MAN Energy Solutions Future in the making

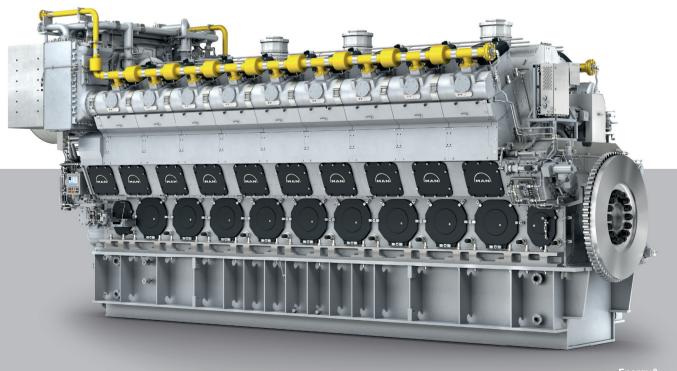


MAN 51/60DF

The MAN 51/60DF runs on either liquid or gaseous fuels and can switch seamlessly from liquid to gas and vice versa during operation, giving you the benefits of a high fuel flexibility. The engine can even be started in gas mode and requires only a very small amount of pilot fuel. Benefitting from the excellent robustness and reliability of its predecessors, the MAN 51/60DF also ensures low emissions and high efficiency.

Benefits at a glance

- Flexible operation and start up
- Start and stop in gas mode
- Full fuel flexibility with HFO, diesel, natural gas, e-methane and bio fuel
- Optimized variants for tropical conditions
- High single cycle efficiency
- Optimized performance settings



Energy& storage systems

MAN 51/60DF

High efficiency and high power

Dimensions

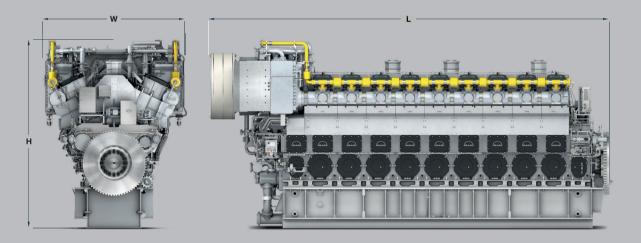
| Cyl. No. | | 6L | | 12V | | 18V |
|---------------|----------|------------|----------------|------------|-----------|------------|
| L | 8,464 mm | 333.2 in | 9,970 mm (HE) | 392.5 in | 13,489 mm | 531.1 in |
| | | | 10,134 mm (HP) | 399.0 in | | |
| н | 5,807 mm | 228.6 in | 6,450 mm | 253.9 in | 6,450 mm | 253.9 in |
| W | 3,156 mm | 124.3 in | 4,884 mm | 192.3 in | 4,884 mm | 192.3 in |
| Engine weight | 171.6 t | 378,313 lb | 293.8 t (HE) | 647,718 lb | 416.8 t | 918,887 lb |
| | | | 297.6 t (HP) | 656,095 lb | | |

Output

| Cyl. No. | | | 6L | | 12V | | 18V |
|--------------|-----|---------|---------|---------|---------|---------|---------|
| Output mech. | kW | 6,300 | 6,900 | 12,600 | 13,800 | 18,900 | 20,700 |
| Speed | rpm | 500/514 | 500/514 | 500/514 | 500/514 | 500/514 | 500/514 |
| Frequency | Hz | 50/60 | 50/60 | 50/60 | 50/60 | 50/60 | 50/60 |

HE = high efficiency version (1,050 kW / cyl.)

HP = high power version (1,150 kW / cyl.)



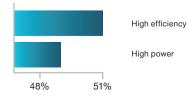
Values according to ISO 3046-1:2002; ISO 15550:2002. Last updated November 2023

Engine Features

General data

- Engine cycle: four-stroke
- No. of cylinders: 6L, 12V, 18V
- Bore: 510 mm / 20.08 in, Stroke: 600 mm / 23.62 in

Fuel efficiency comparison



Engine automation and control

 MAN SaCoS_{one} safety and control system on engine, developed by MAN

Turbocharging system

- MAN constant pressure turbocharging system
- Individual engine / turbocharger optimization matching on site

Fuel & gas system

- Common rail pilot fuel injection system
- Amount of pilot fuel ~1%
- Seamless switch from liquid to gas during operation

- Robust conventional main injection system
- Low pressure gas system (5 bar(g) / 72.52 psi at inlet of gas valve unit)

Starting system

- Starting air valves in cylinder head

Applications

- Whenever fuel flexibility is of benefit
- Locations with non-constant gas supply
- Installations with gas operation at a later date
- Locations with highly volatile fuel prices

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