

TCG 2020 V12 Biogas

Technical data

1200 kWel, 400 V, 50 Hz, Bio gas



Design conditions

Inlet air temperature / rel. Humidity:	[°C] / [%]	30 / 60
Altitude:	[m]	850
Exhaust temp. after heat exchanger:	[°C]	180
NOx raw emissions genset (tolerance -8 %):	[mg/Nm ³ @5% O ₂]	500

Fuel gas data: ¹⁾

Methane number:	[-]	141
Lower calorific value:	[kWh/Nm ³]	5,48
Gas density:	[kg/Nm ³]	1,25
		Bio gas
Analysis: CO ₂	[Vol%]	40,00
N ₂	[Vol%]	4,70
O ₂	[Vol%]	0,30
H ₂	[Vol%]	0,00
CO	[Vol%]	0,00
CH ₄	[Vol%]	55,00
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%]	0,000
H ₂ O	[Vol%]	0,00

Genset:

Engine / Configuration code:	TCG 2020 V12	X
Speed / Mean piston speed:	[1/min] / [m/s]	1500 / 9,8
Configuration / number of cylinders:	[-]	V / 12
Bore / Stroke / Displacement:	[mm] / [mm] / [dm ³]	170 / 195 / 53,1
Compression ratio:	[-]	14,0
Mean effective pressure:	[bar]	18,6
Mean lube oil consumption at full load:	[g/kWh]	0,15
Generator:	Marelli MJB 500 MB4 or similar (*)	
Voltage / voltage range / cos Phi:	[V] / [%] / [-]	400 / 10 / 1,00
Speed / frequency:	[1/min] / [Hz]	1500 / 50

*Reserves the right to change the alternator supplier and type during offer period. The genset data may thereby change slightly.
The power output will not change. Will confirm the alternator type, brand and alternator data sheet with the order confirmation.

Energy balance

Load:	[%]	100	75	50
Electrical power COP acc. ISO 8528-1:	[kW]	1200	900	600
Engine jacket water heat:	[kW ±8%]	665	477	347
Intercooler LT heat:	[kW ±8%]	94	75	44
Lube oil heat:	[kW ±8%]			
Exhaust heat with temp. after heat exchanger:	[kW ±8%]	513	454	346
Exhaust temperature:	[°C ±25°C]	440	483	515
Exhaust mass flow wet / dry:	[kg/h]	6441 / 5856	4836 / 4387	3328 / 3012
Combustion mass air flow:	[kg/h]	5797	4340	2977
Radiation heat engine / generator:	[kW ±8%]	42 / 34	41 / 27	39 / 22
Fuel consumption:	[kW+5%]	2827	2183	1543
Electrical / thermal efficiency:	[%]	42,4 / 41,7	41,2 / 42,6	38,9 / 44,9
Total efficiency:	[%]	84,1	83,8	83,8

System parameters ²⁾

Ventilation air flow (comb. air incl.) with ΔT = 15K	[kg/h]	30300
Combustion air temperature minimum / design:	[°C]	5 / 30
Exhaust back pressure from / to:	[mbar]	30 / 50
Exhaust volume flow wet / dry:	[Nm ³ /h]	4900 / 4333
Maximum pressure loss in front of air cleaner:	[mbar]	5
Zero-pressure gas control unit selectable from / to: ¹⁾	[mbar]	20 ³⁾ / 200
Pre-pressure gas control unit selectable from / to: ¹⁾	[bar]	0,5 / 10
Starter battery 24V, capacity required:	[Ah]	430
Starter motor:	[kWel.] / [VDC]	18 / 24
Lube oil content engine / base frame ⁴⁾ :	[dm ³]	205 / 510
Dry weight engine / genset:	[kg]	5080 / 11580

Cooling system

Glycol content engine jacket water / intercooler:	[% Vol.]	33 / 33
Water volume engine jacket / intercooler:	[dm ³]	111 / 14
KVS / Cv value engine jacket water / intercooler:	[m ³ /h]	46 / 46
Jacket water coolant temperature in / out:	[°C]	80 / 93
Intercooler coolant temperature in / out:	[°C]	50 / 52
Engine jacket water flow rate from / to:	[m ³ /h]	36 / 56
Water flow rate engine jacket water / intercooler:	[m ³ /h]	47 / 35
Water pressure loss engine jacket water / intercooler:	[bar]	1 / 0,6
Engine jacket water pressure outlet min / max:	[bar rel.]	2 / 2,5

Notes:

- 1) See also Techn. Circular 0199-99-3017
- 2) See also "Layout of power plants"
- 3) Minimum pressure may be higher, depending on project conditions.
- 4) optional
- 5) DIN EN ISO 3746 (σ_{R0}±4 dB)
- 6) Measured in exhaust pipe (f ≤ 250Hz: ±5dB f > 250Hz: ±3dB)
- 7) DIN 45635-11, Appendix A

Sound data

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}	S
f [Hz]																															
Air-borne noise ⁵⁾	94	94,7	98	100,5	106,1	108,9	107,6	108,5	106	115,3	115	114,8	108,6	110,2	109,5	108,8	109,2	108,2	108,1	107,6	107	108,5	103,5	102,3	114,1	107	101,4	103,8	98,1	120,7	114,0
L _{W,Third} [dB(lin)]																														±4dB(A)	
Exhaust noise ⁶⁾	114,2	116	124,6	115,9	120	129	125,3	134,1	125,3	130	128,4	128,2	126,4	125,8	125	119	117,8	116,6	117,7	117,6	116,3	115,5	114,6	113,7	114,9	113,9	113,4	112,9	111,1	132,1	15,5 ⁷⁾
L _{W,Third} [dB(lin)]																														±3dB(A)	

L_W: Sound power level

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

Onepager

Subject to technical changes

1864, 01.10.2025