

CAUTION! PLEASE READ!



Proper Charging is Crucial! Charge before initial use!

Be sure to read the Instruction Sheet for full instructions.

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. The chart below will help ensure proper charge voltage with different ranges of temperature.

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)

CHARGE VOLTAGE REFERENCE CHART

Temperature	32°F (0°C)	50°F (10°C)	68°F (20°C)	77°F (25°C)	86°F (30°C)	104°F (40°C)
Charge Voltage	15.30	15.00	14.80	14.70	14.50	14.30
Float Voltage	14.10	14.20	13.75	13.65	13.50	13.35



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!



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

Introduction

Congratulations on your purchase of our lithium battery. You have in your hand the cutting edge lithium ion battery made pulse discharge 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. Fundamentally, they have serious risks associated with them and these must be understood to avoid danger, loss of property, and personal injury.

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 ion 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.

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

Powersports Lithium Batteries	Model Number	*Weight lbs.	*Weight kgs.	Dimensions: inch			MAX Amps	CA (Pb Eq)	Ah (Pb Eq)	Wh
				Length	Width	*Height				
	Li-S545	3	1.36	6.97	3.38	5.12	960	720	31.2	132
	Li-S680	4.5	2	7.13	2.99	6.58	1440	1080	46.8	198
	Li-S925	6.5	2.95	6.54	6.89	4.92	2160	1620	70.2	297
	Li-S975	8.5	3.85	7.84	5.29	6.68	2880	2160	93.6.2	396
	Li-S1200	11.4	5.15	7.79	6.54	6.68	3840	2880	124.8	528
	Li-S5100	11.4	5.15	9.10	5.43	8.27	3840	2880	124.8	528
	Li-S5100R	11.4	5.15	9.10	5.43	8.27	960	2880	124.8	528
	Li-S3400	14	6.35	10.24	6.89	7.01	4800	3600	156	660

*Excluding Terminals

! The Quick List

- READ the battery label and do not exceed any of those ratings.
- Do not over discharge this battery. Terminal voltage should remain above 12V at all times. Disconnect when not in use.
- Make sure you have the correct charger. Lithium Ion batteries are voltage sensitive so pay close attention to the max voltage rating.
- Do not use an undersized battery for the job esp. in applications under 32°F. If the terminal voltage under load drops below 10V, the battery is too small for the job. Stop and resolve this issue before continuing.
- Pulse loads by their very nature are a pseudo short circuit of the battery. This is fundamentally destructive to the battery so each battery's State of Health should be regularly checked.
- 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 ion down to 30~50% SoC. However, the XS Power lithium models can be paralleled with AGM batteries.
- Open circuit voltage should be, 16.5 for 16 volt and 13.0V 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. Optionally a Gel battery compatible charger may be used if the output voltage does not exceed the ratings on the battery's label.

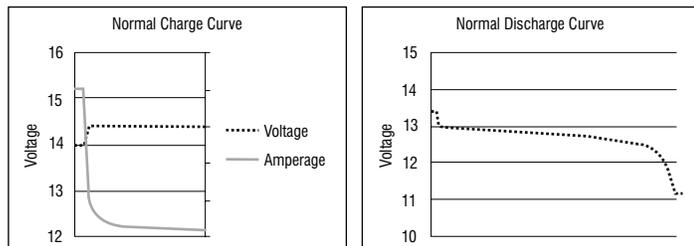
Lithium batteries are by their very nature voltage sensitive. Further, the lithium battery is the most vulnerable to damage while charging. It is important that the charging process of the battery be fully understood and carefully controlled.

- 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.

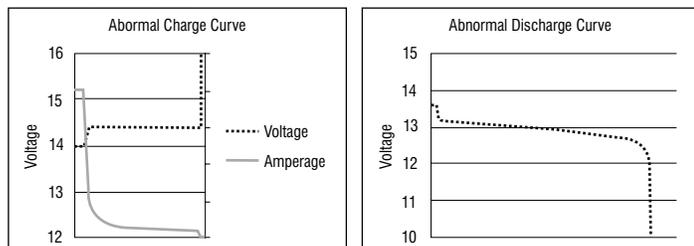
Lithium batteries do not have a "memory effect" therefore they do not have to be empty to benefit from re-charging. Simply recharge them when convenient and avoid overcharging. In general, float charging or battery maintaining should be avoided.

Battery Behavior Indicating A Problem

The charging and discharging behavior of a Lithium Ion 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 ion 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.)
- 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.
- Use with alternators requires that the charging voltage be limited to 14.4V or less. 13.8~14.0 is preferred.
- 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. This battery is not waterproof.
- Do not crush, puncture, or dispose in fire or water.
- Do not attempt to open, disassemble, or service the battery pack.

Warranty

XS Power warrants 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 one (1) 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 not guaranteed (ie. if the battery still accepts energy and discharges energy, it is considered "good")
- Internal resistance is not guaranteed. (ie. if the battery was at 4milliΩ new and now is 6, 8, 10 or greater milliΩ internal resistance, it is considered "good")
- 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.