Marine

DIESEL ENGINE 20V 8000 M91L

for fast vessels with low load factors (1DS)

Optional equipment and finishing shown. Standard may vary.

<table>
<thead>
<tr>
<th>Engine</th>
<th>Dimensions (LxWxH) mm (in)</th>
<th>Mass, dry kg (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M93</td>
<td>6645 x 2040 x 3375 (261.6 x 80.3 x 132.9)</td>
<td>49600 (109348)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mass, wet kg (lbs)</th>
</tr>
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<tbody>
<tr>
<td>51965 (114563)</td>
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</tbody>
</table>

**Engine type**

<table>
<thead>
<tr>
<th>Engine type</th>
<th>20V 8000 M91L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated power ICFN (bhp)</td>
<td>10000 (13410)</td>
</tr>
<tr>
<td>Speed (rpm)</td>
<td>1150</td>
</tr>
<tr>
<td>No. of cylinders</td>
<td>20</td>
</tr>
<tr>
<td>Bore/stroke (mm in)</td>
<td>265/315 (10.4/12.4)</td>
</tr>
<tr>
<td>Displacement (l cu in)</td>
<td>347.4 (21200)</td>
</tr>
<tr>
<td>Optimization of exhaust emissions*</td>
<td>IMO II</td>
</tr>
</tbody>
</table>

* IMO - International Maritime Organisation (MARPOL)

Typical applications: OPVs, Corvettes, Frigates, Destroyers and Landing Ships with naval requirement and large yachts with high acoustic requirements respectively.
### Standard equipment

**Starting system**
Air starter motor, 15 bar; press. reduct. station 40/15 bar, coolant preheating system

**Oil system**
Lube oil pump, automatic filter with backflushing, centrifugal oil filter, lube-oil heat exchanger, lube oil priming pump, lube oil level monitoring/replenishment system, switchboxes for lube oil replenishment and priming pumps

**Fuel system**
Fuel delivery pump, fuel duplex filter with diverter valve, “common rail” fuel injection system with high-pressure pump, pressure accumulator and electronically fuel injection with cylinder cutout system, jacketed HP fuel lines, leak-off fuel tank level m onitore, fuel hand pump, fuel pre-filter with water separator, fuel recooler

**Cooling system**
MTU-split-circuit coolant system, coolant-to-raw water plate core heat exchanger, centrifugal raw water pump with priming system, coolant circulation pump, coolant expansion tank

**Combustion air system**
Engine coolant temperature-controlled intercooler, sequential turbocharging with 4 water-cooled turbochargers, on-engine set of combustion-air filters

**Exhaust system**
On-engine exhaust manifolds, exhaust bellow

**Mounting system**
Highly resilient mounts for high acoustic requirements and/or shock requirements to NATO Standards

**Power transmission**
Torsional and offset compensating couplings

**Engine management system**
Engine control and monitoring system (MDEC), interface to remote control and monitoring system, local operating panel (LOP)

**Interfaces**
Flexible joints (hose lines, rubber bellows)

### Optional equipment

**Starting system**
Compressed air tanks

**Monitoring/Control system**
Monitoring and control system MCS-5, remote control system RCS-5

**Gearbox option**
Various gearbox models

**Flywheel/housing**
SAE 0 flywheel housing “wet”, SAE 1 flywheel housing “dry”, SAE 1 flywheel housing “wet”

**Accessory drives**
Battery charging alternator, 28VDC, aux. PTO’s for hydraulic pump drives and compressors

### Fuel consumption *

<table>
<thead>
<tr>
<th>at rated power</th>
<th>g/kWh</th>
<th>l/hr</th>
<th>gal/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>20V 8000 M91L</td>
<td>199</td>
<td>2397.6</td>
<td>633.3</td>
</tr>
</tbody>
</table>

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

Reference conditions:
> Intake-air temperature: 25°C (77°F)
> Ambient air pressure: 1000 mbar
> Altitude above sea level: 100 m (328 ft)

Customization possible. Engines illustrated in this document may feature options not fitted as standard to standard engine.