

Marine Propulsion FOCS-CHD series




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

THE COMPANY

Lombardini Marine, a division of the Lombardini Group, was set up with the objective of preparing and marketing engines for marine applications based on well-established and reputed FOCS and CHD families.

Lombardini Marine is a very modern structure managed by a group of persons highly experienced in the marine engine field and capable of applying to this specific sector the most advanced available technology.



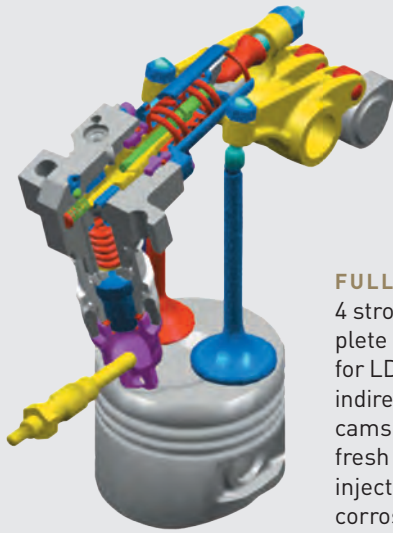
INNOVATIONS

THE PRODUCT

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

Finally, the engines fully conform to the new EC, BSO and EPA regulations on pollution 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 the salt corrosion, which place this line of engines among the technologically most advanced ones today available. Lombardini Marine have one of the most efficient and qualified technical assistance organizations offering a fast and highly professional service which has been developed by the Lombardini Group as a long-term commitment towards its customers.

FOCS PROJECT



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 LDW 502 M), 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 LDW 502 M, 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 all 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 "Lombardini 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 "Lombardini 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

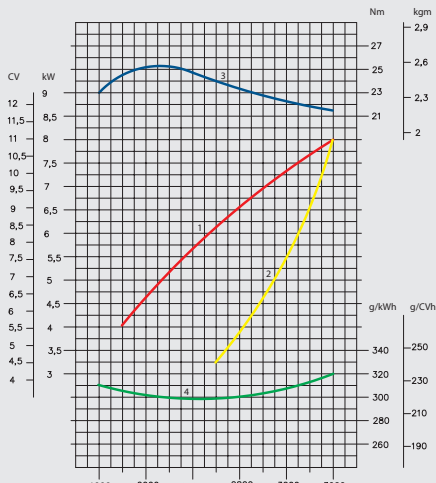
Components subject more frequent checking are located in the upper part of the engine, just under the cover. This allows easy and low cost equipment maintenance.

LDW 502 M

QUICK SPECIFICS

2
CYLINDER

11 | **8** @ 3600 rpm
HP | kW



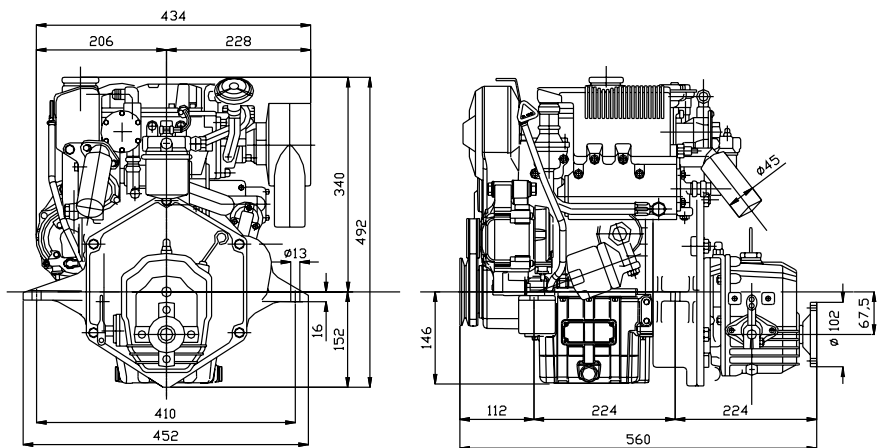
1. Power at propeller shaft - 2. Propeller demand curve
3. Maximum torque - 4. Fuel consumption

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.



DATA

DIMENSIONS (mm)

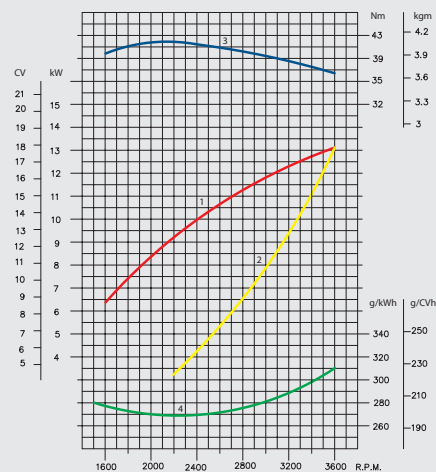


LDW 702 M

QUICK SPECIFICS

2
CYLINDER

18 | **13.2** @ 3600 rpm
HP | kW



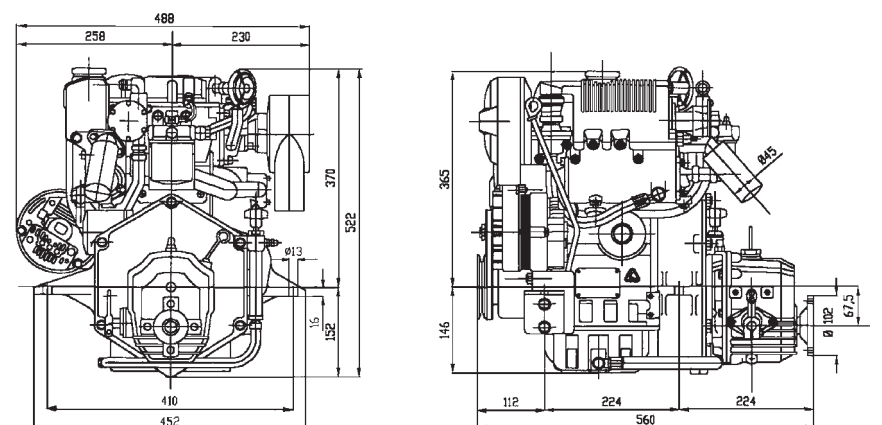
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DATA

DIMENSIONS (mm)





LDW 1003 M

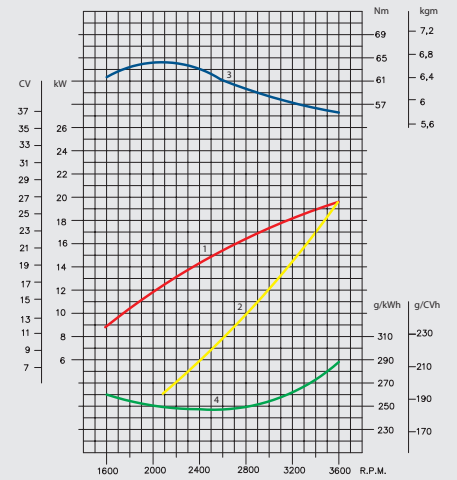
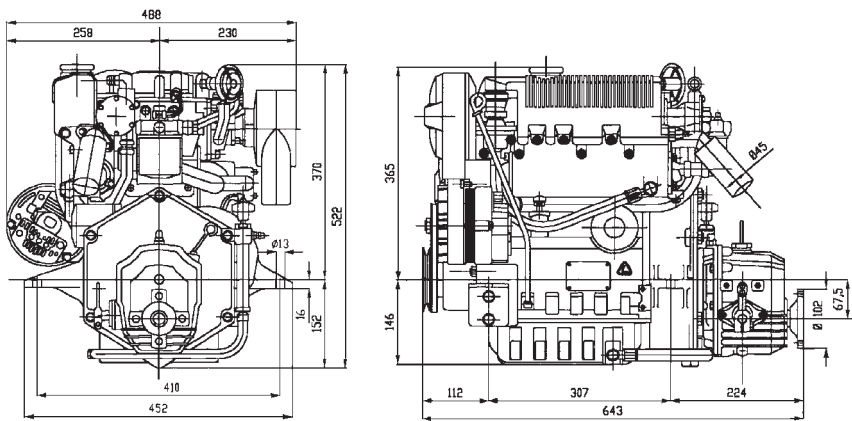
QUICK SPECIFICS

3
CYLINDER

27 | **19.5** @ 3600 rpm
HP | kW

DATA

DIMENSIONS (mm)



1. Power at propeller shaft - 2. Propeller demand curve
3. Maximum torque - 4. Fuel consumption

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.



LDW 1404 M

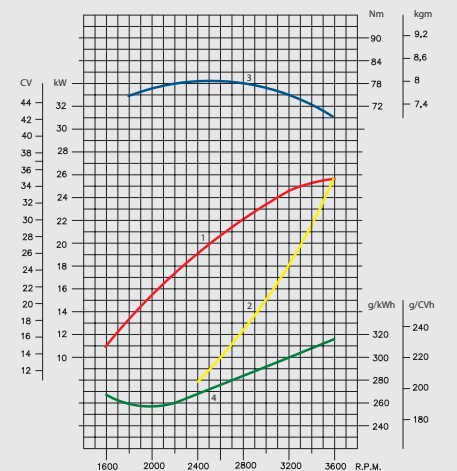
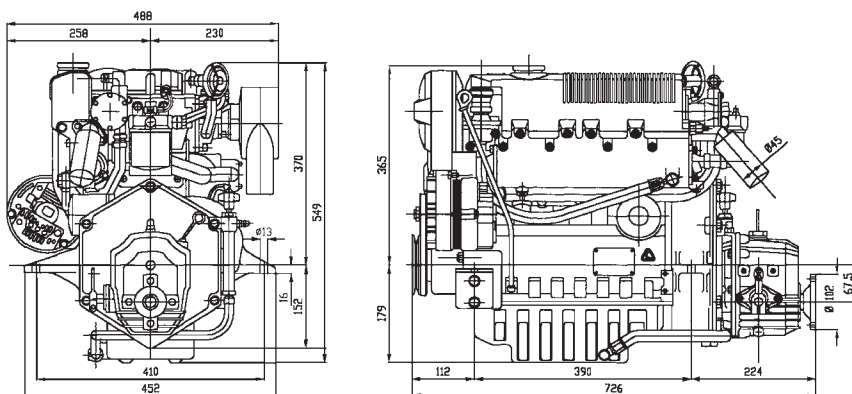
QUICK SPECIFICS

4
CYLINDER

35 | **25.5** @ 3600 rpm
HP | kW

DATA

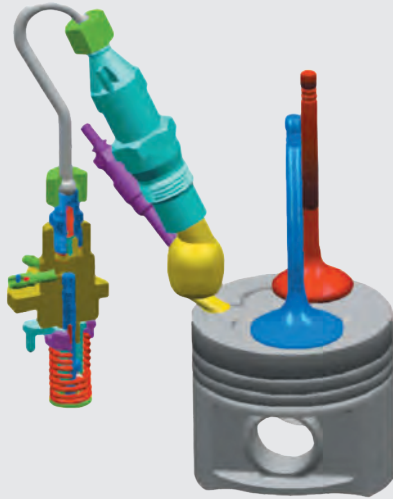
DIMENSIONS (mm)



1. Power at propeller shaft - 2. Propeller demand curve
3. Maximum torque - 4. Fuel consumption

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.

CHD PROJECT



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.

Also for maintenance of the QLC pump it is not strictly necessary to involve the services of a pump specialist, but the servicing of parts can be completed by any qualified workshop.



LDW 2204 M

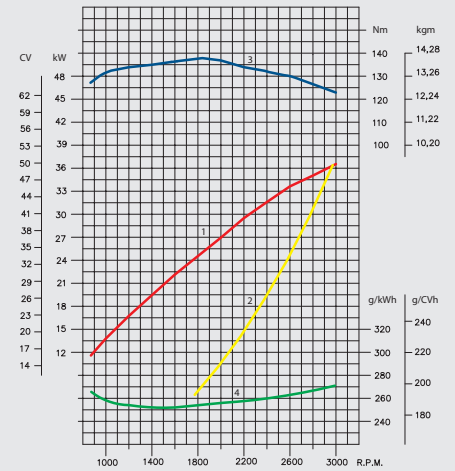
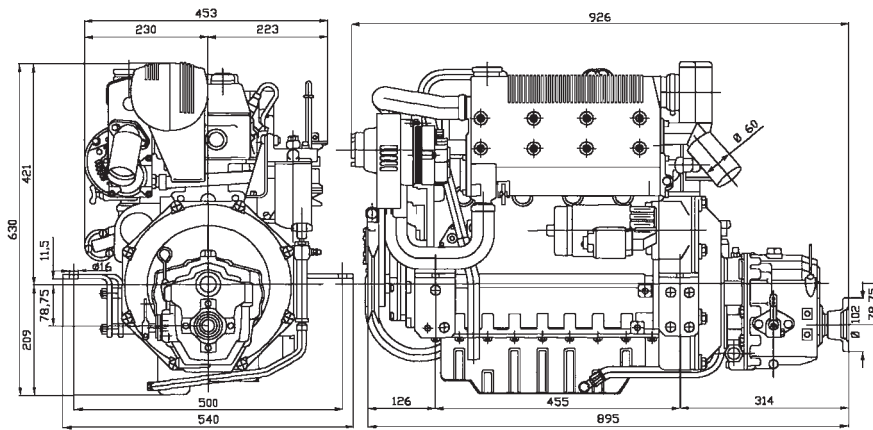
QUICK SPECIFICS

4
CYLINDER

50 | **36.6** @ 3000 rpm
HP | kW

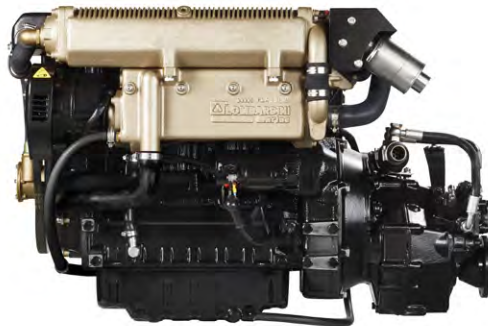
DATA

DIMENSIONS (mm)



1. Power at propeller shaft - 2. Propeller demand curve
3. Maximum torque - 4. Fuel consumption

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.



LDW 2204 MT

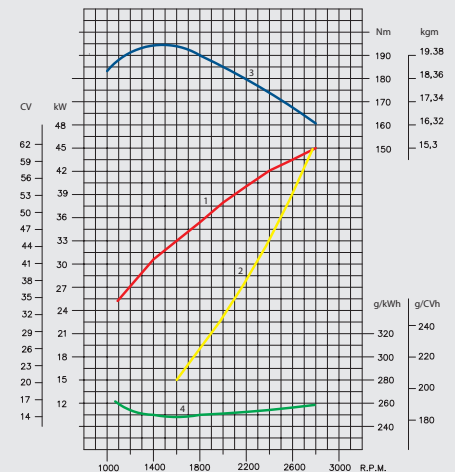
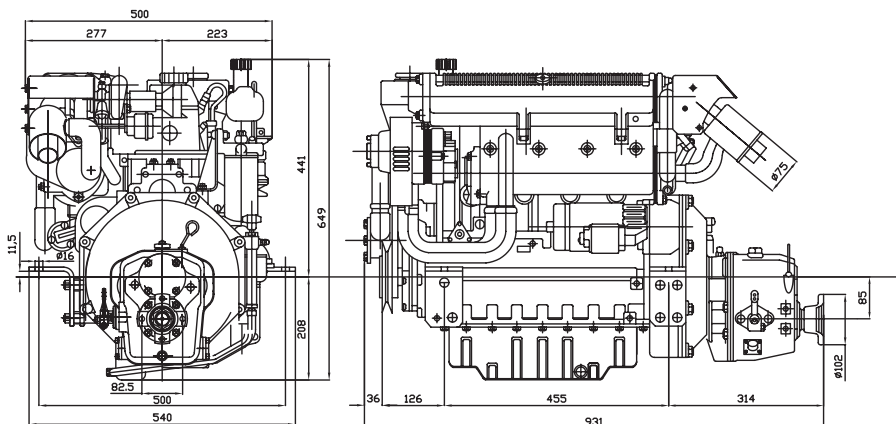
QUICK SPECIFICS

4
CYLINDER

61 | **45** @ 2800 rpm
HP | kW

DATA

DIMENSIONS (mm)



1. Power at propeller shaft - 2. Propeller demand curve
3. Maximum torque - 4. Fuel consumption

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.

S-DRIVE PROJECT

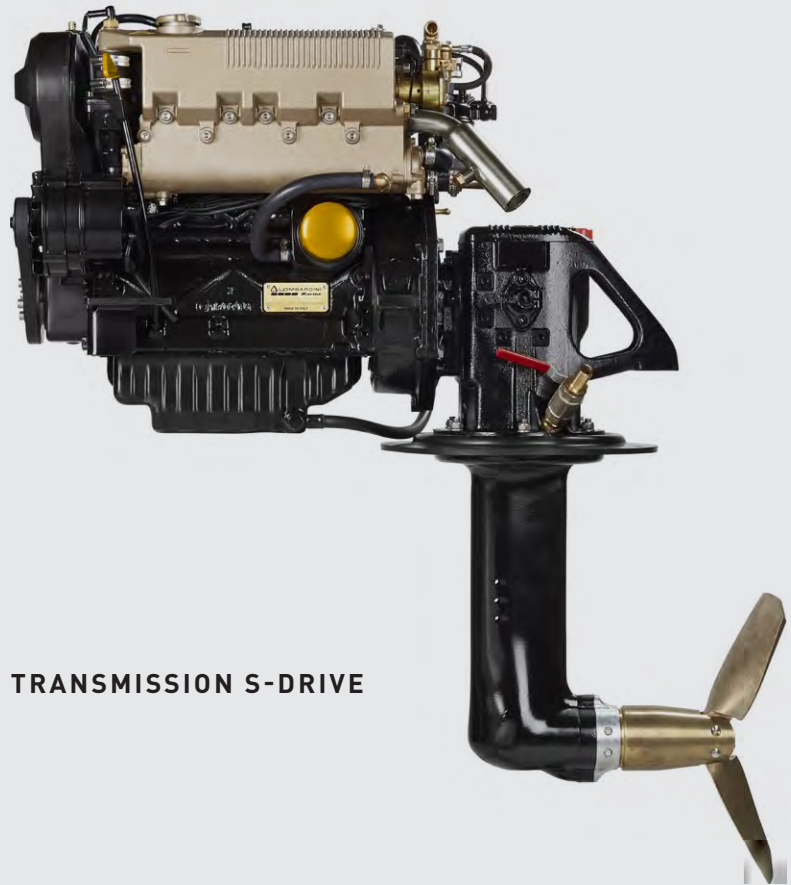
The Lombardini Marine S-Drive transmission (10÷40 cv) and S-Drive M transmission (40÷80 cv) have been developed from our experience gained from years of sailboat racing.

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.

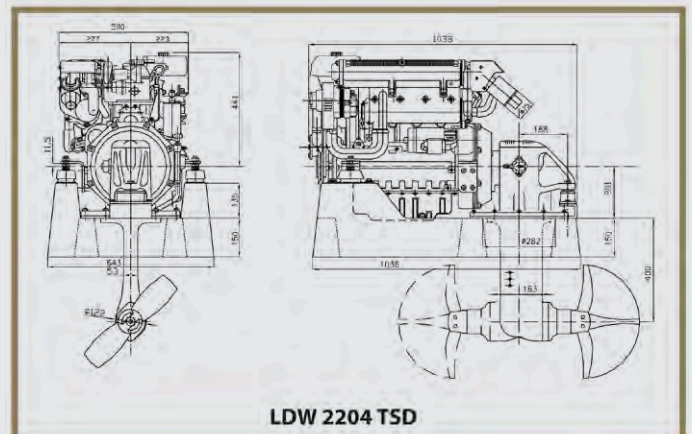
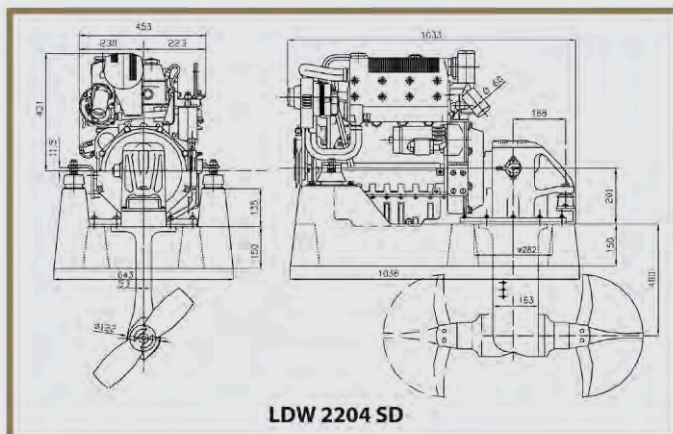
Helical gears (reduction ratio 2.18:1 in (S-Drive – FOCS engines) and 1.8:1 in (S-Drive – CHD engines). Folding blades or fixed on request propeller:

- for S-Drive (FOCS engines) fit LH or RH propeller
- for S-Drive (CHD engines) fit LH propeller

TRANSMISSION S-DRIVE

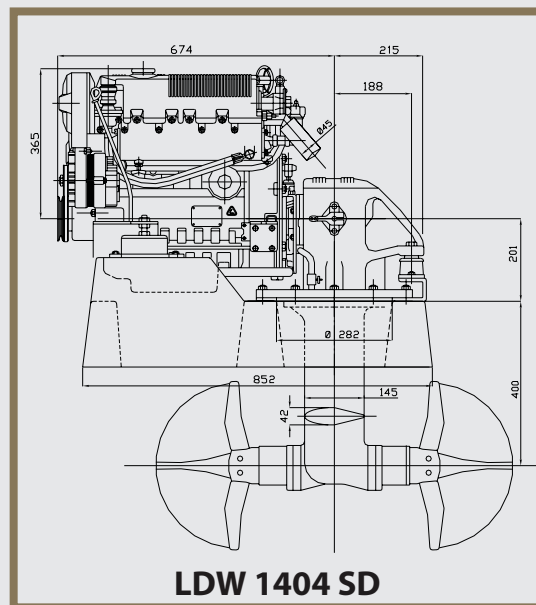
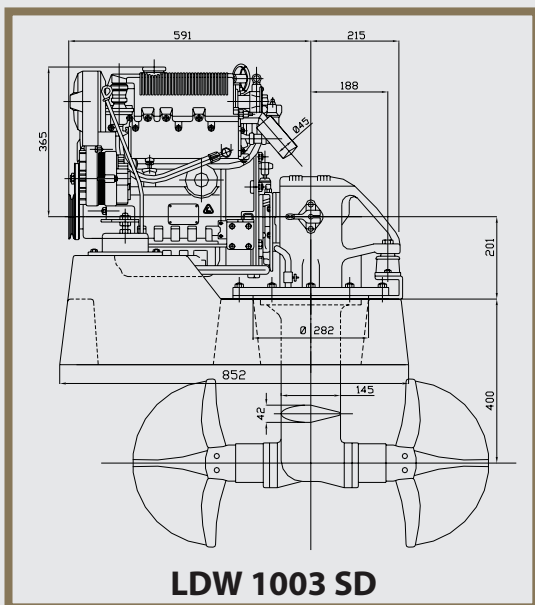
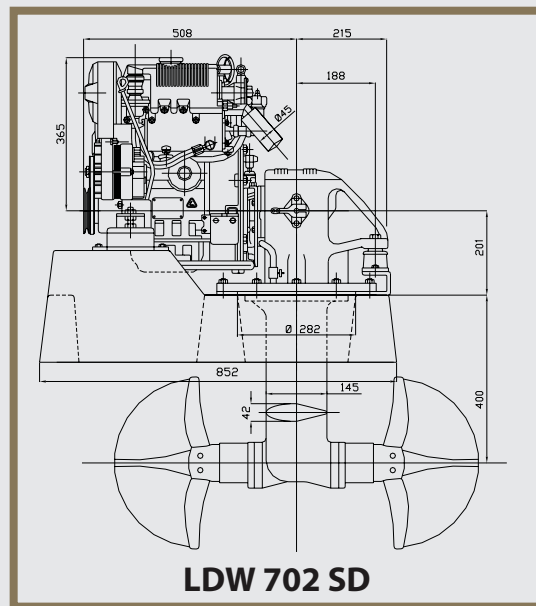
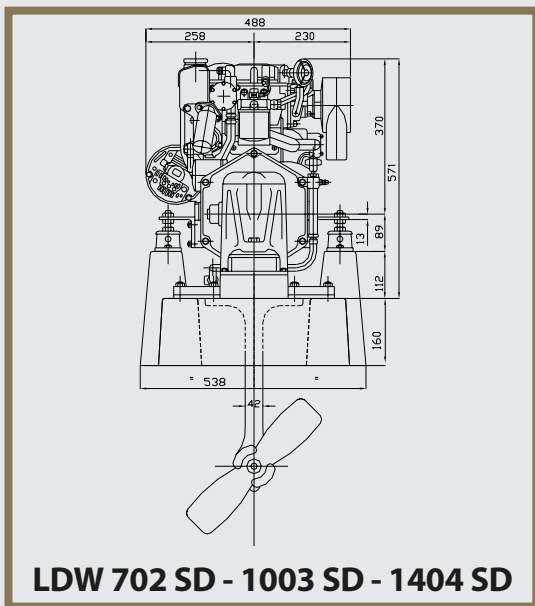
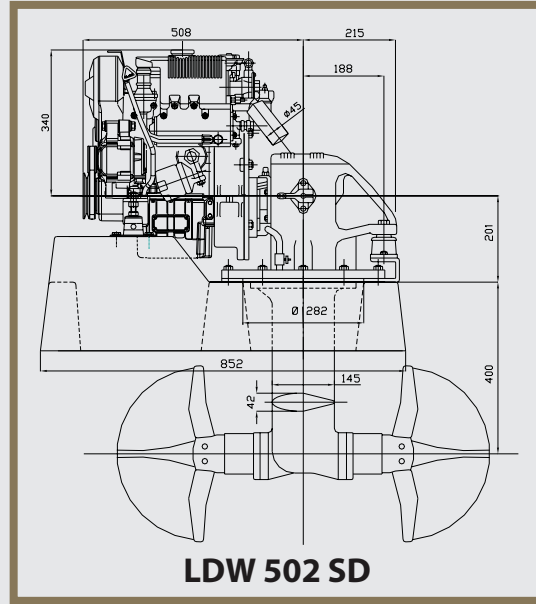
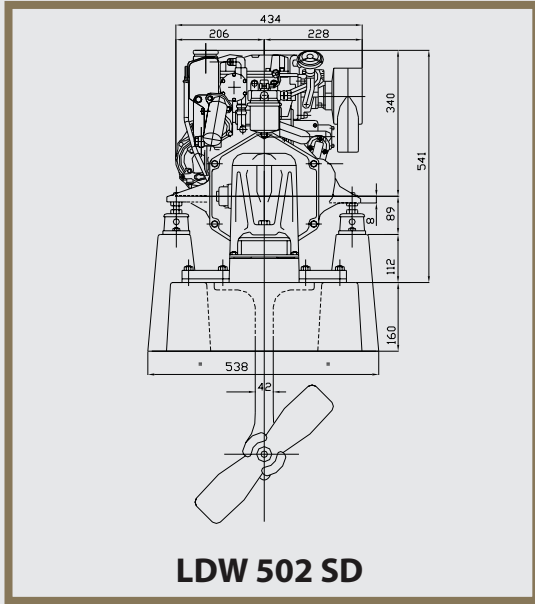


Overall dimensions CHD engines with S-Drive M transmission



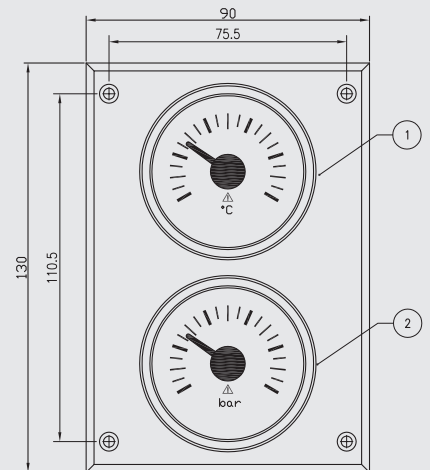
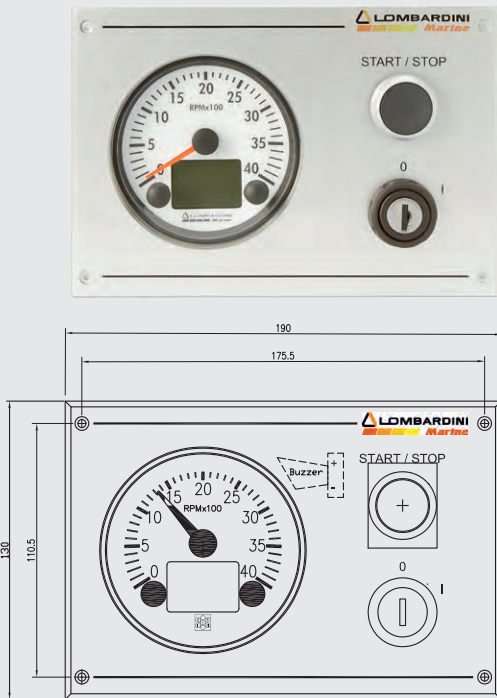
Overall dimensions

F0CS engines with S-Drive transmission



ACCESSORIES

DE LUXE INSTRUMENT PANEL



^ **OPTIONAL**: analogue instruments: Water Temperature and Oil pressure.

< **MEASURED PARAMETERS**: Rpm; Voltmeter; Hour counter; Cooling water temperature; Oil pressure (on demand); NMEA 2000 exit (on demand).

< **ALARMS**: High fresh water temperature; Low oil pressure; Alternator charge; Service intervals.

RUBBER MOUNTS FOR

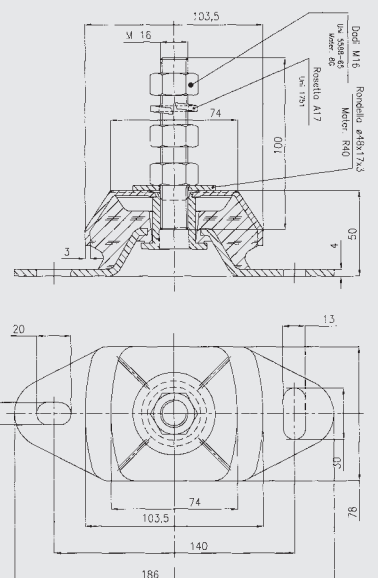
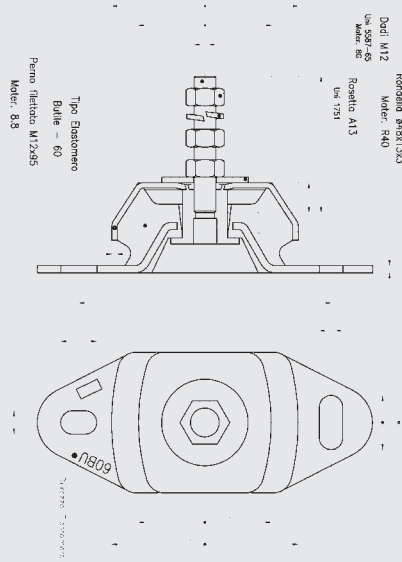
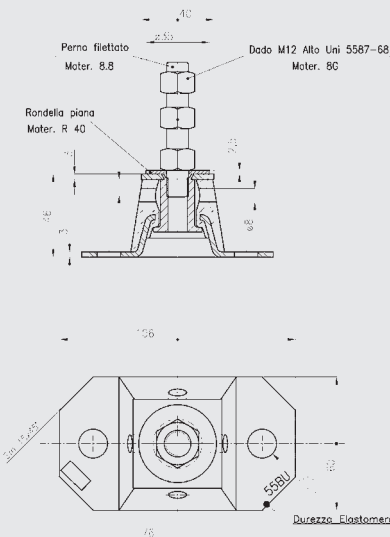
LDW 502 M



LDW 702 M - LDW 1003 M - LDW 1404 M



LDW 2204 M - LDW 2204 MT



MARINE PROPULSION



Model	LDW 502 M	LDW 702 M	LDW 1003 M	LDW 1404 M	LDW 2204 M	LDW 2204 MT	LDW 2204 M	LDW 2204 MT	
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 cm ³	505	686	1028	1372	2199	2199	2199	2199	
Power	HP	11	18	27	35	50	61	60	84
	kW	8	13.2	19.5	25.5	36.6	45	44	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	

- with TECHNODRIVE TMC 40 reversing gear
- with TECHNODRIVE TMC 60 reversing gear
- with TECHNODRIVE TMC 260 reversing gear

Standard equipment on inboard engines

12V electric starter; 120A alternator (exception of LDW 502M with 40A alternator); sea water pump; fuel lift pump; sump oil extraction pump; dry air filter; fuel filter; 2:1 ratio for right hand rotation mechanical reversing gear (on request hydraulic for CHD series), further ratios available on request; cable end fittings for throttle, gear and engine stop; Digital De Luxe instrument panel; 10 meters loom; use and maintenance booklet.



KOHLER® Engines

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