

AUXILIARY CONVERTER

BORDLINE® M45 AC_1000V

For passenger coaches
with 1000 Vac train line voltage



—
BORDLINE® M45 AC
for passenger coaches

System overview

The BORDLINE® M45 AC static converter is based on state-of-the-art IGBT technology and provides a three-phase sinusoidal AC voltage output as well as regulated DC voltage output for charging the battery.

BORDLINE® M45 AC auxiliary converter contains:

- Input and EMC filter (1)
- AC/DC converter with galvanic insulation (2)
- Three phase inverter (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 (1) to an AC/DC converter (2), which consists of a boost converter and a DC/DC converter. The boost converter controls the power factor, while regulating the voltage on the primary DC-link, as a

The BORDLINE® M45 AC static converter is a compact, rugged unit used to generate onboard supply voltages for passenger coaches from the train line. This unit is part of ABB's BORDLINE® M product platform for onboard converters. The converter can be connected directly to the 1000 Vac/16.7 Hz train line.

first level for the DC/DC converter. The DC/DC converter generates a regulated voltage for the secondary DC-link, which is galvanically insulated 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).

Battery charger

For charging the batteries and supplying the vehicle DC loads an independent DC/DC converter (5) with galvanic insulation is available. In case of a heavily discharged vehicle battery, the electronics will be fed from a flat battery start device (8) which is connected directly to the input voltage. Switchover is managed automatically.



01

01 New commuter train (NPZ), Switzerland
Photo: SBB

02 Block diagram
BORDLINE® M45 AC_1000

Control and monitoring

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

Cooling systems

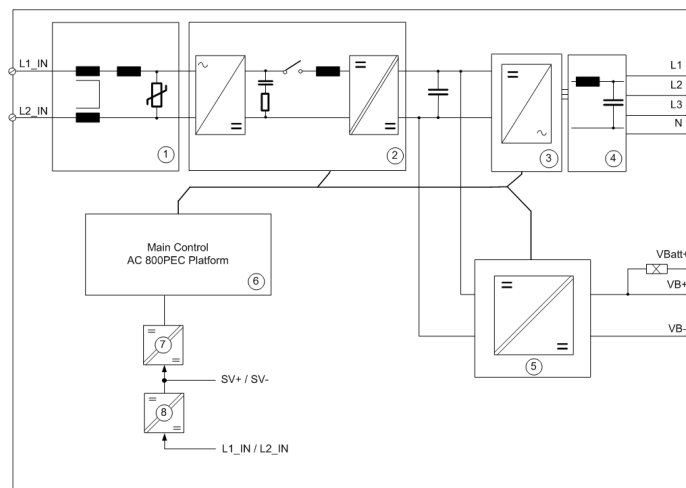
The units are cooled by forced air. The externally mounted fans and the air duct are integral parts of the onboard converter. A thermal monitoring device protects the converter from becoming overheated.

Mechanical design

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

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 inter-



02

face 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.).

Application example

In 2006, Swiss Federal Railways (SBB) embarked on their largest refurbishment program for regional trains so far. The Domino modernization programme consists of a general overhaul of the 20-year-old 'NPZ' motor and driving trailer cars and a replacement of the 40-year-old intermediate coaches. More than 300 units of BORDLINE® M45 AC have been ordered for this project so far, with further orders pending.

Technical data	BORDLINE® M45 AC_1000
Train line voltage	1000 Vac/16.7 Hz
Three-phase AC output	3 x 400 V/50 Hz/45 kVA
DC output	36 Vdc/6.5 kW
DC output options	24/48/72/110 Vdc
BUS interface	CAN
Productions options (included)	Flat battery start device
Dimensions (L x W x H)	1800 x 756 x 450 mm
Weight	< 350 kg

ABB Switzerland Ltd
Traction
Austrasse
5300 Turgi, Switzerland
sales.traction@ch.abb.com

abb.com/railway
abb.com/tractionconverters

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB AG does not accept any responsibility whatsoever for potential errors or possible lack of information in this document. We reserve all rights in this document

and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents – in whole or in parts – is forbidden without prior written consent of ABB AG. Copyright© 2018 ABB
All rights reserved