BORDLINE® CC750 AC_15-25kV
For regional trains (EMUs) with 15/25 kVac line voltage

BORDLINE® CC750 AC converts the power from the 15 kVac/16.7 Hz or 25 kVac/50 Hz line into propulsion power for the traction motors and auxiliary power for onboard consumers (AC, DC and battery).

Characteristics
• High energy-efficiency
• Compact and light weight design
• High switching frequency
• 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 AC 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.

BORDLINE® CC750 AC Compact Converter contains:
• 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 AC Compact Converter is a rugged unit incorporating modern IGBT technology that can control one or two motors in parallel. With a constant high switching frequency of 2 kHz, BORDLINE® CC750 AC 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.
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 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 air flow 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 AC is housed in a traction proven IP54 cabinet, designed for mounting in the machine room. The modular design offers easy maintenance access.

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
Since 2002, more than 3000 units of the series BORDLINE® CC750 AC have been ordered or supplied for Stadler’s electric multiple unit train type FLIRT operating successfully in various countries and climate zones.