The BORDLINE® M10 DC static converter is a compact, rugged unit developed to feed air compressors of the tram.

**Characteristics**
- IGBT technology
- Compact and robust design
- Integrated sine filter
- Fed by 750 Vdc catenary (525 Vdc - 975 Vdc)
- Output: 400 Vac 50Hz 3Ph
- Ethernet diagnostic
- Full digital control
- Installation on the roof

**System overview**
The BORDLINE® M10 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 (400 Vac 50Hz 3Ph) to supply air compressor

**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 525 Vdc and 975 Vdc and it is protected by an external fuse.

**3Ph inverter (750 Vdc/400 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 nominal output power is 10 kVA with a 25 kVA peak up to 10 sec.
Control and monitoring
The converter is full digital controlled (DSP technology). The monitoring of the converter is supported by Ethernet interface (via RJ-45 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 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® M10 DC_750V is mounted in trams produced by Ulasim (Turkey) and running in Istanbul. RGM Polycontrol converter has been designed for a new tramway design project.

Technical data

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>750 Vdc (525 Vdc - 975 Vdc)</td>
</tr>
<tr>
<td>Output voltage</td>
<td>400 Vac 50Hz 3 Ph</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP65</td>
</tr>
<tr>
<td>Dimensions (L x W x H)</td>
<td>990 x 430 x 423 mm</td>
</tr>
<tr>
<td>Environmental conditions</td>
<td>-25°C ÷ +70°C</td>
</tr>
<tr>
<td>Weight</td>
<td>&lt; 80 kg</td>
</tr>
<tr>
<td>Communication interface</td>
<td>Ethernet</td>
</tr>
</tbody>
</table>

For more information please contact:

ABB S.p.A.
Auxiliary Converters
Via Buccari 19-21
16153 Genova, Italy
Tel: +39 010 609971
E-Mail: traction.converters@it.abb.com
www.abb.com/railway