| Voltage Frequency Voltage Frequency Voltage | Technical Data Sheet 93800052824_V01_en_GB | MTU 20V4000 GS GG20V4000A1 | | onsite energy | | |
|--|---|-------------------------------|---------|---------------------------|---------------------------------------|--|
| Note missions (47, 5 % 0.0) | Voltage / Frequency | V / Hz | 11000 | 1 | 50 | |
| Michature cooler fat slage water temperature (in) | Cooling water temperature (in / out) | | | 77 / 91 | | |
| Mature cooler 2nd stage water temperature (in) Co | NOx emissions (dry, 5 % O ₂) | • | | < 250 | | |
| Exhaust gas temperature Catalytic converter Special equipment Special equipmen | • , , , | | | | | |
| Special equipment | • , , , | | | | | |
| Special pulpment Previous a pulpment Previous and pregulations are tresperature Previous and pregulations are tresperature Previous and pregulations are tresperature Previous and pregulations Previous and previous and pregulations Previous and pregulations Previous and pregulations Previous and previous an | | °C | | | | |
| Eventor above sea level m / mbar 100 | · | | | not included | | |
| Contact contact regulations in Funding Standard specifications and regulations 100 | · | | | | | |
| Part | | | 100 | · | 1000 | |
| Search specifications and regulations Work 100 75 59 | | | | | | |
| Electrical Power **** 1905 1901 1288 1901 128 | • | % | | | | |
| Energy by 1501 500 | | | | | | |
| Thermal coutput totals "0 | | | | | | |
| Thermal output michae (block, bibe oil, 1st stage mixture cooler) ** Thermal output mixture cooler 1st stage ** Thermal output mixture 1st stage ** | | | | | | |
| Thermail output mixture cooler fat stage | | | | | | |
| Thermal pulpur instruce colore 2nd stage 61 | | | 1411 | 1038 | 123 | |
| Enhance 1,20 ° C) ° | | | 217 | 127 | 02 | |
| Engine power ISO 3046-1 | | | | | | |
| Generator efficiency at power factor = 1 | Engine power ISO 3046-1 2) | | | | · , | |
| Electrical efficiency | | | | | | |
| Total efficiency | | | | | | |
| Combustion air Volume flow " | · · · · · · · · · · · · · · · · · · · | | | | | |
| Combustion air / Exhaust gas m³ i.N./h 10046 7563 5075 Combustion air mass flow kg/h 12973 9767 6554 Exhaust gas volume flow, wet ¹⁰ m² i.N./h 1046 7947 5345 Exhaust gas volume flow, duy ¹¹ m² i.N./h 1942 7101 4751 Exhaust gas sans silow, wet kg/h 1309 1010 6788 Exhaust temperature after turbocharger "C 423 459 514 Reference future "CH_255 Vcl," mot applicable 101 | | | 57.5 | 00.0 | 00.0 | |
| Combustion air volume flow with mass flow m* IAM, mass flow 10046 (8554) 7563 (8554) 5075 (8554) 5075 (8554) 5075 (8554) 5075 (8554) 5075 (8554) 5075 (8554) 5075 (8554) 5075 (8554) 5075 (8554) 5075 (8554) 5075 (8554) 5075 (8554) 5075 (8554) 5074 (8554) 5075 (8554) 5075 (8554) 5075 (8554) 5075 (8554) 5074 (8554) 5075 (8554) <td></td> <td>12.4.4</td> <td></td> <td></td> <td></td> | | 12.4.4 | | | | |
| Combustion air mass flow Right 12973 9767 6554 545 5 | | m³ i.N./h | 10046 | 7563 | 5075 | |
| Exhaust gas volume flow, unt 1 | | | | | | |
| Exhaust gas volume flow, dry "9 | | | | | | |
| Exhaust gas mass flow, we' contained and returbing any service of the shaust temperature after turbing any service of the shaust temperature after turbing and service of the shaust temperature after turbing and service of the servi | | | | | | |
| Natural gas | | | 13409 | 10101 | 6788 | |
| Natural gas | | - | 423 | 459 | 514 | |
| Severage gas | | | | | | |
| Bogas | Natural gas | | | CH ₄ >95 Vol.% | | |
| Landfill gas | Sewage gas | | | not applicable | | |
| Fuel requirements " MN 70 | Biogas | | | not applicable | | |
| Minimum methane number Minimum methane number Range of heating valuer design / operation range without power derating Wilh/m³ i.N. 10.0 - 10.5 / 8.4 - 11.0 | Landfill gas | | | not applicable | | |
| Range of heating value: design/ operation range without power derating kWh/m³ i.N. 10.0 - 10.5 / 8.4 - 11.0 Exhaust gas emissions ³³¹¹ Compliance with emissions standards only for ≥ 1268 kWel mg/m³ i.N. < 250 | Fuel requirements 9) | | | | | |
| Exhaust gas emissions 3-10 Compliance with emissions standards only for ≥ 1268 kWel Mox. stated as No. (div, 5 % O.) mg/m³ i.N. < 1000 | | | | | | |
| CO (dry, 5 % O₂) mg/m³ i.N. < 1000 | Exhaust gas emissions ^{5) 8)} Compliance with emissions standards only for ≥ 1268 kWel | | . 250 | 10.0 - 10.5 / 8.4 - 11.0 | | |
| FCHO (dry, 5 % O₂) | | | | | | |
| Mode March | · · · · | - | | | | |
| Number of cylinders / configuration 20 / V Engine type 20V4000L64FNER 20V4000L64FNER Engine speed 1/min 1500 Bore mm 170.0 Stroke mm 210.0 Displacement dm³ 95.3 Mean piston speed dm³ 10.5 Compression ratio bar 21.8 Exhaust back pressure min max. after module mbar - mbar 30 - 60 Exhaust back pressure min max. after module mbar - mbar 30 - 60 Exhaust back pressure min max. after module mbar - mbar 30 - 60 Exhaust back pressure min max. after module mbar - mbar 30 - 60 Exhaust back pressure min max. after module mbar - mbar 30 - 60 Exhaust back pressure min max. after module mbar - mbar 30 - 60 Exhaust back pressure min max. after module mbar - mbar 30 - 60 Exhaust back pressure min max. after module kVA 3724 Insulation class / temperature rise class F) ********************************** | | | < 90 | | | |
| Number of cylinders / configuration 20 / V Engine type 20V4000L64FNER 20V4000L64FNER 1500 | | mg/m² i.iv. | | | | |
| Engine type | | | 20 | 1 | V | |
| Engine speed | , , | | 20 | 20V4000L64FNFR | · · · · · · · · · · · · · · · · · · · | |
| Bore | | 1/min | | | | |
| Stroke mm 210.0 Displacement dm³ 95.3 Mean piston speed m/s 10.5 Compression ratio bar 21.8 BMEP at nominal engine speed min-1 bar 21.8 Lube oil consumption ¹⁰ dm³/n 0.44 Exhaust back pressure min max. after module mbar - mbar 30 - 60 Generator Rating power (temperature rise class F) ¹¹ kVA 3724 Insulation class / temperature rise class F / F Winding pitch 2/3 2/3 Protection IP23 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 77 / 91 Coolant flow rate, constant ^{13,14} 93.9 | <u> </u> | | | | | |
| Displacement dm³ 95.3 | | | | | | |
| Mean piston speed m/s 10.5 Compression ratio 12.5 BMEP at nominal engine speed min-1 bar 21.8 Lube oil consumption ¹⁰⁾ dm³/h 0.44 Exhaust back pressure min max. after module mbar - mbar 30 - 60 Generator Rating power (temperature rise class F) ¹¹⁾ kVA 3724 Insulation class / temperature rise class F) ¹¹⁰ kVA 3724 Insulation class / temperature rise class F) ¹¹⁰ kVA 3724 Insulation class / temperature rise class F) ¹¹⁰ kVA 3724 Insulation class / temperature rise class F) ¹¹⁰ kVA 3724 Insulation class / temperature rise class F) ¹¹⁰ kVA 3724 Insulation class / temperature rise class F) ¹¹⁰ kVA 3724 Insulation class / temperature (in class / temperature | | | | | | |
| Compression ratio BMEP at nominal engine speed min-1 bar 21.8 | | | | | | |
| BMEP at nominal engine speed min-1 bar dm³/h dm³/h 0.44 21.8 Lube oil consumption (0) dm³/h 0.44 30 - 60 Exhaust back pressure min max. after module mbar - mbar 30 - 60 Generator Fating power (temperature rise class F) ¹¹⁾ kVA 3724 Insulation class / temperature rise class F / F | | | | | | |
| Exhaust back pressure min max. after module mbar - mbar 30 - 60 Generator Central controls Contr | | bar | 21.8 | | | |
| Generator Rating power (temperature rise class F) 1111111111111111111111111111111111 | | dm³/h | 0.44 | | | |
| Rating power (temperature rise class F) 11) kVA 3724 Insulation class / temperature rise class F / F Winding pitch 2/3 Protection IP23 Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) 12) 0.8 / 0.95 Voltage tolerance / frequency tolerance % ±10 / ±5 Engine cooling water system | Exhaust back pressure min max. after module | mbar - mbar | | 30 - 60 | | |
| Insulation class / temperature rise class | | | | | | |
| Winding pitch 2/3 Protection IP23 Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) 12) 0.8 / 0.95 Voltage tolerance / frequency tolerance % ± 10 / ± 5 Engine cooling water system Colant temperature (in / out), design °C 77 / 91 Coolant flow rate, constant 13) 14) m³/h 93.9 Pressure drop, design 14) Cv value 13) 15) bar / m³/h 2.89 / 56.1 Max. operation pressure (coolant before engine) bar 6.0 Exhaust gas temperature (out) °C Exhaust gas temperature (out) °C Coolant temperature (in / out), design °C Coolant temperature (n) design 14) Cv value 13) 15) kPa / m³/h / Pressure drop, design 14) Cv value 13) 15) kPa / m³/h / Min. coolant flow rate / min. operation gauge pressure RPa / m³/h / bar / | Rating power (temperature rise class F) 11) | kVA | | 3724 | | |
| Protection IP23 Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) 20 | Insulation class / temperature rise class | | | F/F | | |
| 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 77 / 91 Coolant flow rate, constant 13) 14) m3/h 93.9 Pressure drop, design 14) Cv value 13) 15) bar / m3/h 2.89 / 56.1 Max. operation pressure (coolant before engine) bar 6.0 6.0 Exhaust gas temperature (out) °C Coolant temperature (out), design °C Coolant temperature (in / out), design °C Coolant volumetric flow, constant 13) 14) m3/h Pressure drop, design 14) Cv value 13) 15) kPa / m3/h / Min. coolant flow rate / min. operation gauge pressure m3/h / bar / | | | | | | |
| Voltage tolerance / frequency tolerance % ± 10 / ± 5 Engine cooling water system Coolant temperature (in / out), design °C 77 / 91 Coolant flow rate, constant ¹³¹¹²¹⟩ m³/h 93.9 56.1 Pressure drop, design ¹²¹⟩ bar / m²/h 2.89 / 56.1 Max. operation pressure (coolant before engine) bar 6.0 6.0 Exhaust gas heat exchanger (EGHE) °C Coolant temperature (out) °C Coolant temperature (in / out), design °C Coolant volumetric flow, constant ¹³¹¹²⟩ m³/h Fressure drop, design ¹²¹⟩ MPa / m²/h / Min. coolant flow rate / min. operation gauge pressure m²/h / bar / / | Max allowable of industive (evereveited) / conscitive (undersysted) 12) | | | | | |
| Engine cooling water system Coolant temperature (in / out), design Coolant flow rate, constant (13) 14) Pressure drop, design (14) Max. operation pressure (coolant before engine) Exhaust gas teat exchanger (EGHE) Exhaust gas temperature (out) Coolant temperature (in / out), design Coolant temperature (in / out), design Coolant volumetric flow, constant (13) 14) Pressure drop, design (14) Cv value (13) 15) KPa / m³/h Min. coolant flow rate / min. operation gauge pressure | | 0/_ | | | | |
| Coolant temperature (in / out), design Coolant flow rate, constant 13) 14) Ressure drop, design 14) Covalue 13) 15) Max. operation pressure (coolant before engine) Exhaust gas heat exchanger (EGHE) Exhaust gas temperature (out) Coolant temperature (in / out), design Coolant temperature (in / out), design Coolant volumetric flow, constant 13) 14) Pressure drop, design 14) Covalue 13) 15) KPa / m³/h Min. coolant flow rate / min. operation gauge pressure Coolant temperature (in / out), design / (CVV) Min. coolant flow rate / min. operation gauge pressure Coolant temperature (in / out), design / (CVV) Repa / m³/h / bar / (CVV) Repa / m³/h / (CVV) | | 70 | | ± IU/±5 | | |
| Coolant flow rate, constant ¹³⁾¹⁴⁾ Ressure drop, design ¹⁴⁾ Cv value ¹³⁾¹⁵⁾ Bar / m³/h 2.89 / 56.1 Max. operation pressure (coolant before engine) Exhaust gas heat exchanger (EGHE) Exhaust gas temperature (out) Coolant temperature (in / out), design Coolant volumetric flow, constant ¹³⁾¹⁴⁾ Pressure drop, design ¹⁴⁾ Cv value ¹³⁾¹⁵⁾ KPa / m³/h Min. coolant flow rate / min. operation gauge pressure m³/h / bar / | | °C | 77 / 01 | | | |
| Pressure drop, design ¹⁴) Cv value ^{13) 15)} bar / m³/h 2.89 / 56.1 Max. operation pressure (coolant before engine) bar 6.0 Exhaust gas heat exchanger (EGHE) Exhaust gas temperature (out) °C Coolant temperature (in / out), design °C Coolant volumetric flow, constant ^{13) 14)} m³/h Pressure drop, design ¹⁴) Cv value ^{13) 15)} kPa / m³/h / for / Min. coolant flow rate / min. operation gauge pressure m³/h / bar / | | | | | | |
| Max. operation pressure (coolant before engine) bar 6.0 Exhaust gas heat exchanger (EGHE) Exhaust gas temperature (out) °C Coolant temperature (in / out), design °C Coolant volumetric flow, constant 13 14) m³/h Pressure drop, design 14) Cv value 13 15) kPa / m³/h / J Min. coolant flow rate / min. operation gauge pressure m³/h / bar / | Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)} | | | 1 | 56 1 | |
| Exhaust gas heat exchanger (EGHE) Exhaust gas temperature (out) Coolant temperature (in / out), design °C Coolant volumetric flow, constant 13) 14) Pressure drop, design 14) Cv value 13) 15) Min. coolant flow rate / min. operation gauge pressure coolant volumetric flow, constant 13) 14) Min. coolant flow rate / min. operation gauge pressure coolant ratio of C | | | | 6.0 | | |
| Exhaust gas temperature (out) Coolant temperature (in / out), design °C Coolant volumetric flow, constant ^{13) 14)} Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)} KPa / m³/h Min. coolant flow rate / min. operation gauge pressure °C kPa / m³/h / | | | | | | |
| Coolant temperature (in / out), design °C Coolant volumetric flow, constant ^{13) 14)} m³/h Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)} kPa / m³/h / Min. coolant flow rate / min. operation gauge pressure m³/h / bar / | | °C | | | | |
| Coolant volumetric flow, constant ^{13) 14)} Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)} Min. coolant flow rate / min. operation gauge pressure m³/h / bar / | Coolant temperature (in / out), design | | | | | |
| Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)} kPa / m³/h / Min. coolant flow rate / min. operation gauge pressure m³/h / bar / | Coolant volumetric flow, constant ¹³⁾ ¹⁴⁾ | | | | | |
| Min. coolant flow rate / min. operation gauge pressure m³/h / bar / | Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)} | | | / | | |
| | | m³/h / bar | | 1 | | |
| | Max. operation pressure (coolant water) | bar | | | | |

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| rechnical Data Sneet | | IVI I U 20V | | mtu | energy | |
|---|---------------------------------|-------------------------------|-------------------------|---------------------------------------|-----------|--|
| 93800052824_V01_en_GB | | GG20V4 | 000A1 | | energy | |
| Mixture cooler 1st stage, external | | | | | | |
| Coolant temperature (in / out), design | | °C | | | | |
| Coolant volumetric flow, design, constant 13) 14) | 42) 45) | 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 cooling 2nd stage, external | | | | | | |
| Coolant temperature (in / out), design | | °C | 43 / 47.3 | | | |
| Coolant volumetric flow, design, constant 13) 14) | | m³/h | 47.1 | | | |
| Pressure drop, design ¹⁴⁾ | Cv value 13) 15) | bar / m³/h | 1.08 | / | 46.4 | |
| 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 | | 1 | | |
| Max. operation gauge pressure (heating water) | OV Value | bar | | · · · · · · · · · · · · · · · · · · · | | |
| Room ventilation | | Dai | | | | |
| Genset ventilation heat ¹⁷⁾ | | kW | | 147 | | |
| Inlet air temperature: (min./design/max.) | | °C | | | | |
| | | | | 20 / 25 / 30.0 | | |
| Min. engine room temperature 18) | | °C | | 15 | | |
| Max. temperature difference ventilation air (in / out) | 10) | K | | 20 | | |
| Min. supply air volume flow rate (combustion + ventilation) |) 19) | m³ i.N./h | | 30500 | | |
| Gearbox | | % | 100 | 75 | 50 | |
| Efficiency | | % | - | - | - | |
| Starter battery | | | | | | |
| Nominal voltage / power / capacity required | | V / kW / Ah | | 24 / 2 x 9 / | | |
| Filling quantities | | | | | | |
| Lube oil for engine | | dm³ | | 450 | | |
| Coolant in engine | | dm³ | | 310 | | |
| Coolant in mixture cooler | | dm³ | | 25 | | |
| Heating water for plate heat exchanger 20) | | dm³ | | | | |
| Lube oil for gearbox | | dm ³ | | | | |
| Gas regulation line | | | | | | |
| Nominal size / gas pressure min max. (at gas regulation | line inlet) | DN / mbar - mbar | 100 | / | 190 - 250 | |
| Engine sound level 21) (1 meter distance, free field) +3 | 3 dB(A) for total A-weighted | l level tolerance: + 5 dB for | single octave le | evel | | |
| Frequency | () | Hz | 63 | 125 250 | 500 | |
| Sound pressure level | | dB | 93.1 | 95.1 91.5 | 95.0 | |
| Frequency | | Hz | 1000 | 2000 4000 | 8000 | |
| · · · | | dB | 93.5 | | | |
| Sound pressure level | | | | 92.8 91.8 | 99.7 | |
| Linear total sound pressure level | | Lin dB | 104.0 | | | |
| A-weighted total sound pressure level | | dB(A) | 102.0 | | | |
| A-weighted total sound power level | | dB(A) | 122.5 | | | |
| Undampened exhaust noise ²¹⁾ (1 meter distance to ou | itlet within 90°, free field) + | | | | | |
| Frequency | | Hz | 63 | 125 250 | 500 | |
| Sound pressure level | | dB | 118.4 | 118.9 108.8 | 100.5 | |
| Frequency | | Hz | 1000 | 2000 4000 | 8000 | |
| Sound pressure level | | dB | 91.9 | 91.5 91.8 | 84.1 | |
| Linear total sound pressure level | | Lin dB | 122.0 | | | |
| A-weighted total sound pressure level | | dB(A) | 106.5 | | | |
| A-weighted total sound power level | | dB(A) | 119.5 | | | |
| Dimensions (aggregate) | | (', | | | | |
| Length | | mm | | ~ 6500 | | |
| Width | | mm | | ~ 2000 | | |
| | | | | | | |
| Height Cross weight (dry weight) | | mm | | ~ 2400 | | |
| Gross weight (dry weight) | | kg | | ~ 20750 (~ 20000) | | |
| Power derating | | | | | | |
| Elevation | | | | 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 | | |
| Boundary conditions and consumables | | | | | | |
| Systems and consumables have to conform to the following actu- | ial company standards: | | | A001072 | | |
| Normal cubic meter at 1013 mbar and T = 273 K | | | | | | |

- Systems and consumables have to conform to the following actual company standards: Normal cubic meter at 1013 mbar and T = 273 K
- Prime power operation will be designed specific to the project 2)
- 3)
- Generator gross power at nominal voltage, power factor = 1 and nominal frequency
 According to ISO 3046 (+ 5 % tolerance), using reference fuel used at nominal voltage, power factor = 1 and nominal frequency 4)
- Emission values during grid parallel operation 5)
- Thermal output at layout temperature; tolerance +/- 8 % 6)
- 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
- Functional capability
- 10) Reference value at nominal load (without amount of oil exchange)
- 11) Generator (at nominal power) 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, according to ISO 8528-10 and ISO 6798.

Resonance effects of the connected exhaust line can influence the exhaust noise sound pressure level

22) Max. admissible cos phi depending on voltage in accordance with the requirements of the valid 'Standard specifications and regulations'

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