

12,8 Volt Lithium-Iron-Phosphate Batteries Smart With Bluetooth

www.victronenergy.com

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.

Rugged

A lead-acid battery will fail prematurely due to sulfation:

- If it operates in deficit mode during long periods of time (i.e. if the battery is rarely, or never at all, fully charged).
- If it is left partially charged or worse, fully discharged (yacht or mobile home during wintertime).

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. This is a major advantage of LFP compared to lead-acid.

Other advantages are the wide operating temperature range, excellent cycling performance, low internal resistance and high efficiency (see below).

LFP is therefore the chemistry of choice for very demanding applications.

Efficient

In several applications (especially off-grid solar and/or wind), energy efficiency can be of crucial importance. The round trip energy efficiency (discharge from 100% to 0% and back to 100% charged) of the average lead-acid battery is 80%.

The round trip energy efficiency of a LFP battery is 92%.

The charge process of lead-acid batteries becomes particularly inefficient when the 80% state of charge has been reached, resulting in efficiencies of 50% or even less in solar systems where several days of reserve energy is required (battery operating in 70% to 100% charged state).

In contrast, a LFP battery will still achieve 90% efficiency under shallow discharge conditions.

Size and weight

Saves up to 70% in space
Saves up to 70% in weight

Expensive?

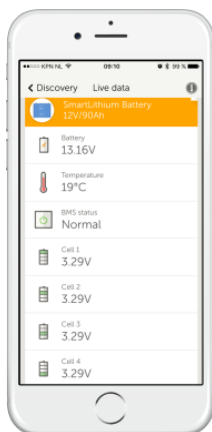
LFP batteries are expensive when compared to lead-acid. But in demanding applications, the high initial cost will be more than compensated by longer service life, superior reliability and excellent efficiency.

Bluetooth

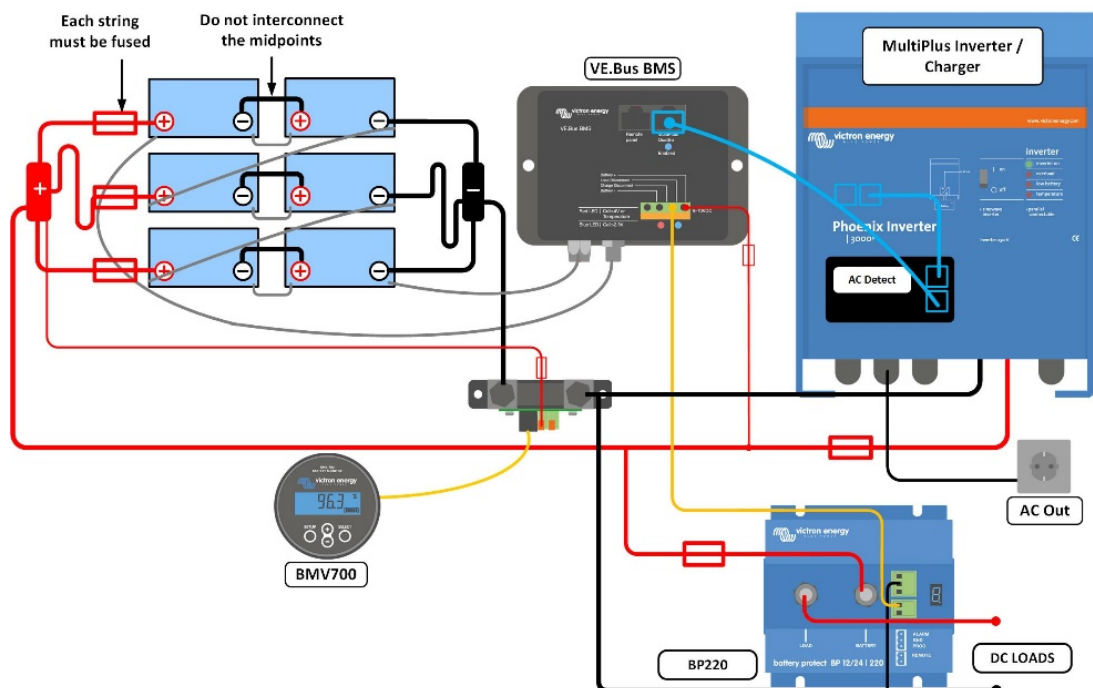
With Bluetooth cell voltages, temperature and alarm status can be monitored. Very useful to localize a (potential) problem, such as cell imbalance.



12,8V 300Ah LiFePO₄ Battery



Li-ion app



Our LFP batteries have integrated cell balancing and cell monitoring. Up to ten batteries can be paralleled and up to four batteries can be series connected, so that a 48V battery bank of up to 3000Ah can be assembled. The cell balancing/monitoring cables can be daisy-chained and must be connected to a Battery Management System (BMS).

Battery Management System (BMS)

The BMS will:

1. Disconnect or shut down the load whenever the voltage of a battery cell decreases to less than 2,5V.
2. Stop the charging process whenever the voltage of a battery cell increases to more than 4,2V.
3. Shut down the system whenever the temperature of a cell exceeds 50°C.

See the BMS datasheets for more features

Battery specification						
VOLTAGE AND CAPACITY	LFP-Smart 12,8/60	LFP-Smart 12,8/90	LFP-Smart 12,8/100	LFP-Smart 12,8/160	LFP-Smart 12,8/200	LFP-Smart 12,8/300
Nominal voltage	12,8V	12,8V	12,8V	12,8V	12,8V	12,8V
Nominal capacity @ 25°C*	60Ah	90Ah	100Ah	160Ah	200Ah	300Ah
Nominal capacity @ 0°C*	48Ah	72Ah	80Ah	130Ah	160Ah	240Ah
Nominal capacity @ -20°C*	30Ah	45Ah	50Ah	80Ah	100Ah	150Ah
Nominal energy @ 25°C*	768Wh	1152Wh	1280Wh	2048Wh	2560Wh	3840Wh
*Discharge current ≤1C						
CYCLE LIFE (capacity ≥ 80% of nominal)						
80% DoD	2500 cycles					
70% DoD	3000 cycles					
50% DoD	5000 cycles					
DISCHARGE						
Maximum continuous discharge current	120A	180A	300A	320A	400A	600A
Recommended continuous discharge current	≤60A	≤90A	≤100A	≤160A	≤200A	≤300A
End of discharge voltage	11V	11V	11V	11V	11V	11V
OPERATING CONDITIONS						
Operating temperature	Discharge: -20°C to +50°C Charge: +5°C to +50°C					
Storage temperature	-45°C to +70°C					
Humidity (non-condensing)	Max. 95%					
Protection class	IP 22					
CHARGE						
Charge voltage	Between 14V and 14,4V (14,2V recommended)					
Float voltage	13,5V					
Maximum charge current	180A	270A	300A	400A	500A	750A
Recommended charge current	≤30A	≤45A	≤50A	≤80A	≤100A	≤150A
OTHER						
Max storage time @ 25°C*	1 year					
BMS connection	Male + female cable with M8 circular connector, length 50cm					
Power connection (threaded inserts)	M8	M8	M8	M10	M10	M10
Dimensions (hwxwd) mm	240x285x132	249x285x160	249x293x168	317x335x228	297x425x265	347x425x265
Weight	12kg	16kg	18kg	33kg	42kg	51kg
*When fully charged						