

COMPACT CONVERTER

BORDLINE® CC750 AC_15-25kV

For regional trains (EMUs) with 15/25 kVac line voltage



BORDLINE® CC750 AC converts the power from the 15 kV/16.7 Hz overhead line into propulsion power for the traction motors and auxiliary power for onboard consumers (AC, DC and battery).

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BORDLINE® CC750 AC
for regional trains (EMUs)

Characteristics

- Low voltage IGBT technology
- Compact and light design with integrated auxiliary converter
- High power density
- Powerful control platform
- Designed for operation under harsh winter conditions

System overview

The line voltage from the catenary is stepped down by the main transformer to feed two BORDLINE® CC750 AC Compact Converters. They supply the propulsion power for the traction motors as well as 400 V / 50 Hz and 110 Vdc for the auxiliary converters. Energy recuperated during braking is fed back through the same chain into the traction supply network.

BORDLINE® CC750 AC contains:

- Input contactor and precharger
- Line converter
- Propulsion converter
- Voltage limiter unit
- Auxiliary converter
- Battery charger
- AC 800PEC control module

Propulsion converter

BORDLINE® CC750 AC Compact Converter is a rugged unit incorporating modern low voltage IGBT technology. With a constant high switching frequency of 2 kHz, BORDLINE® CC750 AC generates a quasi-sinusoidal current waveform, which dramatically reduces the losses, the audible noise and the mechanical stress on the traction motor.

Auxiliary converter, battery charger

The auxiliary converter provides a three-phase sinusoidal AC voltage output and a DC voltage output for charging the battery. A sinus filter smoothes this pulse-width modulated voltage to provide a quasi-sinusoidal voltage waveform at the output terminals of the auxiliary converter. The battery charger is directly coupled to the main DC-link.



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01 Electric low-floor multiple-unit FLIRT for NSB, Norway
Photo: Stadler

02 Block diagram of BORDLINE® CC 750 AC

Powerful control platform

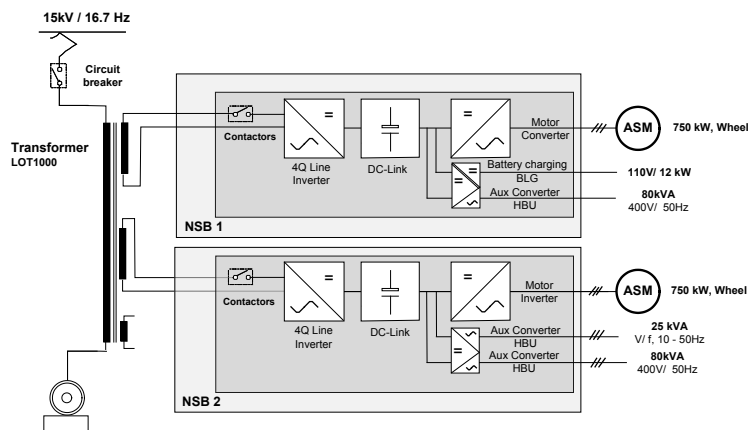
ABB traction converters are built on the AC 800PEC control platform, one of the most powerful modular controller for high-speed performance on the market. This control platform is also used in a wide range of industrial applications. The AC 800PEC software is implemented on three performance levels, 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 cooled using service water, allowing for a very compact construction. The internal fan ensures forced air circulation inside of the power parts and dissipates the heat with an internal air-to-water heat exchanger to the main cooling circuit. An additional, external ventilation of the power parts is not necessary.

Mechanical design

BORDLINE® CC750 AC is housed in an IP54 cabinet, designed for mounting in the machine room. The modular design allows easy access for maintenance.



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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 example

BORDLINE® CC750 AC is mounted in the 4.5 megawatt FLIRT EMU trains from Stadler for the Norwegian State Railways. The five-part electrical trains of the FLIRT family are equipped with three redundant traction chains with six Compact Converters and three transformers of the type LOT 1000.

Technical data	BORDLINE® AC_15-25kV_M_800
AC voltage input	400 Vac, 16.7 Hz and 50 Hz
Propulsion output	0...520 Vac, 750 kW at wheel
Auxiliary converter	3 x 400 V / 50 Hz, 80 kVA
Variable auxiliary supply	10...50 Hz, 25 kVA
Battery charger	110 V, 12 kW
Mounting position	machine room
Vehicle control interface	CANopen, I/Os
Dimensionen (L x W x H)	850 x 900 x 2000 mm
Weight	850 kg

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