

# CM46DF Electric Power Generator Set

5 290 - 7 930 kW<sub>e</sub>



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

**Configuration**  
6, 7, 8, 9 cylinder

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

**Genset rating**  
5 290 - 7 930 kW<sub>e</sub>

**Genset efficiency**  
up to 47.4 % (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	6CM46DF	7CM46DF	8CM46DF	9CM46DF
Engine Type	[-]	4-stroke-cycle	4-stroke-cycle	4-stroke-cycle	4-stroke-cycle
Configuration	[-]	6 cylinder	7 cylinder	8 cylinder	9 cylinder
Fuel Type	[-]	Gas, diesel oil, heavy fuel oil (HFO), crude oil	Gas, diesel oil, heavy fuel oil (HFO), crude oil	Gas, diesel oil, heavy fuel oil (HFO), crude oil	Gas, diesel oil, heavy fuel oil (HFO), crude oil
Genset Rating Range Up To	[kWe]	5 290	6 170	7 050	7 930
Engine Rating Range Up To	[kW]	5 400	6 300	7 200	8 100
Frequency At Speed	[rpm] (50Hz / 60Hz)	50 Hz @ 500 60 Hz @ 514	50 Hz @ 500 60 Hz @ 514	50 Hz @ 500 60 Hz @ 514	50 Hz @ 500 60 Hz @ 514
Voltage	[kV]	3-13.8	3-13.8	3-13.8	3-13.8
Genset Efficiency Up To	[%]	47.4	47.4	47.4	47.4
Emission Level Up To	[-]	WB II	WB II	WB II	WB II
Ready To Accept Loads (Preheated/Vented)	[s]	40	40	40	40
Normal Ramp Up To 100% Load	[s]	80	80	80	80
Emergency Ramp Up 10% To 100% Load	[s]	25	25	25	25
Bore	[mm / in]	460 / 18.11	460 / 18.11	460 / 18.11	460 / 18.11
Stroke	[mm / in]	610 / 24.02	610 / 24.02	610 / 24.02	610 / 24.02
Swept Volume	[l / cu in]	101.4 / 6 186	101.4 / 6 186	101.4 / 6 186	101.4 / 6 186
Mean Effective Pressure Up To	[bar / psig]	21.3 / 309	21.3 / 309	21.3 / 309	21.3 / 309
Aspiration	[-]	turbocharged-aftercooled	turbocharged-aftercooled	turbocharged-aftercooled	turbocharged-aftercooled
Specific Fuel Oil Consumption (SFOC) Up To - World Bank emission certification stage 1 (WBI)	(g/kWh) / (lb/kWh)	186 / 0.410	186 / 0.410	186 / 0.410	186 / 0.410
Specific Fuel Oil Consumption (SFOC) Up To - World Bank emission certification stage 2 (WBII)	(g/kWh) / (lb/kWh)	186 / 0.410	186 / 0.410	186 / 0.410	186 / 0.410
Specific Energy Consumption (BSEC) Up To	(kJ/kWh) / (Btu/kWh)	7 441 / 7 053	7 441 / 7 053	7 441 / 7 053	7 441 / 7 053
Specific Pilot Fuel Consumption (Only Dual Fuel)	(kJ/kWh) / (Btu/kWh)	74 / 70	74 / 70	74 / 70	74 / 70
Specific Lube Oil Consumption	(g/kWh) / (lb/kWh)	0.6 / 0.0013	0.6 / 0.0013	0.6 / 0.0013	0.6 / 0.0013
Length	[mm / in]	12 202 / 480	12 999 / 512	13 729 / 541	14 459 / 569
Width	[mm / in]	3 400 / 134	3 400 / 134	3 400 / 134	3 400 / 134
Height	[mm / in]	6 278 / 247	6 649 / 262	6 649 / 262	6 649 / 262
Dry Weight - Genset	[t / lb]	178.0 / 392 422	195.0 / 429 901	210.0 / 462 970	240.0 / 529 109

### Rating Definitions 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.

# Caterpillar Energy Solutions

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