

006260276_260276_Q04_2_20L64_2150_50_250_EN_SI_V2

GG20V4000D1M

- 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

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

6300	/	50
	78 / 92	
	< 250	
	56	
	444	
	not included	
100	/	1000
	35	
	60	
	VDE-AR-N 4110	

Energy balance	%	100	75	50
Electrical Power ^{2) 3)}	kW	2150	1613	1075
Energy input ^{4) 5)}	kW	5106	3904	2705
Thermal output total ⁶⁾	kW	2440	1911	1374
Thermal output engine (block, lube oil, 1st stage mixture cooler) ⁶⁾	kW	1261	943	657
Thermal output mixture cooler 1st stage ⁶⁾	kW			
Thermal output mixture cooler 2nd stage ⁶⁾	kW	144	85	49
Exhaust heat optional (120 °C) ⁶⁾	kW	(1179)	(968)	(717)
Engine power ISO 3046-1 ²⁾	kW	2200	1653	1109
Generator efficiency at power factor = 1	%	97.7	97.5	96.9
Electrical efficiency ⁴⁾	%	42.1	41.3	39.7
Total efficiency	%	89.9	90.3	90.5
Power consumption ⁷⁾	kW			

Combustion air / Exhaust gas				
Combustion air volume flow ¹⁾	m ³ i.N./h	8590	6442	4357
Combustion air mass flow	kg/h	11098	8322	5628
Exhaust gas volume flow, wet ¹⁾	m ³ i.N./h	9023	6773	4586
Exhaust gas volume flow, dry ¹⁾	m ³ i.N./h	8077	6050	4084
Exhaust gas mass flow, wet	kg/h	11473	8609	5826
Exhaust temperature after turbocharger	°C	444	473	504

Reference fuel ⁸⁾			
Natural gas			CH ₄ >95 Vol.%
Sewage gas			not applicable
Biogas			not applicable
Landfill gas			not applicable
Propane HD 5			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 ≥ 1075 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		20	/	v
Number of cylinders / configuration				
Engine type			20V4000L64FNER TR	
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	18.4		
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. admissible cos phi inductive (overexcited) / capacitive (underexcited) ^{12) 22)}			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	91.0		
Pressure drop, design ¹⁴⁾	Cv value ^{13) 15)}	2.7	/	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 ^{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 cooler 2nd stage, external				
Coolant temperature (in / out), design		°C	56 / 59.2	
Coolant volumetric flow, design, constant ^{13) 14)}		m³/h	44.0	
Pressure drop, design ¹⁴⁾	Cv value ^{13) 15)}	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 ^{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	108	
Inlet air temperature: (min./design/max.)		°C	30 / 35 / 40	
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⁾			24000	
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 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 /	151 - 250
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
Sound pressure level	dB	93.1	95.1	91.5
Frequency	Hz	1000	2000	4000
Sound pressure level	dB	93.5	92.8	91.8
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 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
Sound pressure level	dB	118.4	118.9	108.8
Frequency	Hz	1000	2000	4000
Sound pressure level	dB	91.9	91.5	91.8
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		~ 20000 (~ 19000)	
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'