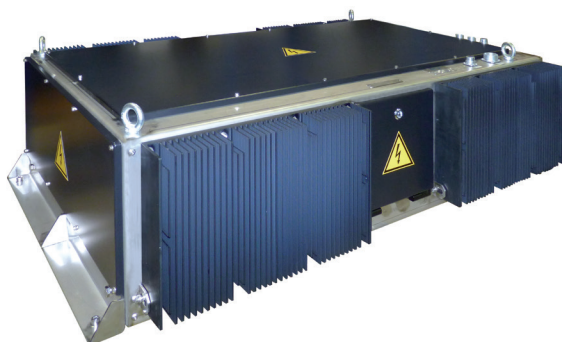


AUXILIARY CONVERTER

BORDLINE® M30 DC_750V

Redundant converter for light rail vehicles (LRVs)



The BORDLINE® M30 DC static converter is a compact, rugged unit developed to feed auxiliary services of the tram.

—
BORDLINE® M30 DC_750V
for LRV

System overview

The BORDLINE® M30 DC converter is based on modern IGBT technology.

The system is composed by:

- N° 1 DC/DC converter (750 Vdc/72 Vdc), that turns catenary voltage (750 Vdc) into 72 Vdc to supply the batteries
- N° 2 redundant DC/DC converters (72 Vdc/24 Vdc), to supply lights, turn signals and brakes (5 kW)
- N° 2 redundant DC/AC inverters (72 Vdc/57 Vac 45 Hz 3ph) to supply fans and safety loop (3 kVA)

HV module (750 Vdc/72 Vdc)

It is configured in a isolated full bridge. This module generates a square wave for the output filter in order to generate a DC BUS (72 Vdc) to supply internally DC/DC converters (24 Vdc) and three-phase inverters (57 Vac - 45 Hz); externally it also charges the batteries.

3ph inverter (72 Vdc/57 Vac 45 Hz 3ph)

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. compressor).

DC/DC converter (72 Vdc/24 Vdc)

A non-isolated DC/DC converter is available to convert the 72 Vdc bus in a 24 Vdc to supply the electronic load of the tram.

Characteristics

- IGBT technology
- Compact and robust design
- Integrated sine filter
- Fed by 750 Vdc catenary (450 Vdc - 1000 Vdc)
- Three outputs: 72 Vdc, 24 Vdc, 57 Vac 45 Hz 3ph
- Integrated battery charger
- Redundant system
- Ethernet diagnostic
- Full digital control
- Installation on the roof

Technical data	BORDLINE® M30 DC_750V
Input voltages	750 Vdc (450 Vdc - 1000 Vdc)
Output voltages	72 Vdc
	24 Vdc
	57 Vac 45 Hz 3ph
Total output power	3 kVA + 25 kW
Protection degree	IP66
Dimensions (L x W x H)	1400 x 950 x 380 mm
Ambient temperatures	-25°C +70°C
Weight	< 300 kg
Communication interface	Ethernet



01

01 Grenoble TFS
Tramways, France

02 Block diagram of
BORDLINE® M30 DC_750V

Control and monitoring

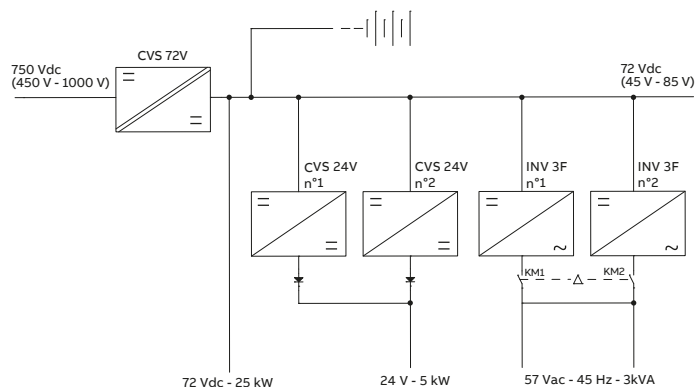
The converter is full digital controlled (DSP technology). The monitoring is supported by Ethernet interface (via M12 connector). A web server, compatible with the most common browsers (e.g. Internet Explorer), on the diagnostic board provides monitoring of converter status.

Cooling system

The converter is cooled by natural convection.

Mechanical design

The metal structure, based on stainless steel material, has been designed for IP66 protection and to be mounted on the tram. As the converter has been developed for the revamping project, it is mechanically and electrically full interchangeable with the old one.



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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 (Ethernet) is available. It permits to monitor converter status and alarms history.

Application example

BORDLINE® M30 DC_750V is mounted on trams running in Grenoble (France). ABB has been designed to replace an old converter after a revamping project.

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