



# BEHOLD THE NEXT GENERATION IN BATTERY TECHNOLOGY

## Why universal battery® LFP Batteries?

Our trusted batteries have been powering essential and critical applications for over half a century. We believe in always delivering the best in quality, performance and customer experience - and that is how we roll.

Custom-engineered for exceptional power, our LiFePO4 (LFP) batteries are the future in battery technology. Ultra-light weight and more powerful than traditional sealed lead-acid batteries, our LFP batteries deliver the best performance in the most extreme environments.



**10X** the cycle life of sealed lead-acid batteries



**Ultra light weight**  
A third of the weight of traditional sealed lead-acid batteries



**Charges 3X faster** than sealed lead-acid batteries



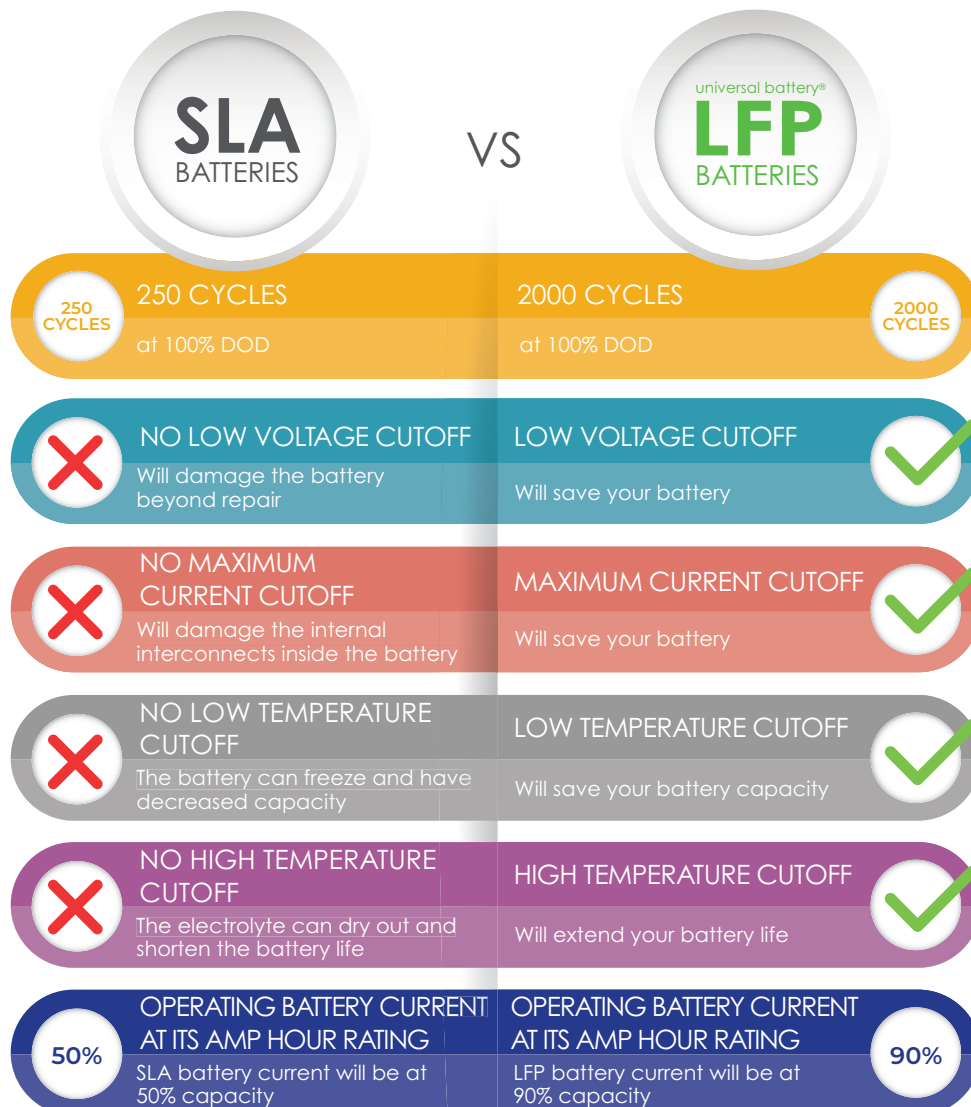
**Smart Battery Management System** protection included

# Have you ever left on an application and returned later to find out that the batteries are over-discharged and beyond repair?

This will never happen with a Universal Battery® LFP battery. With over 50 years of building batteries, you can count on our LFP batteries to be the best choice.

## Features:

- Cycle Life over 2000 cycles
- Low Voltage Cutoff built inside the battery so you cannot damage the battery
- High Current Cutoff built inside the battery so you cannot overload or damage the battery
- Low and High Temperature cutoffs inside the battery so you cannot damage the battery
- Close to 100 percent of the battery capacity even at higher currents



# Engineered for:



Battery Backup



Ice Fishing & Hunting



Industrial



Lighting



Medical



Oil & Gas



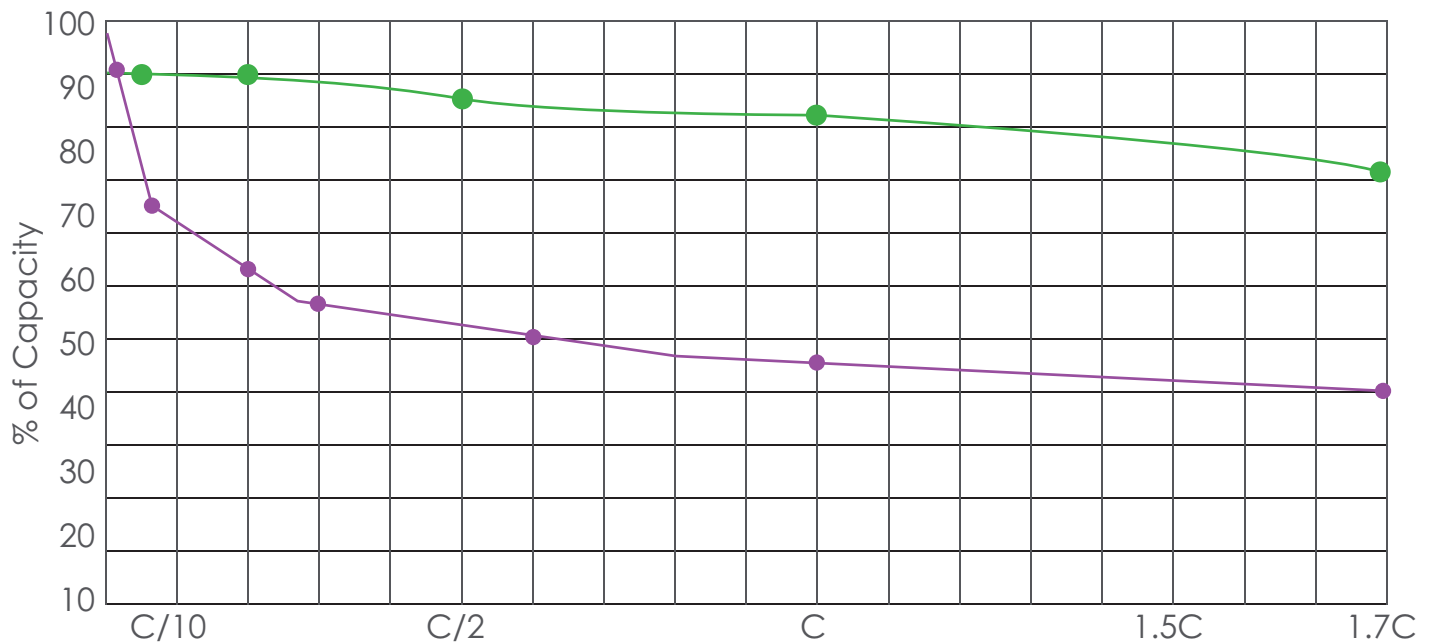
Security



Solar

## The results speak for themselves.

For SLA, as discharge currents increase, the amp hour capacity decreases rapidly. For LFP, as battery discharge currents increase, the amp hour capacity change is minimal.



— universal battery® LFP  
— SLA

C = The amp hour rating of the battery

C/20 - Discharge the battery for 20 hours;  
C/10 - Discharge the battery for 10 hours

### SLA Battery

<b>Nominal Voltage</b>	12.8 Volts
<b>Nominal Capacity</b>	77° F (25° C)
20-hr. (5.00 A)	100 Ah
10-hr. (9.30 A)	93 Ah
5-hr. (17.0 A)	85 Ah
1-hr. (60.0 A)	60 Ah
<b>Approximate Weight</b>	55 lbs (24.9 kgs)
<b>Shelf Life</b> (% of normal capacity at 68°F (20°C))	
3 Months	6 Months
90%	80%
	12 Months
	60%

### universal battery® LFP Battery\*

<b>Nominal Voltage</b>	12.8 Volts
<b>Nominal Capacity</b>	77° F (25° C)
20-hr. (5.00/ A)	103 Ah
10-hr. (10.0 A)	103 Ah
3-hr. (33.0 A)	103 Ah
2-hr. (48.5 A)	97 Ah
<b>Approximate Weight</b>	23.1 lbs (10.5 kgs)
<b>Shelf Life</b> (% of normal capacity at 68°F (20°C))	
3 Months	6 Months
97%	95%
	12 Months
	90%





\*Please note: Universal Battery® LFP batteries are not shipped fully charged per regulations.



# The Battery Management System (BMS) monitors voltage current and battery temperature for you.

Our LFP batteries have an internal Battery Management System (BMS) which monitors the voltage, current and battery temperature of each cell in the LFP battery. If conditions are over the limits of the battery, the BMS will turn the battery off, similar to a circuit breaker in your house. The battery will turn itself back on when the conditions are within the battery parameters.

## Run time comparisons for UPG LFP batteries vs SLA batteries.

 <p>Laptop</p>	<p><b>Universal Battery® LFP1260</b></p> <hr/> <p>Run Time - 1.14 Hours Total Run Time* - 2280 Hours</p>	<p><b>Sealed Lead-Acid Battery 7Ah</b></p> <hr/> <p>Run Time - 46 Minutes Total Run Time* - 192 Hours</p>	<p><b>Sealed Lead-Acid Battery 9Ah</b></p> <hr/> <p>Run Time - 1.08 Hours Total Run Time* - 270 Hours</p>
 <p>400-Watt Inverter at 30% Power (120W)</p>	<p><b>Universal Battery® LFP12120</b></p> <hr/> <p>Run Time - 55 Minutes Total Run Time* - 1833 Hours</p>	<p><b>Sealed Lead-Acid Battery 18Ah</b></p> <hr/> <p>Run Time - 50 Minutes Total Run Time* - 208 Hours</p>	
 <p>400-Watt Inverter at 50% Power (200W)</p>	<p><b>Universal Battery® LFP12180</b></p> <hr/> <p>Run Time - 49 Minutes Total Run Time* - 1633 Hours</p>	<p><b>Sealed Lead-Acid Battery 22Ah</b></p> <hr/> <p>Run Time - 33 Minutes Total Run Time* - 138 Hours</p>	<p><b>Sealed Lead-Acid Battery 26Ah</b></p> <hr/> <p>Run Time - 43 Minutes Total Run Time* - 179 Hours</p>
 <p>2000-Watt Inverter at 20% Power (400W)</p>	<p><b>Universal Battery® LFP121030</b></p> <hr/> <p>Run Time - 2.3 Hours Total Run Time* - 4600 Hours</p>	<p><b>Sealed Lead-Acid Battery 110Ah</b></p> <hr/> <p>Run Time - 1.6 Hours Total Run Time* - 400 Hours</p>	

\* For hours of total run time, we are estimating 2000 cycles for LFP and 250 cycles for SLA at 100% DOD; Temperature at 68° F. Please note: Times are estimated.

## Cost of ownership.

While LFP batteries are more expensive than SLA batteries, the cost is reasonable if you are looking for longer cycle life and to save time through quick and easy charging.



**We recommend Universal Battery® Maintainer 4000 to keep your battery charged and maintained.**

# Can they be put in a Parallel or Series Parallel Connection?

Yes! You can place a maximum of four batteries in a series for:

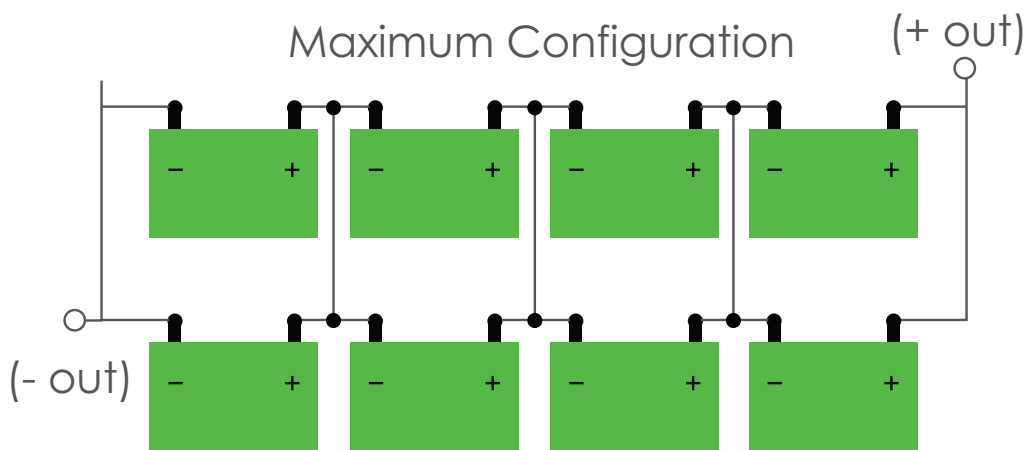
- 24V system with two in series
- 36V system with three in series
- 48V system with four in series (Maximum of 4 batteries in series)

You can place a maximum of two of these batteries in parallel for:

- Two 12v 103Ah in parallel for a 12V 206Ah system, (Maximum of two parallel strings)
- Two 12v 12Ah in parallel for a 12V 24Ah system, (Maximum of two parallel strings)
- Two 12v 6Ah in parallel for a 12V 12Ah system, (Maximum of two parallel strings)
- Two 12v 18Ah in parallel for a 12V 36Ah system, (Maximum of two parallel strings)

We have a Maximum of eight batteries total of the same amp hour rating with a 4s2p configuration or four in series and two in parallel. Please see the diagram below.

You can combine batteries together in a parallel string to achieve higher operating energy by connecting like-polarity terminals of adjacent batteries. To combine batteries in parallel strings, connect all like-polarity wires on adjacent batteries to an appropriately sized terminal block for your application. Refer to the diagram below for an example of eight 12V LFP batteries connected together in a 4S2P configuration. The maximum number of 12V series strings that you can connect in a parallel is two. Parallel string configuration greater than 4S2P are not supported at this time.



- **DO NOT** connect different batches, different types, or old and new batteries in a series.
- Please make sure that the battery voltage difference is below 30mV before parallel connection.
- **DO NOT** connect more than two battery strings in a parallel.
- The parallel application can only extend the working time and cannot double the charging or discharging current.



# Series Connections

The batteries can be combined in a series string to achieve higher operating voltages by connecting the positive terminal of one battery to the negative terminal of the next battery.

**Note:** The maximum number of 12.8V LFP batteries that you can connect in series is four (4).

Figure 2 illustrates four (4) batteries connected in series for a 4S (4 series) configuration.

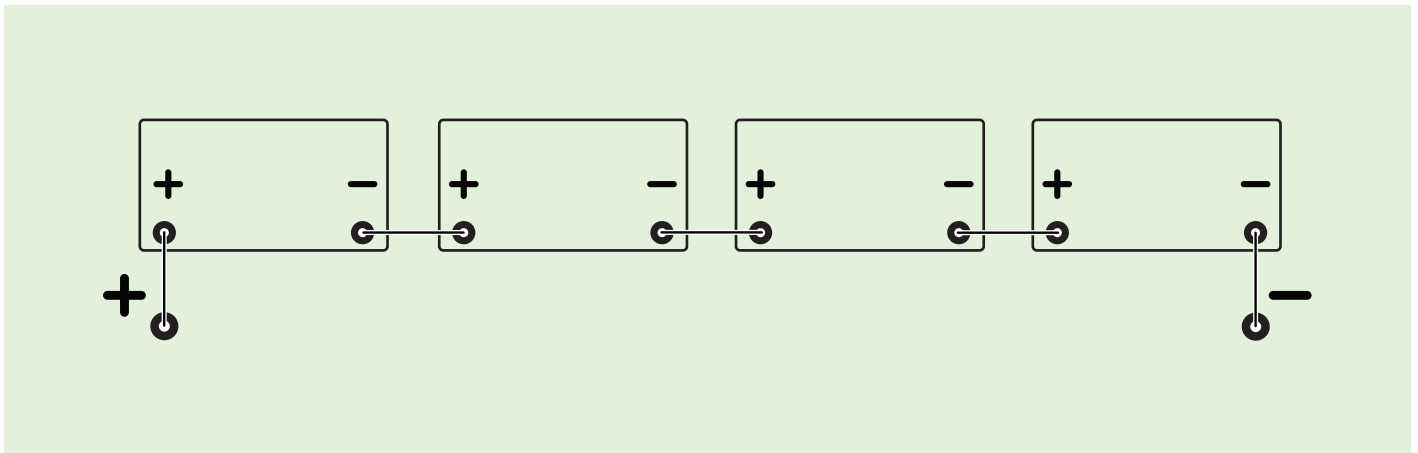


Figure 2: Connecting LFP Batteries in Series

- Two batteries in series:  $2 \times 12.8V = 25.6V$  (nominal) for 24V applications
- Three batteries in series:  $3 \times 12.8V = 38.4V$  (nominal) for 36V applications
- Four batteries in series:  $4 \times 12.8V = 51.2V$  (nominal) for 48V applications

**Note:** Connection in series only increases voltage; it does not increase the allowable charging or discharging current.

## Caution:

Do not connect more than four (4) 12.8V LFP batteries in series. Connecting more than four (4) in series exceeds the voltage limit of the BMS.

Do not connect different batches, different types, old and new batteries in series.

# Parallel Connections

The batteries can be connected in parallel to achieve higher capacity by connecting like-polarity terminals of adjacent batteries. To combine batteries in parallel, connect all like-polarity wires on adjacent batteries to an appropriately sized terminal block for your application.

**Note:** The maximum number of 12.8V LFP battery series that you can connect in parallel is two (2). Two (2) 12.8 LFP batteries may also be connected in parallel.

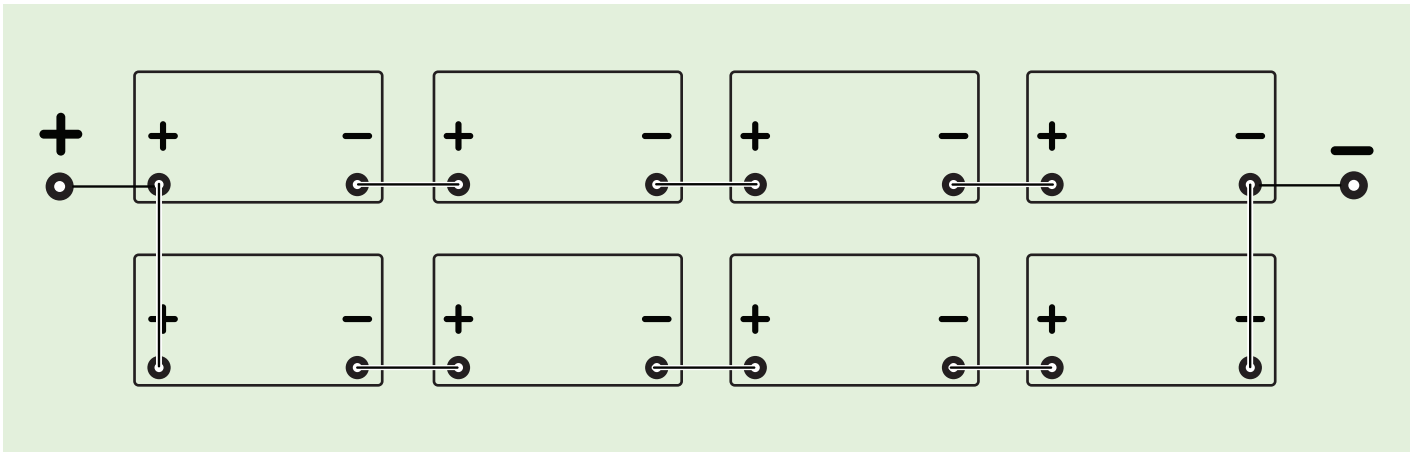


Figure 3: Eight (8) batteries connected in a 4S2P (4 series 2 parallel) configuration

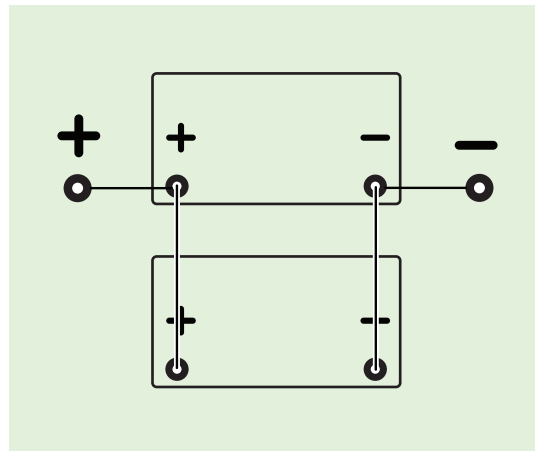


Figure 4: Two (2) batteries connected in parallel configuration

**Note:** A parallel application only extends working time (capacity); it does not increase the allowable charging or discharging current.

**Note:** Battery configurations larger than 4S2P are not supported at this time.

## Caution:

Do not connect more than Two (2) 12.8V LFP batteries, or series strings, in parallel.

Do not connect different batches, different types, old and new batteries in parallel.



# We offer multiple battery sizes to fit your application.

In most applications, our LFP battery line can replace a higher amp-hour SLA battery.\*



## LFP645

UPG No. 48046  
4.5Ah Battery  
F2 Terminals  
0.83 lbs  
L: 2.80"; W: 1.90"; H: 4.00"; TH: 4.20"



## LFP1260

UPG No. 48043  
6Ah Battery in a 7Ah Case  
F2 Terminals  
1.9 lbs  
L: 5.94"; W: 2.56"; H: 3.74"; TH: 4.00"



## LFP12120

UPG No. 48042  
12Ah Battery in a 9Ah Case  
F2 Terminals  
2.8 lbs  
L: 5.94"; W: 2.56"; H: 3.74"; TH: 4.00"



## LFP12180

UPG No. 48044  
18Ah Battery in a 12Ah Case  
F2 Terminals  
4.2 lbs  
L: 5.94"; W: 3.90"; H: 3.70"; TH: 4.06"



## LFP12180

UPG No. 48045  
18Ah Battery  
T4 Terminals  
4.60 lbs  
L: 5.97"; W: 3.87"; H: 3.70"; TH: 4.24"



## LFP121030

UPG No. 48040  
103Ah Battery in a Group 27 Case  
18 Terminals  
26.9 lbs  
L: 13.0"; W: 6.81"; H: 8.50"

\*User should ensure that they are following recommended application guidelines.

## Features:



**10X the cycle life**  
of sealed lead-acid  
batteries



**Smart Battery Management**  
System protection  
included



**Charges 3X faster**  
than sealed lead-acid  
batteries



**Ultra lightweight**  
Less than half of the  
weight of traditional  
sealed lead-acid  
batteries



**2.5X longer shelf life**  
compared to sealed  
lead-acid batteries



**Eco friendly**  
No harmful pollutants,  
corrosive acids or toxic  
heavy metals



Ideal for  
**extreme**  
environments

universal battery®

**LFP**  
BATTERIES

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