

TD_0058_L64_2542_50_250_EN_SI_V2

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

GG20V4000D1M

V / Hz
°C
mg/m³ i.N.
°C
°C
°C
m / mbar
°C
%

6300	/	50
	78 / 92	
	< 250	
	45	
	423	
	not included	
100	/	1000
	25	
	30	
VDE-AR-N 4110		

Energy balance	%	100	75	50
Electrical Power ^{2) 3)}	kW	2542	1906	1271
Energy input ^{4) 5)}	kW	5955	4560	3196
Thermal output total ⁶⁾	kW	2702	2130	1581
Thermal output engine (block, lube oil, 1st stage mixture cooler) ⁶⁾	kW	1411	1039	723
Thermal output mixture cooler 1st stage ⁶⁾	kW			
Thermal output mixture cooler 2nd stage ⁶⁾	kW	209	131	78
Exhaust heat optional (120 °C) ⁶⁾	kW	(1291)	(1091)	(858)
Engine power ISO 3046-1 ²⁾	kW	2600	1952	1307
Generator efficiency at power factor = 1	%	97.8	97.7	97.2
Electrical efficiency ⁴⁾	%	42.7	41.8	39.8
Total efficiency	%	88.1	88.5	89.2
Power consumption ⁷⁾	kW			
Combustion air / Exhaust gas				
Combustion air volume flow ¹⁾	m ³ i.N./h	10042	7559	5062
Combustion air mass flow	kg/h	12973	9765	6540
Exhaust gas volume flow, wet ¹⁾	m ³ i.N./h	10546	7945	5334
Exhaust gas volume flow, dry ¹⁾	m ³ i.N./h	9442	7100	4741
Exhaust gas mass flow, wet	kg/h	13409	10099	6774
Exhaust temperature after turbocharger	°C	423	459	514
Reference fuel ⁸⁾				
Natural gas			CH ₄ >95 Vol. %	
Sewage gas			not applicable	
Biogas			not applicable	
Landfill gas			not applicable	
Fuel requirements ⁹⁾				
Nominal rated methane number	MN		70	
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)} Compliance with emissions standards only for ≥ 1271 kWel				
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.	< 130		
VOC (dry, 5 % O ₂)	mg/m ³ i.N.			
Otto-gas engine, lean burn operation with turbocharging				
Number of cylinders / configuration		20	/	v
Engine type			20V4000L64FNER	
Engine speed	1/min		1500	
Bore	mm		170.0	
Stroke	mm		210.0	
Displacement	dm ³		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 ¹⁰⁾	dm ³ /h	0.45		
Exhaust back pressure min. - max. after module	mbar - mbar		30 - 60	
Generator				
Rating power (temperature rise class F) ¹¹⁾	kVA		3404	
Insulation class / temperature rise class			H / F	
Winding pitch			5/6	
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 / 92		
Coolant flow rate, constant ^{13) 14)}	m ³ /h	93.37		
Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)}	bar / m ³ /h	2.9	/	55.9
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 ^{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	45 / 49.4		
Coolant volumetric flow, design, constant ^{13) 14)}	m³/h	44.0		
Pressure drop, design ¹⁴⁾	Cv value ^{13) 15)}	bar / m³/h	0.84	/ 49.2
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

6

Room ventilation

Genset ventilation heat ¹⁷⁾	kW	141		
Inlet air temperature: (min./design/max.)	°C	20 / 25 / 30		
Min. engine room temperature ¹⁸⁾	°C	15		
Max. temperature difference ventilation air (in / out)	°C	20		
Min. supply air volume flow rate (combustion + ventilation) ¹⁹⁾	m³ i.N./h	30000		

Gearbox

Efficiency	%	100	75	50
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Starter battery

Nominal voltage / power / capacity required	V / kW / Ah	24 / 2 x 9 / --		
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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 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	/	169 - 250
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Engine sound level²¹⁾ (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			

Undamped exhaust noise²¹⁾ (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	~ 2400		
Height	mm	~ 2400		
Gross weight (dry weight)	kg	~ 20500 (~ 19500)		

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
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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) 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'