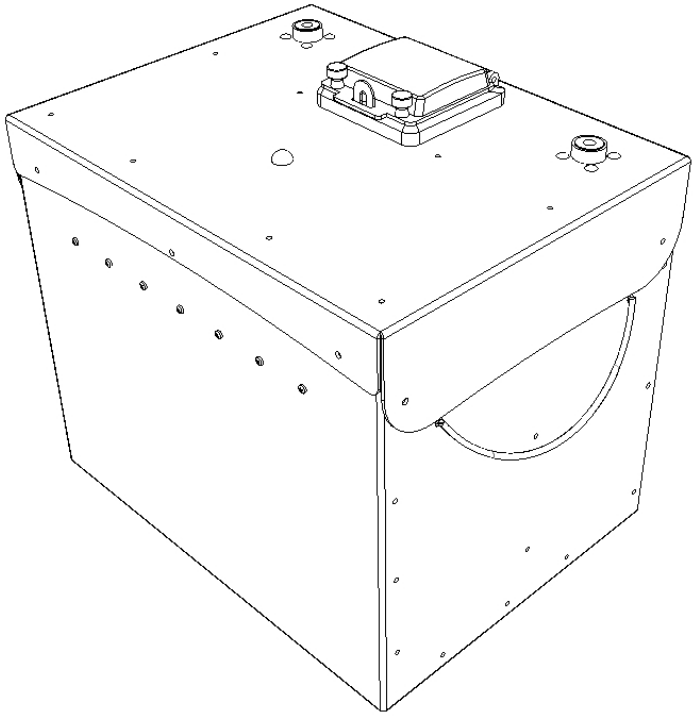
LITHIUM BATTERY SYSTEMS

Powering Freedom™

Installation and Operation Manual

Installation and Operation Manual for Home Storage Battery

LBS-48110-S15-CB80



Contents

1. *INTRODUCTION* 2
2. *TRANSPORTATION* 2
3. *BASIC SAFETY* 2
4. *HANDLING* 4
5. *STORAGE OF BATTERY* 4
6. *LIFE SUPPORT* 5
7. *DAMAGED BATTERY* 5
8. *FIRE MANAGEMENT* 5
9. *QUALIFIED PERSON (INSTALLER)* 5
10. *PRODUCT INFORMATION* 5
11. *INCLUSIONS* 6
12. *SPECIFICATIONS* 7
13. *CHARGING AND DISCHARGING* 8
14. *OVER DISCHARGED BATTERY* 8
15. *LOCATION AND ENVIRONMENT* 8
16. *EXTREME HUMIDITY CLIMATES* 9
17. *BATTERY INSTALLATION* 9
18. *BATTERY ORIENTATION FOR STATIONARY APPLICATIONS* 11
19. *BATTERY ORIENTATION MOBILE INSTALLATIONS* 12
20. *BATTERY CONNECTIONS* 12
21. *BATTERY OPERATION* 13
22. *BATTERY POWER UP / SHUT DOWN PROCEDURE* 13
23. *BATTERY POWER UP* 13
24. *FULL RECHARGE UPON FIRST INSTALLATION* 14
25. *CHARGE TO 100%* 14
26. *SOC ACCURACY* 14
27. *MAIN STATUS LED* 14
28. *OVER DISCHARGED BATTERY RECOVERY* 14
29. *HARD SHUTDOWN RECOVERY* 14
30. *MAINTENANCE* 15
31. *UPGRADING BATTERY CAPACITY* 15
32. *END OF LIFE* 15
33. *WARRANTY* 15

© Copyright 2026 LBS

1. INTRODUCTION

The Home Storage (HS) series Lithium Ferrous Phosphate (LFP) batteries by Lithium Battery Systems (LBS) are designed and manufactured in Queensland, Australia to be a simple to use and install, flexible, and reliable energy storage solution.

The HS battery range can be easily integrated with most inverter and charger combinations. They can be used as the DC supply for UPS systems and work with rectifiers, DC or AC coupled charging devices or other electrical systems where a reliable 48V battery source is required.

Depending on the external components, they can be used for On-Grid and Off-Grid applications. The HS battery range is a nominal 48V DC Battery system, with its own internal Battery Management System (BMS), that can be connected in parallel to create larger capacity energy storage systems.

2. TRANSPORTATION

These HS LFP batteries are designated Dangerous Goods (DG Class 9) UN3480.

The batteries must be treated with care, are safe for road transport, and are shipped in a partially discharged state with terminal protection and the circuit breaker off. Please ensure you comply with your transport providers declarations and local laws for the transport of Dangerous Good DG9.

Batteries where possible, should be shipped in the original manufacturer's packaging, positioned in the correct orientation and secured to a pallet. When shipped on a pallet the batteries should not be stacked more than 3 batteries tall.

3. BASIC SAFETY

The following precautions should be observed.

Battery pack is intended to be a 2 person lift when installing.

The battery module **should not** be:

- Exposed to temperatures above or below the temperature specified within this manual.
- Touched if wet or water damaged.
- Installed in direct sunlight.
- Exposed to strong impacts whilst transporting or installing.
- Used if damaged in any way crushed or punctured.
- Disassembled or rivets are broken or popped.

© Copyright 2026 LBS
www.lithiumbatterysystems.com.au

The HS battery range contains no user maintainable parts.

The battery **should be**:

- Kept dry at all times.
- Kept away from animals and children.

Installers and users are responsible for reading and understanding this manual prior to use or installation.

The HS *series batteries use high grade, metal cased, Lithium Ferrous Phosphate (LFP) cells. These cells are mechanically robust and have passed all relevant certifications including IEC62619, IEC62133, UL1642, UN38.3.*

Each HS *series batteries have an internal Battery Management System (BMS) to ensure reliable service life by monitoring internal cells and the entire battery pack providing protection against:*

- *over and under voltage*
- *over current*
- *over temperature*
- *short circuit*

Each battery has a 2-pole circuit breaker, status indicator light, and high-quality insert M8 terminal connections providing safe and easy installation using common connector components.

Installation should be carried out by a suitably qualified and experienced person who can specify the correctly size cables, DC bus set-up, external circuit protection, polarity checking and suitability of the overall design and ensure compliance to all necessary local/international standards.

Battery disassembly is strictly prohibited including but not limited to battery covers. For any internal maintenance or service, battery must be returned to manufacturer.

© Copyright 2026 LBS
www.lithiumbatterysystems.com.au

4. HANDLING

- Use battery only as directed within all guidelines provided within this document.
- Handle battery with care when installing or transporting.
- The batteries are heavy (>40kg) and proper lifting techniques or equipment should be applied and it is the user or installer to exercise due caution and move or lift these batteries abiding by local OHS (Occupational Health and Safety) laws and/or workplace guidelines.

Do not:

- Use the battery if it appears damaged or broken.
- Use chemicals to clean the battery.
- Touch the DC terminals.
- Touch the DC busbar.

The following Australian Standards will provide general advice regarding safety clothing and equipment:

- *Respiratory equipment: AS/NZS 1715,*
- *Protective Gloves: AS 2161,*
- *Occupational Protective Clothing: AS/NZS 4501 set 2008,*
- *Industrial Eye Protection: AS1336 and AS/NZS 1337,*
- *Occupational Protective Footwear: AS/NZS2210.*

5. STORAGE OF BATTERY

- The battery should be:
- Stored horizontally and stacked no more than 3 batteries tall without extra support.
- Kept in a dry environment away from moisture.
- Stored within 5°C and 25°C for optimal longevity and safety.

After 3 months of storage the battery may need to be charged.

Issues charging after long term storage should be discussed with LBS.

© Copyright 2026 LBS
www.lithiumbatterysystems.com.au

6. LIFE SUPPORT

These batteries **should not** be used in life support applications.

7. DAMAGED BATTERY

A damaged battery should not be used and should be returned to LBS for workshop diagnostics or disposed of via a recycling facility. Leaking electrolyte can cause skin irritation and chemical burns, so contact should be avoided.

8. FIRE MANAGEMENT

- Should the battery pack catch on fire or start to emit smoke, use water spray, dry chemical, carbon dioxide or a chemical fire extinguisher.
- Evacuate the area and call emergency services.
- Toxic gases may be produced if the battery catches fire.
- The battery needs to be rapidly cooled to prevent any heat or fire from spreading.

9. QUALIFIED PERSON (INSTALLER)

The installer needs to be a person with adequate skills, qualifications and experience.

They **should**:

- Have a thorough understanding of standard usage, design and installation principles of battery energy storage systems.
- Have a thorough understanding of all dangers and risks associated with installing and using electrical devices.
- Hold all applicable local, state and country-based qualifications to carry out such work.
- Adhere to all safety and installation requirements within this manual.

10. PRODUCT INFORMATION

The technical information presented here describes the physical and electrical characteristics of the battery and the environment in which it should be installed.

The HS series batteries are self-managed with an internal BMS within each battery to protect it from overvoltage, undervoltage, overtemperature, under temperature and overcurrent.

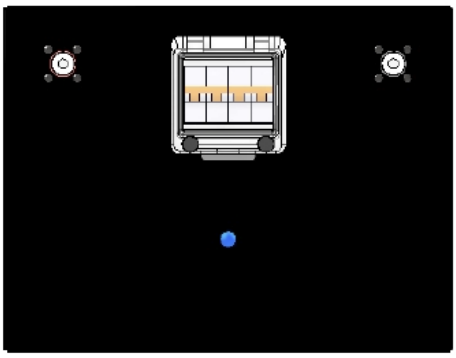
The battery does not require or provide communication with external systems. The Battery or parallel bank of batteries operates as a standalone nominal 48V DC system, and all external system behavior should be configured in relation to the external voltage that it provides.

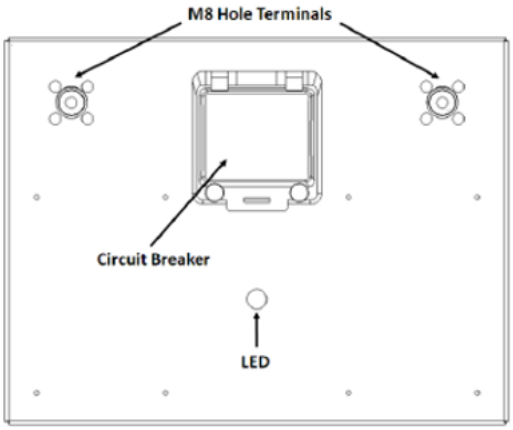
© Copyright 2026 LBS
www.lithiumbatterysystems.com.au

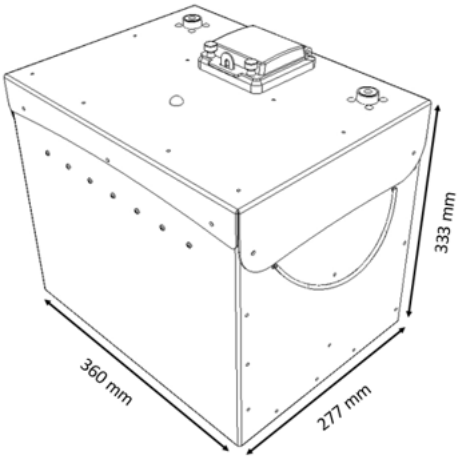
	LBS-48110-S15-CB80
Depth	360mm
Width	277mm
Height	303mm 333mm (Incl. Terminal)
Weight	40kg



	DC Connector
Positive DC Connection	1 x M8 Insert Terminal
Negative DC Connection	1 x M8 Insert Terminal







Please note: There are supplied terminal caps/ covers which shall be used to cover any exposed live DC connections.

11. INCLUSIONS

Each battery comes supplied with a mounting bracket kit, terminal caps and is packed in a cardboard box. All other accessories including cables are sold separately.

© Copyright 2026 LBS
www.lithiumbatterysystems.com.au

12. SPECIFICATIONS

LBS-48110-S15-CB80

Nominal DC Voltage	*48 VDC⎓*
Operational Voltage Window	*40 VDC⎓ to 54.8 VDC⎓*
Nominal Capacity	*5.3kWh*
Usable Capacity	*5.0kWh*
Depth of Discharge	*Up to 100%*
Recommended Depth of Discharge	*90% or less*
Continuous Discharge C-Rate	*1C*
Continuous Discharge Current (Power)	*110A (5kW) max.*
Continuous Charge Current (Power)	*110A (5kW) max.*
Prospective Fault Current (1ms)	*240A*
Circuit Breaker (k Curve)	*2 x Double-Pole C40 360VDC⎓*
Lithium Composition	*Lithium Ferro Phosphate ($LiFePO_4$ or LFP)*
Operating Temperature Range	*-20° to 60°C*
Ideal Operating Temperature Range	*0 to 45°C*
Operating Humidity	*85%*
BMS Over-Volt Cell Level Protection	*3.6 VDC⎓/Cell*
BMS Under-Volt Cell Level Protection	*2.5 VDC⎓/Cell*
BMS Over-Temp Discharge Cut Off	*60°C*
BMS Max Trip Current	*240A*
Self-Discharge	*1% Per Month*
Altitude	*< 2000m (seek manufacturer's advice above 2000m)*
Battery Mounting Options	*Horizontal or vertical/ self-stacking*
Terminal Connections	*M8 Insert Terminal – using external M8 Ring connector cable set*
IP Rating	*IP21*
Efficiency	*>96%*
Cooling	*Natural convection*
Parallel Connection	*Unlimited*
Series Connection	*No*
Communications	*None*
Module Weight	*40kg*
Battery Dimensions	*360mm (D)* *277mm (W)* *303/333mm (H)*
Arc Flash Incident Energy IEm in Cal/cm2 (45cm)	*0.36*
Arc Flash Incident Energy AFB in cm	*24.45*
Certifications	*Battery: AS IEC 62619:2023, UN38.3, AS/NZS 62368.1:2022* *Cell: UL 1973:2022, IEC 62619:2017*
Warranty	*10 Years (Conditions apply)*

© Copyright 2026 LBS
www.lithiumbatterysystems.com.au

13. CHARGING AND DISCHARGING

The battery should be charged and discharged within the operating temperature windows outlined within the specifications table. Current maximums are for each battery.

When multiple batteries are connected in parallel, you can add maximums together for each battery for charging and discharging, although it is suggested that you de-rate the maximum by 20% when multiple devices are connected and ensure you operate within the carrying capacity of the connecting cables and battery terminals.

14. OVER DISCHARGED BATTERY

If the batteries low voltage protection circuit has operated to protect the battery from excessive discharge, it is important that the battery is charged to 100% within 7 days. **Leaving the battery in a discharged state can cause irreversible damage to the battery or battery capacity and would void the warranty.**

LBS batteries that are discharged and neglected may need to be inspected internally for cell damage and brought back into operation only by qualified personnel or at LBS workshops.

Installation should only occur in a suitable, safe location.

15. LOCATION AND ENVIRONMENT

The location of the battery should be in accordance with the IP rating and operating temperature range specified in the specification section of this manual.

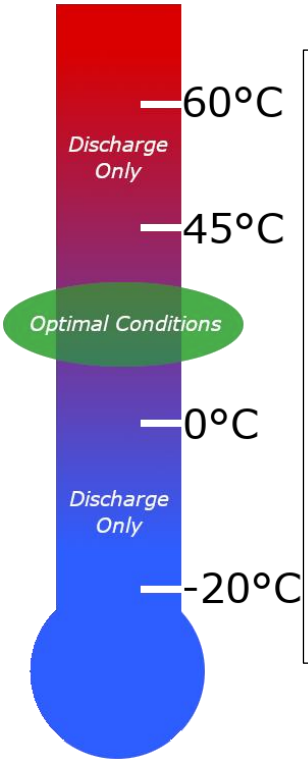
The location of the batteries should meet the below conditions:

- The battery should not be installed where direct contact of salt air or highly constant moist air may be possible. If unavoidable, appropriate air filtration must be used.
- The floor is level, safe, and easy access to the system is free from dangers and obstructions.
- There are no explosive or flammable materials nearby.
- Ambient temperature around the battery is between 0°C and 45°C.
- Temperature is monitored, and if it is likely to frequently fall outside the operating guidelines, then external alarms or triggers enable isolation or the ability to lower operating parameters, specifically the charge and discharge rates
- The temperature should remain as constant as possible.
- The area has minimal dust, and if unavoidable, then suitable filters and enclosures should be used.
- The area or enclosure is vermin resistant.
- The batteries and battery cabinets/housings are not exposed to direct sunlight.
- If the battery is to be installed outdoors, a suitable IP54 or greater enclosure should be used.

© Copyright 2026 LBS
www.lithiumbatterysystems.com.au

16. EXTREME HUMIDITY CLIMATES

When LBS batteries are being installed in climates with extreme humidity, extra precautions should be taken, and climate control techniques should be used to ensure a safe environment is created. The temperature of the cabinet should always be held at a temperature above the dew point.



*At temperatures above **60°C**, the battery must **NOT** be **operated** (charge or loads). Please move the battery into a cooler environment.*

*At temperatures above **45°C**, the battery must **NOT** be **charged**. Battery lifespan is reduced in these conditions*

*Around **25°C** Maintain your battery within this range for optimum battery lifespan and performance*

*At temperatures below **0°C**, the battery must **NOT** be **charged**. Battery performance is reduced in these conditions*

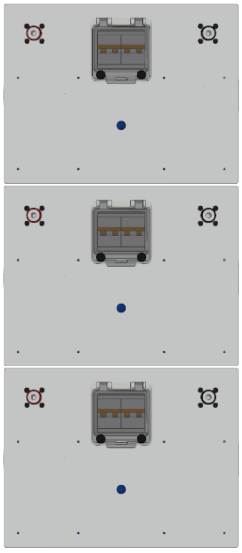
*At temperatures below **-20°C**, the battery must **NOT** be **operated** (charge or loads). Please move the battery into a warmer environment*

17. BATTERY INSTALLATION

- LBS recommends the used or suitable cabinets in keeping with the location of installation. If the location is outdoors, then a suitable IP-rated cabinet should be used.
- If batteries are to be used in parallel to provide greater capacity, the individual batteries can be stacked. When stacked, the batteries are used with the face containing the terminals and circuit breakers being vertical.
- The individual batteries have sufficient mechanical strength to stack to a maximum of 3 batteries high.
- If a custom enclosure is used, ensure the batteries are not stacked more than 3 high unless support rails or structurally sufficient shelves are used to distribute the weight.
- Ensure there is adequate air flow around the battery stack within the cabinet.
- Ensure the selected IP rating is correct for the location.

© Copyright 2026 LBS
www.lithiumbatterysystems.com.au

- Ensure interconnecting cables for parallel connection are of a sufficient cable size and are reasonably similar in length.
- A busbar is recommended for parallel battery connections, but other daisy-chaining cable systems using suitable cable are also viable.
- Except for the top and bottom surfaces of the stack, a clearance of at least 25mm is required.
- A single battery, or the battery stack, needs minimum clearance of 600 mm horizontally from general appliances, windows, doors, and power points, and 1500 mm from specific heat sources like gas bottles and hot-water systems.



A maximum of 3 units high if self-stacked.

- The battery has several convenient locations pre-drilled to attach mounting brackets. **Only** use the pre-drilled holes and 13mm screws provided to avoid damaging the battery and/or penetrating one of the internal cells. Penetrating one of the internal cells **will** lead to **short circuit** and a potentially hazardous situation.

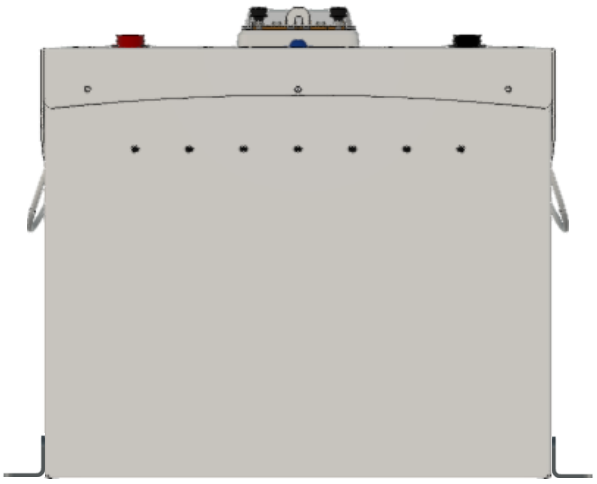
WARNING

ONLY USE PRE-DRILLED HOLES AND SUPPLIED 13MM SCREWS TO MOUNT BRACKETS

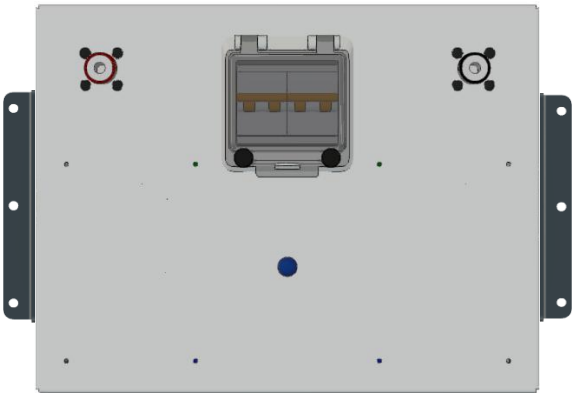


© Copyright 2026 LBS
www.lithiumbatterysystems.com.au

- The pre-drilled bracket mounting points left and right on the base of the battery allow the battery to be fixed in normal orientation to the floor of the storage cabinet.

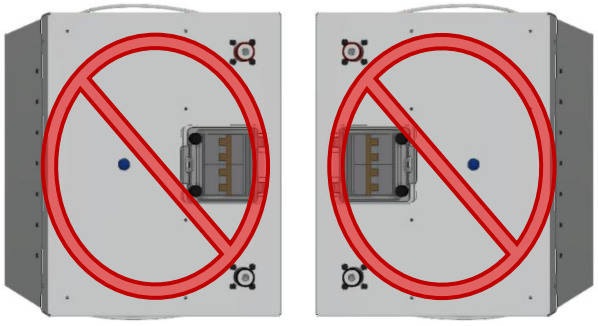


- The pre-drilled bracket mounting points left and right on the front vertical corners allow the battery to be mounted with the terminal face being vertical to the floor of the storage cabinet.



18. BATTERY ORIENTATION FOR STATIONARY APPLICATIONS

The LBS batteries can be mounted in 2 orientations. The only orientation that is not recommended is also not possible, which is with the face containing the Circuit Breaker and terminals on the ground.



© Copyright 2026 LBS
www.lithiumbatterysystems.com.au

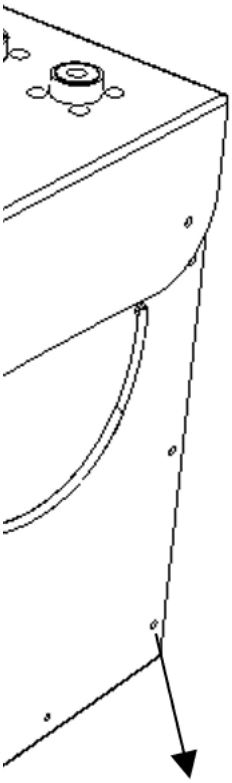
19. BATTERY ORIENTATION MOBILE INSTALLATIONS

Suitable vibration-resistant techniques should be followed, and for caravan installations, they should abide by AUS/NZ3001.2.

20. BATTERY CONNECTIONS

Each battery has a positive and negative M8 insert terminal with an included M8 bolt. These can be tightened with a PH2 screwdriver or M13 spanner or socket. The cable would typically by the correct size required and terminated with an M8 Ring Lug.

The battery case is designed to be electrically floating and isolated from all internal battery connections and in most installations will not require earthing. However, should your application require the case to be grounded a 10G -13mm screw should be used and is supplied with the battery.



Earth Connection

© Copyright 2026 LBS
www.lithiumbatterysystems.com.au

21. BATTERY OPERATION

Prior to use, you should.

- Ensure the polarity of all battery connections are correct.
- Ensure there is no damage to cables.
- Ensure all system breakers are in the OFF position.
- Ensure there is adequate air flow around the battery or within the enclosure.
- Ensure you follow the overall start-up and shutdown sequence for the entire system.

22. BATTERY POWER UP / SHUT DOWN PROCEDURE

Each battery has an integrated DC circuit breaker. You need to open the window to the breaker to be able to push the breaker into the ON or OFF position. The breaker is for the purpose of isolation i.e. turn the breaker OFF and ON, and as another layer of overcurrent protection.

If the breakers trip on overcurrent, remove the loads and the breakers can be turned back on immediately.

Use the following steps to shut down the battery system:

1. Turn off the Power Control Conversions.
2. Turn off The Main System Isolation.
3. Turn off each battery by turning its DC circuit breaker to the OFF position.
4. Ensure the Blue LED on all batteries are no longer illuminated before performing any maintenance work.

23. BATTERY POWER UP

The battery system should only be started (turned ON) or stopped (turned OFF) within the overall start-up or shut-down procedures for the entire system in the sequence that is outlined for the entire system.

The LBS batteries do not provide any output voltage until the circuit breakers are turned on.

Many complete system set-ups that involve large inverters have a mandatory ‘Start Up’ and ‘Shutdown’ sequence. Most inverters on initial connection to the DC battery system have a massive in-rush of current momentarily. It is imperative that the battery system is ready for this in-rush and typically, all batteries are ON and connected to a single DC isolation switch.

© Copyright 2026 LBS
www.lithiumbatterysystems.com.au

24. FULL RECHARGE UPON FIRST INSTALLATION

According to UN38.3, and for safety reasons during transportation, the LBS batteries are supplied in a partial state of charge. Prior to discharging the battery, it should be fully charged prior to any substantial loads being applied.

25. CHARGE TO 100%

It is important for the health of the battery, and to ensure the battery capacity monitoring system does not slip over time, that the batteries are charged to 100% at least once every month.

If the sustained design of the overall system does not have sufficient charge capacity that exceeds the discharge capacity, then additional charging sources should be considered.

26. SOC ACCURACY

An overall monitoring system is often used and uses an external Shunt to calculate SOC. The SOC is often reset when a threshold voltage is reached and is recalibrated to 100%. To ensure SOC accuracy, it is important to ensure that this voltage threshold is reached on a regular basis; otherwise, the SOC may drift over time and not be an accurate reflection of the true SOC.

27. MAIN STATUS LED

The Main LED Status indicator is used to understand the operation of the battery and the state of the BMS. When the battery is on the BMS is safe and operational the **Blue** status light will illuminate.

28. OVER DISCHARGED BATTERY RECOVERY

Shutdown occurs if the voltage in the battery reaches a low level (approx. 37.5V). In the shutdown state, the battery will not provide any DC voltage at its terminals.

By providing a charge ASAP whilst the battery is in this state will ensure the battery will recover easily. Note that the charge must be sufficient to cover whatever loads are also present. It is recommended to remove all loads.

29. HARD SHUTDOWN RECOVERY

If the battery is neglected and remains uncharged after the shutdown, it is important to provide a charging source that does not require a voltage to commence the flow of charge. If the battery is left in this state and does not respond to an external charge source, then the battery will have to be returned to the LBS workshops for recovery. This is not covered by warranty.

This process ensures that the cells are physically inspected for swelling, electrolyte leakage and their voltage to determine if they can be safely recovered. Allowing a battery to get to this point would be considered usage outside standard operating guidelines and would void the warranty.

© Copyright 2026 LBS
www.lithiumbatterysystems.com.au

30. MAINTENANCE

A regular 6 months inspection/ maintenance is highly recommended.

- Regularly check for vermin, animals, insects or creatures in or around the battery installation.
- Regularly check for any foreign objects in or around the batteries and cabinet.
- Regularly check battery connections and cables for damage.
- Regularly check the battery breaker by turning it off and on again within the overall system guidelines.
- Regularly check that the LED indicator is working.

31. UPGRADING BATTERY CAPACITY

It is possible to add additional batteries to an existing installation later. If you are adding extra capacity, the battery must be of the same type and approved by LBS.

At the time of installing a battery into a parallel connection you must ensure that the battery voltages of the new battery and incumbent battery or batteries are reasonably close +/- 0.25V.

32. END OF LIFE

When a LBS battery is removed from service, it should be taken to a legal recycling facility.

33. WARRANTY

LBS-48110-S15-CB80 battery has a 10-year warranty limited to the obligations of warranty outlined in the jurisdiction they were purchased in.

LBS does not cover warranty or any liability for damages or defects caused or from the following:

- Incorrect storage or transportation.
- Incorrect installation and wiring.
- Installed outside the conditions outlined in this manual.
- Inappropriate environmental conditions.
- Failure to follow safety requirements.
- Tampering with or opening of the battery.
- Unauthorised repairs and/modifications.
- External influences such as physical damage, overcharging, overdischarging or electrical damage caused by adjacent electrical elements in the system
- Operated in an environment that is regularly below -20 ^{0}C and/or above 60 ^{0}C
- Multiple occasions where the SOC is under 10%

© Copyright 2026 LBS
www.lithiumbatterysystems.com.au