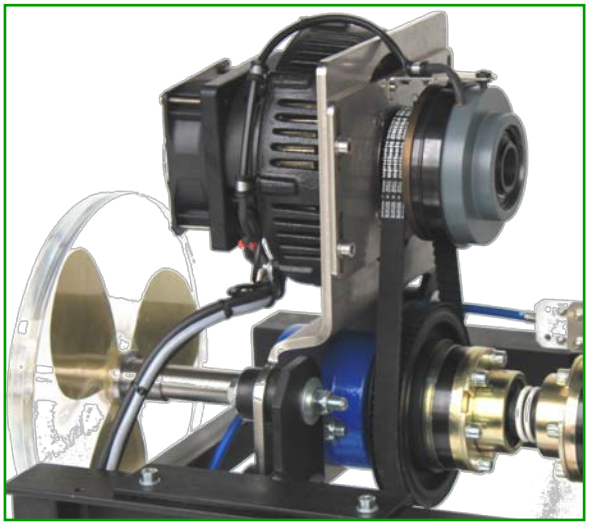
elsail Hybrid

universal hybrid drives



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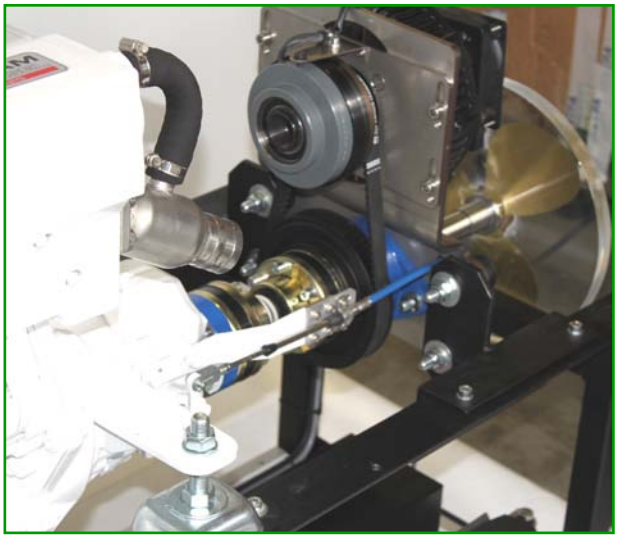
The **elsail Hybrid** is a so called parallel hybrid;
the combustion engine (diesel or petrol) and the **elsail Hybrid** both drive the propeller, but not both at the same time.

The **elsail Hybrid** is 'fuelled' from batteries. The batteries can be charged by switching the **elsail Hybrid** in charging mode (as generator) when the combustion engine is in operation or when the propeller is rotating while sailing. The batteries can of course also be charged in the marina via an (green) electric power supply.

Specifications:

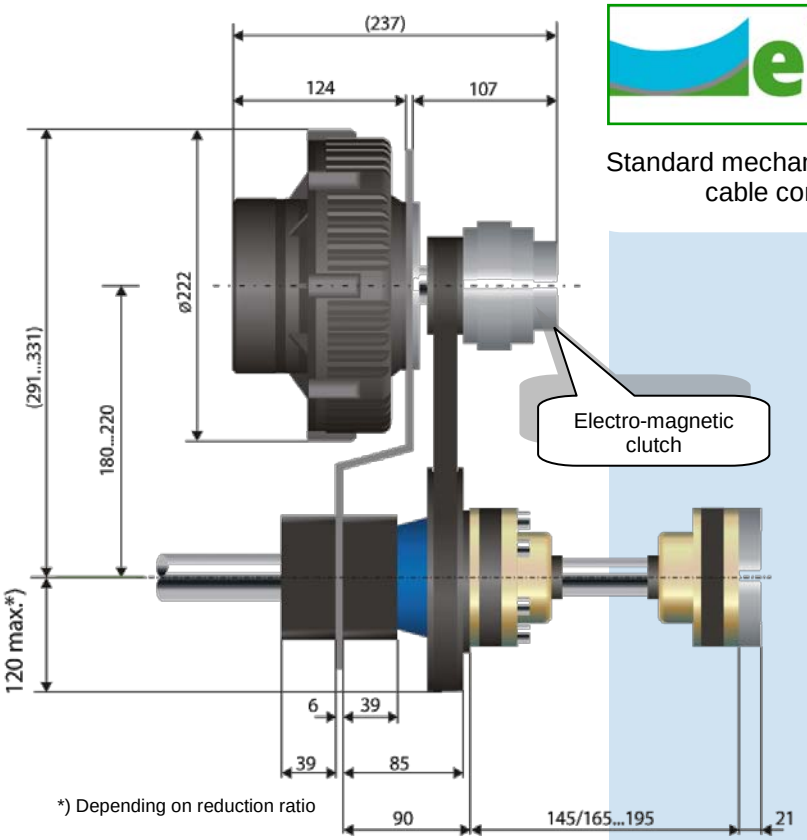
- High power output and low consumption. The PERM DC-Disc motor delivers 4.7 kW.
- Silent and controlled manoeuvring under all conditions
- Acceptable cruising speeds for yachts and boats with (diesel) engines up to 100 hp
- Charges the batteries while sailing or while operating the diesel engine
- Easy to operate switch 'Electric drive – Diesel – Charging' for switching from electric drive to diesel power and the other way around by automatic engaging and disengaging of electro-magnetic clutch
- If either drive has a malfunction (f.i. because of clogged filters or empty batteries), the other drive can immediately take over, thus ensuring a safe continuation of the journey
- The integrated thrust bearing unit can be mounted on any desired position on the prop shaft and is suitable for any engine or gearbox brand/model
- A standard (mechanical) control lever can be used in combination with the smart **elsail-Gearbox** cable de-coupler and the **elsail-Powerbox** for speed control
- Nearly any type of flexible shaft coupling can be fitted
- Various integrated safety devices prevent from f.i. the simultaneous engaging of both electric and diesel drive and from overload situations
- Reduction ratios from 1:1 to 4.5:1 available, so always a good match with the existing installation
- Virtually maintenance free
- Delivery includes complete set of cables
- For prop shafts from Ø 20 to 40 mm (larger sizes on request)

specifications	
Nominal power	4.74 kW
Voltage	48 V
Motor speed in rpm.	2,300
Current (Amp)	110 A
Peak current (max.10	200 A
Charging current (Amp)	± 44 A (when used as generator)
Nominal torque	20 Nm
Peak torque	38 Nm
Available ratios	1: 1 till 4.5:1
Total weight	33 kgs.
For prop shaft diameters	Ø 20 mm. - Ø 40 mm.
Also available as **elsail Solo** for main propulsion	



We calculate the right reduction ratio, the voltage, size of battery pack, top speed and range for you.

elsail Hybrid



*) Depending on reduction ratio

Standard mechanical cable control

Function switch:
Electric – Charging - Diesel

Programmable unit

De-coupler unit for gearbox

Gearbox

Speed regulator

Powerbox

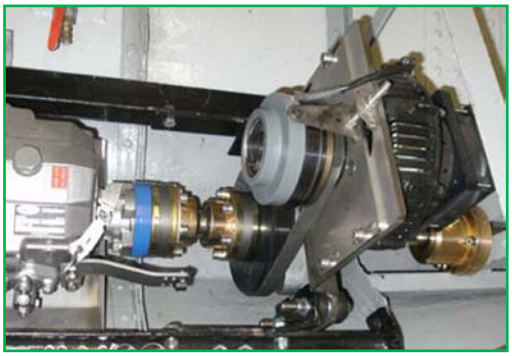
Diesel engine

Electric propulsion unit

Method of calculation for **elsail Hybrid** or **elsail Solo**:
For use as main propulsion in displacement vessels: ± 2 kW per ton (1,000 kg) displacement/weight

For use as hybride propulsion: ± 1 kW per 1,000 kg to acheive 60 to 80% of the hull speed of a displacement vessel.

Red : mech. cable
Blue : mech. cable
Grey : signal cable
Black : power supply cable



Standard delivery includes: PERM DC-Disc motor on adjustable support plate, mounting plate with pre-assembled thrust bearing unit, all installation materials (bolts, nuts etc.), electro-magnetic clutch, multi-belt and pulleys, all power cables (excl. cable from batteries to control box, pre-programmed control box with all necessary safety devices and fuses, switch panel, de-coupler for gearbox lever, control sensor-unit rev control.

'Rule of thumb' to calculate the capacity of the batteries: For each 'step' of 12 Volt a (AGM/Gel) battery of appr. 150 Ah is needed to run at full speed for 1 hour, or 2 hours on 80% of full power, or 4 hours on 50% of full power.
Example: For a 48 Volt / 4.74 kW installation, 4 batteries of 12V /150 Ah are needed to run at full speed for 1 hour.