

# Drop-in power units

Available in a range of outputs, drop-in units offer an easy route to electrification

WORDS: MARCO OTTIKER & ANNE SØRFLAKNE



Propulsion specialist EPTechnologies has developed a range of high-power, complete drop-in units for stern, jet and shaft drives. These units start from approximately 60kW and are available up to 340kW. Systems with lower kW outputs can be produced upon request. The unit has been designed for easy installation, and as an 'all-integrated' system. Units have five points, which must be connected: the seawater inlet/outlet, plug and three cables (for the power lever, the display and the key switch). When installed, the boat and drop-in unit function as one harmonized system.

Many shipyards would like to switch to electric propulsion, acknowledging the potential future market share and environmental benefits. One of the big obstacles to this, however, is their own electric divisions - as such a move requires an increase in workforce.

The challenge in today's market is the difficulty in finding qualified electricians to meet such high demand. This is where the idea started to create a drop-in unit with various power levels, able to cover most of the needs found in the marine market.

In order to install the drop-in unit in the boat, a frame is designed to fit the vessel exactly. This is done in collaboration with the yard. The drop-in unit is shipped and an employee from EPTechnologies will help install the system as much as is needed. This can also be performed remotely.

1. EPTechnologies' high-power drop-in unit
2. The SAY Carbon Yacht 42 as an example platform for the drop-in power unit

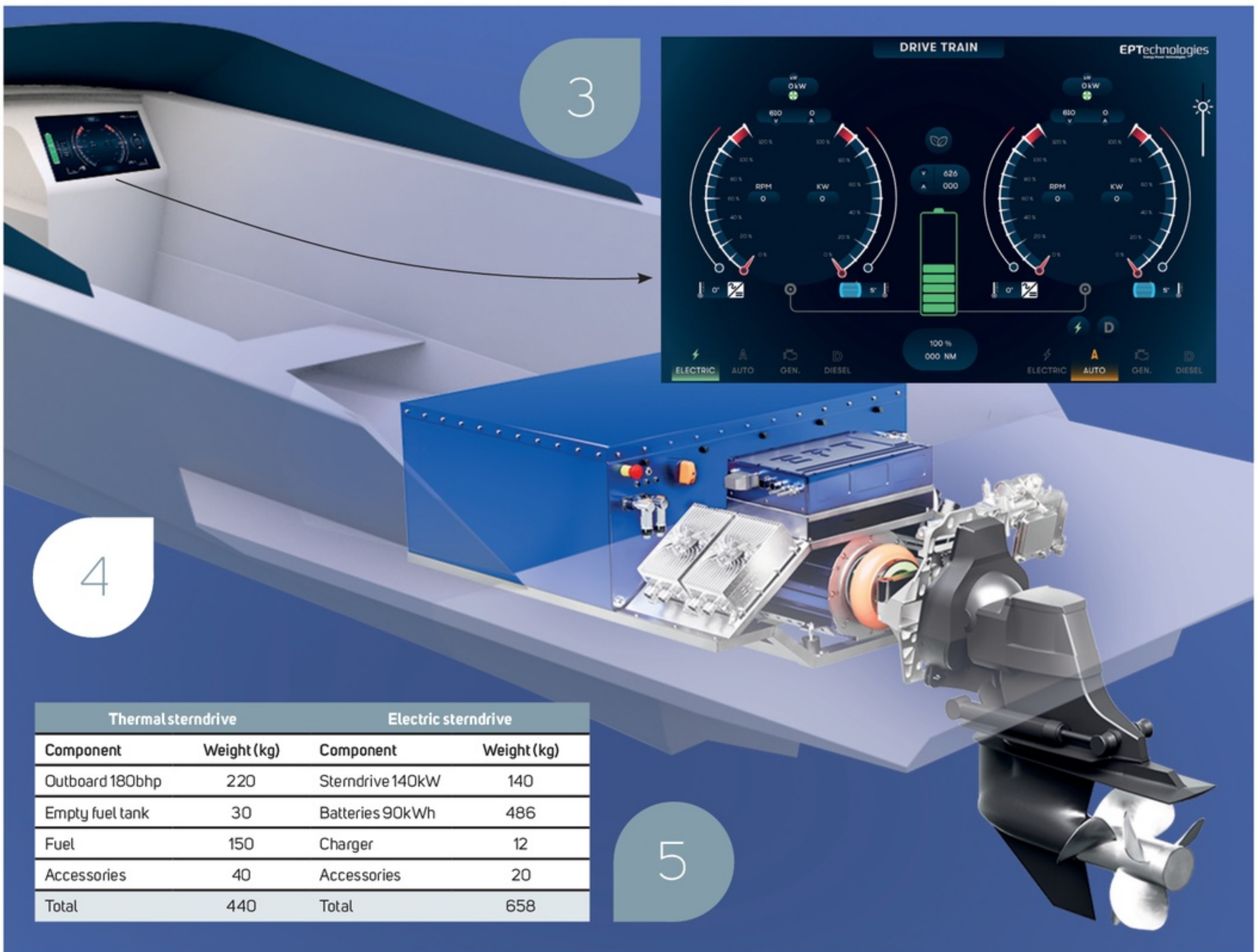
The units include the EPTechnologies display, but customers can opt for a customized Raymarine or Garmin display with an incorporated EPT page, if preferred.

## Powering change

The drop-in units include new, super-light marine batteries, weighing 5.2kg/kWh. In Q1 2023, EPTechnologies aims to reduce this to only 4.9kg/kWh. EPTechnologies determined that it was essential that systems be lightweight, to save energy. It was this that led to the company starting to develop its own batteries.

The marine batteries come with an IP66 rating, are modular and have 1.8C continuous discharge. They also have a built-in fire





Thermal sterndrive		Electric sterndrive	
Component	Weight (kg)	Component	Weight (kg)
Outboard 180bhp	220	Sterndrive 140kW	140
Empty fuel tank	30	Batteries 90kWh	486
Fuel	150	Charger	12
Accessories	40	Accessories	20
<b>Total</b>	<b>440</b>	<b>Total</b>	<b>658</b>

extinguisher to optimize safety. For high-temperature regions such as the Middle East, the batteries have an optional modular water- or air-cooling system.

All components are carefully balanced for lightweighting and endurance, including the e-motor and the controller.

Figure 5 shows a comparison of a thermal and an electric setup on a standard 8.5m day cruiser. The difference is limited, but the aim is to optimize performance further. While the vessel doesn't offer a large range (and while performance depends on hull performance and drive profile), an electric setup is suitable for 89% of boaters' daily trips.

For this type of vessel, the performance of EPTechnologies' larger sized battery bank would be up to two hours at 20kts, 1.5 hours at 25kts or 12 hours at 6kts, depending on platform and speed.

Another version of the drop-in unit can also be installed in combination with EPTechnologies' electric outboarder. The

- 3. EPTechnologies' touchscreen display
- 4. The drop-in power unit as located in a SAY 29
- 5. A comparison of drive units in an 8.5m day cruiser, showing the weight of an ICE and electric system

procedure is the same. The outboarders can be specified with a range of power outputs - from 50bhp to 400bhp - and are built to offer easy operation, high levels of performance and high security standards.

EPTechnologies can provide full remote diagnostics, and update access to the boats.

The EPT BoatControl app is a practical extension of this package. The app enables customers to see battery capacity and provide shore power control, and it also works as a remote control for the charger. In addition, it grants 10 extra contacts/switches of the customer's choice and an NMEA 2000 interface with vessel data. For example, this makes it possible to monitor the boat's status, switch on the fridge and cool the drinks.

In Q2 2022, EPTechnologies will present a new, compact DC range extender for 48V to 700V systems, providing 9kW and weighing only 60kg. This system will have a very small footprint and be easy to install, making it suitable for small vessels. +