

Annex Nr.1

Technical data

2000 kWel; 10500 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 Emission (tolerance - 8%):	[mg/Nm ³ @5%O ₂]	500

Datasheet specification considers the grid codes EU 631/2016 (NC-RfG)

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 2020 V20	
Configuration code:	[-]	
Speed:	[1/min]	1500
Configuration / number of cylinders:	[-] V / 20	
Bore / Stroke / Displacement:	[mm]/[mm]/[dm ³]	170 / 195 / 89
Compression ratio:	[-] 13	
Mean piston speed:	[m/s]	9,8
Mean lube oil consumption at full load:	[g/kWh]	0,15
Generator:	Marelli MJH 630 LA4	
Voltage / voltage range / cos Phi:	[V] / [%] / [-]	10500 / 10 / 1
Speed / frequency:	[1/min] / [Hz]	1500 / 50

Energy balance

Load:	[%]	100	75	50
Electrical power COP acc. ISO 8528-1:	[kW]	2000	1500	1000
Engine jacket water heat:	[kW ±8%]	1017	761	534
Intercooler LT heat:	[kW ±8%]	173	132	84
Lube oil heat:	[kW ±8%]			
Exhaust heat with temp. after heat exchanger:	[kW ±8%]	973	817	628
Exhaust temperature:	[°C ±25°C]	413	441	473
Exhaust mass flow, wet:	[kg/h]	10897	8333	5801
Combustion mass air flow:	[kg/h]	10539	8055	5605
Radiation heat engine / generator:	[kW ±8%]	70 / 62	66 / 53	60 / 46
Fuel consumption:	[kW+5%]	4594	3558	2512
Electrical / thermal efficiency:	[%]	43,5 / 43,3	42,2 / 44,4	39,8 / 46,3
Total efficiency:	[%]	86,8	86,6	86,1

System parameters 1)

Ventilation air flow (comb. air incl.) with ΔT = 15K	[kg/h]	52100
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]	450
Starter motor:	[kWel.] / [VDC]	18 / 24
Lube oil content engine / base frame*:	[dm ³]	300 / 685*
Dry weight engine / genset:	[kg]	8070 / 19600

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]	53 / 52
Jacket water coolant temperature in / out:	[°C]	80 / 93
Intercooler coolant temperature in / out:	[°C]	45 / 49
Engine jacket water flow rate from / to:	[m ³ /h]	60 / 85
Water flow rate engine jacket water / intercooler:	[m ³ /h]	72 / 40
Water pressure loss engine jacket water / intercooler:	[bar]	1,8 / 0,6

1) See also "Layout of power plants":

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

*) optional

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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)																																
L _{W,Tez} [dB(lin)]	94,9	96,9	98,0	100,0	106,3	111,3	111,7	118,9	113,6	116,3	116,8	112,2	111,6	114,2	111,5	111,1	112,2	110,5	111,3	111,4	109,2	107,2	105,7	105,9	109,4	120,3	104,7	99,1	98,6	123,8	140	
Exhaust noise 4)																																
L _{W,Tez} [dB(lin)]	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	125,0	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_{av}=24 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