

LITHIUM BATTERY USER GUIDE

Experience the freedom to roam off-grid with Sphere’s cutting-edge EVO Lithium battery range. Boost your RV adventures with a newfound sense of confidence, thanks to the class-leading 5-year warranty, ensuring peace of mind throughout your journeys.

FEATURES:

- 5 Year Warranty
 - New Advanced BMS
 - Dynamic Cell Balancing technology
 - IP67 or IP65 Water Ingress Rating
 - 2000 Cycles at 100% Discharge.
 - High discharge current max 250A
- Connect in series up to 2 batteries (24-volt system)
 - Connect in parallel up to 4 batteries.
 - Heavy-duty M8 Terminals
 - Maintenance-free
 - Lithium LiFePO4

GENERAL SPECIFICATIONS:

Voltage	12.8VDC
Case Type (Model Dependant)	ABS Plastic or Metal
Chemical	LiFePO4
Cell Type	Prismatic
Discharge Rate Max	100A
Discharge Rate (3 sec)	250A
Charge Rate Max	60A
Charge Rate Min	<1A
Cell Balancing	Active 5A
Cycles@ 80% DOD	3000
Cycles@ 30% DOD	8000
Low Voltage Cut Off	10.0V
Bulk Charge Setting	14.6V
Float Setting	13.6V
Charge Cut off Max	15.0V
BMS Re-Connect	Auto
Operating Range	-20°C to +60°C
Terminal Diameter	8mm
Self Discharge	<3%
IP Rating (Model Dependant)	IP67 or IP65

AUSTRALIAN STANDARDS:

New standards have come into place regarding fitment of lithium batteries into new recreational vehicles such as caravans, motorhomes and camper trailers. The new standard is **AS/NZS 3001.2:2022**.

This guide will assist vehicle manufactures and installers with the minimum requirements set out in the new standard and the minimum requirements set by the battery manufacturer.

Note we would still recommend that vehicle manufacturers and installers consult the full **AS/NZS 3001.2:2022** standards document.

GENERAL BATTERY INSTALLATION INSTRUCTIONS:

- Configure charger to "Lithium" profile or follow charge settings set out in this guide
- Lithium batteries should be fully charged before installation
- When installing batteries in parallel each battery should be fully charged individually before connecting in parallel
- Lithium batteries should be installed in an upright position
- Batteries should be securely fastened in place via a strap or placed in a battery box that is fixed in place
- For external installation Sphere IP67 rated batteries should be used
- When using an inverter use the correct amount of batteries to match with the inverters rated wattage.



Sphere EVO Range:

- ABS Plastic Case
- IP67 Waterproof Rating

BATTERY USAGE INSTRUCTIONS

- Recharge your battery every 3 months. Even when not in use and left isolated, your battery should still be charged.
- If your vehicle is undercover/indoors and your battery is not isolated your system will still continue to use power from the battery. The charger may flatten the battery within weeks, In this case you need to recharge the battery from mains power more often.

BLUETOOTH BATTERY MONITORING

To access the Bluetooth monitor built into Sphere EVO batteries search **"Sphere Battery"** in the App store or Google Play, or scan the QR code.



[DOWNLOAD THE FREE APP NOW](#)

- ✓ Battery Capacity Percentage
- ✓ Remaining Capacity in Amp Hours
- ✓ State of charge or discharge
- ✓ Estimated charge time or Discharge
- ✓ Sum of Volts
- ✓ Power in Watts



- Once installed check the label on the battery with the device name. All Sphere EVO batteries start with the initials "JS".
- To select the correct capacity of the battery within the app press the information icon and select the correct battery capacity from the drop down list. (Eg; 100AH)
- The default Password for Sphere Batteries is JS2023

BATTERY SYSTEM COMMISSIONING

- Make sure battery terminals are tightened with no more than 4 connections per terminal.
- Ensure batteries are fully charged. Ensure the charger is set to the “Lithium” profile or set as per our recommended charge settings.
- Maximum 4 batteries in Parallel.
- Maximum 2 batteries in Series.
- Perform load test with your highest consuming component turned on to make sure no connections are hot.
- If you are using a separate battery shunt monitor, set this to 100% when the battery is fully charged. Sphere EVO batteries have learning SoC monitoring via the Bluetooth app, no need to set.

CHARGER SETTINGS

Battery:	100AH	120AH	200AH	240AH
Recommended Charge Current	30A	30A	40A	40A
Maximum Charge Current	60A	60A	60A	60A

Bulk Charge Voltage: 14.2V~14.6V

Float Charge Voltage: 13.6V

Absorption Current: 5A

Absorption Time: 30mins



- Sphere EVO Range:
- Metal Case
 - IP65 Waterproof Rating

VEHICLE MANUFACTURES AND INSTALLERS

AS/NZS 3001.2:2022

5.4.5 Installation

The battery shall be secured to prevent movement and restrained not to move more than 25mm in any direction when a pulling force of twice the battery weight is applied through the centre of gravity of the battery vertically and horizontally.

5.4.6 Charging

Batteries shall be charged by means that are appropriate to the type of battery being charged.

5.4.7.1 Protection Device

Batteries and associated wiring shall be protected against overload and short circuit by means of fuses or circuit breakers in each unearthed pole. Each battery bank shall be protected via an independent protective device.

Note1 Multiple batteries connected in series or parallel may be considered one battery bank.

Note2 An unearthed pole is a conductor in a DC circuit that is not connected to earth.

5.4.7.2 Location of protection devices

Protection devices as detailed in 5.4.7.1 shall be accessible, protected against accidental damage and installed in one of the following locations:

- (a) within 200mm of the battery terminals; or
- (b) Directly outside the battery compartment; or
- (c) 1M from the battery terminals, provided each conductor is contained within a protective covering, such as a sheathing, conduit or cable trucking for it's entire length from the battery terminals to the circuit protective device, to reduce the risk of mechanical damage.

5.4.7.3 Conductors

Conductors connecting directly to the vehicle battery shall only be made at the terminals provided by the battery manufacturer. There shall be not more than four conductors connected to a single battery terminal.

VEHICLE MANUFACTURES AND INSTALLERS - STANDARDS

AS/NZS 3001.2:2022

5.4.12.2 Location

Lithium ion batteries shall -

- (a) be installed externally, ie behind a wall, compartment or barrier that prevents the egress of gases into the habitable area; and
- (b) not enter the habitable area of the structure; and
- (c) be installed to operate within the manufacturer's defined operating temperatures, including IP rating; and
- (d) be installed in a suitable battery container where the battery manufacturer has not provided encapsulated cells,

5.4.12.3 Battery management safety system

5.4.12.3.1 Requirements

Each lithium ion battery shall be provided with a battery management safety system either integrated into the battery pack or as a separate component. All lithium ion batteries shall comply with AS IEC62619

5.4.12.3.2 Location

N/A as the battery management system is built in

5.4.12.3.3 Electrical Protection

The battery management safety system shall continuously monitor, current and temperature of the battery and protect against the following automatic disconnection

- (a) Over and under voltage; and
- (b) Over and under temperature; and
- (c) Over current

The battery management safety systems should be as per the cell manufacturer's recommendation or designed and manufactured by the same manufacturer

5.4.12.3.4 Monitoring device

Each battery (or bank of batteries) shall be monitored via a battery monitor designed for managing lithium ion batteries. The monitor shall display the state of charge (SoC) and may display voltage. Communications with the monitor may be by wired or wireless connection directly to the battery management safety system.

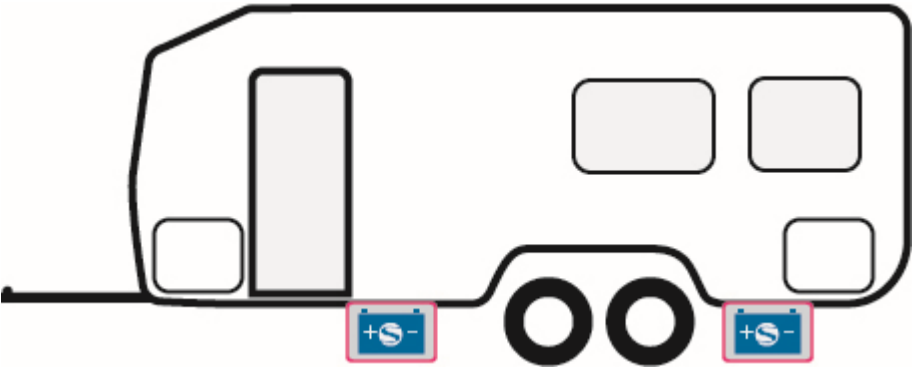
5.4.12.3.5 Commissioning

All lithium ion battery systems should be tested and commissioned as per the battery manufacturer's requirements.

Lithium Battery Installation Options

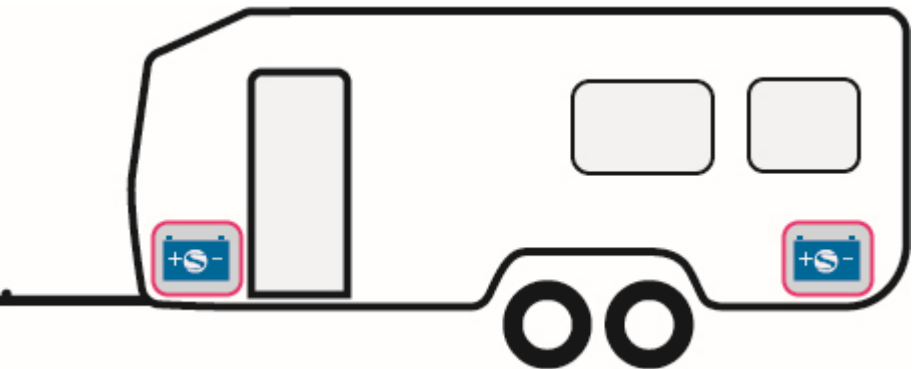
Note: Refer to all Australian Standards documentation in full to ensure compliance.

External mounting method



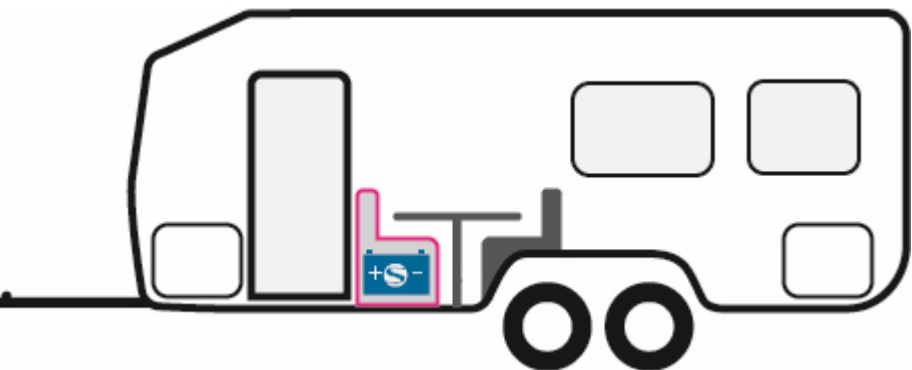
The enclosure must not be part of the habitable area or habitable structure. Venting is optional, if venting is used IP67 batteries are required.

Compartment not part of the habitable area method



The compartment must not be part of the habitable area and only accessible externally. Venting is optional but must not vent into the habitable area of the structure. If venting is used IP67 batteries are required.

Compartment Inside the structure



As example under a seat or behind a wall. The compartment must be fully sealed off from the habitable area and must not vent into the habitable area. Venting is optional but must not vent into the habitable area of the structure. If venting is used IP67 batteries are required. The compartment should be sealed in a way that only allows access by service personnel.

Disclaimer:

Sphere is a sub-brand of Coast to Coast RV services. Coast to Coast has taken every precaution to ensure the accuracy of this user guide. All information and standards referred to are the latest available at the time of release.

Sphere and Coast to Coast assumes no responsibility for any errors or omissions.

It is highly recommended that individuals, installers and manufacturers refer to the latest **AS/NZS 3001.2:2022** standard for accuracy, and to ensure full compliance with the installation of lithium batteries.

Warnings:

Ensure that the battery is correctly installed and maintained. Failure to comply with these instructions and guidelines may cause personal injury and will result in battery failure. Non compliance will void the warranty.



WARNING!

- Do not use the battery for starting or cranking applications on passenger & commercial vehicles.
- Do not modify the battery management system (BMS) by any means.
- Do not disassemble or open the battery case, doing so will void your warranty. Tampering with internal components may result in a risk of electrical shock, fire, injury or possibly death.
- Do not drop, pierce or heavily impact the battery. Always secure the battery before transportation.
- Do not connect the positive and negative terminals of the battery
- Do not ship or store the battery together with metal objects.
- Do not allow the battery to sit in a discharged state.
- Do not dispose of the battery in fire and always keep away from extreme heat sources.
- Not for under bonnet installation.