

CM46DF Electric Power Generator Set

10 580 - 14 110 kW_e



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_e

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/Nm³
- Gaseous: Natural gas with methane number > 80 and lower heating value of 31.5 MJ/Nm³

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 60 Hz @ 514	50 Hz @ 500 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/m³.

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/m³.

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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