The BORDLINE® M7 AC battery charger is a compact, rugged unit to generate supply voltage for rail vehicles.

**System overview**

The BORDLINE® M7 AC converter is based on modern IGBT technology.

The system is composed by:
- FRectifier and EMI filter for 480 and 400 Vac inputs
- Rectifier, EMI filter and step-up (Power Factory Control) for 230 Vac input (option)
- Crowbar (1000 Vdc)
- Insulation transformer: insulate the mains to the load for safety requirements satisfaction
- Control unit
- Rectifier and output filter

**Functionality**

The BORDLINE® M7 AC battery charger feeds from a three-phase inverter inside the loco (480 Vac 3ph 60 Hz, 400 Vac 3ph 50 Hz) to generate a DC voltage (24 Vdc to 28,8 Vdc) to charge the batteries and supply the DC loads of the vehicle.

**Characteristics**

- DSP technology
- Compact and robust design
- Two voltage inputs (480 Vac 3ph 60 Hz, 400 Vac 3ph 50 Hz); option (230 Vac 1ph 50 Hz)
- Liquid cooled system
- Ethernet diagnostic
- Rack mounting
- High reliability thanks to consolidated building blocks

**Technical data**

<table>
<thead>
<tr>
<th>BORDLINE® M7 AC 400-480V</th>
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</thead>
<tbody>
<tr>
<td>Input voltages</td>
<td></td>
</tr>
<tr>
<td>480 Vac 3ph 60 Hz</td>
<td></td>
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<tr>
<td>400 Vac 3ph 50 Hz</td>
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<tr>
<td>230 Vac 1ph 50 Hz (option)</td>
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<tr>
<td>Output voltage</td>
<td>24 Vdc to 28,8 Vdc</td>
</tr>
<tr>
<td>DC output power</td>
<td>7 kW</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions (L x W x H)</td>
<td>483 x 400 x 540 mm</td>
</tr>
<tr>
<td>Ambient temperatures</td>
<td>-25°C +70°C</td>
</tr>
<tr>
<td>Weight</td>
<td>&lt; 65 kg</td>
</tr>
</tbody>
</table>

**DSP Technology**
Control and monitoring
The converter is full digital controlled (DSP technology). The monitoring of the converter is supported by Ethernet interface (via M12 connector). A web server, compatible with the most common browsers (e.g. Internet Explorer) provides monitoring of the converter status (main technical parameters, alarms codes, etc). There’s also a four channel 4-20 mA to provide information (batteries voltage and current) to the train diagnostic.

Cooling system
The unit is liquid cooled. The battery charger is located inside an electrical cabinet where there’s a ventilation of filtered air when the train is running.

Mechanical design
The converter is suitable to be mounted on board inside a cabinet. All electrical interfaces are located in the front for easy and fast connection.

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® M7 AC is mounted in Eurolight and Eurodual locomotives produced by Stadler Valencia (Spain) and running in Europe.