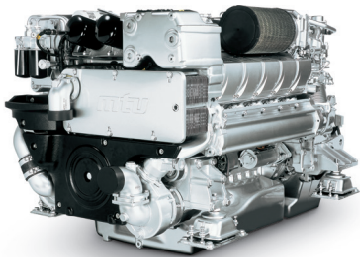




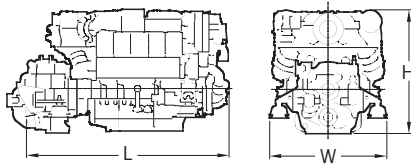
## Marine

# DIESEL ENGINES 12V/16V 2000 M93

for fast vessels with low load factors (1DS)



Engine with gearbox	Dimensions (L x W x H), 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 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 distributor/dealer. May feature options not fitted as standard to standard engine.