Voltage Progression Voltage	Technical Data Sheet 93800050149_V09_en_GB	MTU 12V		onsite energy		
Note missions (arty, 5 % 0.0)	Voltage / Frequency		10500	1	50	
Mixture cooler fast stage water temperature (in) Catalytic cooler fast stage water temperature (in) Catalytic cooler fast stage water temperature temperature temperature Catalytic cooler fast stage water temperature te	Cooling water temperature (in / out)					
Mature cooler 2nd stage water temperature (in) Comparison Compar		•		< 500		
Catalytic convers	• • • • • • • • • • • • • • • • • • • •					
Catalytic converter Special equipment Sp	• • • • • • • • • • • • • • • • • • • •					
Special persistant	•	°C				
Aistude above sea level "robustion air humidity "combustion air humidity "combustion air humidity "sainure specifications and regulations are supported to the search of t	· ·			not included		
Cambastive combustion air hamidating 10						
Standard specifications and regulations Standard specifications Standard			100	·	1000	
	·					
Electrical Down	· · · · · · · · · · · · · · · · · · ·	%		30		
Electrical Power 1516	Standard specifications and regulations					
Energy type 45	Energy balance	%	100	75	50	
Thermal output total "	Electrical Power ^{2) 3)}	kW	1515	1136	758	
Thermal output engine (block), lube oil, 1st stage minuture cooler st stage* Thermal output mixture cooler and stage 4 The 10 The		kW	3438	2634	1838	
Thermal output mixture cooler 1st stage 1	Thermal output total 69	kW	712	521	357	
Thermal pulput mixture cooler 2nd stage 6			712	521	357	
Enhance thesis (120 °C) ⁵¹ KW (981) (585) (440) 786						
Engine power ISO 3046-1						
Semination efficiency at power factor = 1			. ,		_ ,	
Electrical efficiency % 44.1 43.1 41.2 Total efficiency % 84.9 85.1 84.6 Power consumption % 84.9 Power consumption % 85.2 Power consumption % 85.2 Power consumption 85.2 Po						
Total efficiency % 84,9 8.1,9 8.1,9 8.6,8 Power Consumption 17 Exhaust gas Combustion air / Exhaust gas Combustion air / Exhaust gas Combustion air wass flow 8,0 7521 65652 3862 Exhaust gas volume flow, vot 10 61,0 15,0 15,0 15,0 15,0 15,0 15,0 15,0 1						
Combustion air Velume flow 1	·					
Combustion air / Exhaust ass Combustion of wolume flow m³ I.N./h 5624 4.97 2991 Combustion air mass flow kg/h 7521 5652 3862 Exhaust gas volume flow, wet ¹¹ m² I.N./h 616 4524 3094 Exhaust gas mass flow, wet kg/h 774 5845 3997 Exhaust gas mass flow, wet kg/h 774 5845 3997 Exhaust gas mass flow, wet kg/h 774 5845 3997 Exhaust gas mass flow, wet kg/h 774 5845 3997 Exhaust gas mass flow, wet kg/h 774 5845 478 Exhaust gas mass flow, wet kg/h 774 5845 478 Blogas L CH_y55 Vol.% 478 478 Fuel requirements MN 80 <td></td> <td></td> <td>84.9</td> <td>85.1</td> <td>84.6</td>			84.9	85.1	84.6	
Combustion air volume flow 0. m° 1.M.h 5824 4377 2991 Combustion air mass flow kgh 752 5652 3882 Exhaust gas volume flow, wel 1. m° 1.M.h 6016 4524 3094 Exhaust gas mass flow, wel kgh 777 5685 3997 Exhaust gas mass flow, wel c 410 446 476 Exhaust gas mass flow, well c 410 446 476 Reference fue! c 101 applicable 1 614,985 Vol.% 476 Reference fue! c 101 applicable 1 101 applicable		kW				
Exhaust gas volume flow, we 1"	<u> </u>	2 ! N.I. //.	5004	4077	2004	
Exhaust gas volume flow, wet 19 m³ i.N.h 6016 4524 3094 Exhaust gas mass flow, wet kgh 7774 5845 3997 Exhaust gas mass flow, wet c 410 446 476 Exhaust gas mass flow, wet c CH ₄ -95 Vol.% 476 Exhaust gas mass flow, wet c CH ₄ -95 Vol.% 476 Exhaust gas mass flow, wet c CH ₄ -95 Vol.% 476 Exhaust gas mass flow, wet c CH ₄ -95 Vol.% 476 Bedgas c CH ₄ -95 Vol.% 60						
Exhaust gas volume flow, dry 19 Exhaust gass soft we we 19 Exhaust temperature after turbocharger 8 Exhaust gass mass flow, wet 19 Exhaust gass mass flow, wet 29 Exhaust gass mass flow, wet 29 Exhaust gas mass flow, wet 39 Exhaust gas mass flow, wet 29 Exhaust gas exhaust gas mass flow, wet 29 Exhaust gas						
Exhaust tages mass flow, well Exhaust tamperature after turbocharger "C "10 "46 476						
Exhaust temperature after turbocharger "C 410 446 476 Reference fuel ⁸ Chl _x >95 Vol.% Reference fuel ⁸ Chl _x >95 Vol.% Residual contains a policable on a policable						
Natural gas Chi, >95 Vol. 5 Sewape gas Chi, >95 Vol.						
Natural gas Chi, >95 Vol. 5 Sewage gas not applicable Sewage gas not applicable Sewage gas not applicable			410	440	470	
Sewang pass				CH. >95 Vol %		
Biogas						
Landflill gas				•		
Fuel requirements 9				• • • • • • • • • • • • • • • • • • • •		
Minimum methane number Minimum methane number Range of heating value: design/ operation range without power derating Win/m² i.N. 10.0 - 10.5 / 8.0 - 11.0 - 10.5 / 8.0 - 11.0				пос арривале		
Exhaust gase missions 5°9 mg/m³ i.N. < 500 NOx, stated as NO ₂ (dry, 5 % O ₂) mg/m² i.N. < 1000		MN		80		
NOX, stated as NC₂ (dry, 5 % O₂)	Range of heating value: design / operation range without power derating	kWh/m³ i.N.		10.0 - 10.5 / 8.0 - 11.0		
CO (ghy, 5 % O₂) mg/m³ i.N. (1000 HCHO (ghy, 5 % O₂) mg/m² i.N. (1040 CO (ghy, 5 % O₂) mg/m² i.N. (1040 Otto-gas engine, lean burn operation with turbochargins Under of cylinders / configuration 12	Exhaust gas emissions 5) 8)					
HCHO (dry, 5 % O ₂)	NOx, stated as NO ₂ (dry, 5 % O ₂)	mg/m³ i.N.	< 500			
No. Possible Pos	CO (dry, 5 % O ₂)	mg/m³ i.N.	< 1000			
Number of cylinders / configuration 12	HCHO (dry, 5 % O ₂)	mg/m³ i.N.	< 104			
Number of cylinders / configuration 12 / V Engine type 1/min 1500	VOC (dry, 5 % O ₂)	mg/m³ i.N.				
Engine type 12V4000L64 Engine speed 1/min 1500 Bore mm 170.0 Stroke mm 210.0 Displacement dm³ 57.2 Mean piston speed m/s 10.5 Compression ratio bar 21.8 Lube oil consumption ¹⁰ dm³/h 0.27 Exhaust back pressure min max. after module mbar - mbar 30 - 60 Generator Rating power (temperature rise class F) ¹¹ kVA 2167 Insulation class / temperature rise class F) ¹² kVA 2167 Insulation class / temperature rise class F) ¹³ kVA 2167 Insulation class / temperature rise class F) ¹⁴ kVA 2167 Insulation class / temperature rise class F) ¹⁵ kVA 2167 Vinding pitch 2'3 2'3 Protection IP 23 3 Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) ¹² % ±10/±5 Engine cooling water system Coolant temperature (in / out), design °C						
Engine speed	Number of cylinders / configuration		12	/	V	
Bore mm 170.0 Stroke mm 210.0 Displacement dm³ 57.2 Mean piston speed m/s 10.5 Compression ratio m/s 10.5 BMEP at nominal engine speed min-1 bar 21.8 Lube oil consumption ¹⁰⁾ dm³/h 0.27 Exhaust back pressure min max after module mbar - mbar 30 - 60 Generator F F Rating power (temperature rise class F) ¹¹⁾ kVA 2167 Insulation class / temperature rise class F / F F Winding pitch 2/3 Protection IP 23 Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) ¹²⁾ E 19 23 Protection IP 23 Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) ¹²⁾ % ± 10 / ± 5 Engine cooling water system ° ° ° ° 78 / 90 Colant reperature (in / out), design m³/ h 55.3 Fressure drop, design ¹⁴⁾ Cv value ^{13) 15)} bar / m³/h 55.3 Fressure drop, design ¹⁴⁾ Cv value ^{13) 15)}						
Stroke mm 210.0 Displacement dm³ 57.2 Mean piston speed m/s 10.5 Compression ratio 14.0 BMEP at nominal engine speed min-1 bar 21.8 Lube oil consumption ¹⁰⁰ dm³/h 0.27 Exhaust back pressure min max. after module mbar - mbar 30 - 60 Generator Rating power (temperature rise class F) ¹¹⁰ kVA 2167 Insulation class / temperature rise class F englass F / F Winding pitch 2/3 2/3 Protection 1P 23 Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) ¹²⁰ 0.8 / 0.95 Voltage tolerance / frequency tolerance % ± 10 / ± 5 Engine cooling water system Coolant temperature (in / out), design °C 78 / 90 Coolant temperature (in / out), design °C 78 / 90 Fressure drop, design ¹⁴⁾ Cv value ^{13) 15)} bar / m³/h 1.88 / 41.0 Max. allowable p.f. inductive (coolant before engine) bar / m³/h <td></td> <td></td> <td></td> <td></td> <td></td>						
Displacement Str. 2 Str.						
Mean piston speed m/s 10.5 Compression ratio 14.0 BMEP at nominal engine speed min-1 bar 21.8 Lube oil consumption ¹⁰⁾ dm³/h 0.27 Exhaust back pressure min max. after module mbar - mbar 30 - 60 Generator Rating power (temperature rise class F) ¹¹⁾ kVA 2167 Insulation class / temperature rise class F / F Winding pitch 2/3 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 / 90 Coolant flow rate, constant ^{13) 14)} Cv value ^{13) 15)} bar / m³/h 55.3 Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)} bar / m³/h 1.88 / 41.0 Max. operation pressure (coolant before engine) bar / m³/h 1.88 / 41.0 Exhaust gas temperature (out) °C Coolant temperature (in / out), design °C						
Compression ratio BMEP at nominal engine speed min-1 bar 21.8						
BMEP at nominal engine speed min-1		m/s				
Lube oil consumption 10) dm3/h 0.27 Exhaust back pressure min max. after module mbar - mbar 30 - 60 Generator Rating power (temperature rise class F) 11) kVA 2167 Insulation class / temperature rise class F / F Winding pitch 2/3 2/3 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 Colant temperature (in / out), design °C 78 / 90 Coolant flow rate, constant 13) 14) m3/h 55.3 55.3 Pressure drop, design 14) Cv value 13) 15) bar / m3/h 1.88 / 41.0 Max. operation pressure (coolant before engine) bar 6.0 6.0 Exhaust gas heat exchanger (EGHE) C C C Exhaust gas temperature (out) °C C C Coolant temperature (in / out), design °C C C Coolant temperature (in / out), design °C C	·	L	24.0	14.0		
Exhaust back pressure min max. after module mbar - mbar 30 - 60						
Rating power (temperature rise class F) 11) kVA 2167 Insulation class / temperature rise class F / F Winding pitch 2/3 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			0.27	20 60		
Rating power (temperature rise class F) 111) RVA 2167 Insulation class / temperature rise class F / F Winding pitch 2/3 Protection IP 23 Max. allowable p.f. inductive (overexcited) / capacitive (underexcited) 12) 0.8 / 0.95 Voltage tolerance / frequency tolerance %	·	mbar - mbar		30 - 60		
Insulation class / temperature rise class		L\/A		2167		
Vinding pitch 2/3		NVA				
Protection						
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 / 90 Coolant flow rate, constant 13 14 1 m³/h 55.3 Pressure drop, design 14 1 Cv value 13 15 1 bar / m³/h 1.88 / 41.0 Max. operation pressure (coolant before engine) bar 6.0 Exhaust gas heat exchanger (EGHE) Exhaust gas temperature (out) °C Coolant temperature (in / out), design °C Coolant temperature (in / out), design rowspan="2">°C Coolant tolumetric flow, constant 13 14 1 m³/h Fressure drop, design 14 1 Cv value 13 15 1 kPa / m³/h / KPa / m³/h /						
Voltage tolerance / frequency tolerance % ± 10 / ± 5 Engine cooling water system Coolant temperature (in / out), design °C 78 / 90 Coolant flow rate, constant ^{13) 14)} m³/h 55.3 Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)} bar / m³/h 1.88 / 41.0 Max. operation pressure (coolant before engine) bar 6.0 Exhaust gas heat exchanger (EGHE) Exhaust gas temperature (out) °C Coolant temperature (in / out), design °C Coolant temperature (in / out), design °C Toolant volumetric flow, constant ^{13) 14)} m³/h Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)} kPa / m³/h /						
Engine cooling water system Coolant temperature (in / out), design °C 78 / 90 Coolant flow rate, constant ^{13 14} m³/h 55.3 Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)} bar / m³/h 1.88 / 41.0 Max. operation pressure (coolant before engine) bar 6.0 Exhaust gas heat exchanger (EGHE) Exhaust gas temperature (out) °C Exhaust gas temperature (in / out), design °C Coolant temperature (in / out), design °C Coolant volumetric flow, constant ^{13) 14)} m³/h Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)} kPa / m³/h /		%				
Coolant temperature (in / out), design Coolant flow rate, constant ^{13) 14)} Pressure drop, design ¹⁴⁾ Covalue ^{13) 15)} Max. operation pressure (coolant before engine) Exhaust gas heat exchanger (EGHE) Exhaust gas temperature (out) Coolant temperature (in / out), design °C Coolant volumetric flow, constant ^{13) 14)} Pressure drop, design ¹⁴⁾ Covalue ^{13) 15)} Representative (in / out), design °C Covalue ^{13) 15)} Representative (in / out), design °C Covalue ^{13) 15)} Representative (in / out), design °C Covalue ^{13) 15)} Representative (in / out), design °C		,,,		0, _0		
Coolant flow rate, constant 13/14/) m9/h 55.3 Pressure drop, design 14/) Cv value 13/15/) bar / m3/h 1.88 / 41.0 Max. operation pressure (coolant before engine) bar 6.0 Exhaust gas heat exchanger (EGHE) Exhaust gas temperature (out) °C Coolant temperature (in / out), design °C Coolant volumetric flow, constant 13/14/) m9/h Pressure drop, design 14/) Cv value 13/15/) kPa / m3/h /		°C	78 / 90			
Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)} bar / m³/h 1.88 / 41.0 Max. operation pressure (coolant before engine) bar 6.0 Exhaust gas heat exchanger (EGHE) Exhaust gas temperature (out) °C Coolant temperature (in / out), design °C Coolant volumetric flow, constant ^{13) 14)} m³/h Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)} kPa / m³/h /	Coolant flow rate, constant 13) 14)					
Max. operation pressure (coolant before engine) Exhaust gas heat exchanger (EGHE) Exhaust gas temperature (out) Coolant temperature (in / out), design Coolant volumetric flow, constant (3) (14) Pressure drop, design (14) Cv value (13) (15) Exhaust gas temperature (in / out), design (15) Cv value (13) (15)	Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)}			/	41.0	
Exhaust gas heat exchanger (EGHE) Exhaust gas temperature (out) Coolant temperature (in / out), design °C Coolant volumetric flow, constant 13) 14) Pressure drop, design 14) Cv value 13) 15) kPa / m³/h /				<u> </u>	-	
Coolant temperature (in / out), design °C Coolant volumetric flow, constant ^{13) 14)} m³/h Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)} kPa / m³/h /						
Coolant temperature (in / out), design °C Coolant volumetric flow, constant ^{13) 14)} m³/h Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)} kPa / m³/h /	Exhaust gas temperature (out)	°C				
Pressure drop, design ¹⁴⁾	Coolant temperature (in / out), design					
Pressure drop, design ¹⁴⁾	Coolant volumetric flow, constant ^{13) 14)}					
	Pressure drop, design ¹⁴⁾ Cv value ^{13) 15)}	kPa / m³/h		1		
	Min. coolant flow rate / min. operation gauge pressure	m³/h / bar		1		
Max. operation pressure (coolant water) bar	Max. operation pressure (coolant water)	bar				

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Mixture cooler 1st stage, external		001211	000711			
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	OV Value	m³/h / bar				
Max. operation pressure before mixture cooler		bar		•		
Mixture cooler 2nd stage, external		20.				
Coolant temperature (in / out), design		°C	43 / 45.8			
Coolant volumetric flow, design, constant 13) 14)		m³/h	34.3			
Pressure drop, design 14)	Cv value 13) 15)	bar / m³/h	0.36	1		58.4
Max. operation pressure before mixture cooler	OV Value	bar	0.50	6	:	30.4
Heating circuit interface		Dai				
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)	Ov value	bar				
Room ventilation		Dai				
Genset ventilation heat 17)		kW		10	5	
nlet air temperature: (min./design/max.)		°C		20 / 25		
Vin. engine room temperature (18)		<u>.</u>		20 / 20		
		К		20	-	
ax. temperature difference ventilation air (in / out) in. supply air volume flow rate (combustion + ventilation) 19)		m³ i.N./h		205		
Gearbox		%	100	205 7 5		50
Efficiency		%	100	-	-	30
Starter battery		/6	-	-		-
Nominal voltage / power / capacity required		V / kW / Ah		24 / 9.	0 /	
Filling quantities		V / KWV / All		24/3.	.0 /	
Lube oil for engine		dm³		22	·0	
Coolant in engine		dm³		20		
Coolant in mixture cooler		dm³		20		
Heating water for plate heat exchanger 20)		dm³		20	,	
_ube oil for gearbox		dm³				
Gas regulation line		diii				
Nominal size / gas pressure min max.		DN / mbar - mbar	80			180 - 250
Engine sound level ²¹⁾ (1 meter distance, free field) +3 dB	P(A) for total A weighted		80	/		160 - 250
requency	S(A) for total A-weighted	Hz	63	125	250	500
Sound pressure level		dB	83.3	87.4	88.6	91.3
Frequency		Hz	1000	2000	4000	8000
' '		dB				
Sound pressure level		Lin dB	90.1	87.3	92.9	103.9
Sum of pressure levels		Lin dB dB A				
Sum of pressure levels		dB A	104.5			
Sound power level Jndampened exhaust noise ²¹⁾ (1 meter distance to outlet	t within 00° fron field) . 2		123.9			
	t within 90°, free field) +3	dB(A) for total A-weighted Hz	i ievei toierand 63	e 125	250	500
requency						
Sound pressure level		dB Hz	114.8	118.2	114.1	106.7
Frequency			1000	2000	4000	8000
Sound pressure level		dB	98.7	95.7	91.3	87.3
		Lin dB	121.1			
Sum of pressure levels		dB A	109.5			
Sound power level		dB	122.4			
Dimensions (aggregate)						

mm

mm

mm

kg

- Systems and consumables have to conform to the following actual company standards:

 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 $\frac{1}{2}$
- 8) Deviations from the layout parameters respectively the reference fuel can have influence on the obtained efficiency and exhaust emissions
- 9) Functional capability

Gross weight (dry weight)

Combustion air temperature

Mixture cooler coolant temperature (in)

Boundary conditions and consumables

Power derating
Altitude

Methane number

Lenath

Width

Height

- 10) Reference value at nominal load (without amount of oil exchange)
- 11) Genset 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
- 22) Max. admissible cos phi depending on voltage in accordance with the requirements of the BDEW Mittelspannungsrichtlinie (German Medium Voltage Directive)

EDAM / EDAT

~ 5000

~ 2000

~ 2300

~ 14500 (~ 14000)

specific to the project

specific to the project

specific to the project

specific to the project

A001067

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