

AUXILIARY CONVERTER

BORDLINE® M180 AC

For electric locomotives



BORDLINE® M180 AC static converter is used to generate auxiliary supply voltages for locomotive auxiliaries using single phase overhead AC supply.

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Characteristics

- IGBT technology
- Powerful control platform
- Integrated sine filter
- Designed for harsh climatic conditions (55° C, high humidity and pollution degree)
- Pantograph bounce withstand capability
- Retrofit product for several type of locomotives
- High input voltage distortion allowed

System overview

BORDLINE® M180 AC is realized with modern IGBT technology. The power to this converter is supplied from the auxiliary winding of the main traction transformer. The converter supplies power to auxiliary loads such as cooling fans, blowers, pumps, compressors, cabin lights and space heaters. It also charges the locomotive battery. The DC output is galvanically isolated from the input AC supply of static converter and AC output.

BORDLINE® M180 AC auxiliary converter contains:

- Input (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)

AC/DC converter

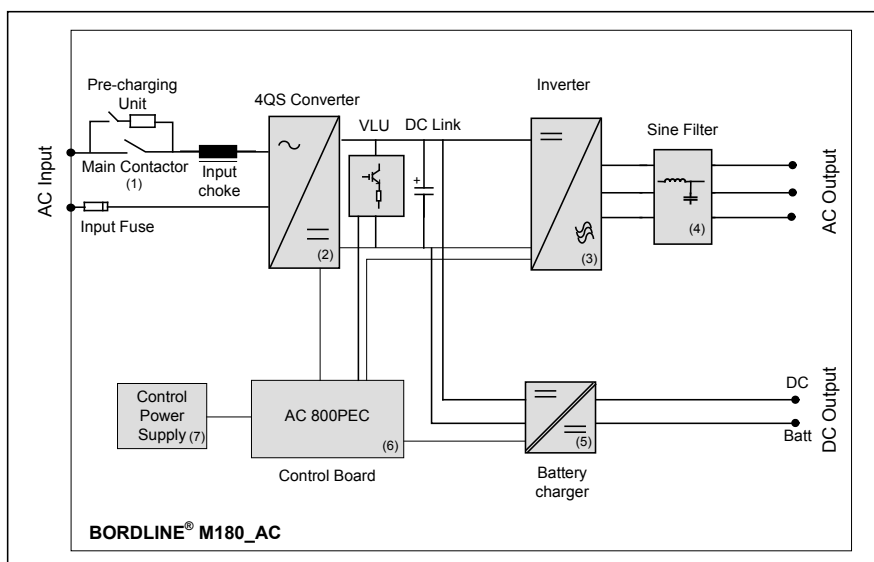
The input voltage is connected through an input (1) to an AC/DC converter (2), which consists of a four-quadrant AC/DC converter. The four-quadrant AC/DC converter controls the power factor, and regulates the voltage on the DCLink. The converter starts automatically when the input voltage achieves the operating range and when the STOP signal is not active.

Three phase inverter

The three phase inverter, due to the installed sine-filter generates, a sinusoidal voltage at the converter output. This output can be connected to standard three-phase motors. High overload capability and a soft-start function permit troublefree 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. A temperature compensated battery charging characteristic is integrated.



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Block diagram
BORDLINE® M180 AC

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 equipment is cooled by forced air. A thermal monitoring device protects the converter from becoming overheated.

Mechanical design

The equipment is housed in an IP55 housing and the magnetic components in an IP21 housing. BORDLINE® M180 AC is suitable to be mounted inside the machine room. 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. The 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® M180 AC is in operation in Indian Railways' locomotives.

Technical data	BORDLINE® M180 AC
Train line voltage	22.5 kV
Input voltage	380... 430 Vac/50 Hz
Three-Phase AC output	3 x 415 V/50 Hz, 180 kVA
Battery output	110V/20A
BUS interface	None
Dimensions (LxWxH)	1740 x 680 x 1650 mm
Weight	1300 kg