ENGLISH

Lithium Battery Smart circuit board replacement instruction

Rev 00 - 10/2022

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1. Introduction and safety

Before following the instructions in this document make sure to first troubleshoot the battery. Follow the troubleshooting instructions in the Lithium Battery Smart manual, see https://www.victronenergy.com/media/pg/Lithium_Battery_Smart/en/troubleshooting-support-and-warranty.html.

- In case of a cell fault, the battery is irreparable. We do not supply spare cells.
- In case of a circuit board fault, the battery is repairable. We supply spare circuit boards.

This repair instruction describes how to replace the Lithium Battery Smart circuit board with a spare.

This instruction is also available as a video:

https://www.youtube.com/embed/FNS1U5ofeGE

Note that in this instruction, photos of a 200Ah 12.8V battery are used. The other battery models have slightly different circuit boards and cell layouts, but the general method of replacing the circuit board is the same. Refer to the Lithium Battery Smart spare parts list on the next page for the part number and a photo of the circuit board for each battery model.

WARNING - HIGH RISK OF ACCIDENTAL SHORT CIRCUIT!!

Short circuits of lithium batteries can be highly hazardous. If you don't understand the risks of exposing battery cell terminals and the consequences of short circuits in lithium batteries, you must not carry out this procedure. This information is presented for competent personnel intending to work from a bench top in an uncluttered space.

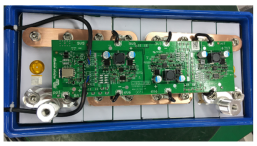
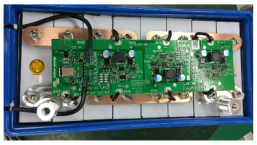
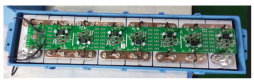
This procedure is made publicly available for the benefit of those who are comfortable with, and able to, carry out the repair themselves.

In case you are not, this is not a problem. Contact your dealer to arrange for the repair to be carried out by an authorised person.

When performing repairs on a lithium battery, be aware that you are working on live equipment. Although the voltages are not that high (12.8 or 25.6V), the battery can supply very high currents in case of a short circuit. Take special care not to accidentally short circuit the positive and negative battery terminals, battery cell terminals or busbars. Always use insulated tools.

2. Lithium Battery Smart spare parts list

The table below lists the battery model, part number and what circuit board part number is used in that particular battery. The list also shows if the lid is screwed or glued onto the battery.

Battery part number	Battery description	Circuit board part number	Lid	Image
BAT512050610	LiFePO4 Battery 12.8V/50Ah Smart	SBP210050000	Glued up to HQ2132 Screwed from HQ2132	
BAT512110610	LiFePO4 Battery 12.8V/100Ah Smart	SBP210110020	Glued up to HQ2115 Screwed from HQ2116	
BAT512116610	LiFePO4 Battery 12.8V/160Ah Smart	SBP210116020	Glued up to HQ2119 Screwed from HQ2120	
BAT512120610	LiFePO4 Battery 12.8V/200Ah Smart	SBP210120020	Glued up to HQ2111 Screwed from HQ2112	
BAT512132410	LiFePO4 Battery 12.8V/330Ah Smart	SBP210132120	Screwed	
BAT524110610	LiFePO4 Battery 25.6V/100Ah Smart	SBP220110020	Screwed	
BAT524120610	LiFePO4 Battery 25.6V/200Ah-a Smart	SBP220120020	Screwed	
BAT512060410	LiFePO4 Battery 12.8V/60Ah Smart (EOL)	SBP210060000	Glued	
BAT512130410	LiFePO4 Battery 12.8V/300Ah Smart (EOL)	SBP210130000	Glued	
BAT524120410	LiFePO4 battery 25.6V/200Ah Smart (EOL)	SBP210120120	Glued	

3. Opening the battery case

There are three different battery case types. The way the battery is opened differs for each different battery case type:

- Situation 1: The battery case has screws that are visible on top of the battery.
- Situation 2: The battery case does not have screws that are visible on top of the battery and has ventilation slots.
- Situation 3: The battery case does not have screws that are visible on top of the battery and does not have ventilation slots.

These are the instructions for each situation:

Opening instructions for situation 1:

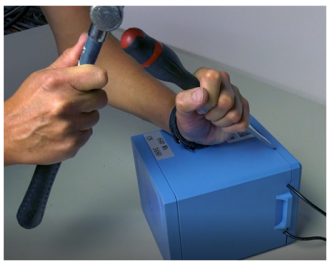
- Remove the two large aluminium nuts from the terminals.
- Remove all Philips head screws from the top cover.
- Lift the lid upwards to remove it.

Opening instructions for situation 2:

- Remove the two large aluminium nuts from the terminals.
- Using a piece of wood and a hammer, tilt the piece of wood up into one of the ventilation holes and give the piece of wood a short and firm tap with the hammer.
- Repeat for each ventilation hole.
- Lift the lid upwards to remove it.

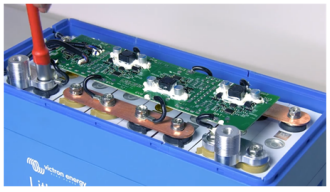
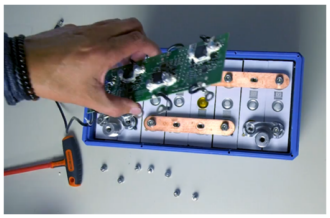
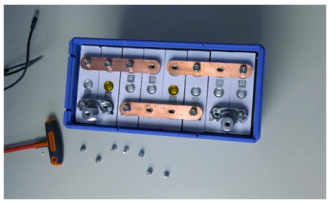
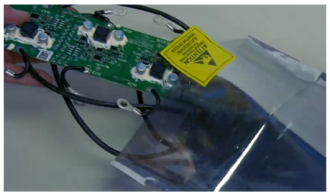
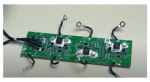
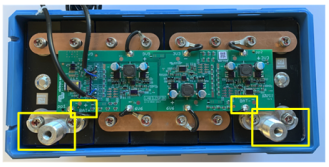
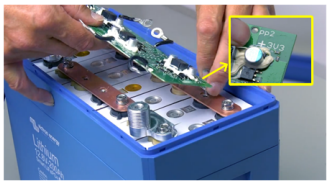
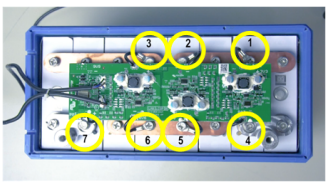
Opening instructions for situation 3:

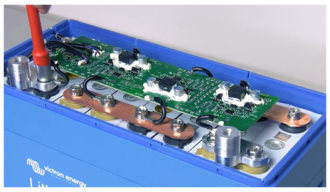
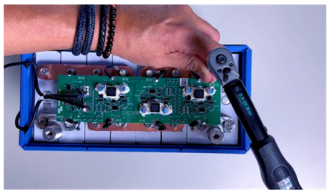
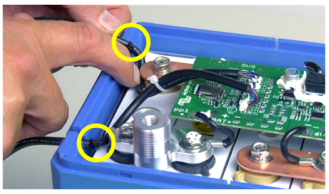
- Remove the two large aluminium nuts from the terminals.
- Using a large flat head screwdriver and a hammer, lay the battery on its side and place the screwdriver at an angle in the seam between the top cover and the battery case, and give a few short and firm taps on the screwdriver with the hammer.
- Repeat at regular intervals around the battery.
- Place the battery upright and lift the lid upwards to remove it.



4. Replacing the circuit board

High risk of accidental electrical short circuit. Perform at your own risk.

Replacement instructions:	
Step 1: • Loosen and remove the bolts that hold the circuit board wires. • CAUTION: for models where the busbar comes loose, do not remove the bolt but replace them after the circuit board wire is removed. • Leave the other bolts in place.	
Step 2: • Remove the circuit board.	
Step 3: • The image on the right shows the battery without the circuit board.	
Step 4: • Remove the new circuit board from its anti-static bag.	
Step 5 • Bend all circuit board wires upward. This prevents an accidental connection between a wire and the wrong busbar or battery cell.	
Step 6: • Position the circuit board above the battery. • Ensure that the "BAT +" text is at the positive terminal and the "BAT –" text is at the negative terminal.	
Step 7: • Insert the top right-hand circuit board wire, with the text "+ 3V3", to the top right-hand busbar. • Hand tighten the bolt using your fingers.	
Step 8: • Repeat this for the other circuit board wires.	

Replacement instructions:	
Step 9: • Hand tighten all bolts using a tool.	
Step 10: • Further tighten the bolts to 10Nm, using a torque wrench.	
Step 11: • Use two cable ties as strain relief for the two BMS cables. • A new pair of cable ties are included with the circuit board.	
Step 12: • Confirm that the circuit board is functioning correctly before closing the cover. • Connect to the battery with the VictronConnect app and check that everything looks all right.	

5. Closing the battery case

Closing instructions:	
Step 1: • Place the lid back on the battery. • In case the battery has screws, place and tighten the screws. Use a low torque setting, and do not over-tighten the screws to avoid damaging the screw holes. • In case the battery was glued, use super glue to glue the lid back on. Use the glue sparingly.	
Step 2: • Fasten the two aluminium terminal nuts (hand-tight). • Take care that the top of the nut is at least 2 to 3 mm under the top of the battery terminal. • Do not over-tighten the nut to prevent the cover from being pulled down too much and possibly damaged.	
Step 3: • The spare circuit board came with a new serial number sticker including puk code and other details. • Affix this new sticker over the old one.