

Performance Data MWM TCG 3020 V20



Technical data

2300 kWel; 10000 V, 50 Hz; Natural gas, MN = 80

Design conditions

Inlet air temperature / rel. Humidity:	[°C] / [%]	25 / 60
Altitude:	[m]	200
Exhaust temp. after heat exchanger:	[°C]	120
NO _x raw emissions genset (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 / Configuration code:	TCG 3020 V20	R
Speed / Mean piston speed:	[1/min] / [m/s]	1500 / 9.8
Configuration / number of cylinders:	[-]	V / 20
Bore / Stroke / Displacement:	[mm]/[mm]/[dm ³]	170 / 195 / 89
Compression ratio:	[-]	13
Mean effective pressure:	[bar]	21,3
Mean lube oil consumption at full load:	[g/kWh]	0,15
Generator:	TDPS TD100-V1 or similar (*)	
Voltage / voltage range / cos Phi:	[V] / [%] / [-]	10000 / 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]	2300	1725	1150
Engine jacket water heat:	[kW ±8%]	1227	897	633
Intercooler LT heat:	[kW ±8%]	181	137	83
Lube oil heat:	[kW ±8%]			
Exhaust heat with temp. after heat exchanger:	[kW ±8%]	1054	882	689
Exhaust temperature:	[°C ±25°C]	403	434	473
Exhaust mass flow wet / dry:	[kg/h]	12239 / 11257	9186 / 8436	6344 / 5815
Combustion mass air flow:	[kg/h]	11830	8873	6122
Radiation heat engine / generator:	[kW ±8%]	70 / 61	65 / 54	60 / 48
Fuel consumption:	[kW±5%]	5232	4015	2838
Electrical / thermal efficiency:	[%]	44,0 / 43,6	43,0 / 44,3	40,5 / 46,6
Total efficiency:	[%]	87,6	87,3	87,1

System parameters ¹⁾

Ventilation air flow (comb. air incl.) with ΔT = 15K	[kg/h]	55100
Combustion air temperature minimum / design:	[°C]	5 / 25
Exhaust back pressure from / to:	[mbar]	30 / 50
Exhaust volume flow wet / dry:	[Nm ³ /h]	9566 / 8537
Maximum pressure loss in front of air cleaner:	[mbar]	5
Zero-pressure gas control unit selectable from / to: ²⁾	[mbar]	20 ³⁾ / 200
Pre-pressure gas control unit selectable from / to: ²⁾	[bar]	0,5 / 10
Starter battery 24V, capacity required:	[Ah]	450
Starter motor:	[kWel.] / [VDC]	18 / 24
Lube oil content engine / base frame:	[dm ³]	300 / 685
Dry weight engine / genset:	[kg]	8170 / 19700

Cooling system

Glycol content engine jacket water / intercooler:	[% Vol.]	33 / 33
Water volume engine jacket / intercooler:	[dm ³]	210 / 22
KVS / Cv value engine jacket water / intercooler:	[m ³ /h]	47 / 58
Jacket water coolant temperature in / out:	[°C]	78 / 93
Intercooler coolant temperature in / out:	[°C]	40 / 44
Engine jacket water flow rate from / to:	[m ³ /h]	60 / 85
Water flow rate engine jacket water / intercooler:	[m ³ /h]	75 / 40
Water pressure loss engine jacket water / intercooler:	[bar]	2,5 / 0,5
Engine jacket water pressure outlet min / max:	[bar rel.]	2,2 / 2,5

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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.

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See also Tech. Circular 0159/23-50/7																												Sound pressure array of engine, depending on project conditions.																												19101	
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 ⁴⁾ $L_{N,TOT}$ [dB(lin)]	94,8	96,1	97,4	101,0	103,7	107,3	112,7	118,9	115,5	115,3	112,7	110,8	112,1	111,5	108,8	108,6	109,3	108,5	108,2	108,8	106,4	104,8	103,8	102,9	106,1	116,7	104,3			121,0	117,3																										
Exhaust noise ⁵⁾ $L_{N,TOT}$ [dB(lin)]	117,7	117,3	120,0	124,0	125,4	126,5	130,7	142,5	127,4	126,7	131,0	125,5	125,2	125,6	126,4	125,1	124,5	123,8	124,3	122,7	122,3	119,8	118,5	116,8	115,4	115,2	113,1	110,7	135,6	15,5 ⁶⁾																											

4) DIN EN ISO 9614-2 (s=±4 dB)				5) Measured in exhaust pipe (f ≤ 250Hz: ±5dB; f > 250Hz: ±3dB)												L _W : Sound power level												S: Area of measurement surface (S ₁ =1m ²)												6) DIN 45635-11, Appendix A			
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L_W: Sound power level

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

6) DIN 45635-11, Appendix A

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Subject to technical changes

k579676, 2025-01-09