

Technical Data Sheet

MTU 12V4000 GS

ROYCE				
TD_0178_L64_1521_50_250_EN_SI_V2	GG12V4000D1			
Voltage / Frequency	V / Hz	400	1	50
Cooling water temperature (in / out)	°C		78 / 90	
NOx emissions (dry, 5 % O ₂)	mg/m³ i.N.		< 250	
Mixture cooler 1st stage water temperature (in)	°C			
Mixture cooler 2nd stage water temperature (in)	°C		45	
Exhaust gas temperature	°C		422	
Catalytic converter	· ·		not included	
Special equipment			not included	
·	m / mbar	100	1	1000
Elevation above sea level		100	•	1000
Combustion air temperature	°C		25	
Relative combustion air humidity	%		30	
Standard specifications and regulations			VDE-AR-N 4110	
Energy balance	%	100	75	50
Electrical Power 2) 3)	kW	1521	1140	760
Energy input ^{4) 5)}	kW	3560	2729	1920
Thermal output total ⁶⁾	kW	1608	1260	938
Thermal output engine (block, lube oil, 1st stage mixture cooler) 6)	kW	828	602	416
Thermal output mixture cooler 1st stage ⁶⁾	kW			
Thermal output mixture cooler 2nd stage 6)	kW	116	79	50
Exhaust heat optional (120 °C) 6)	kW	(780)	(658)	(522)
Engine power ISO 3046-1 2)	kW	1560	1170	784
Generator efficiency at power factor = 1	%	97.5	97.4	97.0
Electrical efficiency 4)	%	42.7	41.8	39.6
Total efficiency	%	87.9	87.9	88.4
Power consumption 7)	kW			
Combustion air / Exhaust gas				
Combustion air volume flow 1)	m³ i.N./h	6100	4573	3069
Combustion air mass flow	kg/h	7880	5908	3965
Exhaust gas volume flow, wet 1)	m³ i.N./h	6404	4806	3233
Exhaust gas volume flow, dry 1)	m³ i.N./h	5748	4302	2878
Exhaust gas mass flow, wet	kg/h	8148	6112	4108
Exhaust temperature after turbocharger	°C	422	458	516
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 Exhaust gas emissions ⁵⁾⁸⁾ Compliance with emissions standards only for ≥ 760 kWel	kWh/m³ i.N.		10.0 - 10.1 / 8.0 - 11.0	
NOx, stated as NO ₂ (dry, 5 % O ₂)	∞ α/∞ 3 i N	< 250		
CO (dry, 5 % O ₂)	mg/m³ i.N. mg/m³ i.N.	< 1200		
HCHO (dry, 5 % O ₂)	mg/m³ i.N.	< 130		
VOC (dry, 5 % O ₂)	mg/m³ i.N.	< 130		
Otto-gas engine, lean burn operation with turbocharging	mg/m- i.iv.			
Number of cylinders / configuration		12	/	V
Engine type		12	12V4000L64FNER	v
Engine type Engine speed	1/min		1500	
Bore	mm		170.0	
Stroke	mm		210.0	
Displacement	dm ³		57.2	
Mean piston speed	uiii		J1 .Z	
	m/s		10.5	
	m/s		10.5 12.5	
Compression ratio		21.8	10.5 12.5	
Compression ratio BMEP at nominal engine speed min-1	bar	21.8 0.27		
Compression ratio BMEP at nominal engine speed min-1 Lube oil consumption ¹⁰⁾	bar dm³/h	21.8 0.27	12.5	
Compression ratio BMEP at nominal engine speed min-1 Lube oil consumption ¹⁰⁾ Exhaust back pressure min max. after module	bar			
Compression ratio 3MEP at nominal engine speed min-1 Lube oil consumption 10) Exhaust back pressure min max. after module Generator	bar dm ³ /h mbar - mbar		12.5 30 - 60	
Compression ratio IMEP at nominal engine speed min-1 Lube oil consumption 10) Exhaust back pressure min max. after module Senerator Rating power (temperature rise class F) 11)	bar dm³/h		12.5 30 - 60 1935	
Compression ratio IMEP at nominal engine speed min-1 Lube oil consumption 10) Exhaust back pressure min max. after module Generator Rating power (temperature rise class F) 111 Insulation class / temperature rise class	bar dm ³ /h mbar - mbar		12.5 30 - 60 1935 H / F	
Compression ratio BMEP at nominal engine speed min-1 .ube oil consumption 10) Exhaust back pressure min max. after module Generator Rating power (temperature rise class F) 11) nsulation class / temperature rise class Winding pitch	bar dm ³ /h mbar - mbar		12.5 30 - 60 1935 H / F 2/3	
Compression ratio BMEP at nominal engine speed min-1 Lube oil consumption 100 Exhaust back pressure min max. after module Generator Rating power (temperature rise class F) 110 nsulation class / temperature rise class Winding pitch Protection	bar dm ³ /h mbar - mbar		12.5 30 - 60 1935 H / F 2/3 IP 23	
Compression ratio 3MEP at nominal engine speed min-1 Lube oil consumption 10) Exhaust back pressure min max. after module Generator Rating power (temperature rise class F) 11) nsulation class / temperature rise class Winding pitch Protection Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) 12)	bar dm ³ /h mbar - mbar		12.5 30 - 60 1935 H / F 2/3 IP 23 0.8 / 0.95	
Compression ratio 3MEP at nominal engine speed min-1 Lube oil consumption 10) Exhaust back pressure min max. after module Generator Rating power (temperature rise class F) 11) nsulation class / temperature rise class Winding pitch Protection Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) 12) Voltage tolerance / frequency tolerance	bar dm ³ /h mbar - mbar kVA		12.5 30 - 60 1935 H / F 2/3 IP 23	
Compression ratio 3MEP at nominal engine speed min-1 .ube oil consumption 10) Exhaust back pressure min max. after module Generator Rating power (temperature rise class F) 11) nsulation class / temperature rise class Winding pitch Protection Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) 12) Voltage tolerance / frequency tolerance Engine cooling water system	bar dm ³ /h mbar - mbar kVA	0.27	12.5 30 - 60 1935 H/F 2/3 IP 23 0.8 / 0.95	
Compression ratio 3MEP at nominal engine speed min-1 Lube oil consumption 10) Exhaust back pressure min max. after module Generator Rating power (temperature rise class F) 11) nsulation class / temperature rise class Winding pitch Protection Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) 12) Voltage tolerance / frequency tolerance Engine cooling water system Coolant temperature (in / out), design Coolant temperature (in / out), design	bar dm³/h mbar - mbar kVA		12.5 30 - 60 1935 H/F 2/3 IP 23 0.8 / 0.95	
Compression ratio BMEP at nominal engine speed min-1 Lube oil consumption 10) Exhaust back pressure min max. after module Generator Rating power (temperature rise class F) 11) nsulation class / temperature rise class Winding pitch Protection Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) 12) Voltage tolerance / frequency tolerance Engine cooling water system Coolant flow rate. constant 13) 14)	bar dm³/h mbar - mbar kVA %	78 / 90 63.92	12.5 30 - 60 1935 H/F 2/3 IP 23 0.8 / 0.95	38.7
Compression ratio 3MEP at nominal engine speed min-1 Lube oil consumption 10) Exhaust back pressure min max. after module Generator Rating power (temperature rise class F) 11) nsulation class / temperature rise class Winding pitch Protection Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) 12) Voltage tolerance / frequency tolerance Engine cooling water system Coolant temperature (in / out), design Coolant flow rate, constant 13) 14) Pressure drop, design 14) Cv value 13) 15)	bar dm³/h mbar - mbar kVA % °C m³/h	0.27 78 / 90	12.5 30 - 60 1935 H/F 2/3 IP 23 0.8 / 0.95	38.7
Compression ratio 3MEP at nominal engine speed min-1 Lube oil consumption 10) Exhaust back pressure min max. after module Generator Rating power (temperature rise class F) 11) Insulation class / temperature rise class Winding pitch Protection Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) 12) Voltage tolerance / frequency tolerance Engine cooling water system Coolant temperature (in / out), design Coolant flow rate, constant 13) 14) Pressure drop, design 14) Cv value 13) 15) Max. operation pressure (coolant before engine)	bar dm³/h mbar - mbar kVA % °C m³/h bar / m³/h	78 / 90 63.92	12.5 30 - 60 1935 H/F 2/3 IP 23 0.8 / 0.95 ± 10 / ± 5	38.7
Compression ratio BMEP at nominal engine speed min-1 Lube oil consumption 10) Exhaust back pressure min max. after module Generator Rating power (temperature rise class F) 11) Insulation class / temperature rise class Winding pitch Protection Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) 12) Voltage tolerance / frequency tolerance Engine cooling water system Coolant temperature (in / out), design Coolant flow rate, constant 13) 14) Pressure drop, design 14) Max. operation pressure (coolant before engine) Exhaust gas heat exchanger (EGHE)	bar dm³/h mbar - mbar kVA % °C m³/h bar / m³/h	78 / 90 63.92	12.5 30 - 60 1935 H/F 2/3 IP 23 0.8 / 0.95 ± 10 / ± 5	38.7
Compression ratio BMEP at nominal engine speed min-1 Lube oil consumption 10) Exhaust back pressure min max. after module Generator Rating power (temperature rise class F) 11) Insulation class / temperature rise class Winding pitch Protection Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) 12) Voltage tolerance / frequency tolerance Engine cooling water system Coolant temperature (in / out), design Cov value 13) 15) Max. operation pressure (coolant before engine) Exhaust gas temperature (out) Coolant temperature (in / out), design	bar dm³/h mbar - mbar kVA	78 / 90 63.92	12.5 30 - 60 1935 H/F 2/3 IP 23 0.8 / 0.95 ± 10 / ± 5	38.7
Compression ratio BMEP at nominal engine speed min-1 Lube oil consumption 10) Exhaust back pressure min max. after module Generator Rating power (temperature rise class F) 11) Insulation class / temperature rise class Winding pitch Protection Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) 12) Voltage tolerance / frequency tolerance Engine cooling water system Coolant temperature (in / out), design Coolant flow rate, constant 13) 14) Pressure drop, design 14) Max. operation pressure (coolant before engine) Exhaust gas heat exchanger (EGHE) Exhaust gas temperature (out) Coolant temperature (in / out), design Coolant temperature (in / out), design Coolant temperature (for cout) Coolant temperature (in / out), design	bar dm³/h mbar - mbar kVA	78 / 90 63.92	12.5 30 - 60 1935 H/F 2/3 IP 23 0.8 / 0.95 ± 10 / ± 5	38.7
Compression ratio BMEP at nominal engine speed min-1 Lube oil consumption 10) Exhaust back pressure min max. after module Generator Rating power (temperature rise class F) 11) Insulation class / temperature rise class Winding pitch Protection Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) 12) Voltage tolerance / frequency tolerance Engine cooling water system Coolant temperature (in / out), design Coolant flow rate, constant 13)14) Pressure drop, design 14) Max. operation pressure (coolant before engine) Exhaust gas heat exchanger (EGHE) Exhaust gas temperature (in / out), design Coolant temperature (in / out), design Coolant temperature (fow. constant 13)14)	bar dm³/h mbar - mbar kVA	78 / 90 63.92	12.5 30 - 60 1935 H/F 2/3 IP 23 0.8 / 0.95 ± 10 / ± 5	38.7
Compression ratio BMEP at nominal engine speed min-1 Lube oil consumption ¹⁰⁾ Exhaust back pressure min max. after module Generator Rating power (temperature rise class F) ¹¹⁾ Insulation class / temperature rise class Winding pitch Protection Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) ¹²⁾ Voltage tolerance / frequency tolerance Engine cooling water system Coolant temperature (in / out), design Coolant flow rate. constant ^{13) 14)}	bar dm³/h mbar - mbar kVA	78 / 90 63.92	12.5 30 - 60 1935 H/F 2/3 IP 23 0.8 / 0.95 ± 10 / ± 5	38.7





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		GG12V4000D1				
lixture cooler 1st stage, external						
Coolant temperature (in / out), design		°C				
Coolant volumetric flow, design, constant 13) 14)	42) 45)	m³/h				
Pressure drop, design 14)	Cv value 13) 15)	bar / m³/h			/	
lin. coolant flow rate / min. operation gauge pressure		m³/h / bar			/	
lax. operation pressure before mixture cooler		bar				
Mixture cooling 2nd stage, external		20	45 / 40 4			
Coolant temperature (in / out), design Coolant volumetric flow, design, constant 13) 14)		°C	45 / 48.4			
Pressure drop, design ¹⁴⁾	Cv value 13) 15)	m³/h bar / m³/h	32.0 0.42		/	50.6
ressure drop, design	Cv value	Dai / III*/II	0.42		/	30.0
fax. operation pressure before mixture cooler		bar		(6	
leating circuit interface						
ingine coolant temperature (in / out), design		°C				
leating water temperature (in / out), design		°C				
leating water flow rate, design 14) 16)		m³/h				
ressure drop, design ¹⁴⁾	Cv value 15) 16)	bar / m³/h		,	/	
Any apprehing region processing (heating water)		bar				
Max. operation gauge pressure (heating water)		Dai				
enset ventilation heat 17)		kW		8	38	
llet air temperature: (min./design/max.)		°C			25 / 30	
lin. engine room temperature 18)		°C			5	
fax. temperature difference ventilation air (in / out)		°C			20	
lin. supply air volume flow rate (combustion + ventilation) 19)		m³ i.N./h			500	
earbox		%	100		' 5	50
fficiency		%				
tarter battery						
ominal voltage / power / capacity required		V / kW / Ah		24 /	9 /	
illing quantities						
irst filling quantity lube oil / refilling amount lube oil		dm³		320	/ 280	
coolant in engine circuit		dm³		20	00	
coolant in mixture cooler		dm³		2	20	
leating water for plate heat exchanger 20)		dm³				
ube oil for gearbox		dm³				
ias regulation line						
	inlet)	DN / mbar - mbar	80		/	144 - 250
cas regulation line lominal size / gas pressure min max. (at gas regulation line i ingine sound level ²¹⁾ (1 meter distance, free field) +3 dB(.					/	144 - 250
lominal size / gas pressure min max. (at gas regulation line i				125	250	144 - 250 500
ominal size / gas pressure min max. (at gas regulation line i ngine sound level ²¹⁾ (1 meter distance, free field) +3 dB(lerance; + 5 dB for single oct	ave level			
ominal size / gas pressure min max. (at gas regulation line i ngine sound level ²¹⁾ (1 meter distance, free field) +3 dB(requency		elerance; + 5 dB for single oct	ave level 63	125	250	500
ominal size / gas pressure min max. (at gas regulation line i ngine sound level ²¹⁾ (1 meter distance, free field) +3 dB(, requency ound pressure level		olerance; + 5 dB for single oct Hz dB	63 83.3	125 87.4	250 88.6	500 91.3
lominal size / gas pressure min max. (at gas regulation line i ngine sound level ²¹⁾ (1 meter distance, free field) +3 dB(requency ound pressure level requency		olerance; + 5 dB for single oct Hz dB Hz	63 83.3 1000	125 87.4 2000	250 88.6 4000	500 91.3 8000
ominal size / gas pressure min max. (at gas regulation line ingine sound level 21) (1 meter distance, free field) +3 dB(, requency ound pressure level requency ound pressure level inear total sound pressure level -weighted total sound pressure level -weighted total sound pressure level		olerance; + 5 dB for single oct Hz dB Hz dB	83.3 1000 90.1	125 87.4 2000	250 88.6 4000	500 91.3 8000
lominal size / gas pressure min max. (at gas regulation line in ngine sound level 21) (1 meter distance, free field) +3 dB(requency ound pressure level requency ound pressure level indicated total sound power level indicated total sound power level indicated total sound power level indicated in	A) for total A-weighted level to	elerance; + 5 dB for single oct. Hz dB Hz dB Lin dB dB(A) dB(A)	83.3 1000 90.1 104.9 104.5 123.9	125 87.4 2000 87.3	250 88.6 4000 92.9	500 91.3 8000
ominal size / gas pressure min max. (at gas regulation line in ngine sound level 21) (1 meter distance, free field) +3 dB(requency ound pressure level requency ound pressure level inear total sound pressure level - weighted total sound pressure level - weighted total sound power level ndampened exhaust noise 21) (1 meter distance to outlet w	A) for total A-weighted level to	olerance; + 5 dB for single oct: Hz dB Hz dB Lin dB dB(A) dB(A) for total A-weighted level toler	83.3 1000 90.1 104.9 104.5 123.9 rance; + 5 dB for	125 87.4 2000 87.3	250 88.6 4000 92.9	500 91.3 8000 103.9
ominal size / gas pressure min max. (at gas regulation line in ngine sound level ²¹⁾ (1 meter distance, free field) +3 dB(.requency ound pressure level requency ound pressure level inear total sound pressure level -weighted total sound pressure level -weighted total sound power level ndampened exhaust noise ²¹⁾ (1 meter distance to outlet werequency	A) for total A-weighted level to	olerance; + 5 dB for single octor Hz dB Hz dB Lin dB dB(A) dB(A) for total A-weighted level toler	83.3 1000 90.1 104.9 104.5 123.9 rance; + 5 dB for	125 87.4 2000 87.3 single octave le	250 88.6 4000 92.9	500 91.3 8000 103.9
ominal size / gas pressure min max. (at gas regulation line in ngine sound level 21) (1 meter distance, free field) +3 dB(.requency ound pressure level requency ound pressure level inear total sound pressure level - weighted total sound pressure level - weighted total sound power level ndampened exhaust noise 21) (1 meter distance to outlet werequency ound pressure level	A) for total A-weighted level to	olerance; + 5 dB for single octor Hz dB Hz dB Lin dB GB(A) dB(A) dror total A-weighted level toler Hz dB	83.3 83.3 1000 90.1 104.9 104.5 123.9 rance; + 5 dB for 63 118.5	125 87.4 2000 87.3 single octave le 125 120.3	250 88.6 4000 92.9 evel 250 110.8	500 91.3 8000 103.9 500 102.2
ominal size / gas pressure min max. (at gas regulation line in ngine sound level ²¹⁾ (1 meter distance, free field) +3 dB(requency ound pressure level requency ound pressure level inear total sound pressure level - weighted total sound pressure level - weighted total sound power level ndampened exhaust noise ²¹⁾ (1 meter distance to outlet we requency ound pressure level requency	A) for total A-weighted level to	olerance; + 5 dB for single octor Hz dB Hz dB Lin dB (B(A) dB(A) for total A-weighted level toler Hz dB Hz	83.3 1000 90.1 104.9 104.5 123.9 rance; + 5 dB for 63 118.5 1000	125 87.4 2000 87.3 single octave le 125 120.3 2000	250 88.6 4000 92.9 250 110.8 4000	500 91.3 8000 103.9 500 102.2 8000
lominal size / gas pressure min max. (at gas regulation line in ngine sound level 21) (1 meter distance, free field) +3 dB(arequency ound pressure level requency ound pressure level index of total sound pressure levelweighted total sound pressure levelweighted total sound power level indampened exhaust noise 21) (1 meter distance to outlet we requency ound pressure level	A) for total A-weighted level to	olerance; + 5 dB for single oct: Hz dB Hz dB Lin dB dB(A) dB(A) for total A-weighted level toler Hz dB Hz dB Hz	ave level 63 83.3 1000 90.1 104.9 104.5 123.9 rance; + 5 dB for 63 118.5 1000 92.9	125 87.4 2000 87.3 single octave le 125 120.3	250 88.6 4000 92.9 evel 250 110.8	500 91.3 8000 103.9 500 102.2
ominal size / gas pressure min max. (at gas regulation line in ningine sound level 21) (1 meter distance, free field) +3 dB(distance) (at gas regulation line in ningine sound pressure level (at gas regulation) (at gas regul	A) for total A-weighted level to	olerance; + 5 dB for single oct: Hz dB Hz dB Lin dB dB(A) dB(A) for total A-weighted level toler Hz dB Hz	ave level 63 83.3 1000 90.1 104.9 104.5 123.9 rance; + 5 dB for 63 118.5 1000 92.9 122.8	125 87.4 2000 87.3 single octave le 125 120.3 2000	250 88.6 4000 92.9 250 110.8 4000	500 91.3 8000 103.9 500 102.2 8000
ominal size / gas pressure min max. (at gas regulation line in ngine sound level 21) (1 meter distance, free field) +3 dB(distance) (1 meter distance) (2 meter distance) (3 meter distance) (4 meter distance) (4 meter distance) (4 meter distance) (5 meter distance) (6 meter distance) (7 meter distance to outlet with the distance distance) (1 meter distance to outlet with the distance) (2 meter distance) (3 meter distance) (4 meter distance) (5 meter distance) (6 meter distance) (7 meter distance) (8 meter distance) (9	A) for total A-weighted level to	olerance; + 5 dB for single octor Hz dB Hz dB Lin dB dB(A) dB(A) for total A-weighted level toler Hz dB Hz dB Hz dB Hz	ave level 63 83.3 1000 90.1 104.9 104.5 123.9 rance; + 5 dB for 63 118.5 1000 92.9 122.8 108.4	125 87.4 2000 87.3 single octave le 125 120.3 2000	250 88.6 4000 92.9 250 110.8 4000	500 91.3 8000 103.9 500 102.2 8000
ominal size / gas pressure min max. (at gas regulation line ingine sound level ²¹⁾ (1 meter distance, free field) +3 dB(requency ound pressure level requency ound pressure level mear total sound pressure level - weighted total sound pressure level - weighted total sound power level ndampened exhaust noise ²¹⁾ (1 meter distance to outlet we requency ound pressure level requency ound p	A) for total A-weighted level to	olerance; + 5 dB for single oct: Hz dB Hz dB Lin dB dB(A) dB(A) for total A-weighted level toler Hz dB Hz	ave level 63 83.3 1000 90.1 104.9 104.5 123.9 rance; + 5 dB for 63 118.5 1000 92.9 122.8	125 87.4 2000 87.3 single octave le 125 120.3 2000	250 88.6 4000 92.9 250 110.8 4000	500 91.3 8000 103.9 500 102.2 8000
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ominal size / gas pressure min max. (at gas regulation line in gine sound level 21) (1 meter distance, free field) +3 dB(requency ound pressure level equency ound pressure level equency ound pressure level evel mear total sound pressure level evel evel evel evel evel evel e	A) for total A-weighted level to	olerance; + 5 dB for single octor Hz dB Hz dB Lin dB dB(A) dB(A) for total A-weighted level toler Hz dB Hz dB Hz dB Hz	ave level 63 83.3 1000 90.1 104.9 104.5 123.9 rance; + 5 dB for 63 118.5 1000 92.9 122.8 108.4	125 87.4 2000 87.3 single octave le 125 120.3 2000 92.3	250 88.6 4000 92.9 250 110.8 4000 92.1	500 91.3 8000 103.9 500 102.2 8000
ominal size / gas pressure min max. (at gas regulation line ingine sound level ²¹⁾ (1 meter distance, free field) +3 dB(dequency object of the control	A) for total A-weighted level to	olerance; + 5 dB for single oct: Hz dB Hz dB Lin dB dB(A) dB(A) for total A-weighted level toler Hz dB Lin dB dB(A) for total A-weighted level toler mb dB Lin dB dB(A) dB(A) dB(A) dB(A) dB(A) dB(A)	ave level 63 83.3 1000 90.1 104.9 104.5 123.9 rance; + 5 dB for 63 118.5 1000 92.9 122.8 108.4	125 87.4 2000 87.3 single octave le 125 120.3 2000 92.3	250 88.6 4000 92.9 250 110.8 4000 92.1	500 91.3 8000 103.9 500 102.2 8000
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- 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 2)
- 4) 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
- 6) 7)
- Thermal output at layout temperature; tolerance +/- 8 %
 Power consumption of all electrical consumers which are mounted at the module / genset
- Deviations from the layout parameters respectively the reference fuel can have influence on the obtained efficiency and exhaust emissions
- 8) Functional capability
- Reference value at nominal load (without amount of oil exchange) oil density set to 860g/l 10)
- 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 losses18) 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'

