

2G - Biogas 50/50 - 35°C - 40°C - NOx 500

Technical data

800 kWel; 600 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

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

Genset:

Engine:	TCG 2016 V16 C	
Speed:	[1/min]	1800
Configuration / number of cylinders:	[-]	V / 16
Bore / Stroke / Displacement:	[mm]/[mm]/[dm ³]	132 / 160 / 35
Compression ratio:	[-]	14,6
Mean piston speed:	[m/s]	9,6
Mean lube oil consumption at full load:	[g/kWh]	0,1
Engine-management-system:	[-]	TEM EVO
Generator:	Marelli MJB 400 LC4	
Voltage / voltage range / cos Phi:	[V] / [%] / [-]	600 / ±10 / 1
Speed / frequency:	[1/min] / [Hz]	1800 / 60

Energy balance

Load:	[%]	100	75	50
Electrical power COP acc. ISO 8528-1:	[kW]	800	600	400
Engine jacket water heat:	[kW ±8%]	426	351	280
Intercooler LT heat:	[kW ±8%]	73	43	23
Lube oil heat:	[kW ±8%]			
Exhaust heat with temp. after heat exchanger:	[kW ±8%]	414	337	249
Exhaust temperature:	[°C ±25°C]	481	500	518
Exhaust mass flow, wet:	[kg/h]	4423	3372	2354
Combustion mass air flow:	[kg/h]	3892	2960	2060
Radiation heat engine / generator:	[kW ±8%]	30 / 26	22 / 21	16 / 18
Fuel consumption:	[kW+5%]	1966	1526	1091
Electrical / thermal efficiency:	[%]	40,7 / 42,7	39,3 / 45,0	36,7 / 48,5
Total efficiency:	[%]	83,4	84,3	85,2

System parameters ¹⁾

Ventilation air flow (comb. air incl.) with ΔT = 15K	[kg/h]	21800
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]	286
Starter motor:	[kWel.] / [VDC]	9 / 24
Lube oil volume engine / external oil tank:	[dm ³]	135 / 260
Dry weight engine / genset:	[kg]	3090 / 7000

Cooling system

Glycol content engine jacket water / intercooler:	[% Vol.]	0 / 35
Water volume engine jacket / intercooler:	[dm ³]	56 / 5
KVS / Cv value engine jacket water / intercooler:	[m ³ /h]	43 / 10
Jacket water coolant temperature in / out:	[°C]	78 / 88
Intercooler coolant temperature in / out:	[°C]	40 / 47
Engine jacket water flow rate from / to:	[m ³ /h]	29 / 50
Water flow rate engine jacket water / intercooler:	[m ³ /h]	38 / 10
Water pressure loss engine jacket water / intercooler:	[bar]	0,8 / 1,0

¹⁾ See also "Layout of power plants":

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

Frequency band f [Hz]	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)]	86,1	90,5	92,3	97,3	103,4	104,3	107	111,4	106,4	109	107,1	111	113,7	108,9	106,7	106,8	106,6	108,7	105,9	105,2	105,6	103,5	104	104,8	121,4	112,8	97,9	99	92,8	123,2	83
Exhaust noise ⁴⁾ L _{W, Octave} [dB(lin)]				120	135			130			124			122			116			117			109			128	15,2				

³⁾ DIN EN ISO 3746 (σ_{R0}=±4 dB)

⁴⁾ DIN 45635-11 Appendix A (±3 dB)

L_W: Sound power level

S: Area of measurement surface (S₀=1m²)