

AUXILIARY CONVERTER

BORDLINE® M50 AC_1000V

For passenger coaches with 1000 Vac train line voltage



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BORDLINE® M50 AC_1000V
for passenger coaches

Characteristics

- Compact and rugged design
- Plug connectors
- Easy access to diagnostic data
- Integrated battery charger

System overview

The BORDLINE® M50 AC onboard converter is based on state-of-the-art IGBT technology and provides three-phase sinusoidal AC voltage output as well as regulated DC voltage output for charging the battery.

BORDLINE® M50 AC auxiliary converter contains:

- Input and EMC filter (1)
- AC/DC converter with galvanic separation (2)
- 2 three phase inverters (3) with sine-filter (4)
- DC/DC converter for battery charging (5)
- AC 800PEC main control module (6)
- Electronics power supply (7)
- Flat battery start device (8)

AC/DC converter

The input voltage is connected through an input and EMC filter to an AC/DC converter, consisting of a boost converter and a resonant DC/DC converter. The boost converter controls the power factor while regulating the voltage on the primary DC-link, as a first level for

The BORDLINE® M50 AC static converter is a compact, rugged unit used to generate onboard supply voltages for passenger coaches from the train line. This product is part of the ABB BORDLINE® M platform for onboard converters. The converter can be connected directly to the 1000 Vac/16.7 Hz train line.

the DC/DC converter. The DC/DC converter generates a regulated voltage for the secondary DC-link with galvanic separation from the input. The converter starts automatically when the input voltage is within the operating range.

Three-phase inverter

The three-phase inverter, due to the integrated sine-filter generates, a sinusoidal voltage at the converter output, which can be connected to standard three-phase motors. High overload capability and a soft-start function permit trouble-free starting of heavy loads (e.g. compressors). The device features two independent three-phase inverters, one with fixed voltage/frequency and one with variable frequency.

Battery charger

For charging the battery and supplying the vehicle DC loads, the onboard converter provides an independent DC/DC converter with galvanic separation. In 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 is managed automatically.



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01 Standard coaches EW IV
Photo: SBB

02 Block diagram
BORDLINE® M50 AC_1000V

Control and monitoring

The main control is based on ABB's AC 800PEC control platform and is structured so that each power section (AC or DC) can work independently of each other. All outputs are short-circuit-proof. The control unit also monitor voltages, currents and internal temperatures.

Cooling systems

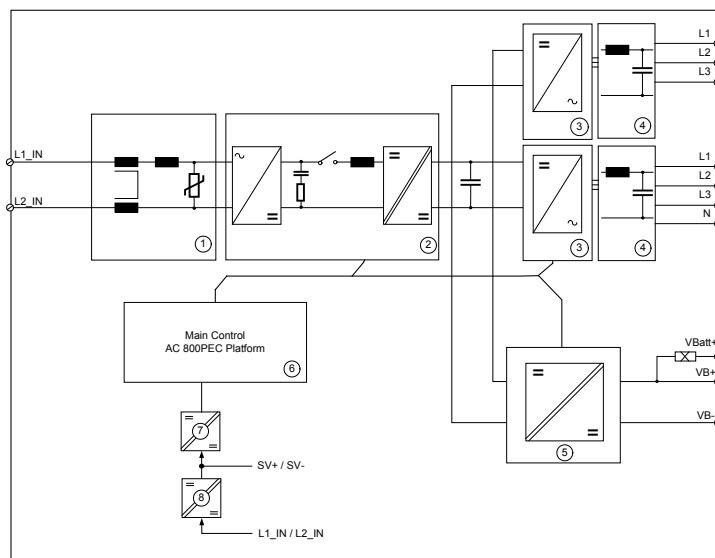
The onboard converter is cooled by forced air. Externally mounted ventilators and air ducts form integral parts of the converter. A thermal monitoring device protects the converter from overheating.

Mechanical design

The equipment is housed in a dust and waterproof housing (IP65) and is suitable for either roof or under-floor mounting. The design is modular and the heat sinks are partitioned, so that individual modules can be easily exchanged.

Diagnostics and service

The service-friendly modular design with highly standardized components ensures high reliability, excellent spare parts availability, and optimized life-cycle costs. For maintenance, an Ethernet interface is available. Further data can be obtained using a standard PC and the BORDLINE®-View, a diagnostic tool that includes an advanced self-diagnosis function, which provides advice and instructions for service and repair. All major bus systems are available (MVB, CAN, etc.).



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Application example

As part of a modernization project, the auxiliary converters in the standard coaches IV (EW IV) for Swiss Federal Railways (SBB) were upgraded with BORDLINE® M50 AC.

Increased demand for passenger information systems and HVAC require more powerful and energy-efficient auxiliary converters.

Technical data	BORDLINE® M50 AC_1000V
Train line voltage	1000 Vac/16.7 Hz/50 Hz/50 kVA
AC output 1	3 x 175... 480 V/23.... 63 Hz/35 kVA
AC output 2	3 x 400 V/50 Hz/15 kVA
DC output	36 Vdc/14 kW
DC output options	24/36/48/72/110 Vdc
BUS interface	CAN
Product option (included)	Flat battery start device
Dimensions (L x W x H)	2000 x 1000 x 450 mm
Weight	360 kg

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