

User Manual

Product Name : Telecom Battery Box

Product Model : ZN-P48100ESA1

Date : 30/08/2021

Approve	Review	Proofread	Compile

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1. Packaging Transportation and Storage

1.1. Items in the Box

The packaging diagram and delivery list of the entire battery pack are shown in Figure 1 and Table 1 respectively.

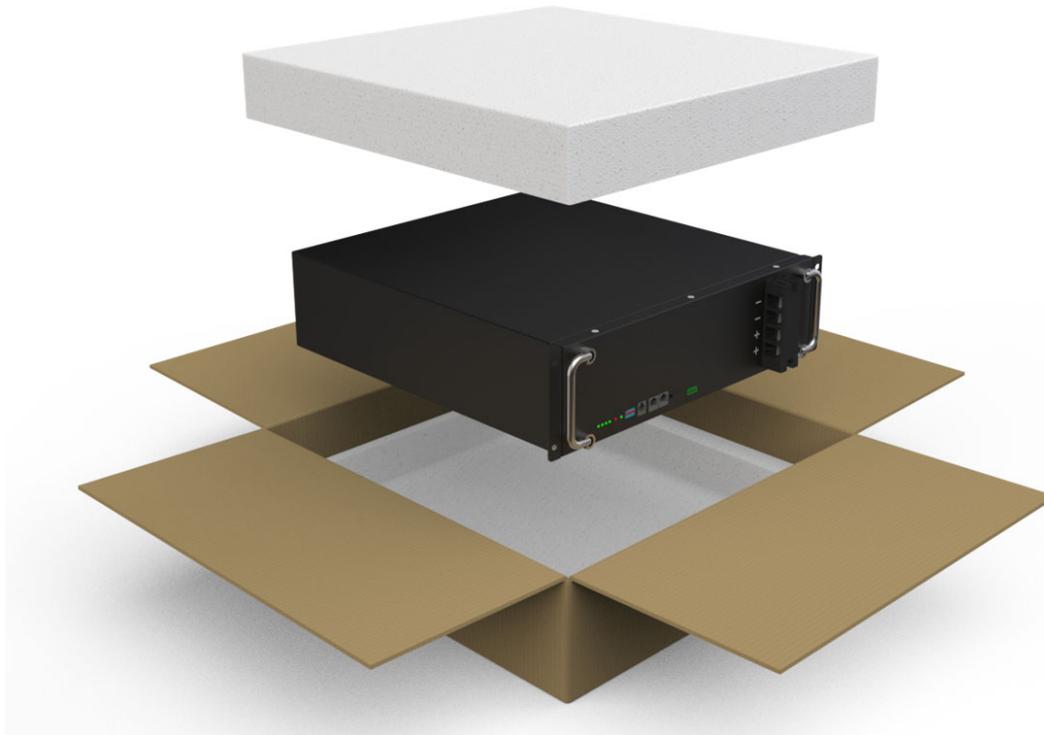


Figure 1. product packaging diagram

Table1.packing list

S.N.	Name	Legend	Specifications	Amount	Standard/Optional
1	Battery box		ZN-P48100ESA1	1	Standard
2	Positive power cable		0.3m,25mm ² , red	1	Optional
3	Negative power cable		0.3m,25mm ² , black	1	Optional
4	Communication network cable		0.35m, blue	1	Optional
5	User manual	/	/	1	Standard

1.2. Transport Requirement

During transportation, the battery packing box must be placed properly and avoid strong vibration, impact and heavy pressure.

1.3. Storage Requirements

Products should be stored in a place free from rain, humidity and sun. During storage, the power of the product shall not be less than 60%.

2. Product Description

2.1. Notes

This product is made of lithium iron phosphate battery, which has the characteristics of good safety, long life, low internal resistance, and high charge and discharge efficiency.

2.1.1. Identification Definition

Table 2. identification definition

	Danger of electric shock
	Ignoring safety warnings or improper operation may result in minor injury or slight or moderate damage to equipment or property
	Do not short-circuit
	Do not disconnect or disassemble by non-professionals
	Do not place near flammable materials
	Do not place the battery near fire
	Please read the product manual before installation and use
	Keep out of reach of children, animals or insects
	Recyclable
	Do not dispose of this product with domestic waste

2.1.2. Operational Safety

For safety reasons, it is the installer's responsibility to be familiar with the contents of this document and all warnings before performing the installation.

- (1) When operating and maintaining this product, please follow the operation regulations of high voltage DC power supply, and take good personal protection measures;
- (2) Keep away from children;
- (3) Avoid touching exposed metal parts before touching the battery;
- (4) In order to prevent the accumulation of static electricity, the maintenance personnel should release the static electricity from the human body before operating the battery;
- (5) Do not place tools or metal parts on the top of the battery;
- (6) Do not step on or sit on the battery;
- (7) Do not short circuit the positive and negative electrodes of the battery directly;
- (8) It is forbidden to change the battery without authorization;
- (9) It is forbidden to cover the battery during charging and discharging;
- (10) It is forbidden to charge or discharge the battery module directly without BMS or other charging and discharging protection measures.

2.1.3. Responding to Emergencies

(1) Electrolyte Leakage

In case of electrolyte leakage, immediately follow the following instructions;

Inhalation: evacuate the contaminated area and seek medical advice immediately;

Eye contact: Rinse eyes with running water for 15 minutes and seek medical advice immediately;

Skin contact: wash the affected area thoroughly with soap and water and seek medical advice immediately;

Ingestion: cause vomiting and seek medical advice immediately.

(2) Battery Soaking

If the battery is immersed in water, do not continue to use.

(3) Battery Damage

If the battery is damaged, please contact us directly.

2.2. Purpose

ZN-P48100ESA1 battery box can be used for communication base station power supply or home energy storage and other similar scenarios.

2.3. Appearance



Figure 2. product appearance

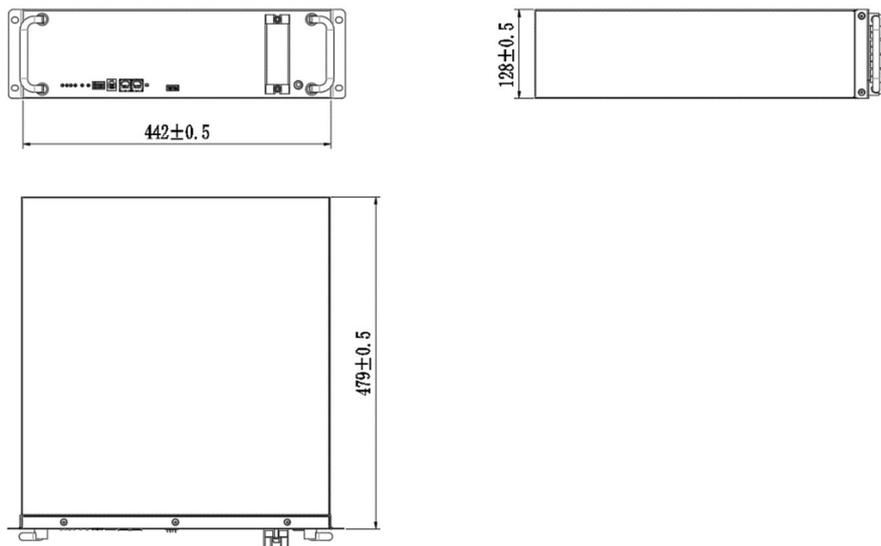


Figure 3. product size

2.4. Structure

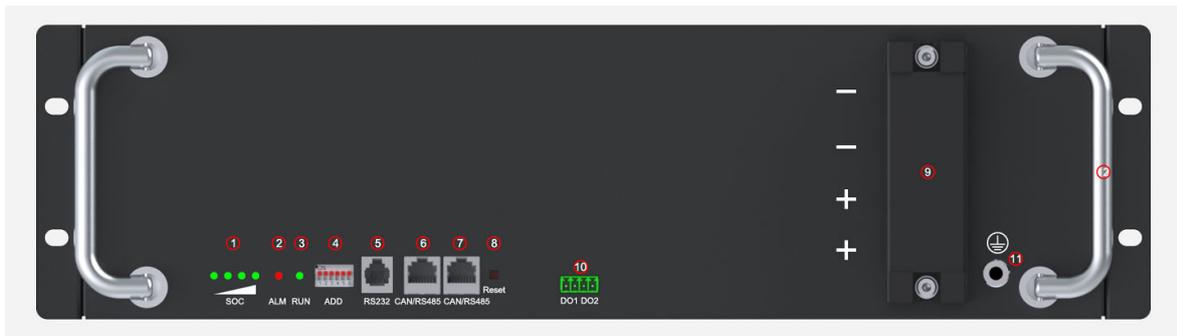


Figure 4. Product panel interface

Table 3. component table

Serial Number	Name	Label	Function Description
1	SOC indicator	/	/
2	Warning indicator	ALM	Alarm in case of battery failure
3	Operation indicator	RUN	Flashing during battery charging and discharging
4	Dial switch	ADD	Address setting for parallel connection of batteries
5	Debugging port	CONSOLE	Connect the computer
6	Communication port	CAN/RS485	CAN: Communication with inverter RS485: Battery pack cascade communication
7	Communication port	CAN/RS485	CAN: Communication with inverter RS485: Battery pack cascade communication
8	Reset switch	RST	BMS reset parameters
9	Positive and negative terminal	+/-	Battery positive and negative output
10	Dry contact	DO1/DO2	For installation of grounding wire
11	Grounding hole	/	Output two control signals
12	Handle	/	Easy to handle battery box

2.5. Electric

See the figure below for the electrical schematic diagram of battery box.

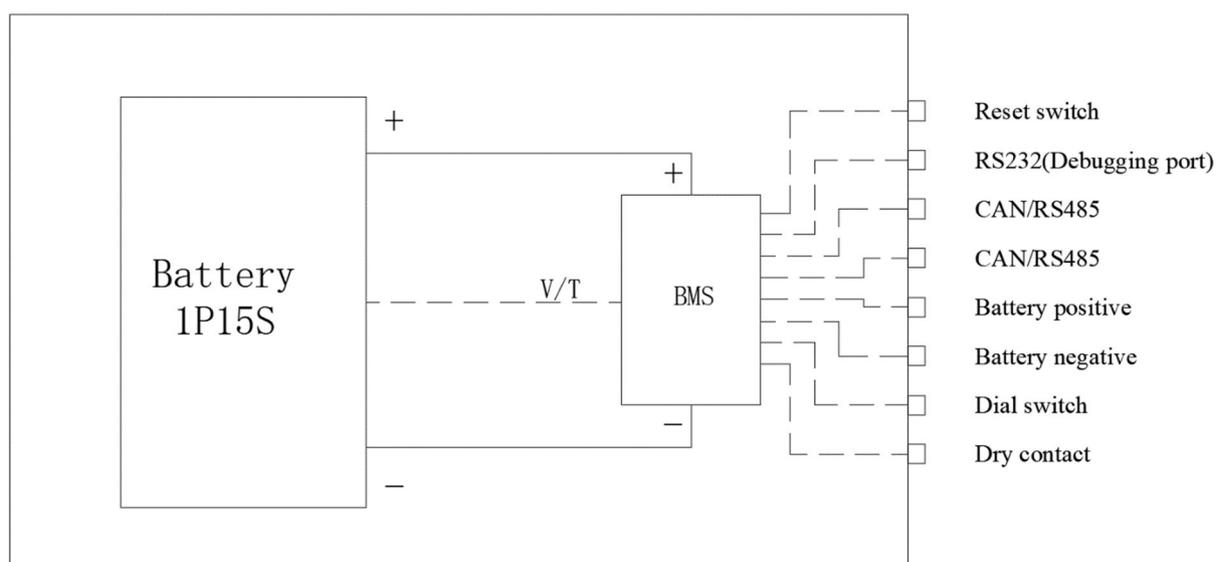


Figure 5. electrical schematic diagram of the product

Please refer to the table below for the electrical performance parameters of residential battery box:

Table 4. product electrical parameters

S.N.	Key items	Specifications
1	Type of battery	LFP
2	Cell Connection	1P15S
3	Rated voltage	48V (25°C±2°C)
4	Rated energy	4.8kWh
5	Standard charging current	50A
6	Maximum continuous charging current	100A
7	Standard discharge current	50A
8	Maximum continuous discharging current	100A
9	Battery self-discharge rate	≤3%/month (25°C, 50%SOC)
10	Cycle life	≥6,000times (0.5C/0.5C, 80%DOD)
11	Maximum Number of Parallel-connected Battery	32
12	Protection & Alarm	Protection or alarm against over over-temperature, over over-current, over over-charge, over over-discharge, short circuit, etc.
13	Network Port	CAN/RS485/2 dry contacts
14	Factory SOC state	30~40%
15	Cooling	Natural Cooling
16	Withstand voltage level	1500V DC
17	Insulation resistance	>100MΩ
18	Ingress protection	IP20
19	Altitude	<2000m
20	Range of working temperature	Charge: 0°C~55°C/ Discharge: -20°C~55°C
21	Storage temperature	-10°C~30°C
22	Relative humidity	5%~95%, RH
23	Weight	About 40kg
24	Dimensions (W*D*H)	442mm* 479mm* 128mm
25	Installation location	Indoor

2.6. Communication Function

- RS232 Communication port

RS232 interface communicate with PC or other intelligent terminals.

PIN	Signal
-----	--------

3	BMS TX
4	BMS RX
5	RS232_GND
1,2,6	NC

- RS485 Communication port

The BMS shall be equipped with RS485 communication interface to communicate with FSU. FSU and BMS communication mode is master-slave. FSU is the master and each BMS is the slave. BMS address 1, 2, 3 ...

The BMS provides two RJ45 communications ports. The two interfaces are physically one serial port, which are connected in BMS board. Each BMS is connected by 8-core direct connection network cable conforming to T568b standard.

PIN	Signal
1,3,6	RS485A
2,7	RS485B
8	GND

- RS485 Communication port

CAN interface communicate with Inverter. Upload battery status and fault information, accept inverter commands.

PIN	Signal
4	CAN-H
5	CAN-L
8	GND

3. Installation

3.1. Tools and Safety Protection Appliance

The following tools are required to install this product.



Wrench



Electric screw driver



Insulated gloves



Goggles



Safety shoes

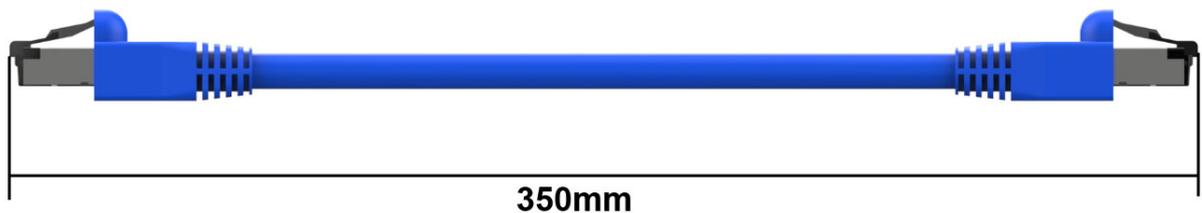
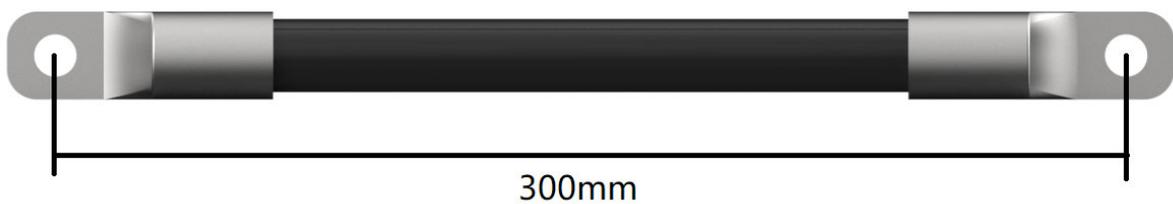
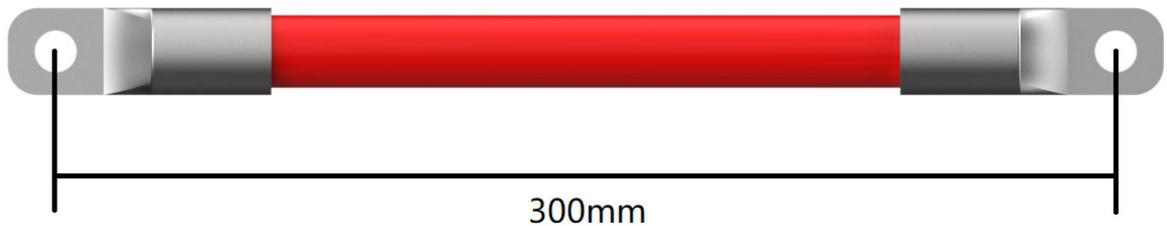
When installing, moving and placing batteries, always follow the instructions in the manual, otherwise there may be safety hazards.

3.2. Package items

Unpacking and check the Packing List

1) For battery module package:

Two power cables and one communication cable for each battery package:



Grounding cable:

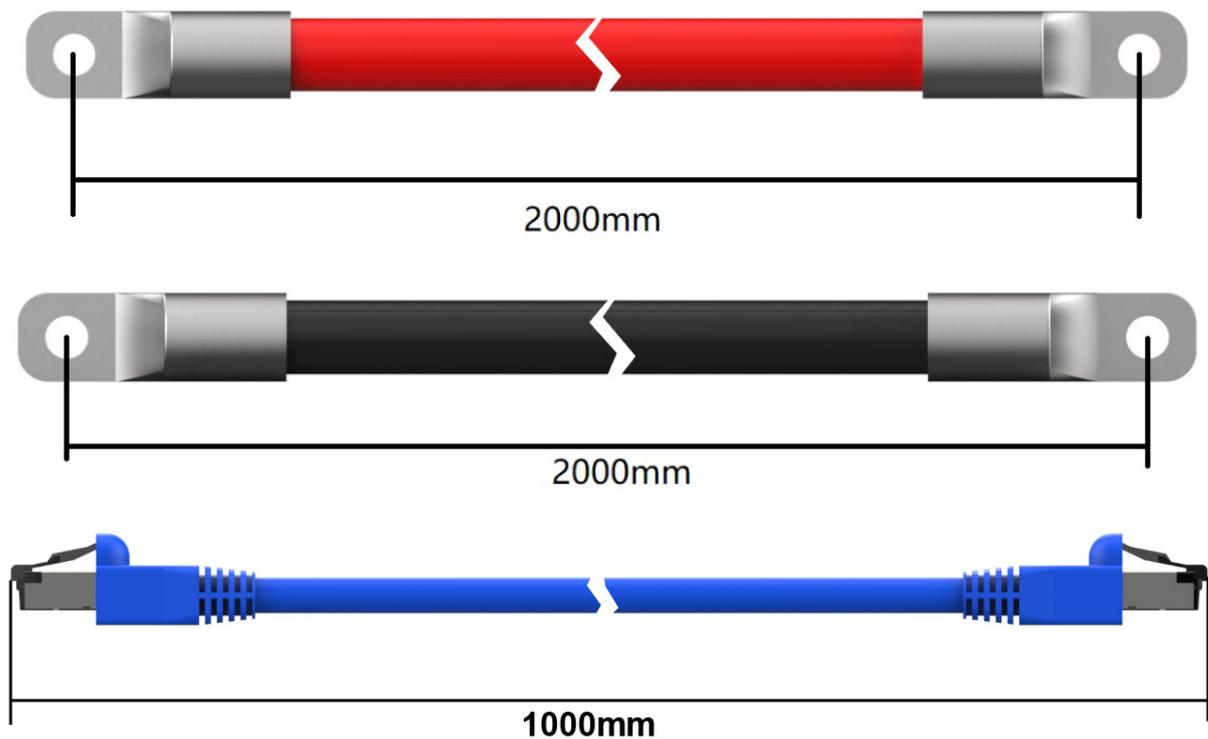


2) For battery system connects to inverters:

Two long power cables (current capacity 120A, **constant 100A**) and one communication cable for each energy storage system:

NOTE

These three cables are belonging to External Cable Kit, **NOT** in battery package. They are in another extra small cable box. If there is anything missed please contact dealer. (**Additional charge**)



3.3. Installation location

Make sure that the installation location meets the following conditions:

- 1) The area is completely waterproof
- 2) The floor is flat and level.
- 3) There are no flammable or explosive materials.
- 4) The ambient temperature is within the range from 0°C to 50°C.
- 5) The temperature and humidity are maintained at a constant level.
- 6) There is minimal dust and dirt in the area.
- 7) The distance from heat source is more than 2 meters.
- 8) The distance from air outlet of inverter is more than 0.5 meters.
- 9) The installation areas shall avoid of direct sunlight.
- 10) There is no mandatory ventilation requirements for battery module, but please avoid of installation in confined area. The aeration shall avoid of high salinity, humidity or temperature.

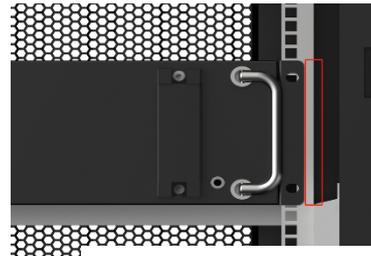
Caution

If the ambient temperature is outside the operating range, the battery pack stops operating to protect itself. The optimal temperature range for the battery pack to operate is 0°C to 50°C. Frequent exposure to harsh temperatures may deteriorate the performance and life of the battery pack.

3.4. Grounding

Grounding cables shall be 10AWG or higher yellow-green cables. After connection, the resistance from battery grounding point to Ground connection point of room or installed place shall smaller than 0.1Ω.

1) based on metal directly touch between the module's surface and rack's surface. If using painted rack the corresponding place shall remove the painting.



2) install a grounding cable to the grounding point of the modules.

Warning

Grounding is necessary.

**3.5. Structure installation**

ZN-P48100ESA1 telecom battery box supports horizontal stacking, as shown in Figure.

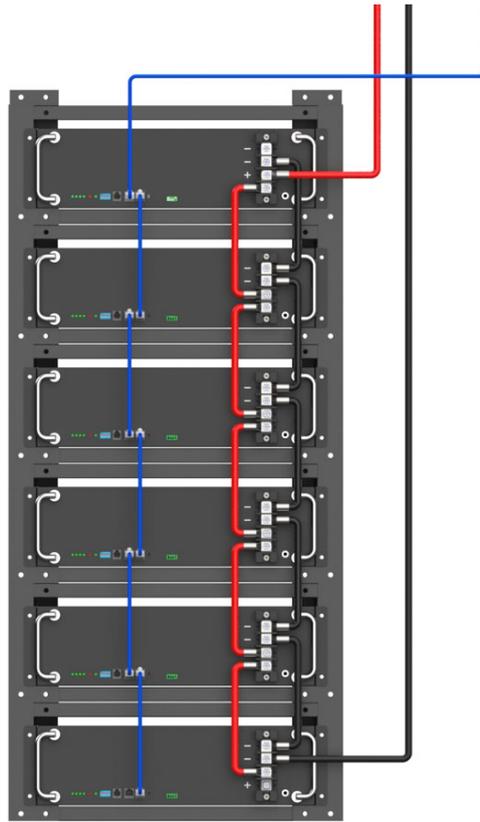
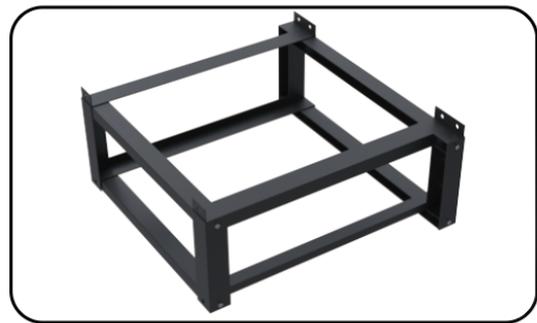


Figure 6. horizontal stacking installation diagram



Step1: Set the main supporter, connect and fix the front connecting bracket with screws from the side.



Step2: Connect and fix the rear connection bracket with screws from the side.



Step3: Align the gap between the brackets to stack.



Step4: Fix the bracket with bolts.



Step5:Fix the bracket with bolts.



Step6:Put the battery into the holder.



Step7:Bolt the battery.



Step8:Finish

Figure 7. installation & fix method

When installing, fix the mounting ears on both sides of the front panel of the battery box to the bracket or other box with M6 screws.

3.6. Electrical installation

The ZN-P48100ESA1 telecom battery box can be used alone, or multiple systems can be used in parallel, up to 31 in parallel. When connecting in parallel, the positive poles of the power line are connected in sequence, and the negative poles are connected in sequence. The communication line is connected from the "CAN/RS485" of the first battery to the "CAN/RS485" of the second battery, and the "CAN/RS485" of the second battery is connected to the "CAN/RS485" of the third battery, and so on, can connect up to 31 batteries. The DIP switch on the panel needs to set up DIP configuration address.

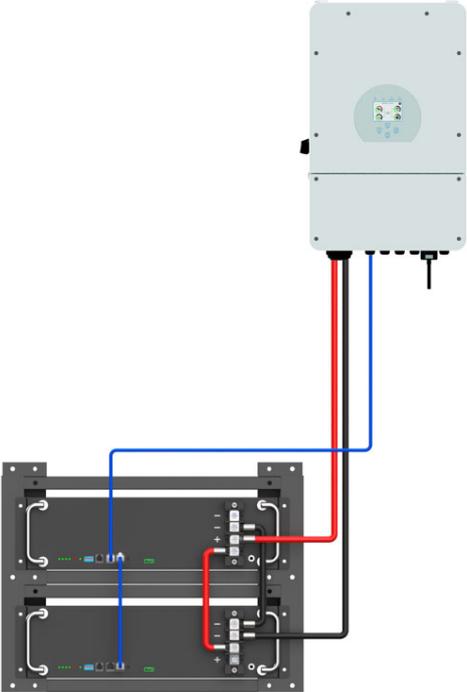


Figure 8. 2 batteries electrical installation diagram

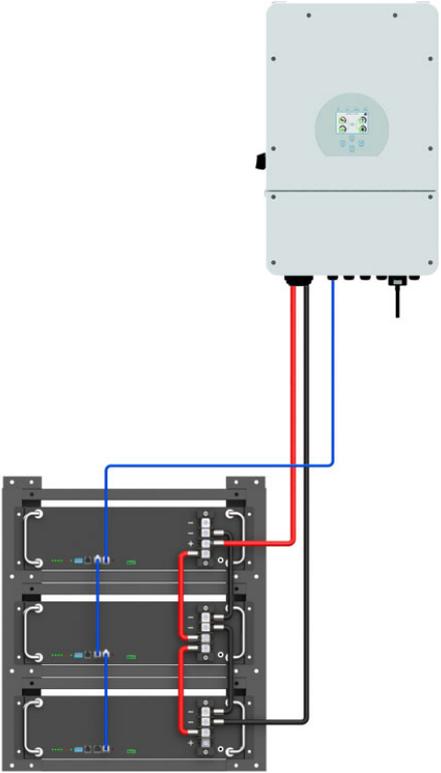


Figure 9. 3 batteries electrical installation diagram

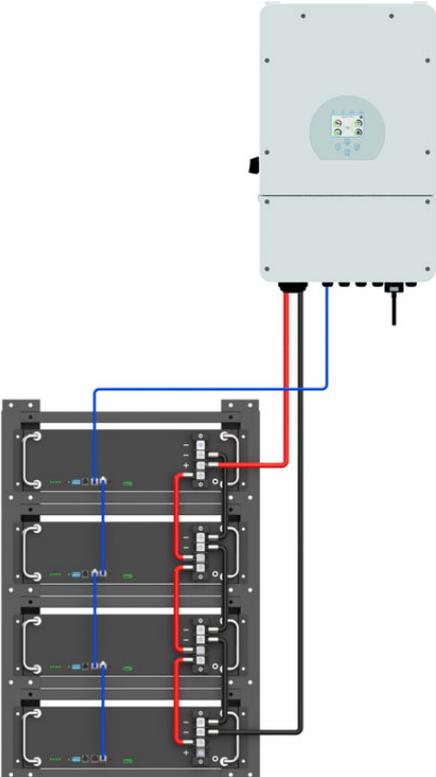


Figure 10. 4 batteries electrical installation diagram

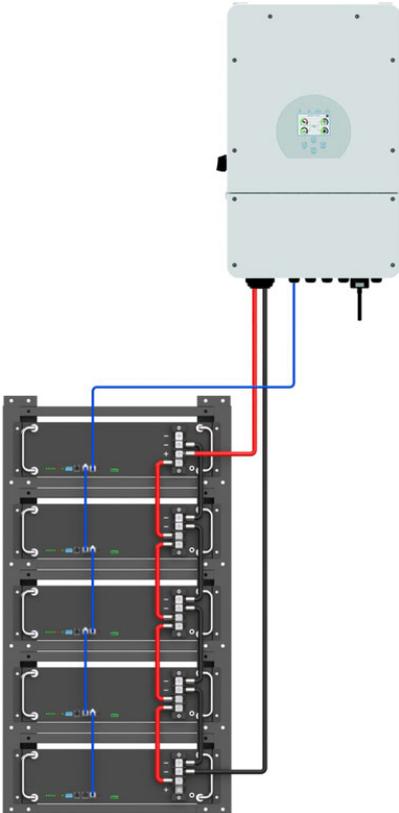


Figure 11. 5 batteries electrical installation diagram

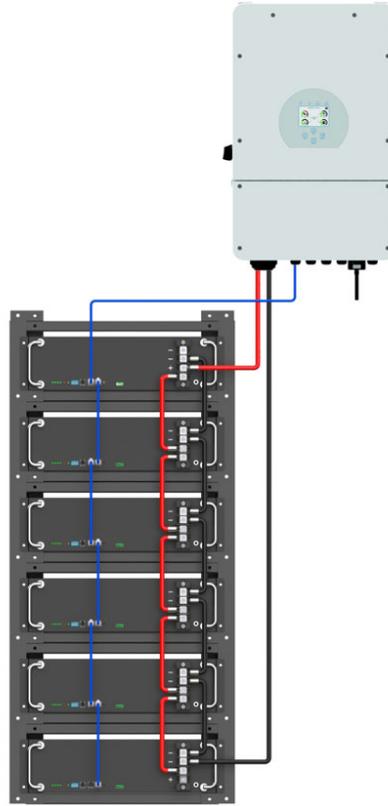


Figure 12. 6 batteries electrical installation diagram

The setting method of the DIP switch is as follows:

No.	Dial switch position					Explain
	1#	2#	3#	4#	5#	
1	ON	OFF	OFF	OFF	OFF	31 sets in parallel (The dial switch has 6 bits in total, and bits 1 to 5 are address bits. The sixth bit is the matching resistance. When used in parallel, the first battery pack and the last battery pack need to dial the sixth bit up, and the sixth bit of the other battery boxes does not need to be dialed.)
2	OFF	ON	OFF	OFF	OFF	
3	ON	ON	OFF	OFF	OFF	
4	OFF	OFF	ON	OFF	OFF	
5	ON	OFF	ON	OFF	OFF	
6	OFF	ON	ON	OFF	OFF	
7	ON	ON	ON	OFF	OFF	
8	OFF	OFF	OFF	ON	OFF	
9	ON	OFF	OFF	ON	OFF	
10	OFF	ON	OFF	ON	OFF	
11	ON	ON	OFF	ON	OFF	
12	OFF	OFF	ON	ON	OFF	

13	ON	OFF	ON	ON	OFF
14	OFF	ON	ON	ON	OFF
15	ON	ON	ON	ON	OFF
16	OFF	OFF	OFF	OFF	ON
17	ON	OFF	OFF	OFF	ON
18	OFF	ON	OFF	OFF	ON
19	ON	ON	OFF	OFF	ON
20	OFF	OFF	ON	OFF	ON
21	ON	OFF	ON	OFF	ON
22	OFF	ON	ON	OFF	ON
23	ON	ON	ON	OFF	ON
24	OFF	OFF	OFF	ON	ON
25	ON	OFF	OFF	ON	ON
26	OFF	ON	OFF	ON	ON
27	ON	OFF	OFF	OFF	ON
28	OFF	OFF	ON	ON	ON
29	ON	OFF	ON	ON	ON
30	OFF	ON	ON	ON	ON
31	ON	ON	ON	ON	ON

The default address 1 is the host. Please set the battery dial switch connected to the load or inverter to 1, and set the other batteries in sequence.

4. Operating

4.1. Power on

Before powering on, make sure that the communication and positive and negative cables are correctly connected, and there are no foreign objects around the battery.

Boot steps:

- Press and hold the system reset switch for 3 seconds, and all indicators on the panel flash once, indicating that the power on is successful.;

4.2. Shutdown

Before disconnecting the cable from the battery, make sure the battery is turned off.

Shutdown steps:

- Press and hold the system reset switch for 3 seconds, and all indicators on the panel flash once and turn off, indicating that the shutdown is successful.;

5. Maintenance

- Battery maintenance must be performed by qualified authorized personnel;

- If the battery has been stored continuously for more than three months, it must be fully charged once;
- Every three months, check whether the connections of battery communication and power cables are loose.

6. Troubleshooting

Table 5. common problems

S.N.	Key items	Specifications
1	Communication failure	Check whether the communication line is loose, and check whether the BMS communication protocol matches the load or inverter.
2	Unable to boot	Use a charging device to charge the battery. If it still cannot be turned on, please contact for maintenance.

7. Interpretation of Abbreviated Words

FPC	Flexible printed circuit
BMS	Battery management system
BMU	Battery management unit
BOL	Begin of life
Bus-bar	Connection bar between cell poles
CAN	Controller area network
EOL	End of life
HV	High voltage
LV	Low voltage
OCV	Open circuit voltage
SOC	State of charge

8. Product Warranty

If you have purchased this product from our factory, you should be aware that this warranty is provided in addition to other rights and remedies held by a consumer at law.

You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

For the above mentioned products, you receive our factory warranty valid for 10 years from the date of delivery from factory. Factory warranty covers any costs for repair or spare parts during the agreed period beginning on the date of delivery of the device, subject to the following conditions.

Factory Warranty Scope

The factory warranty does not cover damages caused by following reasons:

- Breaking the product seal (opening the casing)
- Transport damage
- Incorrect installation or commissioning
- Failure to observe the user manual, quick installation instructions
- Incorrect usage or inappropriate operation
- Insufficient ventilation of the device
- Failure to observe the applicable safety regulations
- Force majeure

Neither does it cover cosmetic defects which do not influence the energy production.

Warranty conditions

If the battery becomes defective during the agreed factory warranty period and, unless this should be impossible or disproportionate, one of the following options will be selected at the discretion of factory:

- Battery repair or
- Battery repair at on-site, or
- Exchange for a replacement device of equivalent value with regard to model and age.

In the latter case, the remainder of the warranty entitlement will be transferred to the replacement device and your entitlement will be documented at factory.

Excessiveness in the meaning above exists in particular if the cost the measures for factor will be unreasonable.

- In view of the value that the device would have without the defect
- Taking in account of the significance of the defect, and
- After consideration of alternative work around possibilities at factory customers could revert to without significant inconvenience.

Please fill the required information in and send this page to factory when you need to apply warranty service support

Warranty Card

User Information

Company / User Name:

Address:

Telephone:

Email:

Project installation location:

Product Information

Battery Model:

Serial No :

Invoice Number :

Purchase Date :

Dealer :

Commission date :

Fault/Error Description: