

# 12,8 & 25,6 Volt Lithium-Iron-Phosphate Batteries Smart With Bluetooth

www.victronenergy.com

## Why lithium-iron-phosphate?

Lithium-iron-phosphate (LiFePO<sub>4</sub> 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

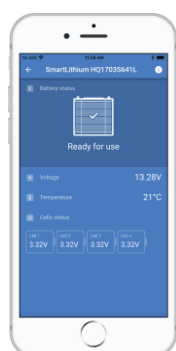
Saves up to 70% in weight

### Expensive?

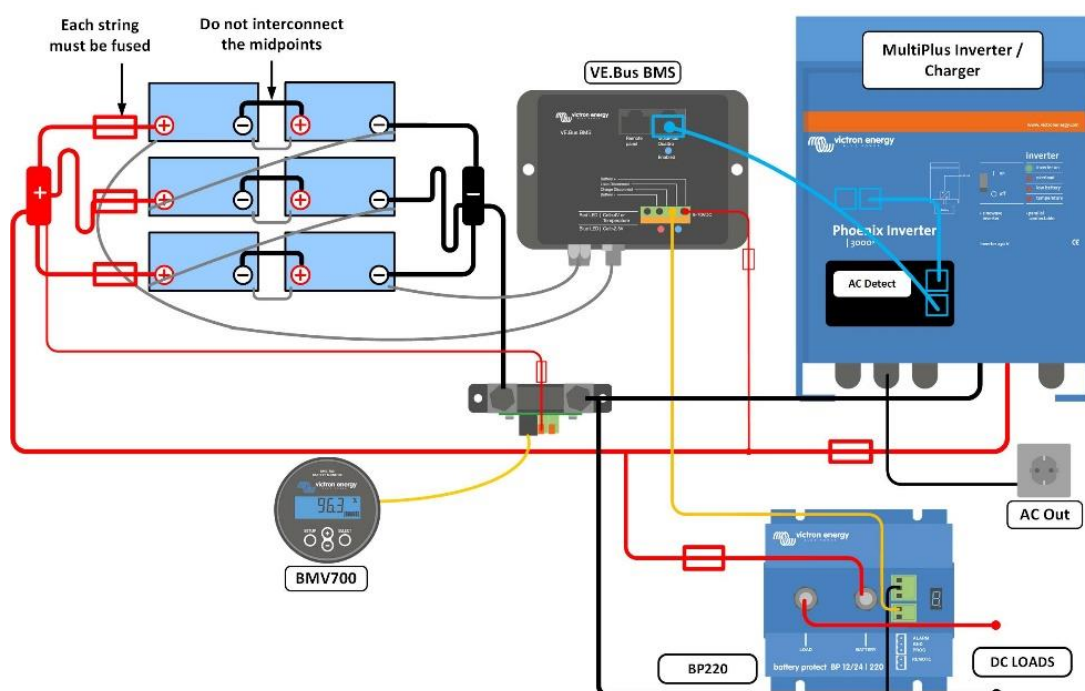
LFP batteries are expensive when compared to lead-acid. But in demanding applications, the high initial



12,8V 300Ah LiFePO<sub>4</sub> Battery



Li-ion app



Our LFP batteries have integrated cell balancing and cell monitoring. Up to 5 batteries can be paralleled and up to four 12V batteries or two 24V batteries can be series connected, so that a 48V battery bank of up to 1500Ah 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 12,8/100	LFP-Smart 12,8/150	LFP-Smart 12,8/160	LFP-Smart 12,8/200	LFP-Smart 12,8/200-a	LFP-Smart 12,8/300	LFP-Smart 25,6/200
Nominal voltage	12,8V	12,8V	12,8V	12,8V	12,8V	12,8V	12,8V	25,6V
Nominal capacity @ 25°C*	60Ah	100Ah	150Ah	160Ah	200Ah	200Ah	300Ah	200Ah
Nominal capacity @ 0°C*	48Ah	80Ah	125Ah	130Ah	160Ah	160Ah	240Ah	160Ah
Nominal capacity @ -20°C*	30Ah	50Ah	75Ah	80Ah	100Ah	100Ah	150Ah	100Ah
Nominal energy @ 25°C*	768Wh	1280Wh	1920Wh	2048Wh	2560Wh	2560Wh	3840Wh	5120Wh
*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	200A	300A	320A	400A	400A	600A	400A
Recommended continuous discharge current	≤60A	≤100A	≤150A	≤160A	≤200A	≤200A	≤300A	≤200A
End of discharge voltage	11V	11V	11V	11V	11V	11V	11V	22V
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/28V and 14,4V/28,8V (14,2V/28,4V recommended)							
Float voltage	13,5V/27V							
Maximum charge current	120A	200A	300A	320A	400A	400A	600A	400A
Recommended charge current	≤30A	≤50A	≤75A	≤80A	≤100A	≤100A	≤150A	≤100A
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	M10	M8
Dimensions (h x w x d) mm	240 x 285 x 132	197 x 321 x 152	237 x 321 x 152	320 x 338 x 233	297 x 425 x 274	237 x 321 x 152	347 x 425 x 274	317 x 631 x 208
Weight	12kg	15kg	20kg	33kg	42kg	22kg	51kg	56kg
*When fully charged								