



BETTENERGY

User Manual

Model: ELESHELL-6.1/10.2/14.3K



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1 General Information

This manual introduces the ELESHELL6. 1/10. 2/14. 3K battery products. Please read this manual carefully before using the battery. For any questions, please contact us immediately for advice and clarification.

1.1 Validity

This user manual is applicable to ELESHELL6. 1/10. 2/14. 3K

This manual contains ELESHELL6. 1/10. 2/14. 3K information, usage, guidance, safety information, installation guide and details on common operation issues and subsequent maintenance measures.

1.2 Intended Use

ELESHELL6. 1/10. 2/14. 3K is an energy storage unit, that is designed for residential application scenarios with the capability of short-term backup.

Notes:

ELESHELL6. 1/10. 2/14. 3K is not suitable for supporting life-sustaining medical devices. This product is intended for used only in accordance with the information provided in the enclosed documents and applicable local standards and regulations. Any other use may result in personal injury or property damage. The illustrations in this manual are only intended to help explain the concept of the system configuration, including use guidelines, safety precautions, common operating problems, and

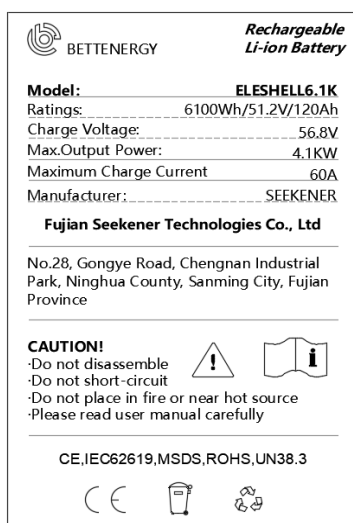
subsequent battery maintenance.

Alterations to the product, e.g. changes or modifications, are only permitted with the express written permission of SEEKENER. Unauthorized changes will not be allowed by warranty claims. SEEKENER shall not be liable for any damage resulting from such changes. Any use of the product other than described in the intended use section does not qualify as appropriate. The enclosed documentation is an integral part of this product. Please keep the documentation in a safe and convenient place for future reference. Product model labels (see Section 1.3) must be attached to the product.

1.3 Product Identification

The type labels were attached on the product, which contain the product identification information. For safe usage, the user must be well-informed of the contents in the type labels.

The Labels include:




BETTENERGY

**Rechargeable
Li-ion Battery**

Model: ELESHELL14.3K
Ratings: 14300Wh/51.2V/280Ah
Charge Voltage: 56.8V
Max.Output Power: 6.1KW
Maximum Charge Current: 120A
Manufacturer: SEEKENER

Fujian Seekener Technologies Co., Ltd
 No.28, Gongye Road, Chengnan Industrial
 Park, Ninghua County, Sanming City, Fujian
 Province

CAUTION!
 ·Do not disassemble
 ·Do not short-circuit
 ·Do not place in fire or near hot source
 ·Please read user manual carefully




CE, IEC62619, MSDS, ROHS, UN38.3






DANGER !
 CHEMICAL HAZARD &
 SHOCK HAZARD

- Do not disassemble or repair by yourself.
- Do not drop, deform, impact, cut or spear with a sharp object.
- Do not place near open flame or incinerate.
- Do not put any objects onto the battery.
- Do not allow to contact with liquid.
- Keep out of reach of children, animals or insects.
- Contact the supplier within 24 hours if anything wrong.







WARNING !



Stop the battery operation immediately to secure the battery safety when environmental temperature is over working temperature (suitable operation temperature is 0~45°C).
 If battery is at high temperature usually, it will impact battery performance.

2 Safety Measures

This section contains safety information that must always be observed when using or installing batteries. To prevent personal injury or property damage and ensure long-term operation of the batteries, please read this section carefully, always Watch for warnings from all safety messages.



Environmental requirements:

1. Do not expose the battery to temperature above 50 °C;
2. Do not place the battery near any heat source;
3. Do not expose the battery to moisture or liquid;
4. Do not expose the battery to a corrosive gas or liquid;
5. Do not expose the battery to a combustible gas or liquid;
6. Do not expose the battery to direct sunlight for extended periods of time;
7. Battery power terminals are not allowed to contact conductive objects, such as electric wires;
8. Place the battery in safe place that away from children and animals;

Operation Precautions:

1. Do not disassemble the battery;
2. Do not touch the battery pack with wet hands;
3. Do not smash, fall, or puncture the battery;
4. Do not reverse the polar series connection battery;
5. Do not short-circuit the terminal, and remove all metal jewelry items that may produce a short-circuit before installation and repair;
6. Always handle the products in accordance with the local safety regulations;
7. Store and use the battery in the user's manual;
8. Ensure reliable grounding;
9. Disconnecting all batteries to the wires before installation and repair;
10. Do not stack batteries outside the protective packaging during storage or handling;
11. The stacking of packaging batteries shall not exceed the quantity specified on the packaging;
12. Continued operation of a damaged battery may lead to dangerous situations, causing serious injuries such as electric shock or combustion;

3 Technical parameters

Basic Parameters	Technical Specification		
Model	ELESHELL6. 1K	ELESHELL10. 2K	ELESHELL14. 3K
Battery Type	LiFeP04	LiFeP04	LiFeP04
Nominal Capacity (Ah)	120A. h	200A. h	280 A. h
Nominal Voltage (V)	51. 2V	51. 2V	51. 2V
Total Energy	6100W. h	10240W. h	14336W. h
Depth of Discharge (90%DOD)	5490W. h	9216W. h	12902 W. h
Maximum Charging Voltage (V)	56. 8V	56. 8V	56. 8V
End of Voltage (V)	49V	49V	49V
Nominal charging current (A)	60A	100A	120A
Maximum Charging Current (A)	60A	100A	120A
Maximum Charging Power (W)	3072W	5120W	7168W
Working Humidity	≤95%rh		

Store Humidity	$\leq 95\%rh$		
Working Altitude	$\leq 2000m$		
Maximum number of Parallel	16 个		
Protection Level	IP65		
Net Weight (Kg)	60KG	80KG	120KG
Dimensions (mm)	422*867.5*118	509*871.7*133	412*750*235
Product Certificate	CE, ROHS , UN38.3, MSDS,		
Circle Life	≥ 5000 次, 80%DOD /25℃/0.5C, 60%EOL		
Communication Port	CAN, RS485, RS232		
Operating temperature	$-10^{\circ}C \sim 55^{\circ}C$		
Storage temperature	$\leq 25^{\circ}C$, 12 个月;		
	$\leq 35^{\circ}C$, 6 个月;		
	$\leq 45^{\circ}C$, 3 个月		

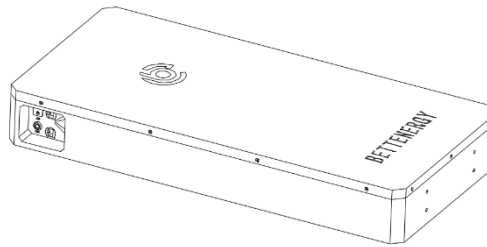
Note: Operating current derating according to the cell voltage and temperature.

4 Technical Items

No.	Name	Comment
1	Discharge	Battery output power for load
2	Charge	Put the electricity into the battery through the charger
3	Full Charge	The battery is fully charged with 100% SOC.
4	Standby	Ready for charging or discharging
5	Turn-off	Turn-off battery output
6	SOC	State of Charging (Useable Capacity)
7	Battery voltage	Voltage between the battery B+ /B -
8	Single-string Voltage	Single-cell voltage
9	Alarm	Indicates that the battery is in an abnormal state
10	Protection	Battery stops charging or discharging
11	Fault	Battery or BMS is damaged and need to be replaced
12	Over discharged	Battery is lack of electricity, and need to be charged in time

5 Product Overview

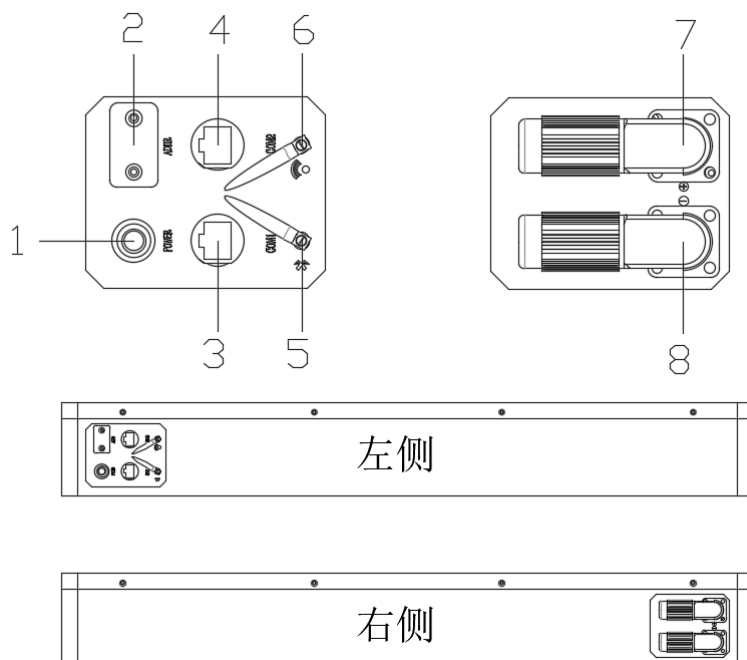
5.1 Brief Introduction.



ELESHELL6.1K/10.2K/14.3K is a lithium battery energy storage system with an operating voltage range of between 49V~56.8V, it is used for household energy storage applications, in cooperation with low voltage inverters to achieve home energy storage purpose.

ELESHELL6.1K/10.2K/14.3K has a built-in BMS (Battery Management System) which can manage and monitor cells information, including voltage, current and the temperature. In addition, the BMS can balance battery charging to extend lifespan. BMS has the protections including over-discharge, overcharge, over-current, high / low temperature, etc. The system can automatically manage the charging status, discharge state, balance state. Multiple batteries can be connected in parallel to expand storage capacity to meet larger capacity and continuous power support time, ELESHELL6.1K/10.2K/14.3K support up to 16 parallel operations.

5.2 Interface Introduction

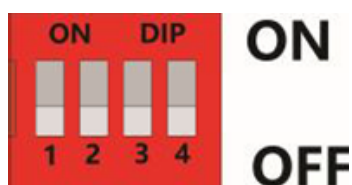


No.	Items	No.	Items
1	power switch	5	Bluetooth
2	ADDR Dial address	6	Wifi
3	COM1 (RS485/CAN)	7	Battery positive pole
4	COM2 (RS485/RS232)	8	Battery negative pole

5.2.1 Start Button

Press the start button, release the button, and the button is locked.

5.2.2 Dial-up Switch Definition



Schematic diagram of the dial-up switch

The dialing switch is used to set the battery BMS address, the code value to the ON position is 1, The code value dialed to 1234 is 0, The host address is 0 and the slave address is 1 ~ 15.

The dial-up address table is as follows:

Dial-up code location				Add res	Dial-up code location				Add res	Dial-up code location				Add res	Dial-up code location				Add res
1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4	
0	0	0	0	0	0	0	1	0	4	0	0	0	1	8	0	0	1	1	12
1	0	0	0	1	1	0	1	0	5	1	0	0	1	9	1	0	1	1	13
0	1	0	0	2	0	1	1	0	6	0	1	0	1	10	0	1	1	1	14
1	1	0	0	3	1	1	1	0	7	1	1	0	1	11	1	1	1	1	15

5.2.3 COM1 Port



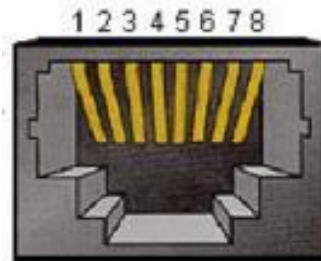
Interface	Definition Description
Pin1	RS485-B
Pin2	RS485-A
Pin3	NC (empty)
Pin4	CAN-H
Pin5	CAN-L
Pin6	NC (empty)
Pin7	NC (empty)
Pin8	NC (empty)

The can communication terminal (RJ45 port) follows the can / RS485

protocol and is connected to the inverter BMS for communication.

1. The can communication terminal (RJ45 port) follows the can / RS485 protocol and is connected to the inverter BMS for communication.
2. If the battery capacity is less than 8%, BMS controls the inverter to forcibly charge through can / RS485 communication to avoid damaging the battery due to deep discharge.
3. If the SOC is lower than 97% for one consecutive month, BMS controls the inverter through can / RS485 communication to fully charge the battery to correct the SOC error.

5.2.4 COM2 port



Interface	Definition Description
Pin1	RS485-B
Pin2	RS485-A
Pin3	RS232-TX
Pin4	RS232-RX
Pin5	RS232-GND
Pin6	NC (empty)
Pin7	RS485-A
Pin8	RS485-B

Com2 communication terminal (RJ45 port) follows RS485 / RS232 protocol and communicates internally when multiple batteries are combined.

6 Installation guide

6.1 Inspection before installation

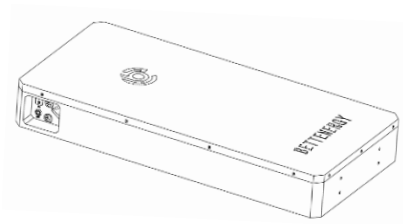
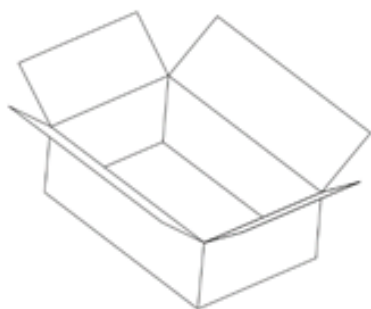
6.1.1 Check the outer packaging



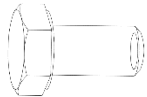
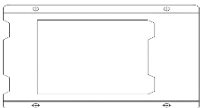






Packaging materials and components may be damaged during transportation. Therefore, please check the packaging material before installing the battery. Check the surface of packaging materials for damage, such as holes and cracks. If any damage is found, do not unpack the battery and contact the dealer as soon as possible. It is recommended that you remove the packaging material within 24 hours before installing the battery.

6.1.2 Check whether the accessories are complete

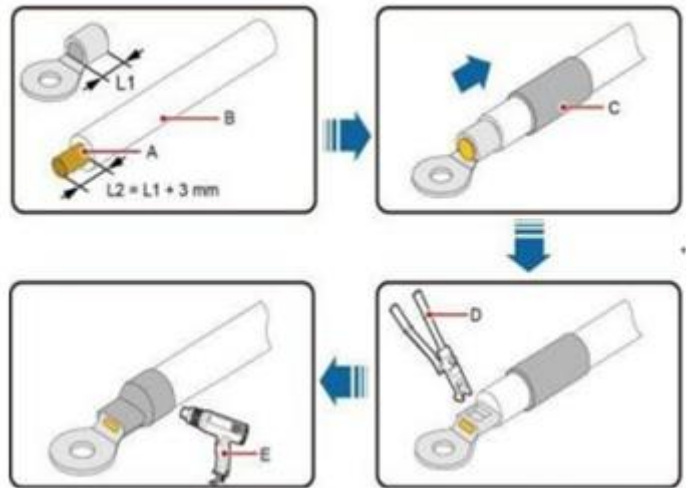
After opening the packing box, check whether the attached accessories are complete. If any damage or missing parts are found, contact your dealer.

The following table shows the random components and mechanical components.

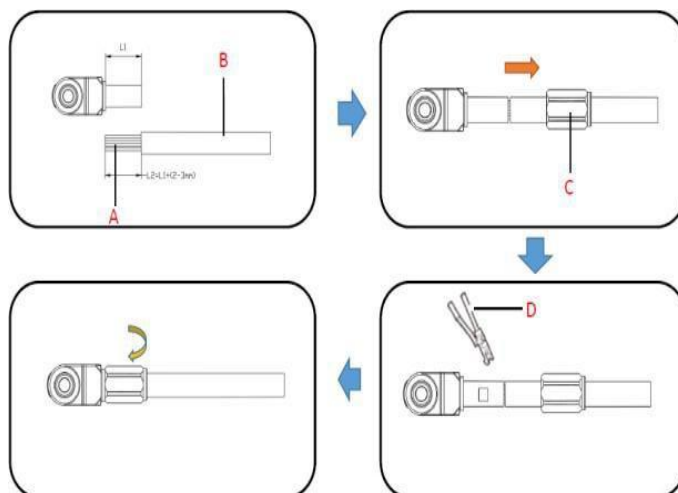


Packing list			
Item	Picture	Quantity	Description
1		1	Battery pack
2		1	Wall hanging plate A (One out of two)
3		4/6	(Wall hanging plate A) (base) M8*16
4		1	Wall hanging plate B (One out of two)
5		4/4	(Wall hanging plate B) (base) Expansion screws M10*100
6		1	Base (One out of two)
7		1	Hub (1 in 2 interface)
8		1	Certificate
9		1	Inspection report
10		1	Quality guarantee

Manufacturing instructions for power cable terminals:










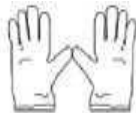



(A) Copper-core wire (B) The insulation layer (C) Heat-shrink tube



(A) Copper Core Line (B) Insulation layer (C) Protective cover

(D) Hydraulic pliers

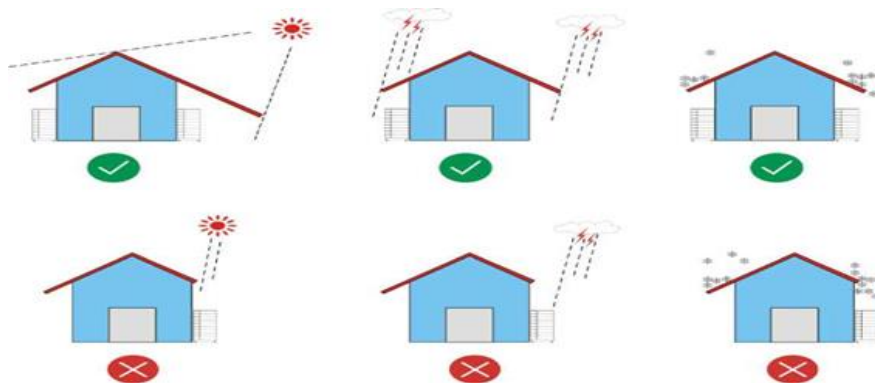
6.2 Tools

Type	Tools		
Installation Tools	Knife 	Hammer drill 	Socket wrench 
	Rubber mallet 	Cross Screwdriver 	
	Inclinometer 	Measuring tape 	
Protective Equipments	ESD gloves 	Safety goggles 	Anti-dust respirator 
	Safety shoes 		

6.3 Installation Requirements

6.3.1 Installation environment requirements

1. Install the battery in an indoor environment.
2. Place the battery in a safe position away from children and animals.
3. Do not place the battery near any heat source, and avoid generating sparks.
4. Do not expose the battery to moist air or liquid.
5. Do not expose the battery to direct sunlight.
6. Do not expose the battery to a combustible gas or liquid.



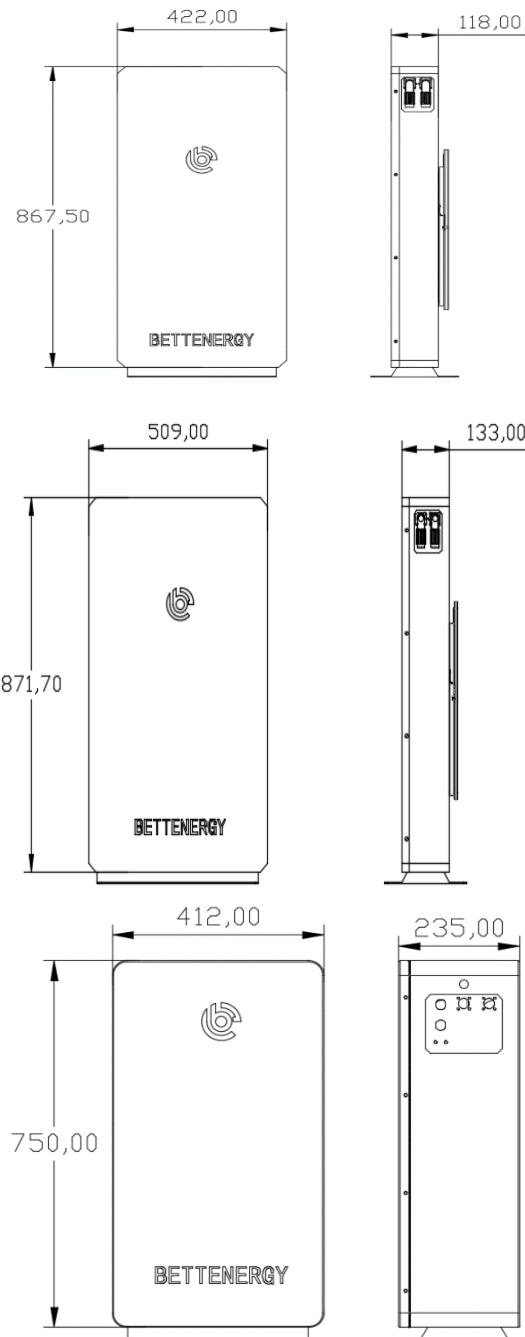
6.3.2 Installation Carrier requirements

1. The mounting carrier shall be fire resistant. Do not install batteries on flammable buildings.
2. The mounting bracket surface shall meet the requirements of bearing requirements.

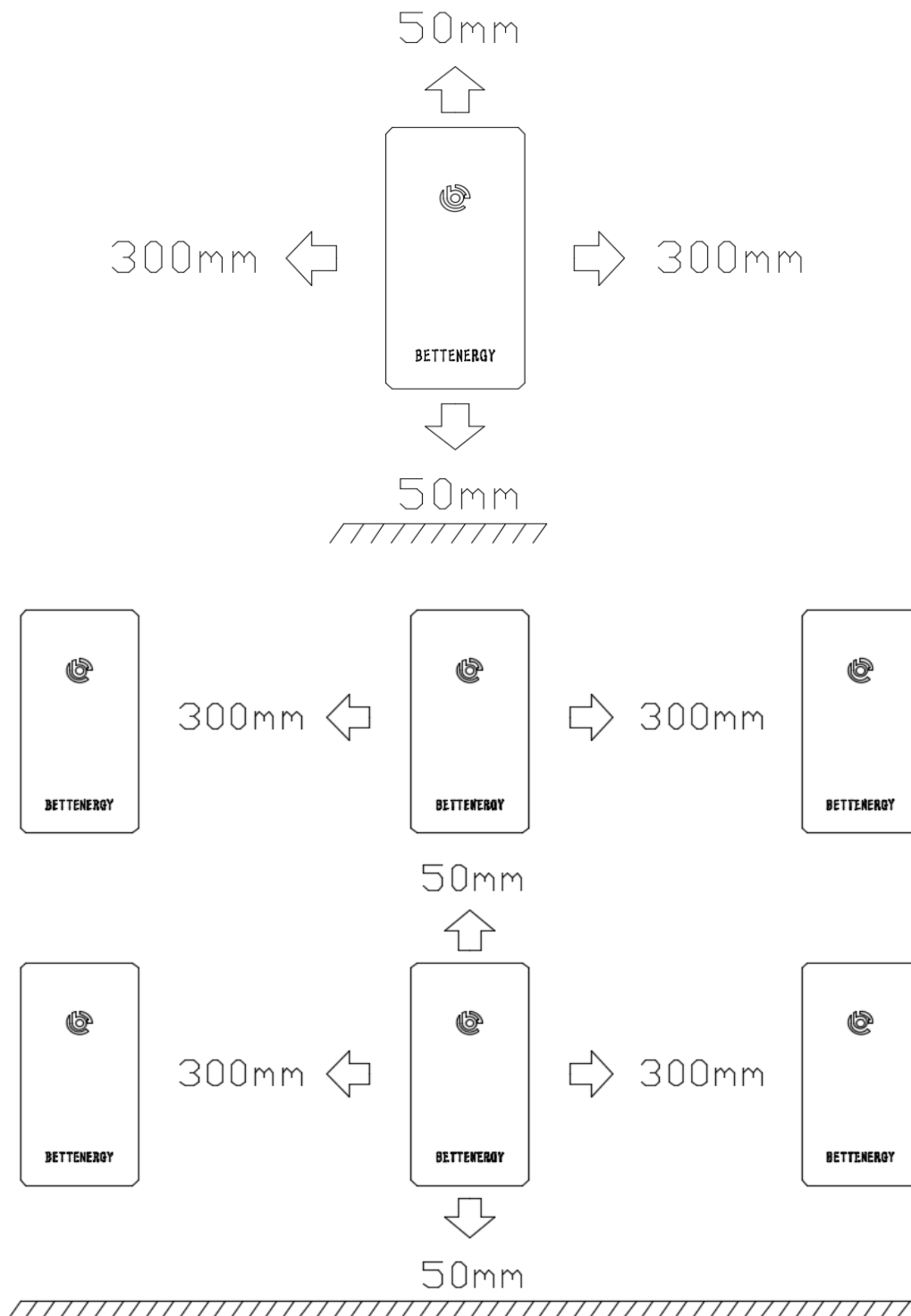


6.4 Installation Instructions

6.4.1 Overall Dimensions

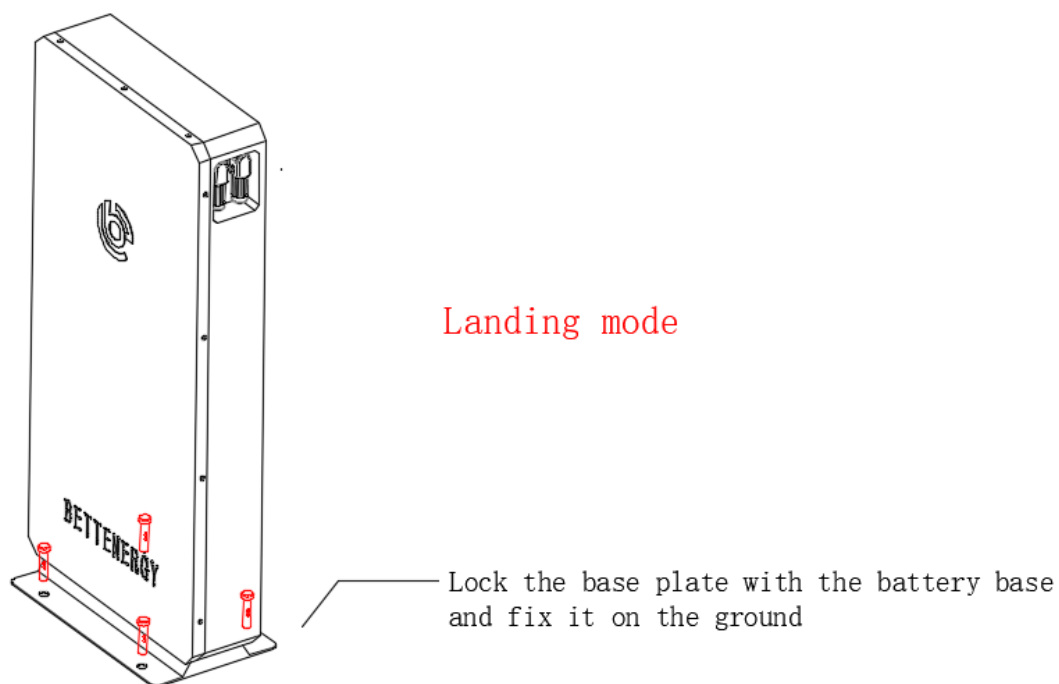
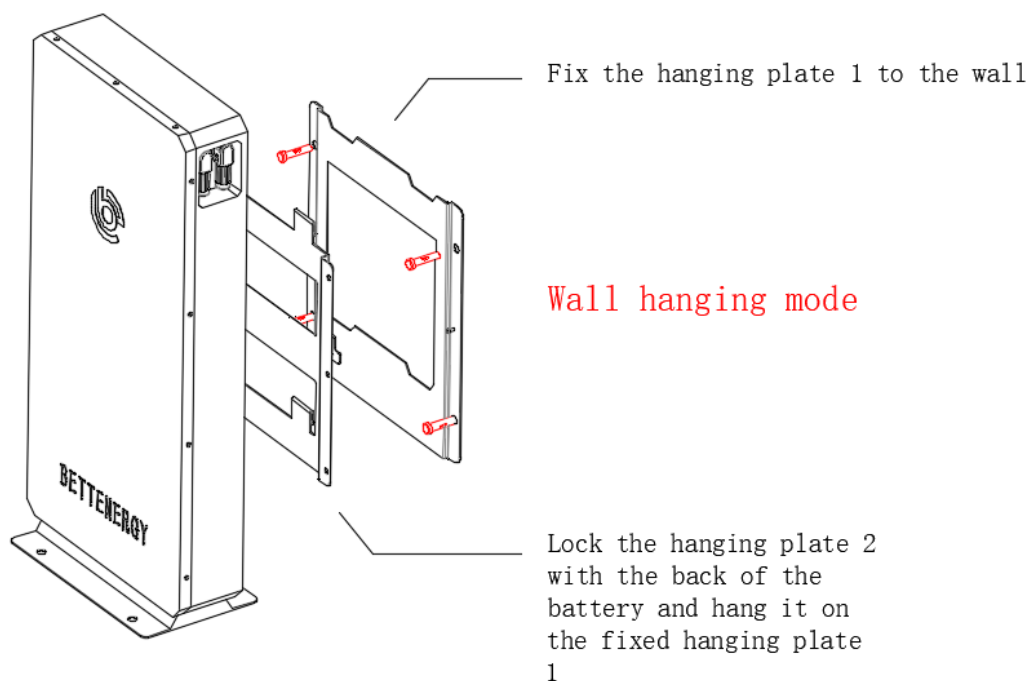


Minimum Installation distance between the battery pack and equipment:

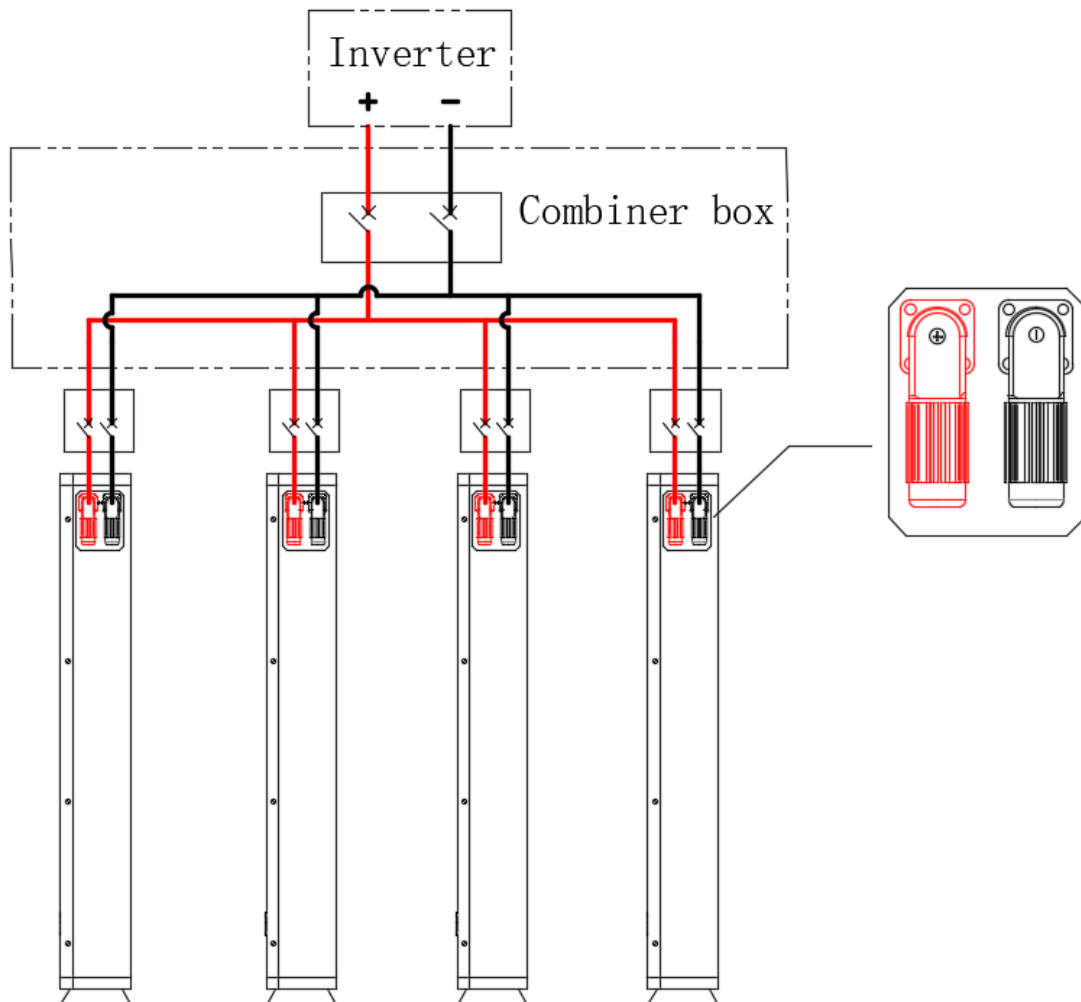


6.5 Connection of all wires

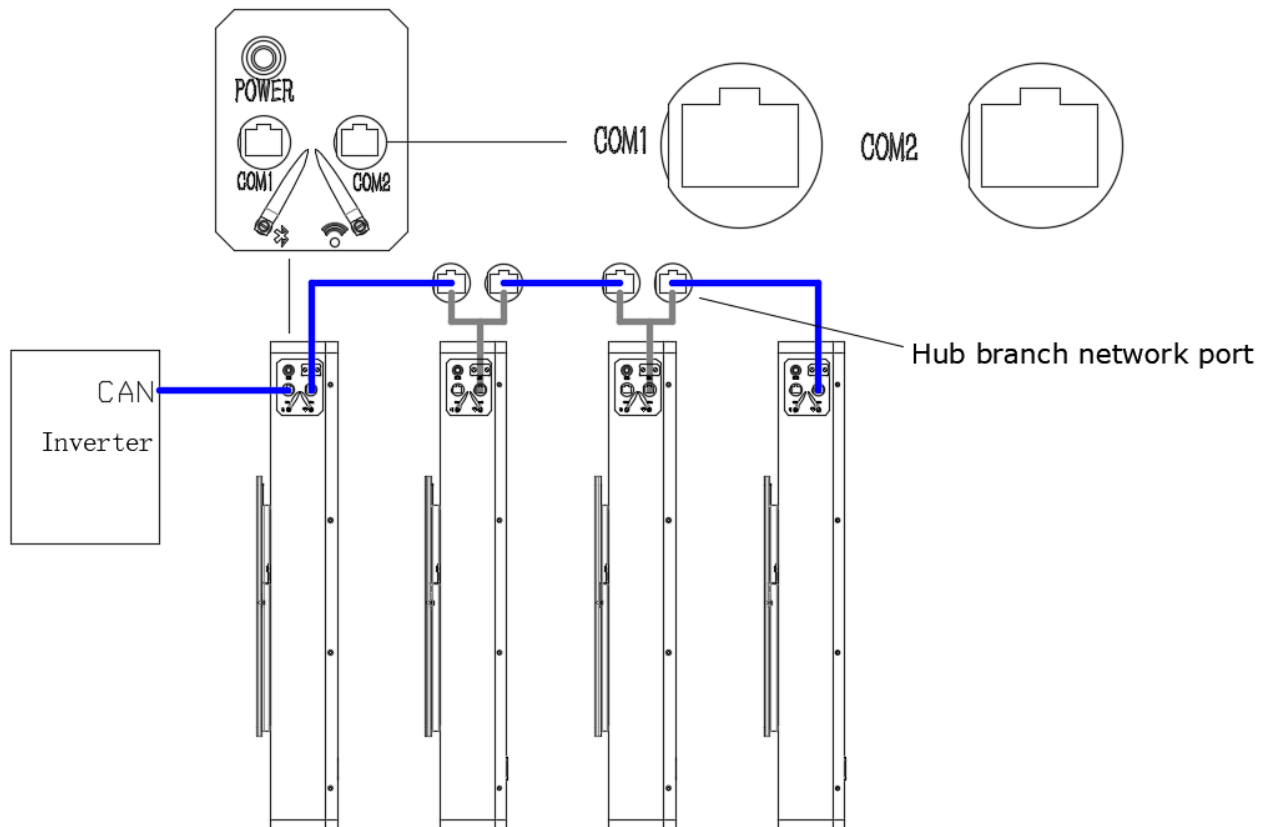
Step 1: fix the battery



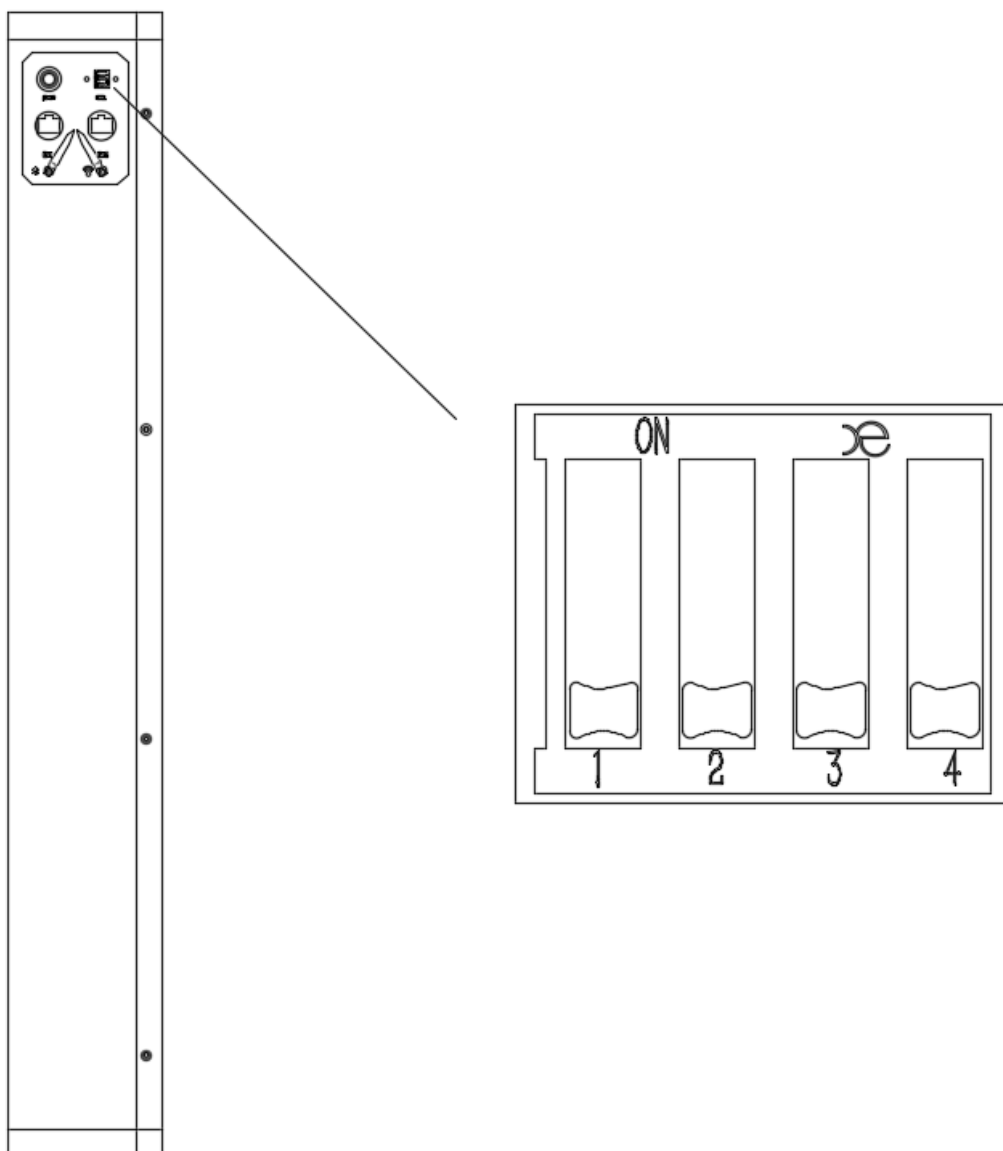
Step 2: connect the power cord



Step 3: connect the internal communication line



Step 4: set BMS communication address



Please refer to 5.2.3: the dialing rule is to set the battery module address in sequence (from far to near: refers to the battery closer to the inverter)

7 Cleaning and maintenance

7.1 Cleaning work

Please note: please turn off the power supply of the system before cleaning. It is recommended to clean LDHEB regularly. If the shell is dirty, please use a soft and dry brush or dust collector to remove the dust. Do not use solvents, or corrosive liquids to clean the enclosure.

7.2 Maintenance

7.2.1 Recharging requirements during normal storage

The battery shall be stored in an environment with a temperature range of -10°C ~ $+45^{\circ}\text{C}$ and shall be maintained regularly according to the following table to 0.5C current is charged until 40%SOC after long storage.

Charging conditions during storage

Store the Ambient temperature	Relative humidity of the storage environment	Storage time	SOC
Below- 10°C		Prohibit	/
$-10\sim 25^{\circ}\text{C}$	5%~70%	\leq , deadline: 12	$30\%\leq\text{soc}\leq 60\%$
$25\sim 35^{\circ}\text{C}$	5%~70%	\leq , deadline for 6 months	$30\%\leq\text{soc}\leq 60\%$

35~45℃	5%~70%	≤ for 3 months	30%≤soc≤60%
Above 4℃ above		Prohibit	

7.2.2 Recharging requirements for excessive discharge

Charge the over-discharge (90%DOD) battery within the time of meeting the table below, otherwise the over-discharge battery module will be damaged.

Charging requirements for excessive battery discharge

Storage Environment Temperature	Storage Time	Note:
-10~25℃	≤ on Day 15	The battery Pack Disconnected to PCS
25~45℃	≤ Day 7:	
-10~45℃	<for 12 hours	Battery pack Connect to the inverter

8 Common Issues and Solutions

8.1 Common Issues and solutions

The user can monitor the operating status, warning, and alarm information through the inverter LCD display.

- 1 .The battery cannot be turned on, and the LED indicator lights all turn off the battery depth discharge and requires charging first. If the external charger supply voltage is 51V or above and the battery still cannot be opened, contact us.

2. The battery can be turned on but not charged or discharge If a red light indicates a system abnormality, check the following values:

- 1) Temperature: Above 55°C or below -10°C, the battery protection turns on.

Solution: Move the battery to Normal operating temperature range between -10 °C to 55 °C.

- 2) Temperature: above 55 °C or below -10°C, the battery cannot discharge.

Solution: Move the battery to Normal operating temperature range between -10 °C to 55 °C.

- 3) Current: if the current of LDHEB-4400 is greater than 60A /, if the current of

LDHEB-6100 is greater than 80A, the battery protection device will open. Solution: if the working current is too large, please change the setting on the power side.

4) High voltage: if the battery voltage is higher than 57.6v or above, the battery charging protection will be turned on. Solution: if the battery is fully charged, please discharge it for a period of time. If the charging voltage is too high, please change the setting on the power side.

5) Low voltage: when the battery is discharged to 49v or lower, the battery discharge protection will be turned on. Solution: charge the battery until the red light goes out. In addition to the above five points, if you still can't find the fault, please turn off the battery and contact us.

3. In multiple battery parallel systems, the SOC LED are different.

1) When the first installation, please charge in full first to balance the capacity gap;

2) If the minimum SOC LED indicator is less than 1 of the maximum SOCLED indicator, in operation and the SOC LED indicator is restored within 10 minutes, normal operation;

3) Before expanding the battery capacity, charge the online battery to 45%-50%SOC;

After expanding the capacity, charge the battery system to balance the capacity gap.

Ensure that the capacity difference before the parallel does not exceed 10%. If the capacity gap is large, it will take about two cycles to balance the capacity gap. The actual balance time depends on the capacity difference and the charge and discharge current. Excluding the above three points, if the SOC display still fails, contact us.

8.2 Emergency

Please cut off the power supply and turn off the battery in case of emergency

1. If the battery pack is damp or immersed in water, do not get close to the battery, and then contact a light Science Company or an authorized dealer for technical support.
2. Do not use water to fire when a fire Only dry powder extinguishers; place the battery pack in a safe area if possible.
3. Battery leaking the electrolyte If the battery pack leaks the electrolyte, avoid contact with the leaking liquid or gas.If someone is exposed to the leaking material, do the follpwing immediately.

Inhalation: evacuate the contaminated areas and seek medical treatment.

Contact: Rinse eyes with running water for 15 minutes and seek medical treatment

Contact skin: Wash the infected site with soap and water and seek medical treatment.


Swallow in: urge vomiting, and seek medical treatment.


Battery damage: Damaged battery is dangerous and must be treated with very carefully. Battery cannot be used or may be dangerous to person or property. If the battery pack is damaged, contact SEEKENER for handling.

Handling of the battery system

- (1) The system treatment must comply with the locally applicable disposal regulations of electronic waste and second-hand batteries
- (2) Do not treat the battery system along with household waste.
- (3) Avoid exposing the battery to high heat or direct sunlight.
- (4) Avoid exposing the battery to high humidity or corrosive environments.
- (5) Do not expose the battery to a combustible gas or liquid.



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BETTENERGY

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