Technical data

2300 kWel; 10500 V, 50 Hz; Acc. to gas analysis

Design conditions

Inlet air temperature / rel. Humidity:	[°C] / [%]	25 / 60
Altitude:	[m]	260
Exhaust temp. after heat exchanger:	[°C]	120
NO_x raw emissions genset (tolerance -8 %):	[mg/Nm³ @5%O_2]	500
Datasheet specification considers the grid codes EU 631/2016 (NC-RfG)		

Genset:

Engine / Configuration code:	**TCG 3020 V20**	P
Speed / Mean piston speed:	[1/min] / [m/s]	1500 / 9.8
Configuration / number of cylinders:	[-]	V / 20
Bore / Stroke / Displacement:	[mm]/[mm]/[dm³]	170 / 195 / 89
Compression ratio:	[-]	14
Mean effective pressure:	[bar]	21,4
Mean lube oil consumption at full load:	[g/kWh]	0,15
Generator:	**Marelli MJH 630 LB4 or similar (*)**	
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.

Fuel gas data: 2)

Methane number:	[-]	78
Lower calorific value:	[kWh/Nm³]	10,43
Gas density:	[kg/Nm³]	0,79
	Acc. to gas analysis	
Analysis CO_2	[Vol%]	1,21
N_2	[Vol%]	1,06
O_2	[Vol%]	0,00
H_2	[Vol%]	0,00
CO	[Vol%]	0,00
CH_4	[Vol%]	90,91
C_2H_4	[Vol%]	0,00
C_2H_6	[Vol%]	5,41
C_3H_6	[Vol%]	0,00
C_3H_8	[Vol%]	1,02
C_4H_8	[Vol%]	0,00
C_4H_{10}	[Vol%]	0,29
C_5H_{12}	[Vol%]	0,05
C_xH_y	[Vol%]	0,05
H_2S	[Vol%]	0,00
H_2O	[Vol%]	0

Energy balance

Load:	[%]	**100**	**75**	**50**
Electrical power COP acc. ISO 8528-1:	[kW]	**2300**	**1725**	**1150**
Engine jacket water heat:	[kW ±8%]	1231	933	651
Intercooler LT heat:	[kW ±8%]	190	141	85
Lube oil heat:	[kW ±8%]			
Exhaust heat with temp. after heat exchanger:	[kW ±8%]	934	784	624
Exhaust temperature:	[°C ±25°C]	378	407	446
Exhaust mass flow | wet / dry:	[kg/h]	11934 / 10974	8967 / 8228	6237 / 5716
Combustion mass air flow:	[kg/h]	11544	8666	6024
Radiation heat engine / generator:	[kW ±8%]	70 / 63	68 / 53	65 / 47
Fuel consumption:	[kW+5%]	5118	3953	2795
Electrical / thermal efficiency:	[%]	44,9 / 42,3	43,6 / 43,4	41,1 / 45,6
Total efficiency:	[%]	87,2	87,0	86,7

System parameters 1)

Ventilation air flow (comb. air incl.) with ΔT = 15K	[kg/h]	54400
Combustion air temperature minimum / design:	[°C]	5 / 25
Exhaust back pressure from / to:	[mbar]	30 / 50
Exhaust volume flow | wet / dry:	[Nm³/h]	9323 / 8319
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]	430
Starter motor:	[kWel.] / [VDC]	18 / 24
Lube oil content engine / base frame:	[dm³]	300 / 685
Dry weight engine / genset:	[kg]	8170 / 20800

Cooling system

Glycol content engine jacket water / intercooler:	[% Vol.]	35 / 35
Water volume engine jacket / intercooler:	[dm³]	210 / 22
KVS / Cv value engine jacket water / intercooler:	[m³/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:	[m³/h]	60 / 85
Water flow rate engine jacket water / intercooler:	[m³/h]	76 / 40
Water pressure loss engine jacket water / intercooler:	[bar]	2,6 / 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.

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 [m²]
Air-borne noise 4) $L_{W,Terz}$ [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 ±4dB(A)	117,3
Exhaust noise 5) $L_{W,Terz}$ [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	124,0	122,7	122,3	119,8	118,5	116,8	115,4	115,2	113,1	110,7	135,6 ±3dB(A)	15,5 5)

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_0=1m²) 6) DIN 45635-11, Appendix A