MWM DIGITALPOWER

www.mwm.net

Discover the latest variants

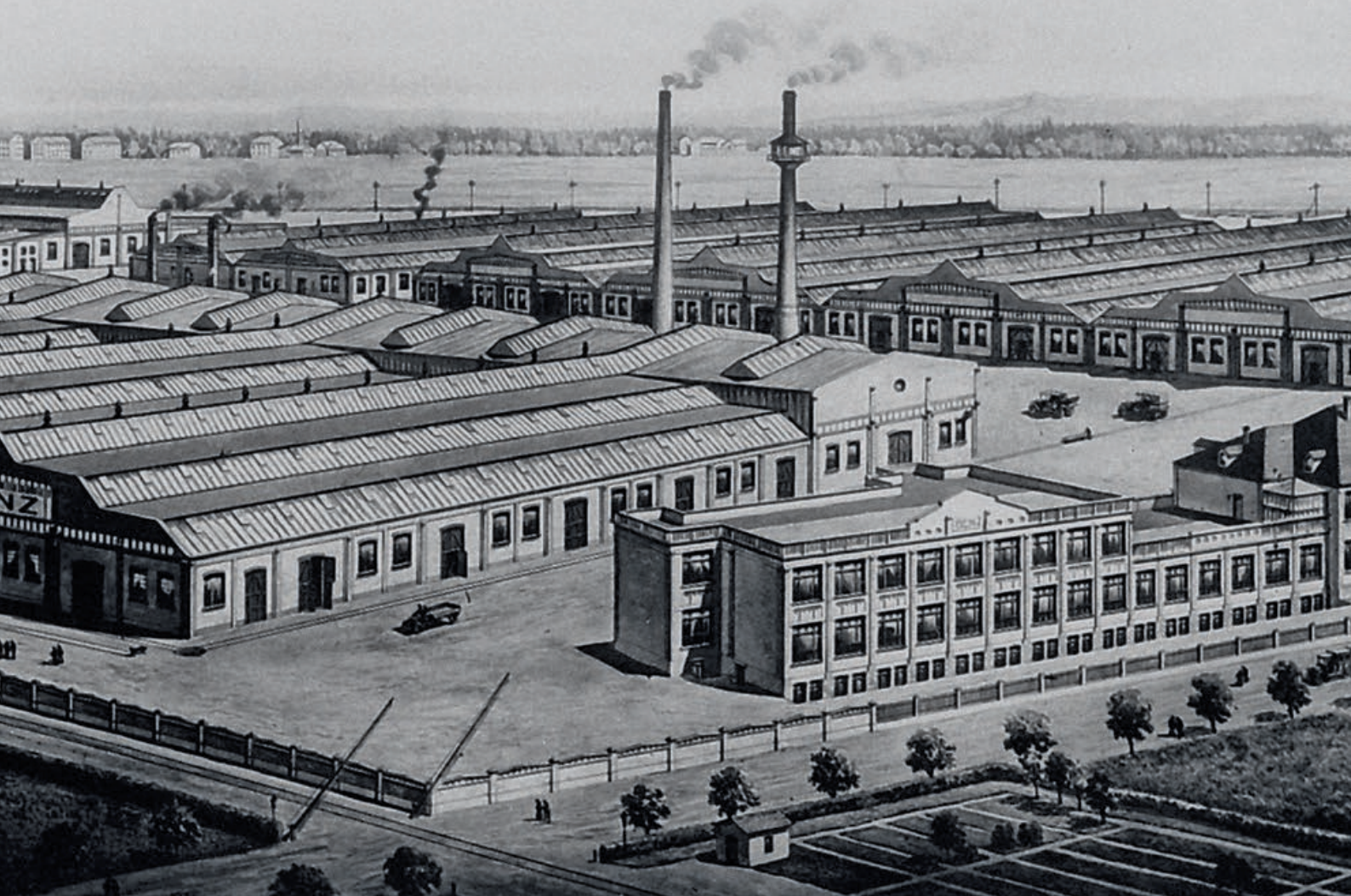
TCG 3020

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.

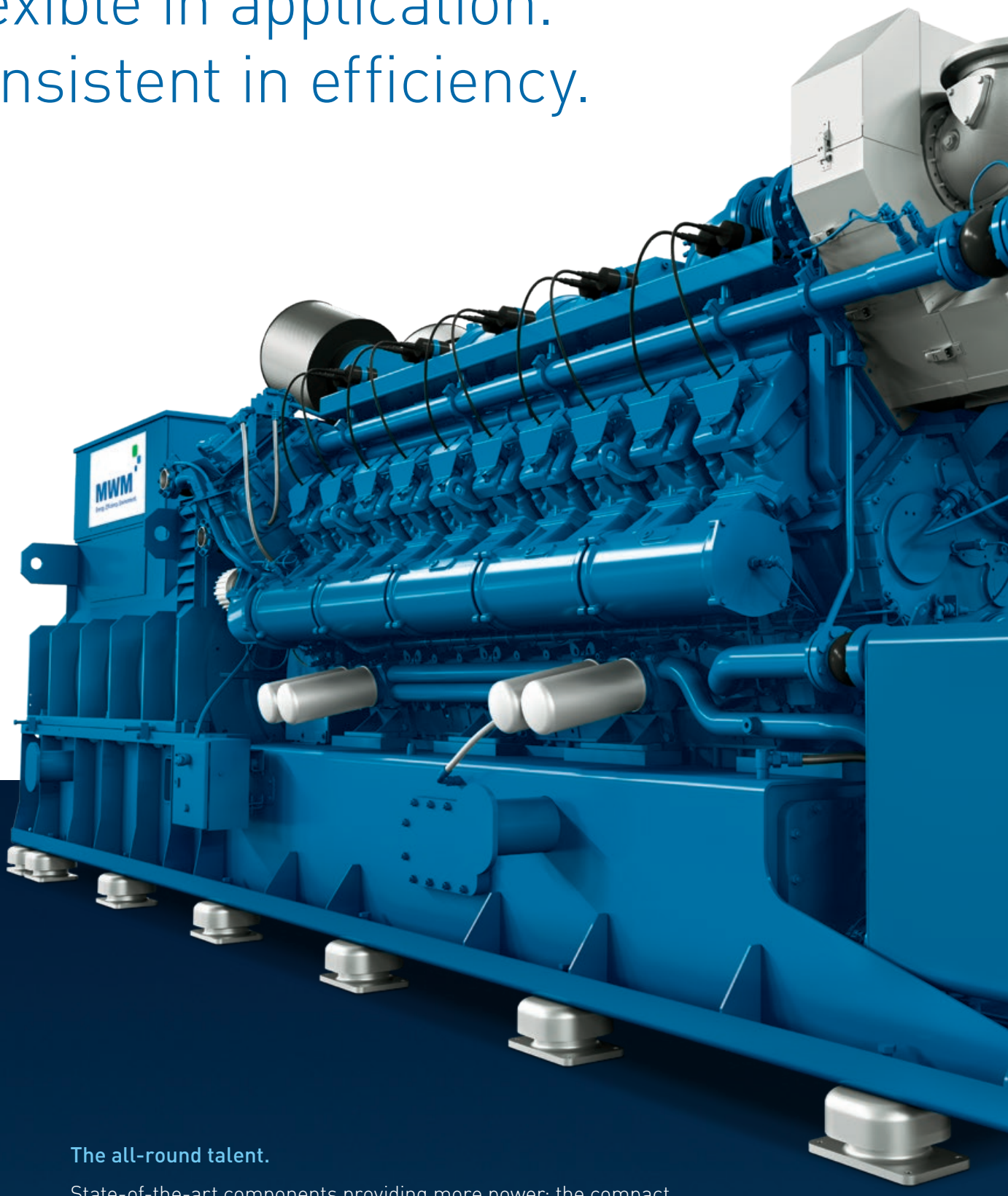


The future of efficiency is digital.

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 gensets are more than merely the next iteration of MWM's proven gas gensets. The new gas gensets 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 electrical and overall efficiency
- ☑ 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 % for natural gas and up to 43.6 % for biogas
- ☑ Increased electrical output up to 2,300 kW_{el}
- ☑ Optimal combination of efficiency and reliability

Varieties of Gases and Applications

- ☑ Available for different fuels like natural gas, biogas, landfill gas and propane gas
- ☑ Optimized variants for different applications like high efficiency, flexibility, CHP, biogas and propane
- ☑ Available in 50 Hz and 60 Hz

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 or 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

Hydrogen
As an admixture to natural gas enables operation with up to 25 vol.% hydrogen – retrofit kits are available

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

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

Technical data 50 Hz (NO_X ⩽ 250 mg/Nm³ [1])

Natural gas applications

TCG 3020 Series			V12	V12	V16	V16	V20	V20	V20	V20
Configuration			P [2]	R [3]	P [2]	R [3]	P [2]	R [3]	PV [4]	RV [5]
Bore/stroke		mm	170/195							
Displacement		dm³	53.0	53.0	71.0	71.0	89.0	89.0	89.0	89.0
Engine speed		min⁻¹	1,500							
Mean piston speed		m/s	9.8							
Length [6]		mm	5,080	5,080	6,100	6,100	6,600	6,600	6,983	6,983
Width [6]		mm	1,815							
Height [6]		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
Electrical power [7]		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 [8]	±8 %	kW	1,359	1,431	1,835	1,910	2,255	2,391	2,031	2,123
Electrical efficiency [7]		%	43.9	42.9	43.6	42.9	44.0	42.9	43.4	42.6
Thermal efficiency [7]		%	43.2	44.5	43.5	44.5	43.1	44.6	44.1	45.2
Total efficiency [7]		%	87.1	87.4	87.1	87.4	87.1	87.5	87.5	87.8

Biogas applications

Sewage gas (65 % CH_4 / 35 % CO_2)
Biogas (50 % CH_4 / 50 % CO_2)
Landfill gas (50 % CH_4 / 27 % CO_2, Rest N_2)

TCG 3020 Series			V12	V16	V20	V20
Configuration			X [9]	X [9]	X [9]	XV [10]
Bore/stroke		mm	170/195			
Displacement		dm³	53.0	71.0	89.0	89.0
Engine speed		min⁻¹	1,500			
Mean piston speed		m/s	9.8			
Length [6]		mm	5,080	6,100	6,600	6,983
Width [6]		mm	1,815			
Height [6]		mm	2,190	2,190	2,190	2,385
Dry weight genset		kg	12,900	17,400	21,400	16,965
Electrical power [7]		kW	1,380	1,840	2,300	2,000
Mean effective pressure		bar	21.5	21.5	21.5	18.6
Thermal output [8]	±8 %	kW	1,407	1,878	2,346	2,097
Electrical efficiency [7]		%	42.6	42.6	42.7	42.2
Thermal efficiency [7]		%	43.4	43.5	43.5	44.3
Total efficiency [7]		%	86.0	86.1	86.2	86.5

Propane gas applications

V20
Z [11]
170/195
89.0
1,500
9.8
6,500
1,815
2,190
17,980
1,880 [12]
17.5
2,063
41.8
45.9
87.7

1) NO_x ⩽ 250 mg/Nm³; exhaust gas dry at 5 % O_2
2) P = High Efficiency. Optimized for high electrical efficiency.
3) R = High Response. Optimized for high total efficiency.
4) PV = High Efficiency for Requested Power. Optimized for high electrical efficiency at requested power.
5) RV = High Response for Requested Power. Optimized for high total efficiency at requested power.
6) Transport dimensions for gensets, components set up separately must be taken into consideration.
7) According to ISO 8528-1 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.
8) Exhaust gas cooled to 120 °C for natural gas and 150 °C for biogas.
9) X = Biogas. Optimized for operation with biogases.
10) XV = Biogas for Requested Power. Optimized for operation with biogases at requested power.
11) Z = Propane. Optimized for operation with propane.
12) 1,880 kW_{el} is also achieved with natural gas applications.

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_X ⩽ 500 mg/Nm³ [1])

Natural gas applications

TCG 3020 Series			V12	V12	V16	V16	V20	V20	V20	V20
Configuration			P[2]	R[3]	P[2]	R[3]	P[2]	R[3]	PV[4]	RV[5]
Bore/stroke		mm	170/195							
Displacement		dm^3	53.0	53.0	71.0	71.0	89.0	89.0	89.0	89.0
Engine speed		min^{-1}	1,500							
Mean piston speed		m/s	9.8							
Length [6]		mm	5,080	5,080	6,100	6,100	6,600	6,600	6,983	6,983
Width [6]		mm	1,815							
Height [6]		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
Electrical power [7]		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 [8]	±8 %	kW	1,296	1,369	1,755	1,824	2,164	2,281	1,949	2,026
Electrical efficiency [7]		%	45.0	44.0	44.7	44.0	45.0	44.0	44.4	43.7
Thermal efficiency [7]		%	42.3	43.6	42.6	43.6	42.3	43.6	43.3	44.2
Total efficiency [7]		%	87.3	87.6	87.3	87.6	87.3	87.6	87.7	87.9

Biogas applications

Sewage gas (65 % CH_4 / 35 % CO_2)
Biogas (50 % CH_4 / 50 % CO_2)
Landfill gas (50 % CH_4 / 27 % CO_2, Rest N_2)

TCG 3020 Series			V12	V16	V20	V20
Configuration			X[9]	X[9]	X[9]	XV[10]
Bore/stroke		mm	170/195			
Displacement		dm^3	53.0	71.0	89.0	89.0
Engine speed		min^{-1}	1,500			
Mean piston speed		m/s	9.8			
Length [6]		mm	5,080	6,100	6,600	6,983
Width [6]		mm	1,815			
Height [6]		mm	2,190	2,190	2,190	2,385
Dry weight genset		kg	12,900	17,400	21,400	16,965
Electrical power [7]		kW	1,380	1,840	2,300	2,000
Mean effective pressure		bar	21.5	21.5	21.5	18.6
Thermal output [8]	±8 %	kW	1,351	1,802	2,254	2,015
Electrical efficiency [7]		%	43.6	43.6	43.6	43.2
Thermal efficiency [7]		%	42.7	42.7	42.9	43.5
Total efficiency [7]		%	86.3	86.3	86.5	86.7

1) NO_x ⩽ 500 mg/Nm³; exhaust gas dry at 5 % O_2.
2) P = High Efficiency. Optimized for high electrical efficiency.
3) R = High Response. Optimized for high total efficiency.
4) PV = High Efficiency for Requested Power. Optimized for high electrical efficiency at requested power.
5) RV = High Response for Requested Power. Optimized for high total efficiency at requested power.
6) Transport dimensions for gensets, components set up separately must be taken into consideration.
7) According to ISO 8528-1 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.
8) Exhaust gas cooled to 120 °C for natural gas and 150 °C for biogas.
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 60 Hz

Natural gas applications

TCG 3020 Series			V20	V20	V20	V20	V20	V20	V20	V20
			(NO_x ⩽ 500 mg/Nm³ [1])				(NO_x ⩽ 250 mg/Nm³ [1])			
Configuration			P[2]	R[3]	PV[4]	RV[5]	P[2]	R[3]	PV[4]	RV[5]
Bore/stroke		mm	170/195				170/195			
Displacement		dm^3	89				89			
Engine speed		min^{-1}	1,500				1,500			
Mean piston speed		m/s	9.8				9.8			
Length [6]		mm	7,738				7,738			
Width [6]		mm	1,815				1,815			
Height [6]		mm	2,551				2,551			
Dry weight genset		kg	21,200				21,200			
Electrical power [7]		kW	2,300	2,300	2,000	2,000	2,300	2,300	2,000	2,000
Mean effective pressure		bar	21.5	21.5	18.7	18.7	21.5	21.5	18.7	18.7
Thermal output [8]	±8 %	kW	2,201	2,292	1,982	2,038	2,294	2,403	2,065	2,136
Electrical efficiency [7]		%	44.4	43.7	43.9	43.4	43.5	42.6	42.9	42.3
Thermal efficiency [7]		%	42.5	43.6	43.5	44.2	43.3	44.6	44.3	45.2
Total efficiency [7]		%	86.9	87.3	87.4	87.6	86.8	87.2	87.2	87.5

Biogas applications

Sewage gas (65 % CH_4 / 35 % CO_2)
Biogas (50 % CH_4 / 50 % CO_2)
Landfill gas (50 % CH_4 / 27 % CO_2, Rest N_2)

TCG 3020 Series			V20	V20	V20	V20
			(NO_x ⩽ 500 mg/Nm³ [1])		(NO_x ⩽ 250 mg/Nm³ [1])	
Configuration			X[9]	XV[10]	X[9]	XV[10]
Bore/stroke		mm	170/195		170/195	
Displacement		dm^3	89		89	
Engine speed		min^{-1}	1,500		1,500	
Mean piston speed		m/s	9.8		9.8	
Length [6]		mm	7,738		7,738	
Width [6]		mm	1,815		1,815	
Height [6]		mm	2,551		2,551	
Dry weight genset		kg	21,200		21,200	
Electrical power [7]		kW	2,300	2,000	2,300	2,000
Mean effective pressure		bar	21.5	18.7	21.5	18.7
Thermal output [8]	±8 %	kW	2,206	1,983	2,293	2,060
Electrical efficiency [7]		%	43.1	42.7	42.2	41.7
Thermal efficiency [7]		%	41.4	42.3	42	43
Total efficiency [7]		%	84.5	85.0	84.2	84.7

Propane gas applications

(NO_x ⩽ 250 mg/Nm³ [1])

V20
Z[11]
170/195
89
1,500
9.8
7,738
1,815
2,551
21,200
1,880
17.6
2,078
41.5
45.8
87.3

1) Exhaust gas dry at 5 % O_2.
2) P = High Efficiency. Optimized for high electrical efficiency.
3) R = High Response. Optimized for high total efficiency.
4) PV = High Efficiency for Requested Power. Optimized for high electrical efficiency at requested power.
5) RV = High Response for Requested Power. Optimized for high total efficiency at requested power.
6) Transport dimensions for gensets, components set up separately must be taken into consideration.
7) According to ISO 8528-1 at U = 0.4 kV, cosphi = 1.0 for 60 Hz, a methane number of MN 80 for natural gas, MN 34 for propane and MN 134 (sewage gas) for biogas applications.
8) Exhaust gas cooled to 120 °C for natural gas and 150 °C for biogas.
9) X = Biogas. Optimized for operation with biogases.
10) XV = Biogas for Requested Power. Optimized for operation with biogases at requested power.
11) Z = Propane. Optimized for operation with propane.

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.

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.

Modern

- ☑ One integrated, flexible control system for all electric power generation applications including genset, generator, electric system, and balance of plant
- ☑ State-of-the-art touchscreen user interface with integrated service tool

Connected

- ☑ Integrated remote access for all operation and service tasks
- ☑ Various interfaces for integration with existing control systems

Efficient

- ☑ Optimized service tool for commissioning, maintenance, and repairs
- ☑ Multiple configurable functions for tailored solutions
- ☑ Guided commissioning and service tasks

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

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