

## BORDLINE® M15 DC\_750V

### Auxiliary converter and battery charger for light rail vehicles

The BORDLINE® M15 DC static converter is a compact, rugged unit developed to feed induction motor, DC loads and charge the batteries of the tram.



BORDLINE® M15 DC\_750V for LRV

#### Characteristics

- IGBT technology
- Compact and robust design
- Integrated sine filter
- Fed by 750 Vdc catenary (500 Vdc - 950 Vdc)
- Outputs: 380 Vac 50Hz 3Ph, 24 Vdc
- Natural convection cooling
- Installation on the roof

#### System overview

The BORDLINE® M15 DC converter is based on modern IGBT technology.

The system is composed by:

- n° 1 input filter for the catenary voltages (750 Vdc)
- n° 1 DC/AC inverter with adjustable output frequency up to 50Hz (380 Vac 50Hz 3Ph) to supply motor
- n° 1 DC/DC converter that turns catenary voltage (750 Vdc) into 24 Vdc to supply the batteries and other DC loads of the vehicle

#### HV Input Filter (750 Vdc)

The converter is powered by the catenary line through an Input Filter, with working range between 500 Vdc and 950 Vdc.

#### 3Ph inverter (750 Vdc/380 Vac 50Hz 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. compressors). The three phase inverter is galvanically insulated by a 50 Hz transformer. The nominal output power is 5 kVA with a 7,5 kVA peak up to 20 sec.

#### Battery charger (750 Vdc/24 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 voltage (24 Vdc) to supply external DC loads and to charge the batteries.

A control for compensation in temperature of batteries charging voltage is integrated.

### Control and monitoring

The monitoring of converter and battery charger status is provided by lamps and dedicated I/O signals. Battery charger output can be monitored by two current 4 - 20 mA signals (output voltage and output current).

### Cooling system

The converter is cooled by natural convection.

### Mechanical design

The metal structure is stainless steel with IP65 protection and it has been designed for a roof mounting. The converter has been designed for a reliable outdoor application, for an easy diagnostic status when installed in the vehicle and an easy maintenance in the lab.

### Application example

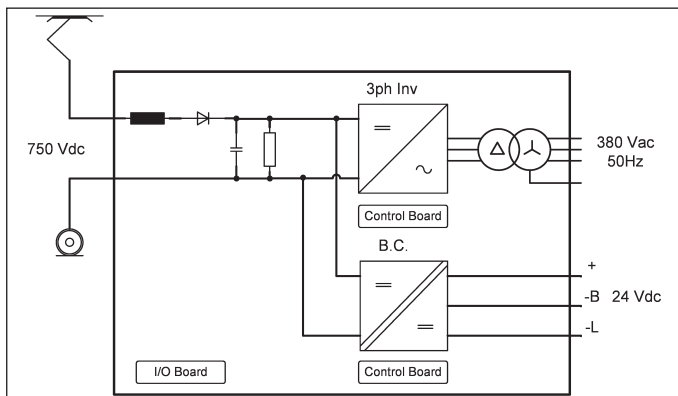
BORDLINE® M15 DC\_750V is mounted in trams produced by Durmazlar and running in Bursa (Turkey). ABB converter has been designed for a new tramway design project.



Durmazlar Tramway, Turkey

### Diagnostics and service

The service-friendly modular design with highly standardized components ensures high reliability, excellent spare parts availability, and optimized life-cycle costs.



Block diagram of BORDLINE® M15 DC\_750V

Technical data	BORDLINE® M15 DC_750V
Input voltage	750 Vdc (500 Vdc - 950 Vdc)
Output voltages	380 Vac 50Hz 3 Ph 24 Vdc
Output power	5 kVA + 10 kW
Protection degree	IP65
Dimensions (L x W x H)	700 x 650 x 480 mm
Environmental conditions	-25°C ÷ +55°C
Weight	240 kg

For more information please contact:

**ABB S.p.A.**

**Auxiliary Converters**

Via Albareto, 35

16153 Genova, Italy

Tel: +39 010 60731

E-Mail: [traction.converters@it.abb.com](mailto:traction.converters@it.abb.com)

[www.abb.com/railway](http://www.abb.com/railway)

Power and productivity  
for a better world™

