MITSUBISHI MGS SERIES

DIESEL GENERATOR SET
50Hz/1500 rpm/380V

MGS1500C

POWER RATING (0.8 P.F.)		MODEL CODE
PRIME	1735 kVA	5CP-7PF
CONTINUOUS	1550 kVA	5C-7PE

MGS1500C with typical options

Voltage Variation

■ Standard Voltage 3Phase 4 Wires
380V

■ Voltages Available 3Phase 4 Wires
380, 400, 415 and 440V

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

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.

Continuous: Code:C

Applicable for supplying power continuously.
Continuous power in accordance with ISO8528, ISO15550, ISO3046/1 and BS5514.

Conditions:

Engine ratings are based on SAE J1349 standard conditions. These ratings also apply at ISO3046/1, DIN6271 and BS5514 standard conditions.
Fuel rates are based 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 overload and additional rating requirements.

DIMENSION (Reference Data)

			PRIME 1735 kVA	CONTINUOUS 1550 kVA
Overall dimensions	L : Length	mm	5435	5420
	W : Width	mm	2160	2160
	H : Height	mm	2635	2635
Total Weight (Dry)		kg	12800	12800
Total Weight (Wet)		kg	13500	13500

MGS SERIES DIESEL ENGINE: MITSUBISHI S16R-PTA-S

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

ENGINE SPECIFICATIONS & TECHNICAL DATA

Bore	mm	170
Stroke	mm	180
Displacement	L	65.4
Piston speed	m/sec.	9.0
Compression ratio		14
Lubricating oil capacity	L	230
Coolant capacity without radiator	L	170
Coolant pump external resistance	m water	5.0
Coolant pump flow rate	L/min	1650
Cooling fan airflow rate	m^3/min	2040
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	350

ENGINE OPERATING DATA

		PRIME 1735 kVA	CONTINUOUS 1550 kVA
Gross Engine Power*	kWm	1450	1300
Brake mean effective pressure	MPa	1.8	1.6
Regenerative absorption	kW	140	140
Noise Level at 1 m (excluding: intake, exhaust & fan)	dB(A)	109	109
Fuel consumption load 100%*	L/hr.	354	314
Fuel consumption load 75%*	L/hr.	264	238
Combustion air inlet flow rate	m^3/min	121	108
Exhaust gas flow rate	m^3/min	320	284
Exhaust gas temperature	℃	520	510
Heat rejection to coolant	kW	882	782
Heat rejection to exhaust	kW	1060	925
Heat rejection to atmosphere from engine	kW	106	94
Heat rejection to atmosphere from generator	kW	61	57

* 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
Air filter, paper element type
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

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, Lub. Oil temperature, 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,
High crankcase internal pressure (MGS-C continuous only)

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)
- Engine Lub. Oil 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
- High exhaust gas 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.

MGS SERIES AC GENERATOR MODEL: MG-7PF (PRIME) MG-7PE (CONTINUOUS)

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 'F'

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
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
Lub. Oil Level Regulator

■ 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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