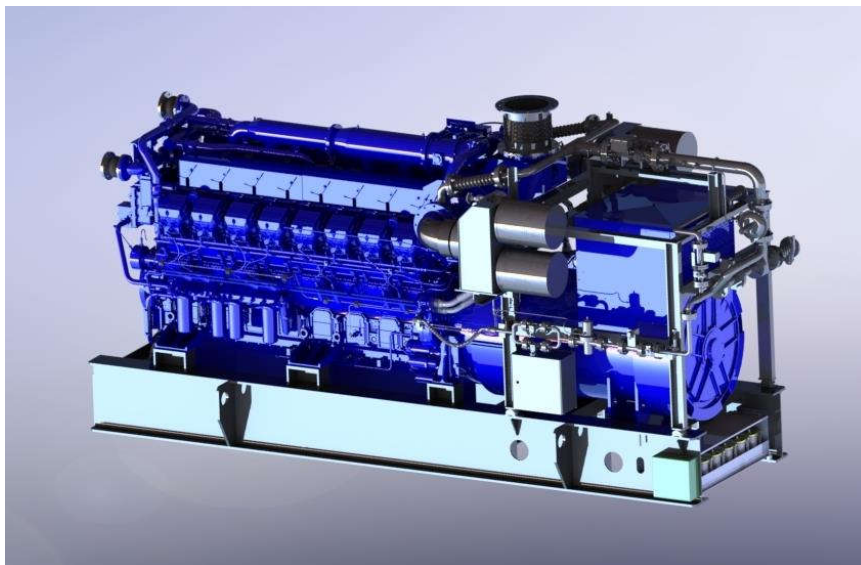


MITSUBISHI 1500KW GAS GENSET MGS-G-EU 1875-C



Rating

Generating set model	MGS-G-EU 1875-C
Generator voltage	400 V or MV/HV up to 20kV
Frequency	50 Hz
Gross generator output	1500 kWe
	1875 KVA
Power factor	1 / 0.8
Duty	Base load
Rating	Continuous
Overload	Not available
Installation location	Indoor

Design Conditions

Ambient temp - avg/max	25 / 40°C
Ambient temp - min	- 15°C
Altitude (maxi)	150 m a.s.l.
Relative humidity (maxi)	85 %
Fuel gas LHV	36470 kJ/Nm ³
Fuel gas methan number-min	80
Fuel gas	Natural gas
NOx emissions level (O2 5%)	500 mg/Nm ³
Lube oil consumption - max	0.34 g/kWh

Alternator main data

Enclosed, self ventilated, self regulated, brushless	
Bearing configuration	Single / double (MV)
Insulation class	H
Temperature rise class	F
Cooling method	Air IC01
Protection	IP23
Excitation system	digital
PT100 for bearing and stator winding	
AVR for single and parallel operation	
Space heater	
Set of CT's for measure and protection	
Set of VT's for measure and protection (MV only)	

Engine data

Engine model	GS16R2-PTK
Engine speed	1500 Rpm
Engine brake output	1563 kWm
Cylinder configuration	16 V
Total displacement	79.9 liters
Bore x Stroke	170 x 220 mm
Compression ratio	12 :1
Turbocharged	4 cycles
Governor	Electronic
Cooling method (electric pump)	Water (radiator)
Starting method	Electrical 24 V DC
Gas pressure at gas line inlet	350 to 600 Kpa

Standards

I.S.O. : International Standard Organization
 C.E.N. : European Standard Committee
 I.E.C: International Electric Commission
 J.I.S : Japanese Industrial Standards (for engine)
 J.E.C: Japan. Electrotechnical committee (engine)
 J.E.M: Japan Elec. Manufacturers Association (Eng.)
 Manufacturers standards

CE compliance

2014/35/EU : low voltage
 2006/42/EC : machinery
 2014/30/EU : EMC
 2014/68/EU : PED

Language - Units

Drawings, documents, nameplates in English
 SI metric system

Tolerances and conditions

Efficiency data for average conditions (avg) – derating above 150 m asl and 40°C intake air temperature
 Fuel input: 0/+5% (ISO3046/1). Submitted to fuel gas specification confirmation
 Heat rejection data for radiator design: including 17% margin
 Exhaust gas flow / temperature: +/- 6% - +/- 8%
 Pictures are not contractual and includes optional accessories
 These information are not contractual. They can be modified by MTEE without prior notice.

Performances (LV : 400V – MV : 6.3 kV – HV : 6.6 to 20 kV)

	Open skid set			Containerized set	
	LV	MV	HV	LV	HV
Auxiliary consumption (Cooling & ventilation) avg/max	29 / 32 kWe	29 / 32 kWe	29 / 32 kWe	35 / 38 kWe	35 / 38 kWe
Step up transformer losses	-	-	17 kWe	-	17 kWe
Gross generator output	1500 kWe	1500 kWe	1483 kWe	1500 kWe	1483 kWe
Net generating output (auxiliary deducted)	1471 kWe	1471 kWe	1453 kWe	1465 kWe	1448 kWe
Fuel gas input	3409 kW	3425 kW	3409 kW	3409 kW	3409 kW
Fuel gas flow rate	337 Nm3/h	337 Nm3/h	337 Nm3/h	337 Nm3/h	337 Nm3/h
Gross Power generation eff.	44.0 %	43.8 %	43.5 %	44.0 %	43.5 %
Net Power generation eff.	43.15 %	42.95 %	42.6 %	43.0 %	42.5 %
Noise level@1m(open skid) 10m(container) - max	108 dB(A)	108 dB(A)	108 dB(A)	65 dB(A)	65 dB(A)

Heat Balance

Heat rejection on Jacket water (HT) for radiator design	628 kW
Heat rejection on lube oil and charge air (LT) for radiator design	539 kW
Heat rejection on exhaust	1016 kW
Thermal radiation (engine block)	82 kW
Flow rate of HT cooling circuit	75 m3/h
Flow rate of LT cooling circuit	30 m3/h
Cooling water temperature at HT outlet - max	91°C +/-2
Cooling water temperature at LT inlet – Avg / max	35 / 49°C
Exhaust gas temperature	400°C
Exhaust gas flow rate	6828 Nm3/h
Air intake flow rate	120 m3/mn

Generating set remote control panel specification and main functions

Manual start and stop by push buttons on the (AGC) Automatic Genset Controller (DEIF made)

Automatic start and stop sequence

Automatic engine protection

Manual and automatic synchronization and parallel operation of gensets

Manual and automatic load sharing of generating sets

Automatic start and stop according to increase or decrease of load demand

Automatic and manual control of engine auxiliaries:

- Jacket water pump
- Intercooler water pump
- Jacket water heater
- Alternator heater
- Lube oil priming pump
- Radiator cooling fan
- Temperature control valves for jacket water and inter cooler
- Generating set ventilation fans

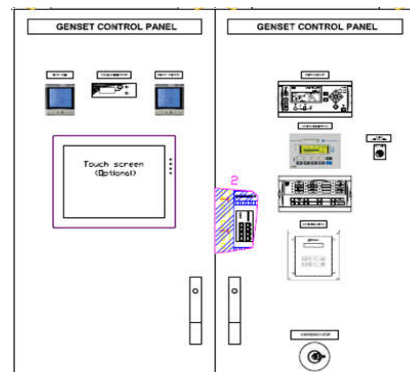
24 V DC energy block to supply PLC and panel equipment

24 V DC charger to supply engine starting batteries

7" Human Machine Interface (HMI) for display and monitoring of operating data, alarms and history logs

HMI is equipped with Ethernet TCP/IP com port for internet remote access

Generating set protection and alarm devices



Optional Harness assembly for cable connection of Genset Control Panel

As an option, this cable kit is delivered already mounted on genset side, with industrial type connectors for GCP connection.

Optional SCADA system integrated in generating set control panel (15" touch screen)

As an option, a 15" graphic colour touch screen is integrated in the Generating set Control Panel, this item complete the HMI system. It is provided with built-in SCADA software for monitoring and control + remote access by web server via the freeware VNC (Virtual Network Computing).

Generating set remote protection circuit breaker specification and main functions (LV)

- Manufacturer: Mitsubishi Electric
- Motorized - 3 poles – 3200 Amps – 0.4 kV
- Electric protection relay - Command coils 24 / 48 V
- Auxiliary contacts - Protection panel of On / off push buttons
- Panel with copper fitting bars.
- Metering device (Class 0.5) for generator net output, auxiliary supply from generator and grid

Generating set remote protection circuit breaker specification and main functions (MV - HV)

- Motorized - 3 poles – Withdrawable – SF6 – 400 Amps
- Command coils 48 V and auxiliary contacts
- VT and CT for measurement and protection
- Protection panel of On / off push buttons
- Panel with copper fitting bars.
- DC supply (48 V) battery and charger
- The panel is equipped with digital protection relay
- Digital metering (class 0.5) provides power (kW, KVA, KVAR), energy (kWh, kVAh, kVARh), 3 ph amps, volts and frequency.

Step up transformer

- Output : 2 000 KVA, A0Ak (low losses)
- Frequency : 50 Hz
- Primary voltage LV : 400 V
- Secondary voltage HV : 6.6 – 11 or 20k V
- Set up plugs (by switch): +/- 2,5% +/- 5%
- Dielectric : Oil
- Coupling : Dyn11, Protection DGPT2
- LV and HV connections
- Protection on LV connections
- Lifting rings , rolls and manufacturer plate
- LV and HV locking
- Oil retention tank (full capacity) with flame arrestor

Busbar from alternator to transformer

- Rating: 400V / 3200 A.
- Poles : 3
- Type : Aluminium
- Protection index : IP31
- Insulation voltage : 1000 V
- Equipments :
 - . LV insulated flexible bar connections
 - . supporting frame
 - . adaptation casings on alternator and transformer

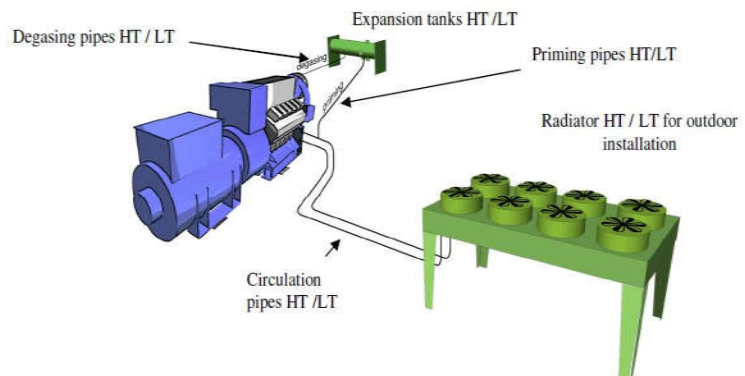
Sound proofed generating set container main specifications

- Sound proofing baffles
- Rain screens protected by anti volatile grid
- Air extractor fans for heat dissipation
- Room thermostat
- Access doors & maintenance doors, with anti panic bar and locks
- Ladder for access to the roof of container
- Normal indoor lighting and emergency lighting
- Fire detection system
- Gas detection syst. + automatic shut off valve
- External emergency stop button
- All technical passages for cables and pipes



Remote external HT / LT dry air cooler main specification

- Horizontal double bundle
- Copper tubes and aluminum fins
- Expansion tanks on radiator
- Low level switches, level indicator
- Noise level < 65 dB(A)@10 m



Engineering and documentation

- Layout drawing of generating set and included auxiliaries
- Generating set tests report
- Fluids schematics of included equipment
- Electrical schematics of included equipment
- Generating set operation manual and spare parts book

Dimensions and weights

	Open skid set			Containerized set	
	LV	MV	HV	LV	HV
Length (mm)	5180	6000	6900	ISO	ISO
Width (mm)	2270	2270	2270	40'	45'
Height (mm)	2430	2430	2430	HC	HC
Dry weight (kg)	14000	15450	16000	32000	34000
Wet weight (kg)	14700	16150	16700	33600	35600

Scope of supply

● Standard item ○ Option - Not included or not applicable	Open skid set		Containerized set	
	LV - MV	HV	LV-MV	HV
Steel base frame with engine-alternator	●	●	●	●
Elastic suspensions of the generating set	●	●	●	●
Starting batteries and cables	●	●	●	●
Pump for lube oil priming	●	●	●	●
Jacket water heating + alternator heating	●	●	●	●
Fuel main and pre chamber gas train fitted on generating set	●	●	●	●
Oil mist separator (centrifugal type, maintenance free)	●	●	●	●
Dry air filter, high efficiency on turbocharger	●	●	●	●
Electrical jacket water pump (loose supply for open skid)	●	●	●	●
Electrical Intercooler pump (loose supply for open skid)	●	●	●	●
Remote external dry air cooler	○	○	●	●
Temp. control valve for jacket water (loose supply for open skid)	●	●	●	●
Temp. control valve for inter cooler (loose supply for open skid)	●	●	●	●
Remote box for radiator fan (feeders and meter)	○	○	●	●
Generating set remote control panel (GCP)	●	●	●	●
Harness assembly for GCP with connectors (mounted on genset side)	○	○	●	●
Remote generating set protection circuit breaker (LV or MV/HV)	○	○	●	●
Generating set factory tests (standard program)	●	●	●	●
Generating set finishing color: Blue RAL 5010	●	●	●	●
Exhaust silencer 50 dB(A) attenuation (loose supply for open skid)	○	○	●	●
Exhaust bellow on turbocharger outlet	●	●	●	●
Automatic filling device on engine sump	●	●	●	●
Lube oil service tank 200 liters capacity (loose supply for open skid)	○	○	●	●
Set of flexible connections for engine	●	●	●	●
Engine standard tools for routine maintenance	●	●	●	●
Step up transformer LV / HV	-	●	-	●
LV connection busbar from alternator to transformer	-	●	-	●
Sound proofed generating set container	-	-	●	●
Elbow pipe between the engine and the silencer	-	-	●	●
Water pipes from engine to dry air cooler	-	-	●	●
Cooling circuit degassing and priming pipes	-	-	●	●
Lube oil pipes from service tank to engine sump filling device	-	-	●	●
LV power cables from alternator to protection circuit breaker	-	-	●	-
HV power cables from transformer to protection circuit breaker	-	-	-	●
Fuel gas flow meter fitted on gas train	○	○	○	○
Scada system, Integrated in genset control panel (15" touch screen)	○	○	○	○
Gas compressor for pre chamber gas train in case of site low press.	○	○	○	○
Oversized dry air cooler for high ambient temp.	○	○	○	○
CHP hot water production module 70 / 90°C	○	○	○	○
Thermal metering	○	○	○	○
On site assistance for supervisory, commissioning and training	○	○	○	○
Alternator according to specific country grid code	○	○	○	○