

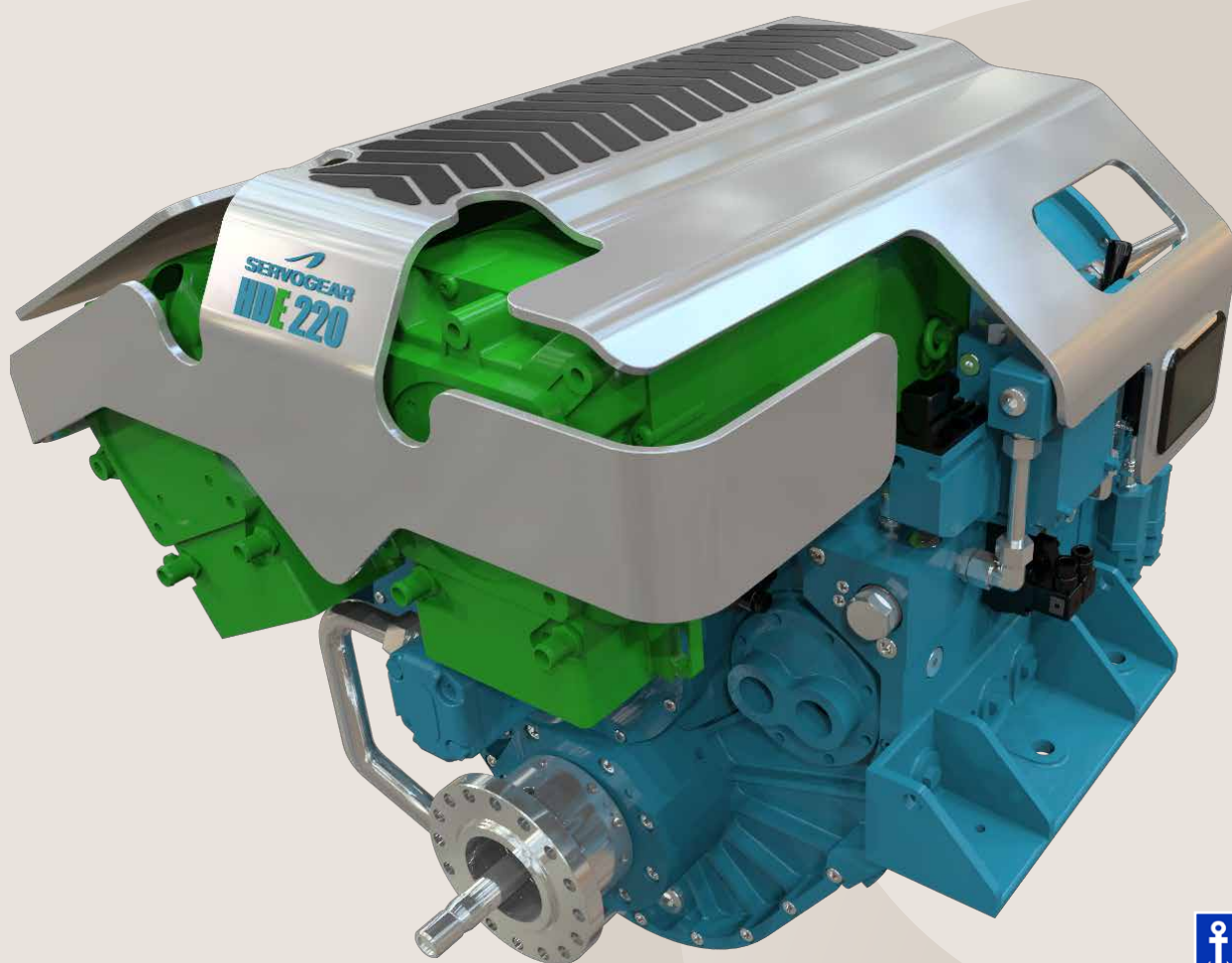


Part of BOS Power

GEARBOX HDE220

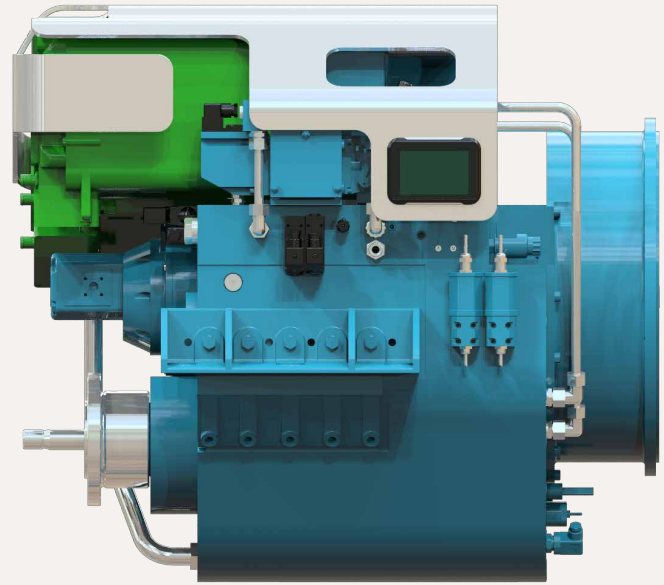
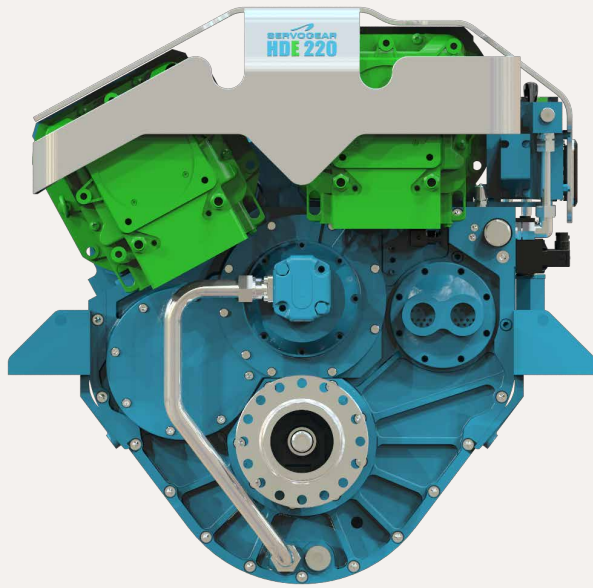
Zero local emissions.

DATA SHEET



Type
Approved
Product

Introduction of the new Servogear HDE220 Hybrid Gearbox



The HDE220 is a light weight hybrid gearbox for high-speed vessels. Depending on the chartered operational profile, and the demands of green footprint from local authorities, the operator can choose to sail electrically or on diesel engines.

This allows the shipowner to support the new "green port certificate" for their vessels.

TECHNICAL SPECIFICATIONS FOR THE SERVOGEAR HDE220 GEARBOX

- **The first completely integrated CPP – plug in hybrid solution on the market**
Built on well proven technology of the HD220 gearbox, combined with the latest electric drive technology.
- **Max input 900 kW @ 2250 rpm**
- **Up to 2 x 150 kW electric motor/generator**
Special designed-, compact-, liquid cooled PM motors from 50 kW to 150 kW, delivered in pairs or single.
- **Same footprint as Servogear HD220**
Makes it interchangeable in retrofitting existing vessel propulsion lines.
- **Integrated pitch actuation**
All functions for the CPP are integrated in the gearbox.
- **Integrated oil cooler**
No spill from hoses and connections outside the unit.
- **Light weight AL-7075-T6 casing**
In the high-speed vessel market, weight is essential. By reducing gearbox weight, extra battery capacity could be added instead.
- **PTO with clutch**

WHY CHOOSE A HYBRID SOLUTION?

Compared to a conventional gearbox, a hybrid solution results in operational cost savings and a lifetime extension for the main engine (TBO).

It is also a major opportunity for the shipowners to make a significant step towards achieving a green vessel profile, and therefore being more attractive for the chart and operators.

ADVANTAGES



- Charging “overnight” at quay side
- Reduced fuel consumption
- Reduced emissions, NOx and CO₂
- Reduced maintenance costs on main engines
- Possibility for zero emissions in harbour operation mode
- Cost savings for the ship owner
- Increased comfort for the crew

WHO WOULD BENEFIT FROM A HYBRID SOLUTION?

The Servogear hybrid solution is ideal for vessels with various operating modes such as workboats, fast ferries, sightseeing vessels and pleasure crafts.



WORKBOATS

Inefficient low power idling between assignments is an ideal condition to run on electric power instead of diesel only.

Our hybrid solution enables the vessel to hold position in the field for hours without the need of starting the main engine. All the energy required for manoeuvring is provided by the combined generator set and battery package.



PASSENGER VESSELS

The operator has the option to run the vessel in electric mode in urban/populated areas, without any emissions. This is especially an advantage in areas where environmental legislation is limiting operation.

‘There is no noise, no smell’ during sightseeing mode. A hybrid solution facilitates a new level of sophisticated transport at sea, perfect for tourist- and pleasure crafts.

CONFIGURATIONS OF EQUIPMENT

The configuration and sizing of a battery supported hybrid system for a high-speed vessel is influenced by following criteria:

- **The required capacity (kWh) for electric propulsion.**

The vessel's operating profile determines the balance between charging and discharging the battery package.

Battery capacity is mainly addressed during slow steaming and/or position keeping. The batteries are charged by the gearbox mounted- PM generator/electromotor(s) while steaming from A to B on conventional diesel engines. This is typical on long and fast relocations. When docking, the batteries will be further charged by means of a shore connection.

- **The weight of the additional hybrid equipment**

For high-speed vessels the impact of the additional equipment weight needs to be evaluated thoroughly. However, small adjustments in the vessel's operating profile allow for further optimization. By e.g. reducing the transit speed by 1 – 2 knots, the weight can be increased for a battery pack, extending the capacity for operating in electro mode at location.

Furthermore: (re-)evaluation of the existing power supply on board could provide another opportunity to further optimize utilization of a hybrid system. The gensets on board e.g. are predominantly for vessel operations and hotel power. These gensets could, if class society rules allow, be removed and the power can instead be taken from the batteries via inverters. The subsequent weight reduction can be addressed to install more capacity on the battery bank.

At quay side, gensets are not required as the vessel gets its' charging and hotel power from a shore-connection, a purposed electric infrastructure for hybrid operations provided by operators/chart.

FINALLY:

A hybrid solution will provide increased comfort for the crew, especially in slow speed/trolling operations and anchored at location.

Reduced noise and vibrations and no cloud of exhaust gases around the vessel in calm weather, as the crew can now shut down both the genset and the main engine and run on batteries only.

With the Servogear hybrid solution, the vessel can hold position for hours, without running the main engines, as the energy comes from the combined battery/genset: a fully electric driven propulsion system with full manoeuvrability!

