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TCG 2020

V16



V12
V16

Gas Engine TCG 2020

1,000 - 1,560 kW_{eI}

Best electrical and thermal efficiency in its class. All gas types: natural gas, biogas, mine gas, landfill gas, sewage gas.

- **Output range from 1,000 to 1,560 kW_{el}**
- **Best electrical and thermal efficiency in its output class**
- **Runs on all gas types**

Cogeneration & Trigeneration

MWM Distributed Power Plants

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MWM Gas Engine TCG 2020 V12, V16 / TCG 2020 K

For the Highest Ratings in Ecology and Economy!

- ▶ **Output range from 1,000 to 1,560 kW_{el}**
- ▶ **Best electrical and thermal efficiency in its output class**
- ▶ **Runs on all gas types: natural gas, biogas, landfill gas, sewage gas, mine gas, etc.**
- ▶ **Low operating costs**
- ▶ **TCG 2020 is mainly used for CHP plants in Europe and for biogas worldwide**
- ▶ **The TCG 2020 V12 in the configuration RW (natural gas) and XW (biogas) is specifically optimized for the 1 MW_{el} capacity range, with even lower operating and maintenance costs**
- ▶ **TCG 2020 K was especially adapted to non-ISO conditions such as high altitudes or high intake air temperatures in the field of natural gas**
- ▶ **More than 2000 power generators with approximately 2,800,000 kW_{el} already installed around the globe**

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The MWM gas engines of the TCG 2020 series are perfectly geared to the challenges of a dynamic market environment. Our models in the output range of 1,000 – 1,560 kW_{eI} meet the high requirements of a broad range of applications and guarantee efficiency, reliability, flexibility and environmental sustainability, together with low lifecycle costs and high profitability.

Description – MWM Gas Engine TCG 2020 / TCG 2020 K

TCG 2020 – High Profitability Thanks to High Efficiency

- Improvements of the intake duct and spark plug provide higher efficiency compared to predecessor model
- Miller valve control times increase genset efficiency

TCG 2020 V12 in the Configuration RW (Natural Gas) and XW (Biogas) – Increased Efficiency and Extended Useful Life in the 1 MW_{eI} Capacity Range

- For all natural gas and biogas applications in countries with 50 Hz networks
- Longer maintenance intervals for all natural gas applications extend useful life by two years
- Optimized electrical efficiency of 43 percent (under ISO conditions) for natural gas applications
- Optimized lubricant management
- Lower internal consumption through higher mixture cooler temperatures for natural gas applications

TCG 2020 K – Optimized for Isolated Operation and Non-ISO Conditions

- Load response in only seven steps

- Fast and reliable supply in the event of grid failures or in isolated operation
- Special 1,000 kW_{el} variant available for high altitude setup and different intake air temperatures

Higher Efficiency and Lower Pollutant Emissions

- Smaller dead spaces in combustion chamber ensure more complete combustion
- Reduced fuel consumption and CO and HC emissions
- This enables gas savings of up to 15 percent a year and increases the profitability of the plant

Higher Efficiency and Long Maintenance Intervals

- Effective crankcase ventilation increases efficiency by utilizing the returned combustible blow-by gas
- Optimized blow-by return and improved separation of the gas phase and liquid phase enable longer maintenance intervals for the turbocharger thanks to the clean intake air

K Editions: Maximum Output at Low Costs

- Improved output capacity of TCG 2020 K under non-ISO conditions and excellent load response through optimum turbocharger design with broad performance map
- New turbocharger TCR 16 for TCG 2020 with water-cooled bearing housing eliminates need for separate maintenance stages for the turbocharger

High Reliability – MWM Gas Engine TCG 2020 / TCG 2020 K

Few Interruptions Due to Long Maintenance Intervals

- No more than two interruptions a year due to scheduled maintenance
- Longest interval until major overhaul compared to competitors
- Use of Xchange components enables time savings of up to 75 percent during the major overhaul, resulting in reduced costs

High Reliability through Mature Drive Technology in 60 Hz Range

- Engine can be operated with an optimum speed of 1500 RPM.
- Lower speed ensures stable and complete combustion, resulting in lower CO emissions and less component wear and tear

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Performance Data – MWM Gas Engine TCG 2020 / TCG 2020 K

Natural gas applications, $\text{NO}_x \leq 500 \text{ mg/Nm}^3$ *

TCG 2020 V12

RW = Optimized for high total efficiency at requested power

Engine type		50 Hz
Electrical output	kW	1000
Thermal output $\pm 8\%$	kW	1056
Electrical efficiency	%	43.0
Thermal efficiency	%	45.4
Total efficiency	%	88.4
Power to heat ratio **		0.95

TCG 2020 V12 K

K = Optimized for robustness and low CAPEX

TCG 2020 V12

R = Optimized for high total efficiency

Engine type		50 Hz	60 Hz	50 Hz	60 Hz
Electrical output	kW	1125	1125	1200	1200
Thermal output $\pm 8\%$	kW	1251	1262	1189	1196

		TCG 2020 V12 K		TCG 2020 V12	
		K = Optimized for robustness and low CAPEX		R = Optimized for high total efficiency	
Engine type		50 Hz	60 Hz	50 Hz	60 Hz
Electrical efficiency	%	41.0	40.7	43.7	43.4
Thermal efficiency	%	45.6	45.6	43.3	43.2
Total efficiency	%	86.6	86.3	87.0	86.6
Power to heat ratio **		0.90	0.89	1.00	1.00

		TCG 2020 V16 K		TCG 2020 V16	
		K = Optimized for robustness and low CAPEX		R = Optimized for high total efficiency	
Engine type		50 Hz	60 Hz	50 Hz	60 Hz
Electrical output	kW	1500	1500	1560	1560
Thermal output ± 8%	kW	1675	1686	1576	1589
Electrical efficiency	%	40.9	40.6	43.3	43.0
Thermal efficiency	%	45.7	45.7	43.8	43.8
Total efficiency	%	86.6	86.3	87.1	86.8
Power to heat ratio **		0.89	0.89	0.99	0.98

* With 5% O₂ and dry exhaust gas

** The power to heat ratio is calculated by dividing the electrical efficiency by the thermal efficiency. Please remember that this is a theoretical value that may deviate from actually measured values.

The values given in these tables are information purposes only and not binding. The information given in the offer is decisive. Other unit variants with other generators are available.

Biogas, Landfill Gas, and Sewage Gas Applications, NO_x ≤ 500 mg/Nm³ *

		TCG 2020 V12 XW = Optimized for operation with biogases at requested power		TCG 2020 V12 X = Optimized for operation with biogases	
Engine type		50 Hz		50 Hz	60 Hz
Electrical output	kW	1000		1200	1200
Thermal output ± 8%	kW	1035		1192	1201
Electrical efficiency	%	42.6		43.0	42.7
Thermal efficiency	%	44.1		42.7	42.7
Total efficiency	%	86.7		85.7	85.4
Power to heat ratio **		0.97		1.00	1.00

		TCG 2020 V16 X = Optimized for operation with biogases	
Engine type		50 Hz	60 Hz
Electrical output	kW	1560	1560
Thermal output ± 8%	kW	1566	1580
Electrical efficiency	%	42.7	42.3
Thermal efficiency	%	42.9	42.8
Total efficiency	%	85.6	85.1
Power to heat ratio **		1.00	0.99

* With 5% O₂ and dry exhaust gas

** The power to heat ratio is calculated by dividing the electrical efficiency by the thermal efficiency. Please remember that this is a theoretical value that may deviate from actually measured values.

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Specifications and Service Intervals – MWM Gas Engine TCG 2020 / TCG 2020 K

Dimensions and Weights

TCG 2020 V12

RW = Optimized for high total efficiency at requested power

XW = Optimized for operation with biogases at requested power

Engine type		50 Hz
Length	mm	4660
Width	mm	1810
Height	mm	2210
Dry weight genset	kg	11200

TCG 2020 V12

RW = Optimized for high total efficiency at requested power

XW = Optimized for operation with biogases at requested power

Engine type		50 Hz
Bore / stroke	mm	170/195
Displacement	dm ³	53.1
Speed	min ⁻¹	1500
Mean piston speed	m/s	9.8

TCG 2020 V12 K

K = Optimized for robustness and low CAPEX

TCG 2020 V12R = Optimized for high total efficiency
X = Optimized for operation with biogases

Engine type		50 Hz	60 Hz	50 Hz	60 Hz
Length	mm	4790	5970	4790	5970
Width	mm	1810	1790	1810	1790
Height	mm	2210	2210	2210	2210
Dry weight genset	kg	11700	13000	11700	13000
Bore / stroke	mm	170/195	170/195	170/195	170/195
Displacement	dm ³	53.1	53.1	53.1	53.1
Speed	min ⁻¹	1500	1500	1500	1500
Mean piston speed	m/s	9.8	9.8	9.8	9.8

Engine type		TCG 2020 V16 K K = Optimized for robustness and low CAPEX		TCG 2020 V16 R = Optimized for high total efficiency X = Optimized for operation with biogases	
		50 Hz	60 Hz	50 Hz	60 Hz
Length	mm	5430	6640	5430	6640
Width	mm	1810	1790	1810	1790
Height	mm	2210	2210	2210	2210
Dry weight genset	kg	13300	14900	13300	14900
Bore / stroke	mm	170/195	170/195	170/195	170/195
Displacement	dm ³	70.8	70.8	70.8	70.8
Speed	min ⁻¹	1500	1500	1500	1500
Mean piston speed	m/s	9.8	9.8	9.8	9.8

The values given in these tables are information purposes only and not binding. The information given in the offer is decisive. Other unit variants with other generators are available.

Service Intervals

TCG 2020 V12, V16, V12 K, V16	First service (check valve clearance)	Cylinder head inspection	Major overhaul
Natural gas, purified biogas, sewage gas, and landfill gas	4000 oh	32000 oh*	64000 oh
Unpurified biogas, sewage gas, and landfill gas	2000 oh	16000 oh*	64000 oh

TCG 2020 V12 RW = Optimized for high total efficiency at requested power XW = Optimized for operation with biogases at requested power	First service (check valve clearance)	Cylinder head inspection	Major overhaul
Natural gas	4000 oh	40000 oh*	80000 oh
Purified biogas, sewage gas, and landfill gas	4000 oh	32000 oh*	64000 oh
Unpurified biogas, sewage gas, and landfill gas	2000 oh	16000 oh*	64000 oh

* "at the latest"

The values given in these tables are information purposes only and not binding. The information given in the offer is decisive. Other unit variants with other generators are available.

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Brochure – MWM Gas Engine TCG 2020

Brochure – MWM Gas Engine TCG 2020

Eight pages of information about the gas engine with the highest ratings in ecology and economy. These high-performance power generators offer high efficiency with low maintenance costs.



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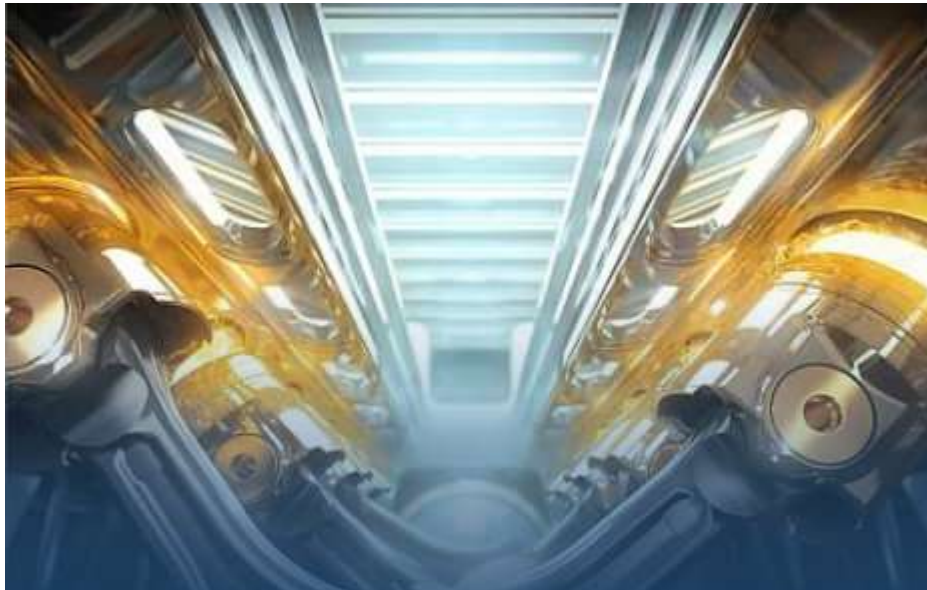




MWM PREMIUM ANTIFREEZE -20

High-performance coolant for MWM diesel and gas engines.

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Test MWM Premium oil for gas engines.

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MWM SPARE PARTS

With its logistics center in Lorsch, Germany, MWM guarantees efficient and reliable global spare-part supply.

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Everything under control: More transparency and value for CHP plants with MWM Remote Asset Monitoring (RAM).

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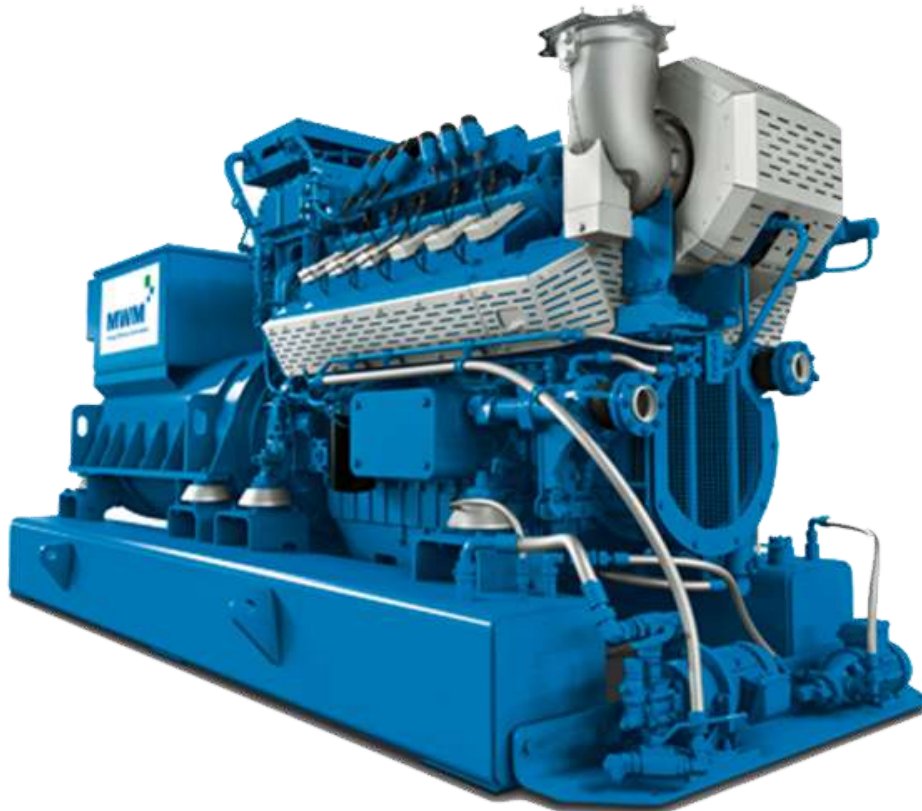
GAS ENGINES & PRODUCTS



Distributed Power Plants

MWM stands for highly-efficient and eco-friendly combined heat and power (CHP) plants for distributed power generation

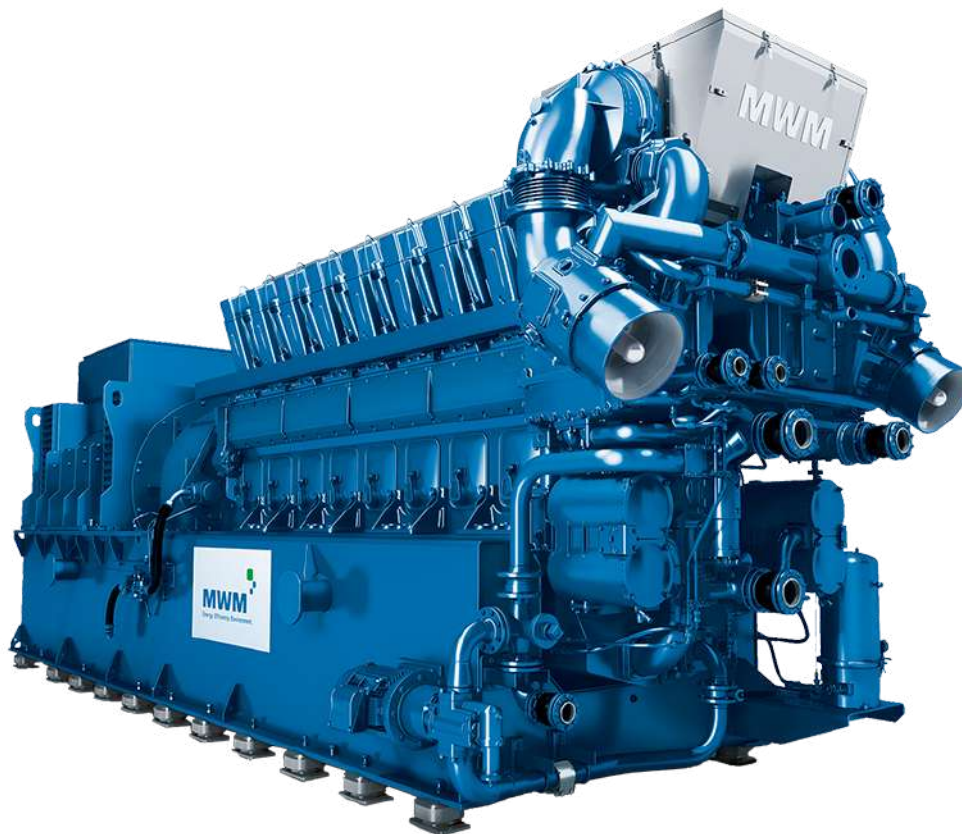
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Gas Engine TCG 3016

New development – greatly reduced operating and installation costs and fully digitized power plant control.

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Gas Engine TCG 2032

High reliability. Low operating costs. Gas types: natural gas, landfill gas, sewage gas, mine gas, coke oven gas. Mainly used in large IPP projects with up to 100 MW_{el}.

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Container Cogeneration Plant

Compact modules for the TCG 3016, TCG 3020 and 2020 gas engines.
Complete turnkey systems for special applications.

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