BORDLINE® CC1500 MS
For multi-system high-speed applications

BORDLINE® CC1500 MS converts the power from the AC or DC line into propulsion power for the traction motors.

Characteristics
• Innovative 3-level converter technology
• Solid aluminum construction and consequent lightweight design
• High energy efficiency
• Motor-friendly (retrofit)
• Line-friendly
• Intelligent multi-system concept
• Integrated auxiliary converter (optional)

System overview
Incoming power from the catenary is stepped down by the main transformer (for AC lines) or directly fed to two BORDLINE® CC1500 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.

BORDLINE® CC1500 MS contains:
• System switches for up to 4 grid voltage systems
• Input contactor and precharger
• 2 line converters (4Q)
• DC-link and resonant filter capacitor
• 1 voltage limiter
• 1 propulsion inverter
• 1 auxiliary inverter (optional)
• AC 800PEC control module

Propulsion converter
BORDLINE® CC1500 MS Compact Converter is a rugged unit incorporating modern IGBT technology. It can control a single motor or two motors in parallel. The Compact Converter is based on ABB’s well-proven three-level topology, which has several advantages over conventional two-level solutions: It is better for the motor, better for the grid, and it saves energy!

• Better for the grid
The inherent features of the three-level technology minimize the line interference current. Neither line filters nor active filters are needed to comply with typical grid codes. Engineering time and effort for homologation in different countries is minimized.

• Better for the motor
The BORDLINE® CC1500 AC three-level inverter has double the conventional semiconductor switching frequency leading to a quasi-sinusoidal current waveform. Current and torque ripples are reduced by more than a factor of four, decreases losses, audible noise and the mechanical stress on the traction motor. Additionally, in the sophisticated configuration of the converter, only half of the line voltage is connected to the motor windings during each IGBT commutation, which cuts the voltage gradient stress on the motor’s insulation materials by a factor of two.
Environmentally friendly
Optimal control, together with a high switching frequency through the whole speed range leads to very smooth, silent and energy efficient operation.

Powerful control platform
ABB Compact Converters are based on the AC800 PEC control platform which is a modular and flexible high-speed traction control unit designed for harsh environmental and operating conditions in rolling stock.

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

Mechanical design
BORDLINE® CC1500 AC is housed in an IP54 cabinet, designed for machine room mounting. The modular design allows adaption to underfloor mounting to fit different vehicle layouts. The modular design allows 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 lifecycle 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.

Application examples
The 15 kVac version of the BORDLINE® CC1500 series replaces the older thyristor-equipped traction converters in 38 power heads of the first generation ICE 1 high speed trains of Deutsche Bahn (DB). The new Compact Converters increase train availability and significantly reduce energy consumption and operating cost.

BORDLINE® CC1500 MS_25-3kV-1.5kV_M_2400

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>AC voltage input (grid side converter)</td>
<td>1850 Vac</td>
</tr>
<tr>
<td>Propulsion output</td>
<td>0... 2700 Vac / 2.2 MW at wheel</td>
</tr>
<tr>
<td>Voltage limiter</td>
<td>included</td>
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<tr>
<td>Auxiliary converter (optional)</td>
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<tr>
<td>Battery charger (optional)</td>
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<tr>
<td>Vehicle control interface</td>
<td>CAN or MVB, I/Os</td>
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<tr>
<td>Mounting positions</td>
<td>machine room or underfloor</td>
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<tr>
<td>Dimensions (L x W x H)</td>
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<tr>
<td>Weight</td>
<td>2300 kg</td>
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