

Basic Technical Data

nominal electrical output	1560	kW	
maximum heat output ¹⁾	1697	kW	

load	50	75	100	%
maximum heat output	982	1339	1697	kW
fuel input	1995	2821	3654	kW
electrical efficiency	39,1	41,5	42,7	%
heat efficiency	49,2	47,5	46,4	%
total efficiency (fuel utilization)	88,3	89,0	89,1	%
gas consumption	307	434	562	Nm 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 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	NO _x	CO	
with 5% of O ₂ in exhaust gases	500	650	mg/Nm ³

Generator

type	MJB 500 MC4		
producer	MARELLI		
cos φ	0,8/1,0		
efficiency in the working point	97,4	%	
voltage	400	V	
frequency	50	Hz	

Engine

type	TCG 2020 V16		
producer	MWM		
number of cylinders	16		
arrangement of cylinders	V		
bore × stroke	170/195	mm	
displacement	71	dm ³	
compression ratio	14 : 1		
speed	1500	rpm	
nominal oil consumption	0,15	g/kWh	
max. engine output	1602	kW	

TCG 2020V16 BG65% CH₄ ; 30.01.2017

Thermal System

Secondary Circuit

heat carrier	water		
circuit's heat output	1577	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	18,9	kg/s	
max. working pressure	600	kPa	
min. pressure in system	100	kPa	
water volume in CHP unit circuit	170	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 150°C)	735	kW	
exhaust gas temperature	434	°C	



Primary Circuit

heat carrier	water + ethylene glycol	
ethylene glycol's concentration	35	%
circuit's heat output	1577	kW
pressure reserve for interconnecting pipes ¹⁾	30	kPa
maximal connect-able volume of system outside the module of CHP unit ²⁾	300	dm ³
max. working pressure	300	kPa
water volume in CHP unit circuit ³⁾	1830	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	120	kW
coolant temperature (outlet from CHP unit – informative)	54,0	°C
coolant temperature (inlet into CHP unit) max	50,0	°C
nominal flow rate	7,9	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 ³⁾	230	dm ³
max. working pressure	300	kPa
min. working pressure	50	kPa
water volume in CHP unit circuit	60	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

methane content	65	%
minimal methane content	> 45	%
low heat value	23,4	MJ/Nm ³
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	96	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	6023	Nm ³ /hr

Exhaust Gas and Condensate Outlet

amount of exhaust gases	6533	Nm ³ /hr
exhaust gas temperature between engine-generator set and exhaust exchanger nominal / max	434/550	°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 500)	14,3	m/s

Lubricant Charges

amount of lubrication oil in the engine	265	dm ³
volume of engine additional oil tank	685	dm ³
replenishment oil tank volume	500	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⁾	0,89	
nominal current at cos φ=0.8	2560	A
generator circuit breaker	NW32 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	< 30	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	3000	A
recommended connection cable ²⁾ (< 50m, at t<35°C)	7×NYY (3×240+120)	

1) Power factor adjustable from 0,89C ÷ 1 ÷ 0,89L (range from 0.89C ÷ 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	0,89
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	4060	5760	mm
width	1485	2200	mm
height	2200	2570	mm
service weight	13850	5280	kg

	Primary circuit's module	Technological module	
length	2935	1750	mm
width	1550	1045	mm
height	2610	2150	mm
service weight	2500	380	kg

	Gas train	
length	1455	mm
width	385	mm
height	775	mm
service weight	100	kg

	Exhaust silencer	
length	5700	mm
width	ø 1000	mm
height	horizontal	mm
service weight	1200	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	950 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.

