



TD\_0415\_L64\_1012\_50\_500\_EN\_SI\_V2

Voltage / Frequency  
 Cooling water temperature (in / out)  
 NOx emissions (dry, 5 % O<sub>2</sub>)  
 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

GG8V4000D1

V / Hz  
 °C  
 mg/m<sup>3</sup> i.N.  
 °C  
 °C  
 °C  
 m / mbar  
 °C  
 %

400	/	50
	78 / 92	
	< 500	
	58	
	414	
	not included	
100	/	1000
	35	
	60	
VDE-AR-N 4110		

Energy balance	%	100	75	50
Electrical Power <sup>2)3)</sup>	kW	1012	759	506
Energy input <sup>4)5)</sup>	kW	2329	1788	1251
Thermal output total <sup>6)</sup>	kW	1084	846	608
Thermal output engine (block, lube oil, 1st stage mixture cooler) <sup>6)</sup>	kW	604	449	309
Thermal output mixture cooler 1st stage <sup>6)</sup>	kW			
Thermal output mixture cooler 2nd stage <sup>6)</sup>	kW	51	32	19
Exhaust heat optional ( 120 °C ) <sup>6)</sup>	kW	( 480 )	( 397 )	( 299 )
Engine power ISO 3046-1 <sup>2)</sup>	kW	1040	782	525
Generator efficiency at power factor = 1	%	97.3	97.1	96.3
Electrical efficiency <sup>4)</sup>	%	43.5	42.5	40.5
Total efficiency	%	90.0	89.8	89.0
Power consumption <sup>7)</sup>	kW			

**Combustion air / Exhaust gas**

Combustion air volume flow <sup>1)</sup>	m <sup>3</sup> i.N./h	3856	2914	1999
Combustion air mass flow	kg/h	4982	3765	2582
Exhaust gas volume flow, wet <sup>1)</sup>	m <sup>3</sup> i.N./h	4053	3066	2105
Exhaust gas volume flow, dry <sup>1)</sup>	m <sup>3</sup> i.N./h	3621	2734	1872
Exhaust gas mass flow, wet	kg/h	5152	3897	2673
Exhaust temperature after turbocharger	°C	414	441	470

**Reference fuel<sup>8)</sup>**

Natural gas			CH <sub>4</sub> >95 Vol.%
Sewage gas			not applicable
Biogas			not applicable
Landfill gas			not applicable

**Fuel requirements<sup>9)</sup>**

Nominal rated methane number	MN		80
Range of heating value: design / operation range without power derating	kWh/m <sup>3</sup> i.N.		10.0 - 10.5 / 8.0 - 11.0

**Exhaust gas emissions<sup>5)8)</sup> Compliance with emissions standards only for ≥ 506 kWel**

NOx, stated as NO <sub>2</sub> (dry, 5 % O <sub>2</sub> )	mg/m <sup>3</sup> i.N.	< 500	
CO (dry, 5 % O <sub>2</sub> )	mg/m <sup>3</sup> i.N.	< 1000	
HCHO (dry, 5 % O <sub>2</sub> )	mg/m <sup>3</sup> i.N.	< 120	
VOC (dry, 5 % O <sub>2</sub> )	mg/m <sup>3</sup> i.N.		

**Otto-gas engine, lean burn operation with turbocharging**

Number of cylinders / configuration		8	/	v
Engine type			8V4000L64FNER	
Engine speed	1/min		1500	
Bore	mm		170.0	
Stroke	mm		210.0	
Displacement	dm <sup>3</sup>		38.13	
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>	dm <sup>3</sup> /h	0.18		
Exhaust back pressure min. - max. after module	mbar - mbar		30 - 60	

**Generator**

Rating power (temperature rise class F) <sup>11)</sup>	kVA		1625
Insulation class / temperature rise class			H / F
Winding pitch			2/3
Protection			IP 23
Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) <sup>12)</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>	m <sup>3</sup> /h	39.97	
Pressure drop, design <sup>14)</sup>	Cv value <sup>13)15)</sup>	bar / m <sup>3</sup> /h	2.3 / 26.7
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>	m <sup>3</sup> /h		
Pressure drop, design <sup>14)</sup>	Cv value <sup>13)15)</sup>	kPa / m <sup>3</sup> /h	/
Min. coolant flow rate / min. operation gauge pressure	m <sup>3</sup> /h / bar		/
Max. operation pressure (coolant water)	bar		



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<b>Mixture cooler 1st stage, external</b>					
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			
<b>Mixture cooling 2nd stage, external</b>					
Coolant temperature (in / out), design		°C	58 / 59.2		
Coolant volumetric flow, design, constant <sup>13) 14)</sup>		m³/h	39.0		
Pressure drop, design <sup>14)</sup>	Cv value <sup>13) 15)</sup>	bar / m³/h	0.73	/	46.6
Max. operation pressure before mixture cooler		bar			6
<b>Heating circuit interface</b>					
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			
<b>Room ventilation</b>					
Genset ventilation heat <sup>17)</sup>		kW			59
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			12500
<b>Gearbox</b>		%	<b>100</b>	<b>75</b>	<b>50</b>
Efficiency		%			
<b>Starter battery</b>					
Nominal voltage / power / capacity required		V / kW / Ah			24 / 9 / --
<b>Filling quantities</b>					
First filling quantity lube oil / refilling amount lube oil		dm³			220 / 200
Coolant in engine circuit		dm³			135
Coolant in mixture cooler		dm³			15
Heating water for plate heat exchanger <sup>20)</sup>		dm³			
Lube oil for gearbox		dm³			
<b>Gas regulation line</b>					
Nominal size / gas pressure min. - max. (at gas regulation line inlet)		DN / mbar - mbar	80	/	117 - 250
<b>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</b>					
Frequency		Hz	<b>63</b>	<b>125</b>	<b>250</b>
Sound pressure level		dB	79.3	89.1	90.0
Frequency		Hz	<b>1000</b>	<b>2000</b>	<b>4000</b>
Sound pressure level		dB	92.2	89.2	88.8
Linear total sound pressure level		Lin dB	102.3		
A-weighted total sound pressure level		dB(A)	101.0		
A-weighted total sound power level		dB(A)	120.0		
<b>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</b>					
Frequency		Hz	<b>63</b>	<b>125</b>	<b>250</b>
Sound pressure level		dB	102.1	118.4	110.3
Frequency		Hz	<b>1000</b>	<b>2000</b>	<b>4000</b>
Sound pressure level		dB	101.4	99.5	93.4
Linear total sound pressure level		Lin dB	119.4		
A-weighted total sound pressure level		dB(A)	109.0		
A-weighted total sound power level		dB(A)	121.5		
<b>Dimensions (aggregate)</b>					
Length		mm			~ 4100
Width		mm			~ 1900
Height		mm			~ 2300
Gross weight (dry weight)		kg			~ 12000 (~ 11500)
<b>Power derating</b>					
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

- 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'