



Technical Data Sheet

MTU 20V4000 GS

023270120\_270120\_A01\_1\_20L64\_2536\_50\_250\_EN\_SI\_V2

{GG20V4000D1M copy from 057270034 Q01}

Voltage / Frequency	V / Hz	10500	/	50
Cooling water temperature (in / out)	°C		78 / 92	
NOx emissions (dry, 5 % O <sub>2</sub> )	mg/m³ i.N.		< 250	
Mixture cooler 1st stage water temperature (in)	°C			
Mixture cooler 2nd stage water temperature (in)	°C		60	
Exhaust gas temperature	°C		423	
Catalytic converter			not included	
Special equipment				
Elevation above sea level	m / mbar	100	/	1000
Combustion air temperature	°C		35	
Relative combustion air humidity	%		60	
Standard specifications and regulations			VDE-AR-N 4110	

Energy balance	%	100	75	50
Electrical Power <sup>2) 3)</sup>	kW	2536	1902	1268
Energy input <sup>4) 5)</sup>	kW	5985	4562	3144
Thermal output total <sup>6)</sup>	kW	2818	2202	1572
Thermal output engine (block, lube oil, 1st stage mixture cooler) <sup>6)</sup>	kW	1512	1113	758
Thermal output mixture cooler 1st stage <sup>6)</sup>	kW			
Thermal output mixture cooler 2nd stage <sup>6)</sup>	kW	169	95	49
Exhaust heat optional ( 120 °C ) <sup>6)</sup>	kW	( 1306 )	( 1089 )	( 814 )
Engine power ISO 3046-1 <sup>2)</sup>	kW	2600	1952	1308
Generator efficiency at power factor = 1	%	97.5	97.4	96.9
Electrical efficiency <sup>4)</sup>	%	42.4	41.7	40.3
Total efficiency	%	89.5	90.0	90.3
Power consumption <sup>7)</sup>	kW			
Combustion air / Exhaust gas				
Combustion air volume flow <sup>1)</sup>	m³ i.N./h	10196	7610	5114
Combustion air mass flow	kg/h	13173	9832	6607
Exhaust gas volume flow, wet <sup>1)</sup>	m³ i.N./h	10704	7997	5380
Exhaust gas volume flow, dry <sup>1)</sup>	m³ i.N./h	9595	7152	4798
Exhaust gas mass flow, wet	kg/h	13612	10166	6837
Exhaust temperature after turbocharger	°C	423	457	493
Reference fuel <sup>8)</sup>				
Natural gas			CH <sub>4</sub> >95 Vol. %	
Sewage gas			not applicable	
Biogas			not applicable	
Landfill gas			not applicable	
Propane HD 5			not applicable	
Fuel requirements <sup>9)</sup>				
Nominal rated methane number	MN		80	
Range of heating value: design / operation range without power derating	kWh/m³ i.N.		10.0 - 10.5 / 8.0 - 11.0	
Exhaust gas emissions <sup>5) 8)</sup> Compliance with emissions standards only for ≥ 1268 kWel				
NOx, stated as NO <sub>2</sub> (dry, 5 % O <sub>2</sub> )	mg/m³ i.N.	< 250		
CO (dry, 5 % O <sub>2</sub> )	mg/m³ i.N.	< 1000		
HCHO (dry, 5 % O <sub>2</sub> )	mg/m³ i.N.	< 130		
VOC (dry, 5 % O <sub>2</sub> )	mg/m³ i.N.			
Otto-gas engine, lean burn operation with turbocharging				
Number of cylinders / configuration		20	/	v
Engine type			20V4000L64FNER TR	
Engine speed	1/min		1500	
Bore	mm		170.0	
Stroke	mm		210.0	
Displacement	dm³		95.33	
Mean piston speed	m/s		10.5	
Compression ratio			12.5	
BMEP at nominal engine speed min-1	bar	21.8		
Lube oil consumption <sup>10)</sup>	dm³/h	0.45		
Exhaust back pressure min. - max. after module	mbar - mbar		30 - 60	
Generator				
Rating power (temperature rise class F) <sup>11)</sup>	kVA		3555	
Insulation class / temperature rise class			F / F	
Winding pitch			2/3	
Protection			IP23	
Max. admissible cos phi inductive (overexcited) / capacitive (underexcited) <sup>12) 22)</sup>			0.8 / 0.95	
Voltage tolerance / frequency tolerance	%		+/- 10 / +/- 5	
Engine cooling water system				
Coolant temperature (in / out), design	°C	78 / 92		
Coolant flow rate, constant <sup>13) 14)</sup>	m³/h	106.0		
Pressure drop, design <sup>14)</sup> Cv value <sup>13) 15)</sup>	bar / m³/h	3.7	/	55.6
Max. operation pressure (coolant before engine)	bar		6	
Exhaust gas heat exchanger (EGHE)				
Exhaust gas temperature (out)	°C			
Coolant temperature (in / out), design	°C			
Coolant volumetric flow, constant <sup>13) 14)</sup>	m³/h			
Pressure drop, design <sup>14)</sup> Cv value <sup>13) 15)</sup>	kPa / m³/h		/	
Min. coolant flow rate / min. operation gauge pressure	m³/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 <sup>13) 14)</sup>	m³/h				
Pressure drop, design <sup>14)</sup>	Cv value <sup>13) 15)</sup>	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	60 / 63.8			
Coolant volumetric flow, design, constant <sup>13) 14)</sup>	m³/h	44.0			
Pressure drop, design <sup>14)</sup>	Cv value <sup>13) 15)</sup>	bar / m³/h	0.84	/	48.5
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 <sup>14) 16)</sup>	m³/h				
Pressure drop, design <sup>14)</sup>	Cv value <sup>15) 16)</sup>	bar / m³/h	/		
Max. operation gauge pressure (heating water)	bar				
Room ventilation					
Genset ventilation heat <sup>17)</sup>	kW			142	
Inlet air temperature: (min./design/max.)	°C			30 / 35 / 40	
Min. engine room temperature <sup>18)</sup>	°C			15	
Max. temperature difference ventilation air (in / out)	°C			20	
Min. supply air volume flow rate (combustion + ventilation) <sup>19)</sup>	m³ i.N./h			30000	
Gearbox	%	100		75	
Efficiency	%				
Starter battery					
Nominal voltage / power / capacity required	V / kW / Ah			24 / 2 x 9 / --	
Filling quantities					
First filling quantity lube oil / refilling amount lube oil	dm³			478 / 450	
Coolant in engine circuit	dm³			310	
Coolant in mixture cooler	dm³			25	
Heating water for plate heat exchanger <sup>20)</sup>	dm³				
Lube oil for gearbox	dm³				
Gas regulation line					
Nominal size / gas pressure min. - max. (at gas regulation line inlet)	DN / mbar - mbar	100	/		172 - 250
Engine sound level <sup>21)</sup> (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	93.1	95.1	91.5	95.0
Frequency	Hz	1000	2000	4000	8000
Sound pressure level	dB	93.5	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)	122.3			
Undampened exhaust noise <sup>21)</sup> (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	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)	119.4			
Dimensions (aggregate)					
Length	mm			~ 6200	
Width	mm			~ 2100	
Height	mm			~ 2400	
Gross weight (dry weight)	kg			~ 21500 (~ 20500)	
Power derating					
Maximum ambient air dew point on site	°C			26.0	
Configuration change				No	
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		

- 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 (ISO 8528-6)
- 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) oil density set to 860g/l
- 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.
- 22) Max. admissible cos phi depending on voltage in accordance with the requirements of the valid 'Standard specifications and regulations'