

Technical Data Sheet

93800051117_V04_en_GB

Voltage / Frequency

Heating 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

Elevation above sea level

Combustion air temperature

Relative combustion air humidity

Standard specifications and regulations

MTU 8V4000 GS

GG08V4000A1



V / Hz	400	/	50
°C		70 / 80	
mg/m ³ i.N.		< 250	
°C			
°C		43	
°C		425	
		not included	
m / mbar	100	/	1000
°C		25	
%		30	

Energy balance	%	100	75	50
Electrical Power ^{2) 3)}	kW	999	749	501
Energy input ^{4) 5)}	kW	2358	1790	1262
Thermal output total ⁶⁾	kW	495	360	244
Thermal output engine (block, lube oil, 1st stage mixture cooler) ⁶⁾	kW	495	360	244
Thermal output mixture cooler 1st stage ⁶⁾	kW			
Thermal output mixture cooler 2nd stage ⁶⁾	kW	72	48	31
Exhaust heat (120 °C) ⁶⁾	kW	(499)	(417)	(324)
Engine power ISO 3046-1 ²⁾	kW	1026	772	520
Generator efficiency at power factor = 1	%	97.4	97.1	96.3
Electrical efficiency ⁴⁾	%	42.4	41.8	39.7
Total efficiency	%	84.5	85.3	84.7
Power consumption ⁷⁾	kW			

Combustion air / Exhaust gas

Combustion air volume flow ¹⁾	m ³ i.N./h	3999	2975	2047
Combustion air mass flow	kg/h	5164	3842	2644
Exhaust gas volume flow, wet ¹⁾	m ³ i.N./h	4132	3076	2116
Exhaust gas volume flow, dry ¹⁾	m ³ i.N./h	3827	2843	1954
Exhaust gas mass flow, wet	kg/h	5342	3977	2737
Exhaust temperature after turbocharger	°C	425	461	503

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.	< 250	
CO (dry, 5 % O ₂)	mg/m ³ i.N.	< 1000	
HCHO (dry, 5 % O ₂)	mg/m ³ i.N.	< 105	
VOC (dry, 5 % O ₂)	mg/m ³ i.N.		

Otto-gas engine, lean burn operation with turbocharging

Number of cylinders / configuration		8	/	V
Engine type			8V4000L64	
Engine speed	1/min		1500	
Bore	mm		170.0	
Stroke	mm		210.0	
Displacement	dm ³		38.1	
Mean piston speed	m/s		10.5	
Compression ratio			14.0	
BMEP at nominal engine speed min-1	bar	21.5		
Lube oil consumption ¹⁰⁾	dm ³ /h	0.17		
Exhaust back pressure min. - max. after module	mbar - mbar		30 - 60	

Generator

Rating power (temperature rise class F) ¹¹⁾	kVA		1770
Insulation class / temperature rise class			H / 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	38.4	
Pressure drop, design ¹⁴⁾	Cv value ^{13) 15)}		/
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)}	m ³ /h		
Pressure drop, design ¹⁴⁾	Cv value ^{13) 15)}		/
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 cooling 2nd stage, external

Coolant temperature (in / out), design	°C	43 / 44.6		
Coolant volumetric flow, design, constant ^{13) 14)}	m³/h	41.7		
Permissible pressure drop outside the heat recovery system	Cv value ^{13) 15)}	bar / m³/h	0.8	/ 46.6
Max. operation pressure before mixture cooler	bar			6

Heating circuit interface

Engine coolant temperature (in / out), design	°C	90 / 78		
Heating water temperature (in / out), design	°C	70 / 80		
Heating water flow rate, design ^{14) 16)}	m³/h	43.2		
Pressure drop, design ¹⁴⁾	Cv value ^{15) 16)}	bar / m³/h	0.3	/ 73.5
Max. operation gauge pressure (heating water)	bar			16

Room ventilation

Genset ventilation heat ¹⁷⁾	kW			63
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			13000

Gearbox

Efficiency	%	100	75	50
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Starter battery

Nominal voltage / power / capacity required	V / kW / Ah			24 / 9.0 / --
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Filling quantities

Lube oil for engine	dm³			200
Coolant in engine / heat recovery system	dm³			135 / 99
Coolant in mixture cooler	dm³			150
Heating water for plate heat exchanger ²⁰⁾	dm³			17
Lube oil for gearbox	dm³			

Gas regulation line

Nominal size / gas pressure min. - max. (at gas regulation line inlet)	DN / mbar - mbar	80	/	119 - 250
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Engine sound level ²¹⁾ (1 meter distance, free field) +3 dB(A) for total A-weighted level tolerance

Frequency	Hz	63	125	250	500
Sound pressure level	dB	79.3	89.1	90.0	92.6
Frequency	Hz	1000	2000	4000	8000
Sound pressure level	dB	92.2	89.2	88.8	100.0
	Lin dB	102.3			
Sum of pressure levels	dB(A)	101.0			
Sound power level	dB(A)	120.0			

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	500
Sound pressure level	dB	102.1	118.4	110.3	106.1
Frequency	Hz	1000	2000	4000	8000
Sound pressure level	dB	101.4	99.5	93.4	84.1
	Lin dB	119.4			
Sum of pressure levels	dB(A)	109.0			
Sound power level	dB(A)	121.2			

Dimensions (aggregate / heat recovery system)

Length	mm	~ 4200 / ~ 1500
Width	mm	~ 2000 / ~ 1800
Height	mm	~ 2400 / ~ 2000
Gross weight (dry weight)	kg	~ 10350 (~ 10000) / ~ 1300 (~ 1060)

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 actual company standards:	A001067
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- 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)