air flow restriction</td>
<td>0.1 kPa</td>
</tr>
<tr>
<td>Ambient air temperature</td>
<td>40 °C</td>
</tr>
<tr>
<td>Allowable exhaust back pressure</td>
<td>6.0 kPa</td>
</tr>
<tr>
<td>Exhaust flange size (internal diameter)</td>
<td>350 mm</td>
</tr>
</tbody>
</table>

ENGINE OPERATING DATA

<table>
<thead>
<tr>
<th></th>
<th>STAND-BY 1900 kW</th>
<th>PRIME 1730 kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Engine Power*</td>
<td>1998 kW</td>
<td>1811 kW</td>
</tr>
<tr>
<td>Brake mean effective pressure</td>
<td>2.1 MPa</td>
<td>1.9 MPa</td>
</tr>
<tr>
<td>Regenerative absorption</td>
<td>192 kW</td>
<td>192 kW</td>
</tr>
<tr>
<td>Noise Level at 1 m (excluding: intake, exhaust &amp; fan)</td>
<td>113 dB(A)</td>
<td>112 dB(A)</td>
</tr>
<tr>
<td>Fuel consumption load 100%*</td>
<td>540 L/hr.</td>
<td>485 L/hr.</td>
</tr>
<tr>
<td>Fuel consumption load 75%*</td>
<td>396 L/hr.</td>
<td>363 L/hr.</td>
</tr>
<tr>
<td>Combustion air inlet flow rate</td>
<td>185 m³/min</td>
<td>166 m³/min</td>
</tr>
<tr>
<td>Exhaust gas flow rate</td>
<td>488 m³/min</td>
<td>438 m³/min</td>
</tr>
<tr>
<td>Exhaust gas temperature</td>
<td>530 °C</td>
<td>530 °C</td>
</tr>
<tr>
<td>Heat rejection to coolant</td>
<td>1345 kW</td>
<td>1208 kW</td>
</tr>
<tr>
<td>Heat rejection to exhaust</td>
<td>1836 kW</td>
<td>1621 kW</td>
</tr>
<tr>
<td>Heat rejection to atmosphere from engine</td>
<td>161 kW</td>
<td>145 kW</td>
</tr>
<tr>
<td>Heat rejection to atmosphere from generator</td>
<td>87 kW</td>
<td>78 kW</td>
</tr>
</tbody>
</table>

* WITH FAN basis.

Deration for engine

Note: Please consult with your nearest Mitsubishi MGS dealer

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 heater
- 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)
- 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)
- Visual indicators on LCD display
  Shutdown alarm
  Warning alarm
  High coolant temperature
  Low oil pressure
  Charge fail
  Under-speed
  Electrical trip
  Fail to stop
- Visual indication alarm and automatically shutdown
  High engine temperature
  Low oil pressure
  Fail to start
  Over-speed
  High voltage
  Low voltage
- Operation status indicated by LED
  Remote start present
  Generator ready
- Pre-Programmed Starting Unit
  Automatic start/stop sequence timing and delay systems configured via MS-Windows based software.

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

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■ Generator amps L1, L2, L3
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■ Generator Frequency Hz
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  High voltage
  Low voltage
■ Operation status indicated by LED
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  Generator ready
■ Pre-Programmed Starting Unit
  Automatic start/stop sequence timing and delay systems configured via MS-Windows based software.
**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 regreaseable bearing, direct drive centrifugal blower.

Enclosure: Drip-proof IP23

**Winding System**
Standard 6 wire winding provides 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, 3 phase 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
  - Removal STD Radiator, Fan & Fan Drive

- **LUBRICATION**
  - Lub. Oil Priming Pump

- **EXHAUST**
  - Exhaust Silencer
  - Exhaust Flexible Pipe

- **GENERATOR**
  - Space Heater
  - 3 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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Mitsubishi Heavy Industries, Ltd. serves for the customers with improved products continually. Therefore specification and some materials will be changed without notice.

The International System of units (SI) is used in this publication.