# Power Module

Scalable and modular Lithium-Ion energy storage system

PowerTech systems

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


## Modular Design

Each **PowerModule block** is designed around a high performance **5.4 kWh Lithium Iron Phosphate** (LiFePO4) battery composed of **sealed cells.**

Each module is equipped with **BMS Matrix®** technology, which ensures the complete safety of the battery in real time and drastically extends its lifespan.

The BMS also manages a cell **heating system** for operation in temperatures down to -25°C.

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

## Key advantages

- **"Plug-and-Play"** and flexible system **:** Easy and fast commissioning
- **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 54 (IP65 upon request)**
- Amphénol **waterproof connection (IP67)**
- External **communication** by **CAN bus** available
- **High lifespan and number of cycles**

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## PowerModule unit - Technical Specifications

| | |
|---|---|
| Min / Nominal / Max voltage | 48.0 V / 51.2 V / 58.4 V |
| Nominal capacity (at 1C, 25°C) | 105Ah (5.376 KWh) |
| Weight (+/- 3 %) | 43.5 Kg |
| Dimensions (l x w x h) | 400 x 290 x 230 mm |
| Operation temperature | from -20°C, up to +60°C |
| Protection Index | IP54 (IP65 upon request) |
| Power connector | Amphenol Powerlok Ind P67 |
| Specific energy | 123.5 Wh/Kg |
| Energy density | 201.5 Wh/l |
| Continuous discharge current (at 20 °C) | 125 A (6.40kW) |
| Peak discharge current (10 minutes / 30 sec) | 200 A (10.24kW) / 250 A (12.80kW) |
| Recommanded charge voltage | 57.0 V (max 58.4V) |
| Floating charge voltage | 53.4 V |
| Standard charge Current | 50 A (2.56kW) |
| Fast charge Current | 100 A (5.12kW) |

## Certifications

- CE, UN 38.3, IEC 62619, IEC62620, IP54
- BV Type Approval for Steel Ships, BATTERY SYSTEMS, UMS, CCS, PORT, IMS

## Technical features of BMS Matrix® Technology

- **Monitoring** of each PowerModule block : current, power, voltage, PCB temperature, cell voltage and temperature, State of Charge (SOC), State of Health (SoH), Contactor states, etc...
- **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 manuall triggered by CAN message
- **Cell heating system management**

BUREAU VERITAS 1828

## APPLICATIONS

- Industrical vehicles
- Marine
- UAV
- Robotics
- Heavy duty traction
- Energy storage
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Further information at : **www.powertechsystems.eu**
or contact our commercial office :
**+33 185 400 970** or **contact@powertechsystems.eu**

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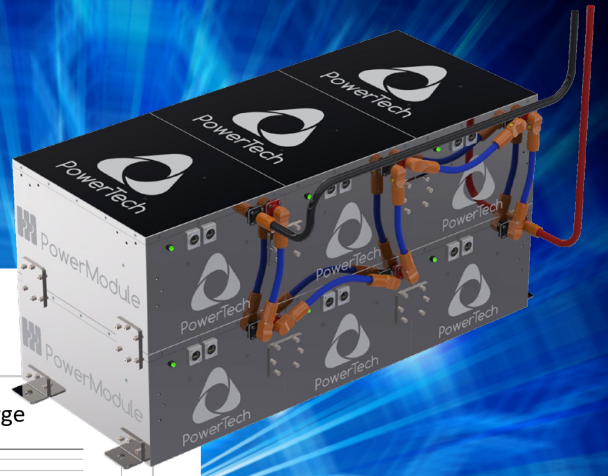
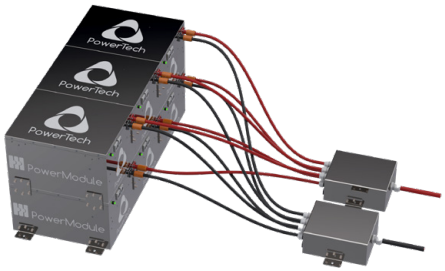



## Specifications of PowerModule assembly

| | |
|---|---|
| Nominal voltage | From 51.2 V, up to 819.2 V (16S) |
| Nominal capacity (at 1C, 25°C) | Up to 688kWh (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<br>3S (153.6V) : up to 42 P<br>4S (204.8V) : up to 32 P<br>5S (256.0V) : up to 25 P<br>6S (307.2V) : up to 21 P<br>7S (358.4V) : up to 18 P<br>8S (409.6V) : up to 16 P<br>9S (460.8V) : up to 14 P<br>10S (512.0V) : up to 12 P<br>11S (563.2V) : up to 11 P<br>12S (614.4V) : up to 10 P<br>13S (665.6V) & 14S (716.8V) : up to 9 P<br>15S (768.0V) & 16S (819.2V) : up to 8 P |

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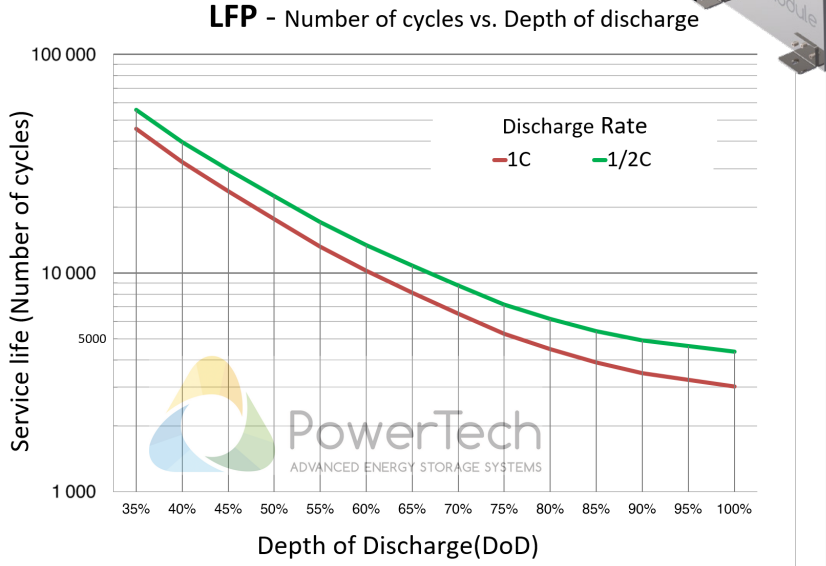
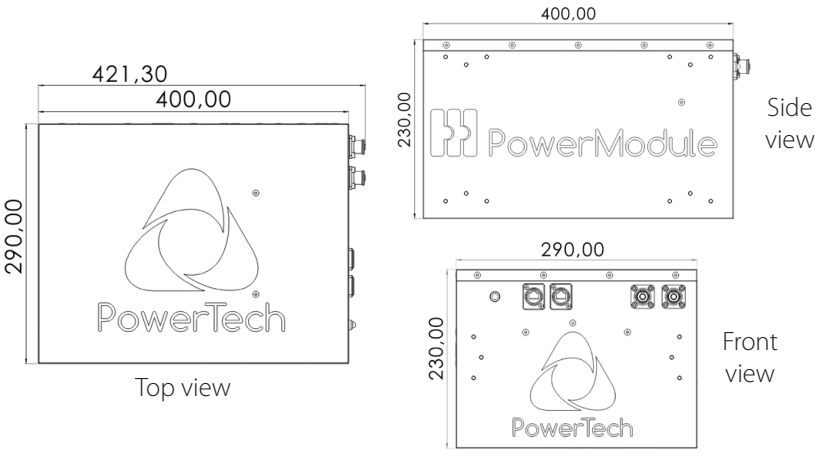
## PowerModule Cycle Life

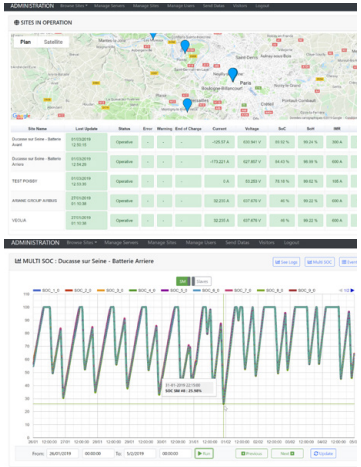



**Important note**: the number of cycles depends on the operating environment (power levels, operating temperature, etc.).
These data have been obtained from laboratory tests in a controlled environment.
These data are given for information only and do not constitute a contractual commitment.

## PowerModule Enclosure Dimensions




## Monitoring System



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