

AUXILIARY CONVERTER

BORDLINE® M40 DC_3kV

For passenger coaches



The BORDLINE® M40 DC static converter is a sealed, compact, rugged unit developed to feed auxiliary services of passenger coaches (HVAC system, DC loads, battery charger).

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BORDLINE® M40 DC_3kV
for low floor coaches

System overview

The BORDLINE® M40 DC converter is based on modern IGBT technology.

The system is composed by:

- N° 1 DC/DC converter, that turns catenary voltage (3000 Vdc) into internal DC link 700 Vdc to supply output stages
- N° 1 DC/AC inverter (700 Vdc/480 Vac 60 Hz 3ph) to supply HVAC system and AC loads (40 kVA)
- N° 1 DC/DC battery charger (700 Vdc/24 Vdc), to supply batteries and DC loads (6 kW)

Functionality

High voltage module is configured as an insulated DC/DC full bridge. It generates the internal DC link at 700 Vdc, stabilised and filtered. To minimize dimensions and weight the stage is designed with patented H bridge configuration.

The three-phase inverter, due to the installed sine-filter, generates a sine wave three-phase voltage at the converter output. A V/F control is implemented to limit the inrush current when a heavy load is powered (e.g. HVAC compressor) with externally controlled normally close output contactor.

An insulated DC/DC converter is available to convert the 700 Vdc bus in a 24 Vdc to supply the electronic loads of the coach and charge batteries. A control for compensation in temperature of batteries charging voltage is integrated.

Characteristics

- IGBT technology
- Compact, robust and lightweight design
- Integrated sine filter
- Fed by 3 kVdc catenary (1800 ÷ 4200 Vdc)
- Outputs: 24 Vdc, 480 Vac 60 Hz 3ph
- Integrated battery charger
- Integrated diagnostic system
- Workshop supply input
- On board installation
- Fire extinguishing system

Technical data	BORDLINE® M40 DC_3kV
Input voltages	3 kVdc (1800 ÷ 4200 Vdc)
Output voltages	480 Vac 60 Hz 3ph 24 Vdc
Output power	40 kVA + 6 kW
Protection degree	IP65 (+ IP20)
Dimensions (L x W x H)	1100 x 824 x 1690 mm
Ambient temperatures	-25°C +50°C
Weight	600 kg
Communication interface	USB



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01 Low floor regional coaches (Italy)
02 Block diagram of BORDLINE® M40 DC_3kV

Control and monitoring

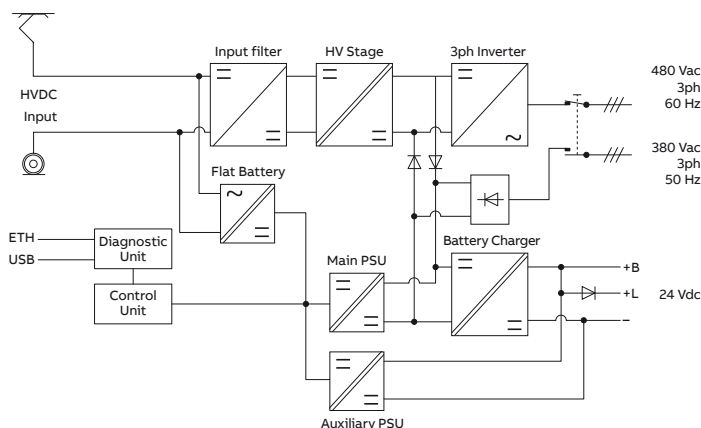
A USB connection for local monitoring and diagnostic data download is available.

Cooling system

The converter is cooled by forced air.

Mechanical design

The metal structure, based on stainless steel material, has been designed to be mounted inside the coach. The design concept of an air force cooling system with a “dirty” zone water-resistant (IP20) and a waterproof “clean” zone containing electronics and other components (IP65), improves the reliability of system. As the converter has been developed for a revamping project, it has a high customized mechanical design.



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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 a diagnostic interface (USB) is available. It permits to monitor converter status and alarms history.

Application example

BORDLINE® M40 DC_3kV is mounted on Regional Coaches running in Italy. ABB converter has been designed for a revamping project (HVAC system added inside the coach).

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