SunStonePower

LITHIUM BATTERY PACK
USER MANUAL

MODEL: SLPO48-100

※ Please read this manual before using the battery pack
※ Please keep this manual properly after reading

1. Product key parameters

NO.	Item	Specification
1.1	Appearance	The battery pack surface is clean, free from scratches and mechanical damage.
1.2	Charging voltage	56.8V±0.2V
1.3	Nominal voltage	51.2V
1.4	Cut-off voltage	40V
1.5	Nominal capacity	100Ah (After standard charging, discharging at 0.5C.)
1.6	Min. capacity	100Ah (After standard charging, discharging at 0.5C.)
1.7	Standard charging current and voltage	Step 1: 50A constant current charge to 56.8V; Step 2: 56.8V constant voltage charge until the charging current reaches 5A. Temp.: 0~45°C
1.8	Charging time	2.5hours (for reference)
1.9	Max charging current	50A
1.10	Max. discharge current	50A
1.11	Working Temp.	Charging: 0~45°C; Discharging: -20~55°C
1.12	Storage Temp. and humidity range	1month: -20~45°C 3 months: -10~45°C 6 months: 0~25°C humidity: 45~90% RH The battery should be cycled every three months.
1.13	Cycle life	After 6000 cycles, at 25°C, 50A charge and discharge 80% DOD, recoverable capacity ⩾80%
1.14	Initial battery internal resistance	⩽100mΩ (50% capacity, AC impedance1kHz measuring)
1.15	Battery weight	About 43kg
1.16	Ex-work voltage	52~53.5V
1.17	Dimension	460(L)*483(W)*132(H)
1.18	Function	Supports parallel connection of multiple battery pack (24units)
1.19	Communication	CAN and RS485
1.20	Color	White

2. Structural characteristics and interface definition

A. Basic structure: 2mm sheet metal box structure and rack.
B. Installation method: screw lock.
C. Surface coating: add spray paint.

3. Main function

3.1 Overall structure

The battery pack is mainly composed of the following parts: 4U metal outer box, a 16S1P modular, accessories include: patch cord, external terminal post etc. The overall structure is simple and easy to remove & maintain, high reliability, light weight and high energy density.

3.2 Interaction

<table>
<tr><th>INTERFACE</th><th colspan="6">FUNCTION</th><th>REMARK</th></tr>
<tr><td rowspan="28">Digital Tube</td><td colspan="6" rowspan="28">There are 4 display interfaces:
1. Current voltage value
2. Current current value
3. Current SOC
4. Fault code (not displayed when there is no fault)
U is voltage
A is current
C is current power</td><td>Error Code</td></tr>
<tr><td>E11：Module equipment failure level 1 alarm</td></tr>
<tr><td>E12：Module equipment failure level 2 alarm</td></tr>
<tr><td>E21：Module communication error level 1 alarm</td></tr>
<tr><td>E22：Module communication error level 2 alarm</td></tr>
<tr><td>E31：Module address abnormal level 1 alarm</td></tr>
<tr><td>E32：Module address abnormal level 2 alarm</td></tr>
<tr><td>E41：Module balanced abnormal level 1 alarm</td></tr>
<tr><td>E42：Module balanced abnormal level 2 alarm</td></tr>
<tr><td>E51：Module overvoltage level 1 alarm</td></tr>
<tr><td>E52：Module overvoltage level 2 alarm</td></tr>
<tr><td>E61：Module undervoltage level 1 alarm</td></tr>
<tr><td>E62：Module undervoltage level 2 alarm</td></tr>
<tr><td>E71：Module charging overcurrent level 1 alarm</td></tr>
<tr><td>E72：Module charging overcurrent level 2 alarm</td></tr>
<tr><td>E81：Module discharge overcurrent level 1 alarm</td></tr>
<tr><td>E82：Module discharge overcurrent level 2 alarm</td></tr>
<tr><td>E83：Module discharge load short circuit (severe)</td></tr>
<tr><td>E91：Single battery overvoltage level 1 alarm</td></tr>
<tr><td>E92：Single battery overvoltage level 2 alarm</td></tr>
<tr><td>E101：Single battery undervoltage level 1 alarm</td></tr>
<tr><td>E102：Single battery undervoltage level 2 alarm</td></tr>
<tr><td>E111：Module battery high temperature level 1 alarm</td></tr>
<tr><td>E112：Module battery high temperature level 2 alarm</td></tr>
<tr><td>E121：Module battery low temperature level 1 alarm</td></tr>
<tr><td>E122：Module battery low temperature level 2 alarm</td></tr>
<tr><td rowspan="2">Indicator light</td><td colspan="6">Alarm: yellow light flashes</td><td>No fault code appears when normal.</td></tr>
<tr><td colspan="6">Alarm/Fault: red light flashes</td><td>A fault code will appear during an alarm/failure.</td></tr>
<tr><td rowspan="6">Button</td><td colspan="6">When in running state:</td><td rowspan="6">If the wakeup fails, wait for 10 sec and wake up again.
After under-voltage automatic sleep, only support charging wake up.</td></tr>
<tr><td colspan="6">1. Short press: display page switching</td></tr>
<tr><td colspan="6">2. Long press: enter sleep mode (3~6 sec)</td></tr>
<tr><td colspan="6">(Valid when disconnected from the bus)</td></tr>
<tr><td colspan="6">When in sleep state:</td></tr>
<tr><td colspan="6">1. Short press: invalid
2. Long press: wake up (3~6 sec)</td></tr>
<tr><td rowspan="18">Encoder</td><td colspan="5">Set up IP address by encoder</td><td></td><td></td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>Invalid address</td><td></td></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>Address 1</td><td></td></tr>
<tr><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>Address 2</td><td></td></tr>
<tr><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>Address 3</td><td></td></tr>
<tr><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>Address 4</td><td></td></tr>
<tr><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>Address 5</td><td></td></tr>
<tr><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>Address 6</td><td></td></tr>
<tr><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>Address 7</td><td></td></tr>
<tr><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>Address 8</td><td></td></tr>
<tr><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>Address 9</td><td></td></tr>
<tr><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>Address 10</td><td></td></tr>
<tr><td>ON</td><td>OFF</td><td>ON</td><td>ON</td><td>Address 11</td><td></td></tr>
<tr><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>Address 12</td><td></td></tr>
<tr><td>ON</td><td>ON</td><td>OFF</td><td>ON</td><td>Address 13</td><td></td></tr>
<tr><td>ON</td><td>ON</td><td>ON</td><td>OFF</td><td>Address 14</td><td></td></tr>
<tr><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>Address 15</td><td></td></tr>
</table>

INTERFACE	NO.	SIGNAL NAME	REMARK
RS485/CAN (RJ11)	1	CAN-L	CAN bus low level
	2	CAN-H	CAN bus high level
	3	485-B	RS485-B
	4	485-A	RS485-A
	5	GT	Communication reference
	6	COM_UP	Wake signal input (3~5V)

4.1 Temp. control threshold value

Item	Tpmin / Tpmax(°C)	Level
Normal operation temp.	10<Tpmin<35	Running normal
Low temp. threshold value	-20<Tpmin≤-15	Alarm
	Tpmin≤-20	Protect
Radiator high temp. threshold value	75≤Tpmax<85	Alarm
	Tpmax>85	Protect
Battery cell high temp. threshold value	60≤Tpmax<65	Alarm
	Tpmax>65	Protect

4.2 Voltage threshold value

NO.	Battery cell voltage range (V)	Level
1	2.5<Vmin≤2.9	Alarm
2	Vmin≤2.5	Protect
3	2.9<V<3.65	Normal
4	3.65≤Vmax≤3.75	Alarm
5	Vmax>3.75	Protect

4.3 Current threshold value

NO.	Item	Parameter(A)	Status
1	Battery pack	<75	Normal
2		75≤Imax≤105	Alarm
3		Imax >105	Protect
4	Battery pack stack	Imax <800	Normal
5		Imax >800	Alarm
6		Imax>1000	Protect

5. Daily use and maintenance of battery pack

5.1 Daily maintenance of battery pack

1. Check the voltage data on the BMS display and the actual battery voltage value to ensure the accuracy of the voltage collection of the BMS. If they are inconsistent, proofreading is required. The error between the collected voltage and the actual battery voltage does not exceed 10mV.
2. Check the temperature collection data and actual temperature value of the BMS, and the data error between the collected data and the actual temperature value is not allowed to exceed 3℃, to ensure that the battery will not be charged or discharged when the temperature is too high or too low.
3. Check the BMS current collected data and actual current value, the error is not allowed to exceed 1%, to ensure that the battery will not be charged or discharged by overcurrent.
4. Check the reliability of the charging equipment to ensure that the charging equipment performs charging according to the voltage and current regulationsent by the BMS, to ensure that the battery will not be overcharged.
5. Check the connection of the battery pack is good, the contact points are in normal contact, and there is no accumulation of dust, powder, metal chips.

5.2 Caution

1. Keep batteries or battery packs away from dangerous items or materials, such as corrosive chemicals, dangerous machinery and equipment, and high-temperature environments.
2. Unreasonable use of this of products may cause smoke, such as external short circuit, overcharging, and high ambient temperature. If smoke occurs, please cut off the power in time, use carbon dioxide or dry powder fire extinguisher for treatment, and bury it with sand or mud. The crowd must be evacuated in time during the entire process.

3. Unreasonable use of this series of products may cause the single battery to swell. In severe cases, it may cause the casing to rupture or crack. In these conditions, the battery should be stopped immediately. Please contact our technical department or after-sales service department for further solution.
4. It is forbidden to short circuit the positive and negative terminal of the battery directly, and avoid any metal or other conductive objects contacting the positive and negative terminal of the battery. This operation may cause personal injury or property damage.
5. It is forbidden to immerse the battery in water or other conductive liquids. This operation may cause personal injury or property damage.
6. It is forbidden to use this product in series or parallel with other types of batteries. it is also for bidden to conduct the entire power system in series or parallel operation. This operation may cause personal injury or property loss. If necessary, please contact the relevant technical department to obtain the correct technical support.
7. It is forbidden to get wet under the environment of more than 95%RH, even immerse in water. Otherwise, it may cause internal short circuit, loss of function or abnormal chemical reaction, and cause fire, smoke, explosion and other accidents.
8. It is forbidden to put the battery system into fire or to be exposed to a high temperature environment exceeding the temperature conditions specified in this specification for a long time. These environments above the safe temperature range will cause a significant decrease in the performance and life of this product, and even cause serious consequences such as combustion and explosion.
9. It is forbidden to store and use in an environment with high static electricity or high electromagnetic radiation. Otherwise, the electronic devices in this product will be damaged, which may cause potential safety hazards.
10. Connect the positive and negative terminal of the battery system strictly in accordance with the instructions, and reverse charging is prohibited.
11. When the electrolyte leaks, avoid contacting the electrolyte with skin and eyes. In case of contact, wash the area with plenty of water and seek medical assistance. It is forbidden for any person or animal to swallow any part of the battery system or the substance contained in the battery system.