SARGENT

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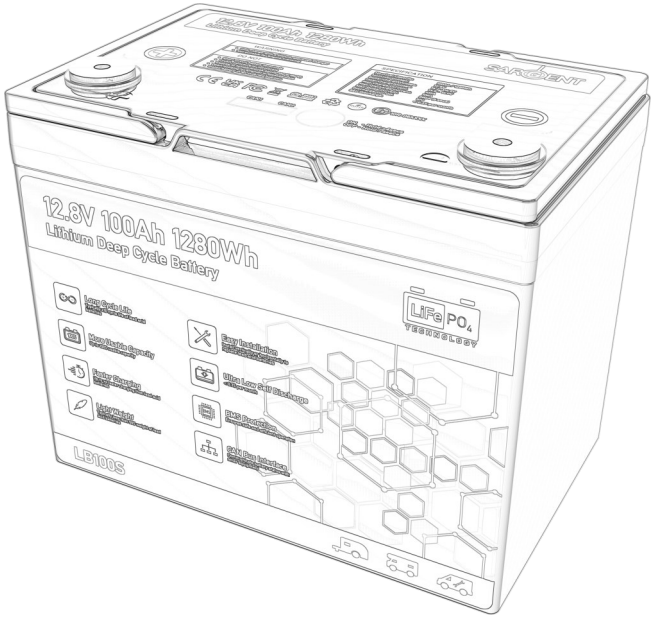


Lithium Deep Cycle Battery

Installation & User Instructions

LB100S

Contents

Safety

General Advice

- Only charge with a lithium approved charger
- Not suitable for engine cranking
- Do Not - Short circuit battery terminals
- Do Not - Crush, puncture or incinerate
- Do Not - Expose to temperatures above 132°F (50°C)
- Do Not - Open housing or attempt to disassemble
- Do Not - Install battery in an inverted position

Disposal Information

Disposal of lithium batteries marked with the recycling symbol should only be done at a certified recycling location. Batteries must not be mixed with domestic or industrial waste.

Overview

The Sargent range of lithium deep cycle batteries provide a simple drop-in replacement for most lead acid batteries used in leisure applications. They provide significant advantages over lead acid, including reduced weight, longer life, a more useable capacity and faster charging. Using optional CAN Bus communication, the batteries are able to integrate with Sargent power control systems to provide additional battery management features.

Key Features

- Light Weight - typically less than 50% weight of lead acid batteries
- Long Life - typically x10 cycle life of lead acid batteries
- More Useable Capacity - Up to 100% useable energy
- Fast Charging - Up to x4 faster charging than lead acid batteries
- Low self discharge - Less than 0.3% per month in Sleep Mode

Installation

The battery can be installed vertically or horizontally (with label facing upwards) but should never be installed in an inverted position. The battery should be held firmly in place by suitable straps or mounting brackets.

Safety Warnings

- Do not install in a sealed environment or adjacent to heat sources
- Do not install in an environment that may be subject to high humidity or water splashes
- Do not use with damaged or inadequately rated cables
- The battery must be protected by a suitably rated fuse

Wiring & Fusing

In order to reduce voltage losses, it is recommended to keep cabling runs as short as possible from the battery to the power distribution unit. Please refer to the table for recommended wiring gauges depending on length and required fuse rating

Fuse	Battery to Distribution Unit distance	
	Up to 3m	Up to 6m
20A	3mm² / 14AWG	4mm² / 12AWG
30A	4mm² / 12AWG	6mm² / 10AWG
40A	6mm² / 10AWG	10mm² / 8AWG

Connections

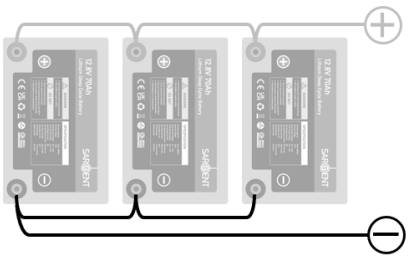
The connecting cables should be terminated with ring terminals suitable for connection to bolts supplied (M8 for LB100S). Use the supplied bolt, spring washer and plain washer, as shown below.

First connect load positive (+) cable to battery positive (+) terminal. Next connect the load negative (-) cable to battery negative (-) terminal. Check both terminals are fully tightened, 20Nm is recommended. Ensure the terminals are suitably protected against short circuit, for example if the battery is mounted under a seat.

Parallel connection options

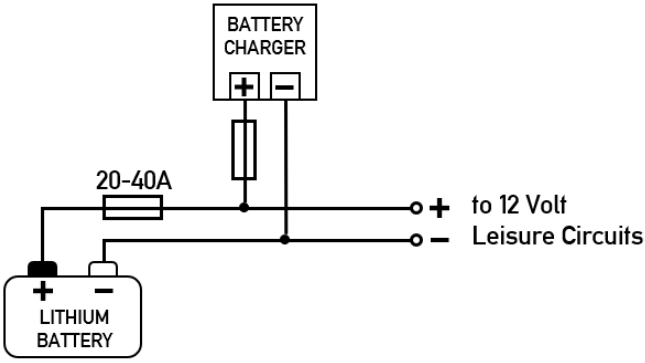
It is possible to connect up to four batteries in parallel. Before connecting together, it is important to fully charge all batteries to ensure the terminal voltages are the same.

Parallel connection



Charging options

Below are recommended connections for a battery charger. Always ensure the charger is suitably fused to protect cabling.



When fitted in a leisure vehicle, the battery can be re-charged from a number of sources such as, a mains charger, the vehicle battery/ alternator (during driving) or solar panel (via a regulator). To ensure

optimal charging, it is recommended to us a lithium compatible charger or one which can be configured to be suitable for lithium. Below are the recommended charging parameters

Parameter	LB100S
Bulk Current	100A (max)
Boost(Absorption) Voltage	14.2 - 14.6V
Float Voltage	13.8 - 14.0V

Due to the high charging currents possible when charging lithium batteries, it is recommended to fit a DC-DC charger when charging from the vehicle battery/alternator during driving, rather than a traditional split charge relay. This will help limit the current during charging and prevent overloading of cabling and/or fuses.

Battery State of Charge calibration

After installation of a new battery, it will take a few charge / discharge cycles before the Battery Management System (BMS) is fully calibrated to the battery charger being used. During this time, if a compatible Sargent display is being used to show battery information, it may not initially indicate 100% state of charge when the battery is full. This is normal and part of the self-calibration of the battery.

Turning on the battery

To reduce long term discharge of the battery, its is delivered in a **Sleep Mode** and no power will be available at the battery terminals. To switch the battery **On**, press and hold the power button for at least 4 seconds.

Operation

Charging

Always switch off the charger before connecting or disconnecting the battery.

To maximise cycle life, it is recommended to use a charger which is able to switch off or fall back to a float voltage once the charge cycle is complete.

The battery has protection against cold weather charging and will not accept charge if the temperature is below 0^{o}C

The battery can be recharged at any state of charge without effecting performance and should be fully charged before using for the first time.

For optimum lifespan it is not recommended to charge at a rate greater than 1C e.g. 100A for a 100Ah battery

Discharging

It is not recommended to discharge the battery continuously at currents greater than 1C e.g. no more than 100A for a 100Ah battery

When discharging at temperatures below 0^{o}C, there will be some capacity loss e.g. at -20^{o}C the capacity will drop to around 70%

To avoid activation of the batteries Undervoltage Protection (UVP) it is recommended to set protection on the connected equipment to a higher voltage than the battery undervoltage protection.

Undervoltage Protection

If the battery becomes deeply discharged, the output will be automatically switched off by the Battery Management System (BMS) in order to help protect the battery. To recover a battery from this shutdown state, connect a battery charger and allow it to fully re-charge.

To help avoid deep discharge:-

- Fully charge the battery before winter storage of the vehicle
- During storage, check no equipment is left connected to the battery which could totally discharge the battery

Overcurrent Protection

The battery is suitable for supplying heavy loads up to 1C, for example the 100Ah battery is able to supply up to 100amps continuous current. If this current is exceeded by using heavy loads, then the battery management system (BMS) will shut down the battery to protect itself. Please check the load is suitable for the rating of battery being used, for example when using a motor mover or power inverter.

Sleep Mode

To reduce power consumption, the battery will automatically enter a Sleep Mode if no activity is detected for 30 minutes and cell voltages are becoming low (less than 3.1V per cell).

To conserve power, the battery can also be forced into Sleep Mode at any time by holding the power button for at least 4 seconds.

There are four ways the battery can exit the Sleep Mode,

- Charging the battery
- Applying a load to the battery
- Sending a CAN Bus command
- Pressing power button for 4 seconds

The following table shows typical power consumption of the battery in each mode:-

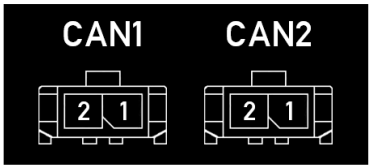
Mode	Power at terminals?	Internal Current Drain	% Charge reduction per month	Estimated life from 100% charged
Normal Operation	Yes	~30mA	~20%	~5 months
Sleep Mode	No	~300uA	< 0.3%	~33 months

Storage

- Never store that battery in a discharged state as this will reduce life
- Before storage it is recommended to fully charge the battery.
- During long term storage, the battery should be re-charged at least once every six months.
- For extended storage periods, it is recommended to put the battery into Sleep Mode to reduce the internal current drain.

CAN Bus Interface

The CAN Bus interface is for manufacturer use only and allows the unit to be monitored and controlled from compatible Sargent display panels.



Pin	Function
1	CAN H
2	CAN L

Specification

Model	LB100S
Nominal capacity	100Ah
Nominal voltage	12.8V
Rec. Boost charge voltage	14.2 - 14.6V
Rec. Float charge voltage	13.8 - 14.0V
Max rec. charge current	100A
Max cont. discharge current	100A
Max pulse current (5 secs max)	200A
Undervoltage protection / recovery	10.0V / 11.6V
Self discharge (per month): Normal Operation: Sleep Mode:	 ~20% < 0.30%
Form factor	Group 24
Terminals	M8
Dimensions (L x W x H)	260x168x209
Nett Weight	9.50kg

Notes

Notes

Sargent Electrical Services Ltd
Unit 39, Tokenspire Business Park, Beverley, East Yorks, HU17 0TB, UK
Phone: +44(0)1482 881655 | Fax: +44(0)1482 678987
Email: support@sargentltd.co.uk
Tech Support: +44(0)1482 678981

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