

**Imperial**

**Basic Technical Data**

Nominal electrical output	1200	kW		
Maximum heat output <sup>1)</sup>	4,476,734	BTU/h		
<i>1) Maximum heat output is a sum of heat outputs of secondary and aftercooler circuit at their full utilization</i>				
Load	50	75	100	%
Heat power	2,569,345	3,531,570	4,476,734	BTU/h
Fuel input	5,145,514	7,301,989	9,441,404	BTU/h
Heat rate	8,576	8,113	7,868	BTU/kW <sub>e</sub>
Electrical efficiency	39,8	42,1	43,4	%
Heat efficiency	49,9	48,3	47,4	%
Total efficiency (fuel utilization)	89,7	90,4	90,8	%
Gas consumption	5,638	8,001	10,345	CFH

*The Basic Technical Data are applicable for the standard conditions pursuant to the "Technical instruction" document.  
The minimum permanent electrical output must not drop below 50 % of the nominal output.  
Gas consumption is expressed under the conditions (59°F, 14.648 psi, Low Heat Value 912.18 BTU/CF)*

**Observance of Emission Limits**

Emissions	CO	NOx	VOC	
At 15% of O <sub>2</sub> in exhaust gas	0.6	1.0	0.7	g/HP-hr

**Generator**

Type	MJB 450 MB4		
Producer	MARELLI		
Cos φ	1,0		
Voltage	480	V	
Frequency	60	Hz	

**Metric**

**Basic Technical Data**

Nominal electrical output	1200	kW		
Maximum heat output <sup>1)</sup>	1312	kW		
<i>1) Maximum heat output is a sum of heat outputs of secondary and aftercooler circuit at their full utilization</i>				
Load	50	75	100	%
Heat power	753	1035	1312	kW
Fuel input	1508	2140	2767	kW
Electrical efficiency	39,8	42,1	43,4	%
Heat efficiency	49,9	48,3	47,4	%
Total efficiency (fuel utilization)	89,7	90,4	90,8	%
Gas consumption	160	227	293	m <sup>3</sup> /h

*The Basic Technical Data are applicable for the standard conditions pursuant to the "Technical instruction" document.  
The minimum permanent electrical output must not drop below 50 % of the nominal output.  
Gas consumption is expressed under the conditions (15°C, 101.325 kPa, Low Heat Value 34MJ/m<sup>3</sup>)*

**Engine**

Type	TCG 2020 V12		
Producer	MWM		
Number of cylinders	12		
Arrangement of cylinders	V		
Bore × stroke	170/195	mm	
Displacement	3,234	cui	
Compression ratio	13 : 1		
Speed	1500	rpm	
Nominal oil consumption	0.2	g/kWh	
Max. engine output	1232	kW	

*TCG2020V12 480V natural gas; 04.05.2016*



## Thermal System

### Secondary circuit

Heat carrier	water	
Total system heat recovery	4,080,925	BTU/h
Nominal water temperature, input / output	158/194	°F
Return water temperature, min / max	104/158	°F
Nominal flow rate	226.6	GPM
Max. working pressure	87	psi
Allowed operation over-pressure on connecting flanges <sup>1)</sup>	65	psi
Min. pressure in system	14.5	psi
Water volume in CHP unit circuit	39.6	gal
Pressure reserve of pump for covering pressure losses outside container	7.2	psi
Nominal temperature drop	36	°F

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	%
Total system heat recovery	4,080,925	BTU/h
Max. working pressure	43.5	psi
Water volume in CHP unit circuit	396.3	gal

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

Heat carrier	water + ethylene glycol	
Ethylene glycol's concentration	35	%
Total system heat recovery	395,809	BTU/h
Coolant temperature (outlet from CHP unit – informative)	109.4	°F
Coolant temperature (inlet into CHP unit) max	104	°F
Nominal flow rate	153.7	GPM
Max. working pressure	43.5	psi
Water volume in CHP unit circuit	59.4	gal

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

## Fuel, Gas Inlet

Low heat value	912.18	BTU/CF
Min. methane number	80	
Gas pressure	1.2 – 2.2	psi
Max. pressure change under varying consumption	10	%
Max. gas temperature	95	°F

## Thermal System

### Secondary circuit

Heat carrier	water	
Total system heat recovery	1196	kW
Nominal water temperature, input / output	70/90	°C
Return water temperature, min / max	40/70	°C
Nominal flow rate	14,3	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	150	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	%
Total system heat recovery	1196	kW
Max. working pressure	300	kPa
Water volume in CHP unit circuit	1500	dm <sup>3</sup>

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

Heat carrier	water + ethylene glycol	
Ethylene glycol's concentration	35	%
Total system heat recovery	116	kW
Coolant temperature (outlet from CHP unit – informative)	43,0	°C
Coolant temperature (inlet into CHP unit) max	40,0	°C
Nominal flow rate	9,7	kg/s
Max. working pressure	300	kPa
Water volume in CHP unit circuit	225	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	255,911	BTU/h
Amount of combustion air	2,904	CFM
Outdoor air temperature, min / max	-68/95	°F
Max. air temperature at the outlet flange	122	°F

**Exhaust Gas and Condensate Outlet**

Amount of exhaust gases	3,003	CFM
Exhaust gas temperature, nominal / max	248/302	°F
Max. back-pressure of exhaust gases downstream the CHP unit flange	0.14	psi
Speed of exhaust gases at the outlet (DN 400)	16.2	m/s

**Oil**

Amount of lubrication oil in the engine	54.2	gal
Amount of lubrication oil in the gearbox	15.3	gal
Volume of engine additional oil tank	134.7	gal
Replenishment oil tank volume	211.3	gal

**Unit Dimensions and Weights\***

Total length	622	in
Width total / transport	236.2 / 118.1	in
Height total / transport	393.7 / 118.1	in
Service weight of the entire CHP unit	86,957	lb

\* Approximate values

**Combustion and Ventilation Air**

Unused heat removed by the ventilation air	75	kW
Amount of combustion air	4934	Nm <sup>3</sup> /h
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	5102	Nm <sup>3</sup> /h
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 400)	16,2	m/s

**Oil**

Amount of lubrication oil in the engine	205	dm <sup>3</sup>
Amount of lubrication oil in the gearbox	58	dm <sup>3</sup>
Volume of engine additional oil tank	510	dm <sup>3</sup>
Replenishment oil tank volume	800	dm <sup>3</sup>

**Unit Dimensions and Weights\***

Total length	15800	mm
Width total / transport	6000 / 3000	mm
Height total / transport	10000 / 3000	mm
Service weight of the entire CHP unit	39440	kg

\* Approximate values



**Noise Parameters**

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

nominal voltage	277/480	V
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nominal frequency	60	Hz
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power factor <sup>1)</sup>	0,8	
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nominal current at cos φ=0.8	1800	A
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generator circuit breaker	NW20 H1 3P	
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short-circuit resistance of switchboard R1	40	kA
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short-circuit resistance of switchboards R2, R3, R4 and R5	10	kA
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contribution of the actual source to the short-circuit current	< 18	kA
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protection of power switchboard R1 closed/open	IP 31/00	
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protection of control switchboard R2 closed/open	IP 31/00	
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protection of frequency changers' switchboard R3 closed/open	IP 31/00	
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protection of engine switchboard R4 closed/open	IP 31/00	
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protection of cooling switchboard R5 closed/open	IP 66/00	
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recommended superior protection	1900	A
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recommended connection cable <sup>2)</sup> (< 50m, at t<35°C)	5×NYY (3×240+120)	
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1) Power factor adjustable from 0,8C ÷ 1 ÷ 0,8L (range from 0.8C ÷ 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	0,8
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output [% Pnom]	100	100	98
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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)

**Color Version**

Engine, generator and internal parts of unit	RAL 5010 (blue)
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Container	RAL 5013 (blue)
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**Caution**

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

