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V1.1

# PowerDepot H5

User Manual



## Content

|                                                                    |            |
|--------------------------------------------------------------------|------------|
| <b>Statement of Law.....</b>                                       | <b>II</b>  |
| <b>Safety Precautions .....</b>                                    | <b>III</b> |
| <b>Preface .....</b>                                               | <b>IV</b>  |
| <b>1 Introduction .....</b>                                        | <b>1</b>   |
| 1.1 Brief Introduction.....                                        | 1          |
| 1.2 Product Properties .....                                       | 1          |
| 1.3 Product identity definition .....                              | 2          |
| <b>2 Product Specification.....</b>                                | <b>3</b>   |
| 2.1 Size and Weight.....                                           | 3          |
| 2.2 Performance Parameter .....                                    | 3          |
| 2.3 Interface Definition .....                                     | 3          |
| 2.4 Battery Management System(BMS) .....                           | 5          |
| 2.4.1 Voltage Protection.....                                      | 5          |
| 2.4.2 Current Protection.....                                      | 6          |
| 2.4.3 Temperature Protection .....                                 | 6          |
| 2.4.4 Other Protection .....                                       | 6          |
| <b>3 Installation and Configuration .....</b>                      | <b>7</b>   |
| 3.1 Preparations for installation .....                            | 7          |
| 3.1.1 Environmental requirements .....                             | 7          |
| 3.1.2 Tools and data .....                                         | 8          |
| 3.1.3 Technical preparation .....                                  | 8          |
| 3.1.4 Unpacking inspection .....                                   | 8          |
| 3.1.5 Engineering coordination .....                               | 10         |
| 3.2 Equipment installation .....                                   | 10         |
| 3.2.1 Floor installation.....                                      | 11         |
| 3.2.2 Mounted on the wall .....                                    | 12         |
| 3.2.3 Electrical installation .....                                | 14         |
| 3.2.4 Battery module DIP switch definition and description.....    | 18         |
| 3.2.5 Battery parameter settings on the inverter .....             | 24         |
| 3.2.6 Register on the website after installation .....             | 24         |
| <b>4 Use, maintenance and troubleshooting.....</b>                 | <b>25</b>  |
| 4.1 Battery system usage and operation instructions .....          | 25         |
| 4.2 Alarm description and processing .....                         | 26         |
| 4.2.1 Alarm and countermeasure for affecting system output .....   | 26         |
| 4.2.2 Alarm and countermeasure for un-affecting system output..... | 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 Daqin New Energy Tech (Taizhou) Co., Ltd when the product or technology is updated. Web URL: <http://www.dyness-tech.com.cn>

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

**Manual Version:** V1.1

### Revision History

| Revision NO. | Revision Date | Revision Reason                                |
|--------------|---------------|------------------------------------------------|
| 1.0          | 2020.4.30     | First Published                                |
| 1.1          | 2020.09.28    | 1. Add new inverters in DIP switch description |

## 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 on the same device.
- Please avoid any form of damage to battery, especially stab, hit, trample or strike.
- 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 explosion.
- For your safety, please do not arbitrarily dismantle any component in any circumstances. The maintenance must be implemented by authorized technical personnel or our company's technical support. Device breakdown due to unauthorized operation will not be covered under warranty.



### Caution

- The products have been strictly checked before shipment. Please contact us if you find any abnormal phenomena such as device outer case bulging.
- In order to ensure safety and normal use of the product, the equipment should be grounded properly before use.
- To assure the product normal operation, please make sure parameters among the relevant device are compatible and matched.
- **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 product life span, please comply with the operation environment instruction to ensure 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's fully discharged or over-discharging protection mode is activated.  
Formula of theoretical standby time:  $T=C/I$  (T is standby time, C is battery capacity, I is total current of all loads).
- The surface of the PowerDepot H5 cabinet is affixed with a torn invalid label. Therefore, before opening the cover to change the DIP switch mode, you need to contact and inform us the product ID. We will record this battery ID and authorize the opening operation to be performed. Except for changing the DIP switch mode, no other operations are allowed. In the next stage, you can log in on our website to apply for operating authorization directly.

# Preface

---

## Manual Description

PowerDepot H5 Lithium Iron Phosphate Battery is external battery module which can store the electricity for home use. When you apply the grid or photovoltaic system as your powers supply, the product can collect electricity to charges the battery. When grid or photovoltaic system is power off , the product can supply electricity itself for your home loads.

PowerDepot H5 User manual included the device structure, parameters, basic procedure and method of installation, operation, maintenance.

## Safety Statement

- Only qualified and trained professionals are qualified to install, operate, maintain the device.
- Please comply with local safety regulations and operational rules during installation, operation and maintenance, or it could cause unexpected injury or device damage.
- The safety declaration mentioned in the manual are only supplement context for your local safety regulations.
- The seller does not undertake any responsibility for device operations or usage of violating general safety requirements and safety standards.

## Sign explanation

User should clear the meaning of the caution sign below when configuring or operating PowerDepot H5 series products.



## Caution

Neglecting the warnings might cause equipment failure.

# 1 Introduction

---

## 1.1 Brief Introduction

PowerDepot H5 series is equipped with lithium iron phosphate battery for family use . We base on customer needs and market requirement to develop cutting-edge battery storage technology and offer this high quality product to supply stable electricity for all kind of user's devices. The products have long life span and can be applied in high temperature environment and take less space for installation.

PowerDepot H5 series carries self-developed battery management system. When you apply the grid or photovoltaic system as your powers supply, the products can collect electricity to charges the battery. When grid or photovoltaic system is power off , the products can supply electricity itself for your home loads. Products also can be paralleled to build a multi-module system with more capacity to satisfy the longtime energy storage demand.

## 1.2 Product Properties

PowerDepot H5 series energy storage product's anode materials are lithium iron phosphate, battery cells are managed effectively by BMS with better performance.

The systems features as below:

- Comply with European ROHS, Certified SGS, employ non-toxic, non-pollution environment-friendly battery.
- Anode materials are lithium iron phosphate (LiFePO<sub>4</sub>), high safety performance, longer life span.
- Equipped with BMS (battery management system) mode, with 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.
- Flexible configurations, allow parallel of multi-battery for longer standby time.
- Self-ventilation, 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, products' life span and discharging performance are well under high temperature.
- Less volume, lighter weight, seal grade up to IP65 embedding design for easier installation and maintenance.

### 1.3 Product identity definition

FIG1-1 Battery Energy Storage System nameplate

| DYNESS<br>ENERGY STORAGE SYSTEM |                                        | RECHARGEABLE LI-ION BATTERY            |  |                                                                                     |                                                                                     |
|---------------------------------|----------------------------------------|----------------------------------------|--|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Type                            | <input type="checkbox"/> Powerbox mini | <input type="checkbox"/> Powerbox mini |  | CE                                                                                  |  |
| Nominal Energy                  | 2.4kWh                                 | 4.8kWh                                 |  |                                                                                     |                                                                                     |
| Voltage Range                   | 40.5V~54V                              | 40.5V~54V                              |  |  |  |
| Nominal Voltage                 | 48V                                    | 48V                                    |  |                                                                                     |                                                                                     |
| Max.Charging Current            | 50A                                    | 100A                                   |  |  |  |
| Max.Discharging Current         | 50A                                    | 100A                                   |  |                                                                                     |                                                                                     |
| Ambient Temperature             | -10℃~50℃                               | -10℃~50℃                               |  |                                                                                     |                                                                                     |
| Protection Class                | I                                      | I                                      |  |                                                                                     |                                                                                     |
| IP Grade                        | IP65                                   | IP65                                   |  |                                                                                     |                                                                                     |
| S/N:                            |                                        |                                        |  |                                                                                     |                                                                                     |



Battery voltage is higher than safe voltage, direct contact may cause 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.

## 2 Product Specification

### 2.1 Size and Weight

Table 2-1 PowerDepot H5 series device model

| Specification Model | Nominal Voltage | Nominal Capacity | Dimension (mm) | Weight (kg) | IP Level |
|---------------------|-----------------|------------------|----------------|-------------|----------|
| PowerDepot H5 -5.0  | 48V             | 100Ah            | 574*228*600mm  | 65kg        | IP65     |
| PowerDepot H5 -2.5  | 48V             | 50Ah             | 574*228*600mm  | 44kg        | IP65     |

### 2.2 Performance Parameter

Table 2-2 PowerDepot H5 performance parameter

| Item                  | PowerDepot H5 -2.5 | PowerDepot H5 -5 |
|-----------------------|--------------------|------------------|
| Nominal Voltage(V)    | 48V                | 48V              |
| Work Voltage Range(V) | 42~54              | 42~54            |
| Nominal Capacity(Ah)  | 50Ah               | 100Ah            |
| Nominal Energy(kWh)   | 2.4                | 4.8              |
| Nominal Power(kW)     | 0.7                | 1.5              |
| Max Power(kW)         | 2.4                | 4.8              |
| 1S Peak Power(kW)     | 2.64               | 5.28             |
| 1S Peak Current(A)    | 55                 | 110              |
| Charging Current(A)   | 25                 | 50               |
| Discharge Current(A)  | 25                 | 50               |

### 2.3 Interface Definition

This section elaborates on interface functions of the front panel of the device.

Figure2-1 PowerDepot H5 the sketch of front interface.

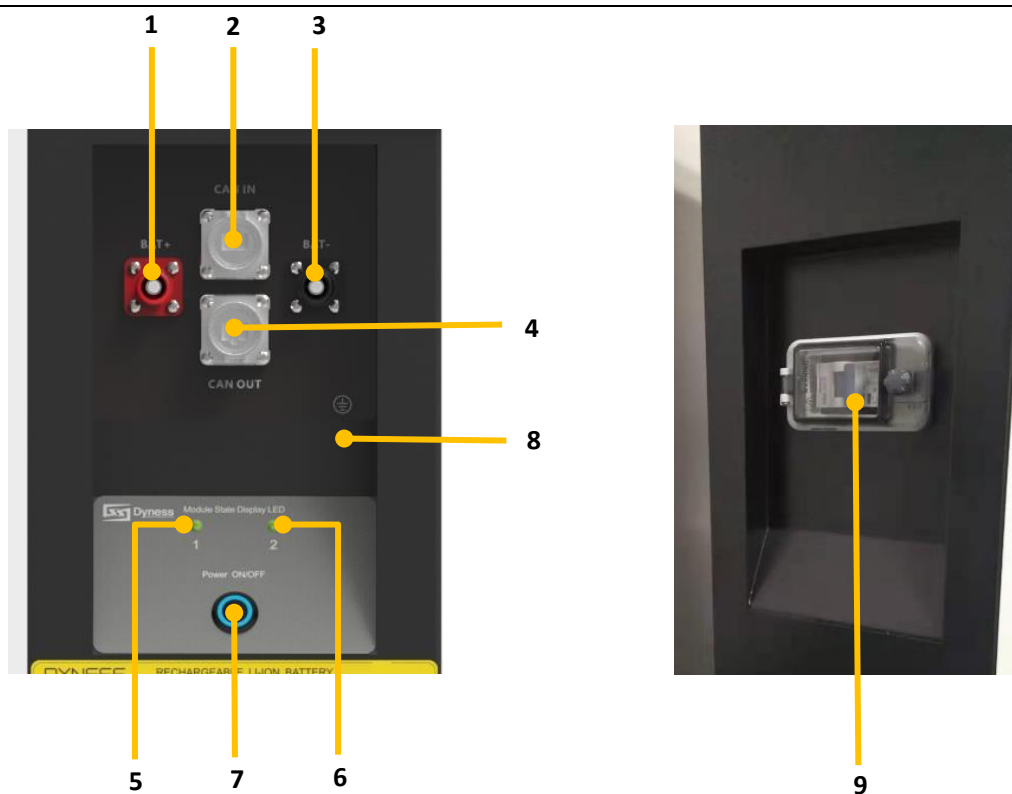


Table 2-3 Interface Definition

| Item | Name            | Definition                                                                                                                                                                                                                                                                                                                                                                   |
|------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Positive socket | The battery DC output positive pole, which is connected to the positive pole of the inverter through the cable                                                                                                                                                                                                                                                               |
| 2    | COM IN          | When the system is used independently:<br>The CAN/RS485 socket is connected to the inverter CAN/RS485 interface through the communication cable.<br>When the system is used in parallel:<br>This CAN/RS485 communication socket is connected to the COM OUT interface of the previous PowerDepot H5 through communication cable.<br>(Factory default CAN communication mode) |
| 3    | Negative socket | The battery DC output negative pole, which is connected to the negative pole of the inverter through the cable                                                                                                                                                                                                                                                               |
| 4    | COM OUT         | When the system is used independently:<br>This CAN/RS485 socket is a reservation interface<br>When the system is used in parallel:<br>This CAN/RS485 communication socket is connected to the COM IN interface of the next PowerDepot H5 through communication cable.<br>(Factory default CAN communication mode)                                                            |
| 5    | LED1            | Module 1 status indicator light                                                                                                                                                                                                                                                                                                                                              |

| Item | Name                    | Definition                                                                                                                                                                                                                                                                                                     |
|------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6    | LED2                    | Module 2 status indicator light                                                                                                                                                                                                                                                                                |
| 7    | Reset switch            | Press the switch and the battery system turn on.<br>When the battery is in the non-use state such as storage, transportation etc., it needs to be turn off by pressing the Reset switch button, and the battery system will automatically sleep after the device without external load and power for 72 hours. |
| 8    | Ground connection point | Shell ground connection                                                                                                                                                                                                                                                                                        |
| 9    | DC circuit breaker      | Circuit protection                                                                                                                                                                                                                                                                                             |

Table 2-4 LED status indicators (Take PowerDepot H5-5.0 as an example)

| State                         | Protect/Alarm/Normal | Led1                                       | Led2 | Directions                                                                                                                                     |
|-------------------------------|----------------------|--------------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Shut down                     |                      | off                                        | off  | All off                                                                                                                                        |
| Stand-by/Charging/Discharging | Normal               | ●                                          | ●    | Always on, $11\% \leq \text{SOC} \leq 100\%$                                                                                                   |
|                               | Alarm                | ●                                          | ●    | Always on, Corresponding module alarm or $0\% < \text{SOC} \leq 10\%$                                                                          |
|                               | Protection           | ●                                          | ●    | Flashing, (Corresponding module protection be activated / Over-discharge protection / Over-current protection / Temperature abnormality, etc.) |
| Other case                    | Alarm                | Yellow, green and red flash alternately    |      | All module address assignments in the system are incomplete                                                                                    |
|                               |                      | The master PowerDepot H5 LED1 yellow flash |      | Communication failure between batteries                                                                                                        |

## 2.4 Battery Management System(BMS)

### 2.4.1 Voltage Protection

#### Low Voltage Protection in Discharging:

When any module cell voltage is lower than the rated protection value during discharging, the over-discharging protection be activated, and the battery buzzer makes alarm sound. Then battery system stops supplying power to the outside. When the voltage of each cell recovers to rated value and total voltage restored to above 45V, the protection is released.

#### Over Voltage Protection in Charging:

During charging stage, the system will stop charging when the total voltage of the battery pack is higher than rated value or the voltage of any single cell reaches the protection value. When the total voltage returns to below 52V and the cell voltage back to below the rated protection value, the protection is released.

## 2.4.2 Current Protection

### **Over Current Protection in Charging:**

When the charge current of each module  $> 45A$ , current limit protection mode is activated, current will be limited to 5A, protection is removed after rated time delaying 10S. Circulate like this until the current is lower than 45A.

### **Over Current Protection in Discharging:**

When the discharge current is higher than the protection value 55A, the battery buzzer alarms and the system stops discharging. The system is released from protection after the rated delay time of 1min.



### **Note:**

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

## 2.4.3 Temperature Protection

### **Low/Over temperature protection in charging:**

When battery's temperature is beyond range of  $-5^{\circ}C \sim +55^{\circ}C$  during charging, temperature protection be activated, device stops charging. The protection is released when it back to rated range of working temperature.

### **Low/Over temperature protection in discharging:**

When battery's temperature is beyond range of  $-20^{\circ}C \sim +55^{\circ}C$  during discharging, temperature protection be activated, device stops supplying power to the outside. The protection is released when it back to rated range of working temperature.

## 2.4.4 Other Protection

### **Short Circuit Protection:**

When the battery is activated from the off state, if a short circuit occurs, the DC circuit breaker will respond first. If the DC circuit breaker does not operate, the short circuit protection function of BMS will be activated automatically and cut off the device's output.

### **Self Shutdown:**

When device have no connection of external loads, power supply and communication equipment for over 72 hours, the device will go into hibernation automatically.



### **Caution**

The maximum operating current required for the electrical load shall be less than the maximum discharge current capacity of the battery.

## 3 Installation and Configuration

### 3.1 Preparations for installation

#### Safety Requirement

The product can only be installed by personnel who have been trained in the power-supply system and have sufficient knowledge of the electrical 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:  $-20^{\circ}\text{C} \sim +55^{\circ}\text{C}$

- Charging temperature range is  $0^{\circ}\text{C} \sim +55^{\circ}\text{C}$ ,
- Discharging temperature range is  $-20^{\circ}\text{C} \sim +55^{\circ}\text{C}$

Storage temperature:  $-10^{\circ}\text{C} \sim +35^{\circ}\text{C}$

Relative humidity: 5% ~ 85%RH

Elevation: no more than 4000m

Operating environment: Indoor or outdoor installation should avoid the sunlight and wind, no conductive dust and corrosive gas.

The following conditions shall be met:

- Installation location should be away from the sea to avoid corrosion from brine or high humidity environment.
- The ground for product arrangement shall be flat and level.
- Ensure there is no flammable explosive materials near to the installation places.
- The optimal ambient temperature is  $15^{\circ}\text{C} \sim 30^{\circ}\text{C}$
- Keep away from dust and messy zones

### 3.1.2 Tools and data

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

Table 3-1 Tool instrument

| Name                           |                      |
|--------------------------------|----------------------|
| Screwdriver (Slotted、Phillips) | Multimeter           |
| Torque wrench                  | Clamp current meter  |
| Diagonal pliers                | Insulation tape      |
| Pointed nose pliers            | Temperature meter    |
| Pliers to hold the wire        | Anti-static bracelet |
| Stripping pliers               | Cable tie            |
| Electric drill                 | Tape measure         |

### 3.1.3 Technical preparation

#### Electrical interface check

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

- Confirm whether the user's equipment, the PV equipment or other power supply equipment has the DC output interface, and measure whether the output voltage of the interface meets the requirements of the voltage range of table 2-2
- Verify the maximum discharge current capacity of the user's equipment, the PV equipment or other power supply equipment. The DC standby interface, and the maximum discharge current shall be higher than the maximum charging current of the products used in table 2-2.
- If DC interface maximum discharge capacity of the user's equipment is less than the maximum charging current of products using in table 2-2, the user's interface should have the power equipment of DC current limiting function to ensuring the normal work of user equipment.

#### The security check

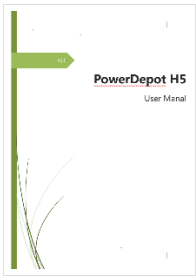
- Firefighting equipment should be arranged near the equipment, such as portable dry powder fire extinguisher.
- Automatic fire fighting system shall be provided for the case where necessary.
- Flammable, explosive and other dangerous materials placed beside the battery are prohibited.

### 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, so as to prevent from being exposed to sunlight 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 professional 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 packaging is damaged, it must be inspected and recorded in detail.

Packing list is as follows:

|                                                                                                                                                  |                                                                                                                                            |                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
|  <p>Battery×1</p>                                               |  <p>Battery bottom bracket ×1</p>                         |  <p>Support bracket ×2</p>                   |
|  <p>M6 bolt ×8<br/>Fixing battery box with battery bracket</p> |  <p>Power cable ×2<br/>connect battery with inverter</p> |  <p>Standard<br/>Communication cable ×1</p> |
|  <p>User manual ×1</p>                                        |  <p>Positioning cardboard×2</p>                         |  <p>Expansion screw ×8</p>                 |
|  <p>120ΩCAN resistor ×1</p>                                   |  <p>RJ45 Waterproof connector ×2</p>                    |                                                                                                                                 |

### 3.1.5 Engineering coordination

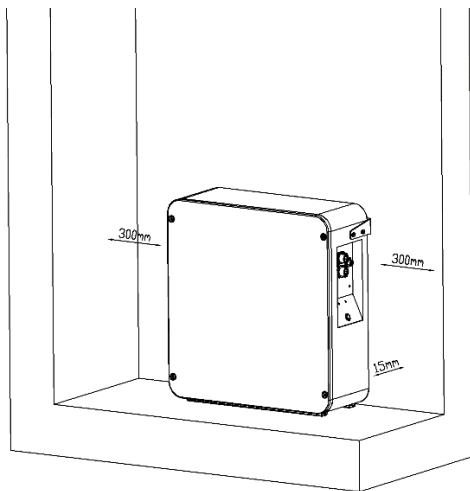
Attention should be paid to the following items before construction:

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

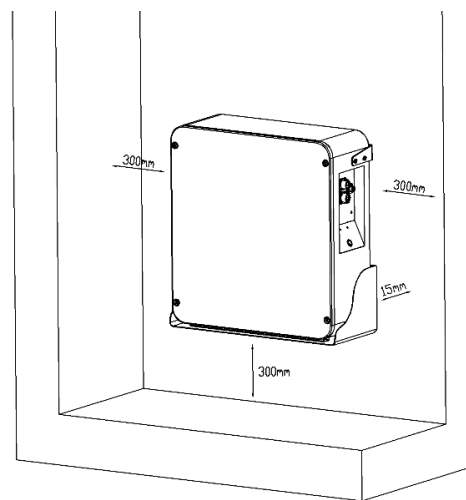
## 3.2 Equipment installation

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



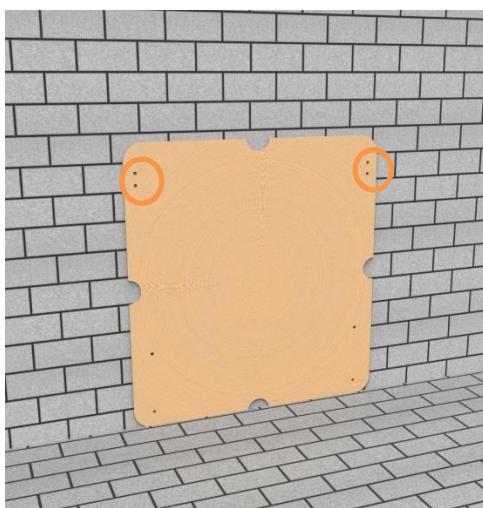
Wall installation

Table 3-2 Installation steps

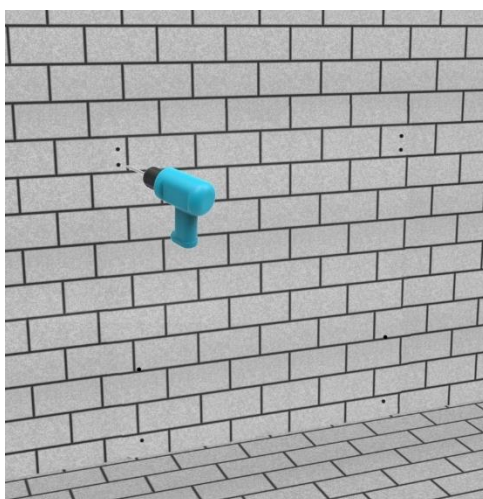
|               |                         |                                                                                                                                     |
|---------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step1</b>  | System outage           | 1. Ensure that the battery is in a shutdown state<br>(Disconnect the battery power cable and press the Reset button to turn it off) |
| <b>Step 2</b> | Mechanical installation | 1. bracket check                                                                                                                    |
|               |                         | 2. Equipment installation                                                                                                           |
| <b>Step3</b>  | Electrical installation | 1. Connect the grounding cable                                                                                                      |
|               |                         | 2 Electrical installation                                                                                                           |
|               |                         | 3. Connect inverter                                                                                                                 |
|               |                         | 4. Communication interface connection                                                                                               |

### 3.2.1 Floor installation

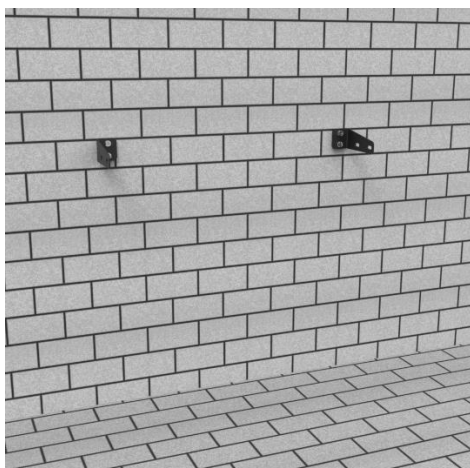
When the battery system is placed directly on the ground, a fixed support must be used to fix the top of the battery box on the wall.



1. Use the positioning cardboard (provided in accessory package) and mark the screw hole positions on the wall, as shown four holes in the picture on the left.
2. The bottom of the board must be in horizontal touch with the ground while marking the holes.



3. According to the marked position, use an electric drill to drill 4 holes with a diameter of 10mm on the wall for installing M6 expansion bolts. The depth of the holes should be greater than 70mm.



4. Fixing the shell of the M6 expansion bolt into the hole on the wall.
5. Use the M6 bolt to fix the Support bracket on the wall and control the torque force at 6NM.



6. Carry the battery box to the installation site, and place it at 15mm away from the wall surface. Connect the support bracket and the battery box with M6 bolts.

## 3.2.2 Mounted on the wall

The following accessories need to be added when install the battery on the wall.

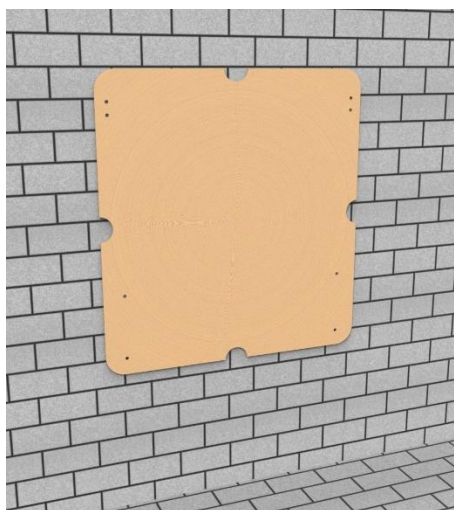


Battery bottom bracket ×1

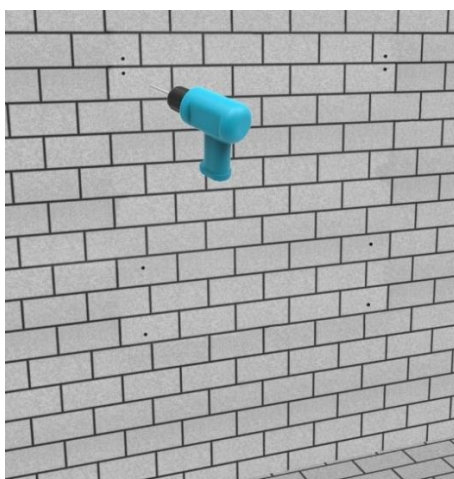


Expansion screw ×4

## Installation procedure:



1. Use the positioning cardboard (provided in accessory package) and mark the screw hole positions on the wall, as shown eight holes in the picture on the left.
2. The cardboard must be perpendicular to the ground while marking the holes.
3. The bottom of the cardboard is about 300mm to the ground.



4. According to the marked position, use an electric drill to drill 8 holes with a diameter of 10mm on the wall for installing M6 expansion bolts. The depth of the holes should be greater than 70mm.



5. Fixing the shell of the M6 expansion bolt into the hole on the wall, and fix the Support bracket and Battery bottom bracket on the wall with M6 bolts and control the torque force 6NM.



6. Carry the battery box to the installed Battery bottom bracket.  
Use M6 bolts to connect the Support bracket&bottom bracket with the box and control the torque force 6NM.

### 3.2.3 Electrical installation

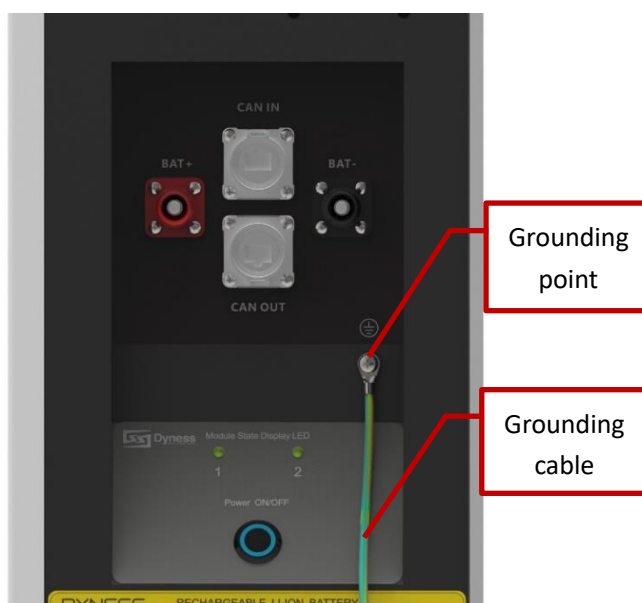
Use multimeter to measure the device before power cable connection procedure. Check the cable continuity, confirm positive and negative and mark the cable labels.

Measuring methods:

- Power cable check: select the buzzer mode of multimeter and detect the both ends of the same color cable. If the buzzer calls, it means the cable is in good condition.
- After visual testing of power line connection, the positive and negative poles of the battery shall be connected respectively to the positive and negative poles of another device (inverter).

#### Connect the battery box to the ground cable

Customer needs to prepare a M6 OT terminals and ground cables. Connect the battery shell as shown below. The sectional area of the grounding cable shall be at least 6mm<sup>2</sup> and the bolt locking torque is 6NM.



## 2 Inverter connection



### Note:

If there is any question during installation, please contact retailer to avoid damage to the equipment.

① When the system is used independently:

**Note:** Before installation, please confirm whether the DIP switch mode of No. 1 module in PowerDepot H5 is correct according to the the inverter model. For specific DIP operation methods, please refer to “3.2.4 Battery module DIP switch instruction and description.” Except for the inverter specified by the customer's special requirements, the factory default DIP switch mode of Module No.1 is DIP Switch mode 1 (ADD: 0010). If the inverter is equipped with other DIP switch mode, open the cover and set DIP switch mode of the Module No.1 to the correct mode. Before opening the front panel to operate, you must inform us the ID of the PowerDepot H5. We will record the battery ID and give device opening operation authorization. Except changing the DIP switch mode, no other operations can be done .

- The connection between inverter and battery should apply the power cable and communication cable which has been offered in your accessory package. ( the communication cable is standardized type and The applicable inverter module has been indicated on the cable Label. Please contact us if the communication cable can not match yours inverter ) The cable connection procedure showed below:
- Keep the battery system at power off state, connect the power cable to the interface on the input side of the inverter first, and then connect the power cable to the interface on the battery side.
- The battery output interface is a quick connector, and the power cable (positive, negative) plug can be directly inserted into the battery socket. The power cable cross section is 25 mm<sup>2</sup>.



### Communication interface connection

Connect the CAN IN port of the battery to the CAN or RS485 communication interface of the inverter by a RJ45 communication cable.

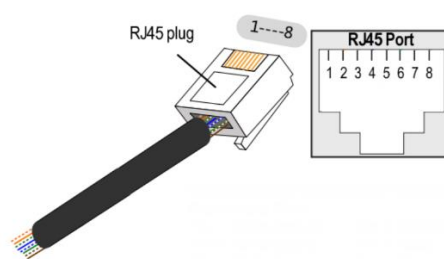
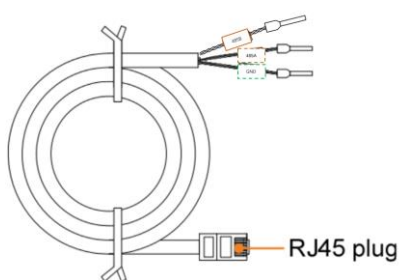
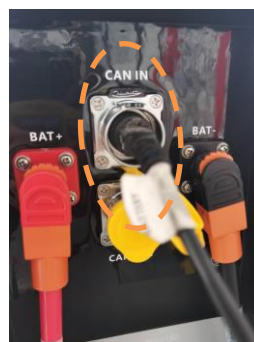
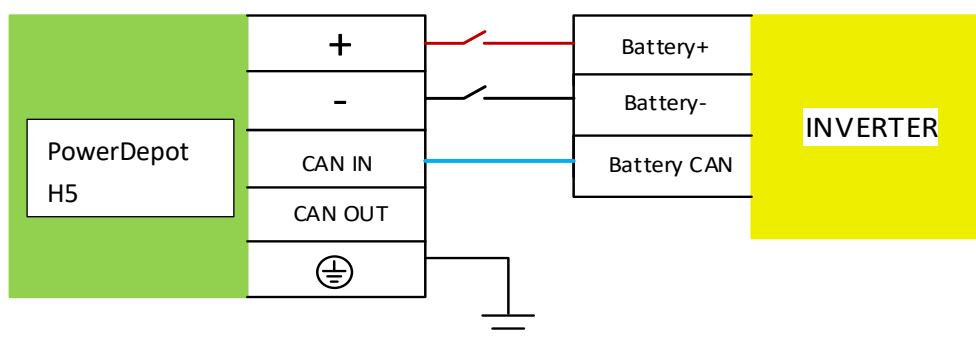


Table 3-3 Pin Definition

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

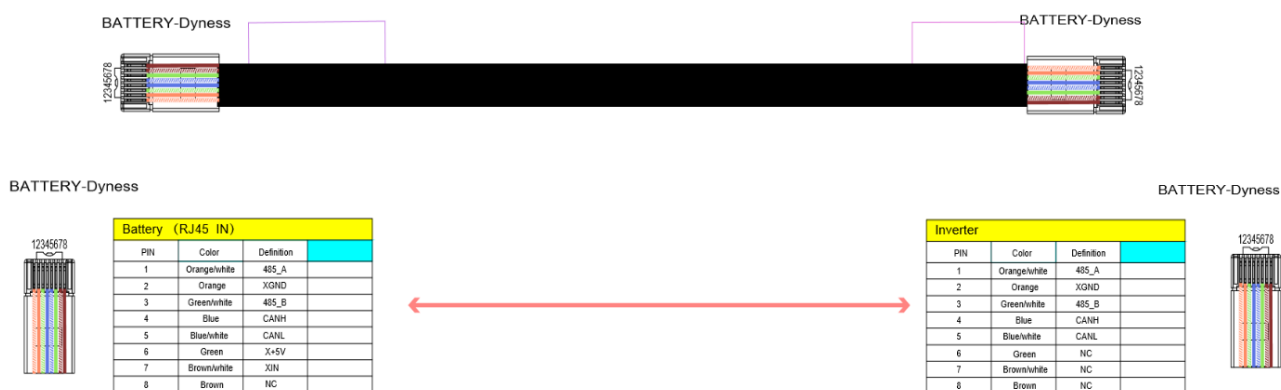


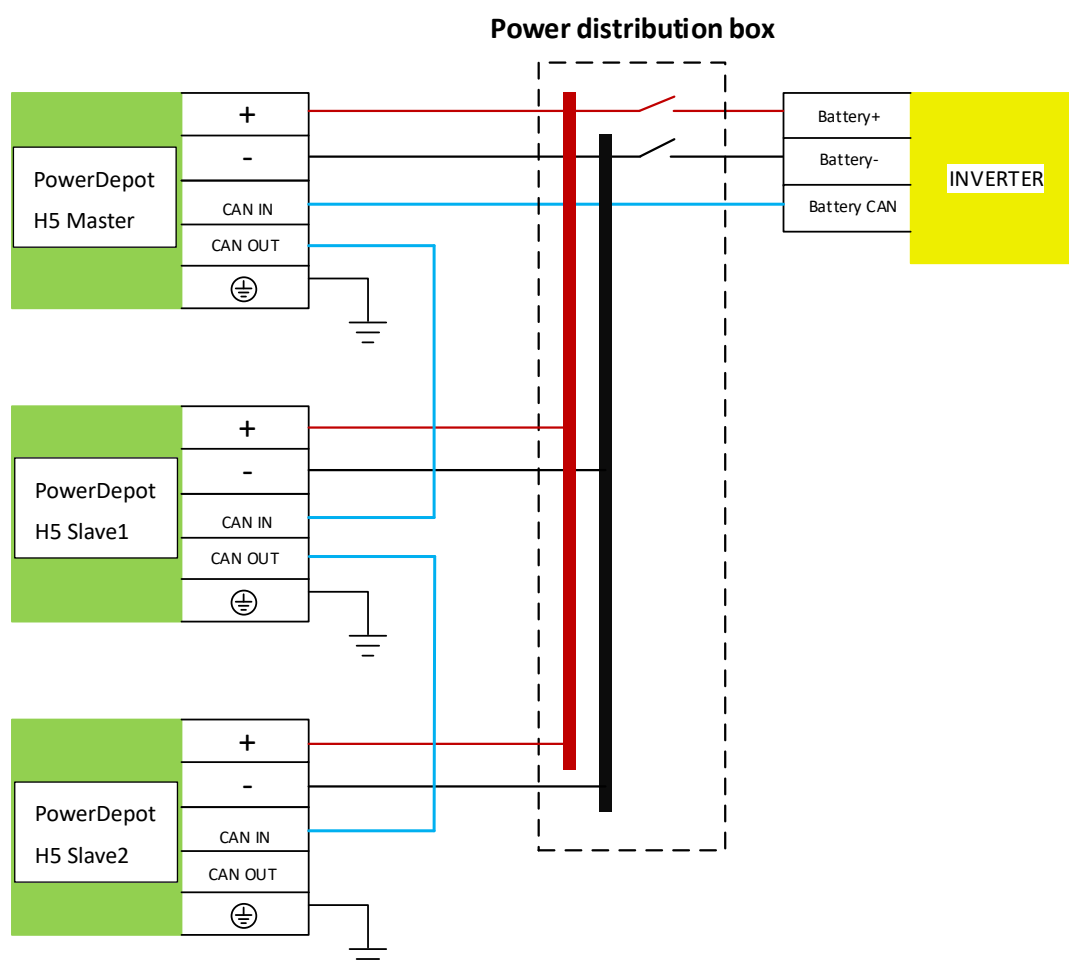
## ② When the system used in parallel:

When the system is used in parallel, it supports up to 3 PowerDepot H5 in parallel. According to the number of parallel system (Take three PowerDepot H5 in parallel as an example), the system needs to use: Power cable × 3pair, Battery-Inverter communication cable × 1PCS, Battery-Battery communication cable × 2PCS, Distribution box × 1PCS. The over-current capacity of the distribution box should be much higher than the maximum nominal current value when the load is running.

### PINOUT of system parallel communication cable:

PINOUT of Battery-Battery communication cable diagram shown as below:





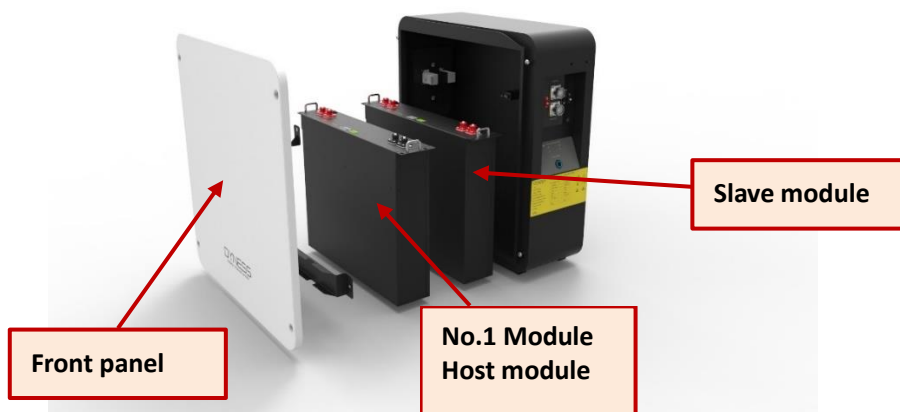
### 3.2.4 Battery module DIP switch definition and description

Table 3-4 DIP switch Definition

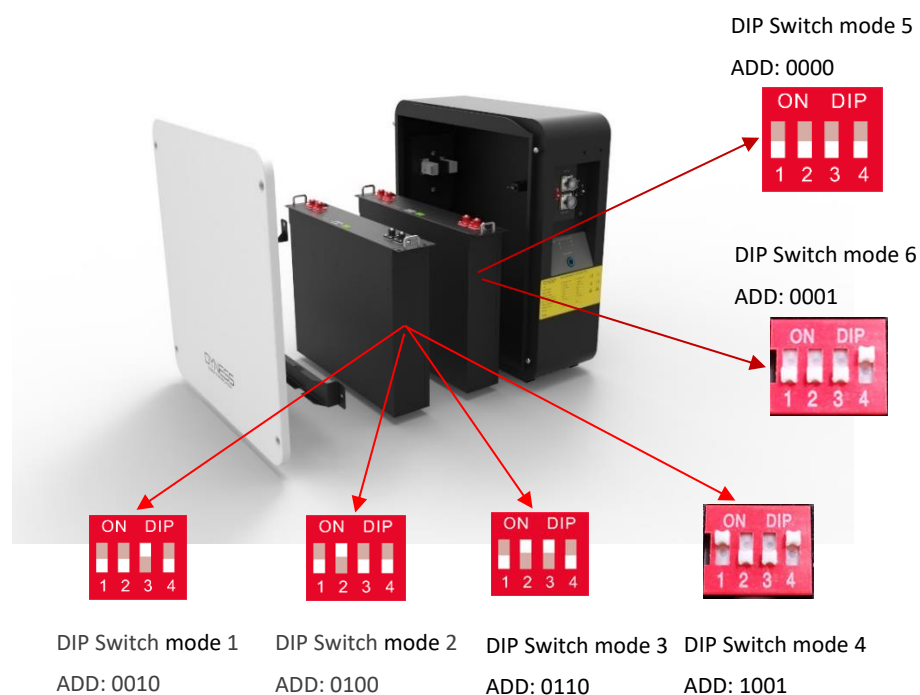
| DIP switch position (host communication protocol and baud rate selection) |    |               |                           |
|---------------------------------------------------------------------------|----|---------------|---------------------------|
| #1                                                                        | #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:

For PowerDepot H5 series system, the No. 1 module near the front panel side is the host, another one is slave.



When the battery is connected in parallel, 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 communication mode is shown as below:



1. For different inverter model, you need to set different DIP mode:

(1) Ensure the communication cable that communicates with the inverter is correct.

(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 connecting you need confirm that the DIP switch mode of the host module in PowerDepot H5 is 0010(“# 3” to “ON” , generally factory default is this 0010 mode).



(3) If the battery communicates with the Axpert-king, Axpert-VMIII, Growatt SPH/SPA(CAN comm)、GMDE、Saj(485 comm), change the host module DIP switch to 0100(“#2” to “ON”) before connecting.



(4) If the battery communicates with the Growatt SPF HVM-P/ES/WPV by RS485 communication, change the host module DIP switch to 0110(“#2” & “#3” to “ON”) before connecting.



(5) If the battery communicates with the ICC by 485 communication, change the host module DIP switch to 1001(“#1” & “#4” to “ON”) before connecting,



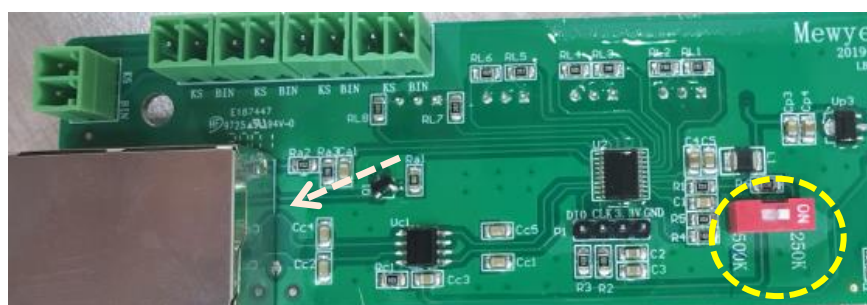
the DIP switch of the slave module should be changed to 0001(“#4” to “ON”) at the same time.



(6) If PowerDepotH5 needs to be used with ICC, the DIP on the light PCB of the PowerDepot must be changed to ON, as shown in the figure below. The DIP on the light PCB of the PowerDepot shipped by default is in “OFF” state(500K).



Factory default is in "OFF" state (500K)



Should be dialed to "ON" (250K) for ICC

(7) Generally the DIP switch of the slave module no need to be changed, keep it 0000; But for ICC, it needs to be changed to 0001.

(8) When the PowerDepot H5 are used in parallel, you need set the master PowerDepot DIP switch mode as above, and set all the modules DIP switch in slaves PowerDepot to 0000 (include the host module in slave PowerDepot), it's 0001 for ICC, this is very important.

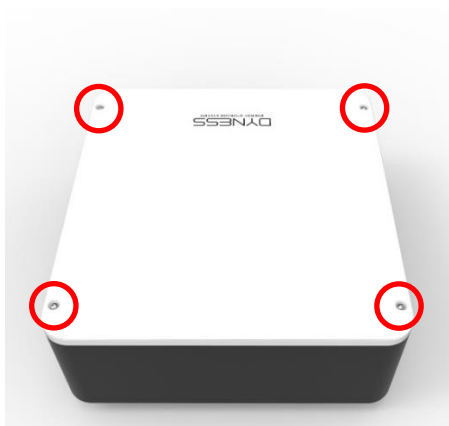
Note: For more information of matching inverter brands, please subject to the latest document  
<The list of compatibility between Dyness ESS and Inverters>.

## Caution

1. The DIP switch Mode 4 and Mode 6 is only for ICC (a special communication device for some no-communication inverter), it's a special firmware in PowerDepot H5, different from general firmware, so if customers want to use that, please contact dyness to confirm.
2. Generally factory default DIP switch status of the host module in PowerDepot H5 is Mode 1. When they are used in parallel, all the slave PowerDepot H5 systems need to be opened the cover and change the DIP switch of the host module to Mode 5 (i.e. ADD: 0000), the master PowerDepot no need change.

Proceed as follows:

- a. Remove the four screws on the cover and open the cover.



- b. Find the red DIP switch on the host module and confirm the status of the DIP switch.



- c. Set the DIP switch to the original state (Mode5: i.e. ADD: 0000)



- d. Re-install the cover with four screws which were removed in step a.



### Note:

- Confirm the positive and negative interface of battery output terminal and inverter input terminal. The red power cable is for connection of the battery's positive to inveter's positive, and the black power cable is for the connection of battery's negative to inveter's negative. Before connection, it is necessary to confirm the charge and discharge parameters of the inverter interface.

Voltage and current should meet the requirements of Table 2-2 battery performance parameters.

- When you use battery in parallel, it doesn't need to change the DIP switch of the host module in the master PowerDepot H5 which communicates with the inverter directly.
- **The following operations can only be performed after being authorized by us:**
- How to judge that the communication between PowerDepot H5 and PowerDepot H5 is normal:
  1. 1. If there is communication between the inverter and battery system, it can be judged by the maximum charge and discharge current value on the inverter sent by the battery.

$$\frac{(\text{The maximum charge and discharge current value dispiled on the inverter})}{(\text{The maximum charge and discharge current value of one battery module})} = \text{number of modules}$$

If the equation holds after calculation, it means communication between PowerDepot H5 and PowerDepot H5 is normal.

2. If the PowerDepot H5 light board shows three different colors flash alternately, it means the communication between PowerDepot H5 is fault.

Table 3-3 Battery& Inverter power matching table

| Power of<br>Hybrid Inverter/<br>Off-grid Inverter | PowerDepot H5       |                    |
|---------------------------------------------------|---------------------|--------------------|
|                                                   | Type                | System Energy(kWh) |
| 1KW                                               | PowerDepot H5-2.5   | 2.4                |
| 2KW                                               | PowerDepot H5-5.0   | 4.8                |
| 3KW                                               | PowerDepot H5-5.0   | 4.8                |
| 4KW                                               | 2*PowerDepot H5-5.0 | 9.6                |
| 5KW                                               | 2*PowerDepot H5-5.0 | 9.6                |
| 6KW                                               | 2*PowerDepot H5-5.0 | 9.6                |
| 8KW                                               | 3*PowerDepot H5-5.0 | 14.4               |

|                  |             |                                                                                                                                                                                             |
|------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equipment<br>Use | Charging    | a) The battery's long-term continuous charging current should be $\leq 0.5C$<br>b) If the battery remaining capacity is empty, please charge it within 48 hours after the battery is empty. |
|                  | Discharging | c) The long-term continuous discharge current of the battery should be $\leq 0.5C$<br>d) The recommend maximum depth of discharge (DOD)of Battery PACK is no more than 85%.                 |

### 3.2.5 Battery parameter settings on the inverter

Max Charging(Bulk) Voltage: 53.5V

Absorption Voltage: 53V

Float Voltage: 52.5V

Shut Down(cut off) Voltage: 47V

Shut Down(cut off) SOC: 20%

Restart Voltage: 49V

Max Charge Current: PowerDepot H5-2.5=25A, PowerDepot H5-5.0=50A

Max Discharge Current: PowerDepot H5-2.5=25A, PowerDepot H5-5.0=50A

Capacity: PowerDepot H5-2.5=50Ah, PowerDepot H5-5.0=100Ah

### 3.2.6 Register on the website after installation

After the battery system installation is completed and the running is normal, you need to log in to the DYNESS official website to register the product installation and use information to make the product warranty effective. Please follow the instructions on the website to register.

<http://www.dyness-tech.com.cn>



Service



Sign Up

## 4 Use, maintenance and troubleshooting

### 4.1 Battery system usage and operation instructions

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

- 1 Check whether the breaker is in OFF state.



- 2 Press the battery power button, the power button LED light is on, and 2 LED indicator lights will be on and show the green color after self-check.



After pressing the power button, if the battery status indicator lights shows abnormally, please refer to the "4.2 Alarm description and processing". If the failure cannot be eliminated, please contact the retailer timely.

- 3 Use a voltmeter to measure whether the voltage across the BAT + / BAT- terminals of the inverter is higher than 42V, and check whether the voltage polarity is consistent with the input polarity of the inverter. If the voltage across the terminals BAT + / BAT- of the inverter is higher than 42V, which means the battery has begun to work normally.
- 4 After confirm the battery output voltage and polarity are correct, turn on the inverter, then turn on the circuit breaker switch.

- 5 Check whether the indicator light for the inverter and the battery connection (the communication indicator and the battery access status indicator) is in normal condition. If normal, the connection between the battery and the inverter is completed. If the indicator light show abnormal, please check the inverter manual or contact the local retailer.

## 4.2 Alarm description and processing

When protection mode is activated or system failure occurred, the ALM indicator on the front panel will alarm. User can inspect the system through management software to check specific alarm class and take appropriate action.

### 4.2.1 Alarm and countermeasure for affecting system output

If there are any abnormalities affecting the output, such as battery cell in the battery module occurs over-current protection during charge/discharge, under-voltage protection, and temperature protection in the system, please refer to Table 4-1.

Table 4-1 Main alarm and Protection

| Statue          | Alarm category       | Alarm indication                   | Processing                                                     |
|-----------------|----------------------|------------------------------------|----------------------------------------------------------------|
| Charge state    | Over-current         | RED light flashing<br>Buzzer start | Reduce the charging current below the rated value.             |
|                 | High temp protection | RED light flashing                 | Stop charging and find out the cause of the trouble.           |
| Discharge state | Over-current         | RED light flashing<br>Buzzer start | Stop discharge and reduce discharge current below rated value. |
|                 | High temp protection | RED light flashing                 | Stop discharging and find out the cause of the trouble.        |
|                 | Low voltage alarm    | RED light flashing<br>Buzzer start | Start charging.                                                |
|                 | SOC less than 10%    | Yellow light on                    | Start charging.                                                |

### 4.2.2 Alarm and countermeasure for un-affecting system output

If a low SOC alarm occurs, the battery system also issues a corresponding alarm signal. Maintainer should check the equipment according to the prompt information, determine the type and position of the fault, and take corresponding countermeasures to avoid affecting the system output. The countermeasures refer to Table 4-2.

Table 4-2 minor alarm

| Alert category               | Alarm indication                                    | Countermeasure                                           |
|------------------------------|-----------------------------------------------------|----------------------------------------------------------|
| $0\% < \text{SOC} \leq 10\%$ | System working status:<br>yellow light is always on | Stop discharging, and charge the battery system in time. |

### 4.3 Analysis and treatment of common faults

| Item | Fault phenomenon                                                           | Reason analysis                                                                         | Solution                                                                                                 |
|------|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| 1    | The indicator does not respond after the system power on                   | Make sure press and hold the power button for 3s.                                       | Check the power switch                                                                                   |
| 2    | No DC output after the system power on                                     | Check if the DC breaker is turned on                                                    | Check the status of the DC circuit breaker on the side of cabinet                                        |
| 3    | No DC output and red light flashing, buzzer beeping                        | Battery voltage is too low                                                              | Charging the battery system                                                                              |
| 4    | The battery cannot be fully charged                                        | Charge voltage is low                                                                   | Adjust charging voltage within 53.5V~54V range                                                           |
| 5    | The power cable sparks when system power on and ALM indicated Red light on | Power connection short-circuit                                                          | Turn off the battery, check the cause of the short circuit                                               |
| 6    | The host of PowerDepot H5 LED1 is yellow flashing                          | Communication fault between PowerDepot H5, or between internal modules in PowerDepot H5 | Check the external communication cable firstly, Check the internal communication cable secondly          |
| 7    | The LED 1,2 flash alternately without stopping                             | Modules communication address distribution is faulty                                    | Check the external communication cable connection firstly.<br>Check the slave PowerDepot H5 DIP setting. |

Table 4-3 Analysis and treatment of common faults

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



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