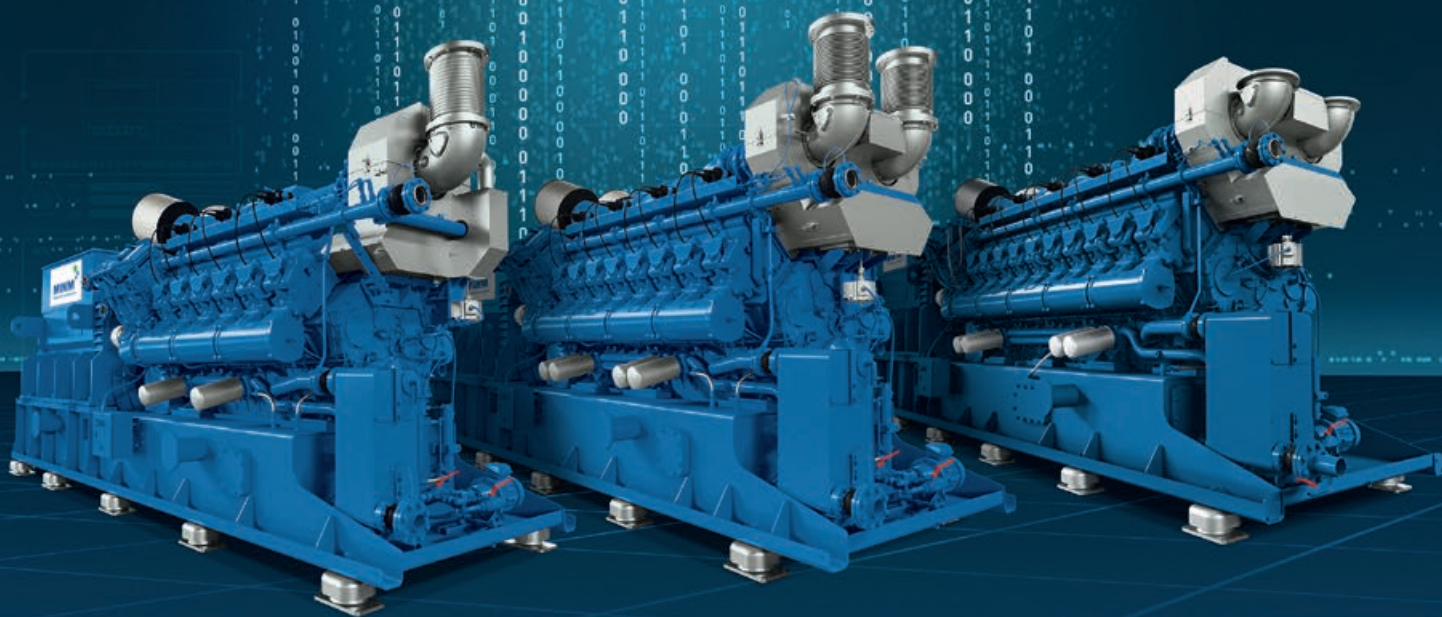


**MWM DIGITALPOWER**

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

Discover  
the new  
models



# TCG3020

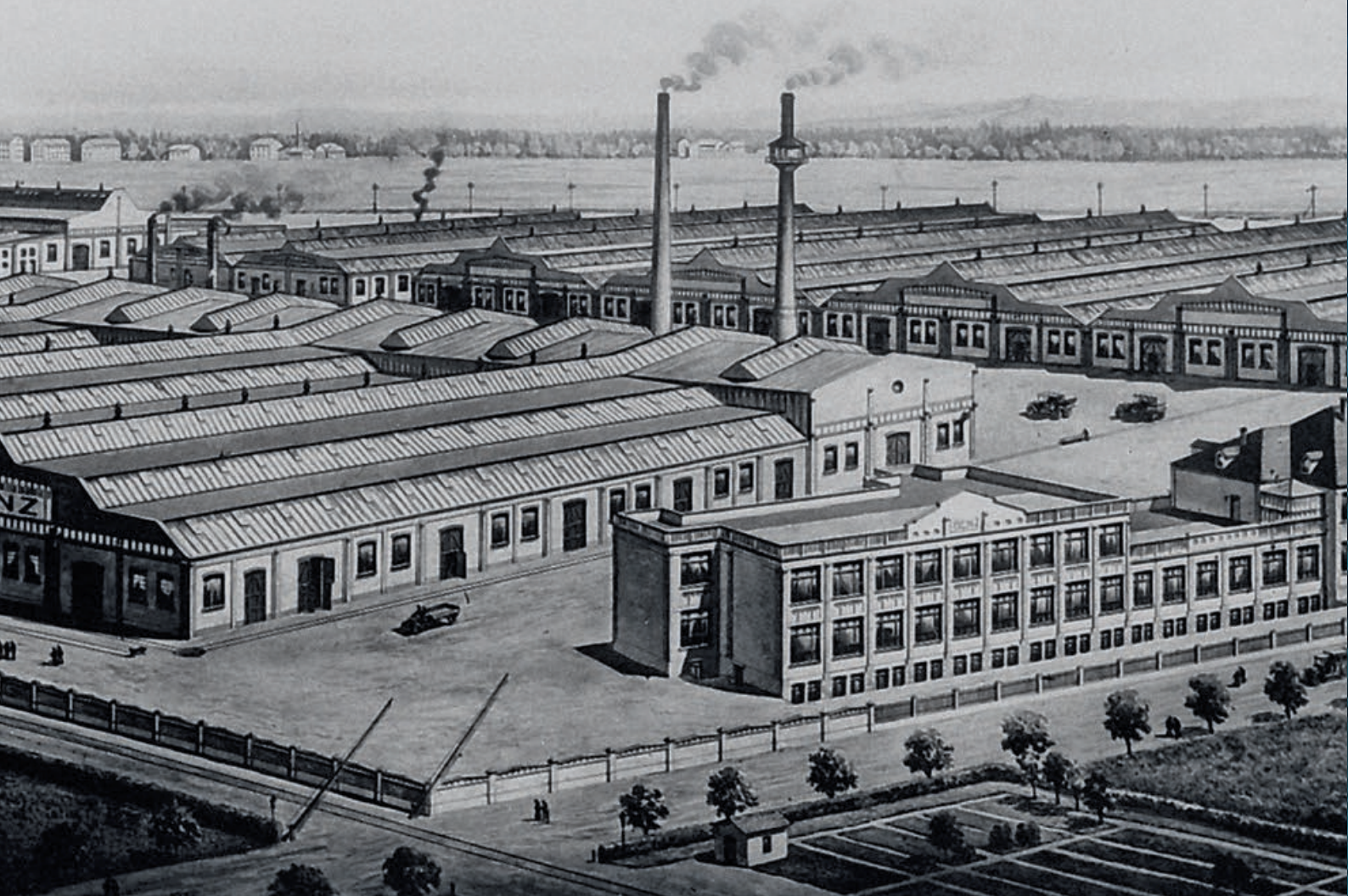
— The all-round talent. —

**MWM**  
Energy. Efficiency. Environment.



# 150 years of experience for your success.

With MWM, you benefit from 150 years of experience in gas engine technology and energy generation. Since 2011, we have been part of the network of Caterpillar Inc., gaining access to international expertise and resources on the basis of which we can develop individual turnkey solutions for you. Draw on the security and experience of a specialist that has installed thousands of highly efficient and reliable plants around the globe.



# The future of efficiency is digital.

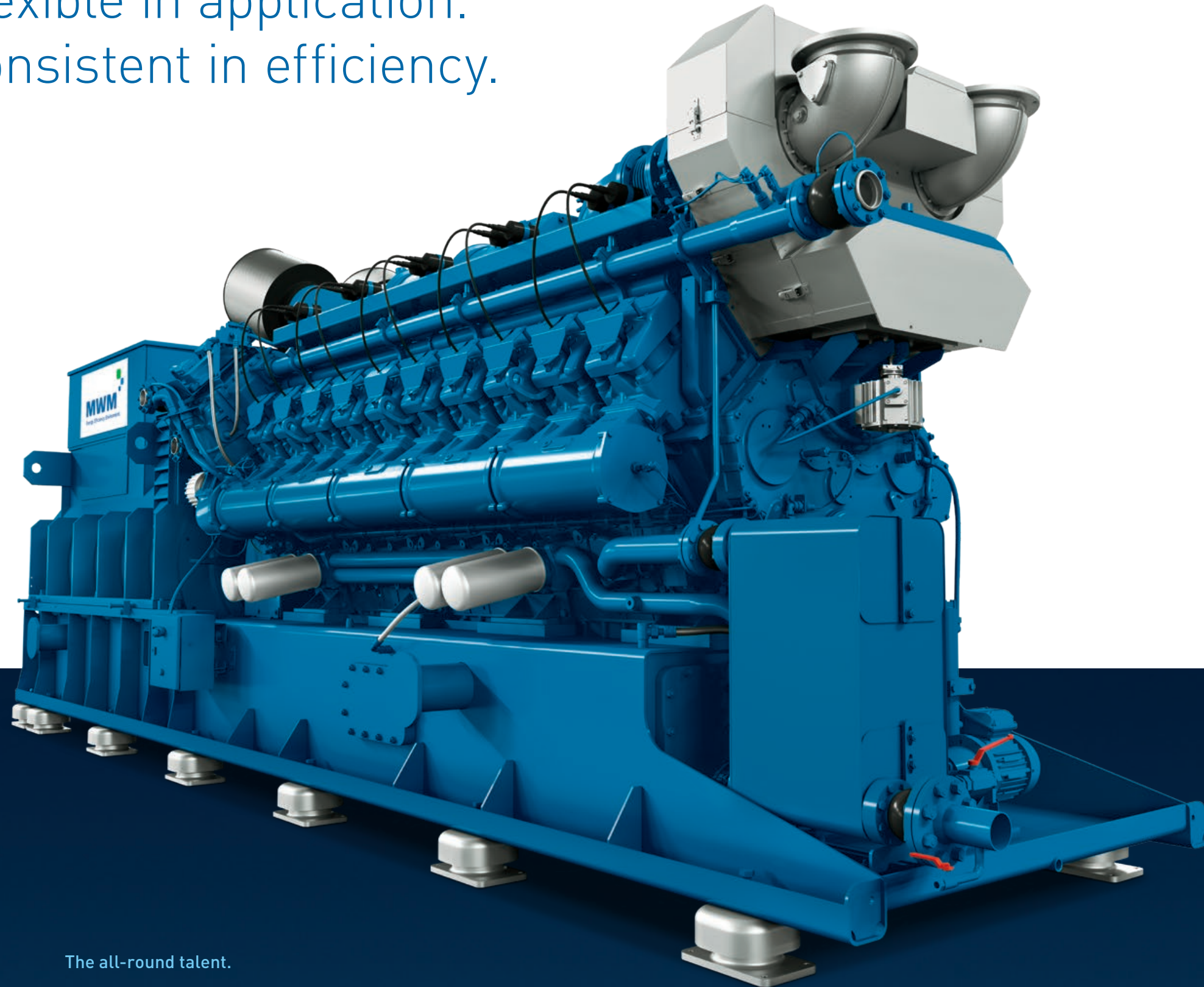
With MWM Digital Power, the energy market enters a new age. State-of-the-art components combined with smart and secure data analysis ensure improved maintenance, efficiency and optimized capacity utilization of your plants.

The MWM TCG 3020 gas engines are more than merely the next iteration of MWM's proven gas gensets. The new gas engines and turnkey solutions represent an entirely new development – perfectly tailored to the challenges of Industry 4.0 and the changed framework conditions of a dynamic energy market in the age of global value chains.





# Flexible in application. Consistent in efficiency.



## The all-round talent.

State-of-the-art components providing more power: the compact design, a focus on a wide range of applications and high efficiency values make sure of that. Controlled by the smart and secure TPEM (Total Plant & Energy Management), the new TCG 3020 series offers highest profitability and reliability.

**MWM DIGITALPOWER**

### ■ High Profitability

- ✓ High efficiency values
- ✓ Low oil consumption 0.15 g/kWh
- ✓ Up to 80,000 oh until major overhaul results in high profitability for the customer

### ■ High Reliability

- ✓ Reliable and proven core engine
- ✓ Upgraded with state of the art technologies
- ✓ Extended maintenance intervals

### ■ High Efficiency

- ✓ Increased electrical efficiency – up to 45 % (NG) and up to 43.6 % (BG)
- ✓ Increased electrical output up to 2,300 kW<sub>el</sub>
- ✓ Optimal combination of efficiency and reliability

### ■ Varieties of Gases and Applications

- ✓ Available for different applications like natural gas, biogas, landfill and propane gas operation
- ✓ Optimized variants for high efficiency, flexibility and biogas

### ■ New Engine and Plant Control System TPEM

- ✓ Hardware and Software for the engine and holistic plant control
- ✓ Enables full power capability of the genset with maximum reliability, availability, performance and usability

### ■ High Power Density

- ✓ Compact design: The TCG 3020 Series delivers up to 18 % more power output at the same size as its predecessor



# Benefit from the TCG 3020!

Contact us: [www.mwm.net](http://www.mwm.net) or [info@mwm.net](mailto:info@mwm.net)

## Superior operation and efficiency.



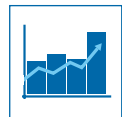
### Reduced operating costs

Due to high efficiency, low oil consumption and low service costs



### High Reliability

Providing up to 80,000 oh until major overhaul due to improved reliability



### Increased performance

More power with higher efficiency



### Tailor-made for your application

Optimized variants for all kind of gases and boundary conditions

## The TCG 3020: Successful deployment.

### Krikato BVBA, Belgium

The TCG 3020 V20 is the second MWM genset for tomato producer Krikato BVBA in Belgium. In 2012, they decided to use the MWM brand – at that time, a TCG 2020 V12 – for the construction of a CHP. They once again selected an MWM genset for the extension of their greenhouse. Since June 2020, the two gensets together have been generating 3.5 MW of electrical and 4.2 MW of thermal power and reliably supply the greenhouse, which has been expanded from 1.2 to 1.7 hectares, with electricity and heat.

By using SCR catalysts, the carbon dioxide in the exhaust gas released by the natural gas-powered MWM gas gensets can be used for organic carbon fertilization of the plants after proper treatment, which has a positive effect on growth and yield.

1x MWM TCG 2020 V12, 1x MWM TCG 3020 V20 | Go-live: 2012 and June 2020



## One genset, various applications

### Combined Heat and Power (CHP)



Utilities  
District heating  
Industrial  
Hospitals  
Airports  
Greenhouses

### Electrical Power



Energy services  
Independent power producers  
Utilities  
Industrial

### Biogas



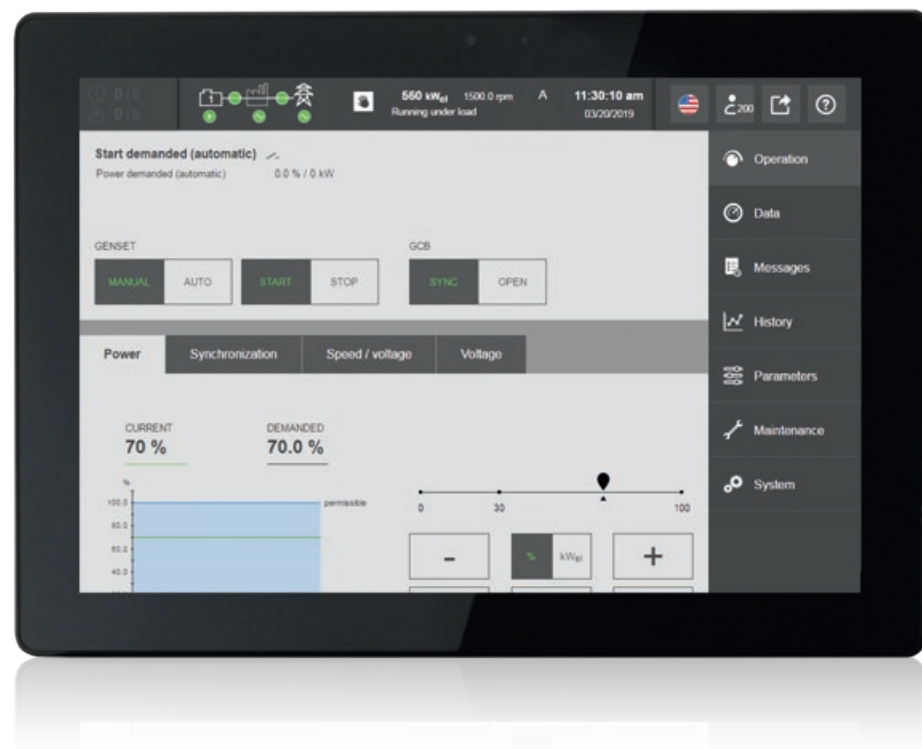
Agriculture  
Food industry  
Sewage  
Landfill



# TPEM. The door to the digital age.

With its comprehensive digital power plant control TPEM (Total Plant & Energy Management), MWM redefines the control standard for energy solutions.

TPEM eliminates the need for additional control systems, as all power plant data for the genset and plant control are combined in one system. The optimum power plant control enables high economic efficiency, provided from a single source.



## State-of-the-art system: economical, efficient and complete

### ■ One user interface

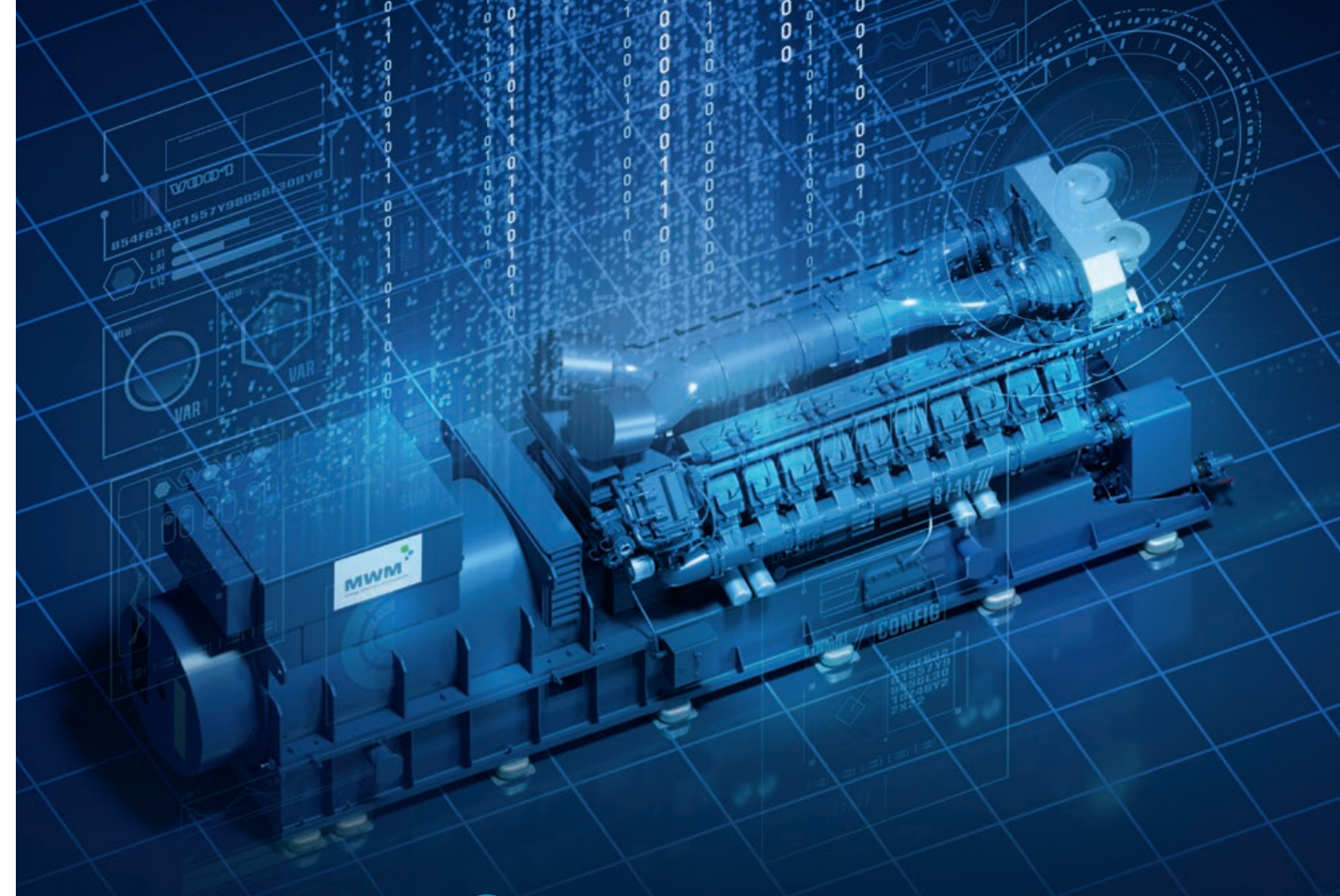
- ✓ Complete power plant control and setup

### ■ Connectivity solutions

- ✓ Remote plant control with free "TPEM Remote client" software and extensive monitoring and analytics options with "MWM RAM" subscription

### ■ Security-oriented technology

- ✓ Safety chain for cogeneration plant monitoring (TÜV-certified)



## Set up

- ✓ Custom-tailored technical solutions
- ✓ One integrated, flexible control system for all electric power applications
- ✓ Multiple functionalities for individual solutions

## Optimize

- ✓ Data management and analysis delivers information for optimizing the system
- ✓ Life cycle history enables access to data over the entire life cycle of the genset and the peripherals

## Operate

- ✓ High efficiency through optimal control
- ✓ Enables remote management and monitoring
- ✓ Use the full genset potential with maximum reliability



# Technical data 50 Hz (NO<sub>x</sub> ≤ 500 mg/Nm<sup>3 1)</sup>)

Engine type – TCG 3020		V12	V12	V16	V16	V20	V20	V20	V20
Bore/stroke	mm	170/195	170/195	170/195	170/195	170/195	170/195	170/195	170/195
Displacement	dm <sup>3</sup>	53.0	53.0	71.0	71.0	89.0	89.0	89.0	89.0
Speed	min <sup>-1</sup>	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Mean piston speed	m/s	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
Length <sup>2)</sup>	mm	5,080	5,080	6,100	6,100	6,600	6,600	6,983	6,983
Width <sup>2)</sup>	mm	1,710	1,710	1,710	1,710	1,710	1,710	1,706	1,706
Height <sup>2)</sup>	mm	2,190	2,190	2,190	2,190	2,190	2,190	2,385	2,385
Dry weight genset	kg	12,900	12,900	17,400	17,400	21,400	21,400	16,965	16,965

## Natural gas applications

NO<sub>x</sub> ≤ 500 mg/Nm<sup>3 1)</sup>

Engine type – TCG 3020		V12	V12	V16	V16	V20	V20	V20	V20
Configuration		P <sup>5)</sup>	R <sup>6)</sup>	P <sup>5)</sup>	R <sup>6)</sup>	P <sup>5)</sup>	R <sup>6)</sup>	PV <sup>7)</sup>	RV <sup>8)</sup>
Electrical power <sup>3)</sup>	kW	1,380	1,380	1,840	1,840	2,300	2,300	2,000	2,000
Mean effective pressure	bar	21.5	21.5	21.5	21.5	21.5	21.5	18.6	18.6
Thermal output <sup>4)</sup>	±8 % kW	1,296	1,369	1,755	1,824	2,164	2,281	1,949	2,026
Electrical efficiency <sup>3)</sup>	%	45.0	44.0	44.7	44.0	45.0	44.0	44.4	43.7
Thermal efficiency <sup>3)</sup>	%	42.3	43.6	42.6	43.6	42.3	43.6	43.3	44.2
Total efficiency <sup>3)</sup>	%	87.3	87.6	87.3	87.6	87.3	87.6	87.7	87.9

## Biogas applications

NO<sub>x</sub> ≤ 500 mg/Nm<sup>3 1)</sup>

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

Biogas (50 % CH<sub>4</sub> / 50 % CO<sub>2</sub>)

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

Engine type – TCG 3020		V12	V16	V20	V20
Configuration		X <sup>9)</sup>	X <sup>9)</sup>	X <sup>9)</sup>	XV <sup>10)</sup>
Electrical power <sup>3)</sup>	kW	1,380	1,840	2,300	2,000
Mean effective pressure	bar	21.5	21.5	21.5	18.6
Thermal output <sup>4)</sup>	±8 % kW	1,351	1,802	2,254	2,015
Electrical efficiency <sup>3)</sup>	%	43.6	43.6	43.6	43.2
Thermal efficiency <sup>3)</sup>	%	42.7	42.7	42.8	43.5
Total efficiency <sup>3)</sup>	%	86.3	86.3	86.4	86.7

1) NO<sub>x</sub> ≤ 500 mg/Nm<sup>3</sup>; exhaust gas dry at 5 % O<sub>2</sub>.  
2) Transport dimensions for gensets, components set up separately must be taken into consideration.  
3) According to ISO 3046-1 at U = 0.4 kV, cosphi = 1.0 for 50 Hz, a methane number of MN 80 for natural gas and MN 134 (sewage gas) for biogas applications.  
4) Exhaust gas cooled to 120 °C for natural gas and 150 °C for biogas.

5) P = High Efficiency. Optimized for high electrical efficiency.  
6) R = High Response. Optimized for high total efficiency.  
7) PV = High Efficiency for Requested Power. Optimized for high electrical efficiency at requested power.  
8) RV = High Response for Requested Power. Optimized for high total efficiency at requested power.  
9) X = Biogas. Optimized for operation with biogases.  
10) XV = Biogas for Requested Power. Optimized for operation with biogases at requested power.

Data for special gases and dual gas operation on request.

The values given on these datasheets are for information purposes only and not binding. The information given in the offer is decisive.

# Technical data 50 Hz (NO<sub>x</sub> ≤ 250 mg/Nm<sup>3 1)</sup>)

Engine type – TCG 3020		V12	V12	V16	V16	V20	V20	V20	V20	V20
Bore/stroke	mm	170/195	170/195	170/195	170/195	170/195	170/195	170/195	170/195	170/195
Displacement	dm <sup>3</sup>	53.0	53.0	71.0	71.0	89.0	89.0	89.0	89.0	89.0
Speed	min <sup>-1</sup>	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Mean piston speed	m/s	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
Length <sup>2)</sup>	mm	5,080	5,080	6,100	6,100	6,600	6,600	6,500	6,983	6,983
Width <sup>2)</sup>	mm	1,710	1,710	1,710	1,710	1,710	1,710	1,710	1,706	1,706
Height <sup>2)</sup>	mm	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,385	2,385
Dry weight genset	kg	12,900	12,900	17,400	17,400	21,400	21,400	17,980	16,965	16,965

## Natural gas and propane gas applications

NO<sub>x</sub> ≤ 250 mg/Nm<sup>3 1)</sup>

Engine type – TCG 3020		V12	V12	V16	V16	V20	V20	V20	V20	V20
Configuration		P <sup>6)</sup>	R <sup>7)</sup>	P <sup>6)</sup>	R <sup>7)</sup>	P <sup>6)</sup>	R <sup>7)</sup>	Z <sup>8)</sup>	PV <sup>9)</sup>	RV <sup>10)</sup>
Electrical power <sup>3)</sup>	kW	1,380	1,380	1,840	1,840	2,300	2,300	1,880 <sup>5)</sup>	2,000	2,000
Mean effective pressure	bar	21.5	21.5	21.5	21.5	21.5	21.5	17.7	18.6	18.6
Thermal output <sup>4)</sup>	±8 % kW	1,359	1,431	1,835	1,910	2,255	2,391	2,063	2,031	2,123
Electrical efficiency <sup>3)</sup>	%	43.9	42.9	43.6	42.9	44.0	42.9	41.8	43.4	42.6
Thermal efficiency <sup>3)</sup>	%	43.2	44.5	43.5	44.5	43.1	44.6	45.9	44.1	45.2
Total efficiency <sup>3)</sup>	%	87.1	87.4	87.1	87.4	87.1	87.5	87.7	87.5	87.8

## Biogas applications

NO<sub>x</sub> ≤ 250 mg/Nm<sup>3 1)</sup>

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

Biogas (50 % CH<sub>4</sub> / 50 % CO<sub>2</sub>)

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

Engine type – TCG 3020		V12	V16	V20	V20
Configuration		X <sup>11)</sup>	X <sup>11)</sup>	X <sup>11)</sup>	XV <sup>12)</sup>
Electrical power <sup>3)</sup>	kW	1,380	1,840	2,300	2,000
Mean effective pressure	bar	21.5	21.5	21.5	18.6
Thermal output <sup>4)</sup>	±8 % kW	1,407	1,878	2,346	2,097
Electrical efficiency <sup>3)</sup>	%	42.6	42.6	42.7	42.2
Thermal efficiency <sup>3)</sup>	%	43.4	43.5	43.5	44.3
Total efficiency <sup>3)</sup>	%	86.0	86.1	86.2	86.5

1) NO<sub>x</sub> ≤ 250 mg/Nm<sup>3</sup>; exhaust gas dry at 5 % O<sub>2</sub>.  
2) Transport dimensions for gensets, components set up separately must be taken into consideration.  
3) According to ISO 3046-1 at U = 0.4 kV, cosphi = 1.0 for 50 Hz, a methane number of MN 80 for natural gas, MN 34 for propane and MN 134 (sewage gas) for biogas applications.  
4) Exhaust gas cooled to 120 °C for natural gas and 150 °C for biogas.

5) 1,880 kW<sub>el</sub> is also achieved with natural gas applications.  
6) P = High Efficiency. Optimized for high electrical efficiency.  
7) R = High Response. Optimized for high total efficiency.  
8) Z = Propane. Optimized for operation with propane.  
9) PV = High Efficiency for Requested Power. Optimized for high electrical efficiency at requested power.  
10) RV = High Response for Requested Power. Optimized for high total efficiency at requested power.

11) X = Biogas. Optimized for operation with biogases.  
12) XV = Biogas for Requested Power. Optimized for operation with biogases at requested power.

Data for special gases and dual gas operation on request.

The values given on these datasheets are for information purposes only and not binding. The information given in the offer is decisive.

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