

LiFePO4

Next Generation Lithium Batteries.



FACT SHEET

This is a basic technical overview on our range of LiFePO4 lithium batteries.

- A LiFePO4 battery is made by combining multiple cells in series and parallel to provide the required voltage and charge capability. For a standard 12V battery this requires 4 cells in series (often expressed as 4S) with a nominal voltage of 12.8V.
- Within each battery housing exists a battery management system (BMS). This is used to oversee the well being of the overall battery pack and manages issues such as Over-voltage cut off, Low battery cut off and Over temperature shut down. It also balances the multiple single cells within the battery ensuring they are all correctly charged.
- Due to the BMS design, not all LiFePO4 batteries can be wired in series, and if they can be, there are limitations as to how many can be wired in a series string. Maximum for our range is 4 pieces. Generally there are no problems wiring the batteries in parallel. In theory, you could use unlimited batteries in parallel.
- It is important to note that prior to first use, all LiFePO4 batteries should be fully charged. Altronics LiFePO4 batteries are supplied 30% charged from the factory.
- If a LiFePO4 battery's BMS "low battery cut off" activates, it will disconnect the battery from the battery terminals. This will present a very low voltage across the battery terminals (potentially 0V) which may look like the battery is dead, but simply indicates that it is protecting itself. Chargers designed for LiFePO4 batteries will recognise this and bring the battery out of protect mode via various methods. For example our M8536A charger will pulse charging voltage into the BMS until it has charged the battery enough for the BMS to reconnect the battery (this can take up to 20 minutes). Once the battery has been reconnected, charging will proceed as normal.
- At a pinch a LiFePO4 can be charged with an SLA charger, however this will make poor use of the battery's capacity and we strongly recommend a LiFePO4 compatible charger such as M8536A.

Lithium's offer several advantages over traditional SLA batteries.

- ✓ Weight - up to half the weight of equivalent SLA models
- ✓ Low self discharge
- ✓ Longer service life up to 10 years
- ✓ Can't be damaged by over discharging
- ✓ Built in battery management system BMS to protect the battery

LiFePO4 Lithium Iron Phosphate Batteries

12V150AH

Model:SL4581B


Powerhouse
BATTERIES


The latest generation in maintenance free batteries is here! LiFePO4 batteries offer longer service life than traditional lead acid batteries, plus weigh less than HALF as much as SLA batteries. LiFePO4 also provide more usable life per cycle, allowing for longer run times by holding a higher voltage until capacity is almost exhausted. These batteries will also maintain 80-90% charge when in storage - far higher than their lead acid counterparts.

Each battery is fitted with an internal battery management system to provide safe charging and discharging at all times. This system provides internal short circuit, over temperature and under/over voltage cut off. Can be wired in series and/or parallel.



Applications



BATTERY SPECIFICATIONS

Battery Type - Chemistry	LiFePO4	Internal Resistance - Milliohms	< 50 mΩ
Nominal Voltage	12.8 V	Efficiency - round trip	> 99.5 %
Amp Hour Capacity	150 AH	Self Discharge per Month	< 3 %
Energy Density	1920 Wh	Max - series connections	51.2 V
Dimensions(LxWxH)	521*237*215 mm	Parallel connections	4PCS
Weight	20 KGS	Case IP Rating	IP50
Terminal Type	M8	DesignLife	20 Years
Terminal Torque	16 NM	Cycle Life (1C, 25°C@80%DOD)	>4000 cycles
Case Material	ABS	Cycle Life (0.2C, 25°C@80%DOD)	>6000 cycles
BMS build-in	Yes		
		Discharge Temperature	(-23 to 65) °C
Recommend Charge Voltage	14.8 ±0.20V	Charge Temperature	(-3 to 65) °C
Max Charge Voltage	15.2 ±0.20V	Storage Temperature	(-20 to 45C) °C
Recommend Charge current	40 A		
Max Charge Current	150 A	Bluetooth(APP)	Optional
Charge Current (0 to -10°C)	<0.1 C	LCD Screen	Optional
Charge Current (-20 to -10°C)	<0.05 C	Heating functions -20°C	Optional By Charger
Recommend Discharging voltage	10.4 ±0.20V	Batteryself heating function	Optional BY Cell
Max Discharging Voltage	9.2 ±0.20V		
Max Discharge Current	150 A	Shipping Classification	UN3480, CLASS 9
Pulse Discharge Current	650 A±15S	Other Certifications	CB /CE

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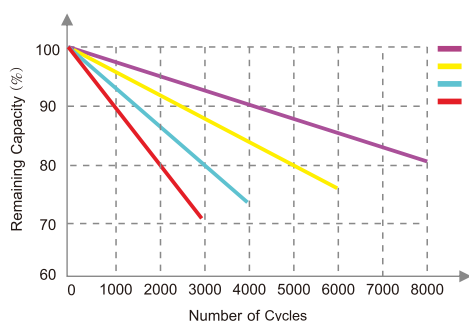


BMS SPECIFICATIONS

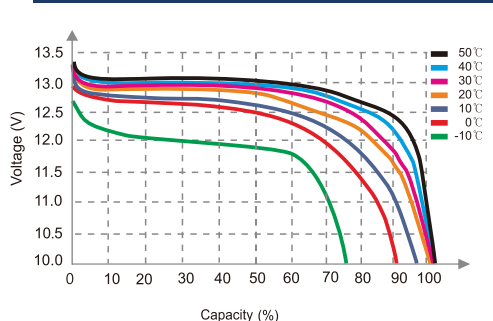
BMS Version :JWZN

BMS Protections Range:	Over (Voltage, Current, Temperaturemanagement) and cell balance					
Over Charging Cell protection	>3.85	±0.05V	Delay	2 ±0.5S		
Over Charging Pack protection	>15.4	±0.20V	Delay	2 ±0.5S		
Over Charging Current 1	>150	±2.0A	Delay	5 ±2.0S		
Over Charging Current 2	-	±2.5A	Delay	-	±1.0S	
OverCharging Temp Protection 1	<-0 or>65	±3°C	Release	>3 or < 60	±3°C	Delay:2±0.5S
Over Discharging Cell protection	<2.3	±0.05V	Delay	2 ±0.5S		
Over Discharging Pack protection	<9.2	±0.20V	Delay	2 ±0.5S		
Over Discharging current 1	>650	±2.5A	Delay	15 ±2.0S		
Over Discharging current 2	>1300	±2.5A	Delay	1 ±1.0S		
Over Discharging current 3	--	±2.5A	Delay	±1.0S		
Over Discharging Temp Protection 1	<-20 or>65	±3°C	Release	> -15 or < 60	±3°C	
PCB Temp protection	>95	±3°C	Release	< 75	±3°C	Delay:2±0.5S
Cell Balance Start	3.6 ±0.05V					
Balance Current	36 ±20mA					
Short circuit			Delay	350 ±0.5ms		
Power consumption	<100	uA	Switch-off mode	Storage & transportation		
	<100	uA	Sleep mode	Protection & stand-by		
	<15	mA	Operating mode	Operating		
	<28	mA	Operating mode	Low voltage to start Pre-charge		
Communication ports	Opitonal for CAN/Bluetooth/RS485/Dryport/SNMP			Can be customizeddevice		
Temperature accuracy	±2	°C	Measuring range -40~100°C			
Voltage accuracy	±3.5	mv	For cells and module			
Current accuracy	FSC	±5%	Measuring range -200~+200A			
SOC	±5%		Integral calculation			

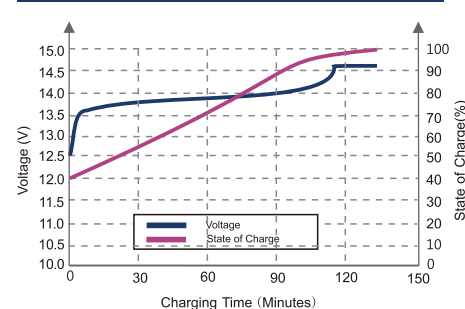
Different DOD Discharge Cycle Life Curve 1C 25C



Different Temperature Discharge Curve(0.2C)



State of Charge Curve(0.5C, 25°C)



Important Information Regarding Your Lithium Battery.



The Powerhouse range of Lithium batteries have undergone two charge/discharge cycles at the factory during manufacture, and are only shipped with approximately 30% charge.

It is important to completely charge a new battery prior to first use. To obtain best performance and prolong battery life, you should use a battery charger suitable for Lithium batteries.

In an emergency you can use a traditional SLA charger, but you will not get optimum performance from the battery as it will never get to 100% charged.

Battery Management System (BMS) Overview

Every model Powerhouse Lithium battery has an inbuilt Battery Management System known as a BMS which is an elaborate electronic protection circuit. The purpose of the BMS is to protect the internal battery cells from numerous adverse conditions, including over temperature, over voltage, under voltage, over discharge as well as ensuring the internal cells making up the battery are properly charged and discharged and are overall well balanced.

SAFE/SLEEP mode.

During use, if the battery does encounter over temperature, over voltage, under voltage or over discharge situations, the BMS will place the battery into "SAFE/SLEEP" mode. When in this "SAFE/SLEEP" mode, there is no voltage present at the terminals. If you measured the battery with a DC volt meter the reading will be 0V. This could lead you to believe the battery is dead or faulty, but it is not. It is in protection "SAFE/SLEEP" mode and to continue using it, it has to be brought out of this state.

Reactivating Battery From "SAFE/SLEEP" mode.

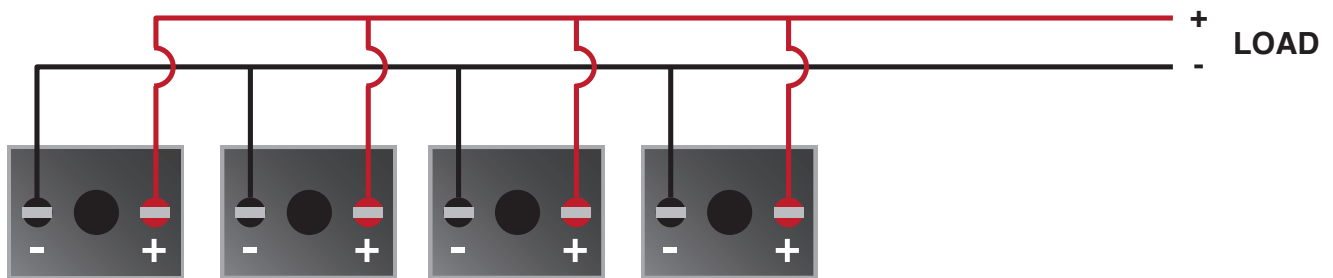
With the battery completely disconnected, you will need to use a mains lithium battery charger with a "wake" circuit (suitable Powetran chargers include M8534A and M8536A). This will pulse the battery, eventually getting it to start charging. The time it takes varies depending on the charger used and the capacity of the battery. This can take from several minutes to more than an hour.

Do not use the battery until it has been 100% recharged.

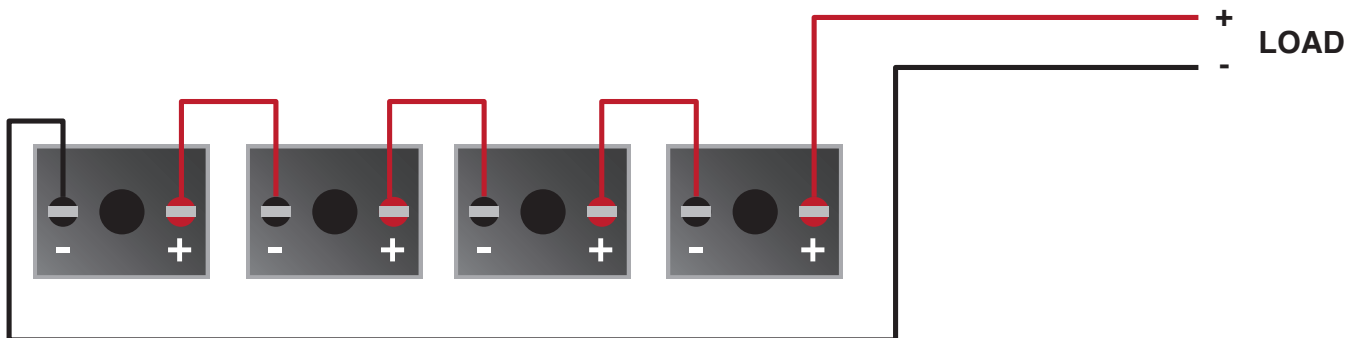
Battery Wiring Configurations

Regardless of your wiring configuration it is technically best to individually charge each battery to 100% capacity using the same charger before connecting them. This ensures all batteries are at the same terminal voltage and will charge/discharge evenly.

Parallel Batteries (no limit on number connected - always check battery datasheets to confirm).



Series Batteries (maximum 4 units - always check battery datasheets to confirm).



Note: When using LiFePO4 batteries in circuits, NEVER mix brands, capacities or voltages. Always use identical batteries in your circuit (ie: same brand/model, same amp hour (Ah) rating, same voltage).

Disclaimer

Information provided as a guide only. Please seek professional advice when installing battery circuits in your vehicle or trailer. Battery wiring can carry very high currents and if not fused correctly, could cause circuit failures and fires.

Warranty Statement

Altronic Distributors warrants Powerhouse LiFePO4 batteries for 5 years from date of purchase from Altronic or its resellers to the consumer. If this item is part of an installation or another product, please contact the installer or supplier for your warranty. During the warranty period, we undertake to repair or replace your product at no charge if found to be defective due to a manufacturing fault. The warranty excludes damage by misuse or incorrect installation (i.e. failure to install and operate device according to specifications in the supplied instruction manual), neglect, shipping accident, or no fault found, nor by use in a way or manner not intended by the supplier.

For repair or service please contact your PLACE OF PURCHASE.

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. NOT FIELD SERVICEABLE.

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