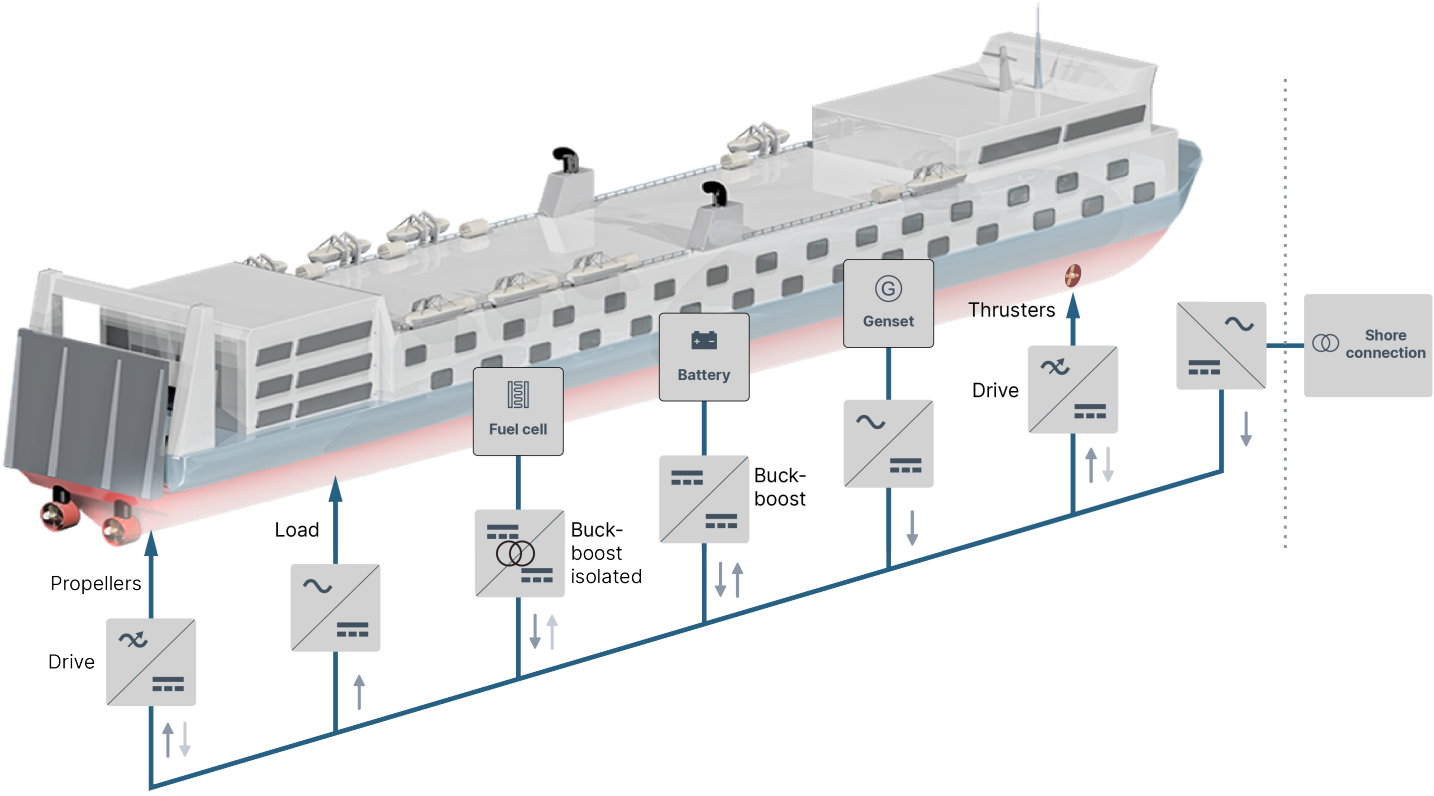
Introducing the iE Convert



For almost 100 years, DEIF has provided reliable products to the marine industry. This includes bridge instrumentation and advanced controllers. DEIF provides customer support with a global presence.

We have partnered with AVL and Wolfspeed to create marine power converters based on the latest silicon carbide technology. Power converters engineered by AVL have been used in demanding applications for years. Our collaboration with Wolfspeed ensures a steady supply of reliable silicon carbide MOSFETs.

Why silicon carbide?

Silicon carbide (SiC) operates at very high switching frequency. The high switching frequency leads to smaller filters, and there is low energy loss across a wide load range. Thanks to the smaller filters, SiC power converters are smaller and lighter than similar products based on IGBTs.

Smaller: Compared to IGBTs, the power converters require 60 % of the volume. This saves valuable engine room space.

Lighter: Compared to IGBTs, the power converter weight is 30 to 40 %. The lower weight means lower energy consumption over the life of the vessel.

99%

Efficiency: Lower energy losses mean a higher efficiency, which adds even more to the fuel savings. Lower losses also means less cooling demand. In addition, SiC technology has an almost flat efficiency curve. This means energy savings at all load factors (rather than at one sweet spot).

High efficiency over a wide range: SiC technology has an almost flat efficiency curve. This means energy savings at all load factors (rather than at one sweet spot).

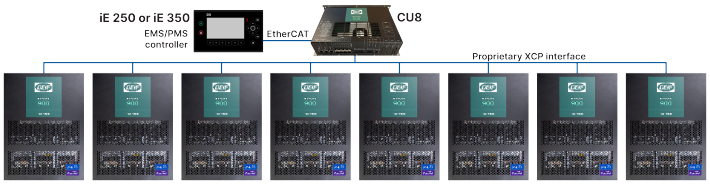
Galvanic isolation: On hybrid vessels with multiple energy sources, such as fuel cells, it is essential to prevent circulating and stray currents. Our technology provides isolation through soft-switching CLLC topology and a switching frequency up to 75 kHz.

Power quality: Faster switching means more accurate energy transformation. Our converters deliver higher quality power with minimal harmonic distortion.

Thermal performance: SiC MOSFETs can withstand a junction temperature up to 200 °C, which is much higher than IGBTs. This enables operation at sustained higher loads and flexibility in handling peak loads.

How it works

iE Convert is easy to install and simple to use. The platform uses modular design, with three form factors. Up to eight power blocks can run in parallel and synchronise. As a result, the iE Convert offers a wide range of power conversion capacity, from 125 kVA to 6 MVA.



You can connect the iE Convert controller to a DEIF iE controller for seamless power/energy management. For PLC integration, you can use the CODESYS platform from DEIF.

Power block	Power	400 V AC	690 V AC
iE Convert 125	125 kVA	180 A	105 A
iE Convert 500	500 kVA	693 A	402 A
iE Convert 900	900 kVA	1300 A	753 A

Specifications

Power losses: 1 to 2 %
Switching speed: 24 to 75 kHz
AC nominal voltage: Up to 690 V AC, at 50 or 60 Hz, and up to 400 Hz for special cases
DC nominal voltage: 750, 1100, or 1350 V DC
Protections: Voltage, current, and fault monitoring
Supply: 12 to 36 V DC, 5 A

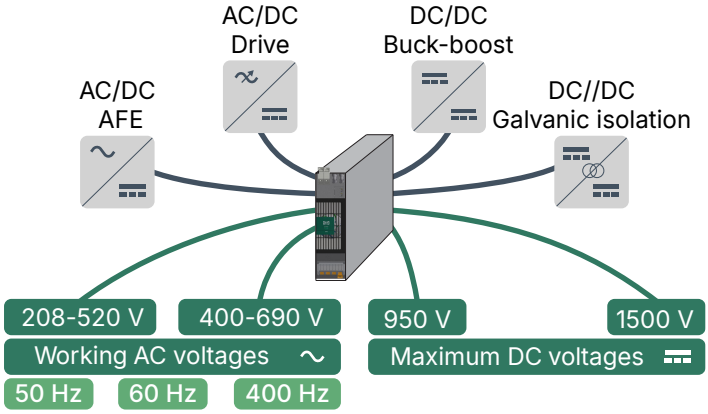
Housing: IP2X, or none (IP00)
Ambient temperature: -20 to 60 °C
Coolant temperature: 20 to 40 °C
Coolant type: Antifrogen N-water mix: 25:75
Humidity: 95 % RH, non-condensing
Altitude: Up to 2000 m

Communication: Modbus interface, EtherCAT

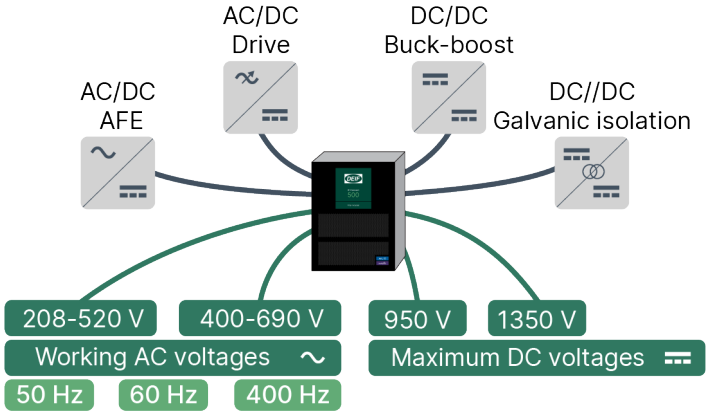
Standards and approvals: DNV-GL (Marine), UL, Cybersecurity, CE, RoHS

Form factors

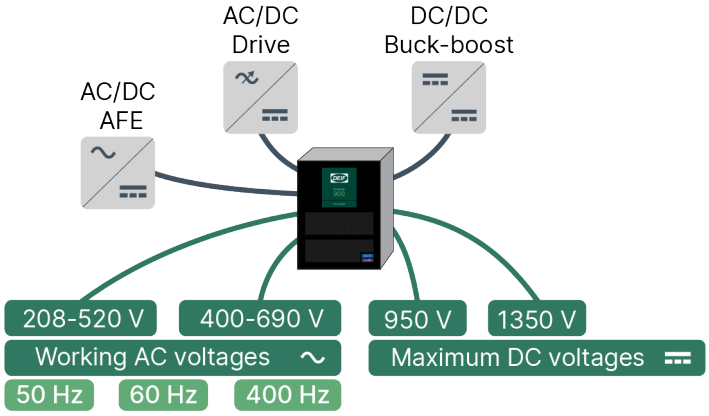
iE Convert 125



iE Convert 500



iE Convert 900



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Marine application guide