

## Basic Technical Data

nominal electrical output	800	kW
maximum heat output <sup>1)</sup>	843	kW

load	50	75	100	%
maximum heat output	486	667	843	kW
fuel input	1010	1433	1856	kW
electrical efficiency	39,6	41,9	43,1	%
heat efficiency	48,1	46,5	45,4	%
total efficiency (fuel utilization)	88,7	88,4	88,5	%
gas consumption	155	220	286	Nm <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 mentioned for biogas with methane content 65%, at normal conditions (0°C, 101,325 kPa).

Gas consumption tolerance, or fuel input tolerance, at 100% load is +5%.

Tolerance 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 150°C and aftercooler circuit

## Observance of Emission Limits

emissions	NOx	CO	
with 5% of O <sub>2</sub> in exhaust gases	500	650	mg/Nm <sup>3</sup>

## Generator

type	MJB 450 MB4
producer	MARELLI
cos φ	1,0
efficiency in the working point	97,1 %
voltage	400 V
frequency	50 Hz

## Engine

type	TCG 3016 V16
producer	MWM
number of cylinders	16
arrangement of cylinders	V
bore × stroke	132/160 mm
displacement	35 dm <sup>3</sup>
compression ratio	14,6 : 1
speed	1500 rpm
nominal oil consumption	0,1 g/kWh
max. engine output	824 kW

TCG3016V16 BG65%CH<sub>4</sub>; 14.12.2017

## Thermal System

### Secondary Circuit

heat carrier	water
circuit's heat output	792 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	9,5 kg/s
max. working pressure	600 kPa
min. pressure in system	100 kPa
water volume in CHP unit circuit <sup>1)</sup>	770 dm <sup>3</sup>
pressure loss at the nominal flow rate <sup>1)</sup>	90 kPa

1) total value (engine-generator in sound enclosure and exhaust gas module without connecting pipeline)

### Utilization of exhaust gas output for other purposes

heat output of exhaust gases (cooling to 150°C)	362 kW
exhaust gas temperature	421 °C

### Primary Circuit

heat carrier	water + ethylene glycol
ethylene glycol's concentration	35 %
circuit's heat output	430 kW
max. working pressure	300 kPa
water volume in CHP unit circuit	140 dm <sup>3</sup>



**Aftercooler Circuit**

heat carrier	water + ethylene glycol	
ethylene glycol's concentration	35	%
circuit's heat output	51	kW
coolant temperature (outlet from CHP unit – informative)	50,0	°C
coolant temperature (inlet into CHP unit) max	45,0	°C
nominal flow rate	2,7	kg/s
pressure reserve at the nominal flow rate <sup>1)</sup>	70	kPa
highest allowed maximal hydrostatic height of system	10	m
maximal connect-able volume of system outside the module of CHP unit <sup>3)</sup>	80	dm <sup>3</sup>
max. working pressure	300	kPa
min. working pressure	50	kPa
water volume in CHP unit circuit	40	dm <sup>3</sup>

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**

methane content	65	%
minimal methane content	> 45	%
low heat value	23,4	MJ/Nm <sup>3</sup>
gas pressure	6	kPa
max. pressure change under varying consumption	10	%
max. gas temperature	35	°C

**Combustion and Ventilation Air**

unused heat removed by the ventilation air	56	kW
air temperature at the ventilation inlet min / max	20 - 35	°C
air temperature at the ventilation recommended	25	°C
amount of combustion air	3140	Nm <sup>3</sup> /hr
max. amount of ventilation air at the outlet flange	19800	m <sup>3</sup> /hr
max. air temperature at the outlet flange	50	°C
max. counter-pressure on flanges of ventilation air <sup>1)</sup>	120	Pa

1) total sum of pressure losses of connected ventilation pipeline without necessity of using additional fun

**Exhaust Gas and Condensate Outlet**

amount of exhaust gases	3398	Nm <sup>3</sup> /hr
exhaust gas temperature between engine-generator set and exhaust exchanger nominal / max	421/550	°C
exhaust gas temperature, nominal / max	150/180	°C
permissible pressure loss of the interconnecting and following exhaust piping	10	mbar
speed of exhaust gases at the outlet (DN 350)	15,2	m/s

**Lubricant Charges**

amount of lubrication oil in the engine	480	dm <sup>3</sup>
replenishment oil tank volume	360	dm <sup>3</sup>

**Noise Parameters**

version	standard	option <sup>1)</sup>	
sound enclosure of CHP unit at 1m	75		dB(A)
ventilation inlet and outlet at 1m from the silencer	80	65	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 <sup>1)</sup>	0,81	
nominal current at cos φ=0.81	1440	A
generator circuit breaker	NS1600 H 3P	
short-circuit resistance of switchboard R1	35	kA
short-circuit resistance of switchboards R2, R4	10	kA
contribution of the actual source to the short-circuit current	< 15	kA
protection of power switchboard R1 closed/open	IP 31/00	
protection of control switchboard R2 closed/open	IP 31/00	
protection of engine switchboard R4 closed/open	IP 31/00	
recommended superior protection	1600	A
recommended connection cable <sup>2)</sup> (< 50m, at t<35°C)	4×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)
sound enclosure	RAL 5013 (blue)

**Unit Dimensions and Weights**

dimensional drawing	R0574
service weight	18765 kg

**Caution**

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

