

COMPACT CONVERTER

## BORDLINE® CC750 DE, energy storage option

For diesel-electric regional trains



BORDLINE® CC750 DE converts diesel generator power into propulsion power for the traction motors and auxiliary power for onboard consumers (AC, DC and battery). The braking energy can be recuperated with the optional supercap controller. This allows to drastically reduce the diesel engine motorization of the vehicle.

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BORDLINE® CC750 DE  
for diesel-electric  
regional trains (DMU)

### Characteristics

- Best fuel efficiency control due to active rectifier function
- Very compact and lightweight due to low voltage IGBT technology
- All power electronics in one unit (propulsion and auxiliary converter, battery charger)
- Modular design allows flexible mechanical layout (machine room, underfloor, roof mounted)

### System overview

BORDLINE® CC750 DE employs an active inverter module (IGBT) rectifying the asynchronous generator voltage to feed the DC-link. This completely decouples the DC-link voltage from the engine speed. Hence, the engine always runs at best efficiency. An identical inverter module is used to control the traction motor which greatly simplifies the component set-up.

BORDLINE® CC750 DE Compact Converter contains:

- Active rectifier
- DC-link filter
- Braking chopper
- Propulsion converter
- Integrated auxiliary converter
- Supcap control option
- Integrated battery charger
- AC 800PEC control

### Propulsion converter

BORDLINE® CC750 DE Compact Converter is a compact and solid unit incorporating modern IGBT technology and can control one or two motors in parallel. With a constant high switching frequency of 2 kHz, BORDLINE® CC750 DE generates a quasi-sinusoidal current waveform, which drastically reduces losses, audible noise and mechanical stress on the traction motor.

### Braking chopper, supercap

The braking energy can be dissipated in the brake resistor. Alternatively it can be recuperated into the supercap which allows to reduce the diesel engine motorization of the vehicle.



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01 Diesel-electric train  
FLIRT for Elron, Estonia  
Photo: Stadler

02 Block diagram  
BORDLINE® CC750 DE  
including supercap

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### 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.

### 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.

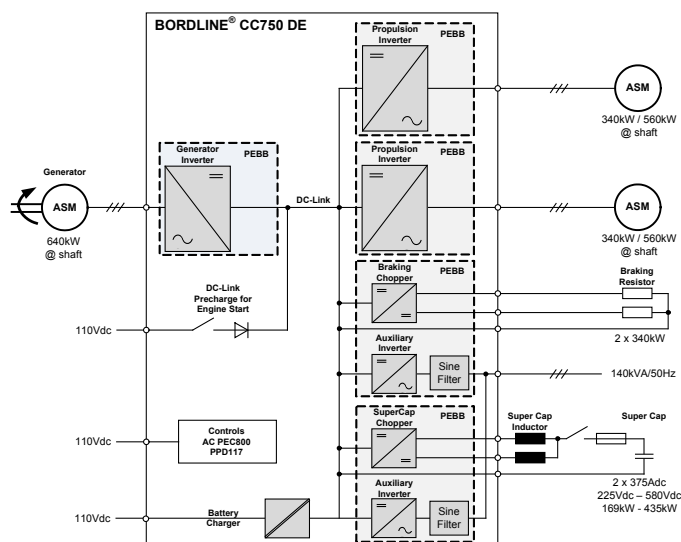
### Cooling system

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

### Mechanical design

The unit is customized for machine room, roof or under-floor mounting. The modular design allows for easy access of 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

The BORDLINE® CC750 DE is used in Stadler's diesel-electric fleet (GTW and FLIRT). The BORDLINE® CC750 DE version with supercapacitors is installed in Stadler's FLIRT DMU fleet for Elron, Estonia.

Technical data	BORDLINE® CC750 DE_D_M_900
Intermediate circuit voltage	750 Vdc
Generator inverter	2 x 520 kW (at shaft)
Motor inverter (traction / braking)	2 x 450 kW (at shaft)
Braking chopper	3 x 260 kW
Auxiliary converter	3 x 480 V / 50 Hz, 220 kVA
Energy Storage Chopper (ESC)	435 kW
Vehicle control interface	CANopen, I/Os
Weight	600 kg
Mounting position	machine room, IP54
Dimensionen (L x W x H)	830 x 820 x 1835 mm

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