Basic Technical Data

nominal electrical output			2000	kW
maximum heat output[1)]			2155	kW

load	50	75	100	%
maximum heat output	1234	1700	2155	kW
fuel input	2486	3537	4578	kW
electrical efficiency	40,2	42,4	43,7	%
heat efficiency	49,7	48,1	47,1	%
total efficiency (fuel utilization)	89,9	90,5	90,8	%
gas consumption	263	375	485	m^3/hr

	EKO[2)]	PE/I[3)]	
nominal electrical output	2000	2479[4)]	kW/kVA
maximum heat output	2271	2155	kW
fuel input	4578	4578	kW
electrical efficiency	43,7	43,3	%
heat efficiency	49,6	47,1	%
total efficiency (fuel utilization)	93,3	90,4	%
fuel consumption at 100% output	485	485	m^3/hr
fuel consumption at 75% output	375	375	m^3/hr
fuel consumption at 75% output	263	263	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
2) Technical parameters of CHP unit with economizer (an option). 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 φ = 0,8.

Observance of Emission Limits

emissions [1)]	NOx	CO	
with 5% of O_2 in exhaust gases	500	300	mg/Nm^3

1) Indicated emission values of NOx are possible to decrease below 100mg/Nm^3 (option).

Generator

type	MJB 560 LB4	
producer	MARELLI	
cos φ	0,8/1,0	
efficiency in the working point	96,5/97,3	%
voltage	400	V
frequency	50	Hz

Engine

type	TCG 2020 V20	
producer	MWM	
number of cylinders	20	
arrangement of cylinders	V	
bore × stroke	170/195	mm
displacement	89	dm^3
compression ratio	13,0 : 1	
speed	1500	rpm
nominal oil consumption	0,2	g/kWh
max. engine output	2055	kW

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Thermal System

Secondary Circuit

heat carrier	water	
circuit's heat output	1977	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	23,6	kg/s
max. working pressure	600	kPa
min. pressure in system	100	kPa
water volume in CHP unit circuit	220	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)	972	kW
exhaust gas temperature	414	°C

Primary Circuit

heat carrier	water + ethylene glycol	
ethylene glycol's concentration	35	%
circuit's heat output	1977	kW
pressure reserve for interconnecting pipes[1)]	30	kPa
maximal connect-able volume of system outside the module of CHP unit [2)]	400	dm^3
max. working pressure	300	kPa
water volume in CHP unit circuit[3)]	2400	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	178	kW
coolant temperature (outlet from CHP unit – informative)	43,0	°C
coolant temperature (inlet into CHP unit) max	38,0	°C
nominal flow rate	11,1	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)]	250	dm^3
max. working pressure	300	kPa
min. working pressure	50	kPa
water volume in CHP unit circuit	80	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	125	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	8200	Nm^3/hr

Exhaust Gas and Condensate Outlet

amount of exhaust gases	8479	Nm^3/hr
exhaust gas temperature between engine-generator set and exhaust exchanger nominal / max	414/550	°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 500)	17,3	m/s

Lubricant Charges

amount of lubrication oil in the engine	300	dm^3
volume of engine additional oil tank	685	dm^3
replenishment oil tank volume	650	dm^3

Noise Parameters

version	standard	option[1)]	
CHP unit at 1m	116		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)]	0,81	
nominal current at cos φ=0.8	3600	A
generator circuit breaker	NW40 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	< 40	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	4000	A
recommended connection cable [2)] (l< 50m, at t<35°C)	9×NYY (3×240+120)	

1) Power factor adjustable from 0,81C ÷ 1 ÷ 0,81L (range from 0.81C ÷ 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:

power factor [-]	1	0,95	0,81
output [% Pnom]	100	100	98

2) The stated cables are for information only. A check calculation for temperature rise and voltage drop must be made according to the actual length, placement and type of the cable (maximum allowed voltage drop is 10 V)

Colour Version

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

Unit Dimensions and Weights

	Engine generator set	Exhaust gas module	
length	8105	5710	mm
width	1775	2300	mm
height	2615	2705	mm
service weight	18650	6860	kg

	Primary circuit's module	Technological module	
length	2905	1840	mm
width	1550	850	mm
height	2530	2250	mm
service weight	2940	390	kg

	Gas train	
length	1140	mm
width	385	mm
height	845	mm
service weight	120	kg

	Catalytic converter	Exhaust silencer	
length	1200	6800	mm
diameter	ø 900	ø 1100	mm
installation position	horizontal	horizontal	mm
service weight	200	1400	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		1000 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.