BORDLINE® CC750 DC converts the power from the 1.5 kVdc line into propulsion power for the traction motors and auxiliary power for onboard consumers (AC, DC and battery).

Characteristics
- High power density
- Latest IGBT technology
- Solid aluminum underfloor construction
- Integrated cooling system
- Motor converter for four parallel motors
- Integrated auxiliary converter, battery charger
- Flat battery start-up function
- Powerful control platform

System overview
BORDLINE® CC750 DC Compact Converter is realized with modern IGBT technology and converts the DC line voltage into drive power for the traction motors.

BORDLINE® CC750 DC consists of:
- Line contactor
- Precharge contactor/resistor
- DC-link capacitor
- Propulsion converter
- Braking chopper
- Battery charger
- Auxiliary converter
- Cooling system including water to air heat exchanger, pump and fan
- AC 800PEC control module

Propulsion converter
BORDLINE® CC750 DC Compact Converter is a compact unit based on modern 3.3 kV IGBTs. It can control either one or up to four motors in parallel.

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

Auxiliary converter, battery charger
The auxiliary converter provides a three-phase sinusoidal AC voltage output for the external 50 Hz auxiliary transformer. The low voltage power supply and battery charger is internally connected to the three-phase AC output of the converter. In the case of a heavily discharged vehicle battery, the electronics will be fed from a flat battery start device which is connected directly to the input voltage. Switchover occurs automatically.
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 power electronics are efficiently cooled using service water, allowing a very compact construction. The temperature of the coolant is lowered using a heat exchanger, which is integrated into the converter cabinet. An additional internal blower provides forced air circulation inside the cubicle, in order to avoid hot spots.

Mechanical design

BORDLINE® CC750 DC is housed in a traction proven IP65 housing, designed to be mounted under-floor. 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_DC_1.5kV is mounted in the vehicle cars of Nanjing Metro, line 1 extension south serving the city of Nanjing, China. The six-car metro trains are supplied with four Compact Converter BORDLINE® CC750_DC_1.5kV. Shenzen’s Metro (SZM), China has two BORDLINE® CC750_DC_1.5kV mounted in their four-car metro trains in service on line 4.

Technical data

<table>
<thead>
<tr>
<th>DC line voltage (EN 50163)</th>
<th>1500 Vdc</th>
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<tbody>
<tr>
<td>Propulsion output</td>
<td>3 x 0...1480 Vac, 1700 kW at wheel</td>
</tr>
<tr>
<td>Braking chopper</td>
<td>1500 kW</td>
</tr>
<tr>
<td>Auxiliary converter</td>
<td>3 x 400 V / 50 Hz, 245 kVA</td>
</tr>
<tr>
<td>Battery charger</td>
<td>110 Vdc, 35 kW</td>
</tr>
<tr>
<td>Vehicle control interface</td>
<td>CANopen, I/Os</td>
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<tr>
<td>Mounting position</td>
<td>underfloor</td>
</tr>
<tr>
<td>Dimension (LxWxH)</td>
<td>2000 x 2100 x 680 mm</td>
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<tr>
<td>Weight</td>
<td>1500 kg</td>
</tr>
</tbody>
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