Power Module Solid State

High Performance and Scalable Lithium-ion energy storage system

PowerTech systems

PowerModule® *Solid State* : **Modular, Smart, Safe** and **efficient** energy storage solution.

Modular Design

PowerModule is designed around a high performance **5.12 kWh Lithium Iron Phosphate** (LiFePO4) battery composed of **Solid State technology cells.**

This recent technology allow **fast charging** time, **longer lifetime**, improved safety with **non-flammable electrolyte**, and **very low cell heat-up** during use.

Each module is equipped with **BMS Matrix®** technology with active balancing, which ensures total battery safety in real time and considerably extends battery life. The BMS manages cell reheating for **low-temperature operation down to -25°C.**

The PowerModule blocks are connected to each other by a private and secure CAN communication bus. This distributed architecture ensures **high fault tolerance** and **easy commissioning**.

The high modularity and scalabity allow to easily build storage systems up to 819 VDC nominal and 655kWh

Key advantages

- **"Plug-and-Play"** and flexible system **:** Easy and fast commissioning
- **New solid state cell technology** with highest safety and cycle life
- **Scalable system : Serial and/or Parallel assembly** up to **128 modules** to fullfill the most complex appplications
- **Real-time monitoring** in the cloud is available
- **Stainless steel housing IP 67 rated**
- Amphénol **waterproof connection (IP67)**
- Internal and external **communication** by **CAN bus**
- **High lifespan and number of cycles**
- **Pressure relief valve** on front panel

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PowerModule - Technical Specifications

Min / Nominal / Max voltage	48.0 V / 51.2 V / 58.4 V
Nominal capacity (at 1C, 25°C)	100Ah (5.12 KWh)
Weight (+/- 3 %)	49.5 Kg
Dimensions (l x w x h)	485 x 296 x 230 mm
Operation temperature	from -20°C, up to +60°C
Protection Index	IP67
Power connector	Amphenol Powerlok IP67
Specific energy	103.5 Wh/Kg
Energy density	155.1 Wh/l
Continuous discharge current (at 20 °C)	200 A (10.24kW)
Peak discharge current (at 20 °C)	300 A (15.36kW) for 15 minutes
Recommanded charge voltage	57.0 V (max 58.4V)
Floating charge voltage	53.4 V
Standard charge Current	100 A (1 hour)
Fast charge Current	200 A (30 minutes)

Certifications

- CE, UN 38.3, IEC 62619, IEC62620
- Pending : Type Approval Certification for Steel Ships, ECE R100

Technical features of BMS Matrix® Technology

- **Monitoring** of each module : current, power, voltage, cell voltage and temperature, State of Charge (SOC), State of Health (SoH), Contactor states, etc...
- **Active Balancing** for a quick and energy efficient cell balancing process
- **Realtime communication** of alerts, warning and status messages using bus **CAN 2B** for external devices.
- **Intra and Inter module balancing**. This function ensures perfect cell balancing within each module and between all modules in a system
- **Automatic cut-off** triggered by alert events, ie : over-current, over-charge, over-temperature, etc, or manually triggered by CAN message
- **Cell heating** system management

APPLICATIONS

- Industrical vehicles
- Last mile delivery
- Electric vehicles
- Marine
- UAV
- Robotics
- Heavy duty traction
- Energy storage
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Further information at : **www.powertechsystems.eu**
or contact our commercial office :
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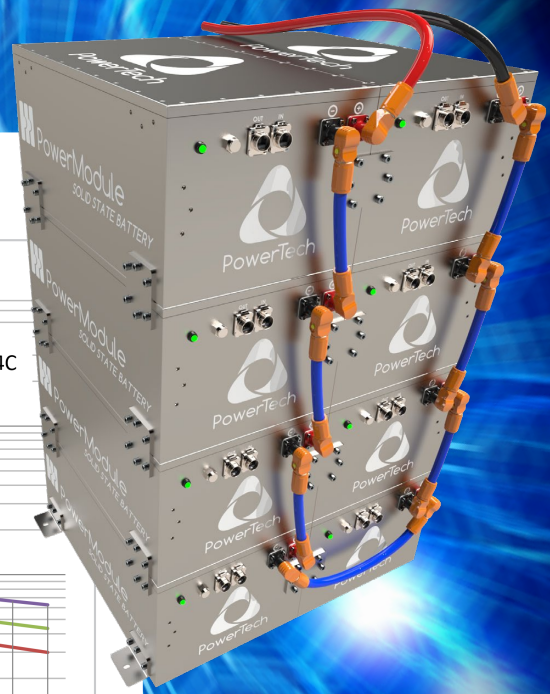
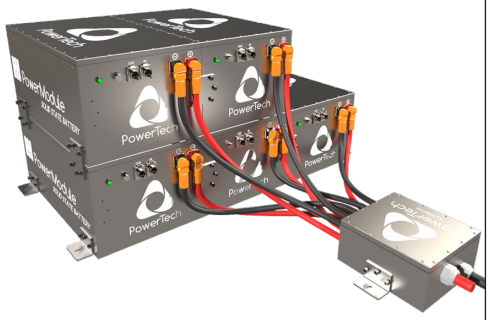


Specifications of PowerModule assembly

Nominal voltage	From 51.2 V, up to 819.2 V (16S)
Nominal capacity (at 1C, 25°C)	Up to 655kWh (128 modules)
Serial assembly	Up to 16 modules in series (819.2 V nominal)
Parallel assembly	Up to 128 modules in parallel (51.2 V nominal)
Serial and Parallel assembly	2S (102.4V) : up to 64 strings in parallel (P) 3S (153.6V) : up to 42 P 4S (204.8V) : up to 32 P 5S (256.0V) : up to 25 P 6S (307.2V) : up to 21 P 7S (358.4V) : up to 18 P 8S (409.6V) : up to 16 P 9S (460.8V) : up to 14 P 10S (512.0V) : up to 12 P 11S (563.2V) : up to 11 P 12S (614.4V) : up to 10 P 13S (665.6V) : up to 9 P 14S (716.8V) : up to 9 P 15S (768.0V) : up to 8 P 16S (819.2V) : up to 8 P



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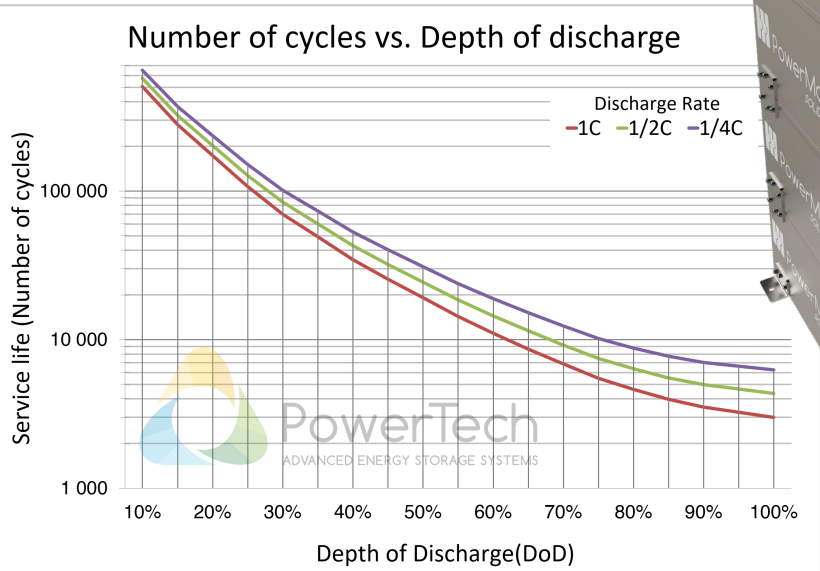
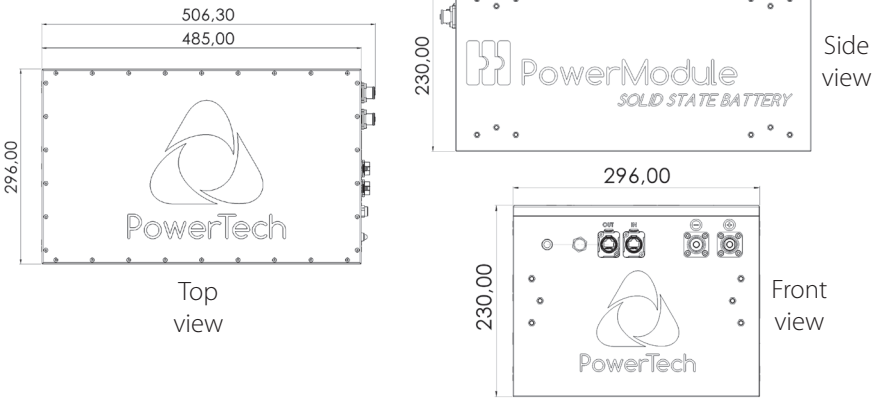
PowerModule Cycle Life

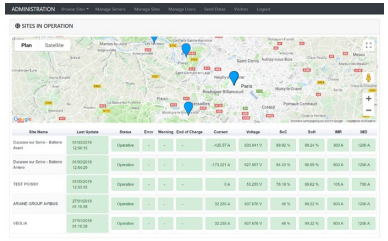


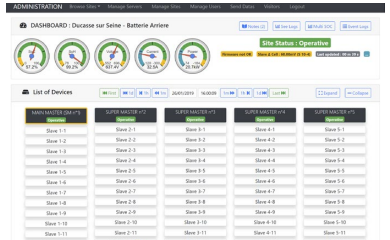
Important note: the number of cycles depends on the operating environment (power levels, operating temperature, etc.).
These data have been obtained from laboratory tests in a controlled environment.
These data are given for information only and do not constitute a contractual commitment.

PowerModule Enclosure Dimensions



Monitoring System





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V1.5

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