

AUXILIARY CONVERTER

# BORDLINE® M75\_DC 600-750V

## For metro cars



The BORDLINE® M75 DC static converter is a compact, rugged unit developed to feed auxiliary services of the metro.

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BORDLINE®  
M75\_DC\_600-750V  
for metro cars

### System overview

The BORDLINE® M75 DC converter is based on modern IGBT technology.

The system is composed by:

- N° 1 DC/AC inverter (600-750Vdc/230 Vac 60 Hz 3ph - 55 kVA) to supply AC loads
- N° 1 AC/AC insulation transformer (230 Vac 3ph to 120 Vac 1ph - 2,4 kVA)
- N° 1 LVPS1 DC/DC converter (600-750Vdc/48 Vdc - 15 kW), to supply car-loads @48Vdc and batteries
- N° 1 LVPS2 DC/DC converter (48 Vdc/24 Vdc - 5 kW), to supply DC loads @24 Vdc

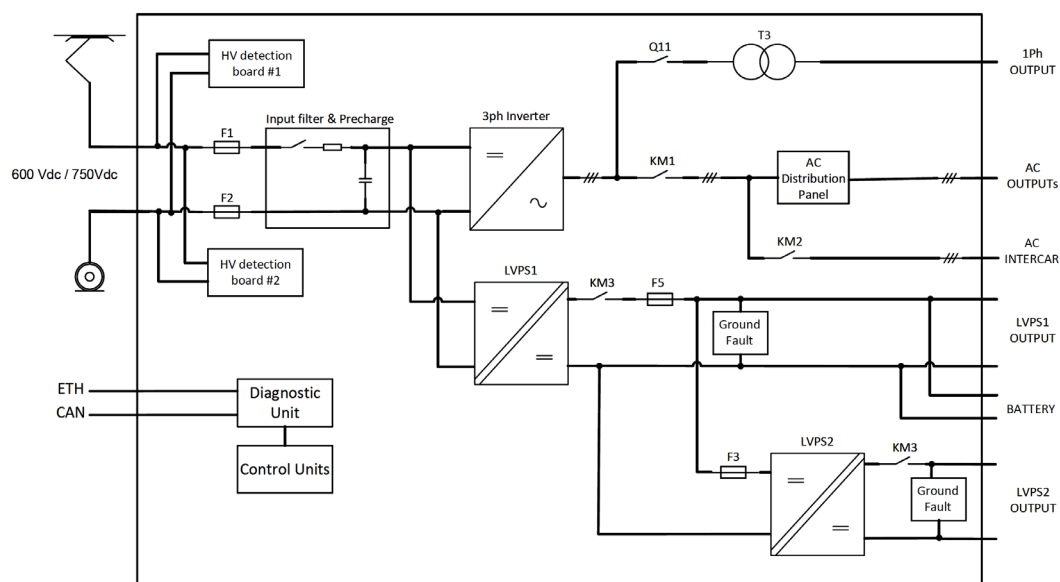
### Functionality

A not isolated three-phase inverter, due to the installed sine-filter, generates a sine wave three-phase voltage at the converter output. Three-phase output also feeds 3ph to 1ph transformer. A V/F control is implemented to limit the inrush current when a heavy load is powered (e.g. compressor). An isolated DC/DC converter is available to convert the 600-750Vdc catenary voltage in a 48 Vdc to supply the electronic loads of the metro and charge the batteries. An isolated DC/DC converter is available to supply DC electronic loads of the metro @24 Vdc. The LVPS2 is fed by LVPS1 or battery.

### Characteristics

- IGBT technology
- Compact and robust design
- Integrated sine filter
- Fed by 600-750Vdc catenary (480Vdc - 1000Vdc)
- Integrated battery charger (LVPS2)
- Ethernet diagnostic and CANopen communication bus
- Full digital control
- Underfloor installation

Technical data	BORDLINE® M75_DC_600-750V
Input voltages	600-750Vdc (480Vdc - 1000Vdc)
Outputs	230 Vac 60 Hz 3ph - 55kVA - P.F. 0.8
	120 Vac 60 Hz 1ph - 2,4 kVA
	48 Vdc - 15 kW
	24 Vdc - 5 kW
Protection degree	IP65
Dimensions (L x W x H)	1483 x 1176 x 486 mm
Ambient temperatures	-25°C +50°C
Weight	< 460kg
Communication interface	Ethernet, CANopen



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01 Block diagram of  
BORDLINE® M75 DC\_600V

### Control and monitoring

The converter is full digital controlled (DSP technology) and it is structured so that each power section (AC or DC) can work independent of each other. All outputs are short-circuit proof. The control electronics also monitor voltages, currents and internal temperatures. The interface to the Train Control and Management System is managed by CANopen bus.

An HV detection board flashing LED light when the converter is fed by either catenary or shop power.

### Cooling system

The converter is cooled by forced air. The internally mounted fan and the air duct are integral parts of the onboard converter. A thermal monitoring device protects the converter from becoming overheated.

### Mechanical design

The cabinet, based on painted steel material (dielectric white internally and black externally), has been designed for IP66 protection and to be mounted on metro cars (underfloor). The heatsinks 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. For maintenance a diagnostic interface (Ethernet) is available. Further data can be obtained using a standard PC with common browser to access the ABB control Terminal PTE software, a diagnostic tool that includes an advanced self-diagnosis function, which provides advice and instructions for service and repair.

### Application example

BORDLINE® M75 DC\_600-750Vdc is mounted on metro cars running in Vancouver (Canada).