

TD\_0031\_L64\_2028\_50\_250\_EN\_SI\_V3

GG16V4000D1

- Application
- Operation mode
- Engine type
- 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
- Maximum ambient air dew point on site
- Standard specifications and regulations

	400	50
V / Hz	400	50
°C	78 / 91	
mg/m <sup>3</sup> i.N.	< 250	
°C	45	
°C	432	
	not included	
m / mbar	100	1000
°C	25	
°C	19.0	
	VDE-AR-N 4110	

	%	100	75	50
<b>Energy balance</b>				
Electrical Power <sup>2)3)</sup>	kW	2028	1521	1014
Energy input <sup>4)5)</sup>	kW	4751	3626	2549
Thermal output total <sup>6)</sup>	kW	2149	1682	1252
Thermal output engine (block, lube oil, 1st stage mixture cooler) <sup>6)</sup>	kW	1093	808	554
Thermal output mixture cooler 1st stage <sup>6)</sup>	kW		99	
Thermal output mixture cooler 2nd stage <sup>6)</sup>	kW	145		62
Exhaust heat optional ( 120 °C ) <sup>6)</sup>	kW	( 1056 )	( 874 )	( 698 )
Engine power ISO 3046-1 <sup>2)</sup>	kW	2080	1560	1044
Generator efficiency at power factor = 1	%	97.5	97.5	97.1
Electrical efficiency <sup>4)</sup>	%	42.7	42.0	39.8
Total efficiency	%	87.9	88.3	88.9
Power consumption <sup>7)</sup>	kW			

**Combustion air / Exhaust gas**

Combustion air volume flow <sup>1)</sup>	m <sup>3</sup> i.N./h	7995	6000	4047
Combustion air mass flow	kg/h	10328	7751	5228
Exhaust gas volume flow, wet <sup>1)</sup>	m <sup>3</sup> i.N./h	8398	6307	4263
Exhaust gas volume flow, dry <sup>1)</sup>	m <sup>3</sup> i.N./h	7517	5635	3791
Exhaust gas mass flow, wet	kg/h	10677	8016	5415
Exhaust temperature after turbocharger	°C	432	463	523

**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	70
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 ≥ 1014 kWel**

	Raw emissions	Emissions with Aftertreatment
NOx, stated as NO <sub>2</sub> (dry, 5 % O <sub>2</sub> )	mg/m <sup>3</sup> i.N.	< 250
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.	< 130
VOC (dry, 5 % O <sub>2</sub> )	mg/m <sup>3</sup> i.N.	< 130

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

Number of cylinders / configuration	16	/	v
Engine type		16V4000L64FNER EU	
Engine speed	1/min	1500	
Bore	mm	170.0	
Stroke	mm	210.0	
Displacement	dm <sup>3</sup>	76.27	
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	0.36	
Exhaust back pressure min. - max. after module	mbar - mbar		30 - 60
Turbocharger setting			H55-TA65

**Generator**

Generator type		LVS1804T2Wdg12
Rating power (temperature rise class F) <sup>11)</sup>	kVA	2800
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 / 91
Coolant flow rate, constant <sup>13) 14)</sup>	m <sup>3</sup> /h	80.0
Pressure drop, design <sup>14)</sup>	bar / m <sup>3</sup> /h	3.3
Max. operation pressure (coolant before engine)	bar	6

**Mixture cooler 1st stage, external**

Coolant temperature (in / out), design	°C	
Coolant volumetric flow, design, constant <sup>13) 14)</sup>	m <sup>3</sup> /h	
Pressure drop, design <sup>14)</sup>	bar / m <sup>3</sup> /h	
Min. coolant flow rate / min. operation gauge pressure	m <sup>3</sup> /h / bar	
Max. operation pressure before mixture cooler	bar	

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Mixture cooler 2nd stage, external			
Coolant temperature (in / out), design	°C	45 / 49.4	
Coolant volumetric flow, design, constant <sup>13) 14)</sup>	m³/h	32.0	
Pressure drop, design <sup>14)</sup>	Cv value <sup>13) 15)</sup>	bar / m³/h	0.42
			50.1
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 in heat exchanger, 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	119	
Inlet air temperature: (min./design/max.)	°C	20 / 25 / 30	
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	24500	
Gearbox			
Efficiency	%	100	75
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	365 / 330	
Coolant in engine circuit	dm³	270	
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	142 - 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	84.8	90.5 90.0 93.0
Frequency	Hz	1000	2000 4000 8000
Sound pressure level	dB	92.5	91.8 99.2 101.4
Linear total sound pressure level	Lin dB	104.8	
A-weighted total sound pressure level	dB(A)	104.4	
A-weighted total sound power level	dB(A)	124.1	
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	113.9	119.8 111.9 104.5
Frequency	Hz	1000	2000 4000 8000
Sound pressure level	dB	97.1	96.8 94.0 83.9
Linear total sound pressure level	Lin dB	121.6	
A-weighted total sound pressure level	dB(A)	108.0	
A-weighted total sound power level	dB(A)	120.6	
Dimensions (aggregate)			
Length	mm	~ 5400	
Width	mm	~ 1900	
Height	mm	~ 2300	
Weight	kg	~ 17500 (~ 16500)	
Power derating			
Design drawing			
Load step			
Maintenance plan			
Configuration change		No	
Boundary conditions and consumables			
Systems and consumables have to conform to the following actual company standards:		A001072	

- 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 (ISO 8528-6)
- 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 %
- Max. admissible cos phi depending on voltage in accordance with the requirements of the valid 'Standard specifications and regulations'
- 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) oil density set to 860g/l
- If the voltage tolerance is greater than +/-5%, the theoretical service life of the insulation system may be reduced due to the permanent max. nominal conditions of the generator.
- 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.
- Max. admissible cos phi depending on voltage in accordance with the requirements of the valid 'Standard specifications and regulations'