

12,8 & 25,6 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 demanding applications.



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.



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.

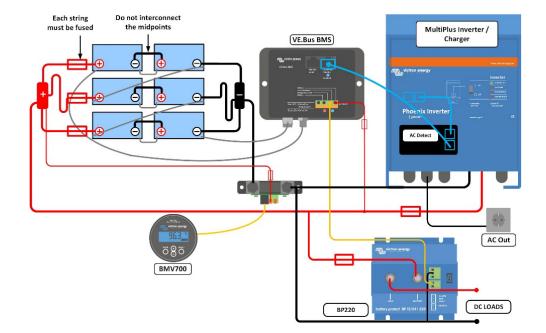
Very useful to localize a (potential) problem, such as cell imbalance.



12,8V 300Ah LiFePO4 Battery



Li-ion app



Our LFP batteries have integrated cell balancing and cell monitoring. Up to 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. Generate a pre-alarm whenever the voltage of a battery cell decreases to less than 3,1V (adjustable 2,85 3,15 V).
- 2. Disconnect or shut down the load whenever the voltage of a battery cell decreases to less than 2,8V (adjustable 2,6 V 2,8 V).
- 3. Stop the charging process whenever the voltage of a battery cell increases to more than 3,75 V or when the temperature becomes too high.

See the BMS datasheets for more features

Nominal voltage 12,8V 12,8V 12,8V 12,8V 12,8V 12,8V 12,8V 12,8V 25,6V 25,6V 25,6V Nominal capacity @ 25°C* 50Ah 60Ah 100Ah 160Ah 200Ah 300Ah 330Ah 100Ah 200Ah Nominal capacity @ 25°C* 25Ah 30Ah 50Ah 80Ah 130Ah 160Ah 240Ah 260Ah 80Ah 160Ah Nominal capacity @ 25°C* 25Ah 30Ah 50Ah 80Ah 100Ah 150Ah 160Ah 50Ah 160Ah Nominal capacity @ 25°C* 640Wh 768Wh 1280Wh 2048Wh 2560Wh 3840Wh 4220Wh 2560Wh 5120Wh 100Ah 150Ah 160Ah 150Ah 160Ah 150Ah 160Ah 150Ah 160Ah 150Ah 160Ah 16				Batt	ery specific	ation				
Nominal capacity @ 25°C* 50Ah 60Ah 100Ah 160Ah 200Ah 300Ah 330Ah 100Ah 200Ah Nominal capacity @ 0°C* 40Ah 48Ah 80Ah 130Ah 160Ah 240Ah 260Ah 80Ah 100Ah Nominal capacity @ 0°C* 25Ah 30Ah 50Ah 80Ah 100Ah 150Ah 160Ah 240Ah 260Ah 80Ah 100Ah Nominal capacity @ 25°C* 640Wh 768Wh 1280Wh 2240Wh 2250Wh 3840Wh 4220Wh 2560Wh 1220Wh 2560Wh	VOLTAGE AND CAPACITY	Smart	Smart	Smart	Smart	Smart				
Nominal capacity @ 0°C*	Nominal voltage	12,8V	12,8V	12,8V	12,8V	12,8V	12,8V	12,8V	25,6V	25,6V
Nominal capacity @ -20°C ⁺ 25Ah 30Ah 50Ah 80Ah 100Ah 150Ah 160Ah 50Ah 100Ah Nominal henergy @ 25°C ⁺ 640Wh 768Wh 1280Wh 2048Wh 2560Wh 3840Wh 4220Wh 2560Wh 5120Wh 105kharge current ≤1C CYCLE LIFE (capacity ≥ 80% of nominal)	Nominal capacity @ 25°C*	50Ah	60Ah	100Ah	160Ah	200Ah	300Ah	330Ah	100Ah	200Ah
Nominal energy @ 25°C* 640Wh 768Wh 1280Wh 2048Wh 2560Wh 3840Wh 4220Wh 2560Wh 5120Wh *Discharge current ≤1C	Nominal capacity @ 0°C*	40Ah	48Ah	80Ah	130Ah	160Ah	240Ah	260Ah	80Ah	160Ah
Discharge current ≤1C **Software current ≤1C** **Software current ≤1C** **Software current ≤10** **Maximum continuous of 100A 120A 200A 320A 400A 600A 400A 200A 400A 100A 100A 11,2V	Nominal capacity @ -20°C*	25Ah	30Ah	50Ah	80Ah	100Ah	150Ah	160Ah	50Ah	100Ah
CYCLE LIFE (capacity ≥ 80% of nominal)	Nominal energy @ 25°C*	640Wh	768Wh	1280Wh	2048Wh	2560Wh	3840Wh	4220Wh	2560Wh	5120Wh
2500 cycles 3000 cycles 5000 cycles	*Discharge current ≤1C									
3000 cycles 5000 cycles				CYCLE LIFE	(capacity ≥ 80%	of nominal)				
Solid Sol	80% DoD	2500 cycles								
Maximum continuous 100A 120A 200A 320A 400A 600A 400A 200A 400A 400A 800A 400A 400A 800A 400A 400A 800A 400A 400A 800A 400A	70% DoD	3000 cycles								
Maximum continuous discharge current 100A 120A 200A 320A 400A 600A 400A 200A 400A Recommended continuous discharge current ≤50A ≤60A ≤100A ≤160A ≤200A ≤300A ≤300A ≤100A ≤200A End of discharge voltage 11,2V	50% DoD	5000 cycles								
discharge current Recommended continuous discharge rurent S50A S60A S60A S100A S100A S100A S200A S100A S100A S100A S100A S200A S100A S10					DISCHARGE					
discharge current		100A	120A	200A	320A	400A	600A	400A	200A	400A
Internal resistance 2mΩ 2mΩ 0,8mΩ 0,9mΩ 0,8mΩ 0,8mΩ 0,8mΩ 1,6mΩ 1,5mΩ 1		≤50A	≤60A	≤100A	≤160A	≤200A	≤300A	≤300A	≤100A	≤200A
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 100A 120A 200A 320A 400A 600A 400A 200A 400A Recommended charge current ≤30A ≤30A ≤50A ≤80A ≤100A ≤150A ≤50A ≤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 M8 M8 M8 Dimensions (hxwxd) mm 199 x 188 x 147 239 x 286 x 137 x 321 x 237 x 321 x 237 x 321 x 237 x 321 x 274 206 163 237 x 650 x 163 163 163	End of discharge voltage	11,2V	11,2V	11,2V	11,2V	11,2V	11,2V	11,2V	22,4V	22,4V
Discharge: -20°C to +50°C Charge: +5°C to +50°C	Internal resistance	$2m\Omega$	$2m\Omega$	0,8mΩ	0,9mΩ	0,8mΩ	0,8mΩ	0,8mΩ	1,6mΩ	1,5mΩ
Storage temperature				OPE	RATING CONDIT	IONS				
Humidity (non-condensing) Protection class IP 22 CHARGE Charge voltage Between 14V/28V and 14,4V/28,8V (14,2V/28,4V recommended) Float voltage Max. 95% Between 14V/28V and 14,4V/28,8V (14,2V/28,4V recommended) Float voltage 13,5V/27V Maximum charge current 100A 120A 200A 320A 400A 600A 400A 200A 400A 8ecommended charge current 530A ≤30A ≤30A ≤50A ≤80A ≤100A ≤150A ≤150A ≤50A ≤100A There 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 M8 M8 M8 M8 M8 M8 M	Operating temperature	Discharge: -20°C to +50°C Charge: +5°C to +50°C								
Protection class CHARGE Charge voltage Between 14V/28V and 14,4V/28,8V (14,2V/28,4V recommended) Float voltage Float voltage T3,5V/27V Maximum charge current 100A 120A 200A 320A 400A 600A 400A 200A 400A Recommended charge side side side side side side side sid	Storage temperature	-45°C to +70°C								
CHARGE Charge voltage Between 14V/28V and 14,4V/28,8V (14,2V/28,4V recommended) Float voltage Total voltage Maximum charge current 100A 120A 200A 320A 400A 600A 400A 200A 400A Recommended charge current ≤30A ≤30A ≤50A ≤80A ≤100A ≤150A ≤150A ≤50A ≤100A OTHER Max storage time @ 25°C* Typear BMS connection Male + female cable with M8 circular connector, length 50cm Power connection (threaded inserts) M8	Humidity (non-condensing)	Max. 95%								
Ploat voltage Between 14V/28V and 14,4V/28,8V (14,2V/28,4V recommended)	Protection class	IP 22								
Float voltage Maximum charge current 100A 120A 200A 320A 400A 600A 400A 200A 400A 200A 400A 8ecommended charge current STEAN STEAN STEAN STEAN Max storage time @ 25°C* 1 year Max storage time @ 25°C* 1 year Max storage time @ 25°C* 1 year 1 year Max storage time @ 25°C* 1 year Max storage time @ 25°C* 1 year 1 year Max storage time @ 25°C* 1 year 1 year Max storage time @ 25°C* 1 year 1 year Max storage time @ 25°C* 1 year 1 year 1 year Max storage time @ 25°C* 1 year 2 year					CHARGE					
Maximum charge current 100A 120A 200A 320A 400A 600A 400A 200A 400A Recommended charge current ≤30A ≤30A ≤50A ≤80A ≤100A ≤150A ≤50A ≤100A OTHER Max storage time @ 25°C* Typear BMS connection Male + female cable with M8 circular connector, length 50cm Power connection (threaded inserts) M8 M8 M8 M8 M10 M10 M8 M8 M8 Dimensions (hxwxd) mm 199 x 188 x 147 239 x 286 x 132 197 x 321 x 152 237 x 321 x 152 237 x 321 x 274 265 x 359 x 206 197 x 650 x 163 237 x 650 x 163	Charge voltage	Between 14V/28V and 14,4V/28,8V (14,2V/28,4V recommended)								
Recommended charge current ≤30A ≤30A ≤50A ≤80A ≤100A ≤150A ≤50A ≤100A OTHER Max storage time @ 25°C* Tyear BMS connection Male + female cable with M8 circular connector, length 50cm Power connection (threaded inserts) M8 M8 M8 M8 M10 M10 M8 M8 M8 Dimensions (hxwxd) mm 199 x 188 x 147 239 x 286 x 132 197 x 321 x 152 237 x 321 x 152 237 x 321 x 152 274 206 163 163 237 x 650 x 163	Float voltage	13,5V/27V								
Current ≤30A ≤30A ≤50A ≤80A ≤100A ≤150A ≤150A ≤50A ≤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 M8 M8 M8 Dimensions (hxwxd) mm 199 x 188 x 147 239 x 286 x 132 197 x 321 x 237 x 321 x 237 x 321 x 274 247 x 425 x 265 x 359 x 265 x 359 x 265 x 359 x 265 x 365	Maximum charge current	100A	120A	200A	320A	400A	600A	400A	200A	400A
1 year BMS connection Male + female cable with M8 circular connector, length 50cm Power connection (threaded inserts) M8 M8 M8 M8 M8 M10 M10 M8 M8 M8 Dimensions (hxwxd) mm 199 x 188 x 147 239 x 286 x 132 197 x 321 x 152 237 x 321 x 152 237 x 321 x 152 347 x 425 x 274 265 x 359 x 365	•	≤30A	≤30A	≤50A	≤80A	≤100A	≤150A	≤150A	≤50A	≤100A
BMS connection Male + female cable with M8 circular connector, length 50cm Power connection (threaded inserts) M8 M8 M8 M8 M8 M10 M10 M8 M8 M8 Dimensions (hxwxd) mm 199 x 188 x 147 239 x 286 x 132 197 x 321 x 152 237 x 321 x 152 237 x 321 x 152 247 x 425 x 152 265 x 359 x 197 x 650 x 163 163 x 163					OTHER					
Power connection (threaded inserts) M8 M8 M8 M8 M8 M8 M8 M10 M10 M8 M8 M8 Dimensions (hxwxd) mm 199 x 188 x 147 239 x 286 x 132 197 x 321 x 152 237 x 321 x 152 237 x 321 x 152 347 x 425 x 274 265 x 359 x 206 197 x 650 x 163 163 x 163	Max storage time @ 25°C*	1 year								
(threaded inserts) M8 M8 M8 M8 M8 M8 M8 M10 M10 M8 M8 Dimensions (hxwxd) mm 199 x 188 x 147 239 x 286 x 132 197 x 321 x 152 237 x 321 x 152 237 x 321 x 152 347 x 425 x 274 265 x 359 x 265 x 265 x 359 x 350	BMS connection			Mal	e + female cable v	vith M8 circular co	onnector, length 5	0cm		
Dimensions (nxwxa) mm 199 x 188 x 147 x132 152 152 274 206 163 163		M8	M8	M8	M8	M8	M10	M10	M8	M8
Weight 7kg 12kg 14kg 18kg 20kg 51kg 30kg 28kg 39kg	Dimensions (hxwxd) mm				152			206		
	Weight	7kg	12kg	14kg	18kg	20kg	51kg	30kg	28kg	39kg

