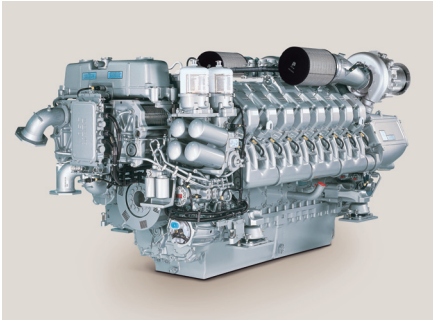


Marine

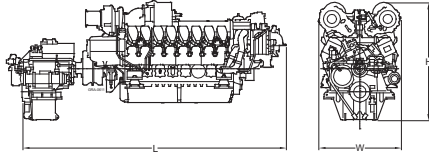
Diesel Engines 12V/16V 4000 M90

for Fast Vessels with Low Load Factors (1DS)



Dimensions and Masses

| 4000 M90 - with gearbox | Dimensions (LxWxH) mm (in) | Mass, dry kg (lbs) |
|-------------------------|----------------------------------|---------------------|
| 12V/ZF 4650 | 3620x1520x1835 (142.5x59.8x72.2) | 8775 kg (19346 lbs) |
| 16V/ZF 7600 | 4525x1520x1890 (178.1x59.8x74.4) | 8920 kg (19665 lbs) |



Typical applications: Fast Yachts, Fast Patrol Boats, Police Craft and Fire-Fighting Vessels

| Engine Model | 12V 4000 M90 | 16V 4000 M90 |
|---|-------------------|-------------------|
| Rated power ICFN kW (bhp) | 2040 (2735) | 2720 (3650) |
| Speed rpm | 2100 | 2100 |
| No. of cylinders | 12 | 16 |
| Bore/stroke mm (in) | 165/190 (6.5/7.5) | 165/190 (6.5/7.5) |
| Displacement, total l (cu in) | 48.7 (2978) | 65.0 (3967) |
| Flywheel housing | SAE 00 | SAE 00 |
| Gearbox type | ZF 4650 | ZF 7600 |
| | i = 1.5 – 2.5 | i = 1.5 – 3.0 |
| Optimization of exhaust emissions ¹⁾ | IMO I | IMO I |

¹⁾ IMO - International Maritime Organization (MARPOL)



Power. Passion. Partnership.

| Performance and Fuel Consumption ¹⁾ | | 12V 4000 M90 | | | 16V 4000 M90 | | |
|--|-------|--------------|-------|------|--------------|-------|-------|
| Speed | rpm | 2100 | 1800 | 1200 | 2100 | 1800 | 1200 |
| Maximum power | kW | 2040 | 1750 | 800 | 2720 | 2350 | 1150 |
| | bhp | 2735 | 2347 | 1073 | 3650 | 3151 | 1542 |
| Power on propeller curve ²⁾ | kW | 2040 | 1280 | 380 | 2720 | 1700 | 460 |
| | bhp | 2735 | 1717 | 510 | 3650 | 2280 | 617 |
| Fuel consumption on propeller curve ²⁾ | g/kWh | 209 | 204 | 210 | 209 | 204 | 215 |
| | l/h | 513.7 | 430.1 | 96.1 | 685.0 | 405.5 | 119.2 |
| | gal/h | 135.7 | 113.6 | 25.4 | 181.0 | 107.1 | 31.5 |

¹⁾ Tolerance +5% per ISO 3046, Diesel fuel to DIN EN 590 with a min L.H.V. of 42800kJ/kg (18390 BTU/lb) ²⁾ 3.0 exponent

| Standard Equipment | |
|--------------------------|---|
| Starting system | Electric starter 24 V, 2 pole |
| Oil system | Gear driven lube oil pump, lube-oil duplex filter with diverter valve, centrifugal oil filter, lube-oil heat exchanger, handpump for oil extraction |
| Fuel system | Fuel delivery pump, fuel duplex filter with diverter valve, "Common Rail" fuel injection system with high-pressure pump, pressure accumulator and electronic fuel injection with cylinder cutout system, jacketed HP fuel lines, flame proof hose lines, leak-off fuel tank level monitored, fuel hand pump, fuel pre-filter with water separator |
| Cooling system | MTU-split-circuit coolant system, coolant-to-raw water plate core heat exchanger, self priming centrifugal raw water pump, gear driven coolant circulation pump, raw-water connection for gearbox cooling |
| Combustion air system | Engine coolant temperature-controlled intercooler, sequential turbocharging with 2 water-cooled turbochargers, on-engine set of seawater-resistant combustion-air filters |
| Exhaust system | Triple-walled, liquid-cooled, on-engine exhaust manifolds, exhaust bellows (horizontal discharge) |
| Mounting system | Resilient mounts |
| Power Transmission | Torsional and offset compensating couplings |
| Auxiliary PTO | Charging generator, 120A, 28V, 2 pole |
| Engine management system | Engine control and monitoring system (MDEC), interface to gearbox control, interface to remote control and monitoring system, local operating panel (LOP) |

| Optional Equipment | |
|---------------------------|--|
| Starting system | Coolant preheating system |
| Oil system | Lube oil priming system |
| Cooling System | Engine version for sealed engine coolant system in conjunction with ship`s side recooling system |
| Exhaust System | Exhaust outlet elbow (45°, 70°, 90°) |
| Auxiliary PTO | Bilgepump |
| Engine management system | In compliance with Classification Society Regulations |
| Monitoring/Control system | Fuel consumption measurement device (KRAL), monitoring and control system MCS-5, remote control system RCS-5 |
| Gearbox Options | Various reserve reduction gearbox models, elec. actuated, gearbox mounts, PTO for hydraulic pump at driving shaft or at mediate shaft, trolling, trailing pump, propeller shaft flange |
| Classification | Classification is available; please consult our Sales Center for detailed information. |

> The rated power corresponds to ISO 3046-1:2002 (E) and ISO 15550:2002(E)

> Intake air temperature 25°C/Sea water temperature 25°C

> Intake air depression 15 mbar/Exhaust back pressure 30 mbar

> Barometric pressure 1000 mbar

The power produced at the flywheel will be within the tolerance of ±3% - according to ISO 15550:2002(E)- up to 45°C (113°F) combustion air temperature measured at the air cleaner inlet and up to 32°C (89.6°F) sea or raw water temperature measured at the sea water pump suction inlet. Specifications are subject to change without notice. All dimensions are approximate. For complete information refer to installation drawing. For further information consult your MTU dealer.

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