

COMPACT CONVERTER

BORDLINE® CC1500 AC_25kV

For freight and passenger locomotives



BORDLINE® CC1500 AC converts the power from the 25 kV / 50 Hz line into propulsion power for the traction motors.

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locomotives

Characteristics

- Two-level topology with 4.5 kV IGBTs
- Single axle control
- Energy efficient power conversion
- Motor and line friendly (suitable for retrofit)
- Water cooled Power Electronic Building Blocks (PEBBs)
- Closed IP54 cabinet
- Service friendly construction with 'handy' modular building blocks

System overview

Incoming single phase supply (25 kV / 50 Hz) from the catenary is stepped down by the traction transformer and fed to the BORDLINE® CC1500 AC Compact Converter. The Compact Converter delivers the required motive power for the vehicle via the downstream drive chain.

During braking, kinetic train energy is converted into electrical energy and fed back to the line. A voltage limiting unit (VLU) is provided to limit the DC-link voltage during transient oscillations.

BORDLINE® CC1500 AC contains:

- Pre-charge unit
- Two 4Q line converters
- Intermediate DC-link filter with resonant capacitor
- DC-Link overvoltage protection module
- Three motor inverters
- AC 800PEC control module

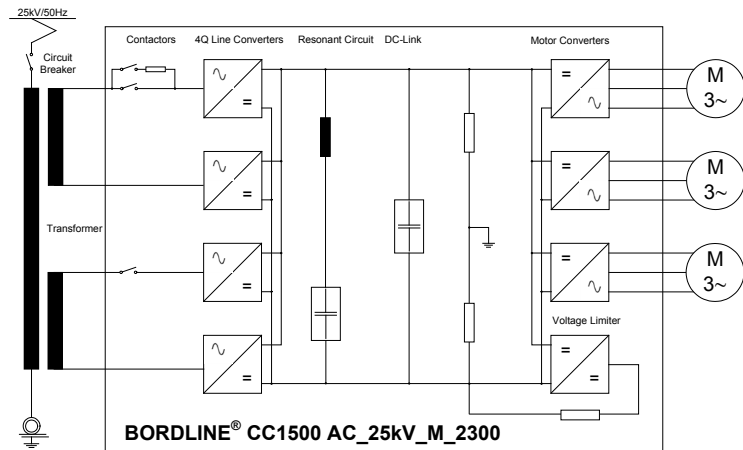
Propulsion converter

BORDLINE® CC1500 AC Compact Converters are compact rugged units equipped with state-of-the-art IGBT based Power Electronic Building Blocks (PEBBs), especially designed for use in railway vehicles. These PEBB modules together with their hardware managers provide a modular and reliable solution for demanding vehicle propulsion applications. With optimized switching patterns and switching frequency, BORDLINE® CC1500 AC generates a quasi-sinusoidal current waveform, which reduces the harmonic losses, the audible noise and the mechanical stress on the traction motor.



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01 Indian Railways locomotive
02 Main Circuit of BORDLINE® CC1500 AC



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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, allowing for a very compact construction. The temperature of the coolant is lowered using an external heat exchanger. An internal blower provides forced air circulation inside the cubicle, and passes the losses via an internal air/liquid heat exchanger to the main cooling circuit. An additional external ventilation of the power section can thus be dispensed with.

Mechanical design

BORDLINE® CC1500 AC is housed in a traction proven IP54 cabinet, designed for mounting in the machine room. Due to its modular design, it allows an 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.

Example of application

BORDLINE® CC1500 AC is replacing older GTO converters, in both the new built and existing freight and passenger locomotives at Indian Railways. The new generation of traction converters ensures state-of-the art traction technology providing higher energy efficiency and improving reliability.

Technical data	BORDLINE® CC1500 AC_25kV_M_2300
AC voltage input primary side	1269 Vac
AC motor output	3 x 0...2180 Vac, 2300 kW at wheel
Voltage limiter	included
Auxiliary converter	not equipped
Battery charger	not equipped
Vehicle control interface	MVB
Dimensions (L x W x H)	2910 x 1050 x 2035 mm
Weight	2300 kg

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