

New energy for marine applications

The future of electrified drive systems



The trend towards electrification

Bosch Engineering offers electric propulsion systems for recreational boats and yachts which shipyards and system integrators can use to implement electrification quickly and easily.

In many regions of the world, new environmental laws for inland and recreational boats will come into force in the coming years. This is a trend not only among shipyards and many boat manufacturers.

The increasing customer demand for a more environmentally friendly and low-noise motorization is also driving the industry. With its electrification solutions, Bosch Engineering wants to play a decisive role in driving the change in shipping, giving boat manufacturers exactly the drive components and system solutions they need.

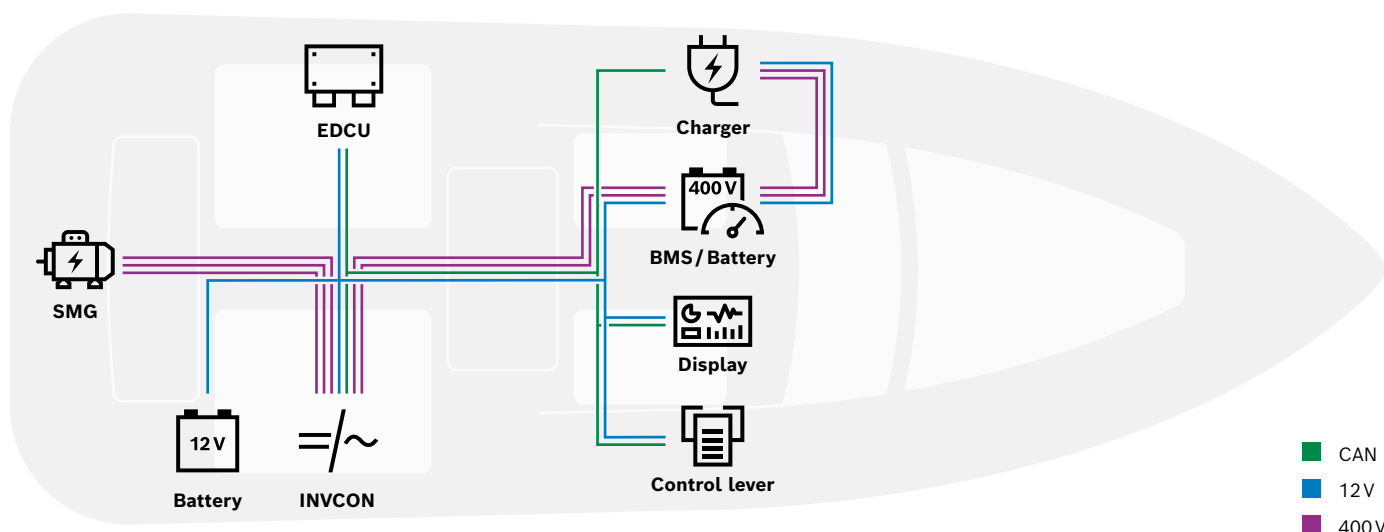
Electric drive system platform: easy integration thanks to platform approach

With the electric drive system platform (EDSP), Bosch Engineering offers boat manufacturers a high-quality solution for electric boat drives. This includes Bosch's own drive components, such as electric motors, inverters and transmissions, as well as all other relevant components like high-voltage batteries, chargers, and cable harnesses. Together with the EDSP, users also receive a description of all the core information required for integration into the boat. This includes a system manual, component specification, ECU software, as well as a commissioning package. In addition, the EDSP approach significantly shortens the time to market for production use.

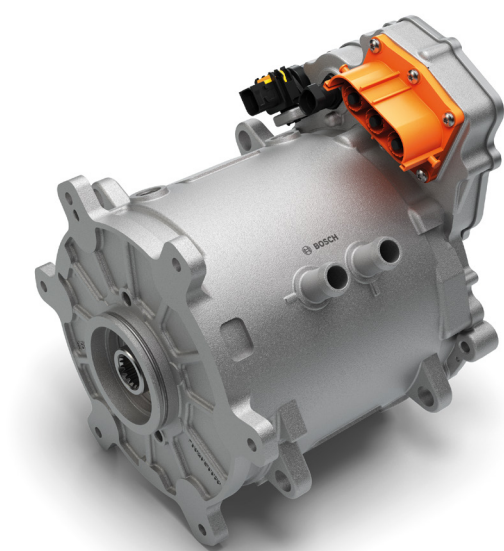
With the EDSP, boat manufacturers benefit from a predefined complete solution that can be installed in sports boats or yachts easily, quickly, and cost-effectively. Moreover, the drive components can also

be supplied individually for independent integration by the customer. The motors are available in two peak power levels of 90kW and 140kW. In particular, the design of the 400V permanent magnet synchronous motor has a high power density and is extremely efficient. The inverter is equipped with a powerful DC/DC converter to supply the 12V consumers, while the reduction gear boasts an impressively high efficiency, runs very quietly, and requires very little maintenance.

The compact dimensions allow boat manufacturers to easily integrate the components even in confined spaces or to retrofit existing applications. What is more, the low total weight of the components increases the maximum range of the boat.



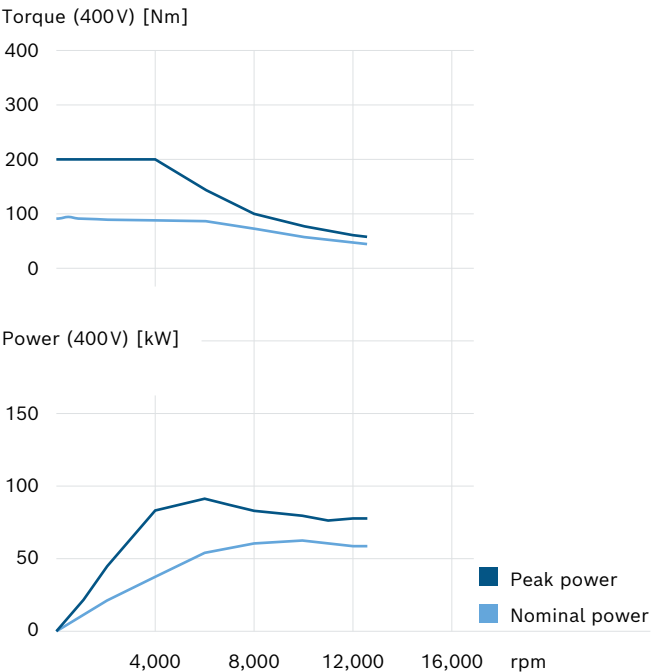
Short overview of technical data



Separate motor-generator 180 off-highway with optional reduction gear

Innovative and powerful shaft drive with a top power of 90 kW

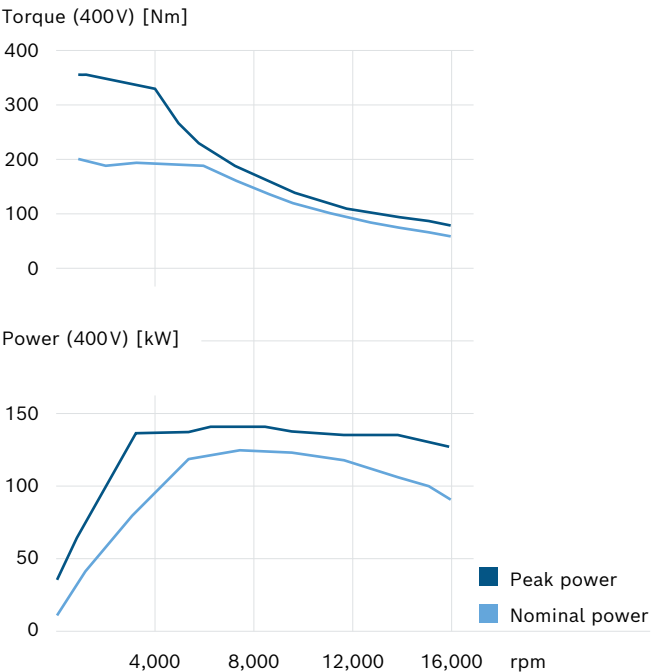
Nominal power	60 kW
Peak power	90 kW
Comparable performance	82 HP
Voltage	up to 425 VDC
Torque	90 Nm
Rotational speed	12,800 rpm
Weight	30 kg

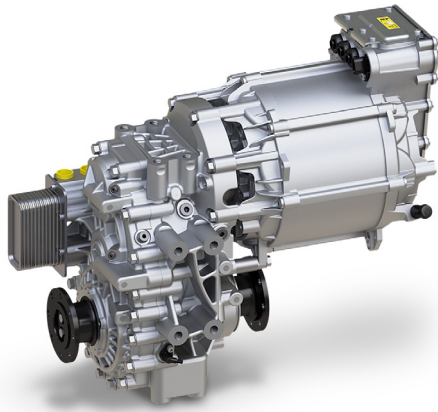


Separate motor-generator 220 off-highway with optional reduction gear

Permanent magnet, water-cooled synchronous motor with high speed and highest power density

Nominal power	120 kW
Peak power	140 kW
Comparable performance	163 HP
Voltage	up to 425 VDC
Torque	200 Nm
Rotational speed	16,000 rpm
Weight	60 kg



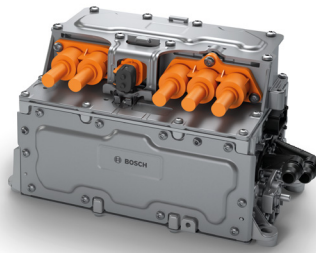


SMG220 with gear unit eGFZ9125

Reduction gear compatible with Bosch SMG motors

Type	1-speed gearbox
Max. output torque	3,800Nm
Ratio	4.0/4.6/5.0/6.0
Noise	NVH*-optimized for best noise reduction

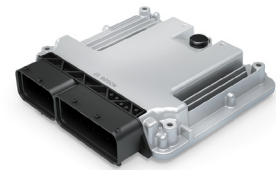
*: noise/vibration/harshness



Inverter INVCON3.3 off-Highway

Power electronics with integrated DC/DC converter for Bosch electric drives

Voltage range, high voltage	205 to 425VDC
Voltage range, low voltage	10.6 to 15.0VDC
Peak power	140kW
Communication interface	CAN 2.0A, 500kbit/s
Dimensions	327×191×192mm
Weight	10kg



EDCU (Electric Drive Control Unit)

Central ECU for controlling and coordinating the entire drive system, including interfaces to the control lever, battery management system, on-board charger, display, and diagnostics tool.

Core functions

- ▶ Control of the drive system
- ▶ Coordination of the high-voltage system and charging process
- ▶ Control of the cooling circuits
- ▶ Display outputs
- ▶ Diagnostic functions

At a glance:

- ▶ With the new electric drive system platform (EDSP), Bosch Engineering offers a sophisticated system solution for simple and fast integration in the boat
- ▶ The EDSP system guideline and software make it easier for users to create a high-voltage drive system that meets the requirements of the European Recreational Craft Directive, at the same time complying with the latest state of the art in functional safety and cybersecurity
- ▶ The platform solution is based on proven high-performance and particularly compact components from the automotive sector
- ▶ The drive components can also be purchased individually for independent integration by the customer



Find more information on our website!

Bosch Engineering GmbH

Robert-Bosch-Allee 1
74232 Abstatt
Germany
Phone +49 7062 911-02

www.bosch-engineering.com