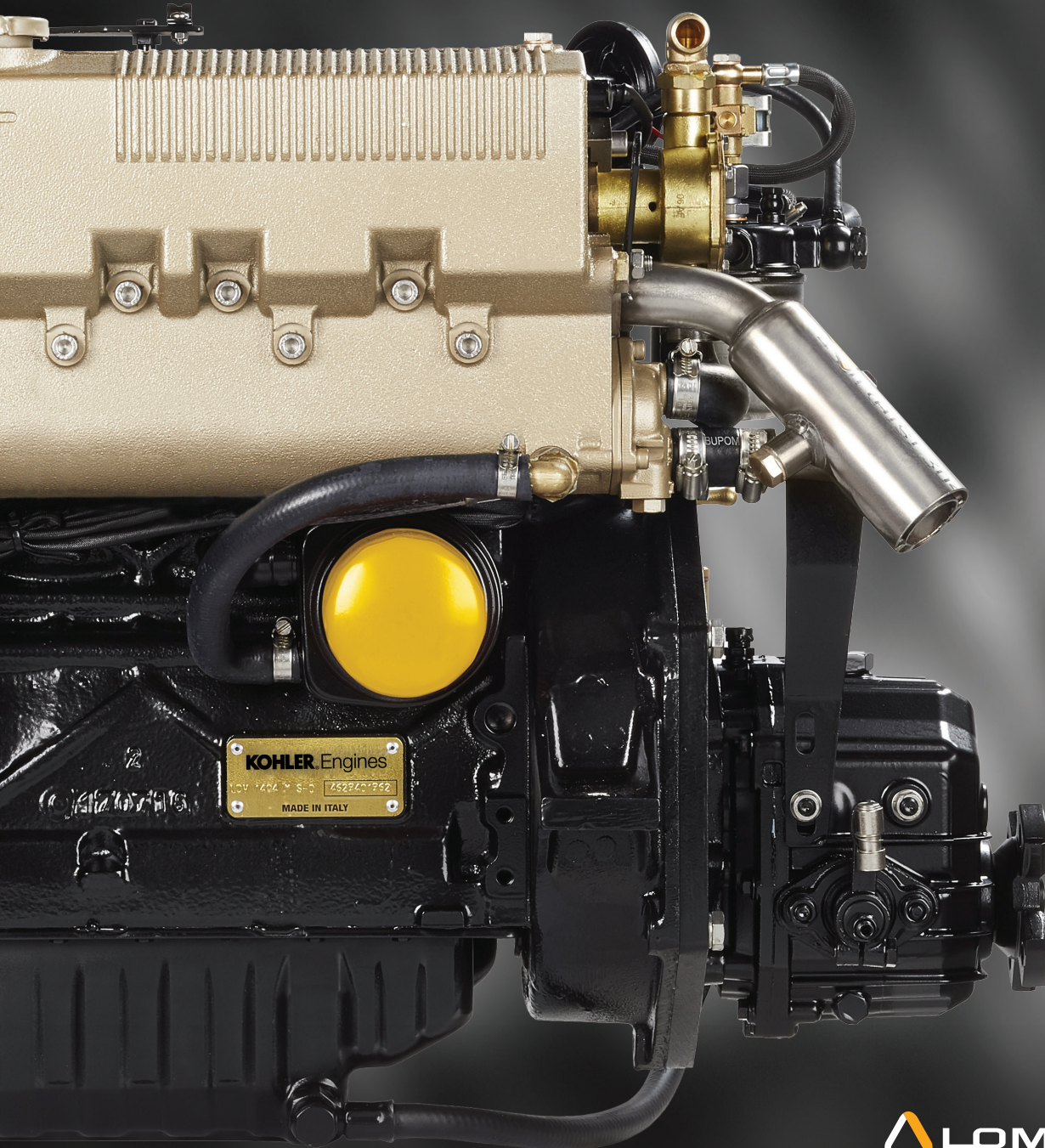


# MARINE PROPULSION

LDW/KDW Series



 **LOMBARDINI**  
**Marine**  
**KOHLER**® Engines



# INNOVATION



## THE COMPANY

Lombardini Marine, a division of Kohler Engines, was set up with the objective of preparing and marketing engines for marine applications,

based on well-established and reputed FOCS and CHD engine families. Lombardini Marine is a very modern structure managed by

a team with a great experience in the marine engine field and capable of applying the most advanced technology to this specific sector.

## THE PRODUCT

This Series of exceptionally light and compact engines features the highest reliability in every condition; furthermore, this specific project has been carried out to optimize durability and low fuel consumption without reducing the performance of the engine.

Finally, the engines are compliant with the EC, BSO and EPA regulations on emission and noise. Particular attention has been paid to simplifying the installation and maintenance operations as well as the specific processes that have been applied to the metals to preserve them against salt corrosion, which place this line of engines among

the most technologically advanced ones currently available. Lombardini Marine has one of the most efficient and qualified technical assistance networks offering a fast and highly professional service which has been developed by Kohler Engines as a long-term commitment towards its customers.



# FOCS

## FULLY OVERHEAD CONTROLLING SYSTEM

4-stroke diesel engines, fresh water cooled via heat exchanger, complete with zinc anode protection, cast-iron engine block (aluminium for KDW 502M), reborable liners, one piece aluminium cylinder head, indirect injection with unit injector pump in the cylinder head, overhead camshaft with timing belt, vane type lubrication pump on crankshaft, fresh water cooling pump in the engine block, stainless steel water injected exhaust elbow, self-priming sea water pump, air filter, anti-corrosion surface treatment.

## ROBUSTNESS, STURDINESS AND MINIMUM WEIGHT

The original design concept as the pearlitic grey cast iron cylinder head with integral reborable “twin” arranged liners, with cross flow intake and exhaust pipes, has allowed the reduction of the engine length assuring at the same time an exceptional sturdiness. The KDW 502M, which has been built with an aluminium engine block and reborable liners, is the lightest of the FOCS series.

## LOW NOISE

Excellent results have been obtained in reducing noise emission thanks to the location of the injection system in the cylinder head, to a ribbing system along the engine structure and to the complete absence of gears. The overhead camshaft is driven through a cogged belt, especially designed for heavy duty applications to ensure longevity of belt life. The lubrication system is fed by a “gerotor” oil pump driven directly by the crankshaft.

## HIGH PERFORMANCES

The utilization of newly developed and patented pump-injector units, in place of a conventional system, incorporating separate fuel injection pumps and injectors, allows the elimination of fuel pipes and consequently provides a better injection timing with the result of great performance advantages.

## LOW EXHAUST EMISSIONS

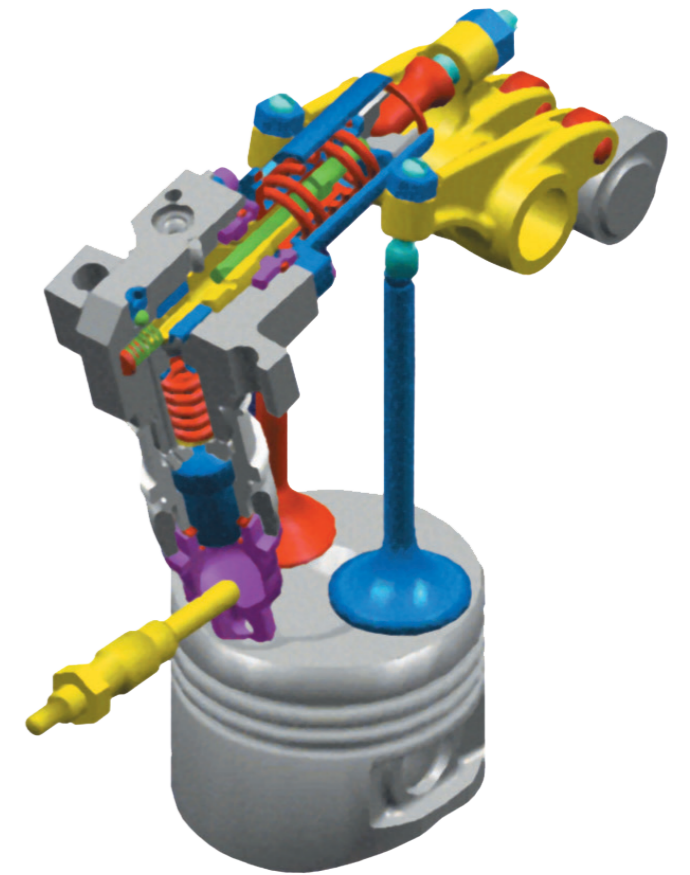
The patented injection system has been tested for exhaust emission levels to the lowest limits. FOCS engines achieved high acclaim with regard to exhaust emissions being well below the EEC requirements.

## ABSENCE OF VIBRATIONS

The very accurate balancing of the moving components together with optimum combustion allows low vibration levels at all engine speeds.

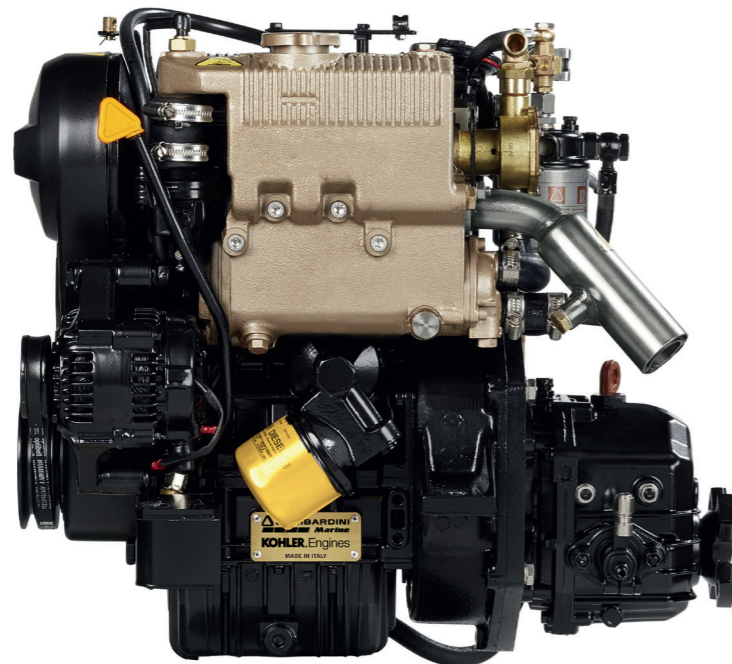
## LOW SERVICING COSTS

Components subject to more frequent checking are located in the upper part of the engine, just under the cover. This allows easy and low cost equipment maintenance.



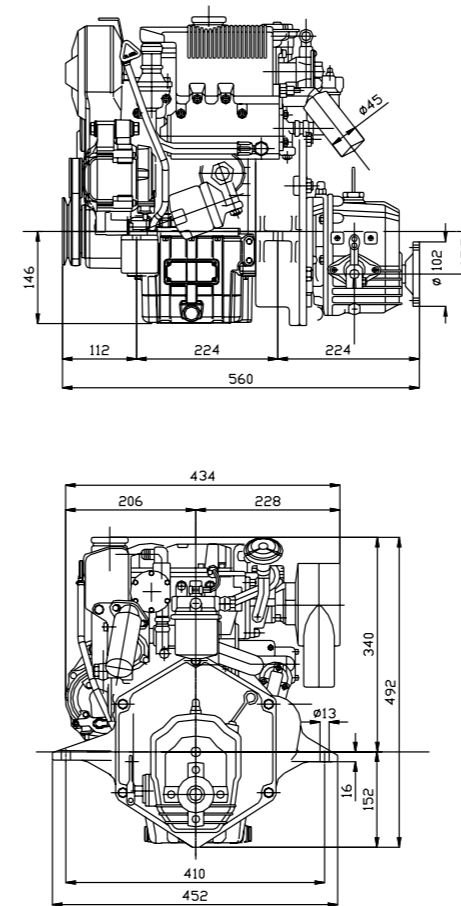


# LDW/KDW 502M



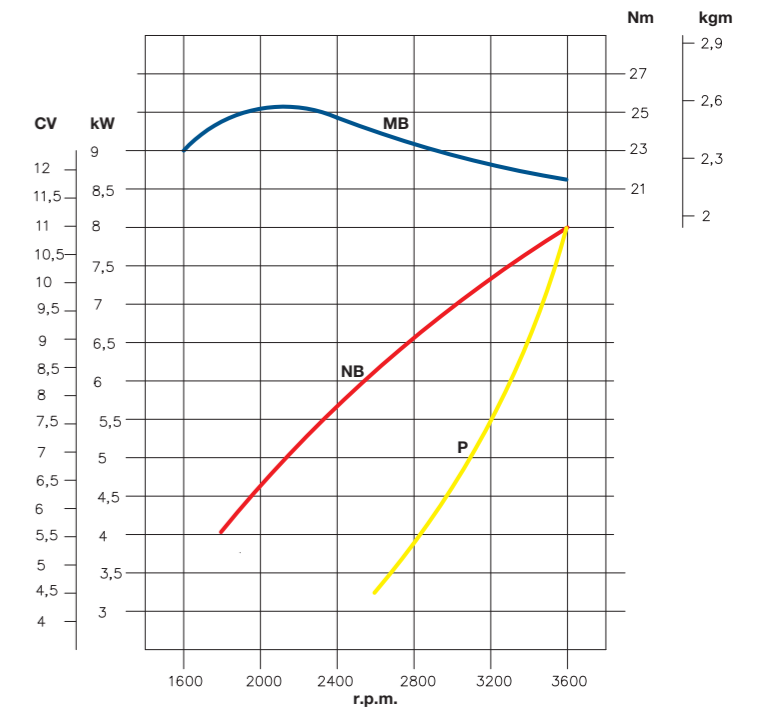
## DATA

Dimensions (mm)



## PERFORMANCE CURVES

(IFN-ACCORDING TO ISO 3046 and ISO 14396)



- MB – Torque curve (NB curve)
- NB – Power curve - ISO 3046/1-IFN
- P – Propeller demand curve

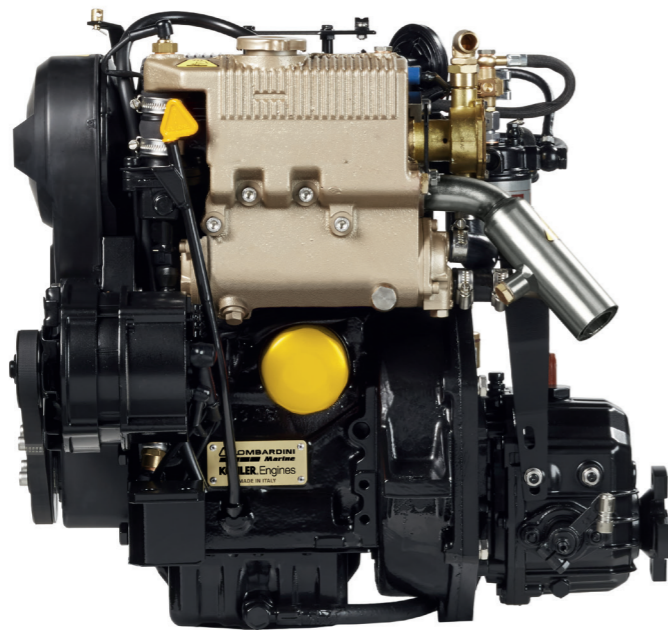
Rating refers to engine after running in with reversing gear, air cleaner and water injected stainless steel exhaust elbow under environment conditions of 20°C. Max. rating certified within 5%. Derating 1% approx. every 100 mt. altitude and 2% approx. every 5°C beyond 20°C.

### Quick specifications

CYLINDERS	2
MAX POWER kW (hp)@rpm	8.0 (11.0) @ 3600

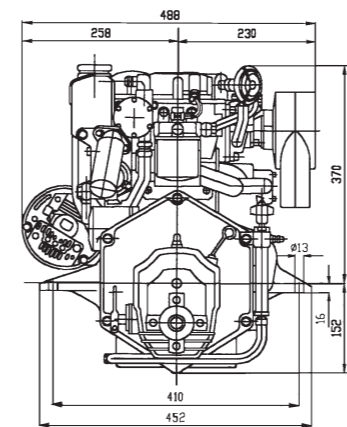
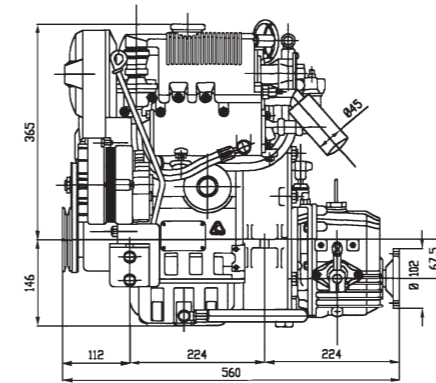


# LDW/KDW 702M



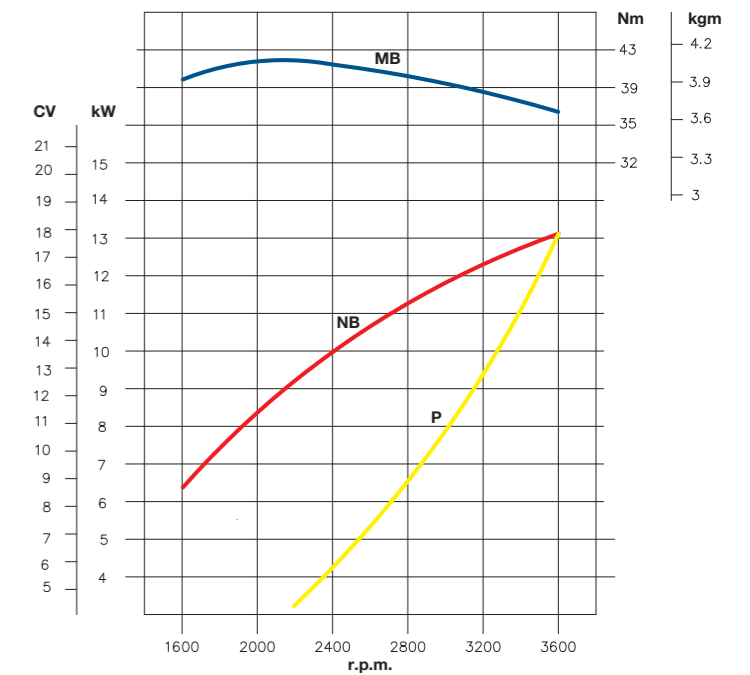
## DATA

Dimensions (mm)



## PERFORMANCE CURVES

(IFN-ACCORDING TO ISO 3046 and ISO 14396)



- MB – Torque curve (NB curve)
- NB – Power curve - ISO 3046/1-IFN
- P – Propeller demand curve

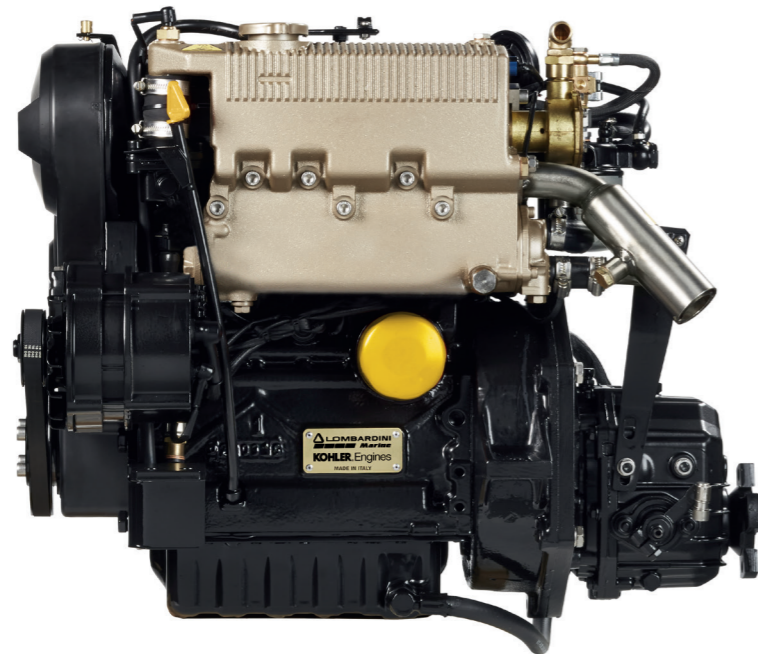
Rating refers to engine after running in with reversing gear, air cleaner and water injected stainless steel exhaust elbow under environment conditions of 20°C. Max. rating certified within 5%. Derating 1% approx. every 100 mt. altitude and 2% approx. every 5°C beyond 20°C.

### Quick specifications

CYLINDERS	2
MAX POWER kW (hp)@rpm	13.2 (18.0) @ 3600

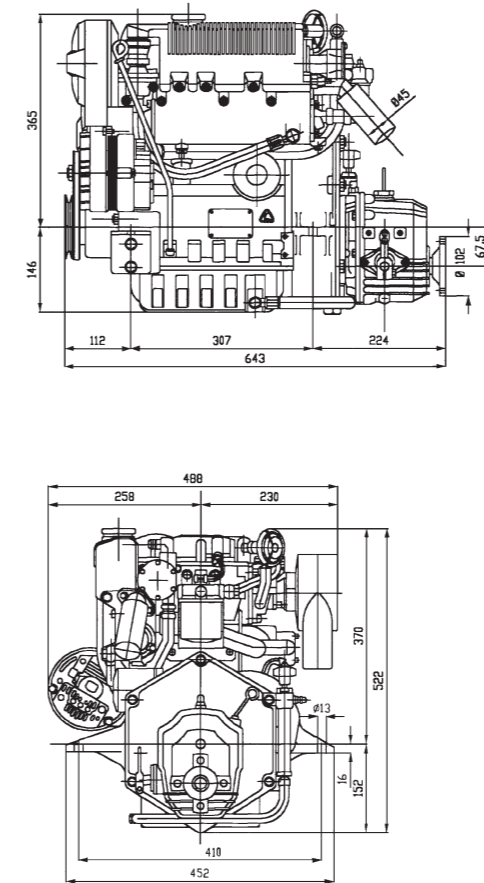


# LDW/KDW 1003M



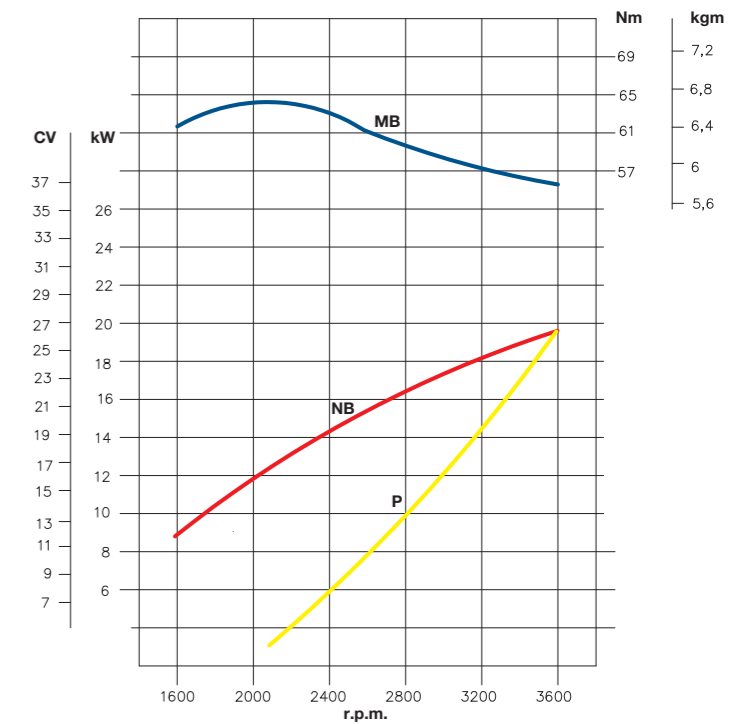
## DATA

Dimensions (mm)



## PERFORMANCE CURVES

(IFN-ACCORDING TO ISO 3046 and ISO 14396)



- MB – Torque curve (NB curve)
- NB – Power curve - ISO 3046/1-IFN
- P – Propeller demand curve

Rating refers to engine after running in with reversing gear, air cleaner and water injected stainless steel exhaust elbow under environment conditions of 20°C. Max. rating certified within 5%. Derating 1% approx. every 100 mt. altitude and 2% approx. every 5°C beyond 20°C.

### Quick specifications

CYLINDERS	3
MAX POWER kW (hp)@rpm	19.5 (27.0) @ 3600







# CHD

## COMPACT HEAVY DUTY

4-stroke diesel engines, fresh water cooled via heat exchanger with zinc anode protection, cast-iron engine block, one piece cast-iron cylinder head, reborable liners, indirect injection, gear driven single shaft with push rod valve operation, crankshaft mounted vane type lubrication pump, water injected stainless steel exhaust elbow, self-priming sea water pump, air filter. Special anti-corrosion treatment.

## DIMENSIONS

The camshaft is located in the upper part of the crankcase to allow a reduced width in the lower area of the engine. The innovative design of the gear train, the injection system design and location, and the reduced cylinder pitch, shorten the engine length.

## OPERATIONAL COMFORT

The special crankshaft balancing gives exceptional low vibrations and ensures an excellent operational performance during use.

## REDUCTION IN NOISE EMISSION

The innovative design of the fuel injection system, as well as the utilization of hypereutectic pistons which reduce piston slap, and the utilization of a heavy-duty block, assist in greatly reducing noise levels that are normally associated with diesel engines.

## PERFORMANCE

The QLC pump, offers high performances on all engine speed. Compared to the conventional injection pump QLC features a one way flow and a unique delivery fuel system that prevents unwanted variations on injection pressure and timing, eliminating gas bubbles.

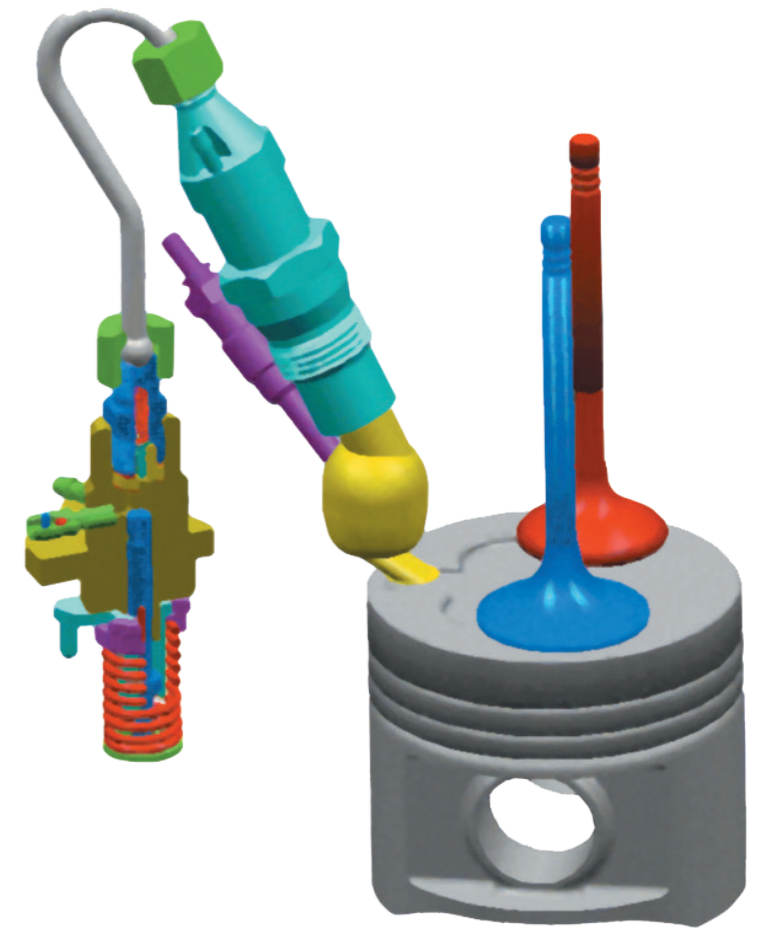
## ENVIRONMENTAL BEHAVIOUR

This line of engines, due to their advanced design of the injection and combustion systems, results in improved environmental behaviour in conformity with expected pollution limits. These exhaust emissions and the engines performances are checked with dedicated test rigs on 100% of the Lombardini Marine production.

## EASY MAINTENANCE

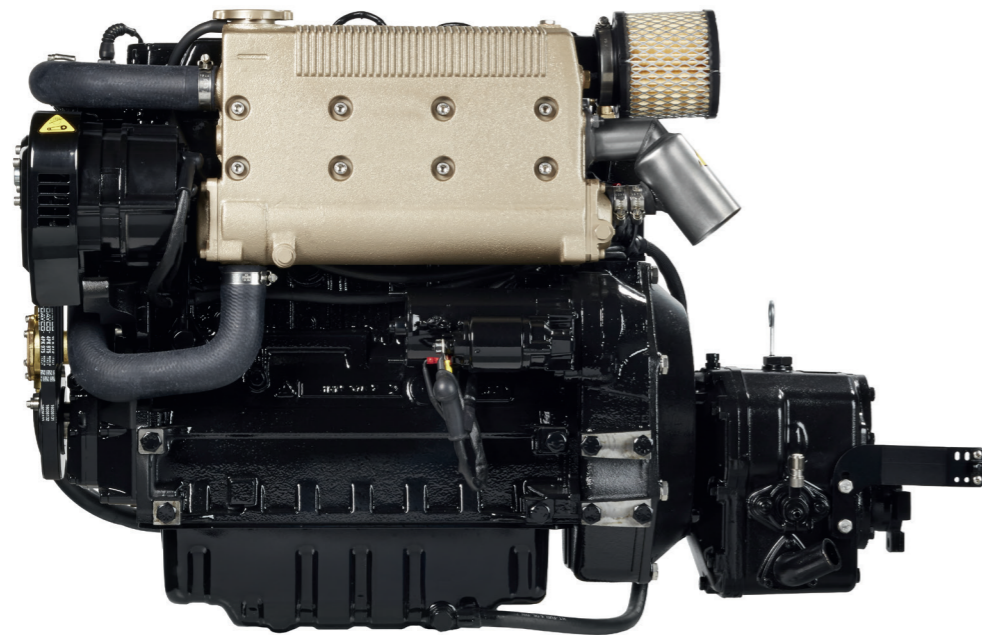
All maintenance operations are made easier due to the simple construction of the product.

All authorized service points can carry out the regular maintenance of QLC pump.



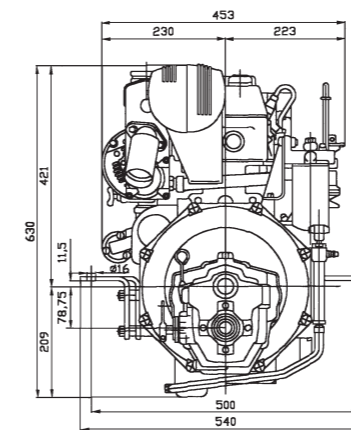
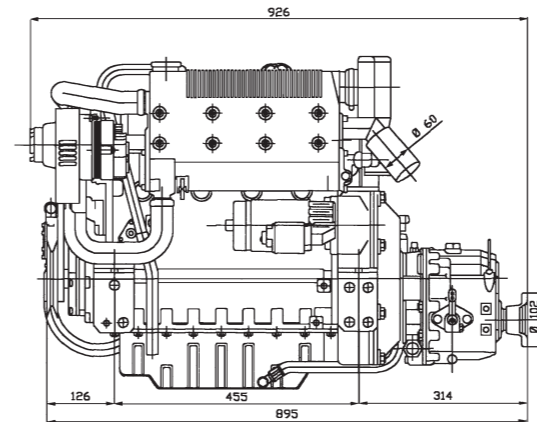


# LDW/KDW 2204M



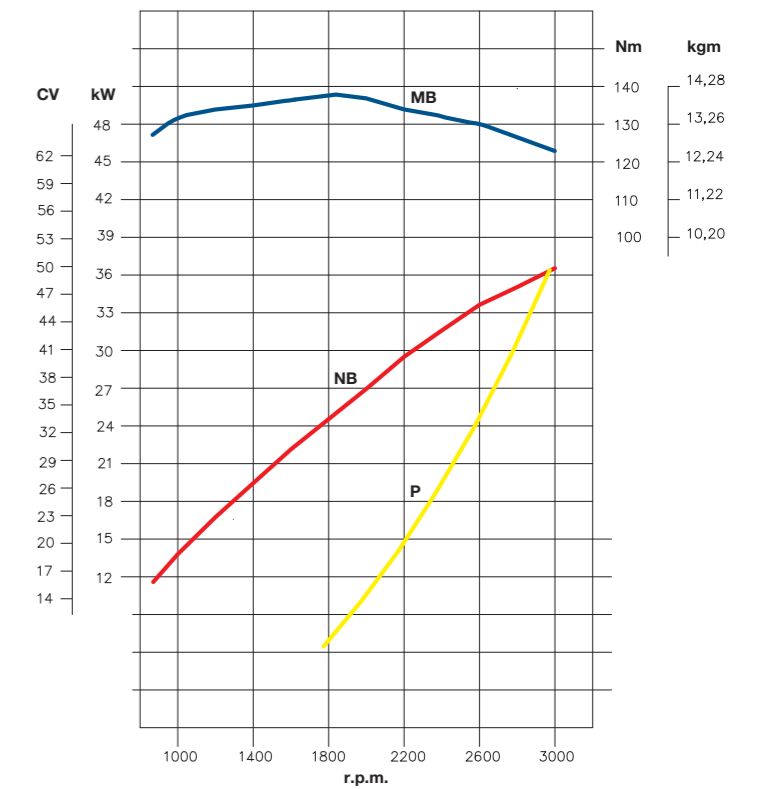
## DATA

Dimensions (mm)



## PERFORMANCE CURVES

(IFN-ACCORDING TO ISO 3046 and ISO 14396)



- MB – Torque curve (NB curve)
- NB – Power curve - ISO 3046/1-IFN
- P – Propeller demand curve

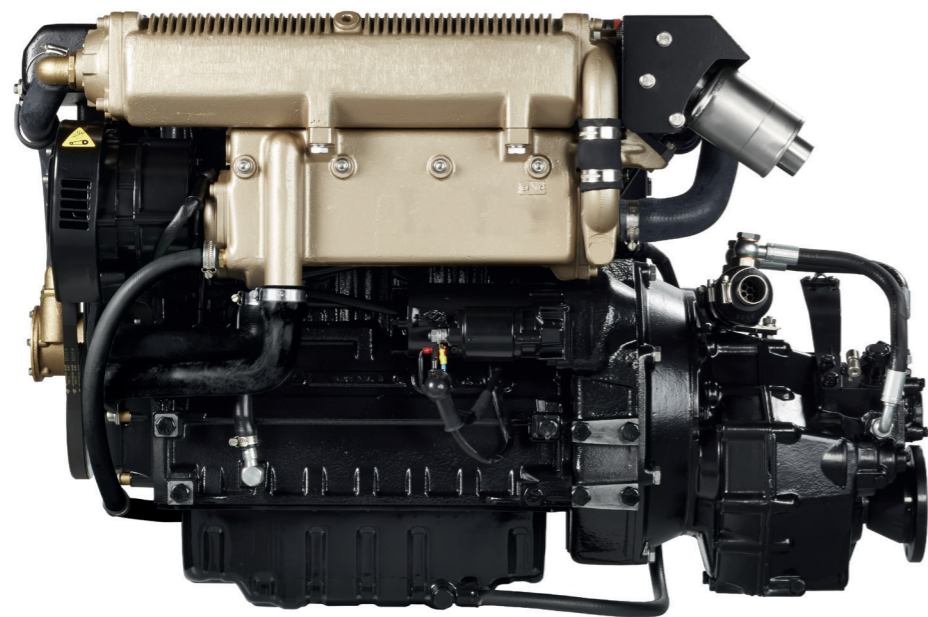
Rating refers to engine after running in with reversing gear, air cleaner and water injected stainless steel exhaust elbow under environment conditions of 20°C. Max. rating certified within 5%. Derating 1% approx. every 100 mt. altitude and 2% approx. every 5°C beyond 20°C.

### Quick specifications

CYLINDERS	4
MAX POWER kW (hp)@rpm	36.6 (50.0) @ 3000

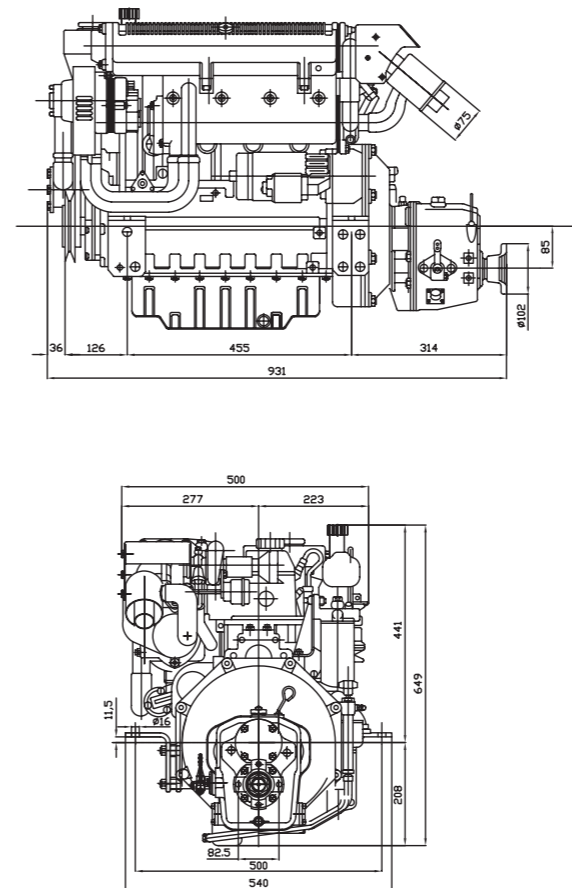


# LDW/KDW 2204MT



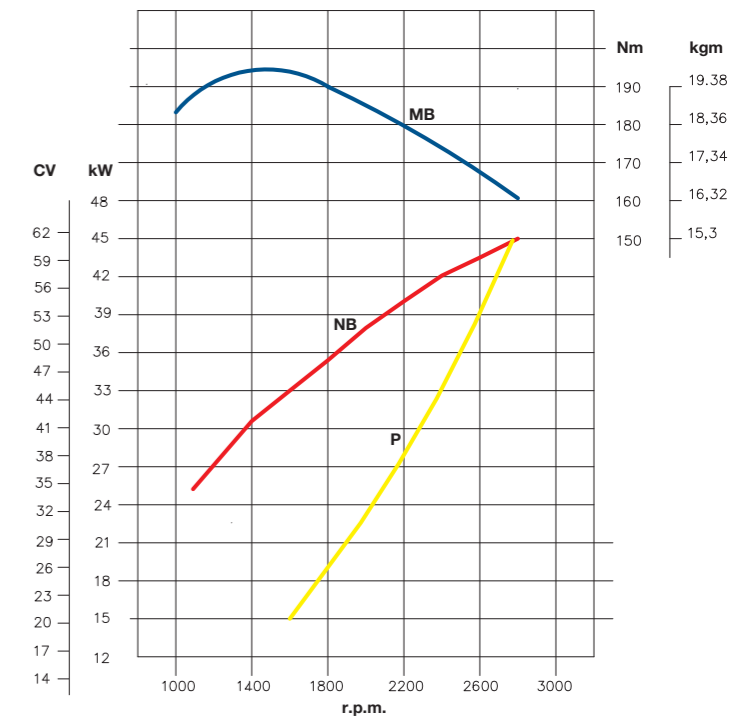
## DATA

Dimensions (mm)



## PERFORMANCE CURVES

(IFN-ACCORDING TO ISO 3046 and ISO 14396)



- MB – Torque curve (NB curve)
- NB – Power curve - ISO 3046/1-IFN
- P – Propeller demand curve

Rating refers to engine after running in with reversing gear, air cleaner and water injected stainless steel exhaust elbow under environment conditions of 20°C. Max. rating certified within 5%. Derating 1% approx. every 100 mt. altitude and 2% approx. every 5°C beyond 20°C.

### Quick specifications

CYLINDERS	4
MAX POWER kW (hp)@rpm	45.0 (61.0) @ 2800



# S-DRIVE

# DIMENSIONS

## FOCS engines with S-Drive transmission

The Lombardini Marine S-Drive transmission (10÷40 cv) and S-Drive M transmission (40÷80 cv) have been developed from our experience gained from years of sailboat racing. This experience in collaboration with many professional skippers helped us to devise transmissions featuring the essential requirements of sturdiness and reliability whilst, at the same time, offering the minimum water resistance during sailing.

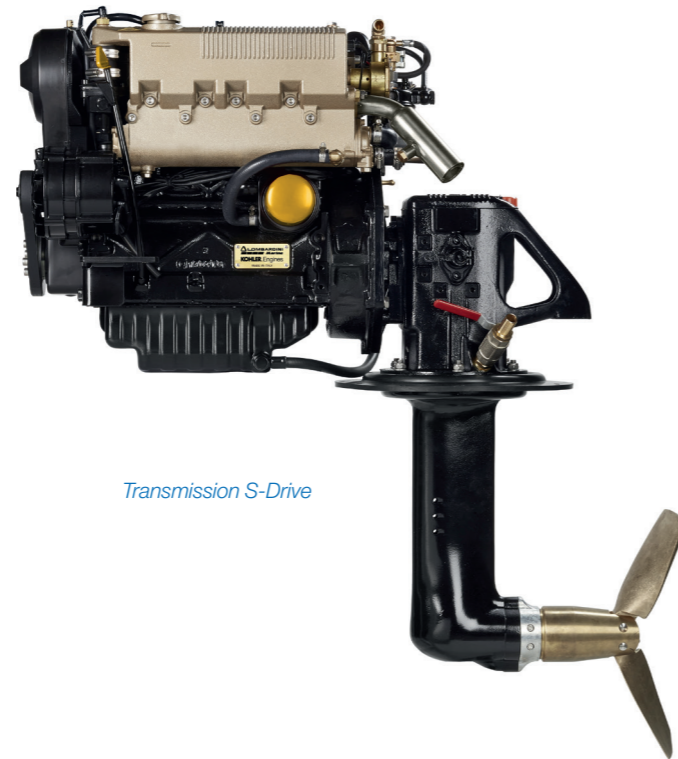
Helical gears reduction ratio  $R=2.18:1$  (for S-Drive - FOCS engines) and  $R=1.8:1$  (for S-Drive - CHD engines).

Folding blades or fixed blades propellers are available on request:

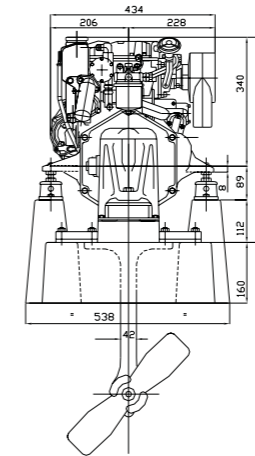
- S-Drive FOCS engines:

propeller direction of rotation LH or RH

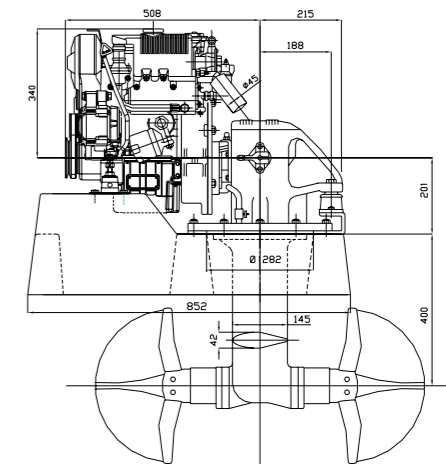
- S-Drive CHD engines: propeller direction of rotation LH



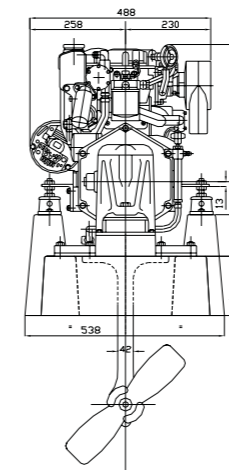
*Transmission S-Drive*



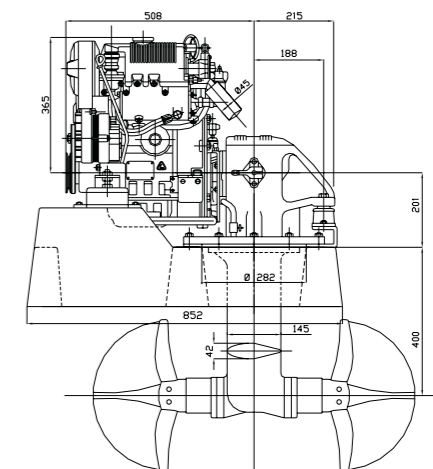
KDW 502 SD



KDW 502 SD



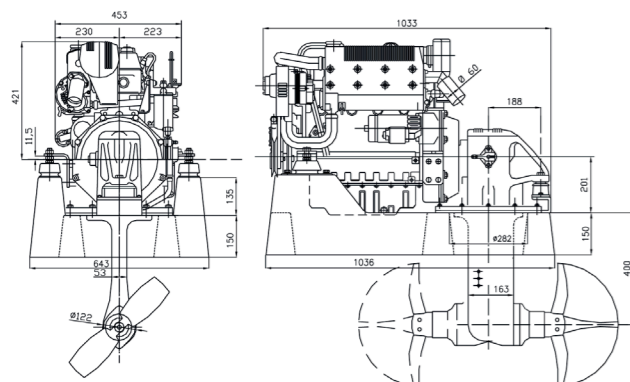
KDW 702 SD - 1003 SD - 1404 SD



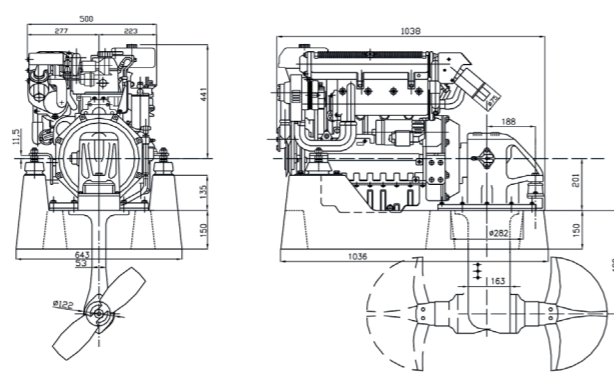
KDW 702 SD

## DIMENSIONS

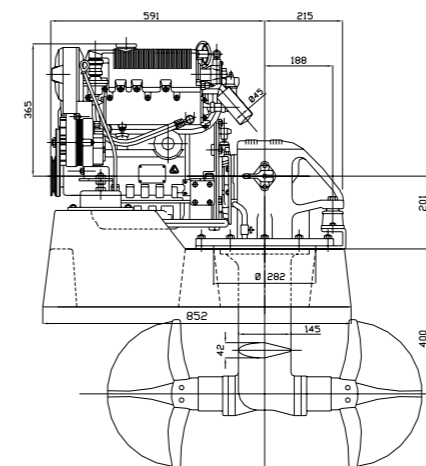
## CHD ENGINES WITH S-DRIVE M TRANSMISSION



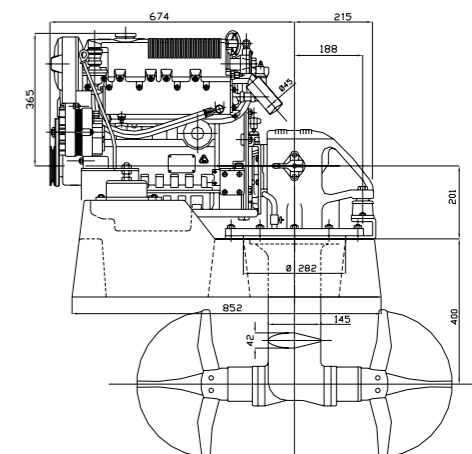
KDW 2204 SD



KDW 2204 TSD



KDW 1003 SD



KDW 1404 SD

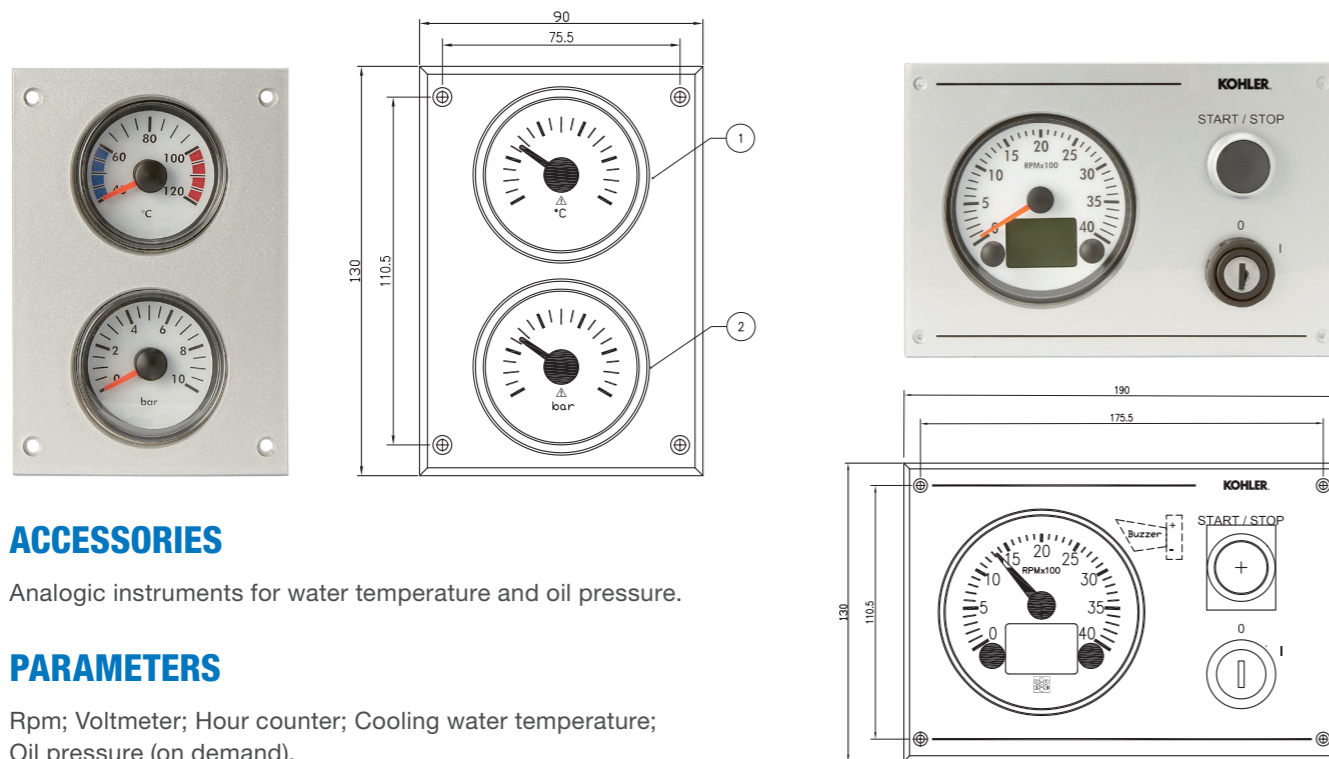


# FEATURES AND OPTIONS



Model	LDW/KDW 502M	LDW/KDW 702M	LDW/KDW 1003M	LDW/KDW 1404M	LDW/KDW 2204M	LDW/KDW 2204MT	LDW/KDW 2204M	LDW/KDW 2204MT
N. Cylinders	2	2	3	4	4	4	4	4
Bore & stroke	72x62	75x77.6	75x77.6	75x77.6	88x90.4	88x90.4	88x90.4	88x90.4
Displacement cm³	505	686	1028	1372	2199	2199	2199	2199
Power	HP	11	18	27	35	50	61	84
	kW	8	13.2	19.5	26	36.6	45	61.8
Compliant	EU RCD Stage 2	EU RCD Stage 2	EU RCD Stage 2	EU RCD Stage 2	EU RCD Stage 2	EU RCD Stage 1	Not Emissioned	Not Emissioned
RPM	3600	3600	3600	3600	3000	2800	3600	3200
Weight kgs (dry)	82 •	99 •	115 •	133 ••	232 ••	253 •••	232 ••	253 •••
Weight kgs (dry) S-Drive engines	108	125	141	160	257	278	257	278

## DELUXE PANEL



## ACCESSORIES

Analogic instruments for water temperature and oil pressure.

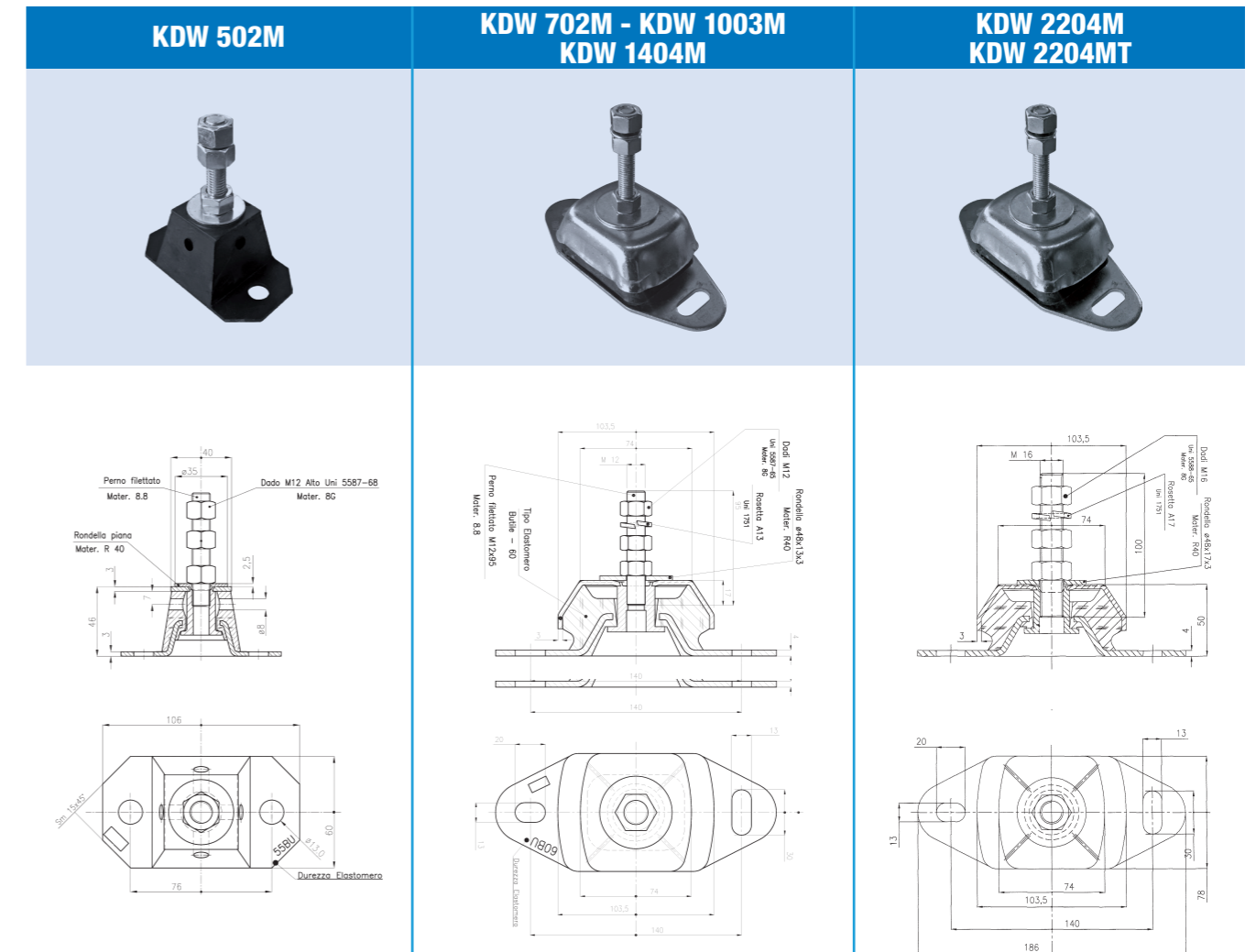
## PARAMETERS

Rpm; Voltmeter; Hour counter; Cooling water temperature; Oil pressure (on demand).

## ALARMS

Hight fresh water temperature; Low oil pressure; Alternator charge; Service intervals.

## RUBBER MOUNTS







Lombardini Marine is a division  
of Lombardini Srl, part of Kohler Group.

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