



POWERCUBE

User Manual

Content

Statement of Law	1
Safety Precautions	2
Preface.....	3
1 Introduction	4
1.1 Brief Introduction	4
1.2 Product Properties.....	4
1.3 Product identity definition.....	4
2 Product Specification	6
2.1 Size and Weight	6
2.2 Performance Parameter	6
2.3 Interface Definition	6
2.3.1 DIP switch definition and description	8
2.4 Battery Management System(BMS)	11
2.4.1 Voltage Protection	11
2.4.2 Current Protection	11
2.4.3 Temperature Protection	11
2.4.4 Other Protection	11
3 Installation and Configuration	12
3.1 Ready for installation	12
3.1.1 Environmental requirements	12
3.1.2 Tools and data	12
3.1.3 Technical preparation	13
3.1.4 Unpacking inspection	13
3.1.5 Engineering coordination	15
3.2 Equipment installation.....	15
3.2.1 Installation preparation	15
3.2.2 Mechanical installation	16
3.2.3 Electrical installation	19
4 Use, maintenance and troubleshooting	25
4.1 Battery system usage and operation instructions	25
4.2 Alarm description and processing.....	26
4.3 Analysis and treatment of common faults.....	26

Statement of Law

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This product complies with the design requirements of environmental protection and personal safety. The storage, use and disposal of the products shall be carried out in accordance with the product manual, relevant contract or relevant laws and regulations.

Customer can check the related information on the website of Jiangsu Daqin New Energy Technology Co., Ltd when the product or technology is updated.

Web URL: <http://www.dyness.net/>

Please note that the product can be modified without prior notice.

Revision History

Revision NO.	Revision Date	Revision Reason
1.0	2019.04.22	First Published
1.1	2019.10.24	Add new product model

Safety Precautions



Warning

- Please do not put the battery into water or fire, in case of explosion or any other situation that might endanger your life.
- Please connect wires properly while installation, do not reverse connect.
- To avoid short circuit, please do not connect positive and negative poles with conductor (Wires for instance).
- Please do not stab, hit, trample or strike the battery in any other way.
- Please shut off the power completely when removing the device or reconnecting wires during the daily use or it could cause the danger of electric shock.
- Please use dry powder extinguisher to put out the flame when encountering a fire hazard, liquid extinguisher could result in the risk of secondary disaster.
- For your safety, please do not arbitrarily dismantle any component in any circumstances unless a specialist or an authorized one from our company, device breakdown due to improper operation will not be covered under warranty.



Caution

- We have strict inspection to ensure the quality when products are shipped out, however, please contact us if case bulging or another abnormal phenomenon.
- For your safety, device shall be ground connected properly before normal use.
- To assure the proper use please make sure parameters among the relevant device are compatible.
- **Please do not mixed-use batteries from different manufacturers, different types and models, as well as old and new together.**
- Ambient and storage method could impact the life span and product reliability, please consider the operation environment abundantly to make sure device works in proper condition.
- For long-term storage, the battery should be recharged once every 6 months, and the amount of electric charge shall exceed 80% of the rated capacity.
- Please charge the battery in 18 hours after it discharges fully and starts over-discharging protection.
Formula of theoretical standby time: $T=C/I$ (T is standby time, C is battery capacity, I is total current of all loads).
- The product is affixed with a torn invalid label before leaving the factory. If anyone need to open the cover to operate, such as set DIP mode, expand the capacity or other operations that won't harm the product, customer needs to contact DYNESS and inform the product ID. DYNESS will record the case, confirm the operation can be operated and will authorize. After the authorization, only professionals are allowed to operate. Contact the DYNESS authorized

distributor or agent to get a new torn invalid label. After the operation, re-attach the new torn invalid label at different locations.

Preface

Manual declaration

Powercube series energy storage system is composed of several B4850 or B4874 energy storage system units connected in parallel to provide users with energy storage power generation.

During the day, the excess power of photovoltaic power generation can be stored in the battery. At night or when needed, the stored electrical energy can be used to supply power to the electrical equipment, which can improve the efficiency of photovoltaic power generation, peak load shifting, and emergency power backup.

This user manual describes 4Box, 5Box, 6Box and 7Box in the Powercube series. It details the basic structure, parameters, installation, and operation and maintenance of the equipment.

1 Introduction

1.1 Brief Introduction

The B4850 and B3 lithium iron phosphate battery systems are standard battery system units. Each module can be connected in parallel to obtain a complete system of certain specifications. Customer can select the appropriate Powercube specifications according to their needs. The product is especially suitable for energy storage applications with high operating temperatures, limited installation space, long power backup time and long service life.

1.2 Product Properties

Powercube series energy storage product's anode materials are lithium iron phosphate, battery cells are managed effectively by BMS with better performance, the system feature as below:

- Comply with European ROHS, Certified SGS, employ non-toxic, non-pollution environment-friendly battery.
- Anode materials are lithium iron phosphate (LiFePO₄), safer with longer life span.
- Carries battery management system with better performance, possesses protection function like over-discharge, over-charge, over-current, abnormal temperature.
- Self-management on charging and discharging, Single core balancing function.
- Intelligent design configures integrated inspection module, with 3 remote functions (remote-measuring, remote-communicating and remote-controlling).
- Flexible configurations allow parallel of multi battery for longer standby time.
- Self-ventilation with lower system noise.
- Less battery self-discharge, then recharging period can be up to 10 months during the storage.
- No memory effect so that battery can be charged and discharged shallowly.
- With wide range of temperature for working environment, -20°C ~ +55 °C, circulation span and discharging performance are well under high temperature.
- Less volume, lighter weight and longer system backup time.

1.3 Product identity definition


Figure1-1 Battery Energy Storage System nameplate

DYNESS







ENERGY STORAGE SYSTEM

RECHARGEABLE LI-ION BATTERY

Type	Module Type	Nominal Energy	Nominal Voltage	Nominal Capacity
Powercube-4Box	<input type="checkbox"/> B4850	9.6KWh	48V	200Ah
	<input type="checkbox"/> B3	14.4KWh	48V	300Ah
Powercube-5Box	<input type="checkbox"/> B4850	12KWh	48V	250Ah
	<input type="checkbox"/> B3	18.0KWh	48V	375Ah
Powercube-6Box	<input type="checkbox"/> B4850	14.4KWh	48V	300Ah
	<input type="checkbox"/> B3	21.6KWh	48V	450Ah
Powercube-7Box	<input type="checkbox"/> B4850	16.8KWh	48V	350Ah
	<input type="checkbox"/> B3	25.2KWh	48V	525Ah
Powercube-8Box	<input type="checkbox"/> B4850	19.2KWh	48V	400Ah
	<input type="checkbox"/> B3	28.8KWh	48V	600Ah
Powercube-9Box	<input type="checkbox"/> B4850	21.6KWh	48V	450Ah
	<input type="checkbox"/> B3	32.4KWh	48V	675Ah



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WWW.DYNESS.NET

	Battery voltage is higher than safe voltage, direct contact with electric shock hazard.
	Be careful with your actions and be aware of the dangers.
	Read the user manual before using.
	The scrapped battery cannot be put into the garbage can and must be professionally recycled.
	After the battery life is terminated, the battery can continue to be used after it recycled by the professional recycling organization and do not discard it at will.
CE	This battery product meets European directive requirements.
 <div style="font-size: x-small; margin-left: 5px;"> Type Approved Safety Regular Production Surveillance www.tuv.com ID: 23005000000 </div>	This battery product passed the TUV certification test.

2 Product Specification

2.1 Size and Weight

Table 2-1 Powercube series Device Model

Product Series	Dimension (mm)	Module type	Nominal Voltage	Nominal Capacity	Weight	IP Level
Powercube-4BOX	492×600×862	B4850	DC48V	200Ah	≈ 151kg	IP65
		B3	DC48V	300Ah	≈ 183 kg	IP65
Powercube-5BOX	492×600×862	B4850	DC48V	250Ah	≈ 176 kg	IP65
		B3	DC48V	375Ah	≈ 218 kg	IP65
Powercube-6BOX	492×600×1000	B4850	DC48V	300Ah	≈ 201 kg	IP65
		B3	DC48V	450Ah	≈ 253 kg	IP65
Powercube-7BOX	492×600×1138	B4850	DC48V	350Ah	≈ 226kg	IP65
		B3	DC48V	525Ah	≈ 288 kg	IP65

2.2 Performance Parameter

Table 2-2 Powercube series performance parameter

Product Series	Powercube-4Box		Powercube-5Box		Powercube-6Box		Powercube-7Box	
	B4850	B3	B4850	B3	B4850	B3	B4850	B3
Nominal Voltage(V)	48	48	48	48	48	48	48	48
Work Voltage Range(V)	42~54	42~54	42~54	42~54	42~54	42~54	42~54	42~54
Nominal Capacity(Ah)	200	300	250	375	300	450	350	525
Nominal Energy(kWh)	9.6	14.4	12	18.0	14.4	21.6	16.8	25.2
Nominal Power(kW)	2.9	4.3	3.6	5.3	4.3	6.2	5.0	7.5
Max Power(kW)	9.6	9.6	12	12	14.4	14.4	16.8	16.8
1s Peak Power(kW)	10.56	10.56	13.2	13.2	15.84	15.84	18.48	18.48
1s Peak Current(A)	220	220	275	275	330	330	385	385
Charging Current(A)	100	148	125	185	150	222	175	259
Discharge Current(A)	100	148	125	185	150	222	175	259

2.3 Interface Definition

This section elaborates on interface functions of the back interface on the Powercube cabinet.

Figure2-1 The sketch of back interface of Powercube.

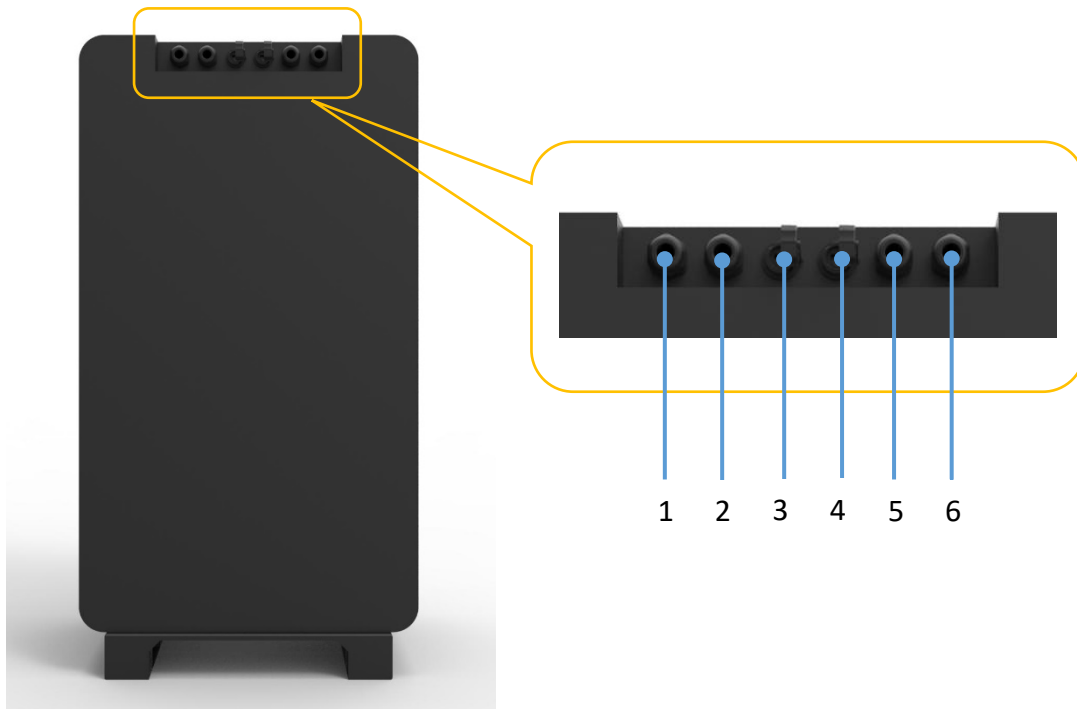


Table 2-3 Interface Definition

Item	Name	Definition
Interface 1	Power cable- negative waterproof connector	Reserve
Interface 2	Power cable- negative waterproof connector	The battery DC output negative pole
Interface 3	RJ45 network cable connector	Reserve
Interface 4	RJ45 network cable connector	CAN/RS485 communication interface (Factory default CAN communication mode)
Interface 5	Power cable- positive waterproof connector	The battery DC output positive pole
Interface 6	Power cable- positive waterproof connector	Reserve

The below section elaborates on interface functions of the front interface of the battery module. Figure2-2 The sketch of interface.

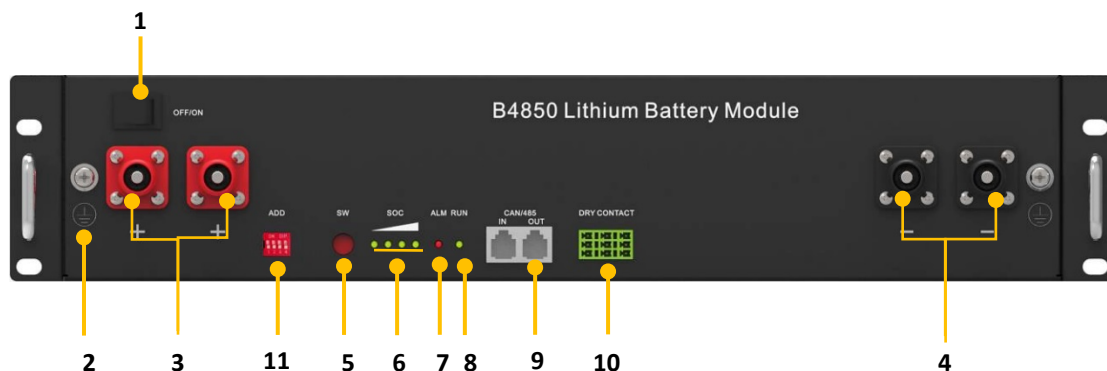


Table 2-4 Interface Definition

Item	Name	Definition
1	Power switch	OFF/ON, must be in the "ON" state when in use
2	Ground connection point	Shell ground connection
3	Positive socket	Battery output positive or parallel positive line
4	Negative socket	Battery output negative or parallel negative line
5	SW (battery wake/sleep switch)	When the "OFF/ON" switch button is in the ON state, press and hold this button for 3 seconds to put the battery into the power-on or sleep state.
6	SOC	The number of green lights on shows the remaining battery power. See Table 2-3 for details.
7	ALM	Red light flashing when an alarm occurs, red light always on during protection status. After the condition of trigger protection is released, it can be automatically closed.
8	RUN	Green light flashing during standby and charging mode. Green light always on when discharging.
9	CAN/485	Communication cascade port, support CAN/ RS485 communication (factory default CAN communication)
10	DRY CONTACT	/
11	ADD	DIP switch

2.3.1 DIP switch definition and description

Table 2-5 Interface Definition

DIP switch position (host communication protocol and baud rate selection)			
#1	#2	#3	#4
Baud rate selection			
ON		OFF	
CAN: 250K,485: 115200		CAN: 500K,485: 9600	

DIP switch description:

The battery pack is connected in parallel in the Powercube, the battery module that communication connected to the inverter is defined as the host. The host can communicate with the slave through the CAN interface. The host summarizes the information of the entire battery system and communicates with the inverter through CAN or 485. The connection mode is divided into the following two cases:

Note:

Before opening the cover to change the DIP mode, contact DYNESS to inform the ID, DYNESS will record the battery ID and authorizes the opening operation. Only authorized by Dyness to operate. Except for changing the DIP mode, any other operations cannot be done.

Figure2-3 DIP switch mode schematic diagram

1. If the host is the latest B4850 battery with DIP switch:
 (1) The communication cable that communicates with the inverter should use the correct one.
 (2) After the battery module parallel cable, cascading cable and communication cable with GDW、Solis、LUX、Sofar、DEYE、VICTRON、IMEON、Infinisolar,Sungrow,SMA,RENAC,DELIOS、SAJ(CAN Comm) inverters are connected, all B4850 batteries should not be turned on first, be sure to put the host DIP switch "# 3" to the "ON" position (to the top), then turn on all the B4850 batteries.



(3) If the battery module is in communication with the inverters of Growatt hybrid(CAN comm)、GMDE、Saj(485 comm)、

Aporet-king turn the host DIP switch "#2" to "ON" position.



(4) If the battery module is in communication with the GROWATT-SPF(off-grid) inverter by 485 communication, turn the host DIP switch "#2" and "#3" to "ON".



(5) The DIP switch of the slave does not need to be changed.

(6) If the energy storage system has only one B4850, it is the host itself, and still follow the above steps.

Note: For more information of matching inverter brands, please subject to the latest document <The list of compatibility between Dynergy ESS and Inverters >.

2. If the host is a B4850 battery module without the DIP switch:

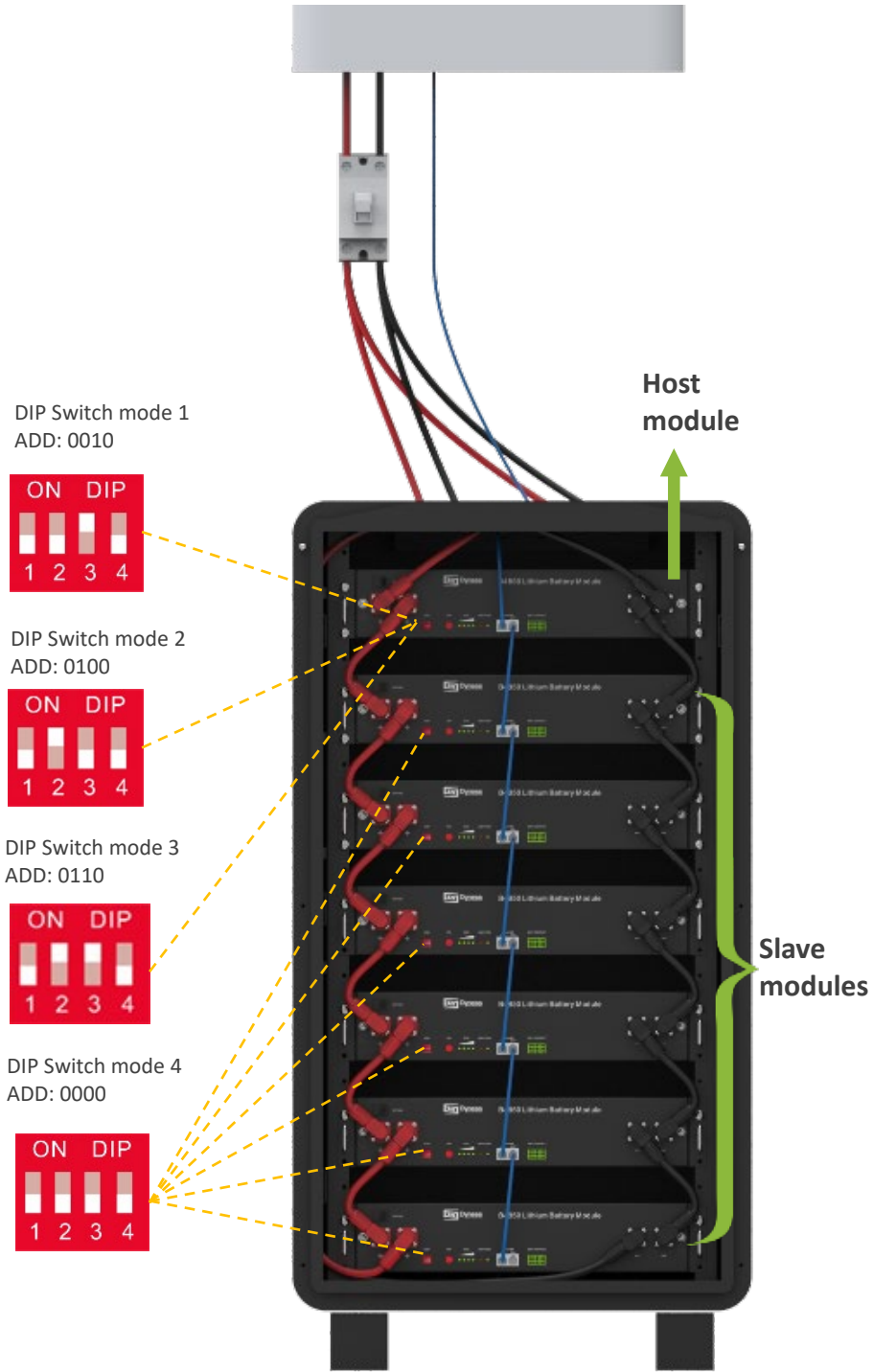
(1) The communication cable that communicates with the inverter should use the correct one which is supplied by DYNESS.

(2) After the battery module parallel cable, cascade cable and the inverter communication cable are connected, turn on all B4850 batteries.

(3)Before connecting with inverter,please ensure the no-dip battery firmware version support yours inverter.

Note: 1.After the whole system connection,set the master DIP mode according to the inverter model firstly,then start the battery.

2.The BAT-INV comms cable is from inverter comm port to master CAN IN port,BAT-BAT cable is from master CAN OUT to slave1 CAN IN,slave1 CAN OUT to slave2 CAN IN...



2.4 Battery Management System(BMS)

2.4.1 Voltage Protection

Discharging Low Voltage Protection :

When any battery cell voltage is lower than the protection value during discharging, the over-discharging protection starts, and the battery buzzer makes an alarm sound. Then battery system stops supplying power to the outside. When the voltage of each cell recovers to rated return range, the protection is over.

Charging Over Voltage Protection :

When total voltage or any battery cell voltage reaches the protection value during charging, battery stops charging. When total voltage or a cell recover to rated return range, the protection is over.

2.4.2 Current Protection

Over Current Protection in Charging :

When the charging current is greater than the protection value, the battery buzzer alarms and the system stops charging. Protection is released after rated time delaying.

Over Current Protection in Discharging :

When the discharge current is greater than the protection value, the battery buzzer alarms and the system stops discharging. Protection is released after rated time delaying.

Note:

The buzzer sound alarm setting can be manually turned off on the background software, and the factory default is on.

2.4.3 Temperature Protection

Less/Over temperature protection in charging :

When battery's temperature is beyond range of 0°C ~+55°C during charging, temperature protection starts, device stops charging.

The protection is over when it recovers to rated return range.

Less/Over temperature protection in discharging :

When battery's temperature is beyond range of -20°C ~+55°C during discharging, temperature protection starts, device stops supplying power to the outside.

The protection is over when it recovers to rated return range.

2.4.4 Other Protection

Short Circuit Protection :

When the battery is activated from the shutdown state, if a short circuit occurs, the system starts short-circuit protection for 1 minute.

Self-Shutdown:

When device connects no external loads for over 72hours, device will dormant standby automatically.

**Caution**

Battery's maximum discharging current should be more than load's maximum working current.

3 Installation and Configuration

3.1 Ready for installation

Safety Requirement

This system can only be installed by personnel who have been trained in the power supply system and have sufficient knowledge of the power system.

The safety regulations and local safety regulations listed below should always be followed during the installation.

- All circuits connected to this power system with an external voltage of less than 48V must meet the SELV requirements defined in the IEC60950 standard.
- If operating within the power system cabinet, make sure the power system is not charged. Battery devices should also be switched off
- Distribution cable wiring should be reasonable and has the protective measures to avoid touching these cables while operating power equipment.
- when installing the battery system, must wear the protective items below:



The isolation gloves



Safety goggles



Safety shoes

3.1.1 Environmental requirements

Working temperature: -20°C ~ +55 °C

- Charging temperature range is 0°C~+55 °C,
- Discharging temperature range is -20 °C ~+55 °C

Storage temperature: -10°C ~ +35 °C

Relative humidity: 5% ~ 85%RH

Elevation: no more than 4000m

Operating environment: Indoor or outdoor installation, sites avoid direct sunlight, no conductive dust and corrosive gas.

- Installation location should be away from the sea to avoid brine and high humidity environment.
- The ground is flat and level.
- There is no flammable explosive near to the installation places.
- The optimal ambient temperature is 15°C ~ 30 °C
- Keep away from dust and messy zones

3.1.2 Tools and data

Hardware tool

Tools and meters that may be used are shown in table 3-1.

Table 3-1 Tool instrument

Name	
Screwdriver (word, cross)	AVO meter
Wrench	Clamp meter
Inclined pliers	Insulating tape
Needle nose pliers	The thermometer
Clip forceps	Wrist strap
Wire stripper	AVO meter
Electric drill	Tape

3.1.3 Technical preparation

Electrical interface check

Devices that can be connected directly to the battery can be user equipment, power supplies, or other power supplies.

- Confirm whether the user's PV power generation equipment, power supply or other power supply equipment has a DC output interface, and measure whether the DC power output voltage meets the voltage range requirements in Table 2-2.
- Confirm that the maximum discharge current capability of the DC power interface of the user's photovoltaic power generation equipment, power supply or other power supply equipment should be greater than the maximum charging current of the products used in Table 2-2.
- If the maximum discharge capacity of the DC power interface of the user's photovoltaic power generation equipment is less than the maximum charging current of the products used in Table 2-2, the DC power interface of the user's photovoltaic power generation equipment shall have a current limiting function to ensure the normal operation of the user's equipment.
- Verify that the maximum operating current of the battery-powered user equipment (inverter DC input) should be less than the maximum discharge current of the products used in Table 2-2.

The security check









- Firefighting equipment should be provided near the equipment, such as portable dry powder fire extinguisher.
- Automatic fire fighting system shall be provided for the case where necessary.
- No flammable, explosive and other dangerous articles are placed beside the battery.


3.1.4 Unpacking inspection

- When the equipment arrives at the installation site, loading and unloading should be carried out according to the rules and regulations, to prevent from being exposed to sun and rain.
- Before unpacking, the total number of packages shall be indicated according to the shipping list attached to each package, and the case shall be checked for good condition.
- In the process of unpacking, handle with care and protect the surface coating of the object.

- Open the package, the installation personnel should read the technical documents, verify the list, according to the configuration table and packing list, ensure objects are complete and intact, if the internal packing is damaged, should be examined and recorded in detail.

Packing list is as follows:

Item	Specification (mm)	Quantity				Figure
		4Box	5Box	6Box	7Box	
Cabinet	492×600×862	1	1			
	492×600×1000			1		
	492×600×1138				1	
Battery module	B4850: 8V50Ah 384×481×90	4	5	6	7	
	B3: 48V745h 384× 481×130					
Parallel cable-positive	Red /25mm ² /L215mm	3	4	5	6	
Parallel cable-negative	Black /25mm ² /L215mm	3	4	5	6	
Power cable-positive1	Red /25mm ² /L3200mm	1	1			
	Red /25mm ² /L3400mm			1	1	
Power cable-positive2	Red /25mm ² /L2000mm	1	1	1	1	
Power cable-negative1	Black /25mm ² /L2000mm	1	1	1	1	
Power cable-negative2	Black /25mm ² /L3000mm	1	1	1	1	
Communication parallel cable	Black/250mm/ Double RJ45 plug	3	4	5	6	
Communication cable-to inverter1	Yellow /L800mm/ Double RJ45 plug	1	1	1	1	

Communication cable-to inverter2	Black/L2000mm/ Double RJ45 plug	1	1	1	1	
----------------------------------	------------------------------------	---	---	---	---	---

3.1.5 Engineering coordination

Attention should be paid to the following items before construction:

- Power line specification.
The power line specification shall meet the requirements of maximum discharge current for each product in table2-2.
- Mounting space and bearing capacity.
Make sure that the battery has enough room to install, and that the battery rack and bracket have enough load capacity.
- Wiring.
Make sure the power line and ground wire are reasonable. Not easy to short-circuit, water and corrosion.

3.2 Equipment installation

Table 3-2 Installation steps

Step1	Installation preparation	Confirm that the ON/OFF switch on the front panel of each B4874 unit is in the "OFF" state to ensure no live operation.
Step 2	Mechanical installation	1. Cabinet placement position determination
		2. Top cables pre-installed
		3. Battery module installation
Step3	Electrical installation	1. Battery module parallel cable installation
		2. Battery module Power cable- positive installation
		3. Battery module Power cable- negative installation
		4. Communication parallel cable connection
Step4	Battery system self-test	1. Press the ON/OFF switch to the "ON" state
		2. BMS system power-on activation
		3. Check the system output voltage
		4. Shut down the system
Step5	Connect to the inverter	1. Wiring the battery system Power cable- positive and Power cable- positive to the circuit breaker between the inverter and battery system.
		2. Connect the Communication cable-to inverter2 to the inverter

3.2.1 Installation preparation

1. Prepare equipment and tools for installation
2. Check the cabinet and confirm that the ON/OFF switch on the front panel of each battery module is in the "OFF" state to ensure no live operation.

3.2.2 Mechanical installation

Case1: If the normal power of inverter is $\leq 5kW$, Mechanical installation shown as follows:

1. Fix the Powercube cabinet to the mounting position and remove the front cover. Pass the total positive cable and the total negative cable (Power cable- positive1/ Power cable-negative1) through the waterproof connector on the back of the cabinet, and insert the external CAN cable(Communication cable-to inverter2) into the RJ45 network cable connector(Interface 4).



Figure3-1

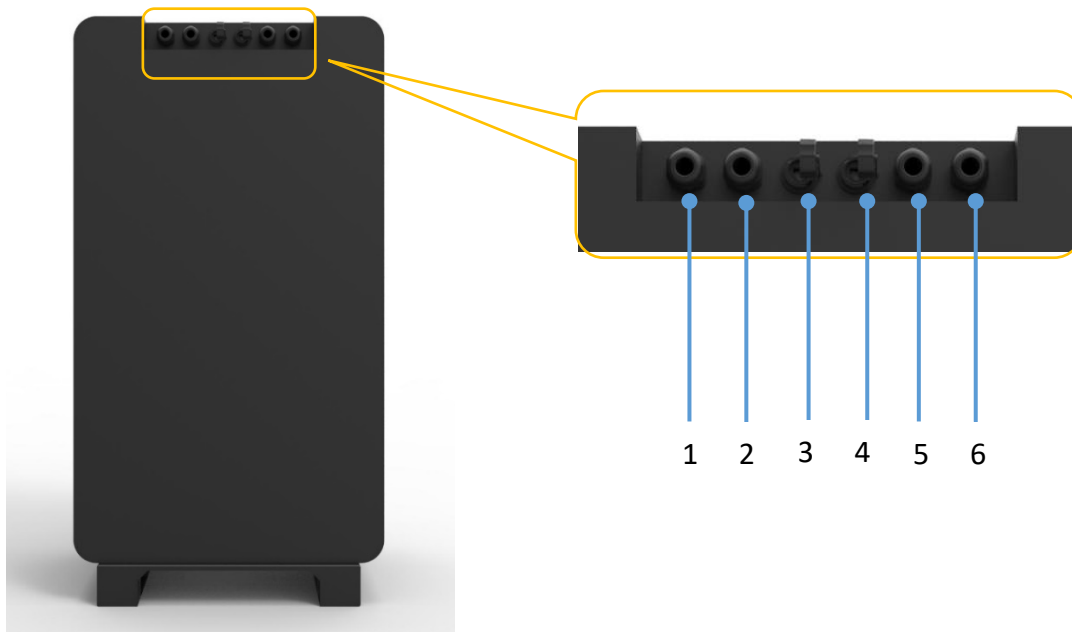


Table 3-3 Interface Definition

Item	Name	Definition
Interface1	Power cable- negative waterproof connector	Reserve
Interface 2	Power cable- negative waterproof connector	The battery DC output negative pole
Interface 3	RJ45 network cable connector	Reserve
Interface 4	RJ45 network cable connector	CAN/RS485 communication interface (Factory default CAN communication mode)

Item	Name	Definition
Interface 5	Power cable- positive waterproof connector	The battery DC output positive pole
Interface 6	Power cable- positive waterproof connector	Reserve

- Place the battery unit on the cabinet bracket as shown in the figure and push it into the cabinet to the installation position.



Figure3-2

- Fix the battery unit in the cabinet with nuts through the mounting holes top on the hanging ears of the battery module front panel. The other units are in this order, as shown in the Figure3-3.



Figure3-3

Case 2: If the normal power of inverter is > 5kW, Mechanical installation shown as follows:

1. Fix the Powercube cabinet to the mounting position and remove the front cover. Pass the total positive cable and the total negative cable (Power cable- positive1, Power cable- positive2 and Power cable-negative1, Power cable-negative2) through the waterproof connector (Interface1,2,5,6) on the back of the cabinet, and insert the external CAN cable(Communication cable-to inverter2) into the RJ45 network cable connector(Interface 4).



Figure3-4

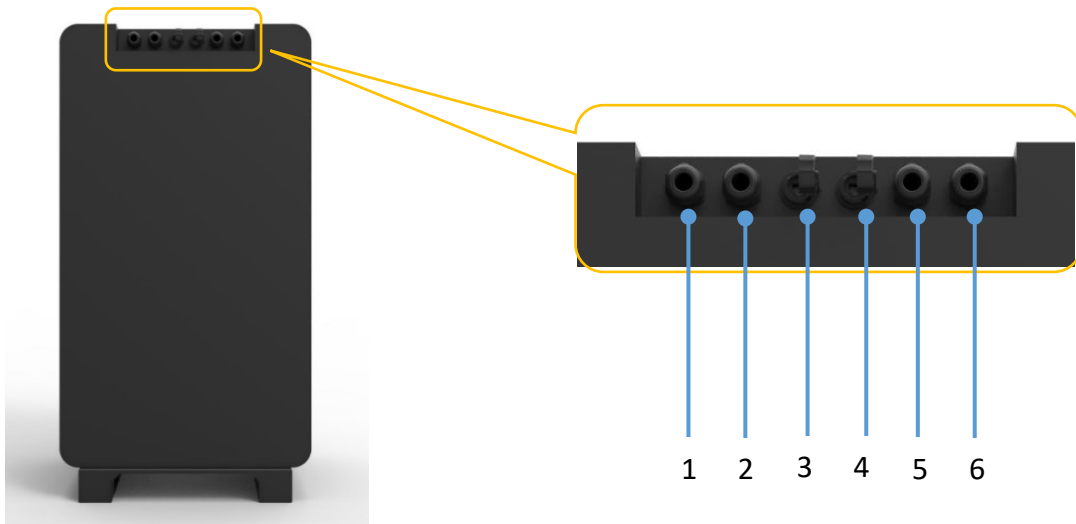


Table 3-4 Interface Definition

Item	Name	Definition
Interface1	Power cable- negative waterproof connector	Reserve
Interface 2	Power cable- negative waterproof connector	The battery DC output negative pole
Interface 3	RJ45 network cable connector	Reserve
Interface 4	RJ45 network cable connector	CAN/RS485 communication interface (Factory default CAN communication mode)
Interface 5	Power cable- positive waterproof connector	The battery DC output positive pole
Interface 6	Power cable- positive waterproof connector	Reserve

2. Place the battery unit on the cabinet bracket as shown in the figure and push it into the cabinet to the installation position.



Figure3-5

4. Fix the battery unit in the cabinet with nuts through the mounting holes top on the hanging ears of the battery module front panel. The other units are in this order, as shown in the Figure3-6.



Figure3-6

3.2.3 Electrical installation

Before connecting the power cables, using multimeter to measure cable continuity, short circuit, confirm positive and negative, and accurately mark the cable labels.

Measuring method:

- Cable availability: Select the buzzer and use the probe to measure the ends of the same color cable. If the buzzer calls, it means the cable is available.
- Short circuit judgment: choose multimeter resistor file, probe the same end of positive and negative pole, if the resistor shows infinity, means that the cable is available.
- After visual testing of power line is connected well, the positive and negative

poles of the battery shall be connected respectively to the positive and negative poles of the opposite terminal.

It is better to add a circuit breaker between the inverter and the battery system. The selection of the circuit breaker requires:

$$\text{Voltage: } U > 60V$$

$$\text{Current: } I = \frac{\text{Inverter power}}{45V}$$

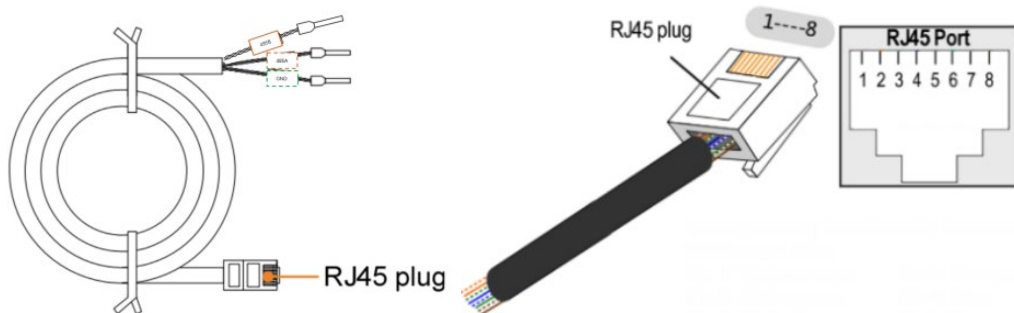
The circuit breaker is installed between the battery module and the inverter, as shown in Figure 3-7:

 **Caution**

Note: If you have any questions during installation, please contact your dealer to avoid damage to the equipment.

Case 1: If the normal power of inverter is ≤ 5kW, power cable installation as follows:

1. Install the power cable
 Install the Parallel cable- negative and the Parallel cable- positive as shown in Figure 3-7, then connect the positive cable and the total negative cable (use Power cable- positive1 and Power cable- negative1).
 Among them, the Power cable- positive1 is red, and Power cable- negative1 is black.
2. Install the communication line
 Insert the Communication cable-to inverter 1 into the IN-communication port of the uppermost No. 1 battery module, take a Communication parallel cable, insert one end into the OUT-communication port of No. 1 battery module, and the other end into the IN-communication port of No. 2 battery module on the next layer.
 Connect all communication lines in this order.



Foot position	Color	Definition
PIN1	Orange/white	485A
PIN2	Orange	XGND
PIN3	Green/white	485B
PIN4	Blue	CANH

PIN5	Blue/white	CANL
PIN6	Green	NC/NULL
PIN7	Brown/white	XIN
PIN8	Brown	NC/NULL

3. Connect to the inverter

Connect the total positive cable(Power cable- positive1) and the total negative cable(Power cable- negative1) that are pulled out from the outside of the cabinet to the circuit breaker(the other end of the circuit breaker is connected to the inverter), and the external CAN communication line 2(Communication cable-to inverter2) is connected to the inverter. Complete as shown in Figure 3-7

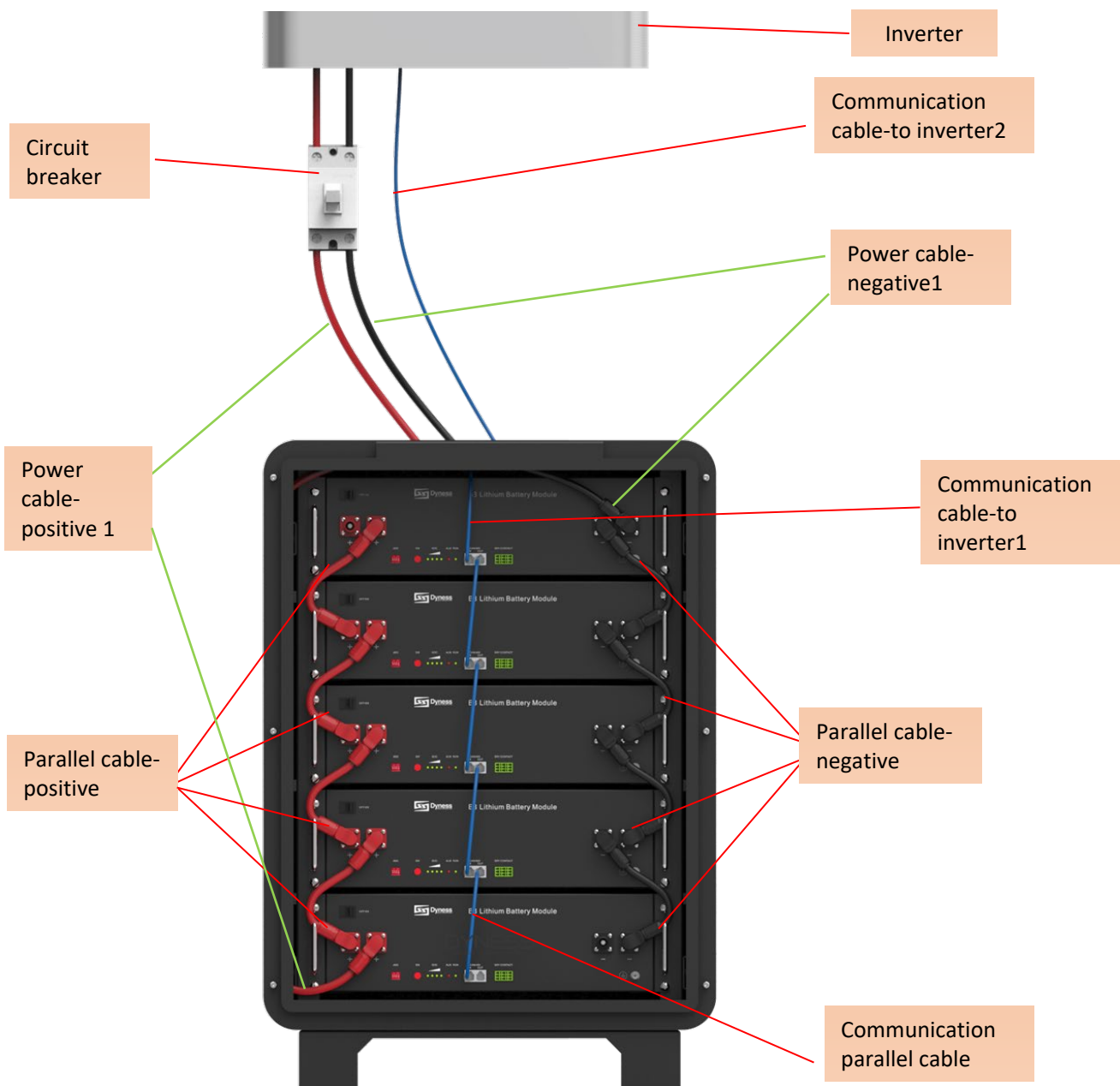
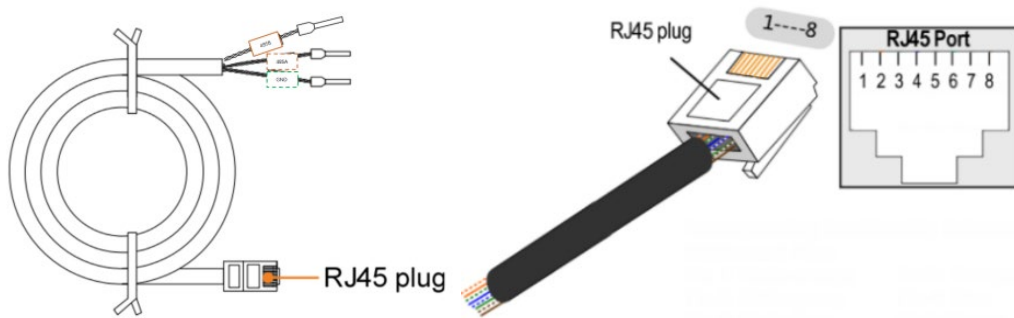


Figure 3-7 Wiring diagram

Case 2: If the normal power of inverter is >5kW, power cable installation as follows:

1. Install the power cable
 Install the Parallel cable- negative and the Parallel cable- positive as shown in Figure 3-8, then connect the positive cable and the total negative cable (use Power cable- positive1, Power cable- positive2 and Power cable- negative1, Power cable- negative2).
 Among them, the Power cable- positive1, Power cable- positive2 are red, and Power cable-negative1, Power cable- negative2 are black.

2. Install the communication line
 Insert the Communication cable-to inverter 1 into the IN-communication port of the uppermost No. 1 battery module, take a Communication parallel cable, insert one end into the OUT-communication port of No. 1 battery module, and the other end into the IN-communication port of No. 2 battery module on the next layer.
 Connect all communication lines in this order.



Foot position	Color	Definition
PIN1	Orange/white	485A
PIN2	Orange	XGND
PIN3	Green/white	485B
PIN4	Blue	CANH
PIN5	Blue/white	CANL
PIN6	Green	NC/NULL
PIN7	Brown/white	XIN
PIN8	Brown	NC/NULL

3. Connect to the inverter
 Connect the total positive cable(Power cable- positive1 and Power cable- positive2) and the total negative cable(Power cable- negative1 and Power cable- negative2) that are pulled out from the outside of the cabinet to the circuit breaker(the other end of the circuit breaker is connected to the inverter), and the external CAN communication line 2(Communication cable-to inverter2) is connected to the inverter. Complete as shown in Figure 3-8.

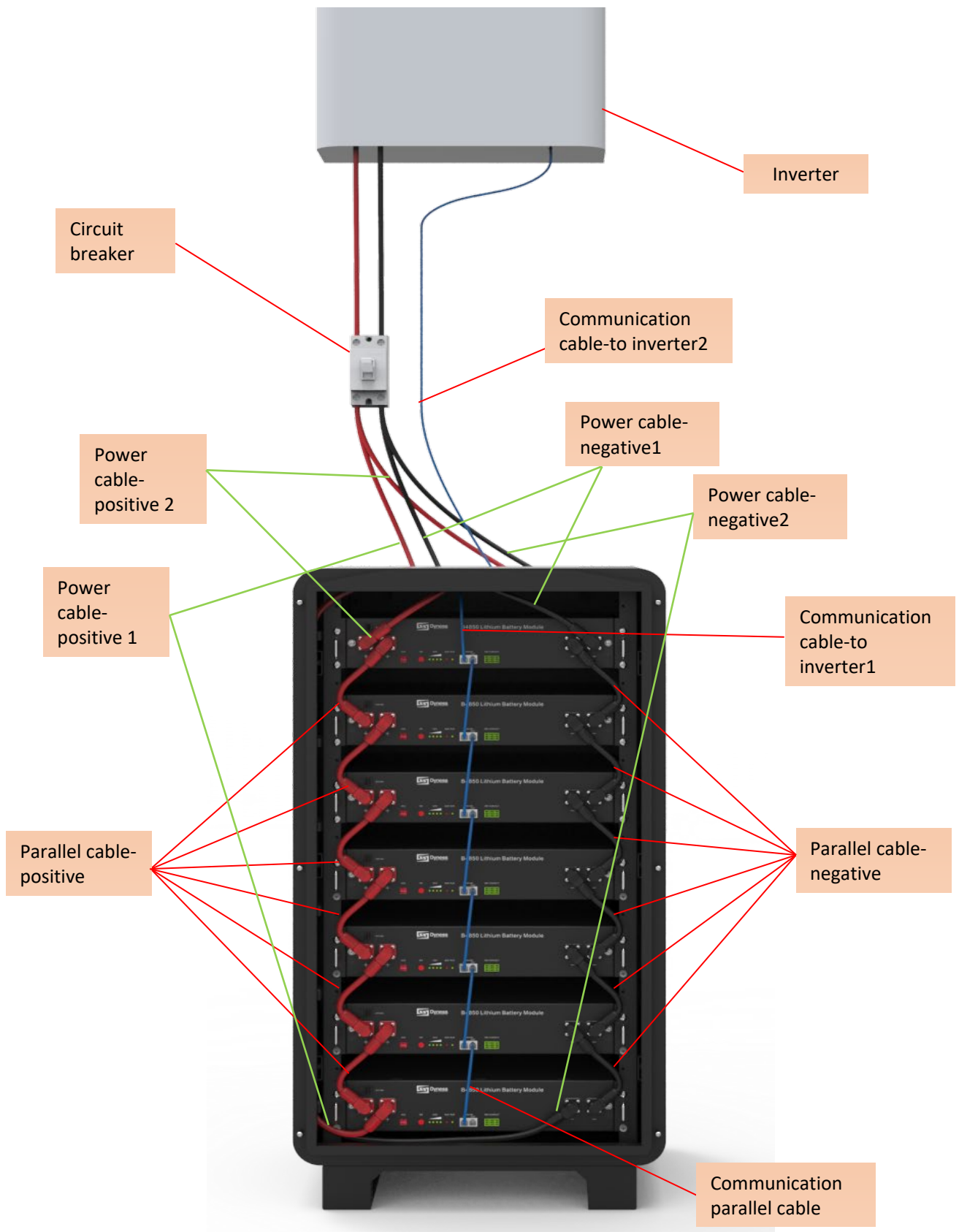


Figure 3-8 Wiring diagram

Table 3-5 Battery& Inverter power matching table

Inverter Output power /kW	B4850			B4874		
	Min. parallel number	Powercube series	System Energy (kWh)	Min. parallel number	Powercube series	System Energy (kWh)
≤4.8 kW	4	Powercube- 5Box	9.6	4	Powercube- 5Box	14.4
≤6.0 kW	5	Powercube- 5Box	12.0	5	Powercube- 5Box	18.0
≤7.2 kW	6	Powercube- 6Box	14.4	6	Powercube- 6Box	21.6
≤8.4 kW	7	Powercube- 7Box	16.8	7	Powercube- 7Box	25.2
≤9.6 kW	8	Powercube- 8Box	19.2	8	Powercube- 8Box	28.8
≤10.8 kW	9	Powercube- 9Box	21.6	8	Powercube- 8Box	32.4

4 Use, maintenance and troubleshooting

4.1 Battery system usage and operation instructions

After completing the electrical installation, follow these steps to start the battery system.

- 1 Press the ON/OFF button to the ON position, press and hold the SW button for 3 seconds.

After the indicator self-test, the RUN indicator will light and the SOC indicator will be on (100% SOC status in the Figure 4-1).

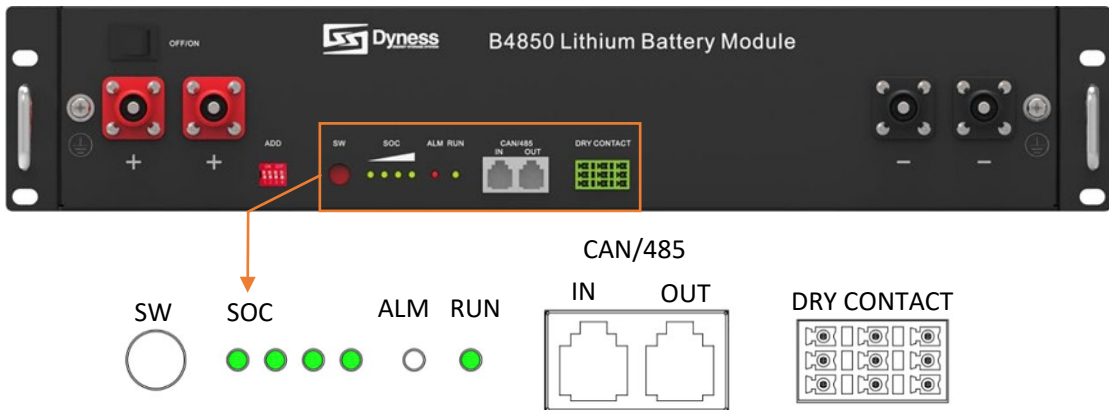


Figure4-1



Note:

After pressing the power button, if the battery status indicator on the front panel of battery module continues to be red, please refer to the "4.2 Alarm description and processing ". If the failure cannot be eliminated, please contact the dealer timely.

- 2 Use a voltmeter to measure whether the voltage of circuit breaker battery access terminal is greater than 42V, and check whether the voltage polarity is consistent with the inverter input polarity. If the circuit breaker battery input terminal has a voltage output and is greater than 42V, then the battery has started normal work.
- 3 After confirming that the battery output voltage and polarity are correct, turn off the battery, set the DIP switch to the correct mode, then turn on the battery system, and connect the communication line to the inverter.
- 4 Turn on the inverter and close the circuit breaker switch between the battery system and the inverter.
- 5 Check whether the inverter and battery connection are normal (If the battery access status indicator on the inverter is normal), and whether the communication between the battery and the inverter is normal. If it is normal, the connection between the battery and the inverter is completed. If the indicator light is abnormal, please refer to the inverter manual for the cause or contact the dealer.
- 6 After confirming the normal state, install the front cover of the cabinet.

4.2 Alarm description and processing

When the protection action or fault occurs in the system, the alarm signal will be given through the working status indicator on the front panel of the battery module. The network management can query the specific alarm categories.

If the fault such as single cell overvoltage, charging over-current, under-voltage protection, high-temp protection and other abnormalities which affects the output, please deal with it according to Table 4-1.

Table 4-1 Main alarm and Protection

Statue	Alarm category	Alarm indication	Processing
Charge state	Over-current	RED, Buzzer start	Stop charging and find out the cause of the trouble
	High temp	RED	Stop charging
Discharge state	Over-current	RED Buzzer start	Stop discharging and find out the cause of the trouble
	High temp	RED	Stop discharging and find out the cause of the trouble
	Total voltage undervoltage	RED Buzzer start	Start charging
	Cell voltage undervoltage	RED Buzzer start	Start charging

4.3 Analysis and treatment of common faults

Analysis and treatment of common faults in the Table 4-2:

Table 4-2 Analysis and treatment of common faults

No.	Fault phenomenon	Reason analysis	Solution
1	The indicator does not respond after the power on	Total voltage lower than 35V	Check the total voltage
2	No DC output	Battery data status is abnormal. Battery gets into over-discharged protection	Read the battery information on the monitor.
3	The DC power supply time is too short	Battery capacity become smaller	Storage battery replacement or add more modules
4	The battery can't be fully charged to 100%	Charging voltage is too low	Adjust charging voltage at 53.5V or 54V

5	The power cable sparks once power on and ALM light RED	Power connection short-circuit	Turn off the battery, check the cause of the short circuit
6	Communication fault	The DIP setting of the host is wrong/ the battery type of the inverter is wrong/ Communication cable used incorrectly/ The communication cable is incorrectly connected at the battery communication port or the inverter communication port/ The battery firmware version is too low to support the inverter	Check these possible cause one by one

If you have any technical help or question, please contact the seller in time.



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