



# HUNDESTED RPS AND SPS LOW RESISTANCE PROPULSION SYSTEMS

The RPS (Retractable Propulsion System) and SPS (Saildrive Propulsion System) are modern saildrive systems with low weight and great flexibility.

- Lightweight
- Complete with CP Propeller
- Capable of both propulsion and regeneration
- Require minimum space inside the hull and engine room
- Can be positioned near the center of the vessel
- Highly efficient when motoring
- Replace a normal stern propeller
- Low noise
- Very easy installation



**HUNDESTED**  **PROPELLER A/s**



RPS Propulsion system



S/Y Canova equipped with a Hundested SPS.

## ABOUT THE SYSTEMS

**The RPS** is a retractable swing saildrive unit. Inside the boat is a 'wet box' where the RPS is mounted until it is needed. It can then swing out when required. The wet box has a door that keeps the hull as hydrodynamic as a per her design. In propulsion/regeneration mode only the leg protrudes from the hull. The RPS has an ahead/astern controllable pitch propeller.

**The SPS** is a fixed saildrive solution where the propeller can go into feathering position. This gives significantly less resistance under sail than a normal shaft, P bracket and propeller. The SPS takes up less space in the engine room than the RPS since there is no need for a wet box.

## POWER SUPPLY AND LAYOUT

Both the RPS and SPS can be driven by an electrical motor or a combustion engine. The RPS will always have the power in at a horizontal direction. The power unit can be positioned aft of the RPS or on the side depending on how it is most convenient. If a combustion engine is used a clutch unit must be mounted on the engine. In the clutch unit it is possible to have two PTO/PTI. In this instance the PTI can be used for regeneration.

If an electric motor is used as a power unit, the installation can be with or without the clutch unit. Without the clutch unit the installation time is reduced. With the clutch unit the use of the PTO is possible. The PTO may be used for sail handling or other hydraulic functions, and this removes the need for an external powerpack.

The SPS can have an electrical motor mounted directly on top of the leg. This will take up

minimal space in the engine room. It can also be delivered with an angle drive in top to have a diesel power unit. In this instance it will then also have a clutch unit and the propeller pitch from feathering to astern.

Both variations are available in five sizes; 286, 335, 386, 426 and 470. The number corresponds to the diameter of the propeller hub and that corresponds to the power.

**286 goes up to approx. 400kw**  
Propeller diameter is 900mm

**335 goes up to approx. 540kw**  
Propeller diameter is 1000mm

**386 goes up to approx. 660kW**  
Propeller diameter is 1200mm

**426 goes up to approx. 860kW**  
Propeller diameter is 1400mm

**470 goes up to approx. 1000kw**  
Propeller diameter is 1600mm

## PROPELLER ORIENTATION

When designing the system for the boat it is important to decide where the focus lies. Is the focus on motoring or regeneration, as the propeller on an RPS/SPS can be positioned forward or astern, as the leg can turn 180 degrees.

If the focus is on having the best possible efficiency when motoring the propeller should be pointing forward when in motoring. If the focus is on regenerating the propeller should be pointing astern when motoring.



SPS – Saildrive Propulsion System.  
The weight is from approx. 950 kg  
excluding the electrical motor.



RPS – Retractable Propulsion System  
with the clutch box. The weight of the  
propulsion unit for a 286 is approx. 1200  
kg and the clutch box is approx. 400 kg.  
The dimensions of the wet box in the  
hull is app. 2x1x1 m.

## REGENERATION

Regeneration is possible on both systems. When in regeneration mode, the propeller should always turn the opposite direction to motoring. If a diesel driven RPS is used for regeneration a hybrid clutch must be mounted on the input shaft of the clutch unit and the generator on the PTO/PTI. The power will then come from the propeller into the clutch unit and out through the PTO/PTI. The size of the generator is limited due to the size of the PTO/PTI. If the RPS is electrical driven, the propeller will simply drive the motor/generator and the system will regenerate.

If an electrically driven SPS is used for regeneration, the electrical motor/generator on the SPS is mounted directly on top of the leg and it is then the size of the generator or the electronic parts connected to the generator.

If a diesel driven SPS is used for regeneration a hybrid clutch must be mounted on the input shaft of the clutch unit and a generator on the PTO/PTI. The power then comes from the propeller into the clutch unit and out through the PTO/PTI. The size of the generator is limited due to the size of the PTO/PTI.

On a conventional propulsion system about 20% of the designed power take out can be regenerated in comparison to 27% on an RPS/SPS as the leg can be turned 180 degrees. Turning the propeller blades the opposite way makes them about 30% more efficient than a standard Hundested CP Propeller positioned for regeneration.

If your primary focus is regeneration, then it is possible for us to design the blades specifically for this.

## MOTORING

Under motor, the RPS and the SPS work the same way. The leg can be used with the propeller pointing forward or astern. Note, the leg is not intended to be used as a steering system and should remain in a fixed position when motoring.

## MANOEUVRING

When manoeuvring we recommend having the engine in a fixed medium-range RPM and the lever only adjusts astern – ahead by changing the pitch of the propeller. The leg can now be turned sideways and give full thrust. The leg turns from ahead to sideways in less than three seconds.

The leg can give thrust in any direction when manoeuvring so the boat can be manoeuvred without the need of a conventional bow thruster.

**SPS – Saildrive Propulsion System.** The weighs approx. 950 kg excluding the electrical motor.

**RPS – Retractable Propulsion System** with the clutch box. The propulsion unit for a 286 is approx. 1200 kg and the clutch box is approx. 400 kg. The dimensions of the wet box in the hull are app. 2 x 1 x 1 m.





S/Y My Song, equipped with Hundested SPS



S/Y Path, equipped with the Hundested SPS

## INSTALLATION

The installation of a RPS or SPS makes hull building much simpler as there is no requirement for the following:

- Stern tube
- Shaft seal
- Boss pipe
- A-bracket / P-bracket
- Complicated alignment between a-bracket, stern tube and gearbox
- Heavy lifting equipment to lift shaft and propeller in

### **For an electrical SPS you will need to provide the following:**

- Four strong and perfectly alligned points
- A hole in the bottom for the leg.
- If it is diesel driven we also need frames for engine and clutch unit.

### **For an RPS you will need to provide the following:**

- A wet box
- Frames for engine and clutch unit

## REFERENCES

Baltic Yachts, Finland, has selected the Hundested Propeller SPS and RPS for their custom built sailing yachts that are designed for performance racing and cruising.

Double SPS installation in a 69 m sailing yacht, using no fossil fuels - due to be launched in 2025.