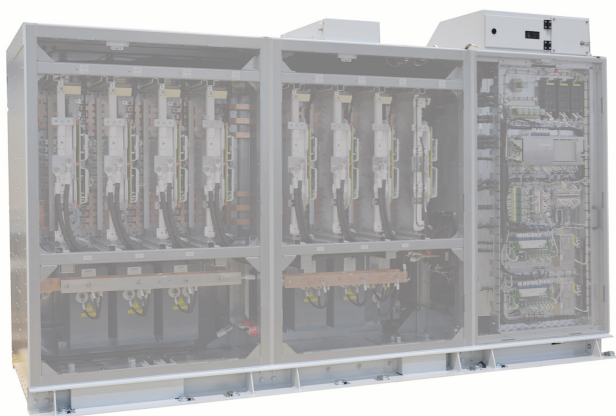


COMPACT CONVERTER

BORDLINE® CC1500 AC_15kV

For electric locomotives



—
Traction converter
BORDLINE® CC1500 AC

Characteristics

- Solid construction and consequent design for low maintenance
- High energy efficiency
- Motor-friendly
- Designed for perfect integration in existing machine room

System overview

Incoming power from the catenary is stepped down by the main transformer to the BORDLINE® CC1500 Compact Converters. 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 contains:

- Input contactor and precharger
- Two line converters (4Q)
- DC-link and resonant filter capacitor
- One voltage limiter
- One propulsion inverter
- AC 800PEC control module

BORDLINE® CC1500 AC converts the power from the AC overhead line into propulsion power required for driving the traction motors.

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!

• Better for the motor

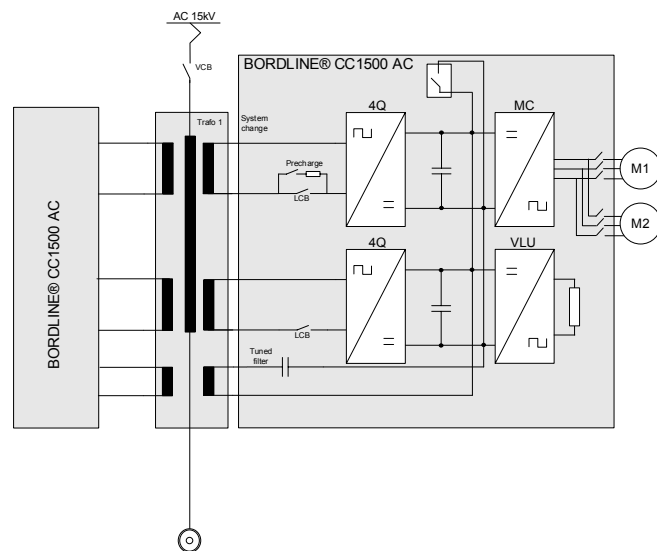
BORDLINE® CC1500 AC three-level inverter has double the conventional semiconductor switching frequency, which optimizes the sinusoidal current waveform. Current and torque ripples are reduced by more than a factor of four, which in turn drastically decreases losses, audible noise and mechanical stress on the traction motor. In addition, the voltage gradient stress on the motor's insulation materials is reduced by a factor of two. These motor-friendly characteristics render the three-level inverter an ideal solution for retrofit projects where existing motors need not be kept.



01

01 Locomotive Re 460 of Swiss Federal Railways
Photo: SBB

02 Blockdiagramm
BORDLINE® CC1500 AC



02

• Better for the grid

The inherent features of the three-level technology minimize the line interference current. Neither line filters nor active filters are needed to comply with typical grid codes. Furthermore, engineering time and effort for homologation in different countries is minimized.

• Environmentally friendly

Optimal control, together with a high switching frequency through the whole speed range, leads to very smooth, silent, reliable and energy efficient operation.

Powerful control platform

ABB Compact Converters are based on the AC800 PEC control platform which is a modular and flexible high-speed traction control unit designed for harsh environmental and operating conditions in rolling stock.

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 15 kVAC version of the BORDLINE® CC1500 series replaces the older Gate turn-off thyristor (GTO) equipped traction converters in the locomotives of the type Re 460 of Swiss Federal Railways (SBB). The new Compact Converters increase train availability and significantly reduce energy consumption and operating cost.

Technical data	BORDLINE® CC1500 AC_15kV_M_3500
AC voltage input (grid side converter)	1786 Vac
Propulsion output	0... 2800 Vac / 3.5 MW at wheel
Voltage limiter	included
Auxiliary converter (optional)	not equipped
Battery charger (optional)	not equipped
Vehicle control interface	CAN or MVB, I/Os
Mounting position	machine room
Dimensions (L x W x H)	3222 x 900 x 1725 mm
Weight	2590 kg

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