

# reference data sheet

## Technical data

**1200 kWel; 10500 V, 50 Hz; Natural gas, MN = 80**

### Design conditions

Inlet air temperature / rel. Humidity:	[°C] / [%]	25 / 60
Altitude:	[m]	100
Exhaust temp. after heat exchanger:	[°C]	120
NO <sub>x</sub> Emission (tolerance - 8%):	[mg/Nm <sup>3</sup> @5%O <sub>2</sub> ]	500

### Fuel gas data: <sup>2)</sup>

Methane number:	[-]	80
Lower calorific value:	[kWh/Nm <sup>3</sup> ]	10,17
Gas density:	[kg/Nm <sup>3</sup> ]	0,79
Standard gas:	Natural gas, MN = 80	

### Genset:

Engine:	<b>TCG 2020 V12</b>	
Configuration code:	[-]	R
Speed:	[1/min]	1500
Configuration / number of cylinders:	[-]	V / 12
Bore / Stroke / Displacement:	[mm]/[mm]/[dm <sup>3</sup> ]	170 / 195 / 53
Compression ratio:	[-]	13
Mean piston speed:	[m/s]	9,8
Mean lube oil consumption at full load:	[g/kWh]	0,15
Generator:	<b>TDPS TD84-V1 or similar (*)</b>	
Voltage / voltage range / cos Phi:	[V] / [%] / [-]	10500 / 10 / 1
Speed / frequency:	[1/min] / [Hz]	1500 / 50

\*CES 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. CES 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]	<b>1200</b>	<b>900</b>	<b>600</b>
Engine jacket water heat:	[kW ±8%]	608	470	338
Intercooler LT heat:	[kW ±8%]	106	71	41
Lube oil heat:	[kW ±8%]			
Exhaust heat with temp. after heat exchanger:	[kW ±8%]	581	482	366
Exhaust temperature:	[°C ±25°C]	414	440	469
Exhaust mass flow, wet:	[kg/h]	6484	4924	3412
Combustion mass air flow:	[kg/h]	6269	4758	3295
Radiation heat engine / generator:	[kW ±8%]	41 / 33	40 / 30	36 / 27
Fuel consumption:	[kW+5%]	2748	2129	1502
Electrical / thermal efficiency:	[%]	43,7 / 43,3	42,3 / 44,7	39,9 / 46,9
Total efficiency:	[%]	87,0	87,0	86,8

### System parameters <sup>1)</sup>

Ventilation air flow (comb. air incl.) with ΔT = 15K	[kg/h]	30000
Combustion air temperature minimum / design:	[°C]	5 / 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: <sup>2)</sup>	[mbar]	20 <sup>3)</sup> / 200
Pre-pressure gas control unit selectable from / to: <sup>2)</sup>	[bar]	0,5 / 10
Starter battery 24V, capacity required:	[Ah]	430
Starter motor:	[kWel.] / [VDC]	18 / 24
Lube oil content engine / base frame:	[dm <sup>3</sup> ]	205 / -
Dry weight engine / genset:	[kg]	5080 / 12150

### Cooling system

Glycol content engine jacket water / intercooler:	[% Vol.]	35 / 35
Water volume engine jacket / intercooler:	[dm <sup>3</sup> ]	111 / 14
KVS / Cv value engine jacket water / intercooler:	[m <sup>3</sup> /h]	46 / 46
Jacket water coolant temperature in / out:	[°C]	80 / 93
Intercooler coolant temperature in / out:	[°C]	47 / 50
Engine jacket water flow rate from / to:	[m <sup>3</sup> /h]	36 / 56
Water flow rate engine jacket water / intercooler:	[m <sup>3</sup> /h]	43 / 35
Water pressure loss engine jacket water / intercooler:	[bar]	0,9 / 0,6

1) See also "Layout of power plants":

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

3) Minimum pressure may be higher, depending on project conditions.

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 <sub>WA</sub> [dB(A)]	S [m <sup>2</sup> ]
<b>Air-borne noise <sup>4)</sup></b>	94,0	94,7	98,0	100,5	106,1	108,9	107,6	108,5	106,0	115,3	115,0	114,8	108,6	110,2	109,5	108,8	109,2	108,2	108,1	107,6	107,0	108,5	103,5	102,3	114,1	107,0	101,4	103,8	98,1	120,7	114
L <sub>W, Terz</sub> [dB(lin)]																														±4dB(A)	
<b>Exhaust noise <sup>5)</sup></b>	114,2	116,0	124,6	115,9	120,0	129,0	125,3	134,1	125,3	130,0	128,4	128,2	126,4	125,8	125,0	119,0	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 <sup>6)</sup>
L <sub>W, Terz</sub> [dB(lin)]																														±3dB(A)	

4) DIN EN ISO 3746 (σ<sub>RD</sub>±4 dB)

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

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

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

6) DIN 45635-11, Appendix A