

**Technical data**

**1560 kWel; 400 V, 50 Hz; Bio gas**

**Design conditions**

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

**Genset:**

Engine:	<b>TCG2020V16</b>	
Speed:	[1/min]	1500
Configuration / number of cylinders:	[ - ]	V / 16
Bore / Stroke / Displacement:	[mm]/[mm]/[dm <sup>3</sup> ]	170 / 195 / 71
Compression ratio:	[ - ]	13,5
Mean piston speed:	[m/s]	9,8
Mean lube oil consumption at full load:	[g/kWh]	0,2
Engine-management-system:	[ - ]	TEM EVO

Generator:	<b>Marelli MJB 500 MC4</b>	
Voltage / voltage range / cos Phi:	[V] / [%] / [-]	400 / ±5 / 1
Speed / frequency:	[1/min] / [Hz]	1500 / 50

**Fuel gas data: 2)**

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

**Energy balance**

Load:	[%]	<b>100</b>	<b>75</b>	<b>50</b>
Electrical power COP acc. ISO 8528-1:	[kW]	<b>1560</b>	<b>1170</b>	<b>780</b>
Engine jacket water heat:	[kW ±8%]	836	627	446
Intercooler LT heat:	[kW ±8%]	129	88	55
Lube oil heat:	[kW ±8%]			
Exhaust heat with temp. after heat exchanger:	[kW ±8%]	789	646	487
Exhaust temperature:	[°C]	485	509	539
Exhaust mass flow, wet:	[kg/h]	8313	6271	4328
Combustion mass air flow:	[kg/h]	7291	5488	3778
Radiation heat engine / generator:	[kW ±8%]	53 / 42	52 / 34	45 / 27
Fuel consumption:	[kW+5%]	3782	2897	2035
Electrical / thermal efficiency:	[%]	41,3 / 43,0	40,4 / 43,9	38,3 / 45,9
Total efficiency:	[%]	84,3	84,3	84,2

**System parameters 1)**

Ventilation air flow (comb. air incl.) with ΔT = 15K	[kg/h]	38800
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 <sup>3</sup> ]	265 / 685
Dry weight engine / genset:	[kg]	6090 / 12700

**Cooling system**

Glycol content engine jacket water / intercooler:	[% Vol.]	35 / 35
Water volume engine jacket / intercooler:	[dm <sup>3</sup> ]	151 / 20
KVS / Cv value engine jacket water / intercooler:	[m <sup>3</sup> /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 <sup>3</sup> /h]	50 / 65
Water flow rate engine jacket water / intercooler:	[m <sup>3</sup> /h]	59 / 35
Water pressure loss engine jacket water / intercooler:	[bar]	1,7 / 1,4

1) See also "Layout of power plants":

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

<b>Frequency band</b> 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 <sub>WA</sub> [dB(A)]	S [m <sup>2</sup> ]
<b>Air-borne noise 4)</b> L <sub>W,Totz</sub> [dB(lin)]	91	92	95	97	100	107	110	112	110	114	116	114	112	113	112	113	113	112	113	113	113	110	108	105	114	106	104	113	101		
<b>Exhaust noise 5)</b> L <sub>W,Octave</sub> [dB(lin)]					129		139		130		128		125		124		120		119												

4) DIN EN ISO 3746

5) DIN 45635-11 Appendix A (±3 dB)

L<sub>w</sub>: Sound power level

S: Area of measurement surface (S<sub>p</sub>=1m<sup>2</sup>)