

## Basic Technical Data

nominal electrical output	2000	kW
maximum heat output <sup>1)</sup>	2154	kW

1) Maximum heat output is a sum of heat outputs of secondary and aftercooler circuit at their full utilization

load	50	75	100	%
heat output	1234	1700	2154	kW
fuel input	2485	3536	4577	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 <sup>3</sup> /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).

## Observance of Emission Limits

emissions <sup>1)</sup>	CO	NOx	
with 5% of O <sub>2</sub> in exhaust gases	300	500	mg/Nm <sup>3</sup>

1) Mentioned emission values of NOx are possible to decrease down to 100mg/Nm<sup>3</sup> (an option).

## Generator

type	MJB 560 LA4
producer	MARELLI
cos φ	0,8/1,0
efficiency in the working point	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 <sup>3</sup>
compression ratio	13,0 : 1
speed	1500 rpm
nominal oil consumption	0,2 g/kWh
max. engine output	2055 kW

TCG2020V20 400V natural gas; 24.03.2015

## Thermal System

### Secondary Circuit

heat carrier	water
circuit's heat output	1970 kW
nominal water temperature, input / output	70/90 °C
return water temperature, min / max	40/70 °C
nominal flow rate	23,6 kg/s
max. working pressure	600 kPa
allowed operation over-pressure on connecting flanges <sup>1)</sup>	450 kPa
min. pressure in system	100 kPa
water volume in CHP unit circuit	280 dm <sup>3</sup>
pressure reserve of pump for covering pressure losses outside container	50 kPa
nominal temperature drop	20 °C

1) highest allowed over-pressure created by connected system to secondary circuit in place of connecting flanges.

### Primary Circuit

heat carrier	water + ethylene glycol
ethylene glycol's concentration	35 %
circuit's heat output	1977 kW
max. working pressure	300 kPa
water volume in CHP unit circuit	2400 dm <sup>3</sup>

### Aftercooler Circuit<sup>1)</sup>

heat carrier	water + ethylene glycol
ethylene glycol's concentration	35 %
circuit's heat output	184 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
max. working pressure	300 kPa
water volume in CHP unit circuit	330 dm <sup>3</sup>

1) Parameters are valid if the dry cooler (optional) is part of delivery

## Fuel, Gas Inlet

low heat value	34 MJ/m <sup>3</sup>
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
amount of combustion air	8198	Nm <sup>3</sup> /hr
outdoor air temperature, min / max	-20/35	°C
max. air temperature at the outlet flange	50	°C

## Exhaust Gas and Condensate Outlet

amount of exhaust gases	8470	Nm <sup>3</sup> /hr
exhaust gas temperature, nominal / max	120/150	°C
max. back-pressure of exhaust gases downstream the CHP unit flange	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 <sup>3</sup>
volume of engine additional oil tank	685	dm <sup>3</sup>
replenishment oil tank volume	1000	dm <sup>3</sup>

## Noise Parameters

CHP unit in 10 m from container	78	dB(A)
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## Electrical Parameters

nominal voltage	230/400	V
nominal frequency	50	Hz
power factor <sup>1)</sup>	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 <sup>2)</sup> (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 [% P <sub>nom</sub> ]	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, internal parts of unit	RAL 5010 (blue)
container	RAL 5013 (blue)



## Unit Dimensions and Weights

length total / transport	20000 / 16300	mm
width total / transport	5500 / 3300	mm
height total / transport	10000 / 3300	mm
service weight of the entire CHP unit	57720	kg

## Caution

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

