

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 kW_e

LET'S DO THE WORK.™

CAT®

G20CM34 Natural Gas Genset

Electric Power Generation

Reliable and efficient operation

- 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

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



RELIABILITY

Competence and experience

- Maximized benefits thanks to individual, tailor-made adjustments and extensions, such as cogeneration systems or combination power plants
- Financing options
- Reliable product support by competence teams for
 - Design and planning
 - Mechanical/electrical engineering
 - Delivery
 - Commissioning
 - Operation and
 - Maintenance

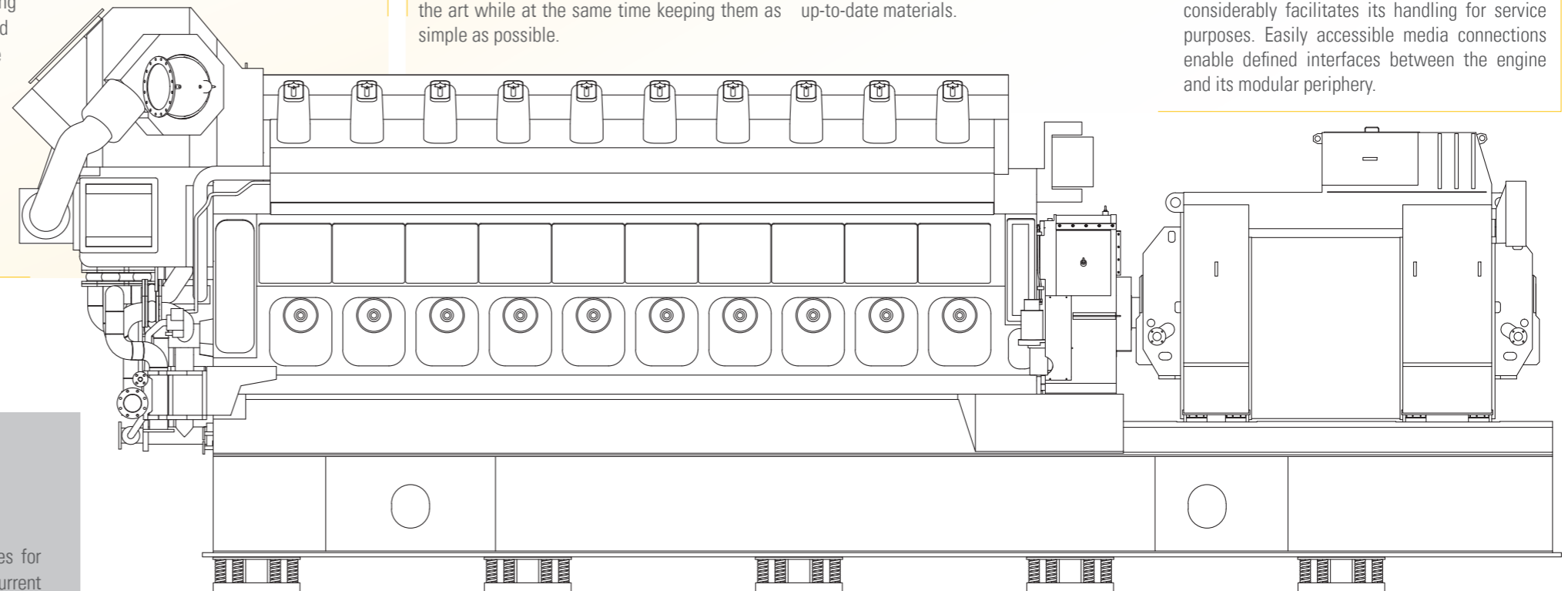
Intelligent simplicity and state-of-the-art engineering - We make your project a success.

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 reflecting the latest state of the art while at the same time keeping them as simple as possible.

Intelligent simplicity in design means that our engines, for example, are provided with a dry engine block with integrated ducts for lubricating oil and charge air. The crankshaft is designed as a suspended shaft and each cylinder has its own, compact cylinder head unit. The number of components is also reduced by the single-pipe exhaust manifold of the engines. Long service life of all components is achieved by using the most up-to-date materials.

FLEXIBILITY

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.



EQUIPMENT

Safety

- Crankcase ventilation*
- Oil mist detector*

Fuel

- Gas valve unit (GVU)*

Combined module

Cooling water¹⁾- 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) or
 - Local Data Panel (LDP) and Generator Control Panel (GCP)

- Provides the control of the engine support modules through Motor Control Center (MCC)
- Asset Intelligence System: Your remote diagnostic system, worldwide

Vibration damping

- Optimum oscillation and vibration damping systems for safe and operationally reliable set-up of the plant, especially adjusted to suit your ambient conditions
- Engine and generator can be supplied as a unit on a common base frame

* Part of the standard scope of supply

¹⁾ Cooling water system requires additional cooling towers, radiators or similar

G20CM34 Natural Gas Genset

Electric Power Generation

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

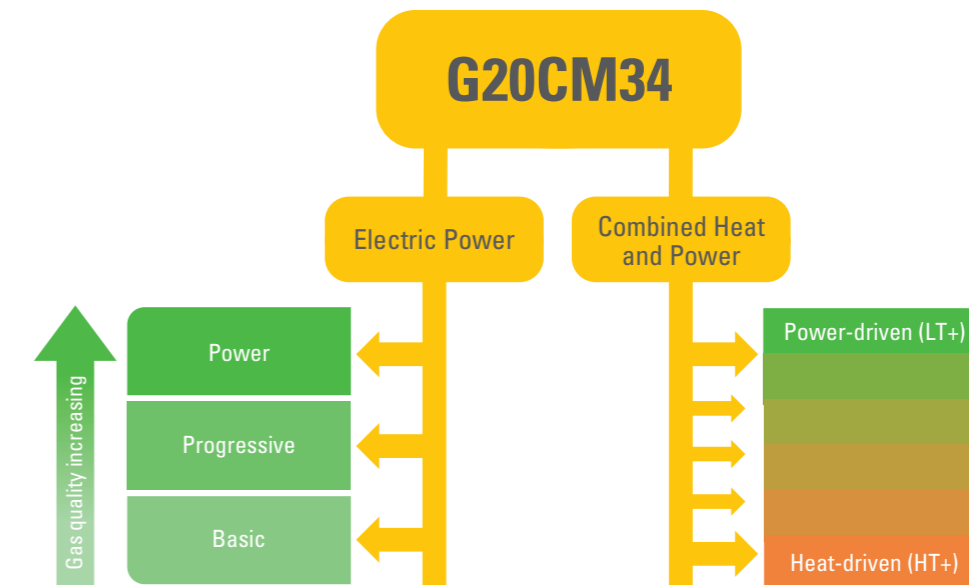
- Compliance with World Bank Emission Certificate according to IFC-2008 without additional exhaust gas aftertreatment
- Compliance with MCPD¹⁾ 2015/2193/EU, IED²⁾ according to 2010/75/EU, and 13th and 44th BImSchV by using SCR and oxidation catalyst.

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
- Safe and efficient operation through long-term service agreements possible

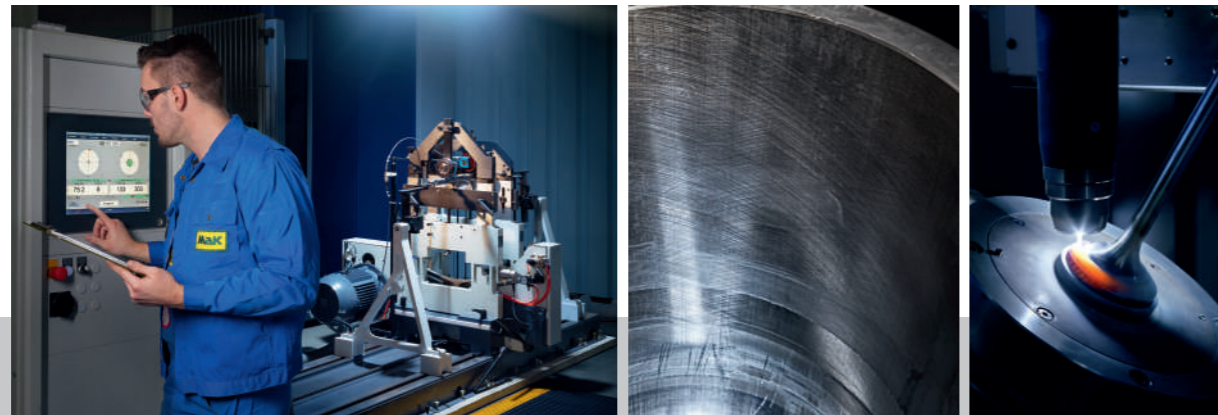
EFFICIENCY

VARIANTS OF OPTIMIZATION



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.

¹⁾ Medium Combustion Plant Directive
²⁾ Industrial Emission Directive



REParts™

Caterpillar Motoren GmbH & Co. KG is offering its costumers 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 sending exchange 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

TECHNICAL ENGINE CHARACTERISTICS

| | Unit | 20 cylinder | |
|---|--------------------------------------|----------------------------|------------|
| | | 50 Hz | 60 Hz |
| Fuel type | [-] | Natural Gas | |
| Electrical power output ¹⁾ | [kW _e] | 10,300 | 9,830 |
| Mechanical power output ²⁾ | [kW] | 10,500 | 10,000 |
| Rated speed at 50 Hz (60 Hz) | [min ⁻¹] | 750 | 720 |
| Bore | [mm] (in) | 340 (13.39) | |
| Stroke | [mm] (in) | 420 (16.54) | |
| Mean effective pressure up to | [bar] (psi) | 22.0 (319) | 21.9 (318) |
| Specific energy consumption at 100 % load ^{2), 3)} | [kJ/kWh] (BTU/kWh) | 7,490 (7.100) | |
| Specific lube oil consumption at 100 % load ²⁾ | [g/kWh] (lb/kWh) | 0.3 (0.0007) | |
| Ready to synchronize (preheated/vented) | [s] | 80 | |
| Recommended normal ramp up to 100 % load | [s] | 100 | |
| Fast start from 0 rpm to 100% load | [s] | < 80 ⁵⁾ | |
| Black start capability | [-] | ✓ | |
| Emission Level | [mg _{Nox} /m ³] | 500 ⁶⁾ | |
| Length of Genset | [mm] (in) | 14,280 (562) | |
| Width of Genset | [mm] (in) | 3,910 (154) | |
| Height of Genset | [mm] (in) | 5,390 (212) | |
| Dry Weight of Genset | [t] (lb) | 164 (3.6*10 ⁵) | |

¹⁾ At a generator efficiency of 98.3 %

²⁾ Performance figures and energy consumption at standard reference conditions based on ISO 3046-1

³⁾ Tolerance of specific energy consumption (BSEC) of the engine 5 %, without engine driven pumps. For each engine driven pump an additional specific energy consumption of 1 % at 100 % load has to be taken into account.

⁴⁾ Guide value, tolerance +0.15 g/kWh, referred to full load

⁵⁾ Depending on synchronization time, engine in stand-by mode

⁶⁾ With an oxygen content of 5 % O₂; Compliance with MCPD 2015/2193/EU, IED according to 2010/75/EU, and 13th and 44th BImSchV by using SCR and oxidation catalyst.

Caterpillar Energy Solutions

medium-speed engines manufactured by:

Caterpillar Motoren GmbH & Co. KG
Falckensteiner Str. 2
24159 Kiel
Germany

For more information:

🌐 www.cat.com/electricpower

@ electricpower@cat.com

☎ +49 431 3995 2020

The information, technical data and reference specifications contained in this brochure are not binding. Caterpillar Motoren GmbH & Co. KG reserves the right to modify and amend data at any time. Any liability for the accuracy of information provided herein is excluded. Caterpillar Motoren will supply further detailed and binding data, drawings, diagrams, electrical drawings, etc. in connection with a corresponding sales order. This brochure supersedes the previous edition of this brochure.

Reproduction or copying of any portion of this document is prohibited without our prior written consent.

© 2019 Caterpillar. All Rights Reserved.

CAT, CATERPILLAR, LET'S DO THE WORK, their respective logos, "Caterpillar Yellow", the "Power Edge" and Cat "Modern Hex" trade dress as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.

Subject to change without notice.

11.19 - e - nndruck, Kiel - MC3

LEHE2027-00

LET'S DO THE WORK.™

