Reference datasheet

Technical data
400 kWel; 480 V, 60 Hz; Landfill gas

Design conditions

Comb. air temperature / rel. Humidity:	[°C] / [%]	25 / 60
Altitude:	[m]	100
Exhaust temp. after heat exchanger:	[°C]	150
NO_x Emission (tolerance - 8%):	[mg/Nm^3 @5%O_2]	500

Genset:

Engine:	**CG132-8**	
Speed:	[1/min]	1800
Configuration / number of cylinders:	[-]	V / 08
Bore / Stroke / Displacement:	[mm]/[mm]/[dm^3]	132 / 160 / 17,5
Compression ratio:	[-]	14,6
Mean piston speed:	[m/s]	9,6
Mean lube oil consumption at full load:	[g/kWh]	0,1
Engine-management-system:	[-]	TEM EVO
Generator:	**Marelli MJB 355 MB4**	
Voltage / voltage range / cos Phi:	[V] / [%] / [-]	480 / ±10 / 1
Speed / frequency:	[1/min] / [Hz]	1800 / 60

Fuel gas data: [2)]

Methane number:		[-]	134
Lower calorific value:		[kWh/Nm^3]	4,99
Gas density:		[kg/Nm^3]	1,18
Standard gas:	Landfill gas		
Analysis:	CO_2	[Vol%]	27,00
	N_2	[Vol%]	23,00
	O_2	[Vol%]	0,00
	H_2	[Vol%]	0,00
	CO	[Vol%]	0,00
	CH_4	[Vol%]	50,00
	C_2H_4	[Vol%]	0,00
	C_2H_6	[Vol%]	0,00
	C_3H_6	[Vol%]	0,00
	C_3H_8	[Vol%]	0,00
	C_4H_8	[Vol%]	0,00
	C_4H_{10}	[Vol%]	0,00
	C_5H_{12}	[Vol%]	0,00
	C_xH_y	[Vol%]	0,00
	H_2S	[Vol%]	0,00

Energy balance

Load:	[%]	**100**	**75**	**50**
Electrical power COP acc. ISO 8528-1:	[kW]	**400**	**300**	**200**
Engine jacket water heat:	[kW ±8%]	205	163	127
Intercooler LT heat:	[kW ±8%]	32	22	13
Lube oil heat:	[kW ±8%]			
Exhaust heat with temp. after heat exchanger:	[kW ±8%]	210	175	134
Exhaust temperature:	[°C ±25°C]	453	478	504
Exhaust mass flow, wet:	[kg/h]	2254	1726	1216
Combustion mass air flow:	[kg/h]	2026	1549	1088
Radiation heat engine / generator:	[kW ±8%]	18 / 14	15 / 12	11 / 11
Fuel consumption:	[kW+5%]	962	750	541
Electrical / thermal efficiency:	[%]	41,6 / 43,1	40,0 / 45,1	37,0 / 48,3
Total efficiency:	[%]	84,7	85,1	85,3

System parameters [1)]

Ventilation air flow (comb. air incl.) with ΔT = 15K	[kg/h]	12200
Combustion air temperature minimum / design:	[°C]	20 / 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]	143
Starter motor:	[kWel.] / [VDC]	5,4 / 24
Lube oil volume engine / external oil tank:	[dm^3]	70 / -
Dry weight engine / genset:	[kg]	2080 / 5370

Cooling system

Glycol content engine jacket water / intercooler:	[% Vol.]	0 / 35
Water volume engine jacket / intercooler:	[dm^3]	28 / 5
KVS / Cv value engine jacket water / intercooler:	[m^3/h]	37 / 10
Jacket water coolant temperature in / out:	[°C]	78 / 88
Intercooler coolant temperature in / out:	[°C]	40 / 44
Engine jacket water flow rate from / to:	[m^3/h]	14 / 25
Water flow rate engine jacket water / intercooler:	[m^3/h]	18 / 8
Water pressure loss engine jacket water / intercooler:	[bar]	0,2 / 0,6

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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)] $L_{W,Terz}$ [dB(lin)]	81,3	85	90,1	98,4	112,3	104,1	104,4	110,6	104,4	104,7	108,4	105,5	107,9	106,8	105,3	105,9	104,2	103,3	104,1	104,2	101,6	100,2	98,6	98,5	100,9	99	94,3	91,9	90,8	114,9	75
Exhaust noise [4)] $L_{W,Octave}$ [dB(lin)]				120			137			135			128			126			124			119			115					132	14,8

3) DIN EN ISO 3746 (σ_{R0}=±4 dB) 4) DIN 45635-11 Appendix A (±3 dB) L_W: Sound power level S: Area of measurement surface (S_0=1m^2)