PowerModule®: Modular, Smart, Secure and efficient storage energy solution.

Design

Each PowerModule block embeds a Lithium Fer Phosphate (LiFePO4) battery plus an internal BMS which controls its own operation (temperature, high and low voltage cut-off, etc.).

PowerModule blocks are inter-connected through a private and secured bus. An external BMS is tied to the system and coordinates PowerModule’s behavior (high-level monitoring balancing), safety (power contactor) and external communication with upstream devices.

PowerModule Technical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>12.8 V</td>
</tr>
<tr>
<td>Nominal capacity (C/5, 23 °C)</td>
<td>110 Ah (1.408 KWh)</td>
</tr>
<tr>
<td>Weight (+/- 2 %)</td>
<td>15.7 Kg</td>
</tr>
<tr>
<td>Dimensions (L x l x H)</td>
<td>260 x 172 x 225 mm</td>
</tr>
<tr>
<td>Power connector</td>
<td>Female M8 x 1.25</td>
</tr>
<tr>
<td>Specific energy</td>
<td>90 Wh/Kg</td>
</tr>
<tr>
<td>Energy density</td>
<td>141 Wh/l</td>
</tr>
<tr>
<td>Continuous discharge current (23 °C)</td>
<td>150 A</td>
</tr>
<tr>
<td>Maximum discharge current (30 s)</td>
<td>300 A</td>
</tr>
<tr>
<td>Cut-off voltage (BMS)</td>
<td>10 V</td>
</tr>
<tr>
<td>Maximum charge voltage (CV)</td>
<td>14.6 V</td>
</tr>
<tr>
<td>Floating charge voltage</td>
<td>&lt;13.4 V</td>
</tr>
<tr>
<td>Continuous charge voltage</td>
<td>50 A (0.5C)</td>
</tr>
<tr>
<td>Internal resistance</td>
<td>6 mOhm</td>
</tr>
</tbody>
</table>

Key advantages

- “Plug-and-Play” and flexible system: Easy and quick deployment
- Scalable system: Up to 255 PowerModule items can be assembled in serial and/or parallel to fulfill the most complex applications
- Smart monitoring and management
- Safe and robust technology (IP protection level: 56)
- External communication bus (CAN) available
- High lifespan and number of cycles
- Certification: CE, UN 38.3, RoHS

Technical features of external BMS

- Monitoring of each PowerModule block: current, power, voltage, PCB temperature, cell temperature, State of Charge (SOC), Contactor states, etc.
- Realtime communication of alerts, warning and status messages using bus CAN 2B for external devices
- Intra module balancing between each cell. This feature is launched as soon a voltage difference >30mV is detected for 2 cells in a same PowerModule.
- Inter module balancing is launched by external BMS as soon a voltage difference > 100mV is detected between two or more PowerModule
- Automatic cut-off triggered by alert events, i.e: over-current, over-charge, over-temperature, etc.
- Power contactor management by external BMS
- Analog 5V signal for SOC measurement

Further information at: www.powertechsystems.eu or contact our commercial office: +33 954 051 619 or info@powertechsystems.eu
## Main CAN messages available

### Main system status messages
- **State of Charge (SOC)**: 0 - 100 %
- **Real time voltage and current**: in V and A
- **Max charge and discharge current**: in A
- **Module temperature**: in °C
- **Min cell and max cell voltage**: in mV
- **Electric insulation level**: in mV
- **ID of eligibles modules for inter balancing**: List of ID

### Module status messages
- **Realtime charge and discharge current**: en A
- **State of Charge (SOC)**: de 0 à 100 %
- **Cell and BMS temperature**: en °C
- **Voltage value for each cell**: en mV

### Warning and alarms
- **No communication between Powermodule blocs**
- **SOC difference between powermodule blocs**
- **Over-temperature warning and alarm**
- **Over-voltage warning and alarm**
- **Deep discharge alarm**
- **Over current and over voltage alarms**

## BMS and PowerModule casing dimensions

![Casing Dimensions Diagram]

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