

CAUTION! PLEASE READ!



Proper Charging is Crucial! Charge before initial use!

Be sure to read the Instruction Sheet for full information.

Proper Charging is crucial to the life of your XS Power battery. It is very important that the temperature of the battery remains cool with respect to the charge voltage.



Do Not Over-tighten Battery Terminals!

Whether using the automotive post adaptors, bolts or screws, the tightening torque should never exceed 8 ft-lbs max on any XS Power Battery!

TEMPERATURE SPECIFICATIONS

Nominal Operating Temp.	77°F (25°C)
Charge Temp. Range	32°F - 104°F (0°C - 40°C)
Discharge Temp. Range	5°F - 122°F (-15°C - 50°C)



PROP 65 WARNING: This product can expose you to chemicals including lead and lead compounds, which are known to the State of California to cause cancer or birth defects or other reproductive harm. Wash hands after handling.

For more information, visit www.P65Warnings.ca.gov

Technical Assistance

Our Customer Service Department is eager to help you with any questions or issues you may have and are available from 8:30AM to 5:30PM, Monday thru Friday at 865-688-5953. In addition, technical support is available via FAX at 865-281-9844 or by email at tech@xspowerbatteries.com

Be sure to check out our website for additional technical and product information.

www.xspowerbatteries.com 888-4XS-POWER International: 865-688-5953

Introduction

Congratulations on your purchase of your lithium battery. You have in your hands a cutting edge lithium battery made for high power loads.

Lithium cells hold, in general terms, three times the energy density of lead acid batteries. However they need careful management to be safe and provide a long service life.

Lithium batteries are not lead acid batteries. That seems to be stating the obvious but for the majority of the people reading this instruction sheet, it is a significant one. You are probably replacing a lead acid (flooded, maintenance free, or AGM) battery with this new lithium battery. To get the most out of your new battery, specific care and procedures are required. Read this sheet carefully so that you fully understand what your new lithium battery can and cannot do.

Burst / SPL Ratings

xMAX45	800A pulse capability (10,000W+)
xMAX67	1200A pulse capability (15,000W+)
xMAX90/DIY	1600A pulse capability (20,000W+)
xMAX135	2200A pulse capability (30,000W+)

Musical Rating

xMAX45	
Standalone	5,000W
100A Alt.	6,000W
200A Alt.	7,000W
300A Alt.	N/A

xMAX67	
Standalone	7,000W
100A Alt.	8,000W
200A Alt.	9,000W
300A Alt.	10,500W

xMAX90	
Standalone	10,000W
200A Alt.	13,000W
300A Alt.	14,000W
400A Alt.	15,000W

xMAX135	
Standalone	14,000W
300A Alt.	18,000W
400A Alt.	22,000W
600A Alt.	24,000W

⚠ The Quick List

- READ battery label and do not exceed ratings.
- Do not over discharge the battery. Terminal voltage should remain above 12V(continuous loads). Disconnect when not in use for long periods to avoid idle drain.
- Make sure to have the correct charger. Lithium batteries are voltage sensitive so pay close attention to the max voltage rating.
- Do not use an undersized battery for the job especially in applications under 32°F. If the terminal voltage under load drops below 10V(pulsed loads), the battery is too small for the job. Stop and resolve this issue before continuing.
- It is always best practice to regularly check the SOH (state of health) of your battery by checking the resting voltage. If the battery is discharged below 10.5V, please contact XS Power for further assistance.
- Failure to maintain the battery inside its specification range can result in premature failure, which in extreme cases can cause harm to property or persons. See the separate SDS sheets for additional information.

REAL POWER UNREAL PERFORMANCE

Installation

You may mount the lithium battery in any direction as long as it is secured from short circuits and/or movement. One word of caution though, this battery is very light and therefore it does not require a great deal of force to hold it. Do not crush the battery with battery retention systems. In general, retaining the battery at its four corners is better than across the middle. The threads are M8-1.25. Optional mounting kits and terminals are available. Observe the maximum torque ratings on the battery label.

- Be extremely careful when making connections. Remember there is no low voltage disconnect, reverse polarity, or short circuit protection on the main terminals of this battery. Further the power output of a lithium battery is four times that of typical lead acid batteries. Short circuits will flow huge amounts of current instantly with the ability to melt metal.
- Do not expose to temperatures above 60°C (140°F). Avoid mounting this battery in the engine compartment if at all possible. Elevated temperatures accelerate the aging process of most battery types and lithium batteries are esp. sensitive to high temperatures. If it must be in the engine compartment, use a heat shield and duct cool air around the battery.
- Parallel connection of this lithium battery is not recommended. By its very nature this connection method cannot be considered 100% safe. If parallel connection is unavoidable, fuses, switches, or fusible links must be used to control excessive cross current (current flowing from one battery to the adjacent battery.)
- Parallel connection with any lead acid type will draw the lithium down to 30~50% SoC if left for extended periods of time. However, the XS Power lithium models can be paralleled with AGM batteries that are charged regularly.
- Open circuit voltage should be, 16.5 for 16 volt and 13.25V for 12 volt when fully charged after resting for 8 hours. If it is less than this after resting for 8 hours, the battery should be taken out of service and must be checked for capacity, cell balance, and State of Health before resuming operation.

Charging

Typically the battery will ship at less than 100% State of Charge (SOC.) Please charge your new battery immediately upon receipt. For charging your 12V Lithium battery we recommend a battery charger specifically designed for lithium batteries.

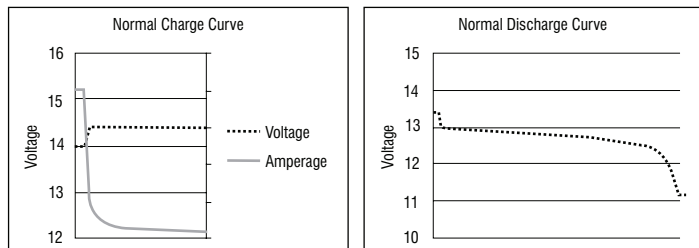
Lithium batteries are by their very nature voltage sensitive. Further, the lithium battery is the most vulnerable to damage while charging. It is important that the charging process of the battery be fully understood and carefully controlled.

- DO NOT use a battery charger designed for "Flooded" or "Maintenance Free" batteries.
- DO NOT use a battery charger with a "de-sulfation mode".
- Remove the battery charger once the battery is full meaning 100% State of Charge. Unlike lead acid batteries, over charging lithium batteries DOES NOT help them nor cause them to store more power. Instead it harms them and should be strictly avoided. Lithium cells are in a state of stress when at 100% SoC and beyond. Continuous charging must be avoided. Note from a practical point of view, the batteries can be left on a battery charger overnight but not more than 8 hours. If the system is not full in 8 hours, call tech support.

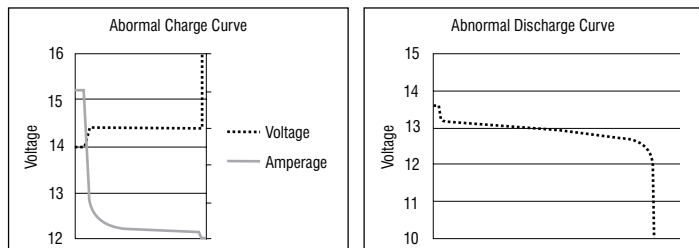
Lithium batteries do not have a "memory effect" therefore they do not have to be empty to benefit from re-charging. Simply recharge them when convenient and avoid overcharging. In general, float charging or battery maintaining should be avoided.

Battery Behavior Indicating A Problem

The charging and discharging behavior of a Lithium battery should be very predictable and repeatable. Changes in behavior should be understood and not ignored. For spot checking the batteries, use an accurate digital multimeter to measure the voltage to at least two decimal places. (Analog type meters are not recommended.) During charging and discharging the voltage should follow this pattern in general:



It Should NOT Look Like This:



Usage

In general the lithium battery will outperform the lead acid battery it is replacing. If it does not, chances are you have a battery that is too small for the job. Stop now, take it out and return it for the correctly sized model. In general pulling the battery's terminal voltage below 10V for even the shortest amount of time is asking for a premature failure. This must be avoided.

Lithium batteries have a relatively flat discharge curve when compared to a lead acid battery. The good news is that the average terminal voltage throughout discharge will be 12.8V for a 12V lithium battery. Unfortunately this is can make judging the state of charge difficult when the battery is near empty. Lithium batteries at a low state of charge will still show a relatively high voltage. It is important to get to know the limits of your battery because over discharge (discharge below 10.0V) must be strictly avoided.

Warnings

To reduce the risk of fire or personal injury including burns:

- Do not over charge the battery (meaning exceed the maximum voltage OR amperage and remove the charger once the battery is at 100% SOC.)
- Specifically regarding the DIY module, do not attempt to service or remove the balancer. If you believe a problem exists, contact XS Power Batteries. Any sort of modification done by anyone other than XS Power Batteries will void the warranty.
- Parallel connection of these lithium batteries is not recommended. By its very nature it cannot be considered 100% safe. If parallel connection is unavoidable, fuses, switches, or fusible links must be used to control excessive cross current (current flowing from one battery to the adjacent battery.)
- Do not short circuit the terminals.
- Alternator max voltage cannot exceed 14.8. 14.6 max is preferred to obtain optimal longevity.
- Do not charge this battery if the terminal voltage is below 12V. Call for XS Power for assistance before proceeding.
- Avoid high temperature. Never operate the battery in environments above 140°F or if the battery itself exceeds 140°F at any point.
- Lithium batteries contain flammable gases. Have a plan in place to respond to possible fire. Installation inside of metal enclosures is recommended in the event of fire.
- Disconnect the battery in total before welding anywhere on the vehicle.
- Do not submerge in water besides disposal. One week fully submerged in salt water will safely kill the battery. Verify voltage is 0V before disposal.
- Do not crush, puncture, or dispose of in fire.
- Do not attempt to open, disassemble, or service the battery pack.

Warranty

XS Power warranties that this product will be free from defects in materials and workmanship under normal use and service, subject to the express terms, remedies, exclusions, conditions, limitations, and disclaimers set forth below.

Warranty Term and Remedies.

For lithium batteries, the limited warranty provided hereunder shall extend for four (4) years from the date of the product's purchase. Should any covered defect in materials or workmanship be discovered during the limited warranty period, XS Power Batteries will repair or replace the product free of charge.

The following damage is specifically excluded:

- Over discharge below 10.5V open circuit voltage.
- Overcharge above 14.6V.
- Capacity is guaranteed within +/- 5% when received, after use this cannot be guaranteed. Internal resistance is guaranteed within +/- 5% at specified SOC when received.
- Water damage and resulting internal corrosion.
- Physical damaged such as case cracks from drops, impacts, or crushing it with a battery mount.

More specifically this text applies:

This limited warranty shall not apply to damage to or failure of a product that results from: (i) any negligence other than by XS Power; (ii) accident (including, but not limited to, damage during shipment and natural disasters); (iii) other circumstances beyond XS Powers' control (including, but not limited to, normal capacity loss or increased resistance due to product aging); (iv) improper installation, operation (including, but not limited to, abnormal or non-consumer use or use in an environment outside the recommended temperature range), maintenance, or storage (including, but not limited to, storage in an overly discharged state); or (v) any other damage directly or indirectly caused by the product's owner, other third parties, or other products (including, but not limited to, misuse, abuse, overcharging, over-discharging, exceeding of the product's limitations set forth in the product's specification sheet or label, neglect, physical damages caused by accidents or crashes, alterations, or connection to poorly-grounded battery chargers). This limited warranty shall also not apply to defects or non-conformities due to the manufacturing process discovered after the expiration of the applicable warranty period. This warranty does not extend to any damage caused by affixing any parts or equipment not purchased from XS Power to the product and no warranties, either express or implied, are made with respect to equipment or products not produced by XS Power. If the product is relocated outside of the continental United States during the applicable warranty period, the product's owner will be responsible for any additional charges (including, but not limited to, shipping and other related charges and expenses) incurred during the warranty process as a result of such relocation.