TCG 3016
150 years of experience for your success.

With MWM, you benefit from about 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 3016 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.
TCG 3016. NEW on the block.


The TCG 3016 is the first of a new generation. State-of-the-art components and the TPEM (Total Plant & Energy Management) control ensure maximum reliability and availability. The improved oil management and optimized cylinder and turbo chargers set new standards in terms of durability and reliability.

- **Highest efficiency in its power range**
  - Electrical efficiency of up to 43.5 percent
  - Maximum profitability through rock-bottom operating costs
  - More efficiency through numerically optimized, low-loss flow design

- **Optimized lube oil management**
  - Lowest-in-class lube oil consumption: 0.1 g/kWh
  - Longer oil change intervals
  - Oil tank and integrated daily refill tank

- **Flanged genset concept**
  - Vibration-decoupled base frame for lower installation costs and reliable operation
  - Greater integrated lube oil volume
  - Integrated oil management

- **Improved turbo charger for a wide field of deployment**
  - Longer maintenance intervals
  - Wider suction air temperature window

- **Higher availability and longer useful life**
  - Optimized combustion through evenly charged cylinders
  - Optimized combustion with lower peak pressure
  - Smoothly running, low-vibration genset

- **Maximum reliability**
  - Very good island mode capability
  - Fulfills G1, G2 & G3 classes according to ISO 8528 with less than 10 steps in most applications

- **TPEM – the new control system**
  - Easy human-machine interface
  - Fully integrated remote access
  - Expanded scope, e.g. synchronization, power switch, and plant control
Superior operation and efficiency.

**Maximum efficiency**
Best total cost of ownership in its power range through unique combination of a long operating period until the major overhaul (80,000 oh for natural gas) and outstanding efficiency (electrical efficiency of up to 43.5 percent).

- Lower gas consumption through improved efficiency and fuel flexibility
- Reduced maintenance costs through longer service intervals and longer operating hours until the major overhaul
- Lower lube oil consumption lead to lower operating cost
- Improved durability ensures higher reliability and availability

The TCG 3016: Successful deployment.

Wentorf Biogas Plant
Norbert Hack, plant operator: "I've been running the TCG 3016 for a few months. As far as I'm concerned, this is the most efficient engine currently available on the market. Compared to its output, its biogas consumption is astonishingly low. The engine is perfectly tuned and runs very quietly. I have already seen many other gensets and models at my colleagues' facilities, but this engine's quality is truly outstanding – a genuine trend-setter. The new development [TPEM] from Mannheim will doubtlessly make the interaction between the control and the engine even more effective. The TPEM offers more possibilities for reading out engine data, which will further improve the plant operation."

Vereinigte Stadtwerke Bad Oldesloe
Holger Herzberg, project manager: "MWM/CES plants excel in terms of their adaptability to specific customer needs, by means of which the plants can be made even more efficient. Besides the plant’s excellent efficiency, this feature really impresses me. The reduced lubricant consumption of less than 0.1 g/kWh is another positive aspect. Compared to the previous oil change interval of about 2,000 to 3,000 operating hours, the TCG 3016 only needs an oil change once every 5,000 operating hours, i.e. about once a year. The gas engine is extremely robust, which translates to longer service life."

Contact us:
www.mwm.net or info@mwm.net

Benefit from the TCG 3016!

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MWM TCG 3016 | Go-live: 2016
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
- Security-oriented technology
  - Meets latest ISO 27001 standards
  - Safety chain for cogeneration plant monitoring (TÜV-certified)
- Remote access
  - Remote power plant control on site and via VPN connection with the free visualization "TPEM Remote Client"

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 power plant
- Life cycle history enables the logging of and access to data throughout the life cycle of the genset and the peripherals

Operate
- High efficiency through optimal power plant control
- Custom-tailored technical solutions
- Enables remote power plant management and monitoring
- Use the full genset potential with maximum reliability
Technical data 50 Hz

Natural gas applications
NOₓ ≤ 500 mg/Nm³ 2)

<table>
<thead>
<tr>
<th>Engine type</th>
<th>TCG 3016</th>
<th>V08</th>
<th>V12</th>
<th>V16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bore/stroke</td>
<td>mm</td>
<td>132/160</td>
<td>132/160</td>
<td>132/160</td>
</tr>
<tr>
<td>Displacement</td>
<td>dm³ ¹)</td>
<td>17.5</td>
<td>26.3</td>
<td>35.0</td>
</tr>
<tr>
<td>Speed</td>
<td>min⁻¹ ³)</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
</tr>
<tr>
<td>Mean piston speed</td>
<td>m/s ¹)</td>
<td>8.0</td>
<td>8.0</td>
<td>8.0</td>
</tr>
<tr>
<td>Length</td>
<td>mm</td>
<td>3,100</td>
<td>3,830</td>
<td>4,200</td>
</tr>
<tr>
<td>Width</td>
<td>mm</td>
<td>1,780</td>
<td>1,780</td>
<td>1,780</td>
</tr>
<tr>
<td>Height</td>
<td>mm</td>
<td>2,150</td>
<td>2,150</td>
<td>2,150</td>
</tr>
<tr>
<td>Dry weight genset</td>
<td>kg</td>
<td>5,720</td>
<td>7,000</td>
<td>8,070</td>
</tr>
</tbody>
</table>

Biogas applications

Minimum heating value Hₜ = 5,0 kWh/Nm³ ³)

<table>
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<tr>
<th>Engine type</th>
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<th>V12</th>
<th>V16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical power</td>
<td>kW</td>
<td>400</td>
<td>600</td>
<td>800</td>
</tr>
<tr>
<td>Mean effective pressure</td>
<td>bar</td>
<td>18.9</td>
<td>18.9</td>
<td>18.8</td>
</tr>
<tr>
<td>Thermal output</td>
<td>kW</td>
<td>4.04</td>
<td>6.18</td>
<td>8.21</td>
</tr>
<tr>
<td>Electrical efficiency</td>
<td>%</td>
<td>43.1</td>
<td>43.3</td>
<td>43.5</td>
</tr>
<tr>
<td>Thermal efficiency</td>
<td>%</td>
<td>43.6</td>
<td>44.6</td>
<td>44.6</td>
</tr>
<tr>
<td>Total efficiency</td>
<td>%</td>
<td>86.7</td>
<td>87.9</td>
<td>88.1</td>
</tr>
</tbody>
</table>

Sewage gas (65% CH₄ / 35% CO₂, rest N₂)
Biogas (60% CH₄ / 32% CO₂, rest N₂)
Landfill gas (50% CH₄ / 27% CO₂, rest N₂)

1) Transport dimensions for gensets, components set up separately must be taken into consideration.
2) NOₓ ≤ 500 mg/Nm³; exhaust gas dry at 5% O₂.
3) According to ISO 3046-1 at U = 0.48 kV, cosφ = 1.0 for 60 Hz, a minimum methane number of MN 70 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.

Technical data 60 Hz

Natural gas applications
NOₓ ≤ 500 mg/Nm³ 2)

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<td>26.3</td>
<td>35.0</td>
</tr>
<tr>
<td>Speed</td>
<td>min⁻¹ ³)</td>
<td>1,800</td>
<td>1,800</td>
<td>1,800</td>
</tr>
<tr>
<td>Mean piston speed</td>
<td>m/s ¹)</td>
<td>9.6</td>
<td>9.6</td>
<td>9.6</td>
</tr>
<tr>
<td>Length</td>
<td>mm</td>
<td>3,100</td>
<td>3,830</td>
<td>4,200</td>
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<tr>
<td>Width</td>
<td>mm</td>
<td>1,780</td>
<td>1,780</td>
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<tr>
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<td>mm</td>
<td>2,150</td>
<td>2,150</td>
<td>2,150</td>
</tr>
<tr>
<td>Dry weight genset</td>
<td>kg</td>
<td>5,720</td>
<td>7,000</td>
<td>7,700</td>
</tr>
</tbody>
</table>

Biogas applications

Minimum heating value Hₜ = 5,0 kWh/Nm³ ³)

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<td>400</td>
<td>600</td>
<td>800</td>
</tr>
<tr>
<td>Mean effective pressure</td>
<td>bar</td>
<td>15.8</td>
<td>15.7</td>
<td>15.7</td>
</tr>
<tr>
<td>Thermal output</td>
<td>kW</td>
<td>42.7</td>
<td>64.8</td>
<td>85.6</td>
</tr>
<tr>
<td>Electrical efficiency</td>
<td>%</td>
<td>42.1</td>
<td>42.6</td>
<td>42.6</td>
</tr>
<tr>
<td>Thermal efficiency</td>
<td>%</td>
<td>45.0</td>
<td>45.7</td>
<td>45.5</td>
</tr>
<tr>
<td>Total efficiency</td>
<td>%</td>
<td>87.1</td>
<td>88.1</td>
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Data for special gases and dual gas operation on request.

Data given in these data sheets are for information only and are not binding. The information given in the offer is authoritative.