



[www.mwm.net](http://www.mwm.net)

# TCG 2020

1050 – 2070 kW | 1408 – 2776 bhp  
at 1500 min<sup>-1</sup> | rpm (60 Hz) with gearbox

**MWM**  
Energy. Efficiency. Environment.

# Technical data 60 Hz – Natural gas applications

NO<sub>x</sub> <= 500 mg /m<sub>n</sub><sup>3</sup> | 1.2 g/bhph<sup>11</sup>

Minimum methane number MN 80  
dry exhaust manifolds

Engine type		TCG 2020 V12	TCG 2020 V16	TCG 2020 V20
Engine power <sup>2)</sup>	kW   bhp	1200   1609	1600   2146	2070   2776
Speed	min <sup>-1</sup>   rpm	1500	1500	1500
Mean effective pressure	bar   psi	18.1   262.5	18.1   262.5	18.7   271.2
Exhaust temperature	approx. °C   °F	430   806	430   806	430   806
Exhaust mass flow wet	approx. kg/h   lb/hr	6053   13341	8259   18203	10600   23362
Combustion air mass flow <sup>2)</sup>	approx. kg/h   lb/hr	5852   12898	7987   17603	10252   22595
Combustion air temperature min./design	°C   °F	20/25   68/77	20/25   68/77	20/25   68/77
Ventilation air flow <sup>3)</sup>	approx. kg/h   lb/hr	29944   65938	39691   87401	50577   111373

Engine parameters				
Bore/stroke	mm   in	170/195   6.7/7.7	170/195   6.7/7.7	170/195   6.7/7.7
Displacement	dm <sup>3</sup>   cu in	53.1   3240	70.8   4320	88.5   5400
Compression ratio		13.5 : 1	13.5 : 1	13.5 : 1
Mean piston speed	m/s   ft/s	9.8   32.16	9.8   32.16	9.8   32.16
Lube oil content <sup>4)</sup>	dm <sup>3</sup>   gal	630   166.5	865   228.6	1080   285.4
Typical mean lube oil consumption <sup>5)</sup>	g/kWh   lb/hr	0.2   0.15	0.2   0.15	0.2   0.15

Generator				
Efficiency <sup>6)</sup>	%	97.2	97.3	97.3

Gear				
Ratio		1 : 1.2	1 : 1.2	1 : 1.2
Efficiency	%	98.8	98.9	98.7

Energy balance				
Electrical power <sup>6)</sup>	kWel	1152	1540	1989
Jacket water heat	± 8% kW   MBtu/hr	581   1982	795   2712	1011   3449
Intercooler LT heat <sup>7)</sup>	± 8% kW   MBtu/hr	124   423	160   546	208   709
Exhaust cooled to 120 °C   248 °F	± 8% kW   MBtu/hr	578   1972	789   2692	1013   3456
Engine radiation heat	kW   MBtu/hr	45   154	60   205	75   256
Generator radiation heat	kW   MBtu/hr	34   116	43   147	56   191
Fuel consumption <sup>8)</sup>	+ 5% kW   MBtu/hr	2718   9274	3666   12508	4705   16053
Electrical efficiency	%	42.4	42.0	42.3
Thermal efficiency	%	42.6	43.2	43.0
Total efficiency	%	84.0	85.2	85.3

System parameters				
Engine jacket water flow rate min./max.	m <sup>3</sup> /h   GPM	36/56   158/245	50/65   219/285	60/85   263/373
Engine K <sub>v5</sub> -value <sup>9)</sup>	m <sup>3</sup> /h   GPM	42   184	46   202	66   290
Intercooler coolant flow rate	m <sup>3</sup> /h   GPM	40   175	40   175	45   198
Intercooler K <sub>v5</sub> -value <sup>9)</sup>	m <sup>3</sup> /h   GPM	30   131	30   131	72   316
Engine jacket water volume	dm <sup>3</sup>   gal	111   30	151   40	210   56
Intercooler coolant volume	dm <sup>3</sup>   gal	28   7	28   7	52   14
Engine jacket water temperature max. <sup>10)</sup>	°C   °F	80/92   176/198	80/92   176/198	80/92   176/198
– with glycol <sup>10)</sup>	°C   °F	(80/92   176/198)	(80/92   176/198)	(80/92   176/198)
Intercooler coolant temperature <sup>10)</sup>	°C   °F	40/42.8   104/109	40/43.5   104/110.3	38/41.7   100/107
Exhaust backpressure min./max.	mbar   psi	30/50   0.44/0.73	30/50   0.44/0.73	30/50   0.44/0.73
Maximum pressure loss in front of air cleaner	mbar   psi	5   0.073	5   0.073	5   0.073
Gas flow pressure, fixed between <sup>11)</sup>	mbar   psi	20...200   0.29...2.9	20...200   0.29...2.9	20...200   0.29...2.9
Starter battery 24 V, capacity required	Ah	430	430	430

# Technical data 60 Hz – Sewage, bio and landfill gas applications

NO<sub>x</sub> <= 500 mg/m<sub>n</sub><sup>3</sup> | 1.2 g/bhph<sup>1)</sup>

Sewage gas (65% CH<sub>4</sub> / 35% CO<sub>2</sub>)

Biogas (60% CH<sub>4</sub> / 32% CO<sub>2</sub>, rest N<sub>2</sub>)

Landfill gas (50% CH<sub>4</sub> / 27% CO<sub>2</sub>, rest N<sub>2</sub>)

Minimum heating value (LHV) = 5.0 kWh/m<sub>n</sub><sup>3</sup> | 483 Btu/cu ft  
dry exhaust manifolds

Engine type		TCG 2020 V12	TCG 2020 V16	TCG 2020 V20
Engine power <sup>2)</sup>	kW   bhp	1050   1408	1400   1877	1750   2347
Speed	min <sup>-1</sup>   rpm	1500	1500	1500
Mean effective pressure	bar   psi	15.8   229.1	15.8   229.1	15.8   229.1
Exhaust temperature	approx. °C   °F	470   878	470   878	475   887
Exhaust mass flow wet	approx. kg/h   lb/hr	5351   11794	7234   15944	9062   19973
Combustion air mass flow <sup>2)</sup>	approx. kg/h   lb/hr	4906   10813	6639   14632	8318   18333
Combustion air temperature min./design	°C   °F	20/25   68/77	20/25   68/77	20/25   68/77
Ventilation air flow <sup>3)</sup>	approx. kg/h   lb/hr	27485   60577	36130   79631	45609   100522

Generator				
Efficiency <sup>6)</sup>	%	97.2	97.3	97.3

Gear				
Ratio		1 : 1.2	1 : 1.2	1 : 1.2
Efficiency	%	98.8	98.9	98.7

Energy balance				
Electrical power <sup>6)</sup>	kWel	1008	1345	1681
Jacket water heat	± 8% kW   MBtu/hr	536   1829	712   2429	858   2927
Intercooler LT heat <sup>7)</sup>	± 8% kW   MBtu/hr	113   386	148   505	199   679
Exhaust cooled to 150 °C   310 °F	± 8% kW   MBtu/hr	534   1822	721   2460	919   3135
Engine radiation heat	kW   MBtu/hr	45   154	60   205	75   256
Generator radiation heat	kW   MBtu/hr	29   99	36   123	47   160
Fuel consumption <sup>8)</sup>	+ 5% kW   MBtu/hr	2489   8492	3329   11359	4158   14187
Electrical efficiency	%	40.5	40.4	40.4
Thermal efficiency	%	43.0	43.0	42.7
Total efficiency	%	83.5	83.4	83.1

System parameters				
Engine jacket water flow rate min./max.	m <sup>3</sup> /h   GPM	36/56   158/245	50/65   219/285	65/85   285/373
Engine K <sub>v5</sub> -value <sup>9)</sup>	m <sup>3</sup> /h   GPM	42   184	46   202	66   290
Intercooler coolant flow rate	m <sup>3</sup> /h   GPM	35   153	35   153	40   175
Intercooler K <sub>v5</sub> -value <sup>9)</sup>	m <sup>3</sup> /h   GPM	30   131	30   131	72   316
Engine jacket water volume	dm <sup>3</sup>   gal	111   30	151   40	210   56
Intercooler coolant volume	dm <sup>3</sup>   gal	28   7	28   7	52   14
Engine jacket water temperature max. <sup>10)</sup>	°C   °F	81/92   178/198	81/92   178/198	81/92   178/198
– with glycol <sup>10)</sup>	°C   °F	(81/92   178/198)	(81/92   178/198)	(81/92   178/198)
Intercooler coolant temperature <sup>10)</sup>	°C   °F	50/52.5   122/127	50/53.3   122/128	50/53.8   122/128
Exhaust backpressure min./max.	mbar   psi	30/50   0.44/0.73	30/50   0.44/0.73	30/50   0.44/0.73
Maximum pressure loss in front of air cleaner	mbar   psi	5   0.073	5   0.073	5   0.073
Gas flow pressure, fixed between <sup>11)</sup>	mbar   psi	20...200   0.29...2.9	20...200   0.29...2.9	20...200   0.29...2.9
Starter battery 24 V, capacity required	Ah	430	430	430

1) NO<sub>x</sub> emissions:  
NO<sub>x</sub> < 0.50 g NO<sub>x</sub>/m<sub>n</sub><sup>3</sup> | 1.2 g/bhph dry exhaust gas at 5% O<sub>2</sub>  
2) Engine power ratings and combustion air volume flows  
acc. to ISO 3046/1  
3) Intake air flow at delta T = 15 K including combustion air  
4) Including pipes, heat exchangers and base frame lube  
oil tank.

5) This values are the mean lube oil consumption between  
maintenance steps which include an E 60 service. Also the  
procedures defined in the TPI 1111-E-06-02 and the Techni-  
cal Circular TR 0199-99-2105 are to be carefully followed.  
6) At 60 Hz, U = 0.48 kV, power factor = 1, speed 1800 min<sup>-1</sup> | rpm  
7) At 40 °C | 104 °F water inlet (50 °C | 122 °F for biogas),  
gearbox with coolant temperature  
8) With a tolerance of + 5%

9) The K<sub>v5</sub>-value is the parameter for the pressure loss in the  
cooling system (= flowrate for 1 bar | 14.5 psi pressure loss).  
10) Inlet/outlet  
11) Consider TR 0199-99-3017  
Data for special gas and dual gas operation on request.  
The values given in this data sheet are for information purposes  
only and not binding.  
The information given in the offer is decisive.

Dimensions 60 Hz Genset		TCG 2020 V12	TCG 2020 V16	TCG 2020 V20
Length	mm   in	6300   248.1	8000   315.0	8800   346.5
Width	mm   in	2000   78.8	2000   78.8	2100   82.7
Height	mm   in	2500   98.4	2500   98.4	2600   102.4
Dry weight genset	kg   lbs	12850   28329	16250   35825	21100   46517

Noise emissions* 60 Hz										
Noise frequency band		Hz	63	125	250	500	1000	2000	4000	8000
<b>Engine type TCG 2020 V12</b>										
Exhaust noise 119 dB (A)	dB (lin)		116	122	121	118	110	110	108	107
Air-borne noise 103 dB (A)	dB (lin)		102	95	96	96	97	95	95	97
<b>Engine type TCG 2020 V16</b>										
Exhaust noise 120 dB (A)	dB (lin)		117	127	119	116	114	113	110	103
Air-borne noise 108 dB (A)	dB (lin)		102	90	95	94	97	96	99	107
<b>Engine type TCG 2020 V20</b>										
Exhaust noise 124 dB (A)	dB (lin)		120	129	122	119	118	117	114	108
Air-borne noise 107 dB (A)	dB (lin)		104	102	97	100	101	101	99	100

Exhaust noise at 1 m,  $\star 45^\circ$ ,  $\pm 2.5$  dB (A)

Air-borne noise at 1 m from the side,  $\pm 1$  dB (A)

\*Values apply to natural gas applications, measured as noise pressure level.

## Characteristics

State-of-the-art 12, 16 and 20 cylinder V-engines • Air-fuel turbocharging and two-stage intercooling • Single cylinder heads with four-valve technology • Centrally arranged industrial spark plug with intensive plug seat cooling • Microprocessor-controlled

high-voltage ignition system • One ignition coil per cylinder • Electronic control and monitoring of genset operation through TEM • Exhaust emissions controlled according to combustion chamber temperature

Version 11/08/E

## Your benefits

- Package of favorable investment and low operating costs.
- Low energy consumption thanks to maximum primary energy utilization.
- Long service intervals and ease of service guarantee additional cost savings.
- Efficient energy conversion with outstanding performance.
- Reliable control and monitoring with high safety standards ensure optimum combustion and maximum engine protection.
- All governing, service, control and monitoring functions are easy and comfortable to operate.

### MWM Group

Mail: [info@mwm.net](mailto:info@mwm.net)

Web: [www.mwm.net](http://www.mwm.net)