

elsail Hybrid

universal hybrid drives



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:

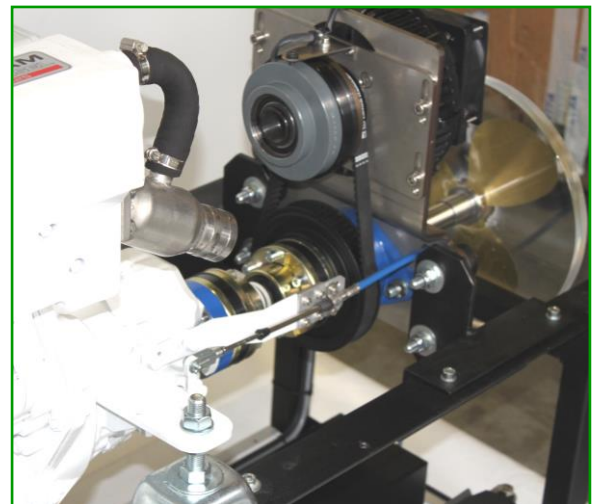
- High power output and low consumption. The PERM DC-Disc motors deliver 4.7 and 7.2 kW.
- Silent and controlled manoeuvring under all conditions
- Acceptable cruising speeds for yachts and boats with (diesel) engines up to 150 hp
- Charges batteries while sailing or while operating the diesel engine
- Easy to operate switch 'Electric drive – Diesel – Charge' for switching from electric drive to diesel power and the other way around by automatic engaging and disengaging of electromagnetic clutch
- If either drive has a malfunction (f.i. because of clogged diesel 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 at any desired position on the prop shaft and is suitable for any engine or gearbox brand/model
- A standard (morse) control lever can be used in combination with the smart **elsail-Gearbox** cable decoupler and the **elsail-Powerbox** for speed control (4.7 version)
- Nearly any type of flexible shaft coupling can be mounted
- Various integrated safety devices prevent from f.i. the simultaneous engaging of both electric and diesel drive and from overload situations
- Virtually maintenance free
- Delivery includes complete set of cables
- For prop shafts from Ø 20 to 50 mm (larger sizes on request)
- Reduction ratios from 1:1 to 4.5:1 available, so always a good match with the existing installation



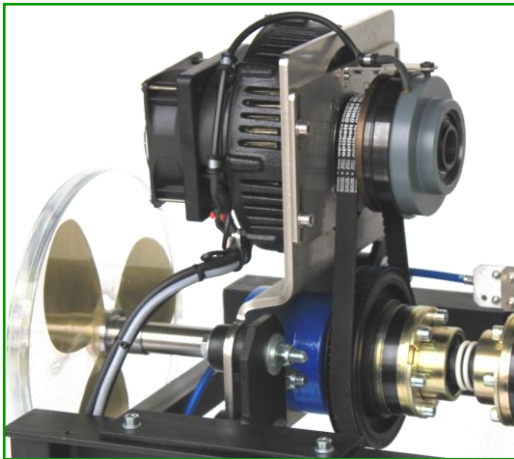
Also available as **elsail Solo** for main propulsion purposes



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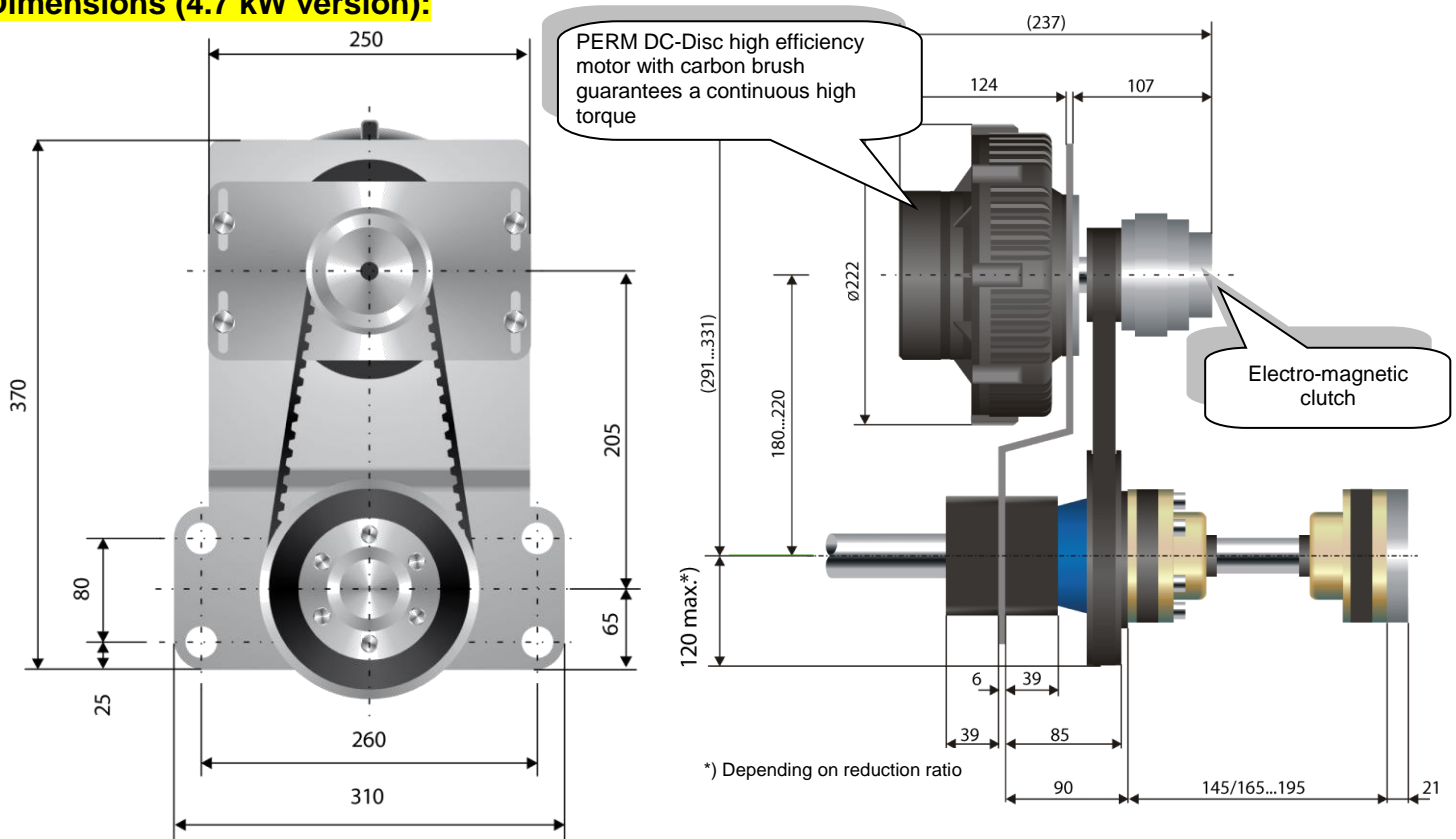


elsail Hybrid



specifications		
Nominal power	4.74 kW	7.2 kW
Voltage	48 V	48 V
Motor speed in rpm.	2,300	1,500
Current (Amp)	110 A	200 A
Peak current (max.10 min)	200 A	350 A
Max charging current (Amp) when used as generator	90 A	140 A
Nominal torque	20 Nm	45 Nm
Peak torque	38 Nm	85 Nm
Available ratios	1.5: 1 till 4.5:1	1.5:1 till 4.5:1
Total weight	33 kgs.	58 kgs.
For prop shaft diameters	Ø 20 - 40 mm.	Ø 30 – 50 mm.

Dimensions (4.7 kW version):



Standard delivery includes: a) PERM DC-Disc motor on adjustable support plate, b) mounting plate with pre-assembled thrust bearing unit, c) all installation material (bolt, nuts etc.), d) electro-magnetic clutch, e) multi-belt and pulleys, f) all cables (excl. cable from batteries to control box), g) pre-programmed control box with all necessary safety devices and fuses, h) switch panel, i) decoupler for gearbox lever control, j) sensor-unit rev control.

Method of calculation for **elsail Hybrid** or **elsail Solo**:

When used as main propulsion for displacement vessels meant to achieve hull speed: ± 2 kW per ton (1,000 kgs). For (semi-)planing vessels other criteria are used.

When used as hybrid drive: ± 1 kW per ton to achieve 60 to 80% of the hull speed of a displacement vessel.

'Rule of thumb' to calculate the capacity of the batteries f.i. for the 4.7 kW unit 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.

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