G20CM34 Natural Gas Genset

Electric Power Generation

GENSET SPECIFICATION

4-stroke natural gas engine with 20 cylinders and an efficiency up to 48.9% at a total power output of 10,300 kWe
**G20CM34 Natural Gas Genset**

**Electric Power Generation**

**Reliability**
- High availability and long operating times through optimized maintenance plans
- Robust engine platform thanks to intelligent simplicity of structure and design
- Highly-efficient turbocharging system with one exhaust gas turbocharger (per cylinder bank), reliable and proven
- Intensive cooling of the key components including exhaust gas valve seats
- High efficiency, also at part load operation

**Performance range**
- Extremely short starting and load ramp-up times
- Island mode with stepwise load ramp-up in six load steps
- Grid parallel operation with continuous load ramp-up
- Engine starts 4 times per day possible, subject to compliance with the Caterpillar guidelines
- Project-specific adjustment to ambient conditions and fuel specifications possible as an option

**Intelligent simplicity and state-of-the-art engineering - We make your project a success.**

The generator sets of Caterpillar Motoren GmbH & Co. KG stand for high operational safety through innovative modular and integral construction. We call this “intelligent simplicity” because you need reliable, flexible, and efficient energy supply. Therefore, our team is constantly developing our products with much innovation and profound knowledge to ensure all plant components always reflect the latest state of the art while at the same time keeping them as simple as possible.

**TRAINING CENTER**

The Caterpillar Engine Training Center in Kiel/Germany offers tailor-made engine training courses for customers and dealers. The courses can relate specifically to your engine application or cover all current engine types, new technologies as well as control and monitoring systems.

All courses are on request and held in small groups of four to eight people. For further information, course contents, open training places and other questions, please contact us:

training_center_kiel@cat.com

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**Safety**
- Crankcase ventilation*
- Oil mist detector*

**Fuel**
- Gas valve unit (GVU)*

**Combined module**
- Cooling water and lubricating oil system partly on a common base frame with standardized pipe interface.

**Intake air**
- Systems that can be adjusted to suit the ambient conditions are available, such as pocket filters, oil bath filters or pulse filters

**Starting air**
- Starting air compressor module
- Starting air receiver module

**Exhaust gas**
- Exhaust gas ventilation module*
- Exhaust silencer
- Further elements, such as SCR and oxidation catalyst, are available as options

**Control and monitoring system**
- Provides the control, monitoring and protection functions of the engine, generator and engine support modules through:
  - Local Control Panel (LCP) (recommended)
  - Local Data Panel (LDP) and Generator Control Panel (GCP)

**Reliability**
- High availability and long operating times through optimized maintenance plans
- Robust engine platform thanks to intelligent simplicity of structure and design
- High efficiency, also at part load operation

**FLEXIBILITY**
- Project-specific adjustment to ambient conditions and fuel specifications possible as an option

**Intelligent simplicity for maintenance and servicing means that we reduce maintenance and down times. Thus, for example, the cylinder heads are particularly easy to access for removal and installation. There is no running-in time required after checking a piston because, thanks to the split connecting rod, there is no need to interfere with the big end bearing. The camshaft is composed of individual sections, which considerably facilitates its handling for service purposes. Easily accessible media connections enable defined interfaces between the engine and its modular periphery.**

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* Part of the standard scope of supply
* Cooling water system requires additional cooling towers, radiators or similar
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**Ease of maintenance**
- Long maintenance intervals and short maintenance procedures cater for high availability
- All maintenance and overhaul jobs are carried out on site throughout the entire life cycle
- Large inspection openings at the engine block facilitate accessibility
- Intelligent maintenance solutions enable an efficient execution of scheduled measures while requiring only a reduced effort
- Long service life of the components thanks to generously dimensioned materials which also allows overhauls

**Simple system integration and installation**
- Standard modular construction for all filters and feed pumps enables quick and low-cost adjustment to your specific conditions on site and an efficient use of resources
- Resilient mounting, already installed at the base frame
- The generator set is delivered ready for installation

**Fuel**
- Natural gas with a Cat methane number ≥ 70 and a calorific value of 31.5 - 43.3 MJ/m³

**Emissions**
- Compliance with World Bank Emission Certificate according to IFC-2008 without additional exhaust gas aftertreatment
- Compliance with MCPD1) 2015/2193/EU, IED2) according to 2010/75/EU, and 13th and 44th BImSchV by using SCR and oxidation catalyst.

**Worldwide product support**
- Worldwide, nearly 200 competent Cat dealers are offering their services to you
- Engineers trained in our facilities are always within reach
- Worldwide quick access to original parts
- Engineers trained in our facilities are always within reach

**REParts™**
Caterpillar Motoren GmbH & Co. KG is offering its customers the most cost-efficient and adequate service solutions in the industry. We are adding value to your investment as well as reducing down time and operating costs.

Your engine will be returned to excellent performance and reliability solely by precise maintenance work with our OEM parts. By exchanging parts in advance, we reduce the down time of your engine. REParts™ genuine spare parts have also the same warranty as our new parts. We’ll take your used components, the amount of refund depends on their condition.

For further information please contact us:
reparts_center@cat.com

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**EFFICIENCY**

**VARIANTS OF OPTIMIZATION**

- **Power-driven (LT+)**
- **Heat-driven (HT+)**

The G20CM34 has been developed to withstand the most challenging conditions and is thus offering a wide range of applications. The genset is offering the possibility to generate electric power by driving a generator via a coupling. Depending on the gas quality, it is possible to further increase the efficiency of the engine (see Electric Power in the figure above). Furthermore, the G20CM34 is offering different variants for application-optimized utilization of Combined Heat and Power generation. The focus of energy utilization is either on electrical energy or heat energy. For a power-driven CHP plant, the genset will be equipped with engine variant “LT+”; for a heat-driven CHP plant, it will be equipped with engine variant “HT+”. For further information regarding the correct choice of engine variant, please read the G20CM34 Project Guide and contact your local dealer.

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**TECHNICAL ENGINE CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Unit</th>
<th>20 cylinder</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 Hz</td>
<td>60 Hz</td>
</tr>
<tr>
<td><strong>Fuel type</strong></td>
<td>Natural Gas</td>
</tr>
<tr>
<td><strong>Electrical power output</strong></td>
<td>[kW]</td>
</tr>
<tr>
<td>[–]</td>
<td>10,300</td>
</tr>
<tr>
<td><strong>Mechanical power output</strong></td>
<td>[kW]</td>
</tr>
<tr>
<td>[–]</td>
<td>10,500</td>
</tr>
<tr>
<td><strong>Rated speed at 50 Hz (60 Hz)</strong></td>
<td>[min⁻¹]</td>
</tr>
<tr>
<td>[–]</td>
<td>750</td>
</tr>
<tr>
<td><strong>Bore</strong></td>
<td>[mm] (in)</td>
</tr>
<tr>
<td>[–]</td>
<td>340 (13.39)</td>
</tr>
<tr>
<td><strong>Stroke</strong></td>
<td>[mm] (in)</td>
</tr>
<tr>
<td>[–]</td>
<td>420 (16.54)</td>
</tr>
<tr>
<td><strong>Mean effective pressure up to</strong></td>
<td>[bar] (psi)</td>
</tr>
<tr>
<td>[–]</td>
<td>22.0 (319)</td>
</tr>
<tr>
<td><strong>Specific energy consumption at 100 % load</strong></td>
<td>[kJ/kWh] (BTU/kWh)</td>
</tr>
<tr>
<td>[–]</td>
<td>7,490 (7,100)</td>
</tr>
<tr>
<td><strong>Specific lube oil consumption at 100 % load</strong></td>
<td>[g/4kWh] (lb/kWh)</td>
</tr>
<tr>
<td>[–]</td>
<td>0.3 (0.0007)</td>
</tr>
<tr>
<td><strong>Ready to synchronize (preheated/vented)</strong></td>
<td>[s]</td>
</tr>
<tr>
<td>[–]</td>
<td>80</td>
</tr>
<tr>
<td><strong>Recommended normal ramp up to 100 % load</strong></td>
<td>[s]</td>
</tr>
<tr>
<td>[–]</td>
<td>100</td>
</tr>
<tr>
<td><strong>Fast start from 0 rpm to 100% load</strong></td>
<td>[s]</td>
</tr>
<tr>
<td>[–]</td>
<td>≤ 80³</td>
</tr>
<tr>
<td><strong>Black start capability</strong></td>
<td>[–]</td>
</tr>
<tr>
<td>[–]</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Emission Level</strong></td>
<td>[mg/m³]</td>
</tr>
<tr>
<td>[–]</td>
<td>14,280 (560)</td>
</tr>
<tr>
<td><strong>Length of Genset</strong></td>
<td>[mm] (in)</td>
</tr>
<tr>
<td>[–]</td>
<td>14,280 (560)</td>
</tr>
<tr>
<td><strong>Width of Genset</strong></td>
<td>[mm] (in)</td>
</tr>
<tr>
<td>[–]</td>
<td>3,910 (154)</td>
</tr>
<tr>
<td><strong>Height of Genset</strong></td>
<td>[mm] (in)</td>
</tr>
<tr>
<td>[–]</td>
<td>5,390 (212)</td>
</tr>
<tr>
<td><strong>Dry Weight of Genset</strong></td>
<td>[t] (lb)</td>
</tr>
<tr>
<td>[–]</td>
<td>164 (3.6*105)</td>
</tr>
</tbody>
</table>

1) Medium Combustion Plant Directive
2) Industrial Emission Directive
3) Performance figures and energy consumption at standard reference conditions based on ISO 3046-1
4) Depending on synchronization time, engine in stand-by mode
5) With an oxygen content of 5 %O₂
6) Tolerance of specific energy consumption (ESEC) of the engine 5 %, without engine driven pumps. For each engine driven pump an additional specific energy consumption of 1 % applies to the engine according to 2010/75/EU, and 13th and 44th BImSchV by using SCR and oxidation catalyst.