

reference data sheet



Technical data

2300 kWel; 480 V, 60 Hz; Natural gas, MN = 80

Design conditions

Inlet air temperature / rel. Humidity:	[°C] / [%]	25 / 60
Altitude:	[m]	100
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:	CG170B-20		P
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:	[-]	14	
Mean effective pressure:	[bar]	21,5	
Mean lube oil consumption at full load:	[g/kWh]	0,15	
Generator:	Leroy Somer LSA 53.2 M12 or similar (*)		
Voltage / voltage range / cos Phi:	[V] / [%] / [-]	480 / 10 / 1	
Speed / frequency:	[1/min] / [Hz]	1800 / 60	
Gear box:	Eisenbeiss GU 360		
Lube oil volume of gear box:	[dm ³]	51	

*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%]	1248	944	657
Intercooler LT heat:	[kW ±8%]	205	152	92
Lube oil heat:	[kW ±8%]			
Exhaust heat with temp. after heat exchanger:	[kW ±8%]	953	800	636
Exhaust temperature:	[°C ±25°C]	380	410	449
Exhaust mass flow wet / dry:	[kg/h]	12066 / 11097	9055 / 8310	6289 / 5765
Combustion mass air flow:	[kg/h]	11662	8743	6069
Radiation heat engine / generator:	[kW ±8%]	71 / 64	69 / 53	66 / 45
Fuel consumption:	[kW+5%]	5176	3993	2820
Electrical / thermal efficiency:	[%]	44,4 / 42,5	43,2 / 43,7	40,8 / 45,9
Total efficiency:	[%]	86,9	86,9	86,7

System parameters ¹⁾

Ventilation air flow (comb. air incl.) with ΔT = 15K	[kg/h]	55200
Combustion air temperature minimum / design:	[°C]	5 / 25
Exhaust back pressure from / to:	[mbar]	30 / 50
Exhaust volume flow wet / dry:	[Nm ³ /h]	9432 / 8415
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:	[kW _{el.}] / [VDC]	18 / 24
Lube oil content engine / base frame:	[dm ³]	300 / 685
Dry weight engine / genset:	[kg]	8170 / 20449

Cooling system ⁷⁾

Glycol content engine jacket water / intercooler:	[% Vol.]	35 / 35
Water volume engine jacket / intercooler:	[dm ³]	210 / 22
KVS / Cv value engine jacket water / intercooler:	[m ³ /h]	47 / 63
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]	77 / 43
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

Page 1 / 2

S3332430EA15256

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.

7) Gear oil cooling within intercooler coolant circuit

Frequency band	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⁾	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⁾	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 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 levelS: Area of measurement surface (S₀=1m²)

6) DIN 45635-11, Appendix A

PwrY_3.1r1_0558705

Subject to technical changes

k578050, 21.02.2024



Technical data
2300 kWel; 480 V, 60 Hz; Natural gas, MN = 80

Design conditions

Inlet air temperature / rel. Humidity:	[°C] / [%]	25 / 60
Altitude:	[m]	100
Exhaust temp. after heat exchanger:	[°C]	120
NO _x raw emissions genset (tolerance -8 %):	[mg/Nm ³ @5%O ₂]	500

Notes for derating⁸⁾

		inlet air temperature			max. inlet air temperature	
		+ 5 K	+ 10 K	max. w/o power derating	island mode ⁹⁾	grid parallel mode ¹⁰⁾
Inlet air temperature	[°C]	30	35	35		35
Load:	[%]	100	100	100	no rating	100
Electrical power COP acc. ISO 8528-1:	[kW]	2300	2300	2300	no rating	2300
Electrical / thermal efficiency:	[%]	44,4 / 42,9	44,3 / 43,2	44,3 / 43,2	no rating	44,3 / 43,2
Total efficiency:	[%]	87,3	87,5	87,5	no rating	87,5
Intercooler coolant temperature in / out:	[°C]	40 / 44	40 / 44	40 ¹¹⁾ / 44	no rating	40 / 44

Notes:

- 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.
- 4) DIN EN ISO 3746 ($\sigma_{R0}=\pm 4$ dB)
- 5) Measured in exhaust pipe ($f \leq 250\text{Hz}$: $\pm 5\text{dB}$; $f > 250\text{Hz}$: $\pm 3\text{dB}$)
- 6) DIN 45635-11, Appendix A
- 7) 60 Hz applications only: Gear oil cooling within intercooler coolant circuit
- 8) The derate information shown does not take into account external cooling system capacity. It assumes that external cooling systems can maintain the specified cooling water temperatures at site conditions.
- 9) ISO 8528-1:2005-06, 6.3.1 a)
- 10) ISO 8528-1:2005-06, 6.3.1 b)
- 11) To maintain a constant air-fuel-mixture inlet manifold temperature, as the inlet air temperature goes up, so must the heat rejection. The listed aftercooler coolant temperatures have been increased considering a limited capacity of the heat exchange circuit to reject heat to the atmosphere. Non standard applications, e.g. use of cooling towers are hereby not considered.