

**TEST REPORT
IEC 62619:2022**

**Secondary cells and batteries containing alkaline or other non-acid electrolytes -
Safety requirements for secondary lithium cells and batteries, for use in industrial
applications**

Report Number..... : ACTE202310100
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Applicant's name : Power Bank Limited
Purchase order/Reference : QU-1282


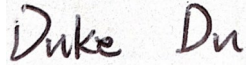
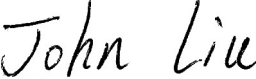
Testing laboratory..... : ACT NZ Limited trading as Auckland Lab
Testing location : 1066E Great South Road, Mount Wellington, Auckland 1060,
New Zealand

Test specification:
Standard : IEC 62619:2022
Test procedure..... : Type test / Selected clauses (Refer to Technical Note)

Test Report Form No. : ACT-TRF-62619
Revision..... : 1.0

Test item description..... : Solar Batteries
Trade Mark..... : Power Bank
Model/Type reference : Portable Batterie Models P6000-8.2; P6000-11.8; P6000-14.4; P9000-8.4; P9000-11.8; P9000-14.4
Stackable Batterie Models S6000-8.2; S6000-11.8; S6000-14.4; S9000-8.4; S9000-11.8; S9000-14.4
Ratings : Refer to Marking Plate Section

Summary of testing : The received samples of Power Bank Models P6000-8.2, P6000-11.8, P6000-14.4, P9000-8.4, P9000-11.8, P9000-14.4, S6000-8.2, S6000-11.8, S6000-14.4, S9000-8.4, S9000-11.8, and S9000-14.4 Solar Batteries complied with relevant selected clauses of the Standard IEC 62619:2022.

	Tested by (name + signature):	
	Duke Du	
	Approved by (name + signature):	
	John Liu	

Copy of marking plate

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



Model	P6000-8.2
Cycle life	6000
Rated energy(kWh)	8.4KWh
Configuration	1P16S
Nominal Voltage(V)	51.2V
Nominal Capacity(Ah)	160Ah @0.5C discharge current 25±2°C
Recommended Working Voltage (V)	48V to 56V
Discharge Cut-off Voltage (V)	41.6V
Standard charge/discharge Current (A)	100A @25±2°C (Recommended)
Max Standard charge/discharge Current (A)	150A @25±2°C
Recommended Working Temperature	-10~50°C(Charge) - -10~50°C(Discharge)
Weight(Kg)	76.5Kg±3kg
Dimension(mm)	(817.26 H)×(412 W) ×(267 D)mm
Recommended SOC Range	15-95%
New Zealand Certification	Sdoc

Marking Label of P6000-8.2

Model	P6000-11.8
Cycle life	6000
Rated energy(kWh)	11.8KWh
Configuration	1P16S
Nominal Voltage(V)	51.2V
Nominal Capacity(Ah)	230Ah @0.5C discharge current 25±2°C
Recommended Working Voltage (V)	48V to 56V
Discharge Cut-off Voltage (V)	41.6V
Standard charge/discharge Current (A)	140A @25±2°C (Recommended)
Max Standard charge/discharge Current (A)	200A @25±2°C
Recommended Working Temperature	-10~50°C(Charge) - -10~50°C(Discharge)
Weight(Kg)	94.74Kg±3kg
Dimension(mm)	(817.26 H)×(412 W) ×(267 D)mm
Recommended SOC Range	15-95%
New Zealand Certification	Sdoc

Marking Label of P6000-11.8

Model	P6000-14.4
Cycle life	6000
Rated energy(kWh)	14.4KWh
Configuration	1P16S
Nominal Voltage(V)	51.2V
Nominal Capacity(Ah)	280Ah @0.5C discharge current 25±2°C
Recommended Working Voltage (V)	48V to 56V
Discharge Cut-off Voltage (V)	41.6V
Standard charge/discharge Current (A)	140A @25±2°C (Recommended)
Max Standard charge/discharge Current (A)	200A @25±2°C
Recommended Working Temperature	-10~50°C(Charge) - -10~50°C(Discharge)
Weight(Kg)	112Kg±3.5kg
Dimension(mm)	(817.26 H)×(412 W) ×(267 D)mm
Recommended SOC Range	15-95%
New Zealand Certification	Sdoc

Marking Label of P6000-14.4

Model	P9000-8.4
Cycle life	9000
Rated energy(kWh)	8.4KWh
Configuration	1P16S
Nominal Voltage(V)	51.2V
Nominal Capacity(Ah)	160Ah @0.5C discharge current 25±2°C
Recommended Working Voltage (V)	48V to 56V
Discharge Cut-off Voltage (V)	41.6V
Standard charge/discharge Current (A)	100A @25±2°C (Recommended)
Max Standard charge/discharge Current (A)	150A @25±2°C
Recommended Working Temperature	-10~50°C(Charge) - -10~50°C(Discharge)
Weight(Kg)	76.5Kg±3kg
Dimension(mm)	(817.26 H)×(412 W) ×(267 D)mm
Recommended SOC Range	15-95%
New Zealand Certification	Sdoc

Marking Label of P9000-8.4

Model	P9000-11.8
Cycle life	9000
Rated energy(kWh)	11.8KWh
Configuration	1P16S
Nominal Voltage(V)	51.2V
Nominal Capacity(Ah)	230Ah @0.5C discharge current 25±2°C
Recommended Working Voltage (V)	48V to 56V
Discharge Cut-off Voltage (V)	41.6V
Standard charge/discharge Current (A)	140A @25±2°C (Recommended)
Max Standard charge/discharge Current (A)	200A @25±2°C
Recommended Working Temperature	-10~50°C(Charge) - -10~50°C(Discharge)
Weight(Kg)	94.74Kg±3kg
Dimension(mm)	(817.26 H)×(412 W) ×(267 D)mm
Recommended SOC Range	15-95%
New Zealand Certification	Sdoc

Marking Label of P9000-11.8

Model	P9000-14.4
Cycle life	9000
Rated energy(kWh)	14.4KWh
Configuration	1P16S
Nominal Voltage(V)	51.2V
Nominal Capacity(Ah)	280Ah @0.5C discharge current 25±2°C
Recommended Working Voltage (V)	48V to 56V
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Standard charge/discharge Current (A)	140A @25±2°C (Recommended)
Max Standard charge/discharge Current (A)	200A @25±2°C
Recommended Working Temperature	-10~50°C(Charge) - -10~50°C(Discharge)
Weight(Kg)	112Kg±3.5kg
Dimension(mm)	(817.26 H) × (412 W) × (267 D)mm
Recommended SOC Range	15-95%
New Zealand Certification	Sdoc

Marking Label of P9000-14.4

Model	S6000-8.2
Cycle life	6000
Rated energy(kWh)	8.4KWh
Configuration	1P16S
Nominal Voltage(V)	51.2V
Nominal Capacity(Ah)	160Ah @0.5C discharge current 25±2°C
Recommended Working Voltage (V)	48V to 56V
Discharge Cut-off Voltage (V)	41.6V
Standard charge/discharge Current (A)	100A @25±2°C (Recommended)
Max Standard charge/discharge Current (A)	150A @25±2°C
Recommended Working Temperature	-10~50°C(Charge) - -10~50°C(Discharge)
Weight(Kg)	76.5Kg±3kg
Dimension(mm)	(750)×(440)×(251)mm
Recommended SOC Range	15-95%
New Zealand Certification	Sdoc

Marking Label of S6000-8.2

Model	S6000-11.8
Cycle life	6000
Rated energy(kWh)	11.8KWh
Configuration	1P16S
Nominal Voltage(V)	51.2V
Nominal Capacity(Ah)	230Ah @0.5C discharge current 25±2°C
Recommended Working Voltage (V)	48V to 56V
Discharge Cut-off Voltage (V)	41.6V
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Max Standard charge/discharge Current (A)	200A @25±2°C
Recommended Working Temperature	-10~50°C(Charge) - -10~50°C(Discharge)
Weight(Kg)	94.74Kg±3kg
Dimension(mm)	(750)×(440)×(251)mm
Recommended SOC Range	15-95%
New Zealand Certification	Sdoc

Marking Label of S6000-11.8

Model	S6000-14.4
Cycle life	6000
Rated energy(kWh)	14.4KWh
Configuration	1P16S
Nominal Voltage(V)	51.2V
Nominal Capacity(Ah)	280Ah @0.5C discharge current 25±2°C
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Recommended Working Temperature	-10~50°C(Charge) - -10~50°C(Discharge)
Weight(Kg)	112Kg±3.5kg
Dimension(mm)	(750)×(440)×(251)mm
Recommended SOC Range	15-95%
New Zealand Certification	Sdoc

Marking Label of S6000-14.4

Model	S9000-8.4
Cycle life	9000
Rated energy(kWh)	8.4KWh
Configuration	1P16S
Nominal Voltage(V)	51.2V
Nominal Capacity(Ah)	160Ah @0.5C discharge current 25±2°C
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Recommended Working Temperature	-10~50°C(Charge) - -10~50°C(Discharge)
Weight(Kg)	76.5Kg±3kg
Dimension(mm)	(750)×(440)×(251)mm
Recommended SOC Range	15-95%
New Zealand Certification	Sdoc

Marking Label of S9000-8.4

Model	S9000-11.8
Cycle life	9000
Rated energy(kWh)	11.8KWh
Configuration	1P16S
Nominal Voltage(V)	51.2V
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Recommended Working Temperature	-10~50°C(Charge) - -10~50°C(Discharge)
Weight(Kg)	94.74Kg±3kg
Dimension(mm)	(750)×(440)×(251)mm
Recommended SOC Range	15-95%
New Zealand Certification	Sdoc

Marking Label of S9000-11.8

Model	S9000-14.4
Cycle life	9000
Rated energy(kWh)	14.4KWh
Configuration	1P16S
Nominal Voltage(V)	51.2V
Nominal Capacity(Ah)	280Ah @0.5C discharge current 25±2°C
Recommended Working Voltage (V)	48V to 56V
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Max Standard charge/discharge Current (A)	200A @25±2°C
Recommended Working Temperature	-10~50°C(Charge) - -10~50°C(Discharge)
Weight(Kg)	112Kg±3.5kg
Dimension(mm)	(750)×(440)×(251)mm
Recommended SOC Range	15-95%
New Zealand Certification	Sdoc

Marking Label of S9000-14.4

Test item particulars	Lithium Solar Batteries for industrial applications
Supply Connection	Supply by terminals
Net Weight	Refer to Marking Plate Section
Dimensions	Refer to Marking Plate Section
Possible test case verdicts:	
- test case does not apply to the test object ..	N/A
- test object does meet the requirement.....	P (Pass)
- test object does not meet the requirement ..	F (Fail)
- object for information or notification only ...	Noted
Testing	
Date of receipt of test item	10/10/2023
Date (s) of performance of tests	16/10/2023 – 30/01/2024
General remarks:	
<p>The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator. All our IECCE testing equipment met the accuracy requirements in accordance with IECCE OD-5014:2019. if required, it is available in the ACT NZ LTD Testing laboratory at customer's request. Determination of the test results from IEC standards in CB scheme includes consideration of measurement uncertainty from the accuracy of these test equipment. For these testing standards which are outside the scope of IEC CB Scheme, the decision rule regarding measurement uncertainty is not taken into account when making compliance decisions.</p>	
Technical Note:	
<p>To avoid damaging the entire battery system, at the request of the client, the propagation test was not performed. Clause 7.3.3 and Annex B are excluded from the scope of the assessment.</p>	

IEC 62619:2022 (Selected clauses)

Clause	Requirement - Test	Result - Remark	Verdict
4	PARAMETER MEASUREMENT TOLERANCES		P
	Parameter measurement tolerances		P
5	GENERAL SAFETY CONSIDERATIONS		P
5.1	General		P
	Cells and batteries are safe under conditions of both intended use and reasonably foreseeable misuse:		P
5.2	Insulation and wiring		P
	Voltage, current, altitude, and humidity requirements		P
	Adequate clearances and creepage distances between connectors		P
	The mechanical integrity of internal connections		P
5.3	Venting		P
	Pressure relief function		P
	Encapsulation used to support cells within an outer casing		P
5.4	Temperature/ voltage/ current management		P
	The design prevents abnormal temperature- rise		P
	Voltage, current, and temperature limits of the cells		P
	Specifications and charging instructions for equipment manufacturers		P
5.5	Terminal contacts of the battery pack and/ or battery system		P
	Polarity marking(s)	<i>Polarity clearly marked.</i>	P
	Capability to carry the maximum anticipated current		P
	External terminal contact surfaces		P
	Terminal contacts are arranged to minimize the risk of short circuits		P
5.6	Assembly of cells, modules, or battery packs into battery systems		P
5.6.1	General		P
	Independent control and protection method(s)		P

IEC 62619:2022 (Selected clauses)

Clause	Requirement - Test	Result - Remark	Verdict
	Recommendations of cell operating limits by the cell manufacturer		P
	Batteries designed for the selective discharge of a portion of their series connected cells		N/A
5.6.2	Battery system design		P
	The voltage control function		P
	The voltage control for series- connected batteries		P
5.7	Operating region of lithium cells and battery systems for safe use		P
	The cell operating region.....:		P
	Designation of battery system to comply with the cell operating region		P
5.8	Quality plan		P
	Manufacturing quality plan (for example: ISO9001, etc.) prepared and implemented.....:	<i>Provided.</i>	P

6	TYPE TEST CONDITIONS		P
6.1	General		P
6.2	Test items		P
	Cells or batteries that are not more than six months old (See Table 1 of IEC62619)		P
	Capacity confirmation of the cells or batteries		P
	Default ambient temperature of test, 25 °C ± 5 °C		P

7	SPECIFIC REQUIREMENTS AND TESTS		-
7.1	Charging procedure for test purposes		P
	The battery discharged to a specified final voltage prior to charging		P
	The cells or batteries charged using the method specified by the manufacturer		P
7.2	Reasonably foreseeable misuse		P
7.2.1	External short-circuit test (cell or cell block)		N/A
	Short circuit with total resistance of 0 mΩ ± 10 mΩ at 25 °C ± 5 °C		N/A
	Results: no fire, no explosion		N/A
7.2.2	Impact test (cell or cell block)		N/A

IEC 62619:2022 (Selected clauses)

Clause	Requirement - Test	Result - Remark	Verdict
	Cylindrical cell, longitudinal axis impact		N/A
	Prismatic cell, longitudinal axis and lateral axis impact		N/A
	Results: no fire, no explosion.		N/A
7.2.3	Drop test (cell or cell block, and battery system)		P
7.2.3.1	General		P
7.2.3.2	Whole drop test (cell or cell block, and battery system)		P
	Description of the Test Unit..... :		N/A
	Mass of the test unit (kg)		N/A
	Height of drop (m)..... :		N/A
	Results: no fire, no explosion		N/A
7.2.3.3	Edge and corner drop test (cell or cell block, and battery system)		P
	Description of the Test Unit		P
	Mass of the test unit (kg)		P
	Height of drop (m)..... :	25mm	P
	Results: no fire, no explosion		P
7.2.4	Thermal abuse test (cell or cell block)		N/A
	Results: no fire, no explosion		N/A
7.2.5	Overcharge test (cell or cell block)		N/A
	For those battery systems that are provided with only a single protection for the charging voltage control		N/A
	Results: no fire, no explosion		N/A
7.2.6	Forced discharge test (cell or cell block)		N/A
	Upper limit charge voltage of the cell		N/A
	Cells connected in series in the battery system :		N/A
	Redundant or single protection for discharge voltage control provided in battery system		N/A
	Target Voltage		N/A
	Maximum discharge current of the cell, Im		N/A
	Discharge current for forced discharge, 1.0 It		N/A
	Discharging time, t = (1 It / Im) x 90 (min.)		N/A

IEC 62619:2022 (Selected clauses)

Clause	Requirement - Test	Result - Remark	Verdict
	Results: no fire, no explosion		N/A
7.3	Considerations for internal short-circuit – Design evaluation		–
7.3.1	General		–
7.3.2	Internal short-circuit test (cell)		N/A
	Samples preparation procedure: a), in accordance with 8. .9 of IEC621 :2012; or b), the nickel particle inserted before charging, or c), the nickel particle was inserted before electrolyte filling.....:		N/A
	Tested according to Cl. 8. .9 of IEC 621 :2012 test method, except all tests were carried out in an ambient temperature of 25 °C ± 5 °C.		N/A
	The appearance of the short-circuit location recorded by photograph or other means		N/A
	The pressing was stopped - When a voltage drop of 50 mV was detected: or		N/A
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) was reached		N/A
	Results: no fire, no explosion		N/A
8	BATTERY SYSTEM SAFETY (CONSIDERING FUNCTIONAL SAFETY)		P
8.1	General requirements		P
	Functional safety analysis for critical controls		P
	Conduct of a process hazard, risk assessment and mitigation of the battery system		P
8.2	Battery management system (or battery management unit)		P
8.2.1	Requirements for the BMS		P
	The safety integrity level (SIL) target of the BMS		P
	The charge control evaluated by tests in clauses 8.2.2 to 8.2.4		P
8.2.2	Overcharge control of voltage (battery system)	<i>Refer to table 8.2.2</i>	P

IEC 62619:2022 (Selected clauses)

Clause	Requirement - Test	Result - Remark	Verdict
	The exceeded charging voltage applied to the whole battery system		P
	The exceeded charging voltage applied to only a part of the battery system, such as the cell(s) ...:		P
	Results: no fire, no explosion		P
	The BMS interrupted the overcharging before reaching 110% of the upper limit charging voltage		P
8.2.	Overcharge control of current (battery system)		P
	Results: no fire, no explosion	<i>No fire No explosion</i>	P
	The BMS detected the overcharging current and controlled the charging to a level below the maximum charging current		P
8.2.4	Overheating control (battery system)		P
	The cooling system, if provided, was disconnected		P
	Elevated temperature for charging, 5 °C above maximum operating temperature		P
	Results: no fire, no explosion		P
	The BMS detected the overheat temperature and terminated charging		P
	The battery system operated as designed during test		P
9	EMC		N/A
	The battery system shall fulfil EMC requirements of the end-device application such as stationary, traction, railway, etc. or the specific requirements agreed between the end-device manufacturer and the battery system manufacturer. The EMC test may be conducted on the end-device, if feasible.		N/A
10	INFORMATION FOR SAFETY		P
	The cell manufacturer provides information about current, voltage and temperature limits of their products		P

IEC 62619:2022 (Selected clauses)

Clause	Requirement - Test	Result - Remark	Verdict
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	The battery system manufacturer provides information regarding how to mitigate hazards to equipment manufacturers or end- users.		P
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11	MARKING AND DESIGNATION (REFER TO CLAUSE 5 OF IEC 62620)		N/A
	The marking items shown in Table 1 in IEC 62620 indicated on the cell, battery system or instruction manual.		N/A
	Cell or battery system has clear and durable markings		N/A
	Cell designation		N/A
	Battery designation		N/A
	Battery structure formulation		N/A

ANNEX A	OPERATING REGION OF CELLS FOR SAFE USE		P
A.1	General		P
A.2	Charging conditions for safe use		P
A.3	Consideration on charging voltage		P
A.4	Consideration on temperature		P
A.5	High temperature range		N/A
A.6	Low temperature range		N/A
A.7	Discharging conditions for safe use		P
A.8	Example of operating region		P

ANNEX C	PACKAGING		P
	The materials and pack design chosen in such a way as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of environmental contaminants		P

Tables of Results:

7.2.1	TABLE: External short-circuit test (cell or cell block)					N/A
Sample No.	Ambient	OCV at start of test (Vdc)	Resistance of Circuit (mΩ)	Maximum Case Temperature Rise ΔT(K)	Results	
Supplementary information: Results: A - No fire or Explosion B - Fire C - Explosion D - The test was completed after 6 h E - The test was completed after the cell casing cooled to 20 % of the maximum temperature rise F - Other (Please explain):						

7.2.5	TABLE: Overcharge test (cell or cell block)					N/A
Sample No.	OCV at start of test (Vdc)	OCV at end of test (Vdc)	Measured Maximum Charging Current (A)	Measured Maximum Charging Voltage (Vdc)	Max. Cell Case Temperature (°C)	Results
Supplementary information: Results: A - No fire or Explosion B - Fire C - Explosion D - Test concluded when temperature reached a steady state condition E - Test concluded when temperature returned to ambient F - Other (Please explain):						

7.2.6	TABLE: Forced Discharge Test (cell or cell block)					N/A
Sample No.	OCV Before Applying Reverse Charge (Vdc)	Targe Voltage (Vdc)	Measured Reverse Charge Current It (A)	Total Time For Reversed Charge Application (min)	Results	
--	--	--	--	--	--	
Supplementary information: Results: A - No fire or Explosion B - Fire C - Explosion D - Other (Please explain):						

7.3.2	TABLE: Internal short-circuit test (cell)				N/A
Sample No.	OCV at start of test, (Vdc)	Particle location 1)	Maximum applied pressure, (N)	Results	
--	--	--	--	--	
Supplementary information: 1) Identify one of the following: 1: Nickel particle inserted between positive and negative (active material) coated area. 2: Nickel particle inserted between positive aluminium foil and negative active material coated area. Results: A - No fire or Explosion B - Fire C - Explosion D - Test concluded when 50 mV voltage drop occurred prior to reaching force limit E - Test concluded when 800/400 N pressure was reached and 50 mV voltage drop was not achieved F - Test was concluded when fire or explosion occurred G - Other (Please explain):					

8.2.2	TABLE: Overcharge Control of Voltage (battery system)					P
Sample No.	OCV at Start of Test of Cell/Cell Blocks (Vdc)	Maximum Charging Current (A)	Max. Charging Voltage of Battery System (Vdc)	Max. Voltage of cell/cell Blocks (Vdc)	Results	
Stackable Battery	3.26	100	57.6	3.359	A, D, F, E	
			Charge Voltage Applied Battery System: 1)			
			Whole	Part		
			53.75	-		
Supplementary information:						
Results:						
A - No fire or Explosion						
B - Fire						
C - Explosion						
D - The voltage of the measured cells or cells blocks did not exceed the upper limit charging voltage						
E - The voltage of the measured cells or cells blocks did exceed the upper limit charging voltage						
F - All function of battery system did operate as intended during the test						
G - All function of battery system did not operate as intended during the test						
H - Other (Please explain): the battery is discharged at a constant current as the standard specified, however, when the battery is charged at 1.1 times the upper limit charging voltage, the BMS will work and alter the charging voltage to around 53-54V.						

8.2.3	TABLE: Overcharge control of current (battery system)				Not Accessed
Sample No.	OCV at Start of Test, (Vdc)	120% of Max. Charging Current (A)	Max. Charging Voltage (Vdc)	Results	
--	--	--	--	--	
Supplementary information:					
Results:					
A - No fire or Explosion					
B - Fire					
C - Explosion					
D - Overcurrent sensing function of BMU did operation and then charging stopped					
E - Overcurrent sensing function of BMU did not operation and then charging stopped					
F - All function of battery system did operation as intended during the test					
G - All function of battery system did not operation as intended during the test					
H - Other (Please explain):					

8.2.4		TABLE: Overheating Control (battery system)		P
Sample No.	OCV at Start (SOC 50%) of Test (Vdc)	Maximum Charging Current (A)	Maximum Charging Voltage (Vdc)	
Stackable Battery	51.44	200	57.6	
Maximum Specified Temperature of Battery System °C		Maximum Measured Cell Case Temperature	Results	
50		--	A, F, H	
<p>Supplementary information:</p> <p>Results:</p> <p>A - No fire or Explosion</p> <p>B - Fire</p> <p>C - Explosion</p> <p>D - Overcurrent sensing function of BMU did operation and then charging stopped</p> <p>E - Overcurrent sensing function of BMU did not operation and then charging stopped</p> <p>F - All function of battery system did operation as intended during the test</p> <p>G - All function of battery system did not operation as intended during the test</p> <p>H - Other (Please explain): The BMS of the battery will alter the charging voltage and current, therefore, the temperature of the battery system did not overheat.</p>				

Photographs: Power Bank Portable Batterie Options



Overview



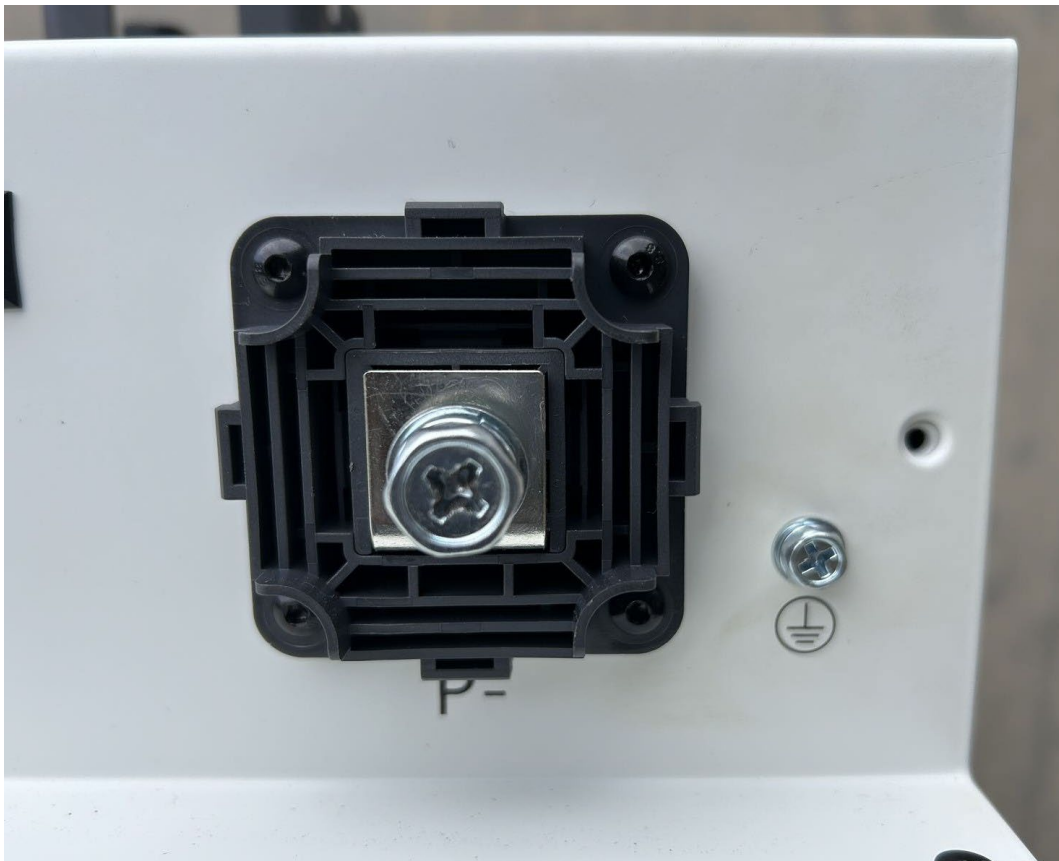
Top View



Side View



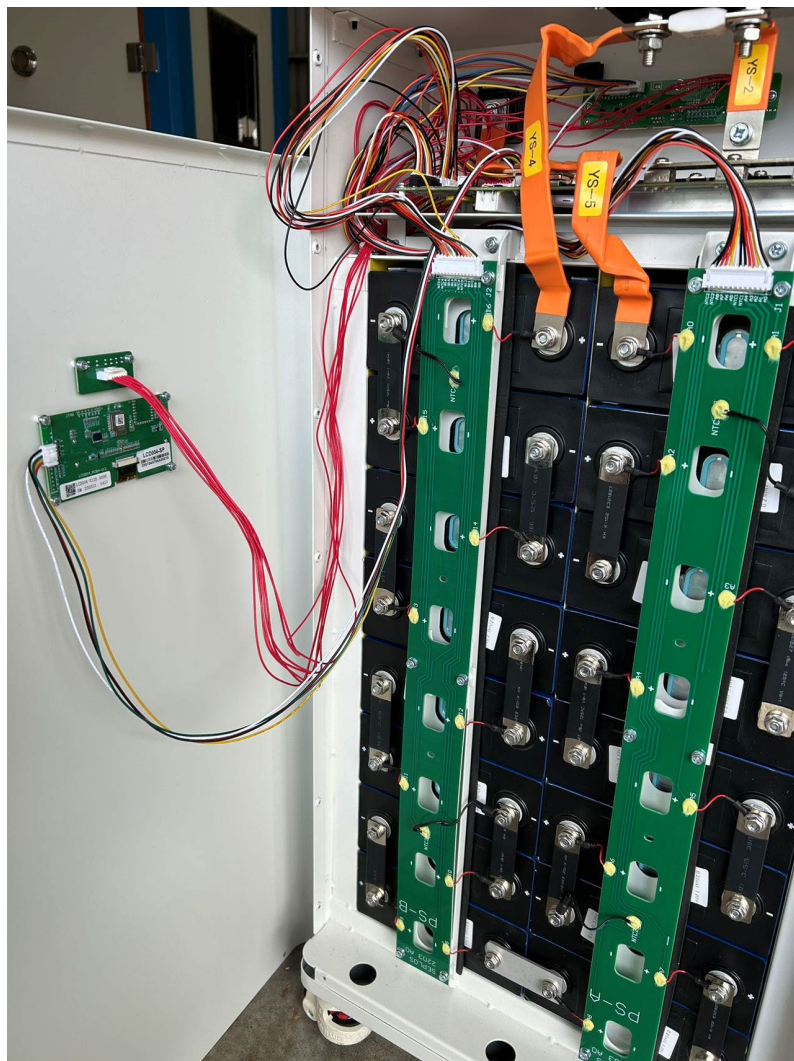
Terminal



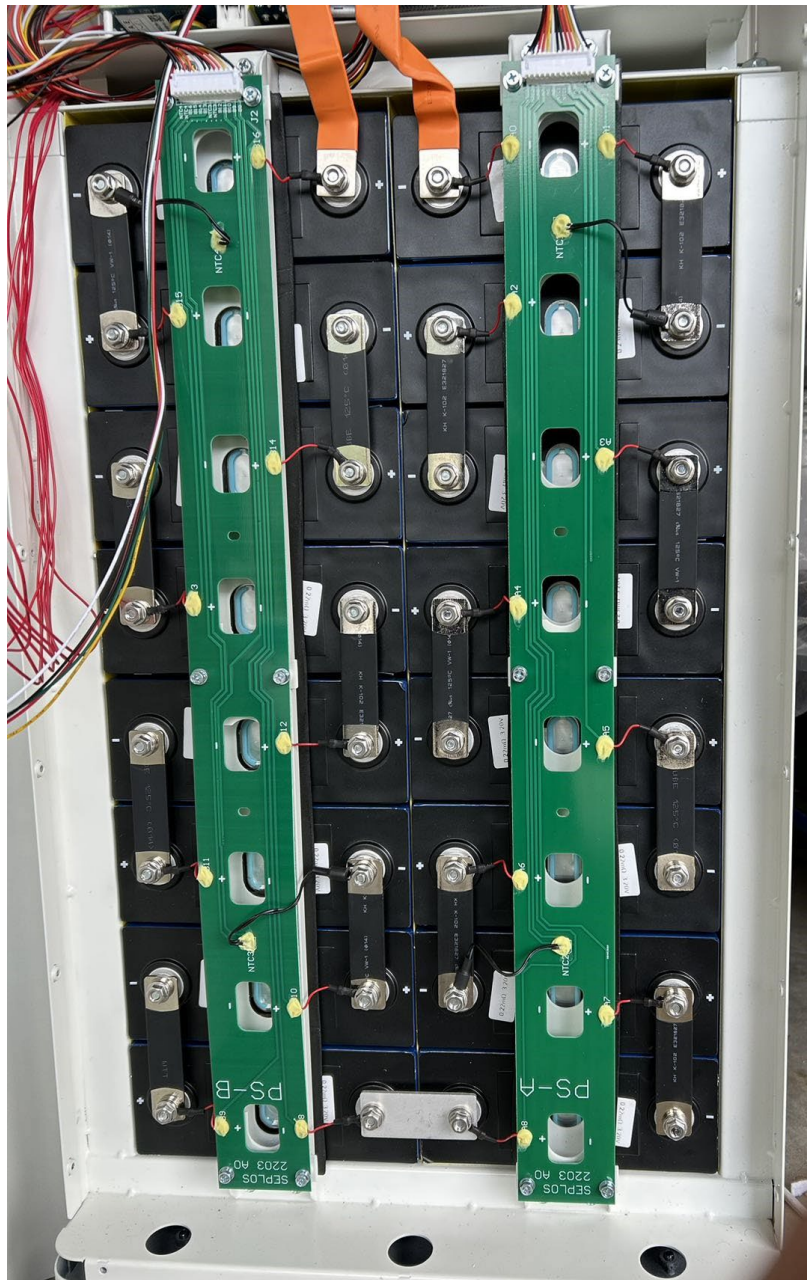
Terminal Close view and Earthing Terminal



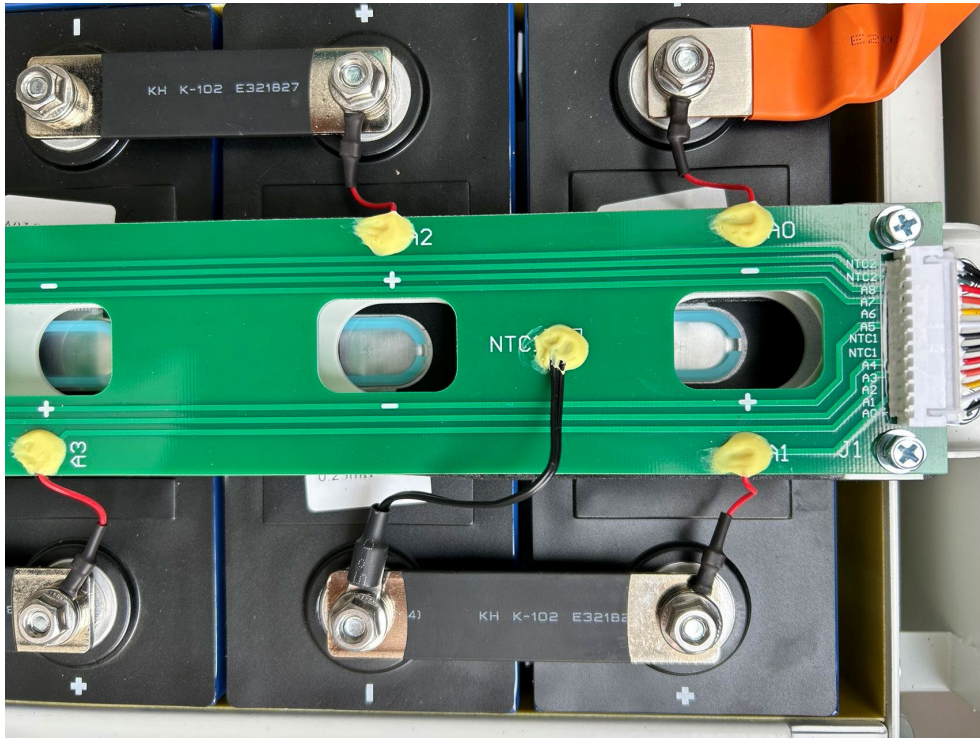
BMS Switch and Connection



Internal Overview



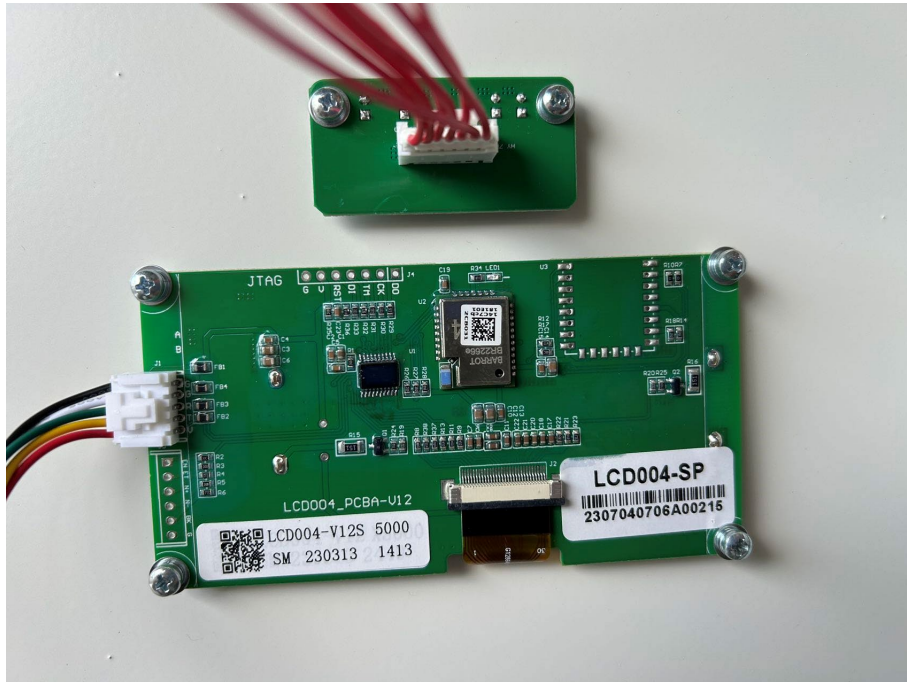
Internal View



Internal Close View



Display Panel



Display PCB

Power Bank Stackable Batterie Options



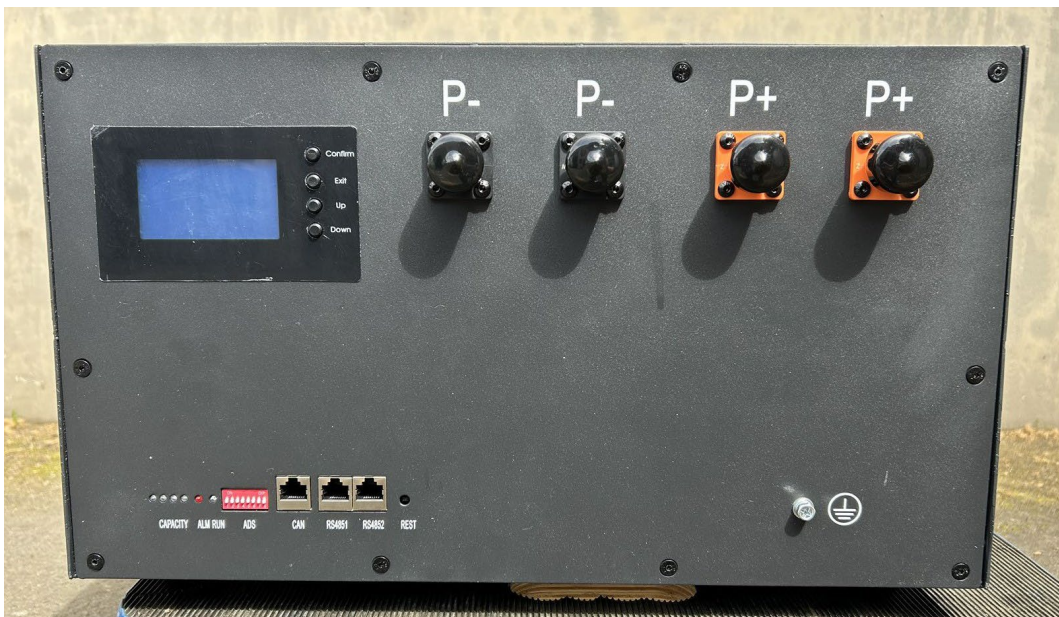
Overview



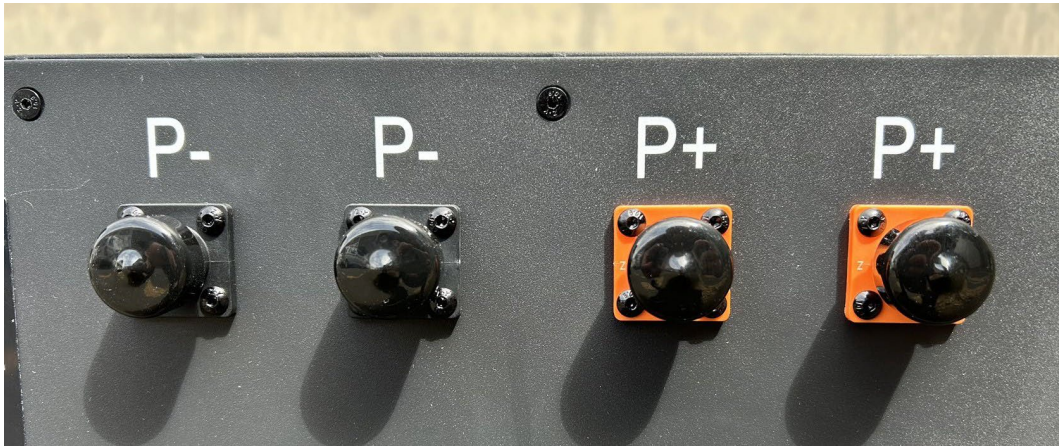
Top View



Side View



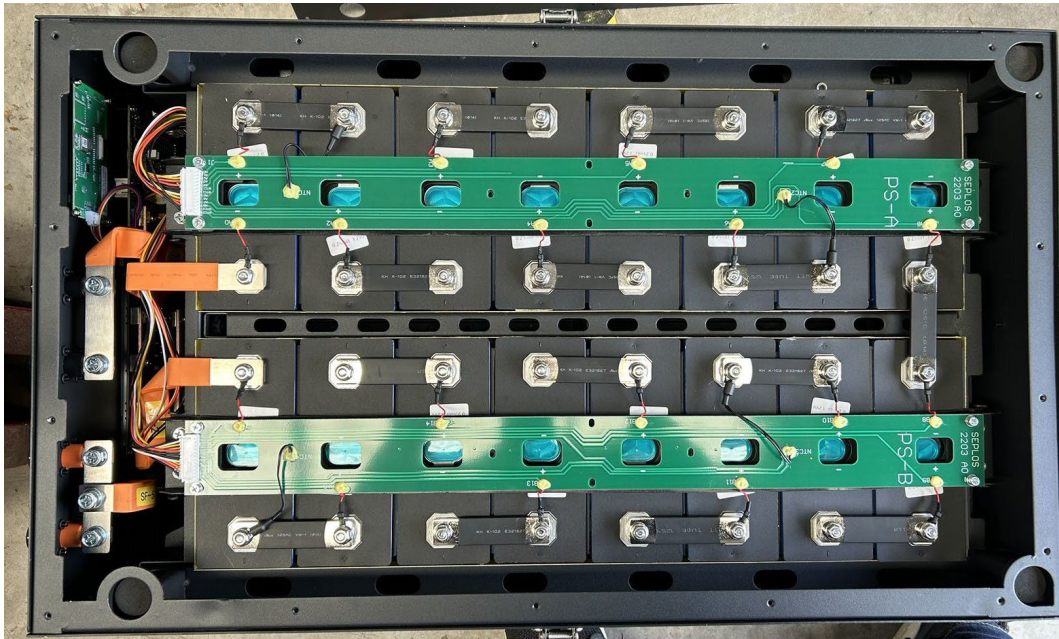
Side View



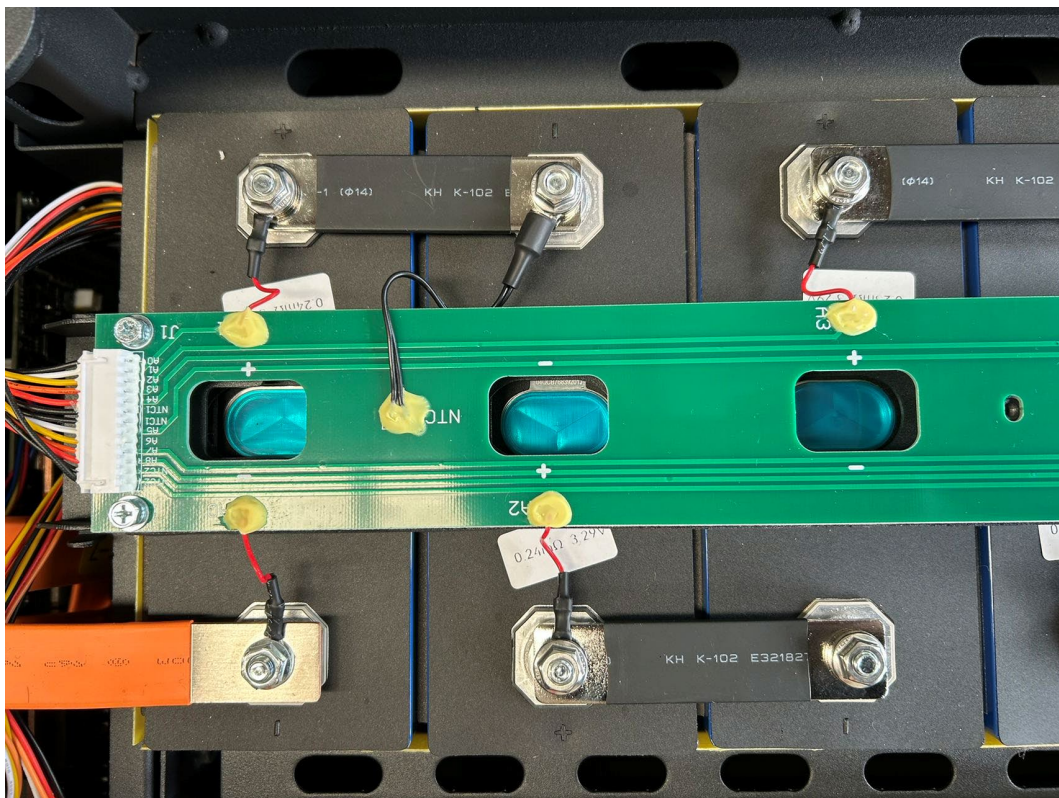
Terminals



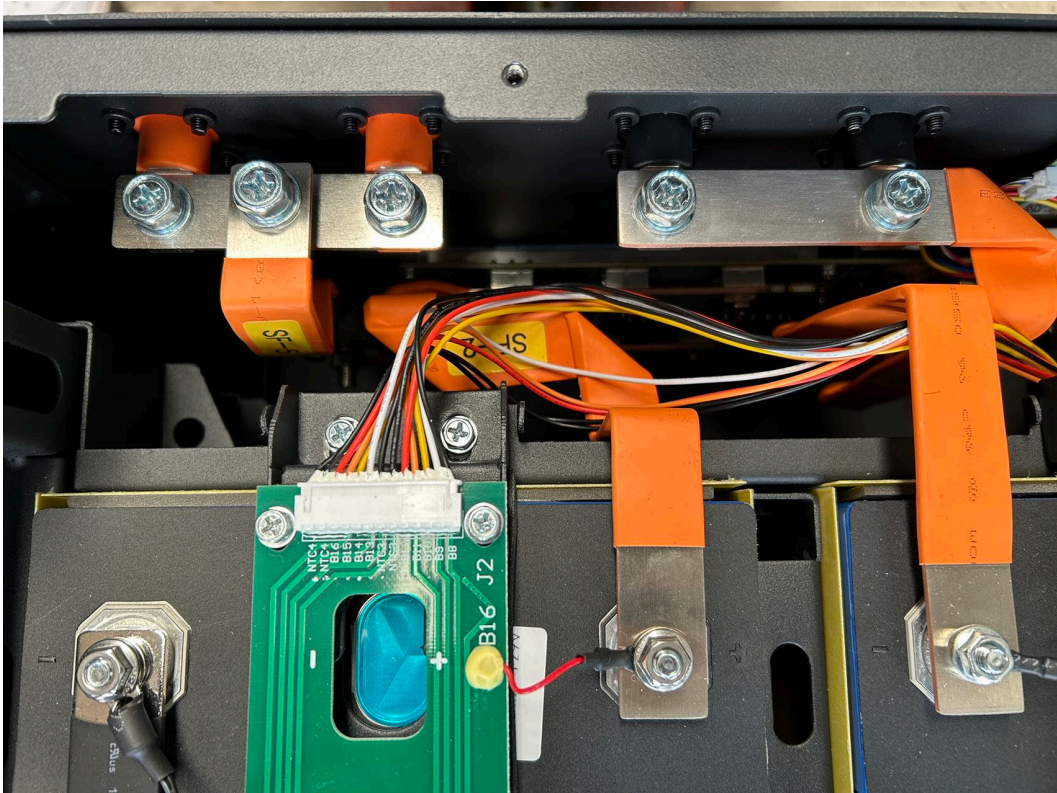
Display Panel



Internal Overview



Terminal Internal View



Internal Close View



Manufacturing Quality Plan:

Procedure for Building Power Bank Solar Batteries:

1 Cell Inspection:

Inspect each of the 16 cells individually for any visible damage or abnormalities.
Saturate charge each of the 16 cells to 3.6 volts individually.
Test and record the voltage of each cell to ensure consistency.

2 Battery Box Assembly:

Inspect all components of the battery box for any defects or damage.
Assemble the battery box with attention to detail and precision.

3 Cell Installation:

Install the 16 charged cells into the battery box.
Connect the cells in series.
Verify the correct orientation and alignment of the cells.

4 PCB Board Connection:

Connect the negative terminal to the PCB board first.
Connect the positive terminal to the PCB board.
Test the voltage on the PCB board to ensure proper connections.

5 Initial Charging:

Turn on the battery and initiate a full charging cycle.
Inspect the battery using a thermal camera during the charging process.

6 Overcharge Protection Test:

Test the PCB overcharge protection when the battery is fully charged.
Ensure that the overcharge protection functions as intended.

7 Discharge and Capacity Testing:

Fully discharge the battery.
Test and record the capacity during the discharge process.
Monitor the battery with a thermal camera to detect any irregularities.

8 Repeat Testing:

Repeat steps 5-6 for a total of 5 cycles to ensure consistency and reliability.

9 Under Voltage Protection Test:

After the final discharge, test the PCB under voltage protection.
Confirm that the under-voltage protection functions as specified.



10 Case Inspection:

Test the battery case for electrical current leakage.
Ensure there are no defects or issues with the case.

12 Finalization:

Close the battery case securely.
Apply all required labelling and stickers to the battery.

12 Charging for Delivery/Storage:

Charge the battery to 51 volts (nominal voltage) in preparation for delivery or storage.

13 Documentation:

Record all test results and observations for quality control records.

14 Quality Assurance Check:

Perform a final quality assurance check to ensure all procedures have been followed correctly.

End of Report ACTE202310100

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