

2G - Natural Gas - 35% - 40°C - NOx 500

Technical data

2000 kWel; 480 V, 60 Hz; Natural gas, MN = 80

Design conditions

Comb. 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:	TCG2020V20	
Speed:	[1/min]	1500
Configuration / number of cylinders:	[-]	V / 20
Bore / Stroke / Displacement:	[mm]/[mm]/[dm ³]	170 / 195 / 89
Compression ratio:	[-]	13,0
Mean piston speed:	[m/s]	9,8
Mean lube oil consumption at full load:	[g/kWh]	0,2
Engine-management-system:	[-]	TEM EVO

Generator:	Marelli MJB 560 LA4	
Voltage / voltage range / cos Phi:	[V] / [%] / [-]	480 / ±5 / 1
Speed / frequency:	[1/min] / [Hz]	1800 / 60

Gear box:	Eisenbeiss GU 360	
Lube oil volume of gear box:	[dm ³]	90

Energy balance

Load:	[%]	100	75	50
Electrical power COP acc. ISO 8528-1:	[kW]	2000	1500	1000
Engine jacket water heat:	[kW ±8%]	1014	768	543
Intercooler LT heat:	[kW ±8%]	188	136	82
Lube oil heat:	[kW ±8%]			
Exhaust heat with temp. after heat exchanger:	[kW ±8%]	977	820	631
Exhaust temperature:	[°C ±25°C]	413	441	472
Exhaust mass flow, wet:	[kg/h]	10937	8371	5837
Combustion mass air flow:	[kg/h]	10577	8092	5640
Radiation heat engine / generator:	[kW ±8%]	70 / 62	66 / 56	60 / 50
Fuel consumption:	[kW+5%]	4612	3575	2528
Electrical / thermal efficiency:	[%]	43,4 / 43,2	42,0 / 44,4	39,6 / 46,5
Total efficiency:	[%]	86,6	86,4	86,1

System parameters 1)

Ventilation air flow (comb. air incl.) with ΔT = 15K	[kg/h]	52300
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
Starter battery 24V, capacity required:	[Ah]	430
Starter motor:	[kWel.] / [VDC]	15 / 24
Lube oil content engine / base frame:	[dm ³]	300 / 685
Dry weight engine / genset:	[kg]	8070 / 21250

Cooling system 5)

Glycol content engine jacket water / intercooler:	[% Vol.]	0 / 35
Water volume engine jacket / intercooler:	[dm ³]	210 / 25
KVS / Cv value engine jacket water / intercooler:	[m ³ /h]	58 / 52
Jacket water coolant temperature in / out:	[°C]	80 / 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]	69 / 40
Water pressure loss engine jacket water / intercooler:	[bar]	1,4 / 0,6

1) See also "Layout of power plants":

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

5) Gear oil cooling within intercooler coolant circuit

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)	97,8	99,4	102,8	106,7	107,4	113,1	112,8	119	116,5	116,3	115,8	111,5	112,1	114	112,3	111,1	112,5	111,2	111,5	111,8	109,1	107,4	107	107	109,9	119,2	107	99,2	99,5	123,7	172
Exhaust noise 4)	118,6	117,9	121,4	127,3	126,9	126,8	126,5	140,9	126,3	129,9	130,9	125,2	126,3	126,5	125,9	125,9	125	123,3	123,9	123,8	123,2	126,3	116,4	115,5	115,2	114,1	114,6	112,6	110,8	135,8	15,5 ⁵⁾

3) DIN EN ISO 3746 (σ_{ref}=±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