620

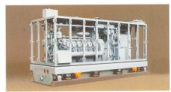
DEUTZ MWM KHD

E

Tailored Power Systems and Service from DEUTZ MWM

DEUTZ MWM prime mover concepts satisfy the requirements of today by looking towards the tasks of tomorrow – reliable and environment-friendly, with high availability and minimal operating costs.

DEUTZ MWM Product Support covers all phases of installation: from planning, through production to the installation and commissioning of the complete power plant. A qualified team, with know-how and experience, is available for this job.



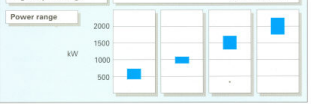
Innovative technology ensures economical operation of engines and power plants, with minimized use of energy: ranging from emergency generating sets to turn-key diesel power plants for heavy fuel operation, in total energy systems, and also as marine main and auxiliary engines.

Comprehensive training is provided for the user's staff. After commissioning, experienced service staff are available throughout the world and round the clock.

The 620 Series in Detail

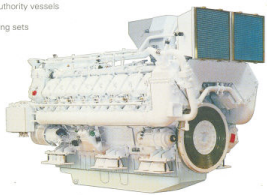
Bore	170 mm			
Stroke	195 mm			
Cylinder arrangement	In-line	90 ° V		
Number of cylinders	6	8	12	16
Displacement	27 l	35 l	53 l	71 l
Engine speed range	1500 – 1860 min^{-1}			

Power range



In the engine speed range up to 1860 min^{-1} the 620 series provides the ideal drive for

- fast work-boats
- public authority vessels
- yachts
- generating sets

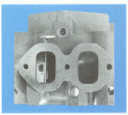


A special feature of 620 series engines is the HALLO-Swirl® system which optimizes the air flow in the combustion chamber, both for high and low loads.

The function:

The air flow required for the best possible combustion is first of all generated in an inlet port of suitable shape. However, depending on this shape the port can be designed either for full-load or for low-load.
The 620 series cylinder heads have two inlet ports. One port is responsible for generating the swirl, the other to produce optimum charge. Under low-load conditions the latter is closed by means of a flap.

This simple, yet highly effective arrangement produces the HALLO-Swirl® (**H**igh **A**nd **L**ow **L**oad **O**ptimized **S**wirl) in the cylinder.



The 620 Series in Detail

Charge port Swirl port

A high compression ratio and high ignition pressure, together with HALLO-Swirl®, ensure extremely low fuel consumption.

The lube oil consumption is also minimal: the cylinder liners are practically not distorted. Moreover, piston geometry, the piston ring pack and the cylinder working surface are so carefully matched that not one drop of lube oil is wasted.

Other factors which contribute to economy are high availability, extremely high reliability and the long life of the engine parts. Servicing is required only at very long intervals and can be carried out quickly - without long downtimes.

Crankcase

The stiff, one-piece nodular cast iron crankcase, with its suspended crankshaft, guarantees optimum functionality and performance. The V-engines have cross-bolted main bearing caps.
The crankcase side-walls extend considerably below the centre of the crankshaft. The engine mounts are bolted on at the side.

Large openings in the crankcase make it possible to remove the pistons without having to dismantle the engine.

Crankshaft

The crankshaft, forged from heat-treatable steel, has induction-hardened journals, bolted-on balance weights and external torsional vibration dampers.

Connecting rod

The connecting rod is forged from heat-treatable steel. Its stepped design reduces the load on the small end bearing. Other features are that it is split diagonally and serrated with lateral support in the piston.

Piston

The forged light-alloy piston has a cast welded-on upper part with cooling channel and ring carrier. It is provided with two compression rings and an oil scraper ring. For cooling purposes lube oil is sprayed continuously through nozzles into the cooling channels.

Cylinder liner

The cylinder liner is made of wear-resistant, thick-walled centrifugally cast iron.

Cylinder head

The cylinder head, made of special grey cast iron, has two inlet valves and two exhaust valves, with rotators. One inlet port is swirl-optimized, the other serves to match the charge of the cylinder to engine speed and load (HALLO-Swirl®).

The valve stems are sealed with O-rings. When running on intermediate fuel, Nimonic exhaust valves are used.

Valve gear

The one-piece, induction-hardened camshaft is mounted in replaceable bearings.

Injection system

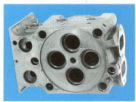
Injection is effected by means of a block-pump, mounted in the V-space. Depending on the application, the engine is fitted with either hydraulic or electronic governor. The injector with multi-hole nozzle is placed at the centre of the cylinder head.

Turbocharging system

The turbochargers are located at the flywheel end of the engine, the charge air coolers next to the turbochargers in front of the cylinder bank. Charging is effected using the PEARL® single tube system.

Starting system

The engines are started either electrically or using compressed air.



Excellence in Engines and Logistics

Pooled Strength – Engine Sales and After-Sales Service

- DEUTZ SERVICE INTERNATIONAL GmbH – DSI for short – is a young but experienced company of the KHD group.

  DSI as a specialized company has gained a reputation for the worldwide service of DEUTZ and DEUTZ MWM engines and power plants.

- Our service network spreads out around the globe. In total, over 3.000 service locations in 150 countries with 15.000 skilled experts are ensuring service support for each and every customer.

  For management purposes, the global network is divided into three large trading areas which have coordinated logistics. The structure in general provides a closely-knit dealer network in each country whose activities are coordinated by resident service companies and agents. In case of need, the DSI headquarter's service staff is ready to give regional assistance and is also able to take charge of complete plant installations.

- Reliable back-up of all DEUTZ and DEUTZ MWM engines is optimally ensured through a common network.

For troubleshooting and quick assistance in an emergency we have established a special round-the-clock emergency service. The "hot line" of our emergency phone directly connects the customer with our emergency staff at DSI Cologne headquarters or the local service bases. We are there to help – worldwide, round the clock.

Wherever you see the logo

KHD
DEUTZ SERVICE

it marks the gateway to:

- Service for DEUTZ and DEUTZ MWM engines
- Genuine parts with certified quality
- Direct access to the original manufacturer's service support
- Member of a worldwide service network

Worldwide
KHD
DEUTZ SERVICE
Round the Clock

Engine Series 620
Diesels for Sets

DEUTZ MWM KHD

Bore / Stroke	mm	170 / 195	
Configuration		V-type	
Number of cylinders		8	12	16
Displacement	dm^3	35.4	53.1	70.8
Engine type		TBD 620 V8	TBD 620 V12	TBD 620 V16

Application		Code for engine power ①	Speed	Service power ② kW		
			1/min			
Continuous duty	Generating sets for operation stationary and on board and for railway current supply	SCXN	1500	880	1320	1760
			1800	960	1440	1920
	Pump sets	SCFN	1500	880	1320	1760
			1800	960	1440	1920
			1860	980	1470	1960
Continuous duty restricted to 1000 h/a	Emergency and peak load generating sets	SXN 1000 h/a	1500	922	1384	1844
			1800	1006	1508	2012
	Emergency pumps, fire extinguishing pumps	SFN 1000 h/a 300 h/a	1500	922	1384	1844
			1800	1006	1508	2012
			1860	1027	1540	2054

Mean piston speed m/s	Speed 1/min	Mean effective pressure at above mentioned SCXN/SCFN-power bar		
9.8	1500	19.9	19.9	19.9
11.7	1800	18.1	18.1	18.1
12.1	1860	17.9	17.9	17.9

ISO specific fuel consumption to DIN ISO 3046/1, related to diesel fuel with a net calorific value of 42700 kJ/kg, without engine-mounted pumps, without fan drive	Speed 1/min	ISO specific fuel consumption at above mentioned SCXN-power g/kWh		
	1500	188	188	189
	1800	194	194	196
	1860	198	198	200

① Code for engine power to DIN ISO 3046, part 7/05.89

SCXN	Continuous net brake power, exceedable by 10 % for 1 hour within 12 hours of operation
SCFN	Cont. net brake fuel stop power
SXN	Net brake power, exceedable by 5 %
1000 h/a	max. annual operating time: 1000 hours
SFN	Net brake fuel stop power
1000 h/a	max. annual operating time: 1000 hours for stationary operating
300 h/a	max. annual operating time: 300 hours for marine operating

② Service power to DIN ISO 3046, part 1/04.91 is determined under operating conditions of the manufacturer's test bed and adjusted to the following reference conditions:

Total barometric pressure	1000 mbar
Air temperature	27 °C
Charge air coolant temperature	35 °C

Power data are valid engines with indirect cooling system with one engine-mounted lube oil pump and two engine-mounted cooling water pumps, without fan drive.

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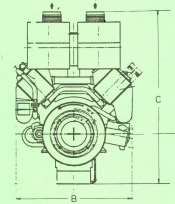
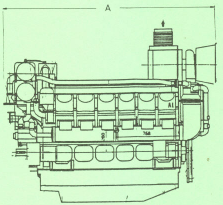
Dimensions and weights





Engine type	Dimensions in mm			Weight
	A	B	C	kg
TBD 620 V8	1950	1390	2055	3000
TBD 620 V12	2600	1390	2075	4100
TBD 620 V16	3150	1390	2075	5500

* with one cooling water pump
with lube oil filter
with plate-type air cleaner
with charge air cooler
with electric starter

without flywheel
without flywheel housing
without generator
without lube oil
without cooling water
without heat exchanger

Engine Series 620
Locomotive Diesels

DEUTZ MWM KHD

Bore / Stroke	mm	170 / 195		
Configuration		V-type		
Number of cylinders		8	12	16
Displacement	dm^3	35.4	53.1	70.8
Engine type		TBD 620 V8	TBD 620 V12	TBD 620 V16

Application	Cooling System ①	Speed	Maximum service power ②					
		1/min	kW	hp	kW	hp	kW	hp
Locomotives for shunting and line service (Power ratings incl. 1 lube oil pump and 1 cooling water pump)	U I	1500	832	1131	1248	1697	1664	2262
		1800	944	1283	1416	1925	1888	2567
	U II	1500	880	1196	1320	1795	1760	2393
		1800	1000	1360	1500	2039	2000	2719

Mean piston speed	Cooling system ①	Speed	Mean effective pressure at above mentioned power					
m/s		1/min	bar					
9.8	U I	1500	18.8		18.8		18.8	
11.7		1800	17.8		17.8		17.8	
9.8	U II	1500	19.9		19.9		19.9	
11.7		1800	18.8		18.8		18.8	

Specific fuel consumption based on diesel fuel (gas oil), with a net calorific value of H_U = 42 700 kJ/kg, not considering engine-mounted pumps and cooling fan drive. Increase fuel consumption figures by 1 % for each engine-mounted pump.	Cooling system ①	Speed	Specific fuel consumption based on above power ratings (UIC consumption figures without additional tolerances!)					
		1/min	g/kWh	g/hph	g/kWh	g/hph	g/kWh	g/hph
	U I	1500	202	148	202	148	203	149
		1800	208	153	208	153	210	154
	U II	1500	199	146	199	146	200	147
		1800	205	151	205	151	207	153

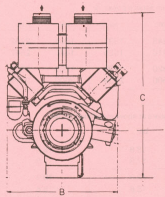
① U I Single circuit cooling system
Cooling of charge air with engine jacket water

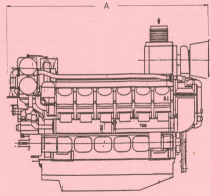
U II Dual circuit cooling system
Cooling of charge air with water in separate cooling circuit

② Max. UIC service net brake power to UIC Code 623 VE, 01.01.89 at following reference conditions:

Barometric pressure	1000 mbar
Air temperature	25 °C
Rel. humidity	30 %
Charge air coolant temperature at inlet	72 °C (with single-circuit cooling system)
Charge air coolant temperature at inlet	55 °C (with two-circuit cooling system)

Dimensions and weights





Engine type	Dimensions in mm			Weight
	A	B	C	kg
TBD 620 V8	1950	1390	2055	3000
TBD 620 V12	2600	1390	2075	4100
TBD 620 V16	3150	1390	2075	5500

* with one cooling water pump
with lube oil filter
with plate-type air cleaner
with charge air cooler
with electric starter

without flywheel
without flywheel housing
without generator
without lube oil
without cooling water
without heat exchanger

Engine Series 620 and Engine Type TBD 604 B L 6 Marine Diesels

DEUTZ MWM KHD

Bore / Stroke	mm	170 / 195							
Configuration		In-line		V-type					
Number of cylinders		6		8		12		16	
Displacement	dm^3	26.6		35.4		53.1		70.8	
Engine type		TBD 604 B L 6		TBD 620 V 8		TBD 620 V12		TBD 620 V16	

Application		Code for engine power ①	Speed	Power ②							
			1/min	kW	hp	kW	hp	kW	hp	kW	hp
Continuous duty	Work boats e.g. fishing boats, harbour boats	MCFN	1500	530	720	—	—	—	—	—	—
		ICFN	1500	—	—	915	1244	1370	1863	1830	2489
		MCFN	1650	586	797	—	—	—	—	—	—
	Fast work boats e.g. catamarans, gliders, hydrofoils	ICFN	1650	—	—	960	1306	1440	1958	1920	2611
		MCFN	1800	637	866	—	—	—	—	—	—
		ICFN	1800	—	—	1016	1382	1524	2073	2032	2764
Continuous duty restricted in time		MC 20 N	1690	606	824	—	—	—	—	—	—
	Yachts Fast authority boats e.g. Marine, Customs, Police	IC 20 N	1750	—	—	933	1269	1400	1903	1867	2538
		MON 2h/12h	1745	667	907	—	—	—	—	—	—
		ION 2h/12h	1805	—	—	1027	1396	1540	2094	2053	2792
		MOFN/I.5h/6h 1000h/a	1800	727	988	—	—	—	—	—	—
		IOFN/I.5h/6h 1000h/a	1860	—	—	1120	1523	1680	2285	2240	3046
	Yachts non-commercial application and classification	MFN 500h/a	1800	727	988	—	—	—	—	—	—
		IFN 500h/a	1860	—	—	1120	1523	1680	2285	2240	3046

Mean piston speed	Speed	Mean effective pressure at above mentioned power					
m/s	1/min	(MCFN) bar		(ICFN) bar			
9.75	1500	16.0		20.7		20.7	
10.73	1650	16.0		19.7		19.7	
11.7	1800	16.0		19.2		19.2	

ISO specific fuel consumption to DIN ISO 3046/1, related to diesel fuel with net calorific value of 42 700 kJ/kg, without oil- and cooling water pumps for 8-, 12-, 16-cylinder models, for 6-cylinder engine with one lube oil- and one water pump engine- mounted	Speed	ISO specific fuel consumption at above mentioned power							
		(MCFN)				(ICFN)			
		g	g	g	g	g	g	g	g
	1/min	kWh	hph	kWh	hph	kWh	hph	kWh	hph
	1500	191.5	141	187	137	187	137	188	138
	1650	192.5	142	190	140	190	140	191	140
	1800	200	147	198	146	198	146	198	146

① Code for engine power to DIN ISO 3046, part 7/05.89

MCFN/ICFN	Cont. net brake fuel stop power
MC 20 N/IC 20 N	Cont. net brake power, exceedable by 20%
MON/ION 2h/12h	Overload power as net brake power for 2 hours within 12 hours of operation
MOFN/IOFN 0.5h/6h	Overload fuel stop power as net brake power for 0.5 hours within 6 hours
MFN/IFN	Net brake fuel stop power

② Power to DIN ISO 3046, part 1/04.91 is determined under operating conditions of the manufacturer's test bed and adjusted to the following reference conditions for 8-, 12-, 16-cylinder models:

Total barometric pressure	1000 mbar
Air temperature	25°C
Charge air coolant temperature	25°C
for 6-cylinder model:	
Air temperature	45°C
Charge air coolant temperature	32°C

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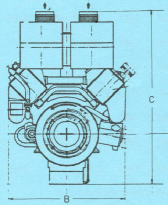

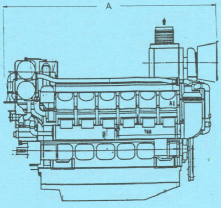

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with lube oil filter
with plate-type air cleaner
with charge air cooler
with electric starter

without flywheel
without flywheel housing
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without heat exchanger

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