

AUXILIARY CONVERTER

BORDLINE® M20 DC_750V

For light rail vehicles (LRVs)



The BORDLINE® M20 DC static converter is a compact, rugged unit developed to feed air compressors of the tram.

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BORDLINE® M20 DC_750V
for LRV

System overview

The BORDLINE® M20 DC converter is based on modern IGBT technology.

The system is composed by:

- N° 1 input filter for the catenary voltages (750 Vdc)
- N° 2 input fuses (one for each inverter)
- N° 2 independent DC/AC inverters with adjustable output frequency up to 50Hz (400 Vac 50 Hz 3ph) to supply air compressors

HV Input Filter (750 Vdc)

The converter is powered by the catenary line through an Input Filter (no galvanic insulation is provided between converter input and MV output) – the filter working range is between 550 Vdc and 950 Vdc and it is protected by two internal fuses (for each DC/AC inverter).

3ph inverter (750 Vdc/380 Vac 50 Hz 3ph)

The three-phase inverters, due to the installed sine filter, generate a sine wave three-phase voltage at the converter output. Two independent V/F controls are implemented to limit the inrush current when a heavy load is powered (e.g. compressors). The nominal output power is 34 kVA (2 x 17 kVA) with a 60 kVA peak up to 5 sec.

Characteristics

- Two independent three-phase inverters in one box
- IGBT technology
- Compact and robust design
- Integrated sine filter
- Fed by 750 Vdc catenary (550 Vdc - 950 Vdc)
- Outputs: 2 x 400 Vac 50 Hz 3ph
- Ethernet diagnostic
- Full digital control
- Installation on the roof

Technical data	BORDLINE® M20 DC_750V
Input voltage	750 Vdc (550 Vdc - 950 Vdc)
Output voltage	2 x 400 Vac 50 Hz 3ph
Output power	2 x 17 kVA
Protection degree	IP43
Dimensions (L x W x H)	850 x 520 x 430 mm
Ambient temperatures	-25°C +55°C
Weight	95 kg
Communication interface	Ethernet



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01 Tramways,
Grenoble (France)
02 Block diagram of
BORDLINE® M20 DC_750V

Control and monitoring

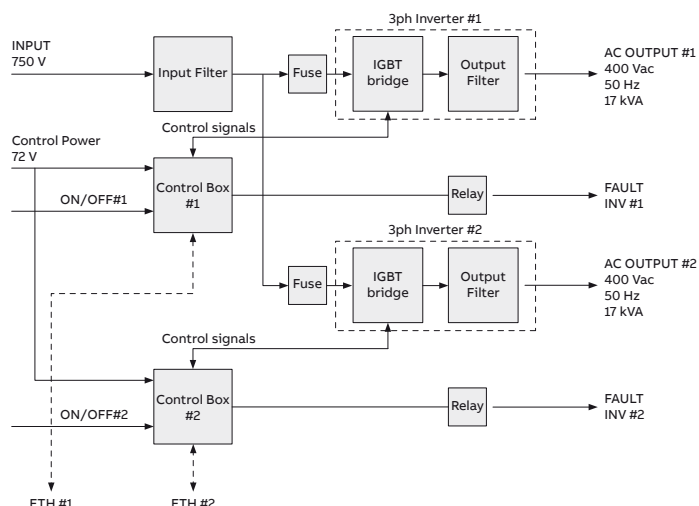
Each inverter is full digital controlled (DSP technology) by two independent control boards. The monitoring of the converter is supported by two Ethernet interfaces (via M12 connector, one for each inverter). A web server, compatible with the most common browsers (e.g. Internet Explorer), on the diagnostic board provides monitoring of converter status. Converter sends to VCU (vehicle control unit) one fault output signal (free voltage contact).

Cooling system

The converter is cooled by natural convection.

Mechanical design

The metal structure is stainless steel and aluminium with IP43 protection and it has been designed for a roof mounting. The converter has been designed for a reliable indoor application, for an easy diagnostic status when installed in the vehicle and an easy maintenance in the lab.



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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 two diagnostic interfaces (Ethernet) are available. They permit to monitor converter status and alarms history.

Application example

BORDLINE® M20 DC_750V is mounted on trams running in Grenoble (France). ABB converter has been designed for a revamping project of an existing tramway.

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