

reference data sheet

Technical data

4500 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 _x Emission (tolerance - 8%):	[mg/Nm ³ @5%O ₂]	500

Fuel gas data: ²⁾

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

Genset:

Engine:	TCG 2032B V16	
Configuration code:	[-]	R
Speed:	[1/min]	1000
Configuration / number of cylinders:	[-]	V / 16
Bore / Stroke / Displacement:	[mm]/[mm]/[dm ³]	260 / 320 / 272
Compression ratio:	[-]	12
Mean piston speed:	[m/s]	10,7
Mean lube oil consumption at full load:	[g/kWh]	0,2
Generator:	TDPS TD145 or similar (*)	
Voltage / voltage range / cos Phi:	[V] / [%] / [-]	10500 / 10 / 1
Speed / frequency:	[1/min] / [Hz]	1000 / 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]	4500	3375	2250
Engine jacket water heat:	[kW ±8%]	1788	1317	869
Intercooler LT heat:	[kW ±8%]	268	179	106
Lube oil heat:	[kW ±8%]	688	616	520
Exhaust heat with temp. after heat exchanger:	[kW ±8%]	1946	1630	1275
Exhaust temperature:	[°C ±25°C]	384	413	454
Exhaust mass flow, wet:	[kg/h]	24274	18248	12435
Combustion mass air flow:	[kg/h]	23481	17634	12002
Radiation heat engine / generator:	[kW ±8%]	198 / 101	154 / 87	109 / 72
Fuel consumption:	[kW+5%]	10163	7862	5544
Electrical / thermal efficiency:	[%]	44,3 / 43,5	42,9 / 45,3	40,6 / 48,0
Total efficiency:	[%]	87,8	88,2	88,6

System parameters ¹⁾

Ventilation air flow (comb. air incl.) with ΔT = 15K	[kg/h]	116900
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: ²⁾	[mbar]	20 / 200
Pre-pressure gas control unit selectable from / to: ²⁾	[bar]	0,5 / 10
Air bottle, volume / pressure	[dm ³] / [bar]	2000 / 30
Starter motor:	[dm ³ /s] / [bar]	800 / 16
Lube oil content engine / base frame:	[dm ³]	1850 / 0
Dry weight engine / genset:	[kg]	24890 / 44890

Cooling system

Glycol content engine jacket water / intercooler:	[% Vol.]	35 / 35
Water volume engine jacket / intercooler:	[dm ³]	570 / 51
KVS / Cv value engine jacket water / intercooler:	[m ³ /h]	88 / 62
Jacket water coolant temperature in / out:	[°C]	78 / 92
Intercooler coolant temperature in / out:	[°C]	40 / 44
Engine jacket water flow rate from / to:	[m ³ /h]	110 / 137
Water flow rate engine jacket water / intercooler:	[m ³ /h]	118 / 65
Water pressure loss engine jacket water / intercooler:	[bar]	1,8 / 1,1
Lube oil temp. engine inlet max. / lube oil flow rate:		80 / 125

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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⁾	101,1	104,1	107,5	107,4	112,6	113,7	120,6	121,2	120,5	117,3	116,4	114,9	114,2	112,9	115,0	115,9	115,3	112,0	112,1	111,6	112,8	115,8	124,8	129,1	121,8	111,5	111,5	108,8	104,2	132,4	224
L _{W, Terz} [dB(lin)]																														±4dB(A)	
Exhaust noise ⁴⁾	123,0	127,2	141,9	125,1	144,6	129,2	132,4	133,0	133,3	130,0	129,2	129,0	128,5	128,8	128,6	126,5	125,7	124,4	124,4	124,6	123,2	124,0	126,3	123,5	121,7	119,6	119,6	122,4	117,9	137,2	16,9 ⁵⁾
L _{W, Terz} [dB(lin)]																														±3dB(A)	

3) DIN EN ISO 3746 (σ₁₀₀=±4 dB)

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

L_W: Sound power level

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

5) DIN 45635-11, Appendix A