Solar Power Mart
Harvest the Sunpower!

Lithium Iron Phosphate
12V LiFePO4 Battery

HIGH PERFORMANCE LITHIUM BATTERY

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.

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

• 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 winter time).

A LFP battery does not need to be fully charged. Service life even slightly improves in case of partial charged 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.

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

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.

LFP batteries are easier to charge than lead-acid batteries. The charge voltage may vary from 14V to 16V (as long as no cell is subjected to more than 4,2V), and they do not need to be fully charged. Therefore several batteries can be connected in parallel and no damage will occur if some batteries are less charged than others.

EFFICIENCY

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

GAMMA BMS

Using the most reliable GAMMA BMS Technologies
The GAMMA BMS connects to the BTV's and its essential functions are:
1. Disconnect or shut down the load whenever the voltage of a battery cell falls 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.
4. Prevent cell under voltage by timely disconnecting the load.
5. Prevent cell overvoltage by reducing charge current or stopping the charge process.
6. Shut down the system in case of over temperature.

A GAMMA BMS is therefore indispensable to prevent damage to large Li-ion battery banks.

2,000 Cycles at 80% DoD
With built-in GAMMA BMS

Solar Power Mart

LiFEPO4 BATTERY

HIGH QUALITY

BATTERY SPECIFICATIONS					
Voltage & Capacity	SPM004LiFePO4	SPM008LiFePO4	SPM016LiFePO4	SPM030LiFePO4	SPM100LiFePO4
Nominal Voltage	12.8V	12.8V	12.8V	12.8V	12.8V
Nominal Capacity @ 25°C	4AH	8AH	16AH	30AH	100AH
Nominal Capacity @ 0°C	3.2AH	6.4AH	12.8AH	24AH	80AH
Nominal Capacity @ -20°C	2AH	4AH	8AH	15AH	50AH
Nominal Energy @ 25°C	51.2Wh	102.4Wh	204.8Wh	384Wh	1280Wh
Cycle Life					
80% DoD 0.2C	2,000 cycles				
100% DoD 0.2C	1,500 cycles				
Discharge					
Recommended Continuous discharge current	≤4A	≤8A	≤16A	≤30A	≤100A
End of discharge voltage	11V	11V	11V	11V	11V
Operating Conditions					
Operating Temperature	-20°C to +50°C (do not charge when battery temperature < 0°C or higher than 50°C)				
Storage Temperature	-10°C to +40°C				
Charge					
Charge Voltage	14.6±0.03V				
Float Voltage	13.6V				
Maximum Charge Current	4A	8A	16A	30A	100A
Recommended Charge Current	≤0.8A	≤1.6A	≤3.2A	≤6.0A	≤25A
Other					
Max Storage time @ 25°C	1 year				
Dimensions	140 x 70 x25 mm	144 x 133 x33 mm	200 x 140 x25 mm	290 x 200 x25 mm	580x 400 x 50 mm
Weight	0.5kg	1kg	2kg	3.5kg	12kg

LIFETIME COST COMPARISON OF SEALED LEAD ACID BATTERY TO LITHIUM BATTERY

	SLA AGM @ 25°C	SLA AGM @ 35°C	SLA AGM @ 45°C	LiFePO4 @ 45°C
System Size	100Ah 12V = 1,200W-hr	100Ah 12V = 1,200W-hr	100Ah 12V = 1,200W-hr	30Ah 12V = 360W-hr
Battery Cost	RM778 (RM0.65/W-hr)	RM778 (RM0.65/W-hr)	RM778 (RM0.65/W-hr)	RM1,258 (RM3.49/W-hr)
Cycle Life	1,400 @ 20% DoD	700 @ 20% DoD	350 @ 20% DoD	2,000 @ 80% DoD
Transportation	RM50	RM50	RM50	RM15
Installation	RM15	RM15	RM15	RM15
Lifetime Cost	RM0.60/W-hr throughput	RM1.20/W-hr throughput	RM2.41/W-hr throughput	RM0.64/W-hr throughput