

Basic Technical Data

nominal electrical output	999	kW		
maximum heat output ¹⁾	1155	kW		
load	50	75	100	%
maximum heat output	689	921	1155	kW
fuel input	1327	1852	2379	kW
electrical efficiency	37,7	40,5	42,0	%
heat efficiency	51,9	49,7	48,5	%
total efficiency (fuel utilization)	89,6	90,2	90,5	%
gas consumption	141	196	252	m ³ /hr

	EKO ²⁾	PE/I ³⁾	
nominal electrical output	999	1236 ⁴⁾	kW/kV A
maximum heat output	1216	1155	kW
fuel input	2379	2379	kW
electrical efficiency	42,0	41,6	%
heat efficiency	51,1	48,5	%
total efficiency (fuel utilization)	93,1	90,1	%
fuel consumption at 100% output	252	252	m ³ /hr

The Basic Technical Data are applicable for the standard conditions pursuant to the "Technical instructions" document.

The minimum permanent electrical output must not drop below 50 % of the nominal output.

Gas consumption is expressed under the invoicing conditions (15°C, 101.325 kPa). Gas consumption tolerance, or fuel input tolerance, at 100% load is +5%.

Tolerances of other parameters are mentioned in "Technical Instructions - Validity of Technical Data" document.

1) Maximum heat output is a sum of heat outputs of secondary circuit with exhaust gas cooled to 120°C and aftercooler circuit

1) Technical parameters of CHP unit with economizer (an option).

Maximum heat output indicated is based on inlet water temperature 70°C into additional exhaust gas exchanger and exhaust gas cooled to 85°C.3) Technical parameters of CHP unit for emergency / island mode

(an option).

4) It is non-overload able output for $\cos \varphi = 0,8$.

Observance of Emission Limits

emissions ¹⁾	NOx	CO	
with 5% of O ₂ in exhaust gases	250	300	mg/Nm ³

1) Indicated emission values of NOx are possible to decrease below 100mg/Nm³ (option).

Generator

type	MJB 450 LA4	
producer	MARELLI	
cos φ	0,8/1,0	
efficiency in the working point	96,3/97,4	%
voltage	400	V
frequency	50	Hz

Engine

type	TCG 2020 V12	
producer	MWM	
number of cylinders	12	
arrangement of cylinders	V	
bore × stroke	170/195	mm
displacement	53	dm ³
compression ratio	13,0 : 1	
speed	1500	rpm
nominal oil consumption	0,15	g/kWh
max. engine output	1027	kW

TCG2020V12 400V _NG_1000kWe; 26.1.2018 250NOx

Thermal System

Secondary Circuit

heat carrier	water	
circuit's heat output	1102	kW
nominal water temperature, input / output	70/90	°C
nominal temperature drop	20	°C
return water temperature, min / max	40/70	°C
nominal flow rate	13,2	kg/s
max. working pressure	600	kPa
min. pressure in system	100	kPa
water volume in CHP unit circuit	110	dm ³
pressure loss at the nominal flow rate	45	kPa

Utilization of exhaust gas output for other purposes

heat output of exhaust gases (cooling to 120°C)	510	kW
exhaust gas temperature	413	°C



Primary Circuit

heat carrier	water + ethylene glycol	
ethylene glycol's concentration	35	%
circuit's heat output	1102	kW
pressure reserve for interconnecting pipes ¹⁾	30	kPa
maximal connect-able volume of system outside the module of CHP unit ²⁾	250	dm ³
max. working pressure	300	kPa
water volume in CHP unit circuit ³⁾	1500	dm ³

1) pressure reserve of internal part for covering pressure losses of interconnecting pipes between module of primary circuit and exhaust gas module

2) if connected volume overstep mentioned value, it is necessary to install into system additional expansion vessel

3) total value (engine-generator, module of primary circuit and exhaust gas module without connecting pipeline)

Aftercooler Circuit

heat carrier	water + ethylene glycol	
ethylene glycol's concentration	35	%
circuit's heat output	53	kW
coolant temperature (outlet from CHP unit – informative)	61	°C
coolant temperature (inlet into CHP unit) max	60	°C
nominal flow rate	9,8	kg/s
pressure reserve at the nominal flow rate ¹⁾	70	kPa
highest allowed maximal hydrostatic height of system	10	m
maximal connect-able volume of system outside the module of CHP unit ²⁾	175	dm ³
max. working pressure	300	kPa
min. working pressure	50	kPa
water volume in CHP unit circuit	50	dm ³

1) pressure reserve of internal part for covering pressure losses of external parts of circuit (interconnection pipeline and dry cooler)

2) if connected volume overstep mentioned value, it is necessary to install into system additional expansion vessel

Fuel, Gas Inlet

low heat value	34	MJ/m ³
min. methane number	80	
gas pressure	8 ÷ 15	kPa
max. pressure change under varying consumption	10	%
max. gas temperature	35	°C

Combustion and Ventilation Air

unused heat removed by the ventilation air	67	kW
surrounding temperature (engine and generator intake) min / max	20 - 35	°C
surrounding temperature (engine and generator intake) nominal	25	°C
amount of combustion air	4335	Nm ³ /hr

Exhaust Gas and Condensate Outlet

amount of exhaust gases	4479	Nm ³ /hr
exhaust gas temperature between engine-generator set and exhaust exchanger nominal / max	431/550	°C
exhaust gas temperature, nominal / max	120/150	°C
permissible pressure loss of the interconnecting and following exhaust piping	10	mbar
speed of exhaust gases at the outlet (DN 400)	13,2	m/s

Lubricant Charges

amount of lubrication oil in the engine	205	dm ³
volume of engine additional oil tank	510	dm ³
replenishment oil tank volume	350	dm ³

Noise Parameters

version	standard	option ¹⁾	
CHP unit at 1m	113	dB(A)	
exhaust gas outlet at 1m from the silencer flange	80	60	dB(A)

1) noise parameters can be reduced by optimizing components to the required acoustic pressure level



Electrical Parameters

nominal voltage	230/400	V	
nominal frequency	50	Hz	
power factor ¹⁾	0,87		
nominal current at cos φ=0.8	1802	A	
generator circuit breaker	NW25 H1 3P		
short-circuit resistance of switchboard R1	40	kA	
short-circuit resistance of switchboards R2, R3, R4 and R5	10	kA	
contribution of the actual source to the short-circuit current	< 20	kA	
protection of power switchboard R1 closed/open	IP 31/00		
protection of control switchboard R2 closed/open	IP 31/00		
protection of frequency changers' switchboard R3 closed/open	IP 31/00		
protection of engine switchboard R4 closed/open	IP 31/00		
protection of cooling switchboard R5 closed/open	IP 66/00		
recommended superior protection	2250	A	
recommended connection cable ²⁾ (l< 50m, at t<35°C)	5×NYY (3×240+120)		
power factor [-]	1	0,95	0,87
output [% P _{nom}]	100	100	98

1) Power factor adjustable from 0,87C ÷ 1 ÷ 0,87L (range from 0,87C ÷ 1 must be verified according to the various types of generators).
 L = inductive load - overexcited
 C = capacitive load - underexcited
 Operation of the generator with a power factor of less than 0.95 causes a power limitation sets the following table:

Colour Version

engine and generator	RAL 5010 (blue)
base frame	RAL 9017 (black)

Unit Dimensions and Weights

	Engine generator set	Exhaust gas module	
length	5460	5420	mm
width	1870	2200	mm
height	2495	2385	mm
service weight	12070	4510	kg

	Primary circuit's module	Technological module	
length	2845	1750	mm
width	1550	1040	mm
height	2535	2150	mm
service weight	2045	330	kg

	Gas train		
length	1495		mm
width	385		mm
height	785		mm
service weight	100		kg

	Catalytic converter	Exhaust silencer	
length	1000	4800	mm
diameter	ø 700	ø 900	mm
installation position	horizontal	horizontal	mm
service weight	135	1000	kg

Switchboards	height [mm]	width [mm]	depth [mm]
R1 ⁽¹⁾	2100	800/1000	800/1000
R2	2100	1600	400
R3 ⁽²⁾	2100	600÷1200	500
R4 ⁽³⁾	1200	800	300
R5 ⁽⁴⁾	430÷1060	330÷855	200÷350

overall service weight 900 kg

- 1) Dimensions depend on direction of power outlets:
 Passing through switchboard = 2100x800x800 mm
 One direction = 2100x800x1000 mm
 Width of switchboard R1 may be extended in special cases.
- 2) Switchboard's width depends on size of frequency changers.
- 3) Switchboard's height depends on MWM. Standard is 1200 mm.
- 4) Switchboard's dimension depends on number of dry coolers' fans.

Caution

Manufacturer reserves the right to alter this document and the linked source materials.

