

Technical Data Sheet

93800050420_V07_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

Elevation above sea level

Combustion air temperature

Relative combustion air humidity

Standard specifications and regulations

MTU 8V4000 GS

GG08V4000A1



V / Hz	400	/	50
°C		78 / 90	
mg/m ³ i.N.		< 500	
°C			
°C		53	
°C		448	
		not included	
m / mbar	100	/	1000
°C		35	
%		60	

Energy balance	%	100	75	50
Electrical Power ^{2) 3)}	kW	776	582	388
Energy input ^{4) 5)}	kW	1854	1431	1016
Thermal output total ⁶⁾	kW	430	340	253
Thermal output engine (block, lube oil, 1st stage mixture cooler) ⁶⁾	kW	430	340	253
Thermal output mixture cooler 1st stage ⁶⁾	kW			
Thermal output mixture cooler 2nd stage ⁶⁾	kW	67	38	19
Exhaust heat (120 °C) ⁶⁾	kW	(424)	(349)	(263)
Engine power ISO 3046-1 ²⁾	kW	800	602	405
Generator efficiency at power factor = 1	%	97.0	96.7	95.7
Electrical efficiency ⁴⁾	%	41.9	40.7	38.2
Total efficiency	%	87.9	88.8	89.0
Power consumption ⁷⁾	kW			

Combustion air / Exhaust gas

Combustion air volume flow ¹⁾	m ³ i.N./h	2956	2249	1545
Combustion air mass flow	kg/h	3818	2904	1995
Exhaust gas volume flow, wet ¹⁾	m ³ i.N./h	3184	2427	1671
Exhaust gas volume flow, dry ¹⁾	m ³ i.N./h	2903	2209	1516
Exhaust gas mass flow, wet	kg/h	4192	3195	2200
Exhaust temperature after turbocharger	°C	448	472	503

Reference fuel ⁸⁾

Natural gas		not applicable		
Sewage gas		CH ₄ 60 Vol.%; CO ₂ 40 Vol.%		
Biogas		CH ₄ 60 Vol.%; CO ₂ 40 Vol.%		
Landfill gas		CH ₄ 60 Vol.%; CO ₂ 40 Vol.%		

Fuel requirements ⁹⁾

Minimum methane number	MN	120		
Range of heating value: design / operation range without power derating	kWh/m ³ i.N.	5.0 - 6.5 / 4.5 - 7.0		

Exhaust gas emissions ^{5) 8)} Compliance with emissions standards only for ≥ 388 kWel

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.	< 80		
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		8V4000L32FB		
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		13.9		
BMEP at nominal engine speed min-1	bar	16.8		
Lube oil consumption ¹⁰⁾	dm ³ /h	0.18		
Exhaust back pressure min. - max. after module	mbar - mbar	30 - 60		

Generator

Rating power (temperature rise class F) ¹¹⁾	kVA	1445		
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 / 1.0		
Voltage tolerance / frequency tolerance	%	± 5 / ± 5		

Engine cooling water system

Coolant temperature (in / out), design	°C	78 / 90			
Coolant flow rate, constant ^{13) 14)}	m ³ /h	33.4			
Pressure drop, design ¹⁴⁾	Cv value ^{13) 15)}	bar / m ³ /h	1.12	/	32.0
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)}	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 cooling 2nd stage, external				
Coolant temperature (in / out), design	°C	53 / 55.2		
Coolant volumetric flow, design, constant ^{13) 14)}	m³/h	28.9		
Pressure drop, design ¹⁴⁾	Cv value ^{13) 15)}	bar / m³/h	0.36	/ 49.3
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		52	
Inlet air temperature: (min./design/max.)	°C		30 / 35 / 40	
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		10500	
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		200	
Coolant in engine	dm³		135	
Coolant in mixture cooler	dm³		15	
Heating water for plate heat exchanger ²⁰⁾	dm³			
Lube oil for gearbox	dm³			
Gas regulation line				
Nominal size / gas pressure min. - max. (at gas regulation line inlet)	DN / mbar - mbar	100	/	100 - 200
Engine sound level ²¹⁾ (1 meter distance, free field) +3 dB(A) for total A-weighted level tolerance; + 5 dB for single octave level				
Frequency	Hz	63	125	250 500
Sound pressure level	dB	75.9	85.8	87.5 90.8
Frequency	Hz	1000	2000	4000 8000
Sound pressure level	dB	86.5	86.2	91.6 95.9
Linear total sound pressure level	Lin dB	99.2		
A-weighted total sound pressure level	dB(A)	98.1		
A-weighted total sound power level	dB(A)	117.2		
Undamped exhaust noise ²¹⁾ (1 meter distance to outlet within 90°, free field) +3 dB(A) for total A-weighted level tolerance; + 5 dB for single octave level				
Frequency	Hz	63	125	250 500
Sound pressure level	dB	101.1	117.9	109.3 103.9
Frequency	Hz	1000	2000	4000 8000
Sound pressure level	dB	96.0	94.2	90.4 85.1
Linear total sound pressure level	Lin dB	118.7		
A-weighted total sound pressure level	dB(A)	106.0		
A-weighted total sound power level	dB(A)	118.2		
Dimensions (aggregate)				
Length	mm		~ 4150	
Width	mm		~ 2000	
Height	mm		~ 2400	
Gross weight (dry weight)	kg		~ 10350 (~ 10000)	
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:			A001072	
<ol style="list-style-type: none"> Normal cubic meter at 1013 mbar and T = 273 K Prime power operation will be designed specific to the project 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 Emission values during grid parallel operation Thermal output at layout temperature; tolerance +/- 8 % Power consumption of all electrical consumers which are mounted at the module / genset Deviations from the layout parameters respectively the reference fuel can have influence on the obtained efficiency and exhaust emissions Functional capability Reference value at nominal load (without amount of oil exchange) Generator (at nominal power) max. 1000 m height of location and max. 40 °C intake air temperature; else power derating Max. allowable cos phi at nominal power (view of producer) 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. Pressure loss at reference flow rate 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. Stated values for pure water, adaption for other cooling fluid composition necessary Only generator- and surface losses Frost-free conditions must be guaranteed Amount of ventilation air must be adapted to the gas safety concept Assemblies including pipe work 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 Max. admissible cos phi depending on voltage in accordance with the requirements of the valid 'Standard specifications and regulations' 				