



# PowerModule

Scalable and modular Lithium-Ion energy storage system



PowerTech  
systems

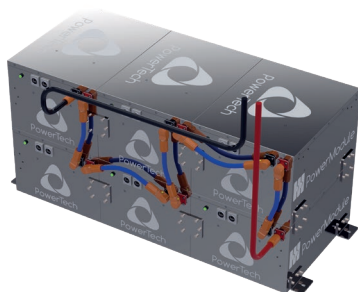
**PowerModule® : Modular, Smart, Safe and efficient energy storage solution.**

## Modular Design

Each **PowerModule block** is designed around a high performance **5.4 kWh Lithium Iron Phosphate (LiFePO<sub>4</sub>)** 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.



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 fulfill the most complex applications
- **Real-time monitoring** in the cloud is available
- **Stainless steel housing IP 54 (IP65 upon request)**
- **Amphenol waterproof connection (IP67)**
- External **communication** by **CAN bus** available
- **High lifespan** and number of cycles



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FRANCE**

## 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)
Recommended 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, **ECE - R100 M1/N1**
- 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 manually triggered by CAN message
- **Cell heating system management**



## APPLICATIONS

- **Industrial vehicles**
- **Marine**
- **UAV**
- **Robotics**
- **Heavy duty traction**
- **Energy storage**
- ...

Further information at : [www.powertechsystems.eu](http://www.powertechsystems.eu)  
or contact our commercial office :  
**+33 185 400 970** or [contact@powertechsystems.eu](mailto:contact@powertechsystems.eu)

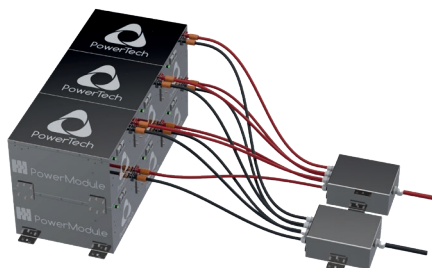


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## Specifications of PowerModule assembly

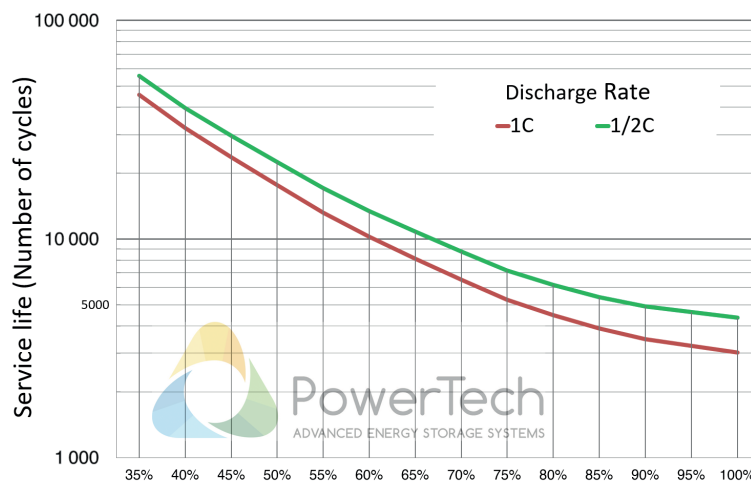
Nominal voltage	From 51.2 V, up to 819.2 V (16S)
Nominal capacity (at 1C, 25°C)	Up to 688kWh (128 modules)
Serial assembly	Up to 16 modules in series (819.2 V nominal)
Parallel assembly	Up to 128 modules in parallel (51.2 V nominal)
Serial and Parallel assembly	2S (102.4V) : up to 64 strings in parallel 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) & 14S (716.8V) : up to 9 P 15S (768.0V) & 16S (819.2V) : up to 8 P



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## PowerModule Cycle Life

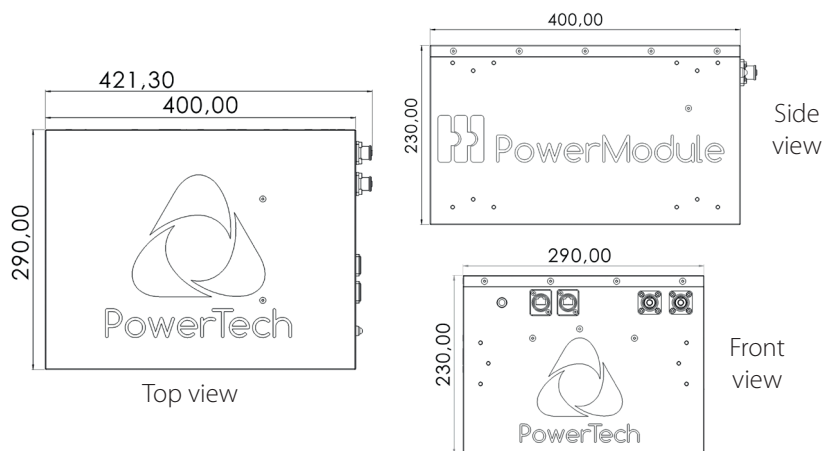
### LFP - Number of cycles vs. Depth of discharge



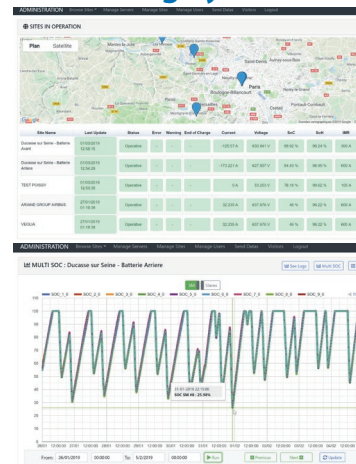
### Depth of Discharge(DoD)

**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



**PowerTech**  
systems  
V2.1

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