



Operating & Maintenance Manual

48V HP Range

Models:

LBS-48110-HP-REG

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1.0 Acronyms & Abbreviations

A	Amperage
AC	Alternating Current
BMS	Battery Management System
DC	Direct Current
DoD	Depth of Discharge
HP	High Power
LBS	Lithium Battery Systems
LED	Light Emitting Diode
LFP	Lithium Iron Phosphate
LVD	Low Voltage Disconnect
O&M	Operating & Maintenance
REG	Regular
SoC	State of Charge
V	Voltage
Voc	Voltage Open Circuit

2.0 Introduction

Congratulations, you have purchased a state-of-the-art lithium battery proudly designed, engineered and built in Australia.

This Operating & Maintenance Manual describes how to safely operate and maintain the High Power (HP) range of 48V batteries for off-grid and grid connect systems.

This User Guide covers the following batteries:

- LBS-48110-HP-REG

This manual does not cover installation. Installation of this battery is to be performed by a qualified, accredited and licensed installer.



Figure 1 – 48110-HP-REG

3.0 Longevity & Depth of Discharge

One of the advantages of lithium batteries over lead-acid batteries is longevity. If you want to realise the long life potential out of your lithium battery then consideration must be given to depth of discharge.

A battery lifespan is rated by the number of cycles before the original capacity has reduced by a certain amount; a cycle is defined as discharging from fully charged, to a percentage Depth of Discharge (DOD), and then charging back to full again. So, DOD describes what percentage of the battery capacity is being used each time.

Note: DOD is different to State of Charge (SOC, also known as Charge Level); in fact, they add together to 100%. So, 80% DOD equates to 20% SOC.

The less DOD you use each cycle, the longer the battery will last.

This fact should be considered when choosing the battery Amp hour capacity. You will have a higher return on battery investment if there is enough capacity at hand such that you are not heavily discharging the battery on every cycle. Extra capacity ensures lower DOD, extended life and a higher financial return on your investment.

LBS SP batteries have a cycle life of 5,000 at 50% and 2,000 at 80% DOD.

4.0 Battery Management System

Your battery comes with a Battery Management System (BMS) mounted internally.

The BMS is an electronic solid-state circuit board which manages the cells and protects the battery across a range of scenarios which primarily includes over charge and over discharge protection. Unlike lead acid batteries, over charging or over discharging a lithium battery may lead to a hazardous scenario. Therefore, the BMS is the heart and soul of a lithium battery.

The Standard Power (SP) family BMS is a highly reliable solid-state device which is primarily designed to keep the cells safe and the overall pack from being damaged by excessive voltage or excessive discharge event.

The LBS High Power (HP) family has a BMS with sophisticated diagnostics and if that is a requirement of your design then contact LBS about their HP battery products.

5.0 Operating Guide

6.0 Specifications

7.0 Care and Maintenance

Like any battery, the environmental conditions impact the health and longevity. Therefore, consider the following with respect to proper care and maintenance of your lithium battery:

1. If not intending to use the battery for a prolonged period of time (one week or longer), turn off the voltmeter by selecting 'Meter Off' on the red rocker switch. This will ensure the voltmeter is isolated and not drawing a small current. If the voltmeter was left on, then over weeks and months it would drain the battery and ultimately flatten it.
2. If the battery is unintentionally discharged flat then it can be recovered. First remove all loads sources and switch off the LED voltmeter. Apply a 'dumb' charger which charges the battery without needing to 'see' the battery first.
3. For long battery life, keep it charged at above 13V at all times. Check the battery once a month. If the open circuit voltage has dropped to 13V or below, then give it a boost. Ensure the voltmeter is turned off at the red rocker switch.
4. All batteries, whether they are lead acid or lithium degrade faster in extreme cold and extreme hot environments.
 - a. Do not charge battery when the ambient temperature is less than zero or above 45°C.
 - b. Do not operate the battery in environments are -20°C or above 60°C. Doing so would reduce its life expectancy.

8.0 FAQ

Will the battery be damaged if allowed to fully discharge?

Firstly, the BMS has a low voltage disconnect at around 10.5V, so the battery will never discharge to zero volts. If the battery is flattened and cuts out at LVD at 10.5V then it can be recovered without damage if on occasion. If it is done repeatedly then it will have a negative impact on longevity.

Maintaining the battery charge at 13V or higher will maintain good battery life.

Look after your lithium battery and it will give you many years of service.

Can the battery be recovered from flat?

Yes. See Section 8.

Does the battery capacity degrade over time?

Yes, all batteries degrade slowly over time, even with no load sources connected. Storage temperature is important to degradation. Roughly every 10°C above ambient 20°C doubles the degradation rate. Cool ambient conditions are better as it slows down degradation rate.

9.0 Contact Us

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