

# MITSUBISHI MGS SERIES

DIESEL GENERATOR SET  
50Hz/1500 rpm/6.6kV/10kV/11kV



## MGS2000HV

50Hz/6.6kV/10kV/11kV

POWER RATING (0.8 P.F.)      MODEL CODE  
PRIME 1900 kVA              56CP-P80R2  
   50CP/51CP-P80S2



MGS2000HV with typical options

### CONDITIONS & DEFINITIONS

#### Prime [PRP] : Code:CP

Applicable for supplying power with varying load instead of the utility for an unlimited time. +10% overload is allowed in accordance with ISO3046/1. Prime power in accordance with ISO15550,ISO3046/1,JIS8002-1,DIN6271 and BS5514. Prime power in accordance with ISO8528.

#### 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 (7.001 lbs./U.S. gal.).

Note: \* Please consult with your nearest Mitsubishi MGS dealer for additional rating requirements.

### DIMENSION (Reference Data)

|                    |            |    | PRIME<br>1900 kVA |
|--------------------|------------|----|-------------------|
| Overall dimensions | L : Length | mm | 6020              |
|                    | W : Width  | mm | 2250              |
|                    | H : Height | mm | 3145              |
| Total Weight (Dry) |            | kg | 16500             |
| Total Weight (Wet) |            | kg | 17210             |

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## MGS SERIES DIESEL ENGINE: MITSUBISHI S16R-PTAH-S

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

### ENGINE SPECIFICATIONS & TECHNICAL DATA

|   |                     |         |
|---|---------------------|---------|
| Bore                                    | mm                  | 170     |
| Stroke                                  | mm                  | 180     |
| Displacement                            | L                   | 65.37   |
| Piston speed                            | m/sec.              | 9.0     |
| Compression ratio                       |                     | 14.0    |
| Lubricating oil capacity                | L                   | 230     |
| Coolant capacity without/with radiator  | L                   | 170/416 |
| Coolant pump external resistance        | m water             | 3.5     |
| Coolant pump flow rate                  | L/min               | 1650    |
| Cooling fan airflow rate                | m <sup>3</sup> /min | 2090    |
| Cooling fan air flow restriction        | kPa                 | 0.1     |
| Ambient air temperature                 | °C                  | 40      |
| Allowable exhaust back pressure         | kPa                 | 6.0     |
| Exhaust flange size (internal diameter) | mm                  | 350     |

### ENGINE OPERATING DATA

|  |                     | <b>PRIME</b><br>1900 kVA |
|--|---------------------|--------------------------|
| Gross Engine Power*                                      | kWm                 | 1600                     |
| Brake mean effective pressure                            | MPa                 | 2.0                      |
| Regenerative absorption                                  | kW                  | 140                      |
| Noise Level at 1 m<br>(excluding: intake, exhaust & fan) | dB(A)               | 113                      |
| Fuel consumption load 100%*                              | L/hr.               | 391                      |
| Fuel consumption load 75%*                               | L/hr.               | 304                      |
| Combustion air inlet flow rate                           | m <sup>3</sup> /min | 140                      |
| Exhaust gas flow rate                                    | m <sup>3</sup> /min | 371                      |
| Exhaust gas temperature                                  | °C                  | 520                      |
| Heat rejection to coolant                                | kW                  | 1024                     |
| Heat rejection to exhaust                                | kW                  | 1318                     |
| Heat rejection to atmosphere from engine                 | kW                  | 123                      |
| Heat rejection to atmosphere from generator              | kW                  | 80                       |

\* WITH FAN basis.

Deration for engine

Note: Please consult with your nearest Mitsubishi MGS dealer

### ENGINE STANDARD EQUIPMENT

Aftercooler  
Turbocharger filter (For MGS-B, HV stand-by and prime)  
Paper element type filter (For MGS-C, HV PRP continuous)  
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

\* Depending on the model, it becomes optional setting.

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## MGS SERIES 7310 MK II GENERATOR CONTROL PANEL

### Features

MGS standard 7310 MK II programmable microprocessor generator control panel provides the following functions

- ◆ Start and stop control
- ◆ Engine and generator measurement items on LCD display and LED on the front panel for operation status indication
- ◆ Engine and generator shutdown and warning protection
- ◆ Generator breaker control
- ◆ Expansion module for additional output and input
- ◆ RS485 and RS232C communication for remote monitoring

### Mounting

Fabricated cubicle mounted on individual bracket with anti-vibration isolator

### Instrument and control accessories

- Generator running indicator
- Manual button
- Auto button
- CB open button (Manual only)
- CB close button (Manual only)
- Manual start button
- Manual Stop/Reset button
- Selector switch (ACTIVE, PANEL LOCK, STOP/RESET)
- Mute alarm button
- Menu navigation button
- Common alarm indicator
- Voltage adjuster
- Speed adjuster
- Emergency stop pushbutton

### Measured items on LCD display

- Generator volts L1-N, L2-N, L3-N
- Generator volts L1-L2, L2-L3, L3-L1
- Generator amps L1, L2, L3
- Generator Frequency Hz
- Engine speed RPM
- Engine oil pressure (PSI & Bar & kPa)
- 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

### Shutdown and Warning items on LCD display

- High coolant temperature : shutdown and warning
- Low oil pressure : shutdown and warning
- Fail to start : shutdown
- Over-speed : shutdown and warning
- Under-speed : shutdown and warning
- Loss of speed signal : shutdown
- Fail to stop : warning
- Over voltage (DC) : warning
- Under voltage (DC) : warning
- Lubrication oil filter clogged : warning
- High oil temperature : shutdown and warning \*1 \*2
- Oil pressure sender open circuit : shutdown
- Charge fail : warning
- Exhaust gas temperature high : warning \*1
- Coolant level low : warning \*1
- High crankcase internal pressure : shutdown \*1
- Generator high current : shutdown (IDMT) and warning
- Over voltage (AC) : shutdown and warning
- Under voltage (AC) : shutdown and warning
- Over frequency : warning
- Under frequency : warning
- Overload : warning
- Winding temperature high (U, V, W) : warning \*1
- Bearing temperature high : warning \*1
- Electrical trip
- Emergency stop : shutdown

\*1 : MGS-C, HV continuous are applicable as standard. The others are applicable as option.

\*2 : MGS2700 and MGS2800 are applicable as standard. The others are applicable as option.

### Operation status indicated by LED

- Remote start present
- Generator ready
- Lubrication oil filter clogged
- Electrical trip

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## MGS SERIES AC GENERATOR MODEL: MG-P80R61/S83 (PRIME)

### Features

MGS original design, double bearings, 4 pole, screen protected, self excited, self regulating and brushless with fully connected damper windings, salient pole rotors, A.C. exciter and rotating rectifier unit. Direct coupled to engine and greasable bearing, direct drive centrifugal blower.

With space heater.

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 'F'

Temperature rise: 105°C(Prime)

### Voltage Regulator(Digital AVR)

Fully sealed, 3 phase RMS sensing AVR with built-in protection against sustained over-excitation.

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: No load <1.5% Non-distorting balanced liner load <3.0%

### Permanent Magnet Generator (PMG)

Separately excited system which provide isolated power supply for the AVR – sustain short circuit current approximately 250-300% under fault condition.

### Sensors

Temperature sensors are provided as follows.

Stator winding, 2 per each phase, PT100

Bearing, 1 per each bearing, PT100

\*Generator winding and bearing temperature indication Meters are option.

### Electrical Design

In accordance with ISO 8528-3, IEC60034-1/BS EN60034-1, BS5000 Part 3, VDE0530, NEMA MG1-32, CSA22-2-100, AS1359 and UL1004.

Telephone Harmonic factor (THF): Less than 2%

### Gen Set Option Features

#### ■ ENGINE

Air Cleaner, paper element dry type  
(For MGS-B, HV stand-by and prime only)  
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 Level Regulator

#### ■ EXHAUST

Exhaust Silencer  
Exhaust Flexible Pipe

#### ■ GENERATOR

Power Factor Regulator

#### ■ CONTROL PANEL

Diesel Generator Integrated Communication Synthesizer  
(DGICS-MII)  
Auxiliary Control Panel

Remote Monitor Interface

2157 expansion unit (Output signal module)

2130 expansion unit (Input signal module)

2133 expansion unit (RTD/Thermocouple input module)

#### ■ SWITCHGEAR

Circuit Breaker MCCB & ACB  
Reverse Power Relay



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