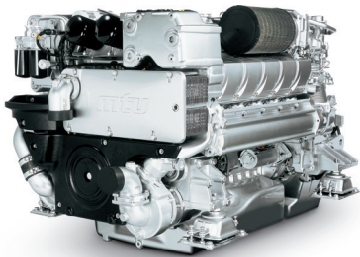




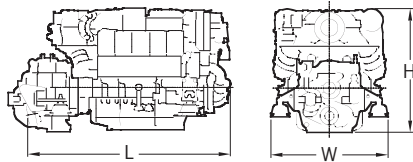
## Marine

# DIESEL ENGINES 12V/16V 2000 M93

for fast vessels with low load factors (1DS)



| Engine with gearbox | Dimensions (LxWxH) mm (in)               | Mass, dry kg (lbs) |
|---------------------|--|--------------------|
| 12V/ZF 2060         | 2573 x 1295 x 1350 (101.3 x 51.0 x 53.1) | 3235 (7132)        |
| 16V/ZF 3060         | 3105 x 1295 x 1390 (122.2 x 51.0 x 54.7) | 3978 (8770)        |



Typical applications: Fast yachts, fast patrolboats, police craft and fire-fighting vessels

Optional equipment and finishing shown. Standard may vary.

| Engine type                                     |           | 12V 2000 M93                              | 16V 2000 M93                              |
|---|-----------|---|---|
| Rated power ICFN                                | kW        | 1340                                      | 1790                                      |
|   | (bhp)     | (1800)                                    | (2400)                                    |
| Speed   | rpm       | 2450                                      | 2450                                      |
| No. of cylinders                                |           | 12  | 16  |
| Bore/stroke                                     | mm (in)   | 135/156 (5.3/6.1)                         | 135/156 (5.3/6.1)                         |
| Displacement, total                             | l (cu in) | 26.8 (1635)                               | 35.7 (2179)                               |
| Flywheel housing                                |           | SAE 0                                     | SAE 0                                     |
| Gearbox type <sup>2)</sup>                      |           | ZF 2060                                   | ZF 3060                                   |
|   |           | i = 1.2 – 2.5                             | i = 1.3 – 3.0                             |
| Optimization of exhaust emissions <sup>1)</sup> |           | IMO II/EPA 2 compl./EU IIIA <sup>2)</sup> | IMO II/EPA 2 compl./EU IIIA <sup>2)</sup> |

1) IMO – International Maritime Organisation  
EPA – US Marine Directive 40 CFR 94  
EU – Nonroad Directive 97/68/ EC

2) Recognition through the RheinshUO (CCNR II)

| Performance & fuel consumption <sup>1)</sup> |        | 12V 2000 M93 |       |       |      | 16V 2000 M93 |       |       |      |
|--|--------|--------------|-------|-------|------|--------------|-------|-------|------|
| Speed  | rpm    | 2450         | 2200  | 2000  | 1200 | 2450         | 2200  | 2000  | 1200 |
| Maximum power                                | kW     | 1340         | 1270  | 1150  | 600  | 1750         | 1700  | 1550  | 790  |
|  | bhp    | 1800         | 1705  | 1540  | 805  | 2400         | 2280  | 2080  | 1060 |
| Power on propeller curve (n3)                | kW     | 1340         | 970   | 740   | 170  | 1790         | 1300  | 980   | 205  |
|  | bhp    | 1800         | 1300  | 990   | 230  | 2400         | 1745  | 1315  | 275  |
| Fuel consumption<br>on propeller curve 1)    | g/kWh  | 213          | 215   | 225   | 216  | 209          | 214   | 217   | 218  |
|  | l/hr   | 343.9        | 251.3 | 200.6 | 44.2 | 450.7        | 335.2 | 250.2 | 53.8 |
|  | gal/hr | 90.8         | 66.4  | 53.0  | 11.7 | 119.1        | 88.6  | 67.7  | 14.2 |

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

| Standard equipment       |   |
|--------------------------|---|
| Starting system          | Electric starter 24 V   |
| Auxiliary PTO            | Alternator, 80A, 28V, 2 pole  |
| Oil system               | Gear driven lube oil pump, lube-oil duplex filter with diverter valve, lube-oil heat exchanger, handpump for oil extraction   |
| Fuel system              | Fuel feed pump, fuel hand pump, fuel pre-filter, fuel main filter with diverter valve, on-engine fuel oil cooler, HP fuel pump, jacketed HP fuel lines, injection nozzles (CR system), flame proof hose lines, leak-off fuel tank level monitored |
| Cooling system           | Coolant-to-raw water plate core heat exchanger, self priming centrifugal raw water pump, gear driven coolant circulation pump   |
| Combustion air system    | Sequential turbocharging with 2 water-cooled exhaust-gas turbochargers, on-engine intake air filters  |
| Exhaust system           | Triple-walled, liquid-cooled, on-engine exhaust manifolds, single centrally located exhaust outlet, 1 exhaust bellows vertical discharge  |
| Mounting system          | Resilient mounts at free end  |
| Engine management system | Engine control and monitoring system (ADEC)   |

| Optional equipment        |  |
|---------------------------|--|
| Auxiliary PTO             | Alternator, 140A, 28V, 2 pole, bilgepump, on-engine PTOs   |
| Oil system                | Centrifugal oil filter, oil replenishment system   |
| Fuel system               | Duplex fuel pre-filter   |
| Cooling system            | Coolant preheating system, integr. seawater gearbox piping   |
| Exhaust system            | 1 exhaust bellows horizontal discharge   |
| Mounting System           | Resilient mounts at driving end  |
| Engine Management System  | In compliance with Classification Society Regulations  |
| Monitoring/Control System | smartline, blueLine, bluevision, BlueVision NewGeneration, Callosum  |
| Power Transmission        | Torsionally resilient coupling   |
| Gearbox Options           | Reverse reduction gearbox, el. actuated, gearbox mounts, trolling mode for dead-slow propulsion, free auxiliary PTO, hydraulic pump drives |
| Classification            | ABS, BV, CCS, DNV, GL, KR, JG, LR, NK, RINA  |

Reference conditions:

- > Power definition according ISO 3046
- > Intake air temperature 25°C/Sea water temperature 25°C
- > Intake air depression 15 mbar / Exhaust back pressure 30 mbar
- > Barometric pressure 1000 mbar
- > Power reduction at 45°C/32°C: none

Specifications are subject to change without notice. All dimensions are approximate. For complete information refer to installations drawing. For further information consult your MTU distributor/dealer. may feature options not fitted as standard to standard engine.