

COMPACT CONVERTER

## BORDLINE® CC750 DC\_3kV

For regional trains (EMUs) with 3 kVdc grid voltage



01 BORDLINE® CC750 DC\_3kV\_M\_1300 for regional trains (EMUs)

02 Comparison of motor phase current for 3-level topology with 3.3 kV/1200 A IGBTs (left) and for 2-level topology with 6.5 kV/600 A IGBTs (right)

### Characteristics

- Well proven 3-level converter topology
- Highly energy-efficient
- Motor and line friendly performance

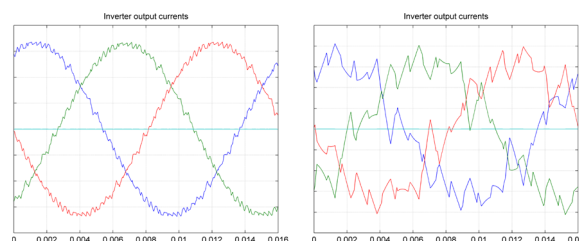
### System overview

BORDLINE® CC750 DC Compact Converter is connected to the 3 kVdc catenary via an external line inductor and the main circuit breaker.

BORDLINE® CC750 DC consists of:

- 1 propulsion converter
- 1 braking chopper
- Integrated auxiliary power converter (fixed and variable frequency)
- Integrated battery charger optional
- AC 800PEC control module

BORDLINE® CC750 DC converts the power from the 3 kVdc line into propulsion power for the traction motors and auxiliary power for onboard consumers (AC, integrated battery charger optional).



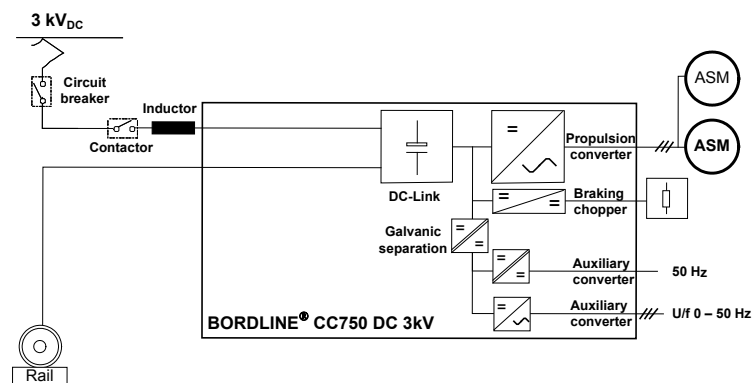
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### Propulsion converter

BORDLINE® CC750 DC Compact Converter is a rugged unit based on modern 3.3 kV IGBTs. It can control either one or two motors in parallel. This Compact Converter makes use of ABB's well-proven 3-level topology, which has several advantages over conventional 2-level solutions: It is better for the motor, better for the grid, and it saves energy!

### Braking chopper

In case the DC catenary is not receptive for recuperative energy, a braking chopper with corresponding resistors is installed. The braking chopper is able to consume the total braking energy in order to ensure safe operation in all cases.



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01 Electric low-floor multiple unit FLIRT for Elron, Estonia

02 Main circuit of BORDLINE® CC750 DC

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### Auxiliary converter

The auxiliary converter generates a current limited 3-phase voltage directly from its galvanically separated DC-link. A sine filter smoothes this pulse width modulated voltage to provide a quasi-sinusoidal voltage waveform at the output terminals of the auxiliary converter. Two outputs are available, one with fixed and one with variable frequency for the fan of the cooling tower.

### Powerful control platform

ABB traction converters are built on the AC 800PEC control platform, probably the most powerful modular controller for high-speed performance on the market. This control platform is also used in a wide range of other industrial applications. The AC 800PEC software is implemented on three performance levels, and this provides 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 speeds up train commissioning significantly.

### Cooling system

The equipment is efficiently cooled using service water, allowing a very compact construction. The temperature of the coolant is lowered using an external heat exchanger.

### Mechanical design

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

### Diagnostic and service

The service friendly modular design with standard components ensures high reliability and low life cycle costs for maintaining the system. The Compact Converter are delivered with BORDLINE® View, a diagnostic tool to visualize signals, parameter and state of traction system. It consists of an advanced self-diagnostic function, which gives advice and instructions for service and repair. BORDLINE® View is easy to use and runs on a standard PC.

### Application example

BORDLINE® CC750 DC\_3kV is mounted in Stadler's broad-gauge electrical trains of the type FLIRT for Elron in Estonia.

Technical data	BORDLINE® CC750 DC_3kV_M_1300
DC line voltage (EN 50163)	3 kVdc
Propulsion output	0...2100 Vac, 2x650 kW at wheel
Braking chopper	1200 kW
Auxiliary converter 1	3x400 V/50 Hz, 140 kVA
Auxiliary converter 2	3x0...400 V/0...50 Hz, 20 kVA
Battery charger (optional, replacing Aux 2)	24/36/72/110 Vdc, 10 kW
Vehicle control interface	CANopen, I/Os
Dimensions (LxWxH)	1350x850x1850mm
Weight	1400 kg

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