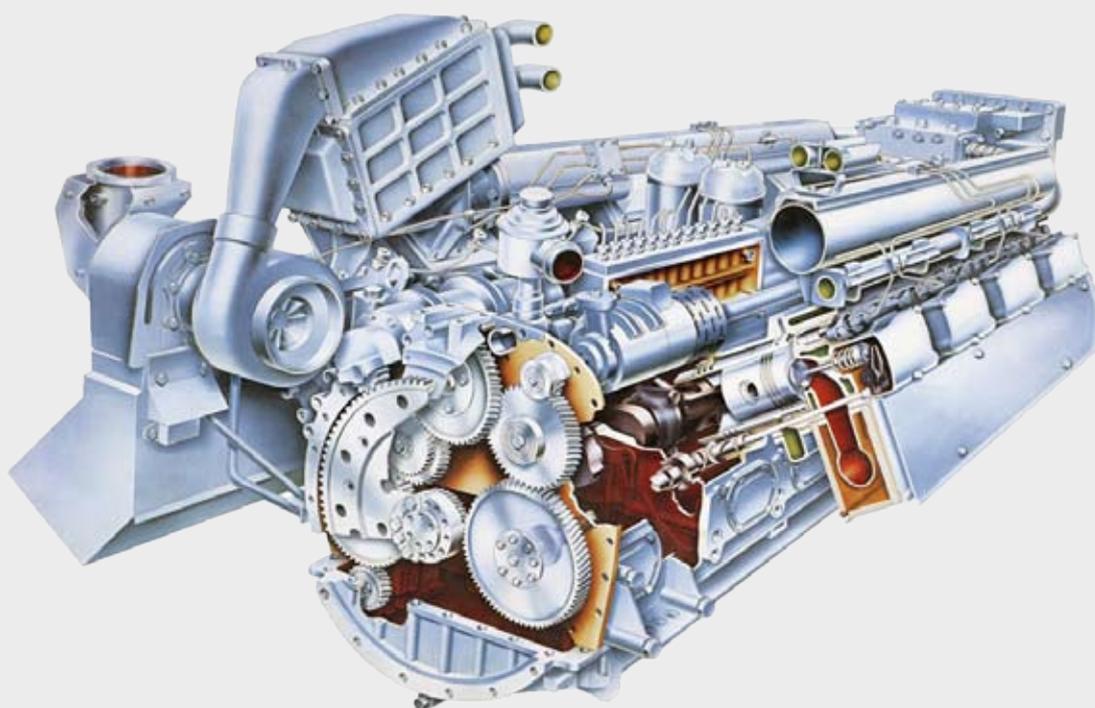


# 816

135-868 kW at 1200-2000 min<sup>-1</sup>

## TOTAL SERVICE



## WÄRTSILÄ DEUTZ MARINE ENGINES

### CHARACTERISTICS

- Water-cooled four-stroke 6- and 8-cylinder in-line engines and 12- and 16-cylinder 120° V-engines.
- Two stage combustion process.
- Turbocharged.
- Charge air cooling optional on all engines.

### BENEFITS

- Compact engine construction.
- High operation reliability due to a simple engine construction and moderate piston speed.
- Easy overhaul.
- Low fuel consumption.
- Low exhaust emissions.



## ENGINE DESCRIPTION

<b>Crankcase</b>	The crankcase is made of nodular cast iron. The oil sump is made of cast iron.
<b>Crankshaft</b>	The crankshaft is made of high-alloyed refined steel and inductive hardened at the bearing positions.
<b>Torsional vibration damper</b>	A viscous-fluid damper is fitted on the V-engines. A viscous-fluid or rubber vibration damper is fitted on the in-line engines.
<b>Cylinder liner</b>	The cylinder liner is made of alloyed centrifugal cast iron.
<b>Connecting rod</b>	The obliquely split connecting rod is made of alloyed refined steel.
<b>Piston</b>	The oil cooled piston is made of light metal and has 3 piston rings.
<b>Cylinder head</b>	The cylinder head is made of high-grade cast iron. The cylinder head contains a vertical or angled pre-combustion chamber, one inlet and one exhaust valve, which are resistant against high thermal loads. Each cylinder head is connected to the crankcase with 8 bolts.
<b>Camshaft</b>	In-line engines have one camshaft, which is induction hardened. V-engines have two camshafts, which are induction hardened.
<b>Injection pump</b>	16-cylinder engine type BA16M has two coupled block pumps. The engine types BA6M, BA8M and BA12M have one block pump.
<b>Governor</b>	In case of in-line engines, the hydraulic governor is located at operating side. In case of V-engines, the hydraulic governor is located in the engine's V-compartment.
<b>Fuel system</b>	Flexible fuel connection pipes (flame-proof), switch-over duplex filter, hand lift pump. The in-line engines are also provided with a fuel pre-filter.
<b>Lubricating oil system</b>	Forced oil circulation by engine mounted lubricating oil pump, which is located in the crankcase.
<b>Lube oil filter</b>	6-, 8- and 12-cylinder engines contain a switch-over duplex filter in main flow and a centrifugal filter in partial flow. 16-cylinder engines contain a switch-over triplex filter in main flow and two centrifugal filters in partial flow.
<b>Starting system</b>	Electric starter (24V DC). A pneumatic starting system is optional. In special cases a combination of both starting facilities is possible.
<b>Cooling water system</b>	Basic configuration of the engine: with radiator or outboard cooler and charge air cooler. Options: without charge air cooler, with charge air cooler in separate circuit (e.g. radiator or outboard cooler), with charge air cooler in raw water flow or with charge air cooler in fresh water circuit.
<b>Exhaust gas system</b>	Exhaust pipe with insulation. Optional: water-cooled in combination with water-cooled turbocharger.
<b>Turbocharger</b>	V-engines: the two turbochargers are located at driving end. Depending on the degree of turbocharging, a charge air cooler per turbocharger can be mounted. In-line engines: one turbocharger is located at driving end.
<b>Classification</b>	By all established classification societies.
<b>EIAPP</b>	The engine can be issued with an EIAPP certificate if it complies with the NO <sub>x</sub> Technical Code according IMO regulations MARPOL 73/78 - Annex VI.

# TECHNICAL DATA

TECHNICAL DATA					
Engine type		BA6M816	BA8M816	BA12M816	BA16M816
Model		in-line	in-line	120° V-engine	120° V-engine
Number of cylinders		6	8	12	16
Bore / stroke	mm	142 / 160	142 / 160	142 / 160	142 / 160
Displacement	l	15.2	20.3	30.4	40.5
Compression ratio		16:1	16:1	16:1	16:1
Direction of rotation		Counter-clockwise			
<b>Continuous rating ('A' to DIN 6270) <sup>1)</sup></b>					
General marine propulsion (no overload), marine rating base load (to VDMA 6280) and marine auxiliary sets					
Rated speed	min <sup>-1</sup>	1200 - 1800	1200 - 1800	1200 - 1800	1200 - 1800
Mean piston speed	m/s	6.4 - 9.6	6.4 - 9.6	6.4 - 9.6	6.4 - 9.6
Rated load <sup>2)</sup>	kW	135 - 265	180 - 355	271 - 530	360 - 710
BMEP	bar	8.9 - 11.6	8.9 - 11.6	8.9 - 11.6	8.9 - 11.6
<b>Intermittent rating ('B' to DIN 6270)</b>					
High-speed rating for patrol revenue and fire boats and yachts					
Rated speed	min <sup>-1</sup>	1200 - 2000	1200 - 2000	1200 - 2000	1200 - 2000
Mean piston speed	m/s	6.4 - 10.7	6.4 - 10.7	6.4 - 10.7	6.4 - 10.7
Rated load <sup>2)</sup>	kW	150 - 325	199 - 434	300 - 650	397 - 868
<b>General data</b>					
Specific fuel consumption at continuous rating (A) at full load	g/kWh	230 - 248	230 - 248	230 - 248	230 - 248
Lube oil consumption	kg/h	0.4 - 0.6	0.5 - 0.8	0.8 - 1.1	1.1 - 1.5
Idling speed	min <sup>-1</sup>	600	600	600	600
Minimum sustained working speed	min <sup>-1</sup>	1000	1000	1000	1000

<sup>1)</sup> All specifications regarding continuous rating 'A' as to DIN 6270 refer to the following reference data.

	BAM 816 without charge air cooler	BAM 816 with charge air cooler
Maximum intake air temperature*	20 °C	30 °C
Maximum raw water temperature**	-	25 °C
At *45 °C and **32 °C derate output with	13.75%	6.5%

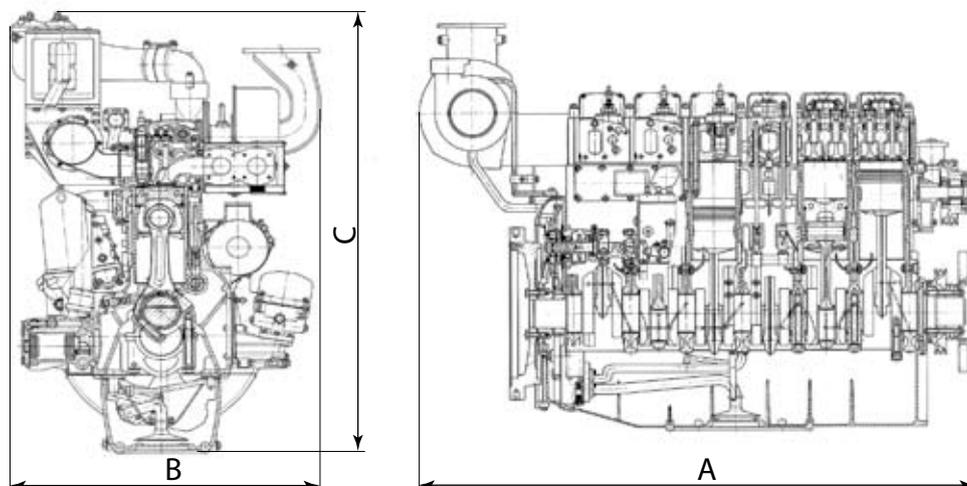
<sup>2)</sup> Output values depending on the charge air cooler / turbocharger configuration.  
All ratings as to VDMA 6280 with 10% temporary overload for starting and recovery.

**Note:**

The values given in this document are for information purposes only and not binding.



## DIMENSIONS



**PRINCIPAL ENGINE DIMENSIONS (mm) AND WEIGHTS (t)**

Engine type	A	B	C	Weight (with flywheel)
BA6M816	1809 <sup>3)</sup>	984 <sup>3)</sup>	1658 <sup>3)</sup>	1.415 - 1.490 <sup>7)</sup>
	1910 <sup>4)</sup>	984 <sup>4)</sup>	1658 <sup>4)</sup>	
BA8M816	2154 <sup>3)</sup>	952 <sup>3)</sup>	1701 <sup>3)</sup>	1.925 - 2.000 <sup>7)</sup>
	2255 <sup>4)</sup>	952 <sup>4)</sup>	1701 <sup>4)</sup>	
BA12M816	1951 <sup>3)</sup>	1605 <sup>3)</sup>	1107 <sup>3)</sup>	2.660 - 2.820 <sup>7)</sup>
	2172 <sup>4)</sup>	1605 <sup>4)</sup>	1130 <sup>4)</sup>	
	1951 <sup>5)</sup>	1605 <sup>5)</sup>	1345 <sup>5)</sup>	
	2172 <sup>6)</sup>	1605 <sup>6)</sup>	1345 <sup>6)</sup>	
BA16M816	2467 <sup>3)</sup>	1605 <sup>3)</sup>	1107 <sup>3)</sup>	3.380 - 3.540 <sup>7)</sup>
	2618 <sup>4)</sup>	1605 <sup>4)</sup>	1130 <sup>4)</sup>	
	2467 <sup>5)</sup>	1605 <sup>5)</sup>	1345 <sup>5)</sup>	
	2618 <sup>6)</sup>	1605 <sup>6)</sup>	1345 <sup>6)</sup>	

<sup>3)</sup> Model with radiator or outboard cooler.

<sup>4)</sup> Model with built-on heat exchanger.

<sup>5)</sup> Model with radiator or outboard cooler and with charge air cooler.

<sup>6)</sup> Model with built-on heat exchanger and with charge air cooler.

<sup>7)</sup> Engine weight without starter, generator and respectively without or with charge air cooler; approximate weight depends on the scope of supply.

WÄRTSILÄ® and DEUTZ® are registered trademarks. Copyright © 2008 Wärtsilä Corporation.

**Wärtsilä Nederland B.V.**

P.O. Box 10608, 8000 GB Zwolle, The Netherlands • Tel. +31 38 425 32 53

• Fax +31 38 425 34 71 • e-mail [service.sales.nl@wartsila.com](mailto:service.sales.nl@wartsila.com) • [www.wartsila.com](http://www.wartsila.com)



**WÄRTSILÄ**

**WARTSILA.COM**