

Imperial

Basic Technical Data

Nominal electrical output	2000	kW		
Maximum heat output ¹⁾	7,435,063	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	4,285,653	5,882,537	7,435,063	BTU/h
Fuel input	8,625,901	12,198,416	15,736,810	BTU/h
Heat rate	8,626	8,132	7,868	3TU/kW _e
Electrical efficiency	39,6	42,0	43,4	%
Heat efficiency	49,6	48,2	47,2	%
Total efficiency (fuel utilization)	89,2	90,2	90,6	%
Gas consumption	9,452	13,366	17,244	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 ₂ in exhaust gas	0.6	1.0	0.7	g/HP-hr

Generator

Type	MJB 560 LA4
Producer	MARELLI
Cos φ	1,0
Voltage	480 V
Frequency	60 Hz

Metric

Basic Technical Data

Nominal electrical output	2000	kW		
Maximum heat output ¹⁾	2179	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	1256	1724	2179	kW
Fuel input	2528	3575	4612	kW
Electrical efficiency	39,6	42,0	43,4	%
Heat efficiency	49,6	48,2	47,2	%
Total efficiency (fuel utilization)	89,2	90,2	90,6	%
Gas consumption	268	379	488	m ³ /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/m³)*

Engine

Type	TCG 2020 V20
Producer	MWM
Number of cylinders	20
Arrangement of cylinders	V
Bore × stroke	170/195 mm
Displacement	5,431 cui
Compression ratio	13 : 1
Speed	1500 rpm
Nominal oil consumption	0.2 g/kWh
Max. engine output	2055 kW

TCG2020V20 480V natural gas; 04.05.2016



Thermal System

Secondary circuit

Heat carrier	water	
Total system heat recovery	6,793,580	BTU/h
Nominal water temperature, input / output	158/194	°F
Return water temperature, min / max	104/158	°F
Nominal flow rate	377.2	GPM
Max. working pressure	87	psi
Allowed operation over-pressure on connecting flanges ¹⁾	65	psi
Min. pressure in system	14.5	psi
Water volume in CHP unit circuit	74	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	6,793,580	BTU/h
Max. working pressure	43.5	psi
Water volume in CHP unit circuit	634	gal

Aftercooler circuit ¹⁾

Heat carrier	water + ethylene glycol	
Ethylene glycol's concentration	35	%
Total system heat recovery	641,483	BTU/h
Coolant temperature (outlet from CHP unit – informative)	111	°F
Coolant temperature (inlet into CHP unit) max	104	°F
Nominal flow rate	176	GPM
Max. working pressure	43.5	psi
Water volume in CHP unit circuit	87.2	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	1991	kW
Nominal water temperature, input / output	70/90	°C
Return water temperature, min / max	40/70	°C
Nominal flow rate	23,8	kg/s
Max. working pressure	600	kPa
allowed operation over-pressure on connecting flanges ¹⁾	450	kPa
min. pressure in system	100	kPa
Water volume in CHP unit circuit	280	dm ³
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	1991	kW
Max. working pressure	300	kPa
Water volume in CHP unit circuit	2400	dm ³

Aftercooler circuit ¹⁾

Heat carrier	water + ethylene glycol	
Ethylene glycol's concentration	35	%
Total system heat recovery	188	kW
Coolant temperature (outlet from CHP unit – informative)	44,0	°C
Coolant temperature (inlet into CHP unit) max	40,0	°C
Nominal flow rate	11,1	kg/s
Max. working pressure	300	kPa
Water volume in CHP unit circuit	330	dm ³

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

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	450,403	BTU/h
Amount of combustion air	4,864	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	5,029	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 500)	17.4	m/s

Oil

Amount of lubrication oil in the engine	79.2	gal
Amount of lubrication oil in the gearbox	23.8	gal
Volume of engine additional oil tank	181	gal
Replenishment oil tank volume	264.2	gal

Unit Dimensions and Weights*

Length total / transport	787.4 / 689	in
Width total / transport	216.5 / 130	in
Height total / transport	393.7 / 130	in
Service weight of the entire CHP unit	130,502	lb

* Approximate values

Combustion and Ventilation Air

Unused heat removed by the ventilation air	132	kW
Amount of combustion air	8263	Nm ³ /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	8545	Nm ³ /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 500)	17,4	m/s

Oil

Amount of lubrication oil in the engine	300	dm ³
Amount of lubrication oil in the gearbox	90	dm ³
Volume of engine additional oil tank	685	dm ³
Replenishment oil tank volume	1000	dm ³

Unit Dimensions and Weights*

Length total / transport	20000 / 17500	mm
Width total / transport	5500 / 3300	mm
Height total / transport	10000 / 3300	mm
Service weight of the entire CHP unit	59190	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 ¹⁾	0,84	
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nominal current at cos φ=0.84	2880	A
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generator circuit breaker	NW32 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	< 30	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	3000	A
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recommended connection cable ²⁾ (< 50m, at t<35°C)	7×NYY (3×240+120)	
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1) Power factor adjustable from 0,84C ÷ 1 ÷ 0,84L (range from 0.84C ÷ 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	0,84
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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.

