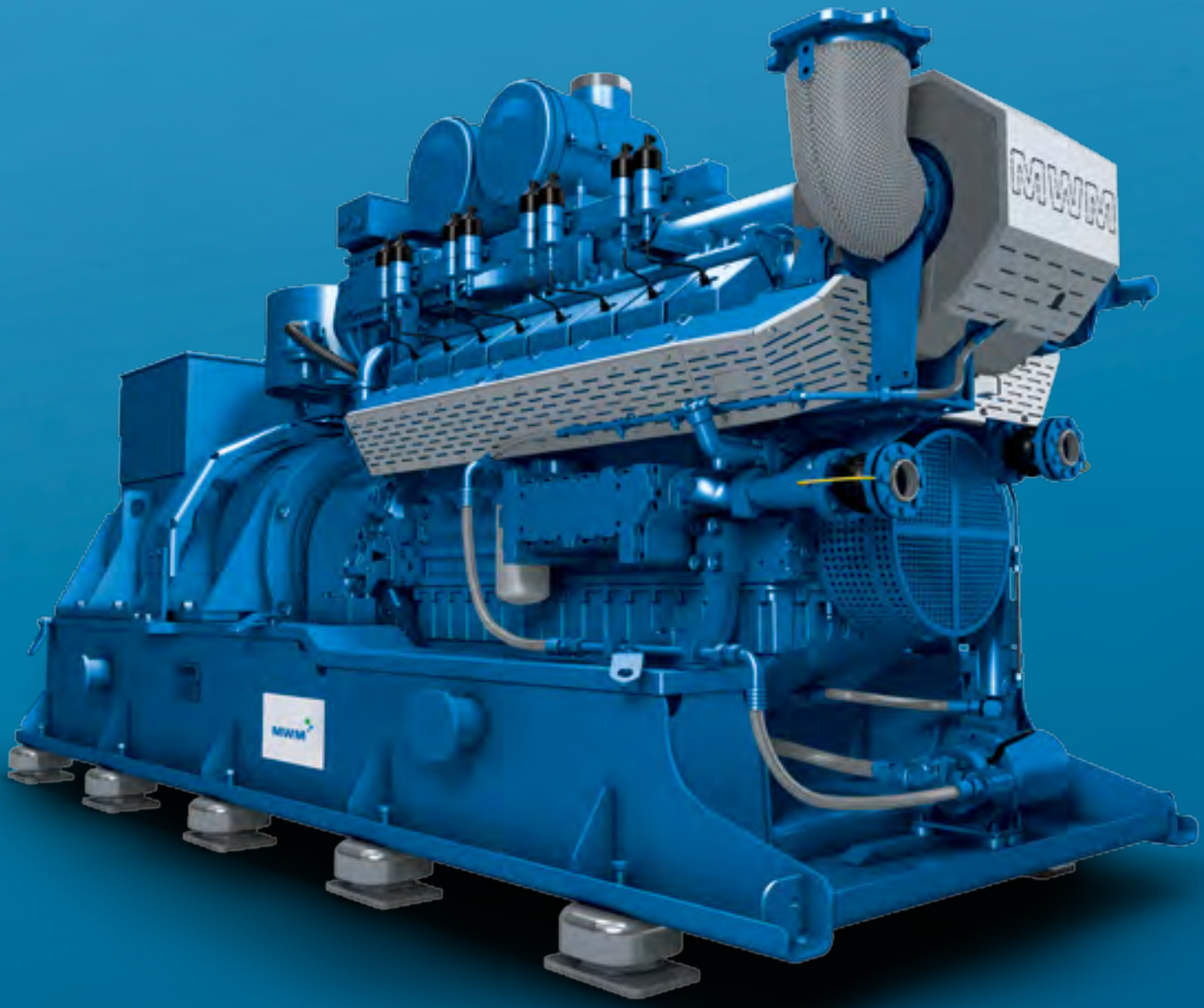
www.mwm.net

TCG 2016

The compact MWM performance package.

For natural gas and biogas with an output from 400 to 800 kW_{el}



MWM

Energy. Efficiency. Environment.

Our experience for your success.

Strong partner for your progress

With MWM you can benefit from 140 years of experience in gas engine technology and energy production. Since 2011 the traditional company, Motorenwerke Mannheim, has belonged to the worldwide network of Caterpillar Inc. This gives us an even more unique expertise that benefits you in the development of individual complete solutions.

Worldwide successful technology

MWM offers you the confidence and experience of a specialist who has already successfully installed hundreds of biogas systems with gas power plants within and outside of the European region. Efficiency and reliability are the decisive factors everywhere.

Competent, reliable, and uncomplicated

We want you to be satisfied with us in every phase of the project: That is why we clearly spell out all agreements in a written order confirmation with a detailed schedule. MWM stands for reliability and quality of planning, right down to commissioning.

We stick to our agreements

If you put great value in an optimal return on your investment in a biogas system and smooth handling, MWM is a natural first choice. We offer comprehensive experience and always keep a close eye on the entire process. Seamless and turnkey ready – from initial consultation to handling of the completed system by our customer service. We say what we do, and we do what we say.

The TCG 2016. Top performance from MWM – used successfully worldwide.

Anderlingen-Ohrel, Germany

A container-hosted TCG 2016 V08 C generates 3,200 MWh of power and 2,552 MWh of heat a year, which are used for the biogas plant. Additionally, a previously installed TCG 2016 V16 B, which runs on gas from the same plant, supplies a local heat network. The integrated MWM biogas processing secures the technology bonus according to the German Renewable Energies Act (EEG).

1 x MWM TCG 2016 V08 C containerized | Commissioning: 2007
1 x MWM TCG 2016 B | Commissioning: 2009

Biogas Plant Géotexia, France

The biogas plant in Brittany, France, uses pig manure and industrial fats to produce around 700m³ of biogas per hour. The biogas is used in 2 containerized TCG 2016 V16 C. The special feature of this plant is the complete recycling of the fermentation residues for dry an liquid fertilizers. Also the waste water is cleaned in a hydrolyse an reverse osmosis and then used for irrigation of a wood plantation.

2 x MWM TCG 2016 V16 C containerized | Commissioning: 2011

CHP Plant, Kletkamp Farm, Germany

Nawaro Kletkamp GmbH & Co. KG uses a biogas CHP plant. Every day, about 20 tons of corn silage are used as input substance. The engine's exhaust heat is used to dry grain and to heat the company's own buildings as well as part of the neighboring town of Lütjenburg. Following the fermentation processes, the residual substrate is used as fertilizer. In total the plant saves 4,000 tons of CO_2 equivalents a year.

1 x MWM TCG 2016 V12 B | Commissioning: 2006

The compact MWM performance package.

More profit

The TCG 2016 is highly efficient thanks to its optimized inlet duct, combustion chamber and spark plugs. Save as much as 15 % per annum on fuel costs – and increase your plant's profitability.

Less overall cost

With its optimized engine components, the TCG 2016 requires up to 50 % less lubricating oil than other similar gensets. In terms of efficiency that means long-term savings.

Lower installation costs

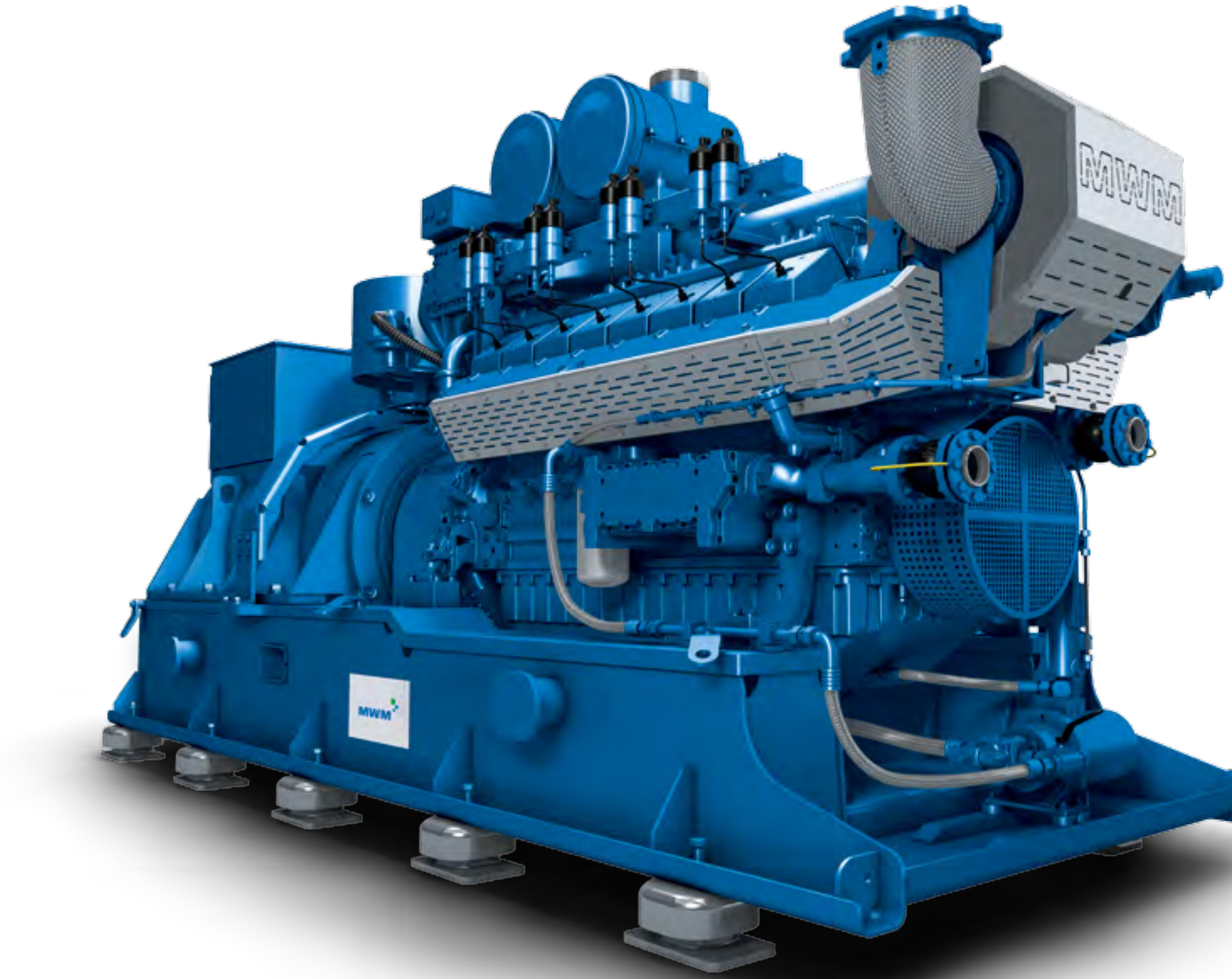
Thanks to its smaller dimensions (width x length), the TCG 2016 takes up to 50 % less space than comparable systems. For you, that means lower installation costs.

Optimum control concept

TEM (Total Electronic Management) controls not just the engine but the entire system including the heat supply from cogeneration. Temperature monitoring for each cylinder and anti-knock control ensure the best possible utilization of fuel and maximum power output, even if gas composition fluctuates.

Flexible usage

The latest technology such as our gas-mixer and TEM allows you to use a wide variety of gases. Even the most problematic gases such as colliery gas, landfill gas and sewage gas can be used without difficulty.



TCG 2016 V16

Technical data 50 Hz

Engine type	TCG 2016	V08 C	V12 C	V16 C
Bore/stroke	mm	132/160	132/160	132/160
Displacement	dm^3	17.5	26.3	35.0
Speed	min^{-1}	1,500	1,500	1,500
Mean piston speed	m/s	8.0	8.0	8.0
Length [1]	mm	3,090	3,690	4,090
Width [1]	mm	1,490	1,490	1,590
Height [1]	mm	2,190	2,190	2,190
Dry weight genset	kg	5,340	7,000	8,450

Natural gas applications

NO_x ≤ 500 mg/Nm³ [2]

Engine type		TCG 2016	V08 C	V12 C	V12 C_515	V16 C
Electrical power [3]		kW	400	600	515	800
Mean effective pressure		bar	19.0	18.9	16.2	18.9
Thermal output [4]	±8 %	kW	428	654	513	854
Electrical efficiency [3]		%	42.3	42.0	43.2	42.5
Thermal efficiency [3]		%	45.2	45.8	43.1	45.3
Total efficiency [3]		%	87.5	87.8	86.3	87.8

Biogas applications

NO_x ≤ 500 mg/Nm³ [2]
Sewage gas (65 % CH_4 / 35 % CO_2)
Biogas (60 % CH_4 / 32 % CO_2, rest N_2)
Landfill gas (50 % CH_4 / 27 % CO_2, rest N_2)

Minimum heating value H_u = 5.0 kWh/Nm³

Engine type		TCG 2016	V08 C	V12 C	V16 C
Electrical power [3]		kW	400	600	800
Mean effective pressure		bar	19.0	18.9	18.9
Thermal output [4]	±8 %	kW	393	593	788
Electrical efficiency [3]		%	42.8	42.7	42.8
Thermal efficiency [3]		%	42.0	42.2	42.2
Total efficiency [3]		%	84.8	84.9	85.0

1) Transport dimensions for gensets, seperately positioned components must be considered.
2) NO_x ≤ 500 mg/Nm³; exhaust gas dry at 5 % O_2.
3) According to ISO 3046/1 at U = 0.4 kV, cosphi = 1.0 for 50 Hz and methane number of MZ 70.
4) Exhaust gas cooled to 120°C with natural gas and 150°C with biogas.

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

Engine type	TCG 2016	V08 C	V12 C	V16 C
Bore/stroke	mm	132/160	132/160	132/160
Displacement	dm^3	17.5	26.3	35.0
Speed	min^{-1}	1,800	1,800	1,800
Mean piston speed	m/s	9.6	9.6	9.6
Length [1]	mm	3,170	3,770	4,130
Width [1]	mm	1,490	1,490	1,490
Height [1]	mm	2,190	2,190	2,190
Dry weight genset	kg	4,800	6,250	7,030

Natural gas applications

NO_x ≤ 500 mg/Nm³ [2]

Engine type		TCG 2016	V08 C	V12 C	V16 C
Electrical power [3]		kW	400	600	800
Mean effective pressure		bar	15.8	15.7	15.7
Thermal output [4]	±8 %	kW	445	675	887
Electrical efficiency [3]		%	41.4	41.3	41.6
Thermal efficiency [3]		%	46.0	46.5	46.1
Total efficiency [3]		%	87.4	87.8	87.7

Biogas applications

NO_x ≤ 500 mg/Nm³ [2]
Sewage gas (65 % CH_4 / 35 % CO_2)
Biogas (60 % CH_4 / 32 % CO_2, rest N_2)
Landfill gas (50 % CH_4 / 27 % CO_2, rest N_2)

Minimum heating value H_u = 5.0 kWh/Nm³

Engine type		TCG 2016	V08 C	V12 C	V16 C
Electrical power [3]		kW	400	600	800
Mean effective pressure		bar	15.8	15.7	15.7
Thermal output [4]	±8 %	kW	415	632	827
Electrical efficiency [3]		%	41.6	41.4	41.7
Thermal efficiency [3]		%	43.1	43.6	43.2
Total efficiency [3]		%	84.7	85.0	84.9

1) Transport dimensions for gensets, seperately positioned components must be considered.
2) NO_x ≤ 500 mg/Nm³; exhaust gas dry at 5 % O_2.
3) According to ISO 3046/1 at voltage = 0.48 kV, cosphi = 1.0 for 60 Hz and a methane number of MZ 70.
4) Exhaust gas cooled to 120°C with natural gas and 150°C with biogas.

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.

For additional MWM locations, scan the QR code or visit the website **www.mwm.net/en/mwm-worldwide**

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