WATTSTOR

RENEWABLE ENERGY STORAGE AND MANAGEMENT SYSTEMS

Lithium-Iron-Phosphate Battery Data Sheet

Why Lithium-Iron-Phosphate?

Lithium-iron-phosphate (LiFePO4 or LFP) is the safest of the mainstream li-ion battery types. The nominal voltage of a LFP cell is 3.2V (lead-acid: 2V/cell). A 12.8V LFP battery therefore consists of 4 cells connected in series; and a 25.6V battery consists of 8 cells connected in series.

A LFP battery does not need to be fully charged (service life even slightly improves in case of partial charge instead of a full charge). Other advantages are the wide operating temperature range, excellent cycling performance, low internal resistance and high efficiency.

Efficiency

The round trip energy efficiency of a LFP battery is 92%. A LFP battery will still achieve 90% efficiency under shallow discharge conditions.

Size and Weight

A LFP battery is one of the lightest and compact batteries on the market, making it ideal if space or weight is an issue.

Cell Balance

These batteries have integrated Cell Balancing, Temperature and Voltage control (BTV). Up to ten batteries can be paralleled and up to four batteries can be series connected (BTVs are simply daisy-chained) so that a 48V battery bank of up to 2000Ah can be assembled. The daisy-chained BTVs must be connected to a Battery Management System (BMS).

Battery Management System (BMS)

The BMS connects to the BTVs and its essential functions are:

- Disconnects or shuts down the load whenever the voltage of a battery cell falls to less than 2.5V.
- Stops the charging process whenever the voltage of a battery cell increases to more than 4.2V.
- Shuts down the system whenever the temperature of a cell exceeds 50°C.

Battery Specifications

Cell Balancing and BMS Interface

Voltage and Capacity	LFP BMS 12.8/160	LFP BMS 12.8/200
Nominal voltage	12.8V	12.8V
Nominal capacity @ 25°C*	160Ah	200Ah
Nominal capacity @ 0°C*	130Ah	160Ah
Nominal capacity @ -20°C*	80Ah	100Ah
Nominal energy @ 25°C*	2048Wh	2560Wh
Cycle Life		
80% DoD	2500 cycles	
70% DoD	3000cycles	
50% DoD	5000 cycles	
Discharge		
Maximum continuous discharge current	400A	500A
Recommended continuous discharge current	≤160A	≤200A
Maximum 10 s pulse current	1200A	1500A
End of discharge voltage	11V	11V
Operating Conditions		
Operating temperature	-20°C to +50°C (maximum charge current when battery temperature < 0°C: 0.05C, i.e. 10A in case of a 200Ah battery)	
Storage temperature -45°C to +70°C	45°C to +70°C	
Humidity (non-condensing) Max. 95%	Max. 95%	
Protection class IP 54	IP 54	
Charge		
Charge voltage	Between 14V and 15 (<14.5V recommended)	
Float Voltage	13.6V	
Maximum charge current	400A	500A
Recommended charge current	≤80A	≤100A
Other		
Max storage time @ 25°C†	1 year	
BMS connection	Male + female cable with M8 circular connector, length 50cm	
Power connection (threaded inserts)	M10	M10
Dimensions (hxwxd) mm	320x338x233	295x425x274
Weight	33kg	42kg

*Discharge current ≤1C. †When fully charged.

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