

COMPACT CONVERTER

BORDLINE® CC750 MS

For hybrid shunting locomotives



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Characteristics

- High energy efficiency
- Hybrid system (15/25 kV and diesel-electric)
- Compact and light design
- Motor and line friendly
- Liquid cooling
- High reliability and availability
- Fast commissioning and homologation

System overview

Incoming power (15/25 kV) from the catenary is stepped down by the main transformer to feed two BORDLINE® CC750 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. Irrespective of braking or motoring the system continues to supply energy to the onboard network and the vehicle battery. For non-electrified lines the propulsion is powered by a diesel generator.

BORDLINE® CC750 MS converts the power from the 15 kV/16.7 Hz or 25 kV/50 Hz line into propulsion power for the traction motors and auxiliary power for onboard consumers (AC, DC and battery). Alternatively, the Compact Converter can be fed with a diesel genset for the non-electrified 'last mile'.

BORDLINE® CC750 AC Compact Converter contains:

- System change over switches
- 1 active rectifier (4Q)
- 1 input contactor and precharger
- 1 DC link filter
- 1 braking chopper
- 1 propulsion converter
- Integrated auxiliary converter
- Integrated battery charger
- AC 800PEC control module

Propulsion converter

BORDLINE® CC750 MS Compact Converter is a rugged unit incorporating modern IGBT technology that can control a single motor or two motors in parallel. With a constant high switching frequency of 2 kHz, BORDLINE® CC750 MS 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

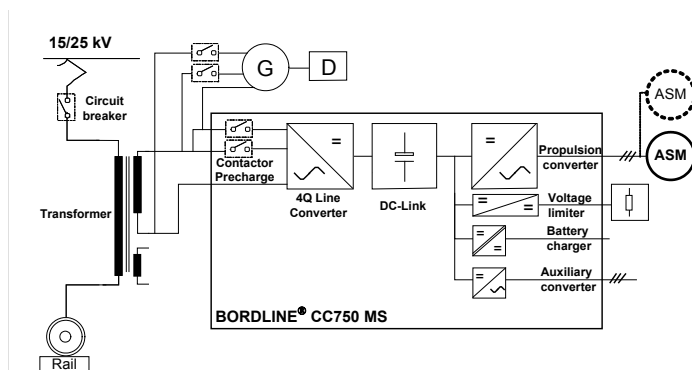
The auxiliary converter provides a three phase sinusoidal AC voltage output and a DC voltage output for charging the battery. It is directly coupled to the main DC link.



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01 Hybrid locomotive by Stadler for SBB Cargo

02 Single-line diagram BORDLINE® CC750 MS



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Powerful control platform

ABB traction converters are built on the AC 800PEC control platform, one of the most powerful modular controllers 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 traction converter features internal liquid cooling, a technology that ABB has developed and optimized with great care in the last ten years. The advantages are manifold: The temperature distribution in all parts of the converter is highly uniform, enhancing the lifetime of the power semiconductors. Power modules can be built so small and lightweight that one person can handle them. No machine room or other cooling airflow needs to enter the converter, and control electronics and power modules can be cleanly sealed from ambient dust, dirt, and humidity. The temperature of the coolant is lowered using an external heat exchanger.

Mechanical design

BORDLINE® CC750 MS is housed in an IP54 proven cabinet, designed for mounting within the machine room. Due to its modular design, it 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 example

BORDLINE® CC750 MS is mounted in the SBB Cargo hybrid locomotive, type Eem 923. The converter version without the diesel generator is in operation in the Ee922 type electric shunting locomotive which is purely electrically driven.

Technical data	BORDLINE® CC750 MS_15-25 kV_D
AC voltage input	400 Vac
Propulsion output (one or two motors)	0...500 Vac, 690 kW at wheel
Braking chopper	600 kW
Auxiliary converter	3 x 400 V/50 Hz, 70 kVA
Battery charger	24/36/72/110 Vdc, 8 kW
Vehicle control interface	CANopen, I/Os
Dimensions (L x W x H)	1896 x 1051 x 1130 mm
Weight	950 kg

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