ELVO SolarBatt

elvosolar.co.nz

Introduction

The ELVO SolarBatt is a battery with fully integrated battery management and solar charging system. All connectors are plug in. This battery is made up of 4 cells.

The SolaBatt uses Lithium Ferric Phosphate ($LiFePO_4$) cells instead of other chemistries like Lithium Ion. This makes it much safer and has a much longer charging cycle lifespan, we expect at least 6,000 charge / discharge cycles before it reaches ½ storage remaining.

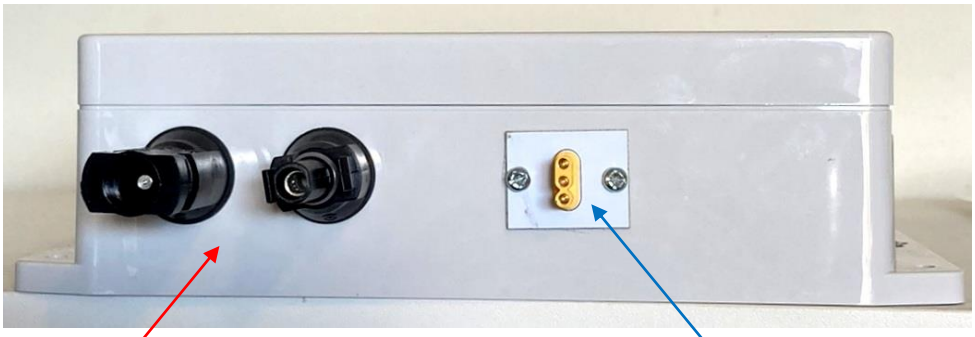
To facilitate the long-life characteristic, we use careful cell management with a microprocessor called a battery management system (BMS). This prevents over-discharge, over-charge, over heating or freezing damage. It also 'balances' the cells when charging so the cells are constantly charged to the same stored energy. We also limit the output from the battery specification to 4 amps max. This is to prevent overheating of the cells, a major contributor to lifespan shortening.

A major design feature is the ultralow standby current draw. When not being used, the battery 'sleeps' with a typical current draw of 40 microamps. This 500 to 1,000 times lower than many battery chargers. This means the battery can tolerate a much longer time not being charged.

If the battery experiences sub zero temperatures, the battery will continue to provide output power with little loss of energy, it is quite capable of output power down to -30ºC BUT like many chemistries, it cannot be allowed to charge below freezing or the cells can be destroyed. To manage this, the battery will be prevented from charging when it is freezing and to help with a rapid recovery, the cells will be heated from solar input power until they rise above freezing.

Installation

- Operating voltage is safe for DIY at a maximum of 22 volts DC
- Must be mounted indoors, away from rain and water sources and out of direct sunlight
- All components are plug-in
- Battery can be mounted in any orientation using the 2 x mounting holes on the flanges



Inputs
Plug solar panel in here

Output
Plug 3 way switch cable here

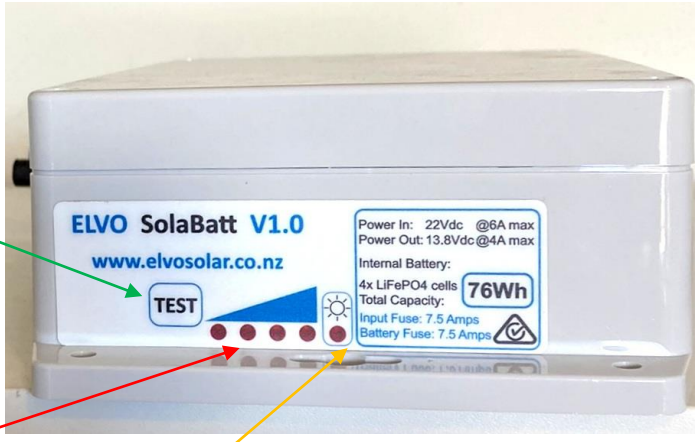
(**Note for reference**: The left solar plug is the +ve input, the right is the- ve)

Output Plug terminals

Solar Panel Voltage – solar panel power bypassed to this terminal
Battery Voltage – battery output. **Note**: this output turns off during charging.
Common (0 volts) **Note:** socket is keyed to prevent incorrect plugging.

Battery Display and Label

The label on the side is also the user interface. To preserve battery life, the battery fuel gauge will only display when the test button is pressed. It might take a 4 to 6 second press to display the LEDs

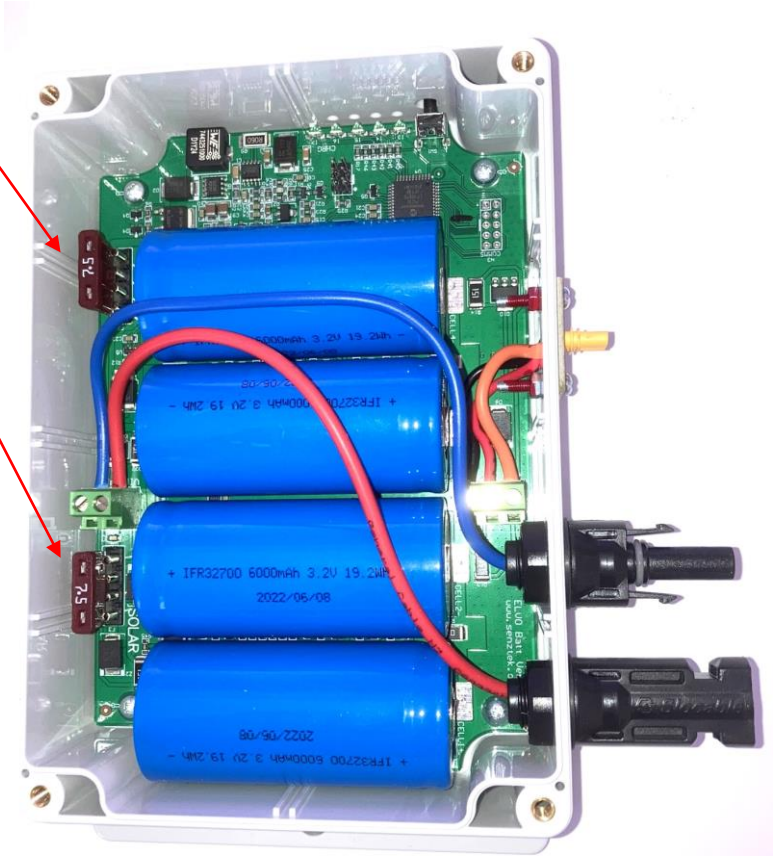


Simple 25%, 50%, 75% and 100% state of charge display with 4 LEDs

If the 4 LEDs are running sequentially to the left when the button is pressed, the battery is freezing and charging is suspended. If running sequentially to the right, the cells are overheated and charging is suspended.

Battery charging light comes on when solar charging

There are 2 x 7.5 amp fuses inside the battery. One to protect the B**attery output** and one to protect the **Solar input**. These are labelled on the board



Detecting a blown fuse

- If the charging LED does not come on while the battery needs charging and the ELVO light will not turn on during the day the **Solar** fuse might be blown.
- If pressing the TEST button produces on LEDs and the ELVO light will not light at night, the **Battery** fuse might be blown.

Changing the Fuses

If some external fault (a short or similar) causes one of the fuses to blow, it will be necessary to replace the fuse with a 7.5 amp automotive fuse. The top will need to be unscrewed and removed to change the fuse/s. Unplug all connectors from the battery first.

Be very careful not to drop any conductive items into the battery circuitry as this can cause permanent damage to the circuitry. Plug the connectors back in and determine if all is functional by pressing the TEST button.

SPECIFICATIONS

Power Supply:	
Supply Voltage	22Vdc max
Quiescent power usage	40uA typical
Battery Output:	Typically 12.8 Vdc Range 11Vdc to 14.2Vdc
EMC and Safety Compliances:	
Emissions	EN 55022-A,
Safety Compliance	AS/NZ 60950.1:2003,
General Specifications:	
Charging Temperature	0~45°C
Battery Output Temperature	-30~45°C
Humidity	5 ~ 85% RH. Non-Condensing
Enclosure Construction	Polycarbonate - Impact Resistant V-2 fire resistance rating Water resistant to IP51
Dimensions (excluding connectors and flanges)	L = 171mm W = 121mm H = 55mm
Weight	1600grams

Note: Do not exceed these specification limits. Exceeding these limits can result in damage to the unit and voiding of the warrantee.

Product Liability. This information describes our products. It does not constitute guaranteed properties and is not intended to affirm the suitability of a product for a particular application. Due to ongoing research and development, designs, specifications, and documentation are subject to change without notification.

Regrettably, omissions and exceptions cannot be completely ruled out. No liability will be accepted for errors, omissions or amendments to this specification. Technical data are always specified by their average values and are based on Standard Calibration Units at 25°C, unless otherwise specified. Each product is subject to the 'Conditions of Sale'.

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