

# MITSUBISHI MGS SERIES

DIESEL GENERATOR SET

50Hz/1500 rpm/3.3kV



## MGS2000HV

50Hz/3.3kV

POWER RATING (0.8 P.F.)	MODEL CODE
STAND-BY 2200 kVA	53S-P80R2
PRIME 2000 kVA	53P-P80R2



MGS2000HV with typical options

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

### DIMENSION (Reference Data)

			STAND-BY 2200 kVA	PRIME 2000 kVA
Overall dimensions	L : Length	mm	6020	6020
	W : Width	mm	2250	2250
	H : Height	mm	2950	2950
Total Weight (Dry)		kg	16200	16200
Total Weight (Wet)		kg	16910	16910

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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

		STAND-BY	PRIME
		2200 kVA	2000 kVA
Gross Engine Power*	kWm	1850	1679
Brake mean effective pressure	MPa	2.3	2.1
Regenerative absorption	kW	140	140
Noise Level at 1 m (excluding: intake, exhaust & fan)	dB(A)	114	113
Fuel consumption load 100%*	L/hr.	446	410
Fuel consumption load 75%*	L/hr.	345	318
Combustion air inlet flow rate	m <sup>3</sup> /min	163	147
Exhaust gas flow rate	m <sup>3</sup> /min	431	389
Exhaust gas temperature	°C	550	550
Heat rejection to coolant	kW	1188	1073
Heat rejection to exhaust	kW	1542	1382
Heat rejection to atmosphere from engine	kW	143	129
Heat rejection to atmosphere from generator	kW	73	67

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

### Measured items on LCD display

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

### Shutdown and Warning items on LCD display

- |   |  |
|---|--|
| ■ High coolant temperature : shutdown and warning   | ■ Generator high current : shutdown (IDMT) and warning |
| ■ Low oil pressure : shutdown and warning           | ■ Over voltage (AC) : shutdown and warning             |
| ■ Fail to start : shutdown                          | ■ Under voltage (AC) : shutdown and warning            |
| ■ Over-speed : shutdown and warning                 | ■ Over frequency : warning                             |
| ■ Under-speed : shutdown and warning                | ■ Under frequency : warning                            |
| ■ Loss of speed signal : shutdown                   | ■ Overload : warning                                   |
| ■ Fail to stop : warning                            | ■ Winding temperature high (U, V, W) : warning *1      |
| ■ Over voltage (DC) : warning                       | ■ Bearing temperature high : warning *1                |
| ■ Under voltage (DC) : warning                      | ■ Electrical trip                                      |
| ■ Lubrication oil filter clogged : warning          | ■ Emergency stop : shutdown                            |
| ■ 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    |  |

\*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-P80R51 (STAND-BY) MG-P80R51 (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 regreaseable bearing, direct drive centrifugal blower.

With Space heater.

Enclosure: Drip-proof IP23

### Winding System

Standard 6 wire winding is provided. All windings are formed wound and impregnated in vacuum pressure with a special epoxy resin.

Overspeed capability: 125% for 2 minutes

Insulation: Class 'H'

Temperature rise: 150°C(Stand-by),125°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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