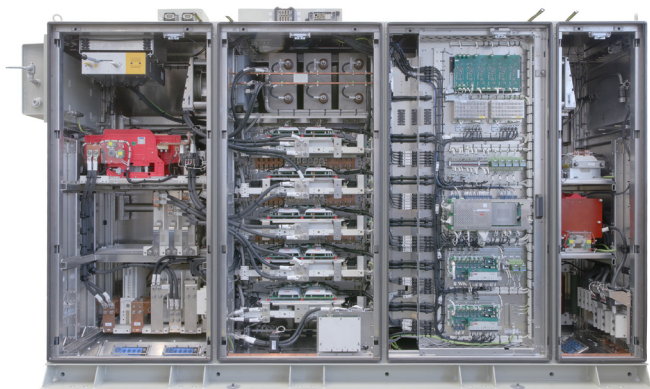


COMPACT CONVERTER

BORDLINE® CC1500 MS

For multi-system high-speed applications



BORDLINE® CC1500 MS converts the power from the AC or DC line into propulsion power for the traction motors.

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Compact Converter
BORDLINE® CC1500 MS

Characteristics

- Innovative 3-level converter technology
- Solid aluminum construction and consequent lightweight design
- High energy efficiency
- Motor-friendly (retrofit)
- Line-friendly
- Intelligent multi-system concept
- Integrated auxiliary converter (optional)

System overview

Incoming power from the catenary is stepped down by the main transformer (for AC lines) or directly fed to two BORDLINE® CC1500 MS 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 MS contains:

- System switches for up to 4 grid voltage systems
- Input contactor and precharger
- 2 line converters (4Q)
- DC-link and resonant filter capacitor
- 1 voltage limiter
- 1 propulsion inverter
- 1 auxiliary inverter (optional)
- AC 800PEC control module

Propulsion converter

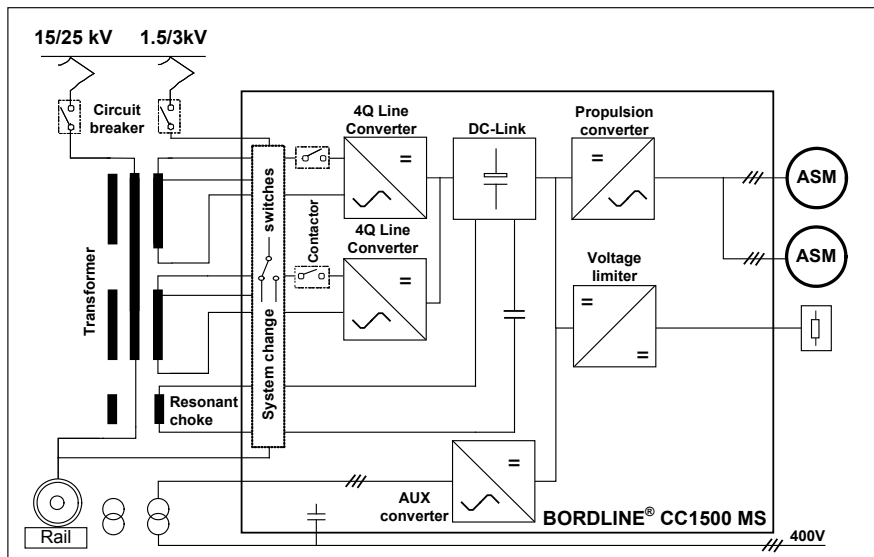
BORDLINE® CC1500 MS Compact Converter is a rugged unit incorporating modern IGBT technology. It can control a single motor or two motors in parallel. The Compact Converter is based on ABB's well-proven three-level topology, which has several advantages over conventional two-level solutions: It is better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

• Better for the 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. Engineering time and effort for homologation in different countries is minimized.

• Better for the motor

The BORDLINE® CC1500 AC three-level inverter has double the conventional semiconductor switching frequency leading to a quasi-sinusoidal current waveform. Current and torque ripples are reduced by more than a factor of four, decreases losses, audible noise and the mechanical stress on the traction motor. Additionally, in the sophisticated configuration of the converter, only half of the line voltage is connected to the motor windings during each IGBT commutation, which cuts the voltage gradient stress on the motor's insulation materials by a factor of two.



02 Blockdiagramm
BORDLINE® CC1500 MS

• Environmentally friendly

Optimal control, together with a high switching frequency through the whole speed range leads to very smooth, silent 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 cooled using service water, thereby allowing for a very compact construction. The temperature of the coolant is lowered using an external heat exchanger.

Mechanical design

BORDLINE® CC1500 AC is housed in an IP54 cabinet, designed for machine room mounting. The modular design allows adaption to underfloor mounting to fit different vehicle layouts. The modular design allows 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.

Application examples

The 15 kVac version of the BORDLINE® CC1500 series replaces the older thyristor-equipped traction converters in 38 power heads of the first generation ICE 1 high speed trains of Deutsche Bahn (DB). The new Compact Converters increase train availability and significantly reduce energy consumption and operating cost.

BORDLINE® CC1500 MS_25-3kV-1.5kV_M_2400	
AC voltage input (grid side converter)	1850 Vac
Propulsion output	0... 2700 Vac / 2.2 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 positions	machine room or underfloor
Dimensions (L x W x H)	3200 x 1050 x 2000 mm
Weight	2300 kg

ABB Switzerland Ltd
Traction
Austrasse
5300 Turgi, Switzerland
sales.traction@ch.abb.com

abb.com/railway
abb.com/tractionconverters

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