

2G - Biogas 65/35 - 35°C - 40°C - NOx 500



Technical data

600 kWel; 600 V, 60 Hz; Acc. to gas analysis

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:	TCG 2016 V12 C	
Speed:	[1/min]	1800
Configuration / number of cylinders:	[-]	V / 12
Bore / Stroke / Displacement:	[mm]/[mm]/[dm ³]	132 / 160 / 26
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 LA4	
Voltage / voltage range / cos Phi:	[V] / [%] / [-]	600 / ±10 / 1
Speed / frequency:	[1/min] / [Hz]	1800 / 60

Fuel gas data: ²⁾

Methane number:	[-]	134
Lower calorific value:	[kWh/Nm ³]	6,48
Gas density:	[kg/Nm ³]	1,16
Acc. to gas analysis		
Analysis: CO ₂	[Vol%]	35,00
N ₂	[Vol%]	0,00
O ₂	[Vol%]	0,00
H ₂	[Vol%]	0,00
CO	[Vol%]	0,00
CH ₄	[Vol%]	65,00
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]	600	450	300
Engine jacket water heat:	[kW ±8%]	315	258	206
Intercooler LT heat:	[kW ±8%]	51	32	17
Lube oil heat:	[kW ±8%]			
Exhaust heat with temp. after heat exchanger:	[kW ±8%]	286	235	175
Exhaust temperature:	[°C ±25°C]	453	472	489
Exhaust mass flow, wet:	[kg/h]	3394	2594	1819
Combustion mass air flow:	[kg/h]	3135	2393	1674
Radiation heat engine / generator:	[kW ±8%]	22 / 20	17 / 18	13 / 16
Fuel consumption:	[kW+5%]	1449	1127	809
Electrical / thermal efficiency:	[%]	41,4 / 41,5	39,9 / 43,7	37,1 / 47,1
Total efficiency:	[%]	82,9	83,6	84,2

System parameters ¹⁾

Ventilation air flow (comb. air incl.) with ΔT = 15K	[kg/h]	16600
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]	143
Starter motor:	[kWel.] / [VDC]	5,4 / 24
Lube oil volume engine / external oil tank:	[dm ³]	100 / 260
Dry weight engine / genset:	[kg]	2650 / 6250

Cooling system

Glycol content engine jacket water / intercooler:	[% Vol.]	0 / 35
Water volume engine jacket / intercooler:	[dm ³]	43 / 5
KVS / Cv value engine jacket water / intercooler:	[m ³ /h]	37 / 10
Jacket water coolant temperature in / out:	[°C]	78 / 88
Intercooler coolant temperature in / out:	[°C]	40 / 45
Engine jacket water flow rate from / to:	[m ³ /h]	22 / 37
Water flow rate engine jacket water / intercooler:	[m ³ /h]	28 / 10
Water pressure loss engine jacket water / intercooler:	[bar]	0,6 / 1,0

¹⁾ See also "Layout of power plants":

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

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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)]	84,8	91,1	101	105,9	99,4	106,4	110,4	107,2	112,3	116,5	111,2	111,8	112,5	107,5	107,3	108,1	104,8	106,4	105,5	105,3	105,6	103,3	102,8	103,9	109,5	101,8	97,7	95,4	92,2	118,3	81
Exhaust noise ⁴⁾ L _{W, Octave} [dB(lin)]				118	129			134			128			128			122			116					133	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)