BORDLINE® CC1500 AC converts the power from the AC overhead line into propulsion power required for driving the traction motors and efficiently generates auxiliary power for onboard consumers.

**Characteristics**
- Innovative three-level converter technology
- Solid construction and consequent design for low maintenance
- High energy efficiency
- Motor-friendly (retrofit)
- Line-friendly
- Intelligent multi-system concept
- Integrated auxiliary converter

**System overview**
Incoming power from the catenary is stepped down by the main transformer to the Compact Converters BORDLINE® CC1500 AC. They supply the motive power via the traction motors. Energy recuperated during braking is fed back through the same chain into the traction supply network.

BORDLINE® CC1500 AC Compact Converter contains:
- System switches for 15 kV and 25 kV grid voltage
- Input contactor and precharger
- Two line converters (4Q)
- DC-link and resonant filter capacitor
- One voltage limiter
- One propulsion inverter
- One auxiliary inverter (optional)
- AC 800PEC control module

**Propulsion converter**
BORDLINE® CC1500 AC Compact Converter is a rugged unit incorporating modern IGBT technology. It can control a single motor or two motors in parallel. The Compact Converter is based on ABB’s well-proven three-level topology, which has several advantages over conventional two-level solutions: It is better for the motor, better for the grid, and it saves energy!

**Powerful control platform**
ABB traction converters are built on the AC 800PEC control platform, one of the most powerful modular controller for high-speed performance on the market. This control platform is also used in a wide range of industrial applications. The AC 800PEC software is implemented on three performance levels, thus providing an excellent range of control and communication functionality, in cycle times that extend from the sub-microsecond to the millisecond level. Compared to most other commercially available traction control systems, the modular application software in the AC 800PEC reduces train commissioning time significantly.
Cooling system
The equipment is efficiently liquid-cooled, resulting in a longer lifetime for all the components and a smaller converter size. The coolant (regular tap water with glycol) dissipates energy through an external heat exchanger.

Mechanical design
BORDLINE® CC1500 AC is housed in an IP54 cabinet, designed for mounting within the machine room. Due to its modular design, the converter can also be adapted to different vehicle layouts and is also available for underfloor mounting. The converter allows for easy access for maintenance.

Diagnostics and service
The service-friendly modular design with highly standardized components ensures high reliability, excellent spare parts availability, and optimized life-cycle costs. The Compact Converter is delivered with BORDLINE® View, a diagnostic tool that visualizes signals, various parameters and the state of the traction system. It consists of an advanced self-diagnosis function, which provides advice and instructions for service and repair. BORDLINE® View is easy to use and runs on a standard PC.

Application examples
The 25/15 kVac version of the BORDLINE® CC1500 series replaces the older gate turn-off thyristor (GTO) equipped traction converters in the Swedish X2 high-speed trains. The new Compact Converters increase train availability and significantly reduce energy consumption and operating cost. After the upgrade, all power heads will be ready for 25 kV operation in Denmark.

ABB will supply the electrical system for 36 trains, including traction transformers, traction converters, battery chargers, electrical subsystem, train control and management system, infotainment, door control (interior), interior lighting and modernisation of HVAC.

Technical data
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<td>Propulsion output</td>
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