POWERCUBE

User Manual

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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-tech.com/

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 and maintenance instructions

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 all kinds of 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.

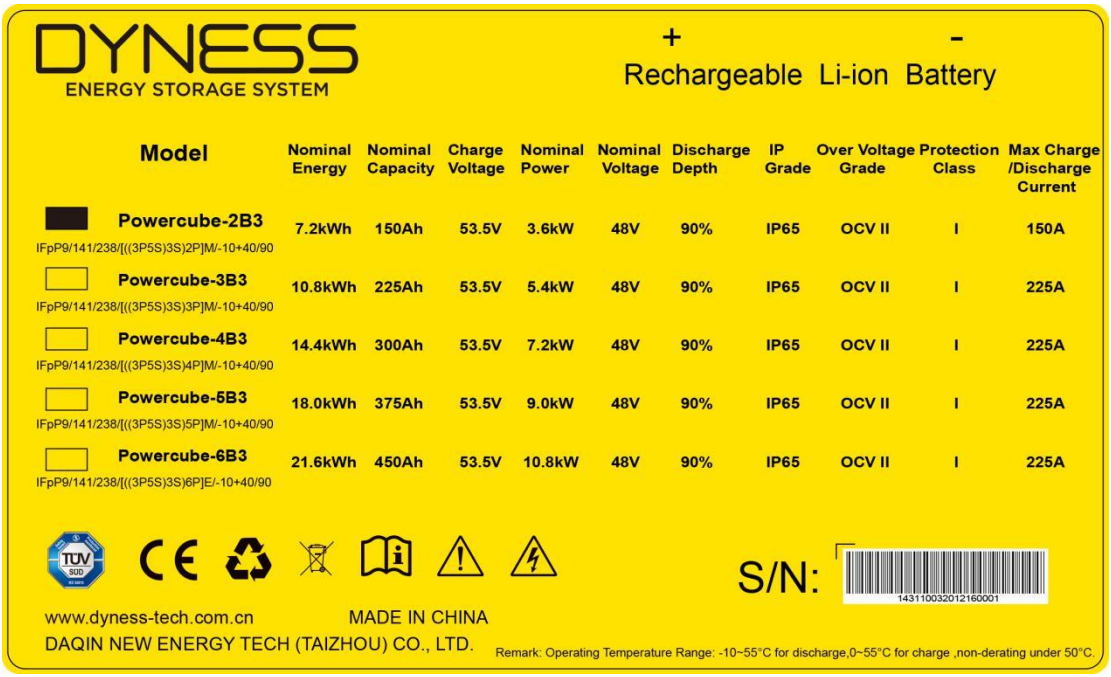
1.2 Product Properties

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, -10°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 -

Model	Nominal Energy	Nominal Capacity	Charge Voltage	Nominal Power	Nominal Voltage	Discharge Depth	IP Grade	Over Voltage Grade	Protection Class	Max Charge /Discharge Current
Powercube-2B3 IFpP9/141/238/[((3P5S)3S)2P]M/-10+40/90	7.2kWh	150Ah	53.5V	3.6kW	48V	90%	IP65	OCV II	I	150A
Powercube-3B3 IFpP9/141/238/[((3P5S)3S)3P]M/-10+40/90	10.8kWh	225Ah	53.5V	5.4kW	48V	90%	IP65	OCV II	I	225A
Powercube-4B3 IFpP9/141/238/[((3P5S)3S)4P]M/-10+40/90	14.4kWh	300Ah	53.5V	7.2kW	48V	90%	IP65	OCV II	I	225A
Powercube-5B3 IFpP9/141/238/[((3P5S)3S)5P]M/-10+40/90	18.0kWh	375Ah	53.5V	9.0kW	48V	90%	IP65	OCV II	I	225A
Powercube-6B3 IFpP9/141/238/[((3P5S)3S)6P]E/-10+40/90	21.6kWh	450Ah	53.5V	10.8kW	48V	90%	IP65	OCV II	I	225A

S/N: 14311003201216000 1

www.dyness-tech.com.cn MADE IN CHINA
DAQIN NEW ENERGY TECH (TAIZHOU) CO., LTD.
Remark: Operating Temperature Range: -10~55°C for discharge,0~55°C for charge ,non-derating under 50°C.

	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.
	This battery product meets European directive requirements.
	This battery product passed the TUV certification test.

2 Product Specification

2.1 Size and Weight

Table 2-1 Powercube series Device Model

roduct Series	Dimension (mm)	Nominal Voltage	Nominal Capacity	Weight	IP Level
Powercube-2B3	600*520*1140	DC48V	150Ah	≈122.5kg	IP65
Powercube-3B3		DC48V	225Ah	≈155kg	IP65
Powercube-4B3		DC48V	300Ah	≈187.5kg	IP65
Powercube-5B3		DC48V	375Ah	≈220kg	IP65
Powercube-6B3		DC48V	450Ah	≈252.5kg	IP65

2.2 Performance Parameter

Table 2-2 Powercube series performance parameter

Product Series	Powercube-2B3	Powercube-3B3	Powercube-4B3	Powercube-5Box	Powercube-6Box
Nominal Voltage(V)	48	48	48	48	48
Work Voltage Range(V)	42~54	42~54	42~54	42~54	42~54
Nominal Capacity(Ah)	150	225	300	375	450
Nominal Energy(kWh)	7.2	10.8	14.4	18.0	21.6
Nominal Power(kW)	3.6	5.4	7.2	9.0	10.8
Max Power(kW)	7.2	10.8	10.8	10.8	10.8
Maximum charge/ discharging current [Ad.c.]	150	225	225	225	225
1s Peak Power(kW)	7.2	10.8	14.4	18	21.6
1s Peak Current(A)	150	225	300	375	450
Charging Current(A)	75	112.5	150	187.5	225
Discharge Current(A)	75	112.5	150	187.5	225
Operating altitude range [m]	⩽2000m	⩽2000m	⩽2000m	⩽2000m	⩽2000m
Storage temperature range (°C)	10~40	10~40	10~40	10~40	10~40
Storage humidity range	5 to 85 % RH	5 to 85 % RH	5 to 85 % RH	5 to 85 % RH	5 to 85 % RH
Protection class	Class I	Class I	Class I	Class I	Class I
Discharge Depth	90%	90%	90%	90%	90%
Over Voltage Grade	OCV II	OCV II	OCV II	OCV II	OCV II
Ambient operating temperature range (°C)	(-10~55) for discharge (0~55) for charge non-derating under 50° C	(-10~55) for discharge (0~55) for charge non-derating under 50° C	(-10~55) for discharge (0~55) for charge non-derating under 50° C	(-10~55) for discharge (0~55) for charge non-derating under 50° C	(-10~55) for discharge (0~55) for charge non-derating under 50° C

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.

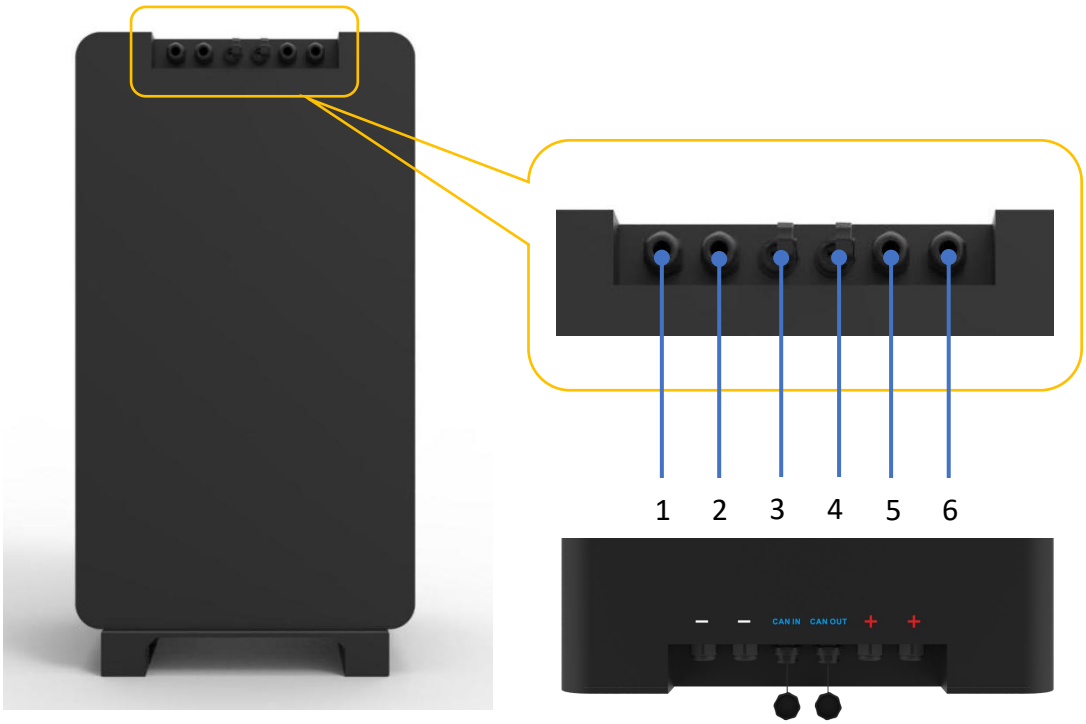


Table 2-3 Interface Definition

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.

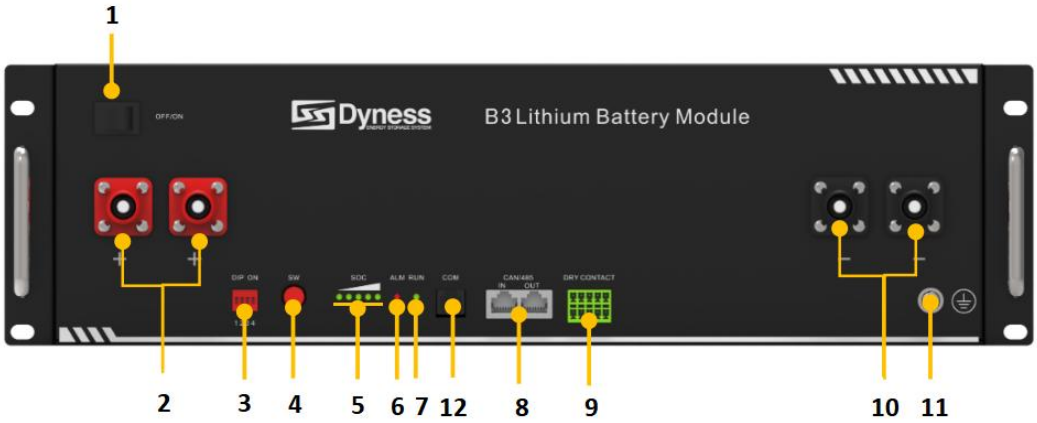


Figure2-2 The sketch of interface.

Table 2-4 Interface Definition

Item	Name	Definition
1	Power switch	OFF/ON, remains ‘ON when using
2	Positive socket	Battery output or parallel positive line
3	ADD	DIP switch
4	SW (battery wake/sleep Switch)	When power switch is in ‘ON’, long pressing SW for 3s to enable the battery for switch-on ,then switch on the DC breaker between the battery with inverter.If you need to shut down the system,firstly swich off the DC breaker between the battery with the inverter, then press SW for 3s and switch the power button to “OFF”.
5	SOC	Green light, showing battery capacity
6	ALM	Red lights, flash when warming, always on when Protection. When the condition of triggering protection is removed, the battery can recover automatically
7	RUN	Green light, flashing when standby, always on when discharge, flash when charging
8	CAN/485	Communication Port Communication (factory default CAN communication)
9	DRY CONTACT	/
10	Negative socket	Battery output or parallel negative line
11	Grounding	Shell ground connection
12	COM	Communication cascade port, support RS232

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
spare		Host or slave	Baud rate selection
OFF		OFF:slave	OFF： CAN: 500K,485: 9600
		ON:host	ON： CAN: 250K,485: 115200

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.

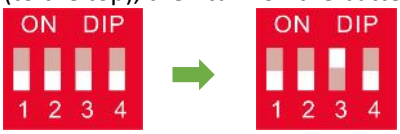
Except for changing the DIP mode, any other operations cannot be done.

Figure2-3 DIP switch mode schematic diagram

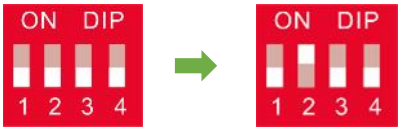
1. If the host is the latest B3 battery with DIP switch:

(1) The communication cable from the host CAN IN to the inverter comm port should be the correct one.

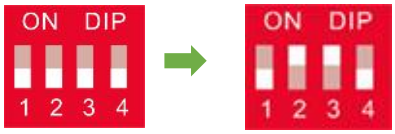
(2) When the battery works with GOODWE、Solis、LUX、Sofar、DEYE、VICTRON、IMEON、Infinisolar、Sungrow、SMA、RENAC、DELIOS、SAJ(CAN Comm) ，Growatt HVM-ES/WPV(CAN port),before starting the battery,you need put the host DIP switch "# 3" to the "ON" position (to the top), then turn on the batteries.



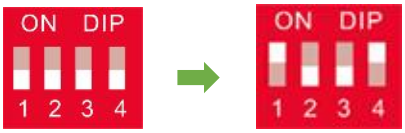
(3) If the battery communicates with the Axpert-king,Axpert-VMIII,Growatt SPH/SPA(CAN comm)、GMDE、Saj(485 comm), turn the host DIP switch "#2" to "ON" position.



(4) If the battery communicates with the Growatt SPF HVM-P/ES/WPV by RS485 port, turn the host DIP switch "#2" and "#3" to "ON".



(5) If the battery module is in communication with the ICC by 485 communication, turn the host DIP switch "#1" and "#4" to "ON".



the DIP switch of the slaves need to turn the “#4” to “ON”.

(7) The DIP switch of the slaves no need to be changed.

(8) If the energy storage system has only one B3, it is the host itself, and still follow the above steps.

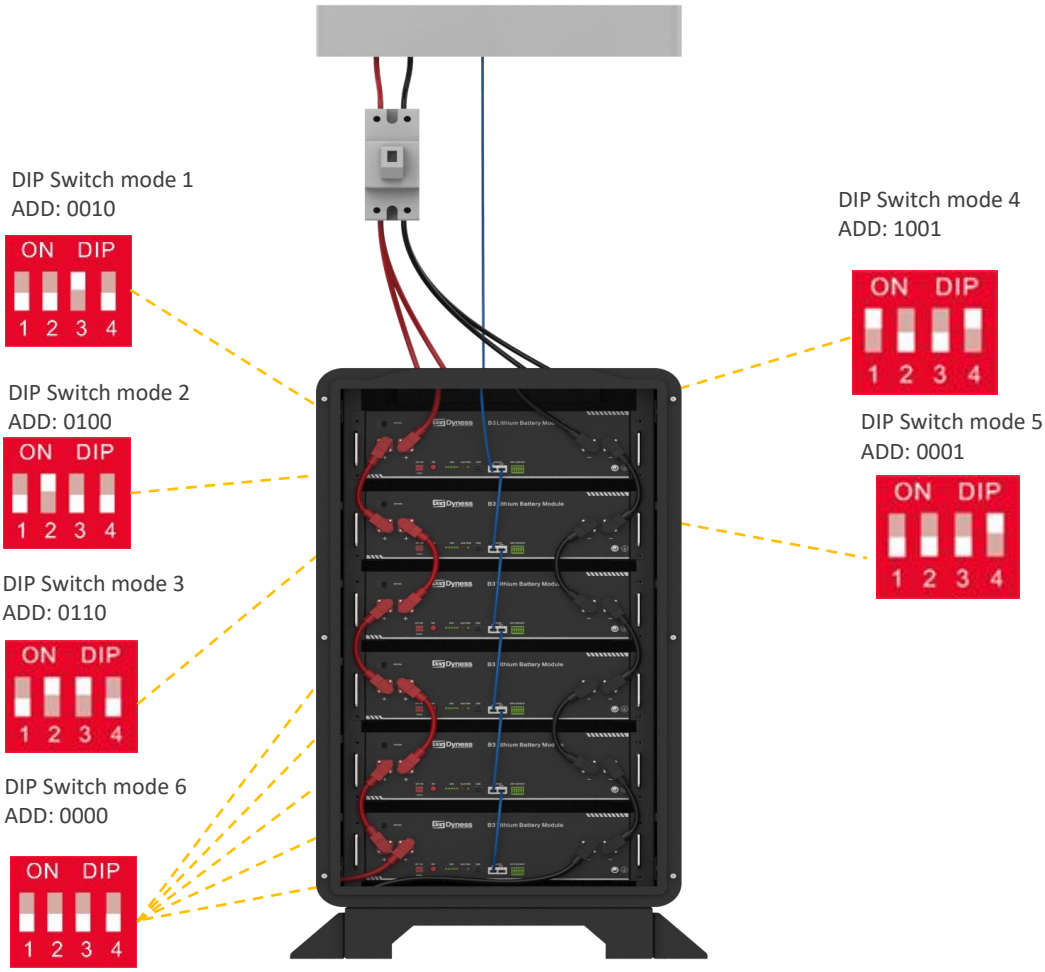
Note: For more information of matching inverter brands, please subject to the latest document <The list of compatibility between Dyness ESS and Inverters >.

Caution： The DIP switch mode in case (5),1001 is only for ICC(a special commnunication device of some no-communication inverter), it’s a specia firmware in BMS,different from general firmware,so if customers want to use ICC,please contact dyness to confirm.

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 ℃ ~55 ℃ 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 -10℃~+55℃ 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: -10ºC ~ +55 ºC

- Charging temperature range is 0ºC~55 ºC,
- Discharging temperature range is-10ºC ~ +55 ºC

Storage temperature: 10 ºC ~ 40 ºC
Relative humidity: 5% ~ 85%RH
Elevation: no more than 2000m
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 15ºC ~ 30 ºC
- 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
		2B3	3B3	4B3	5B3	6B3	
Cabinet	600*520*1140	1	1	1	1	1	
Battery module	B3: 48V745h 480*405×132	2	3	4	5	6	
Parallel cable-positive	Red /25mm²/L215 mm	1	2	3	4	5	
Parallel cable-negative	Black /25mm²/L215 mm	1	2	3	4	5	
Power cable-positive1	Red /25mm²/L3700mm	1	1	1	1	1	
Power cable-positive2	Red /25mm²/L2700mm	1	1	1	1	1	
Power cable-negative1	Black /25mm²/L3700mm	1	1	1	1	1	
Power cable-negative2	Black /25mm²/L2700mm	1	1	1	1	1	
Communication parallel cable	Black/250mm / Double RJ45 plug	1	2	3	4		
Communication cable-to inverter-1	Yellow /L800mm/ Double RJ45 plug	1	1	1	1		

Communication cable-to inverter-2	Black/L2000mm/ Double RJ45 plug	1	1	1	1		
Ground wire	L500mm,4mm^2	1	1	1	1	1	

3.1.5 Engineering coordination

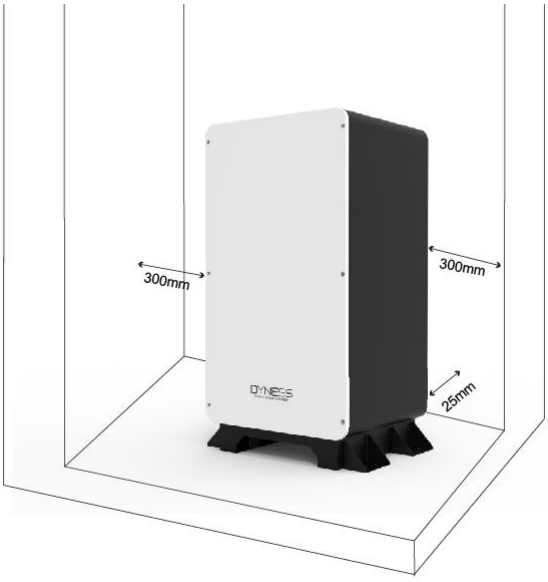
Attention should be paid to the following items before construction:

- 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.
- Circuit breaker.
  Install circuit breaker between the battery system and the inverter,Select the circuit breaker based on the actual battery system usage and installation suggestions.

3.2 Equipment installation

The wall for battery installation shall be solid brick or cement wall with strong bearing capacity and wall thickness no less than 100mm.

Mounting space requirements：



floor installation

Table 3-2 Installation steps

Step1	Installation preparation	Confirm that the ON/OFF switch on the front panel of each B3 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 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

1. Fix the Powercube cabinet to the mounting position and remove the front cover.
   Please refer to 3.2 to place the cabinet on the ground.
   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).

Figure3-1

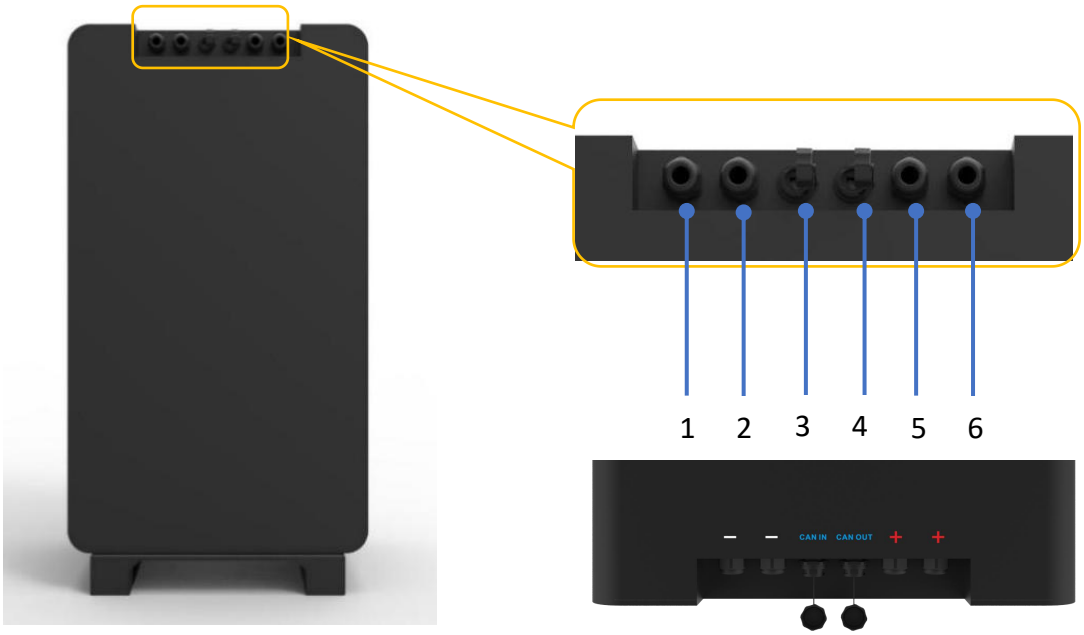


Table 3-3 Interface Definition

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)
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.

Figure3-2

3. 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.

Figure3-3

3.2.3 Electrical installation

Statement：For Australian market, installations should be conducted in accordance with AS/NZS 3000 and AS/NZS 5139".

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:

Voltage: U>60V

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

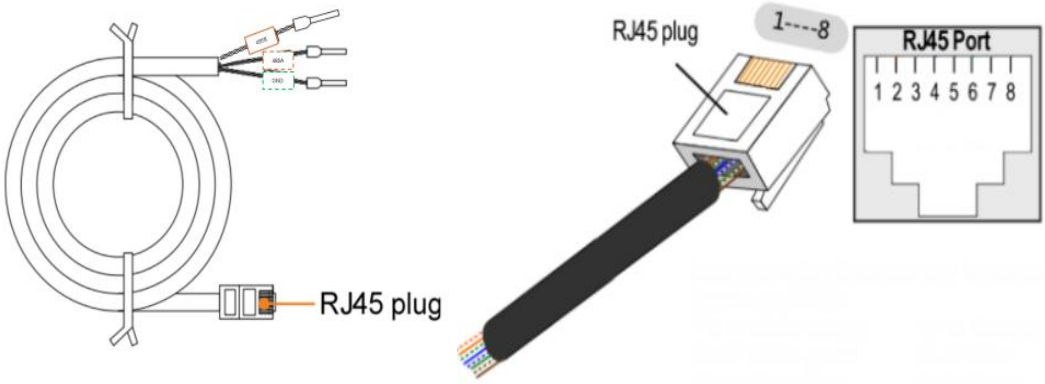
The circuit breaker is installed between the battery module and the inverter, as shown in Figure 3-8:

Caution

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

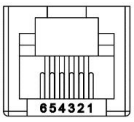
1. Install the power cable
   Install the Parallel cable- negative and the Parallel cable- positive as shown in Figure 3-8, then connect the positive cable and the total negative cable (use Power cable- positive1, Power cable- positive2 and Power cable- negative1, Power cable- negative2).
   Among them, 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	485B
PIN2	Orange	485A
PIN3	Green/white	GND
PIN4	Blue	CANH
PIN5	Blue/white	CANL
PIN6	Green	Reserve
PIN7	Brown/white	XIN
PIN8	Brown	Reserve
PIN9	Orange/white	Reserve
PIN10	Orange	Reserve
PIN11	Green/white	GND
PIN12	Blue	CANH
PIN13	Blue/white	CANL
PIN14	Green	Reserve
PIN15	Brown/white	XOUT
PIN16	Brown	Reserve

The Pin definition of COM port



Foot position	Definition
PIN1	Reserve
PIN2	GND
PIN3	TXD
PIN4	RXD
PIN5	GND
PIN6	Reserve

Note:Please pay attention of the communication com definition of inverter,in order to avoid voltage in the port to affect communication.

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.

   Batteries and inverters must be installed in accordance with the compatibility listed in the “Dyness compatibal list-Final-LV&HV-F-2022V2-Y”;

   Dyness compatibal list-F-2022V2

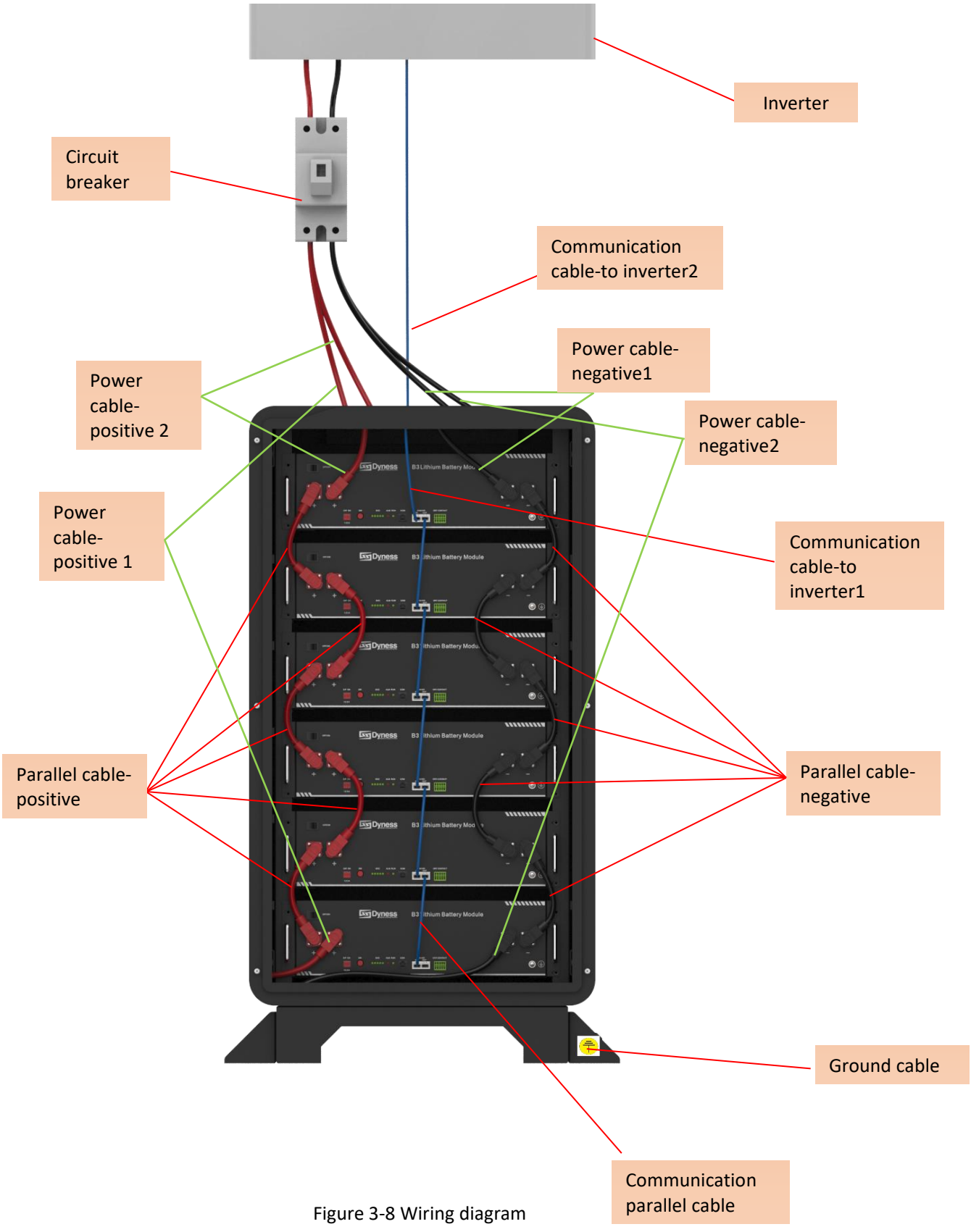


Figure 3-8 Wiring diagram

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).

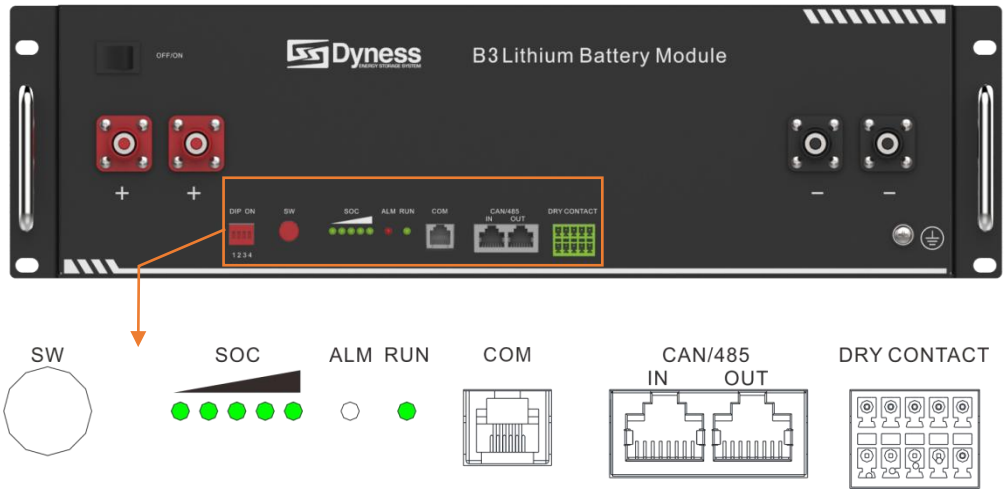


Figure4-1

Note: If you need to shut down the system,firstly switch off the DC breaker between the battery with the inverter, then press SW for 3s and switch the power button to “OFF”.

Caution:

1 After pressing the power button, if the battery status indicator on the front panel 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 the circuit breaker battery access terminal is higher 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 begun to work normally.

3 After confirming that the battery output voltage and polarity are correct, turn on the inverter, close the circuit breaker.

4 Check if the indicator of the inverter and battery connection (communication indicator and battery access status indicator) is normal. If it is normal, successfully complete the connection between the battery and the inverter. If the indicator light is abnormal, please refer to the inverter manual for the cause or contact the dealer.

4.2 Alarm description and processing

When protection mode is activated or system failure occurred, the alarm signal will be given through the working status indicator on the front panel of the B3. 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

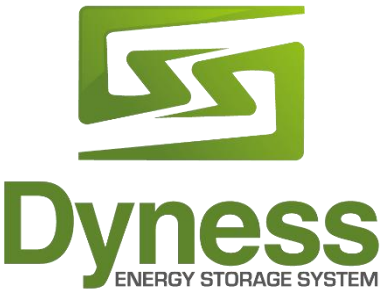
Analysis and treatment of common faults in the Table 4-2:

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 need any technical help or have any question, please contact the dealer in time.



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