

2G - Biogas 50/50 - 35°C - 50°C - NOx 500



Technical data

1560 kWel; 480 V, 60 Hz; Bio gas

Design conditions

Comb. air temperature / rel. Humidity:	[°C] / [%]	25 / 60
Altitude:	[m]	100
Exhaust temp. after heat exchanger:	[°C]	180
NO _x Emission (tolerance - 8%):	[mg/Nm ³ @5%O ₂]	500

Genset:

Engine:	TCG2020V16	
Speed:	[1/min]	1500
Configuration / number of cylinders:	[-]	V / 16
Bore / Stroke / Displacement:	[mm]/[mm]/[dm ³]	170 / 195 / 71
Compression ratio:	[-]	14,0
Mean piston speed:	[m/s]	9,8
Mean lube oil consumption at full load:	[g/kWh]	0,2
Engine-management-system:	[-]	TEM EVO
Generator:	Marelli MJB 500 MC4	
Voltage / voltage range / cos Phi:	[V] / [%] / [-]	480 / ±5 / 1
Speed / frequency:	[1/min] / [Hz]	1800 / 60
Gear box:	Eisenbeiss GU 320	
Lube oil volume of gear box:	[dm ³]	58

Fuel gas data: ²⁾

Methane number:	[-]	149
Lower calorific value:	[kWh/Nm ³]	4,99
Gas density:	[kg/Nm ³]	1,35
Standard gas:	Bio gas	
Analysis: CO ₂	[Vol%]	50,00
N ₂	[Vol%]	0,00
O ₂	[Vol%]	0,00
H ₂	[Vol%]	0,00
CO	[Vol%]	0,00
CH ₄	[Vol%]	50,00
C ₂ H ₄	[Vol%]	0,00
C ₂ H ₆	[Vol%]	0,00
C ₃ H ₆	[Vol%]	0,00
C ₃ H ₈	[Vol%]	0,00
C ₄ H ₈	[Vol%]	0,00
C ₄ H ₁₀	[Vol%]	0,00
C ₅ H ₁₂	[Vol%]	0,00
C _x H _y	[Vol%]	0,00
H ₂ S	[Vol%]	0,00

Energy balance

Load:	[%]	100	75	50
Electrical power COP acc. ISO 8528-1:	[kW]	1560	1170	780
Engine jacket water heat:	[kW ±8%]	861	640	449
Intercooler LT heat:	[kW ±8%]	132	101	67
Lube oil heat:	[kW ±8%]			
Exhaust heat with temp. after heat exchanger:	[kW ±8%]	714	612	481
Exhaust temperature:	[°C ±25°C]	460	496	538
Exhaust mass flow, wet:	[kg/h]	8218	6191	4279
Combustion mass air flow:	[kg/h]	7208	5410	3724
Radiation heat engine / generator:	[kW ±8%]	54 / 49	52 / 42	49 / 37
Fuel consumption:	[kW+5%]	3738	2893	2054
Electrical / thermal efficiency:	[%]	41,7 / 42,1	40,4 / 43,3	38,0 / 45,3
Total efficiency:	[%]	83,8	83,7	83,3

System parameters ¹⁾

Ventilation air flow (comb. air incl.) with ΔT = 15K	[kg/h]	40200
Combustion air temperature minimum / design:	[°C]	20 / 25
Exhaust back pressure from / to:	[mbar]	30 / 50
Maximum pressure loss in front of air cleaner:	[mbar]	5
Zero-pressure gas control unit selectable from / to: ²⁾	[mbar]	20 / 200
Pre-pressure gas control unit selectable from / to: ²⁾	[bar]	0,5 / 10
Starter battery 24V, capacity required:	[Ah]	430
Starter motor:	[kWel.] / [VDC]	15 / 24,0
Lube oil content engine / base frame:	[dm ³]	265 / 685
Dry weight engine / genset:	[kg]	6090 / 14900

Cooling system ⁵⁾

Glycol content engine jacket water / intercooler:	[% Vol.]	0 / 35
Water volume engine jacket / intercooler:	[dm ³]	151 / 20
KVS / Cv value engine jacket water / intercooler:	[m ³ /h]	46 / 30
Jacket water coolant temperature in / out:	[°C]	80 / 93
Intercooler coolant temperature in / out:	[°C]	50 / 54
Engine jacket water flow rate from / to:	[m ³ /h]	50 / 65
Water flow rate engine jacket water / intercooler:	[m ³ /h]	59 / 35
Water pressure loss engine jacket water / intercooler:	[bar]	1,6 / 1,4

1) See also "Layout of power plants":

2) See also Techn. Circular 0199-99-3017

5) Gear oil cooling within intercooler coolant circuit

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Frequency band	25	31,5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	L _{WA} [dB(A)]	S [m ²]	
Air-borne noise ³⁾																																
L _{w, Terz} [dB(lin)]	99,1	96,8	100,2	102,5	104,3	109,6	116,6	113,4	118,1	117,2	116,9	113,2	112,5	112,7	113,7	112,8	113,2	114,7	113	113,8	113	116	109,5	105,7	115,7	107,3	106	113,8	101,4	125,1	±4dB(A)	137
Exhaust noise ⁴⁾																																
L _{w, Terz} [dB(lin)]	118,7	119,6	121,7	121,1	122,6	127,4	126,3	137,6	123,6	124,8	122,4	122,3	124	123,6	123,2	122,8	121,7	120,4	120	120	118,6	118,6	118	117,2	116,9	115,8	115,7	115	113,6	132,3	±3dB(A)	15,5 ⁵⁾

3) DIN EN ISO 3746 (σ_{Ro}=±4 dB)

4) Measured in exhaust pipe (f ≤ 250Hz: ±5dB; f > 250Hz: ±3dB)

L_w: Sound power level

S: Area of measurement surface (S_c=1m²)

5) DIN 45635-11, Appendix A