

Technical Data Sheet

93800050149_V09_en_GB

Voltage / Frequency

Cooling water temperature (in / out)

NOx emissions (dry, 5 % O₂)

Mixture cooler 1st stage water temperature (in)

Mixture cooler 2nd stage water temperature (in)

Exhaust gas temperature

Catalytic converter

Special equipment

Altitude above sea level

Combustion air temperature

Relative combustion air humidity

Standard specifications and regulations

MTU 12V4000 GS

GG12V4000A1



| | | | |
|------------------------|-------|--------------|------|
| V / Hz | 10500 | / | 50 |
| °C | | 78 / 90 | |
| mg/m ³ i.N. | | < 500 | |
| °C | | 43 | |
| °C | | 410 | |
| | | not included | |
| m / mbar | 100 | / | 1000 |
| °C | | 25 | |
| % | | 30 | |

| Energy balance | % | 100 | 75 | 50 |
|--|-----------------------------|-------------------------|---------------------------|---------|
| Electrical Power ^{2) 3)} | kW | 1515 | 1136 | 758 |
| Energy input ^{4) 5)} | kW | 3438 | 2634 | 1838 |
| Thermal output total ⁶⁾ | kW | 712 | 521 | 357 |
| Thermal output engine (block, lube oil, 1st stage mixture cooler) ⁶⁾ | kW | 712 | 521 | 357 |
| Thermal output mixture cooler 1st stage ⁶⁾ | kW | | | |
| Thermal output mixture cooler 2nd stage ⁶⁾ | kW | 104 | 73 | 49 |
| Exhaust heat (120 °C) ⁶⁾ | kW | (691) | (585) | (440) |
| Engine power ISO 3046-1 ²⁾ | kW | 1560 | 1171 | 785 |
| Generator efficiency at power factor = 1 | % | 97.1 | 97.0 | 96.5 |
| Electrical efficiency ⁴⁾ | % | 44.1 | 43.1 | 41.2 |
| Total efficiency | % | 84.9 | 85.1 | 84.6 |
| Power consumption ⁷⁾ | kW | | | |
| Combustion air / Exhaust gas | | | | |
| Combustion air volume flow ¹⁾ | m ³ i.N./h | 5824 | 4377 | 2991 |
| Combustion air mass flow | kg/h | 7521 | 5652 | 3862 |
| Exhaust gas volume flow, wet ¹⁾ | m ³ i.N./h | 6016 | 4524 | 3094 |
| Exhaust gas volume flow, dry ¹⁾ | m ³ i.N./h | 5569 | 4181 | 2854 |
| Exhaust gas mass flow, wet | kg/h | 7774 | 5845 | 3997 |
| Exhaust temperature after turbocharger | °C | 410 | 446 | 476 |
| Reference fuel ⁸⁾ | | | | |
| Natural gas | | | CH ₄ >95 Vol.% | |
| Sewage gas | | | not applicable | |
| Biogas | | | not applicable | |
| Landfill gas | | | not applicable | |
| Fuel requirements ⁹⁾ | | | | |
| Minimum methane number | MN | | 80 | |
| Range of heating value: design / operation range without power derating | kWh/m ³ i.N. | | 10.0 - 10.5 / 8.0 - 11.0 | |
| Exhaust gas emissions ^{5) 8)} | | | | |
| NOx, stated as NO ₂ (dry, 5 % O ₂) | mg/m ³ i.N. | < 500 | | |
| CO (dry, 5 % O ₂) | mg/m ³ i.N. | < 1000 | | |
| HCHO (dry, 5 % O ₂) | mg/m ³ i.N. | < 104 | | |
| VOC (dry, 5 % O ₂) | mg/m ³ i.N. | | | |
| Otto-gas engine, lean burn operation with turbocharging | | | | |
| Number of cylinders / configuration | | 12 | / | V |
| Engine type | | | 12V4000L64 | |
| Engine speed | 1/min | | 1500 | |
| Bore | mm | | 170.0 | |
| Stroke | mm | | 210.0 | |
| Displacement | dm ³ | | 57.2 | |
| Mean piston speed | m/s | | 10.5 | |
| Compression ratio | | | 14.0 | |
| BMEP at nominal engine speed min-1 | bar | 21.8 | | |
| Lube oil consumption ¹⁰⁾ | dm ³ /h | 0.27 | | |
| Exhaust back pressure min. - max. after module | mbar - mbar | | 30 - 60 | |
| Generator | | | | |
| Rating power (temperature rise class F) ¹¹⁾ | kVA | | 2167 | |
| Insulation class / temperature rise class | | | F / F | |
| Winding pitch | | | 2/3 | |
| Protection | | | IP 23 | |
| Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) ¹²⁾ | | | 0.8 / 0.95 | |
| Voltage tolerance / frequency tolerance | % | | ± 10 / ± 5 | |
| Engine cooling water system | | | | |
| Coolant temperature (in / out), design | °C | 78 / 90 | | |
| Coolant flow rate, constant ^{13) 14)} | m ³ /h | 55.3 | | |
| Pressure drop, design ¹⁴⁾ | Cv value ^{13) 15)} | bar / m ³ /h | 1.88 | / |
| Max. operation pressure (coolant before engine) | bar | | 6.0 | 41.0 |
| Exhaust gas heat exchanger (EGHE) | | | | |
| Exhaust gas temperature (out) | °C | | | |
| Coolant temperature (in / out), design | °C | | | |
| Coolant volumetric flow, constant ^{13) 14)} | m ³ /h | | | |
| Pressure drop, design ¹⁴⁾ | Cv value ^{13) 15)} | kPa / m ³ /h | / | |
| Min. coolant flow rate / min. operation gauge pressure | m ³ /h / bar | | / | |
| Max. operation pressure (coolant water) | bar | | | |

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| Mixture cooler 1st stage, external | | | | |
|---|-----------------------------|------------|-------------------------|-----------|
| Coolant temperature (in / out), design | °C | | | |
| Coolant volumetric flow, design, constant ^{13) 14)} | m³/h | | | |
| Pressure drop, design ¹⁴⁾ | Cv value ^{13) 15)} | bar / m³/h | / | |
| Min. coolant flow rate / min. operation gauge pressure | m³/h / bar | | / | |
| Max. operation pressure before mixture cooler | bar | | | |
| Mixture cooler 2nd stage, external | | | | |
| Coolant temperature (in / out), design | °C | 43 / 45.8 | | |
| Coolant volumetric flow, design, constant ^{13) 14)} | m³/h | 34.3 | | |
| Pressure drop, design ¹⁴⁾ | Cv value ^{13) 15)} | bar / m³/h | 0.36 | / 58.4 |
| Max. operation pressure before mixture cooler | bar | | 6 | |
| Heating circuit interface | | | | |
| Engine coolant temperature (in / out), design | °C | | | |
| Heating water temperature (in / out), design | °C | | | |
| Heating water flow rate, design ^{14) 16)} | m³/h | | | |
| Pressure drop, design ¹⁴⁾ | Cv value ^{15) 16)} | bar / m³/h | / | |
| Max. operation gauge pressure (heating water) | bar | | | |
| Room ventilation | | | | |
| Genset ventilation heat ¹⁷⁾ | kW | | 105 | |
| Inlet air temperature: (min./design/max.) | °C | | 20 / 25 / 30 | |
| Min. engine room temperature ¹⁸⁾ | °C | | 15 | |
| Max. temperature difference ventilation air (in / out) | K | | 20 | |
| Min. supply air volume flow rate (combustion + ventilation) ¹⁹⁾ | m³ i.N./h | | 20500 | |
| Gearbox | | | | |
| Efficiency | % | 100 | 75 | 50 |
| Starter battery | | | | |
| Nominal voltage / power / capacity required | V / kW / Ah | | 24 / 9.0 / -- | |
| Filling quantities | | | | |
| Lube oil for engine | dm³ | | 220 | |
| Coolant in engine | dm³ | | 200 | |
| Coolant in mixture cooler | dm³ | | 20 | |
| Heating water for plate heat exchanger ²⁰⁾ | dm³ | | | |
| Lube oil for gearbox | dm³ | | | |
| Gas regulation line | | | | |
| Nominal size / gas pressure min. - max. | DN / mbar - mbar | 80 | / | 180 - 250 |
| Engine sound level ²¹⁾ (1 meter distance, free field) +3 dB(A) for total A-weighted level tolerance | | | | |
| Frequency | Hz | 63 | 125 | 250 |
| Sound pressure level | dB | 83.3 | 87.4 | 88.6 |
| Frequency | Hz | 1000 | 2000 | 4000 |
| Sound pressure level | dB | 90.1 | 87.3 | 92.9 |
| | Lin dB | 104.9 | | |
| Sum of pressure levels | dB A | 104.5 | | |
| Sound power level | dB | 123.9 | | |
| Undamped exhaust noise ²¹⁾ (1 meter distance to outlet within 90°, free field) +3 dB(A) for total A-weighted level tolerance | | | | |
| Frequency | Hz | 63 | 125 | 250 |
| Sound pressure level | dB | 114.8 | 118.2 | 114.1 |
| Frequency | Hz | 1000 | 2000 | 4000 |
| Sound pressure level | dB | 98.7 | 95.7 | 91.3 |
| | Lin dB | 121.1 | | |
| Sum of pressure levels | dB A | 109.5 | | |
| Sound power level | dB | 122.4 | | |
| Dimensions (aggregate) | | | | |
| Length | mm | | ~ 5000 | |
| Width | mm | | ~ 2000 | |
| Height | mm | | ~ 2300 | |
| Gross weight (dry weight) | kg | | ~ 14500 (~ 14000) | |
| Power derating | | | | |
| Altitude | | | specific to the project | |
| Combustion air temperature | | | specific to the project | |
| Mixture cooler coolant temperature (in) | | | specific to the project | |
| Methane number | | | specific to the project | |

Systems and consumables have to conform to the following actual company standards: A001067

- 1) Normal cubic meter at 1013 mbar and T = 273 K
- 2) Prime power operation will be designed specific to the project
- 3) Generator gross power at nominal voltage, power factor = 1 and nominal frequency
- 4) According to ISO 3046 (+ 5 % tolerance), using reference fuel used at nominal voltage, power factor = 1 and nominal frequency
- 5) Emission values during grid parallel operation
- 6) Thermal output at layout temperature; tolerance +/- 8 %
- 7) Power consumption of all electrical consumers which are mounted at the module / genset
- 8) Deviations from the layout parameters respectively the reference fuel can have influence on the obtained efficiency and exhaust emissions
- 9) Functional capability
- 10) Reference value at nominal load (without amount of oil exchange)
- 11) Genset max. 1000 m height of location and max. 40 °C intake air temperature; else power derating
- 12) Max. allowable cos phi at nominal power (view of producer)
- 13) Stated values for cooling fluid composition 65% water and 35% glycol, adaption for use of other cooling fluid composition necessary
The system design must consider the tolerance.
- 14) Pressure loss at reference flow rate
- 15) The Cv value declares the volumetric flow in m³/h at a pressure drop of 1 bar. Min. and max. flow rate limits are defined.
- 16) Stated values for pure water, adaption for other cooling fluid composition necessary
- 17) Only generator- and surface losses
- 18) Frost-free conditions must be guaranteed
- 19) Amount of ventilation air must be adapted to the gas safety concept
- 20) Assemblies including pipe work
- 21) All sound pressure levels at nominal load
- 22) Max. admissible cos phi depending on voltage in accordance with the requirements of the BDEW Mittelspannungsrichtlinie (German Medium Voltage Directive)

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