

VOLVO PENTA MARINE VARIABLE SPEED GENSET

D16-MH (VG)

16.1 liter, in-line 6 cylinder

481 — 545 kWe



Technical Data

Engine designation	D16 MH (VG)		
No. of cylinders and configuration	in-line 6		
Method of operation	4-stroke, direct-injected, turbocharged diesel engine with charge air cooler		
Bore / stroke, mm (in.)	144 / 165 (5.67 / 6.50)		
Displacement, l (in ³)	16.1 (983.9)		
Compression ratio	16.8:1		
Engine	D16 MH 750	D16 MH 800	D16 MH 850
Crankshaft Power HE/KC Cooling, kWm	551	588	625
Rating	1	2	2
Electrical Power, kWe	481	509	545
Emission compliance	IMO II, IMO III, China 2, US EPA Tier 3	IMO II, IMO III, China 2, US EPA Tier 3	IMO II, IMO III, China 2
Specific fuel consumption HE/KC, g/kWh at kWe & rpm (IMO III)			
Peak efficiency	192 (450 kWe / 1500 rpm)	192 (450 kWe / 1500 rpm)	192 (450 kWe / 1500 rpm)
50%	196 (240 kWe / 1500 rpm)	195 (254 kWe / 1500 rpm)	194 (272 kWe / 1500 rpm)
75%	194 (360 kWe / 1500 rpm)	193 (382 kWe / 1500 rpm)	193 (409 kWe / 1500 rpm)
Rated power / rated speed	200 (481 kWe / 1900 rpm)	200 (509 kWe / 1900 rpm)	201 (545 kWe / 1900 rpm)
Recommended fuel to conform to	ASTM-D975 1-D & 2-D, EN 590 or JIS KK 2204		

Fuel temperature 40°C (104°F). Technical data according to ISO 3046 Fuel Stop Power with a tolerance ±4%. Fuel with a lower calorific value of 42700 kJ/kg and density of 840 g/liter at 15°C (60°F). Merchant fuel may differ from this specification which will influence engine power output and fuel consumption. The engine is certified according to IMO Tier III for diesel electric propulsion.

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Technical description

Complete Variable speed Genset

- High system efficiency
- Possible to operate at multiple fix speeds or full variable speeds
- Light and compact Generator set
- Engine coupled to generator via flexible coupling
- Flexible mountings included
- Synchronization not needed
- Possibility to mix engine sizes
- Generator could be ordered with Marine classification according to DNV, LR, BV, RINA and ABS.

Generator

- Permanent magnet generator technology
- Small, robust, light and efficient
- Water cooled
- Insulation Class H, Temperature rise Class F
- Double bearing
- IP65 as standard

Standard EM-PMI540-T3000

- Low voltage connections done with connection box (with 6xM25 and 4xM16 cable glands) and terminal strip (+LVB1)
- Two anti-condensation heaters, 230 VAC/130 W (+HEAT2)
- PT100 in bearing (+BTMP1)
- Redundant temperature surveillance of windings, PT100 (+TEMP5)
- Insulated bearing in N-end (+BIN)

Standard EM-PMI540-T3000-2000 (481 kWe)

- Rotating sensor, in-built non contact resolver, 8-pole pair, needed for non Danfoss inverters (+RES1)

Standard EM-PMI540-T3000-2000 (509 kWe) and EM-PMI540-T3000-2400 (545 kWe)

- Two rotating sensor, in-built non contact resolver, 8-pole pair, needed for non Danfoss inverters (+RES2)

Engine and block

- Cylinder block and cylinder head made of cast iron
- One-piece cast-iron cylinder head
- Ladder frame fitted to engine block
- Replaceable wet cylinder liners and valve seats/guides
- Drop forged crankshaft with induction hardened bearing surfaces and fillets with seven main bearings
- Four valve per cylinder layout with overhead camshaft
- Each cylinder features crossflow inlet and exhaust ducts
- Gallery oil cooled forged aluminum pistons, three piston rings (keystone top ring)
- Rear-end transmission
- Closed crankcase ventilation

Lubrication system

- Freshwater-cooled oil cooler integrated in cylinder block
- Twin full flow oil filter of spin-on type and single by-pass filter

Fuel system

- Electronic Unit Injectors
- Gear-driven fuel pump, driven by timing gear
- Electronically controlled injection timing
- 5-hole high pressure injector nozzles
- Twin engine-mounted spin-on fine fuel filters with change over valve

Air inlet and exhaust system

- Mid-positioned twin entry turbocharger with aftercooler
- Air filter with replaceable inserts
- Wet exhaust elbow (option)
- Loss of sea water alarm

Cooling system

1. Heat Exchanger cooled system (HE)
 - For seawater- and central-cooled Gensets
 - Engine-mounted plate heat exchanger with expansion tank
 - Belt-driven centrifugal freshwater pump
 - Belt-driven rubber impeller raw water pump
2. Keel cooled system (KC)
 - 2-circuit cooling system
 - Belt-driven centrifugal cooling water pump in HT circuit
 - Engine mounted expansion tank in HT circuit
 - Gear driven rubber impeller cooling water pump in CAC LT circuit

Control system

Two options available:

1. MCC (Marine Commercial Control) an open system that is type approved, including separate safety shutdown system.
2. Open CAN Interface, engine delivered without control system. Different options with or without shut down senders and switches.

Optional equipment

Engine

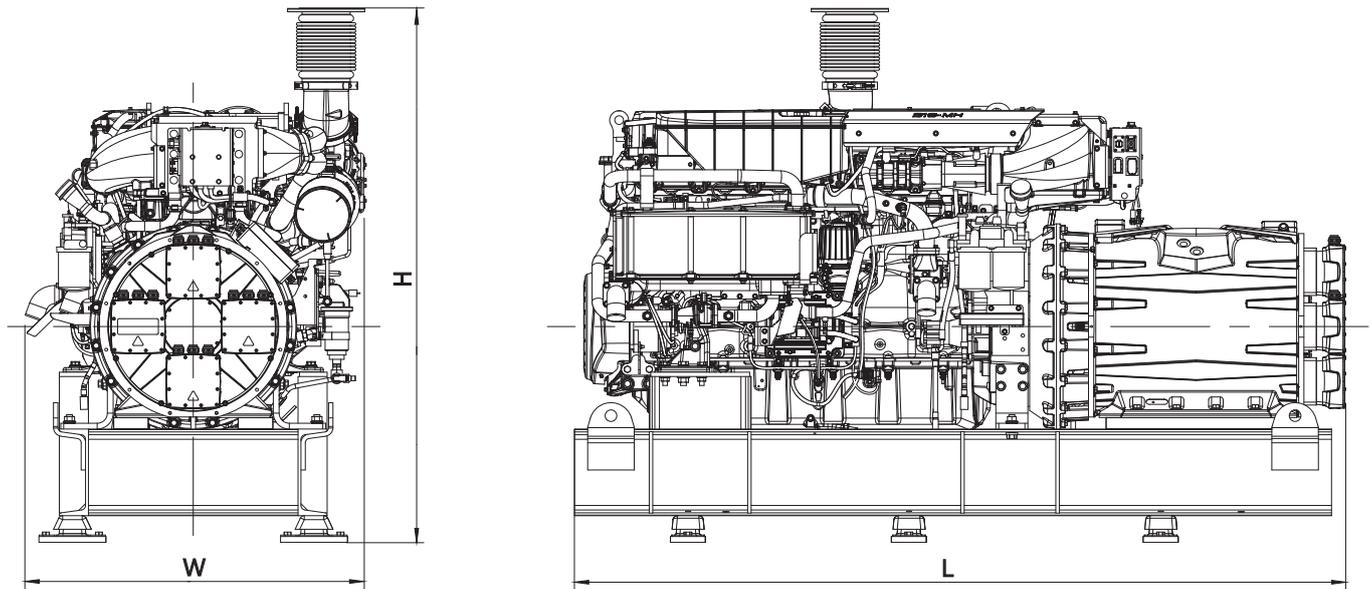
- Exhaust temperature indication
- Engine heater

Exhaust aftertreatment system

- SCR (Selective Catalytic Reduction)
- Aqueous UREA solution 32.5% or 40%
- Complete system – developed, certified, and serviced by one company.
- Fully integrated capabilities
- SCR unit reduces noise by up to 35 dBA
- Wide range of installation options available

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Technical Data HE/KC Genset (Class F)

Power output at 1900 rpm 475 V_{AC}, kW_e

D16 MH 750 / EM-PMI540-T3000-2000-QUAD 481

Power output at 1900 rpm 475 V_{AC}, kW_e

D16 MH 800 / EM-PMI540-T3000-2000-QUAD 509

Power output at 1900 rpm 395 V_{AC}, kW_e

D16 MH 850 / EM-PMI540-T3000-2400-QUAD 545

Inverter requirement

Nominal inverter switching frequency 8 kHz

Minimal inverter switching frequency 4 kHz
(with limited speed 1,4 times nominal speed)

Fuel temperature 40°C (104°F). Technical data according to ISO 3046 Fuel Stop Power and ISO 8665. Fuel with a lower calorific value of 42700 kJ/kg and density of 840 g/liter at 15°C (60°F). Merchant fuel may differ from this specification which will influence engine power output and fuel consumption.

Dimensions L x W x H₁ (mm), not for installation

D16 MH / EM-PMI540-T3000-2000 2649 x 1171 x 1847

D16 MH / EM-PMI540-T3000-2400 2649 x 1171 x 1847

Weight HE, kg

D16 MH / EM-PMI540-T3000-2000-QUAD 3196

D16 MH / EM-PMI540-T3000-2400-QUAD 3196

Weight KC, kg

D16 MH / EM-PMI540-T3000-2000-QUAD 3138

D16 MH / EM-PMI540-T3000-2400-QUAD 3138

H₁ = Height including exhaust compensator

Not all models, standard equipment and accessories are available in all countries. All specifications are subject to change without notice. The engine illustrated may not be entirely identical to production standard engines.

Contact your local Volvo Penta dealer
for more information regarding Volvo
Penta engines and optional equipment/
accessories or visit
www.volvopenta.com



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