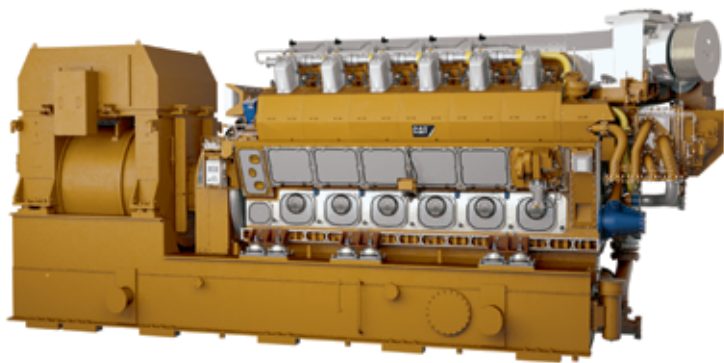


# CM46DF Electric Power Generator Set

10 580 - 14 110 kW<sub>e</sub>



## Cat® Engine Specifications CM46DF, 4-Stroke-Cycle-Liquid Fuel

**Configuration**  
12, 16 cylinder

**Fuel type**  
Gas, diesel oil, heavy fuel oil (HFO),  
crude oil

**Genset rating**  
10 580 - 14 110 kW<sub>e</sub>

**Genset efficiency**  
up to 48.5 % (gas mode)

**Emissions up to**  
World bank emission certification  
(Stage 2)

## FEATURES AND BENEFITS

### Reliable Operation

- Intensive cooling of key components including exhaust valve seats, injector cooling integrated into lubricating oil system
- Reliable, proven and high efficient single turbo charging system
- Classification society standards ensure high safety and quality
- Intelligent simplicity ensures a robust engine platform
- Optimized service schedules enable high availability and long durability

### Control & Monitoring

- Ultrafast start time and load acceptance
- No engine start limitations
- Continuous power (base and peak load), prime power, stand-by
- Part load with high efficiency
- Monitoring for unattended operation
- Asset intelligence system

### Ease Of Installation

- Reduced complexity of standard modular design allows an easy installation
- Low space requirements between the gensets
- Genset is ready for installation
- Generator set designed for direct elastic mounting

### Ease Of Operation

- Low fuel and oil consumption
- Low maintenance requirements
- Operator and maintenance training courses available

### Intelligent Simplicity

- High reliability, modular design and integral construction reduce the number of components by 40% over conventional designs e.g.:
  - Dry engine block with integrated ducts for lubricating oil and charge air and underslung crankshaft
  - Compact cylinder head design
- Smart maintenance solutions
  - Easily removable cylinder heads, quick removable fluid connections
  - Split connecting rods to allow fast and easy piston removal without disturbing the big end bearing
  - Segmental camshaft design
  - Simplified parts spectrum by using single-pipe exhaust gas
  - Engine block free from cooling water
- State-of-art material ensures long life time

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## FEATURES AND BENEFITS

### Ease Of Maintenance

- Smart maintenance solutions allow an easy component accessibility
- Large inspection openings afford an easy serviceability to core engine internals
- Core engine components designed for reconditioning and reuse
- Short maintenance intervals enable high availability
- No engine removal necessary for maintenance and overhauls

### Fuel

- Liquid: Light fuel oil (LFO), crude oil and heavy fuel oil (HFO) with fuel quality up to 700 cSt/50°C according to CIMAC H55/K55
- Dual: Light fuel oil (LFO), crude oil and heavy fuel oil (HFO) with fuel quality up to 700 cSt/50°C according to CIMAC H55/K55  
Natural gas with methane number > 80 and lower heating value of 28MJ/Nm<sup>3</sup>
- Gaseous: Natural gas with methane number > 80 and lower heating value of 31.5 MJ/Nm<sup>3</sup>

### Emission

- World bank (WB) emission certification stage 1 and 2
- Technische Anleitung (TA) Luft 2002 (only gas)
- Post-emission treatment systems for lower emission requirements available

### Expertise & Experience

- Assistance for planning - delivery - commissioning - operation and service
- Expertise and experience for solutions to maximize benefits, e.g. combine heat and power systems (CHP)

### Worldwide Product Support

- With nearly 200 Cat® dealers we are at home around the globe
- Factory-trained technicians, original parts and support are never out of reach
- Long term service agreements offer back-to-back services from preventive maintenance, scheduled maintenance to full operation and maintenance

## EQUIPMENT

### Fuel System

- Circulation module
- Pre-pressure module
- Separator module
- Engine ventilation module (only dual fuel (DF) and gas)
- Gas valve unit (GVU) (only dual fuel (DF) and gas)
- Ignition fuel oil module (only dual fuel (DF))

### Lubricating Oil System

- Combined module: cooling water system and lubricating oil system
- Lubricating oil separator module
- Piping interface module

### Cooling Water System

- Combined module: see lubricating oil system
- Cooling water system with radiators
- Piping interface module

### Starting System

- Starting air compressor module
- Starting air receiver module

### Combustion Air System

- Air filter - pocket
- Air filter - oil bath
- Air filter - pulse

### Exhaust System

- Exhaust gas silencer
- Selective catalytic reduction (SCR) system
- Oxidation catalytic (Oxicat) converter system
- Exhaust gas ventilation module (only dual fuel (DF) and gas)

### Control & Monitoring System

- Local control panel (LCP)
- Local data panel (LDP) / generator control panel (GCP)
- Motor control center (MCC) module
- Engine monitoring package
- Gas leak detection per cylinder (only dual fuel (DF) and gas)

### Mounting System

- Elastic mounting - genset / engine

## TECHNICAL DATA

| Ratings  | Units                | 12CM46DF   | 16CM46DF   |
|--|----------------------|--|--|
| Engine Type  | [-]                  | 4-stroke-cycle                                   | 4-stroke-cycle                                   |
| Configuration  | [-]                  | 12 cylinder                                      | 16 cylinder                                      |
| Fuel Type  | [-]                  | Gas, diesel oil, heavy fuel oil (HFO), crude oil | Gas, diesel oil, heavy fuel oil (HFO), crude oil |
| Genset Rating Range Up To  | [kWe]                | 10 580   | 14 110   |
| Engine Rating Range Up To  | [kW]                 | 10 800   | 14 400   |
| Frequency At Speed   | [rpm] (50Hz / 60Hz)  | 50 Hz @ 500<br>60 Hz @ 514                       | 50 Hz @ 500<br>60 Hz @ 514                       |
| Voltage  | [kV]                 | 3-13.8   | 3-13.8   |
| Genset Efficiency Up To  | [%]                  | 48.5   | 48.5   |
| Emission Level Up To   | [-]                  | WB II  | WB II  |
| Ready To Accept Loads (Preheated/Vented)   | [s]                  | 40   | 40   |
| Normal Ramp Up To 100% Load  | [s]                  | 80   | 80   |
| Emergency Ramp Up 10% To 100% Load   | [s]                  | 25   | 25   |
| Bore   | [mm / in]            | 460 / 18.11                                      | 460 / 18.11                                      |
| Stroke   | [mm / in]            | 610 / 24.02                                      | 610 / 24.02                                      |
| Swept Volume   | [l / cu in]          | 101.4 / 6 186                                    | 101.4 / 6 186                                    |
| Mean Effective Pressure Up To  | [bar / psig]         | 21.3 / 309                                       | 21.3 / 309                                       |
| Aspiration   | [-]                  | turbocharged-aftercooled                         | turbocharged-aftercooled                         |
| Specific Fuel Oil Consumption (SFOC) Up To - World Bank Emission Stage 1 (WB I)  | (g/kWh) / (lb/kWh)   | 184 / 0.406                                      | 184 / 0.406                                      |
| Specific Fuel Oil Consumption (SFOC) Up To - World Bank Emission Stage 2 (WB II) | (g/kWh) / (lb/kWh)   | 184 / 0.406                                      | 184 / 0.406                                      |
| Specific Energy Consumption (BSEC) Up To   | (kJ/kWh) / (Btu/kWh) | 7 272 / 6 893                                    | 7 272 / 6 893                                    |
| Specific Pilot Fuel Consumption (Only Dual Fuel)                                 | (kJ/kWh) / (Btu/kWh) | 74 / 70  | 74 / 70  |
| Specific Lube Oil Consumption  | (g/kWh) / (lb/kWh)   | 0.6 / 0.0013                                     | 0.6 / 0.0013                                     |
| Length   | [mm / in]            | 14 280 / 562                                     | 16 565 / 652                                     |
| Width  | [mm / in]            | 3 890 / 153                                      | 4 027 / 159                                      |
| Height   | [mm / in]            | 4 659 / 183                                      | 4 773 / 188                                      |
| Dry Weight - Genset  | [t / lb]             | 227.0 / 500 449                                  | 286.0 / 630 521                                  |

### Rating Definition And Conditions

Ratings and fuel consumption based on ISO 3046-1 at standard reference conditions.

Lubricating oil consumption tolerance on value +/- 50%.

The Genset rating depends on the efficiency of the final generator specifications.

For liquid: Reference liquid fuel is distillate diesel. Reference lower calorific value: 42700 kJ/kg.

Engine brake specific fuel oil consumption (SFOC) tolerance 5%, without engine driven pumps. For each engine driven pump an additional brake specific fuel consumption of 1% at 100% load has to be calculated.

For dual fuel: Reference gaseous fuel is natural gas with methan number > 80. Minimum lower heating value: 28000 kJ/m<sup>3</sup>.

Engine brake specific energy consumption (BSEC) tolerance 5%, without engine driven pumps. For each engine driven pump an additional brake specific energy consumption of 1% at 100% load has to be calculated.

Gaseous fuel: Reference gaseous fuel is natural gas with methan number > 80. Minimum lower heating value: 31500 kJ/m<sup>3</sup>.

Engine brake specific energy consumption (BSEC) tolerance 5%, incl. engine driven lube oil pump.

For each engine driven pump an additional brake specific fuel consumption of 1% at 100% load has to be calculated.

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# Caterpillar Energy Solutions

medium-speed engines manufactured by:

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

For more information:

 [www.soarpower.com](http://www.soarpower.com)

 [sale@soarpower.com](mailto:sale@soarpower.com)

 +86 400 8111 308

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