WÄRTSILÄ

WÄRTSILÄ Engine Services

UD30 DIESEL ENGINE
NEW COMBUSTION

UD30 V12 M4

UD30 DIESEL ENGINE

Reliable - Compact - Economical

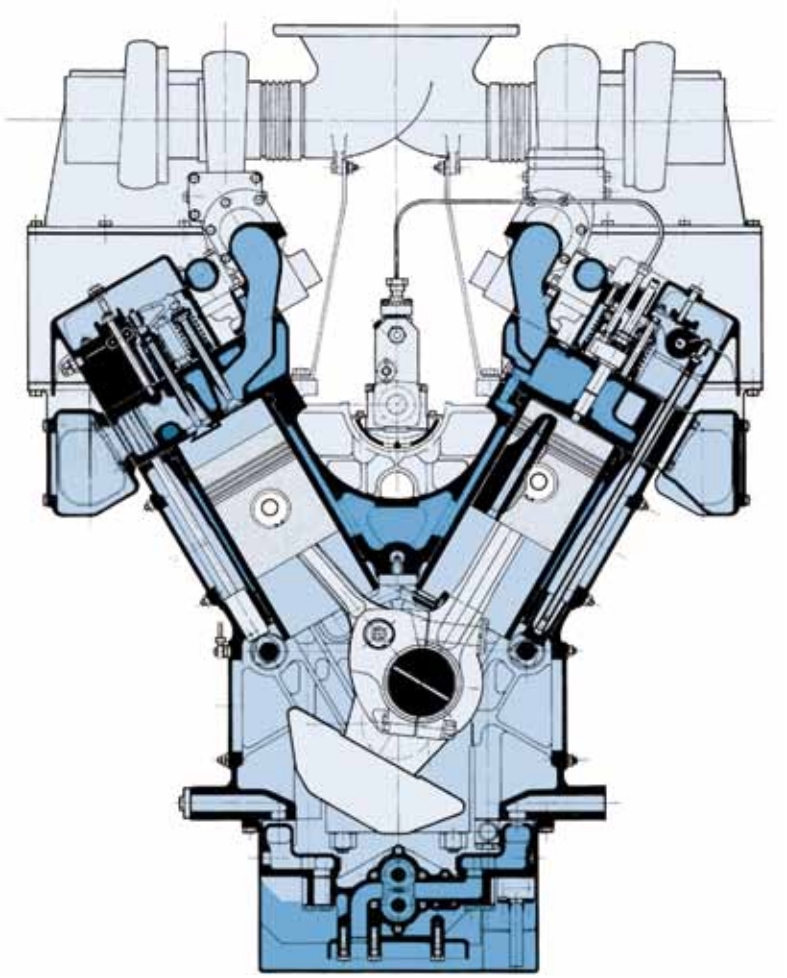
Source of power for applications:
- marine
- power plant
- railway
- industrial

MAIN TECHNICAL CHARACTERISTICS

Bore (mm)	175
A Side stroke (mm)	180
B Side stroke (mm)	192
Speed range (min^{-1})	1000-1500
Normal idling speed (min^{-1})	600
Piston speed (m/s)	6.2-9.7
Cylinder configuration	V12 and V16 to 60°
Unit swept volume (dm^3)	4.5
Compression ratio	14
Self ignition minimum speed (min^{-1})	70
Number of main bearing	7
Rotation	Counter clockwise
Cycle	4 stroke
Supercharging	Turbochargers
Injection mode	Direct

ENGINE WEIGHTS AND DIMENSIONS

	UD30 V12	UD30 V16
Engine dry weight (kg)	5300	6800
Liquids (kg)	300	560
Length (mm)	2610	3090
Width (mm)	1560	1560
Height (mm)	1820	1820



UD30 ENGINE IN CROSS SECTION

The UD30 Diesel engine is produced in V12 and V16 cylinder versions.

This engine is operated within the speed range of 1,000 to 1,560 R.P.M.

A new combustion has been developed.

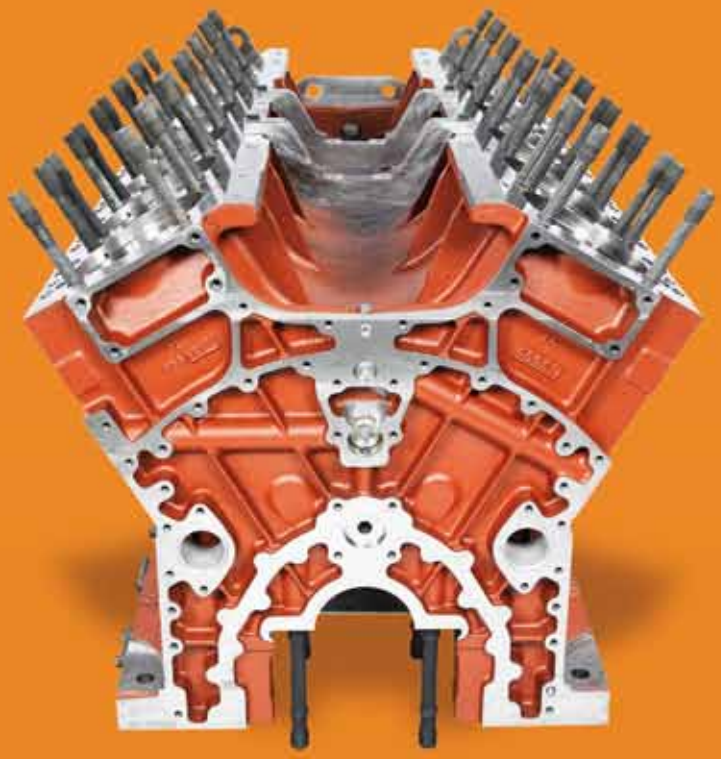
The power output, according to the extent of supercharging, ranges from 440 kW to 1,545 kW at 1,500 R.P.M

• CYLINDER BLOCK

One piece, made of special lamellar graphite cast iron.

Strongly ribbed, the cylinder block is particularly resistant to withstand numerous dynamic demands, both thermal and mechanical.

The injection pump holders reported allow all type of fittings (current or origin).



• LINERS

Made of special centrifuged cast iron and replaceable type (with internal deglossing)

Standard

With anti polishing ring
(Reducing wear on decreasing carbon deposits)

• GEAR TRAIN

The two camshafts, the injection pump and the various moving shafts are interlinked by ground case-hardened helicoidal gears.

• CAMSHAFTS

The dual camshafts are made of treated ground steel.
They are located on both sides of each row of cylinders.

• CYLINDER HEADS

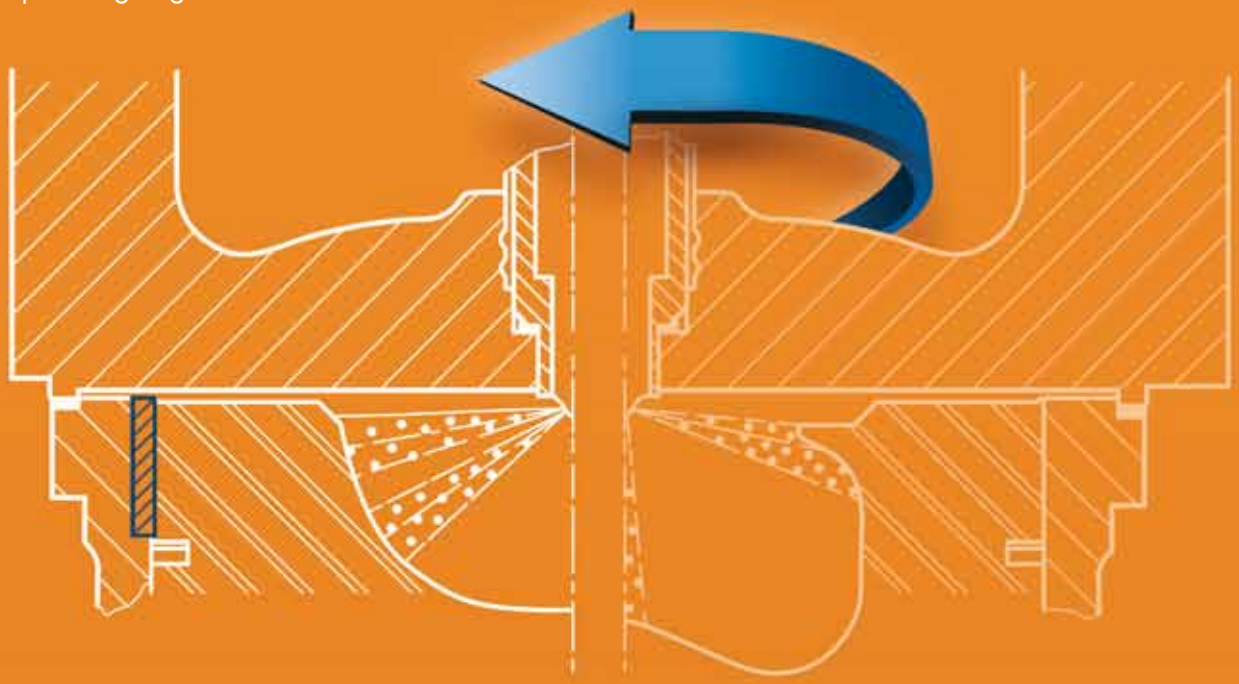
The individual type cylinder heads are made of cast iron, icorporating 4 special alloy valves, that is to say, 2 inlet valves and 2 exhaust valves.

The heat valves seats are treated.

The centrally mounted injector is surrounded by a cooling water chamber.

NEW COMBUSTION
Open bowl chamber
+ Anti polishing ring

STANDARD UD30
Toroïdal chamber



• PISTONS

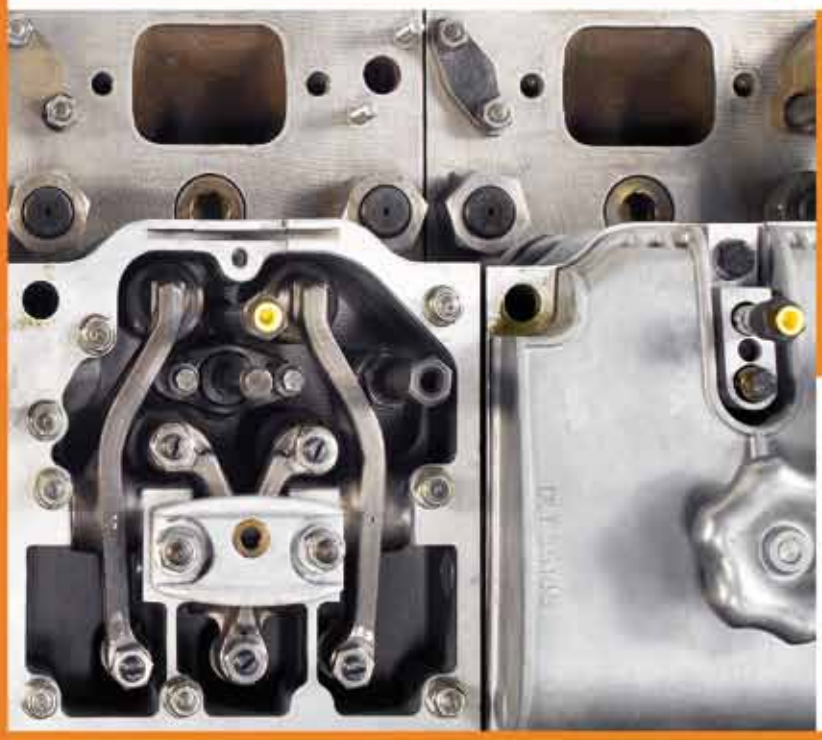
Piston made of aluminium alloy with open chamber (depolluted engines). Cooling assured by an oil circulation in the integrated annular chamber on piston top.

Ring set to 3 grooves:
- Fire ring
- Compression (x1)
- Scraper

One piece piston of aluminum alloy and toroïdal chamber. Cooling assured by an oil circulation in the integrated annular chamber on piston top.

Ring set to 4 grooves:
- Fire ring
- Compression (x2)
- Scraper

With open chamber **Standard**



• ROCKER GEAR

Valve timing is controlled through the camshafts via flat cylindrical tappets, push rods and rockers.

• RECIPROCATING ASSEMBLIES

They are of the vertical section master rod / conrod type and are press fitted (mounting in 4 screws).

The rod assemblies are made of special, treated, drop forged steel.

The piston rod is removal by the provision of access hatches along the cylinder block.

Removal complete assembly is done through the top of the cylinder.

• CRANKSHAFT

The one piece crankshaft is made from molybdenum chrome forged steel.

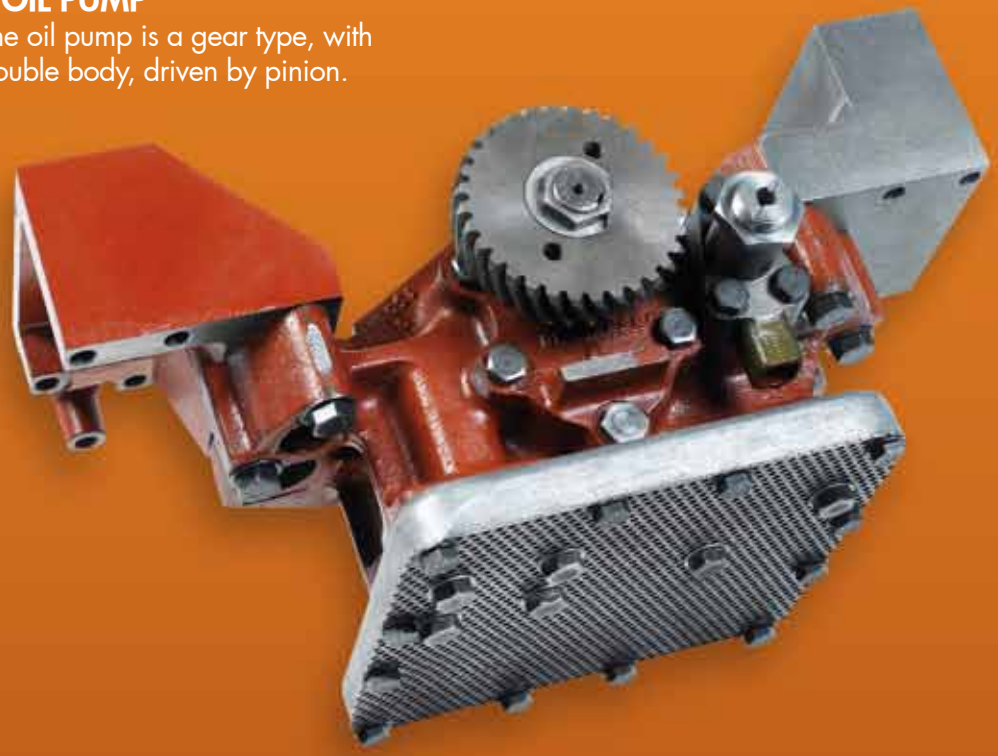
The crankpins and the main journals are ground and surface hardened.

The steel counterweights are mounted on the cranks.

The complete assembly is dynamically balanced.

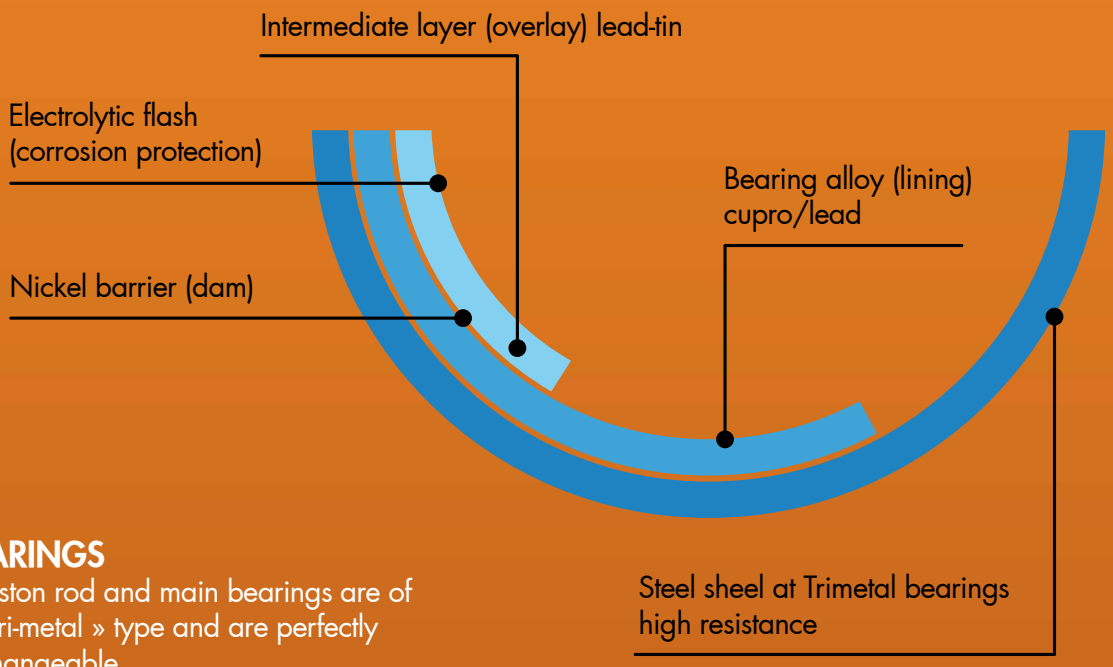
• OIL PUMP

The oil pump is a gear type, with double body, driven by pinion.



• VIBRATION DAMPER

The internal annular mass immersed in silicon and thus reduces the torsional vibrations of the crankshaft.



• BEARINGS

The piston rod and main bearings are of the « tri-metal » type and are perfectly Interchangeable.

They include a surface coating improved scrub resistance.

• INJECTION PUMP

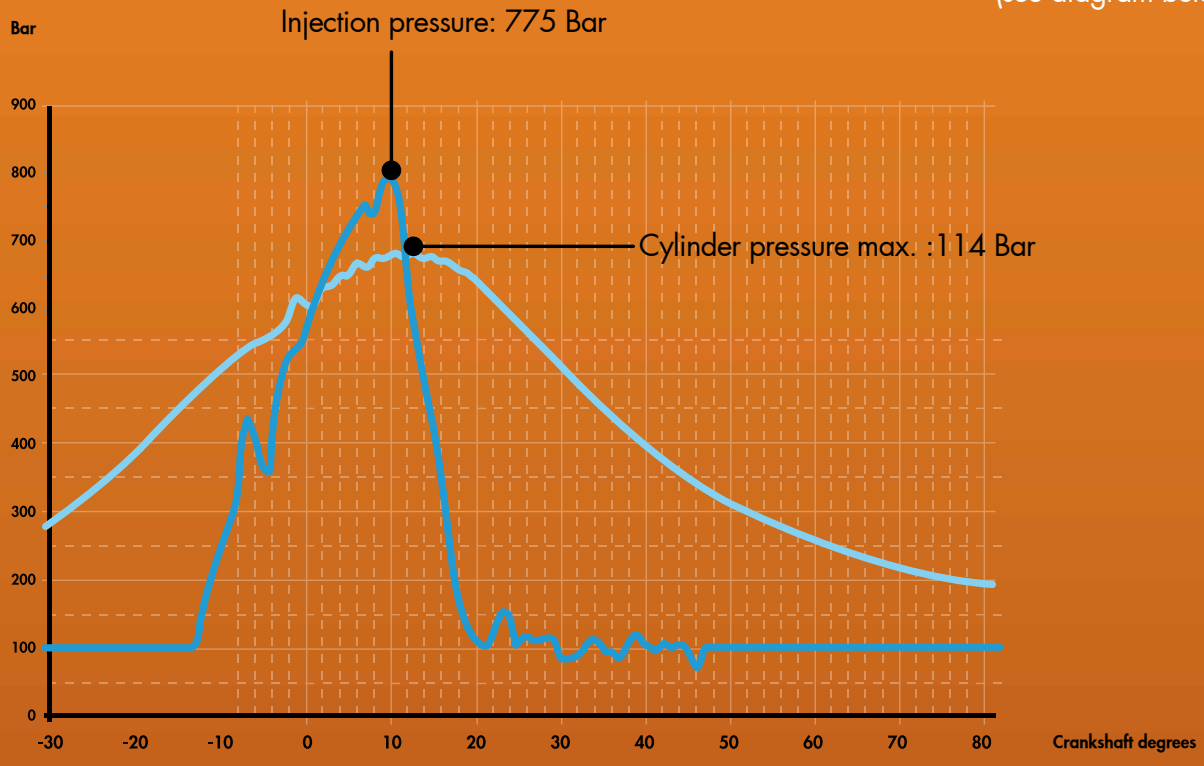
One piece type, 6, 8 or 12 elements depending on the type of engine.

Fitted in the « V engine » or outside according to the application and level of power.

Lubrication is made with engine oil.

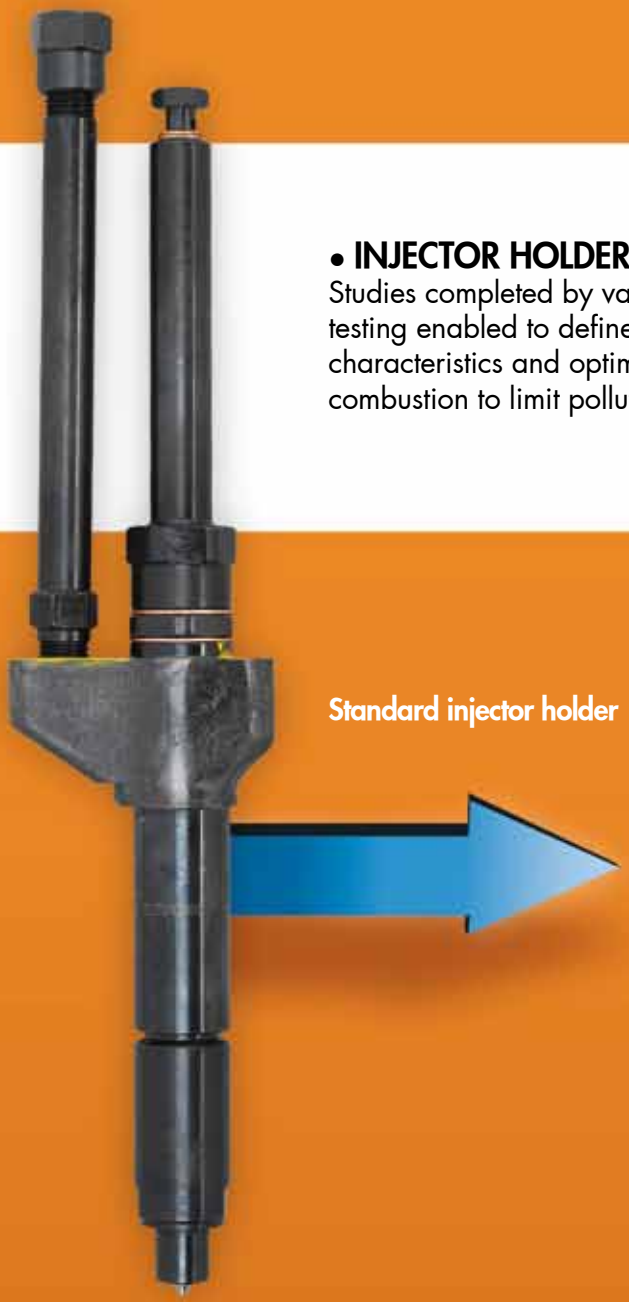
Standard injection pump
(or with improved combustion/see details)

High pressure injection pump
(see diagram below)

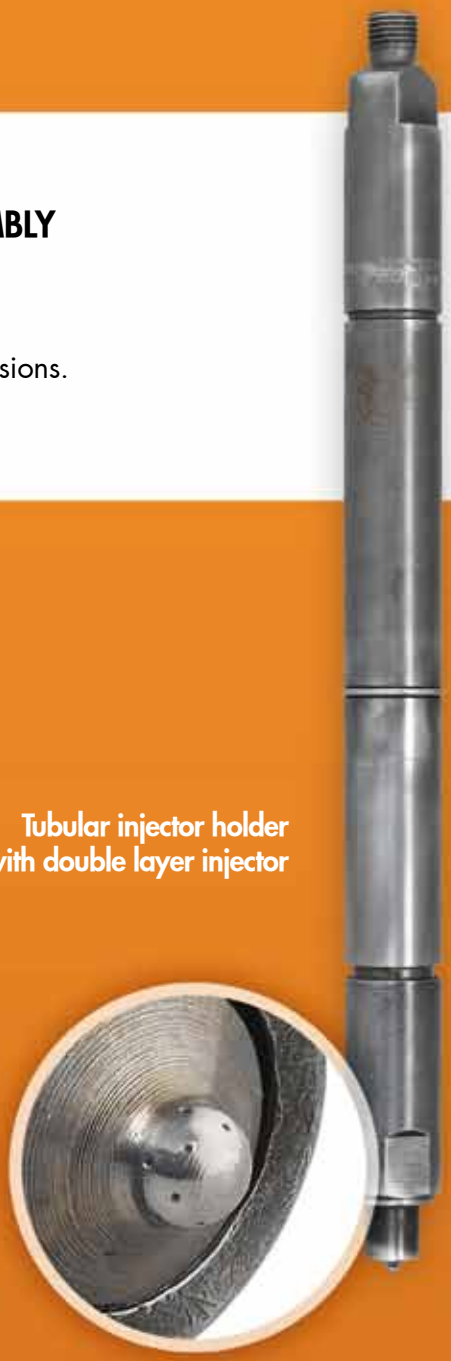


• INJECTOR HOLDER ASSEMBLY

Studies completed by validation testing enabled to define injector characteristics and optimize combustion to limit pollutant emissions.



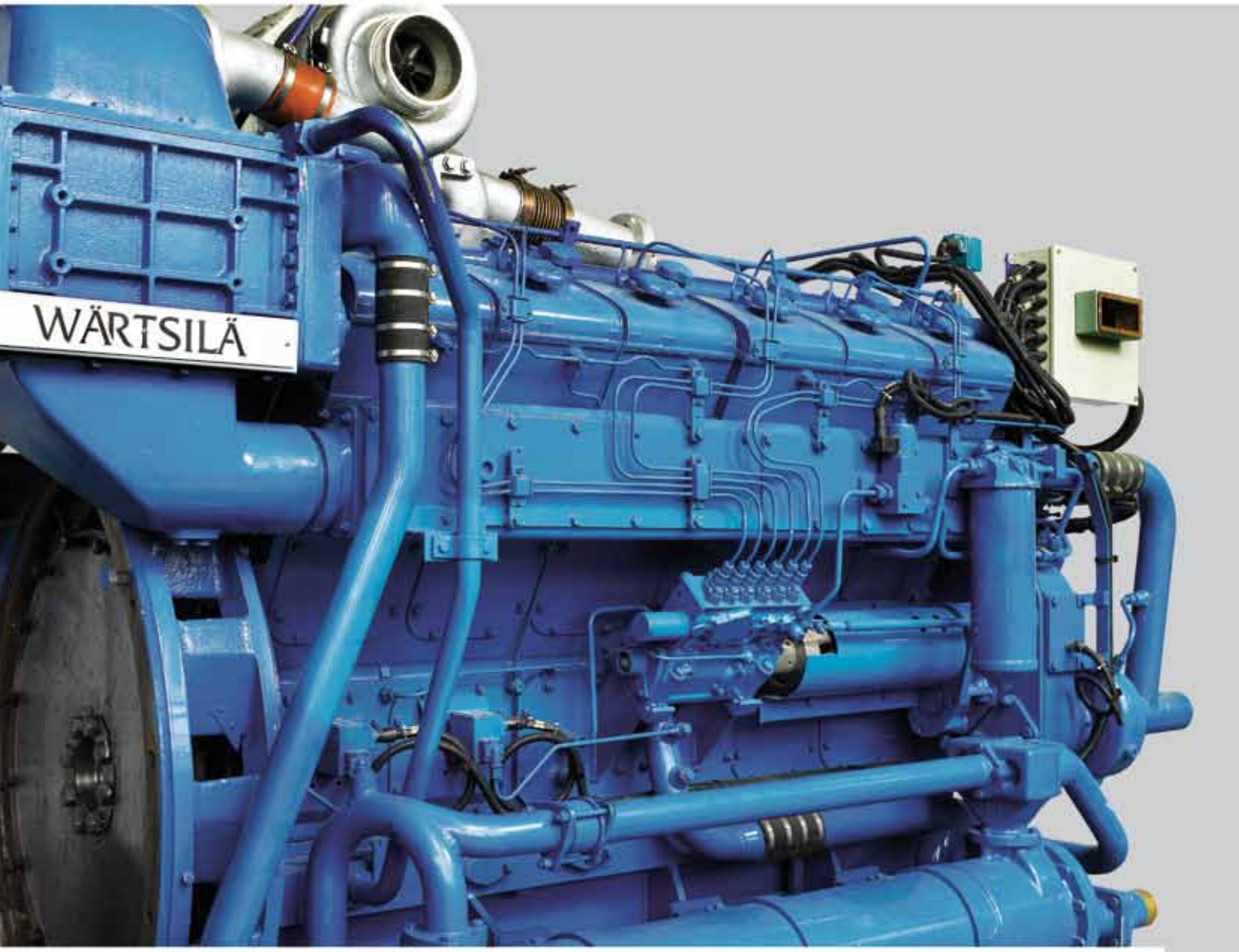
Standard injector holder



Tubular injector holder with double layer injector

• TURBOCHARGER

The UD 30 engine turbocharging is achieved by 2 or 4 turbochargers supplied by pulsed air. The rotating turbine-compressor assembly is mounted on slide bearings directly lubricated from the engine oil circuit. Air intake filtration is provided by adapted cartridges.



• **UD30 V 12 R5LE**

Fluids systems can be examined on request. Alternatively, we can offer starting equipment, speed governing, instrumentation (pressure, temperature, etc.), and safety equipment (overspeed, etc.).

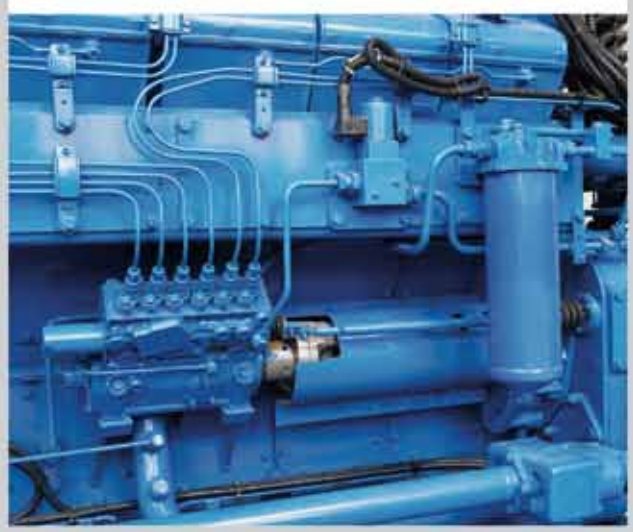
All our work is carried out according to a clearly defined process and according to ISO 9001 ed. 2000, ISO 14001 ed. 2004 OHSAS 18001 ed. 2007.

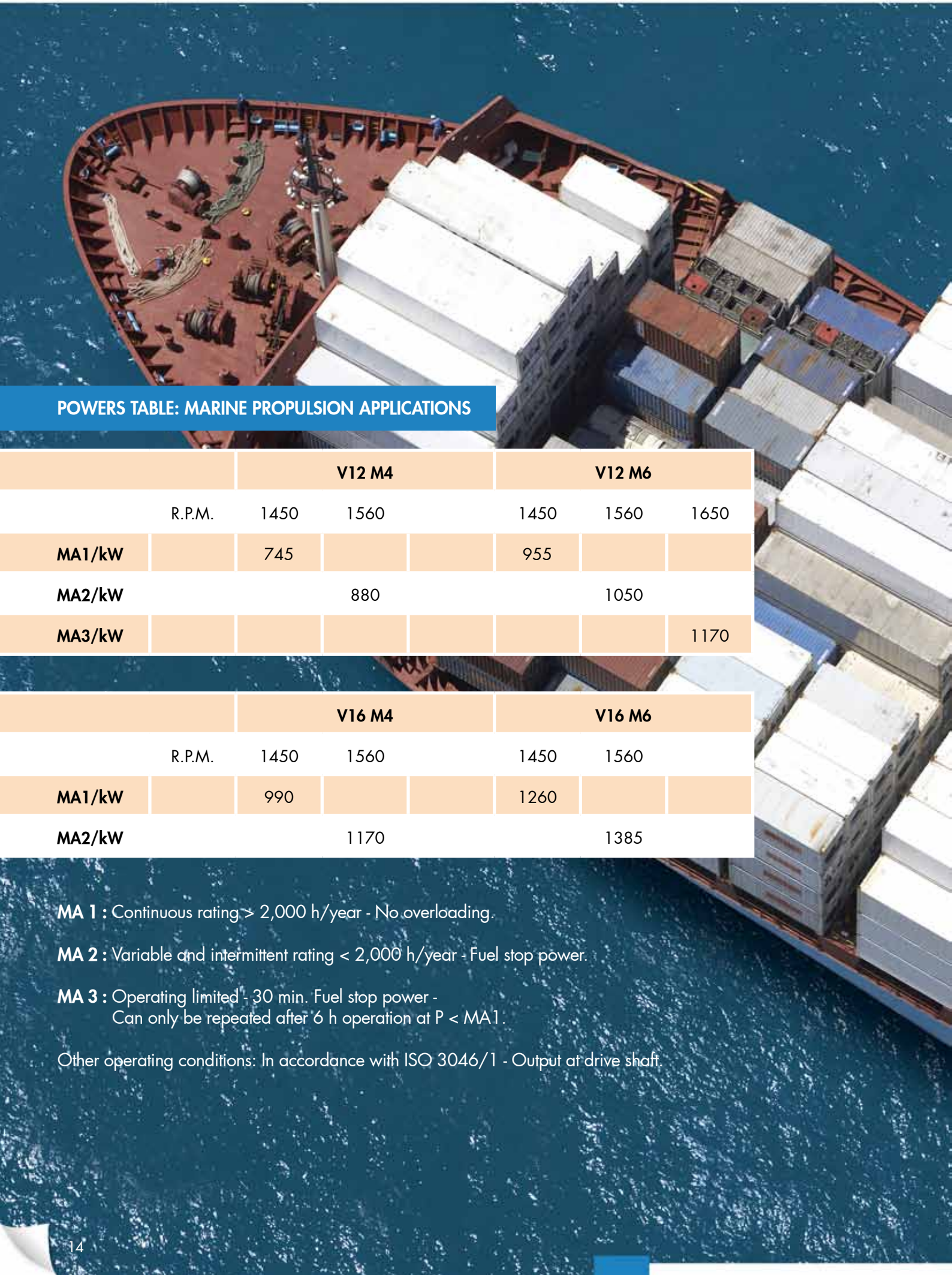
Centrifugal water pump
type is driven by the gear train
Oil cooling full flow is provided
by a multitubular exchanger.

Oil filtration is ensured by
replaceable cartridge filters.

A centrifugal purifying, fitted
on a by-pass circuit, reduces
cartridge filter clogging.
An electrical prelubricating
pump conditions the oil circuit
before starting.

Gasoil filtration is provided by
replaceable cartridge filter.





POWERS TABLE: MARINE PROPULSION APPLICATIONS

		V12 M4			V12 M6		
	R.P.M.	1450	1560		1450	1560	1650
MA1/kW		745			955		
MA2/kW			880			1050	
MA3/kW							1170

		V16 M4			V16 M6	
	R.P.M.	1450	1560		1450	1560
MA1/kW		990			1260	
MA2/kW			1170			1385

MA 1 : Continuous rating > 2,000 h/year - No overloading.

MA 2 : Variable and intermittent rating < 2,000 h/year - Fuel stop power.

MA 3 : Operating limited - 30 min. Fuel stop power -
Can only be repeated after 6 h operation at P < MA1.

Other operating conditions: In accordance with ISO 3046/1 - Output at drive shaft.

GE 1: In accordance with ISO 8528/1 - COP (continuous power) > 2,000 h/year - 10% overload. Continuous rating without time limited. 10% overload limited (1h/12h).
GE 2: In accordance with ISO 8528/1 - PRP (prime power) < 2,000 h/year. Variable and intermittent rating. 10% overload limited (1h/12h).
GE 3: In accordance with ISO 8528/1. LTP (limited power) < 500h/year. Continuous duration start at variable rating max. 300h/year - Fuel stop power.

Other operating conditions: In accordance with ISO 3046/1 - Output at drive shaft.

POWERS TABLE: GENERATING SET APPLICATIONS

		V12 S4			V12 S6		
	R.P.M.	1000	1200	1500	1000	1200	1500
GE1/kW			660	800	690	820	970
GE2/kW			725	880	760	905	1065
GE3/kW			800	970	830	995	1170

		V16 S4			V16 S6		
	R.P.M.	1000	1200	1500	1000	1200	1500
GE1/kW					880	1060	1260
GE2/kW					970	1170	1385
GE2/kW					1070	1285	1545

POWERS TABLE/ RAILWAY TRACTION APPLICATIONS

Operating conditions in accordance with U.I.C - 623-1-0R - Output at drive shaft.

	V12 R3 / R3 LE	V12 R4 / R4 LE	V12 R5 / R5 LE
R.P.M.	1500	1500	1500
kW	700	772	883 1040
ch	950	1050	1200 1414

	V16 R3	V16 R4	V16 R5
R.P.M.	1500	1500	1500
kW	772	1030	1177
ch	1050	1400	1600

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WÄRTSILÄ

Wärtsilä enhances the business of its customers by providing them with complete lifecycle power solutions.

When creating better and environmentally compatible technologies, Wärtsilä focuses on the marine and energy markets with products and solutions as well as services.

Through innovative products and services, Wärtsilä sets out to be the most valued business partner of all customers.

This is achieved by the dedication of more than 19 000 professionals manning 160 Wärtsilä locations in close to 70 countries around the world.

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