

**GROWATT**

# All-in-One Inverter Quick Guide

**SPH 3000-6000 TL-HUB**



**Shenzhen Growatt New Energy Co.,Ltd.**

## Installation environment



Max.+50°C



Min. 0°C



RH.+5%~+95%

## Installation tools

The following tools are required for installation:



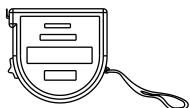
A



B



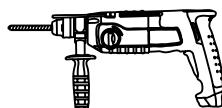
C



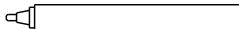
D



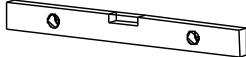
E



F



G



H

A. Allen key (5mm<sup>2</sup>)

B. Cross-head screwdriver

C. Wrench (10mm<sup>2</sup>)

D. Measuring tape

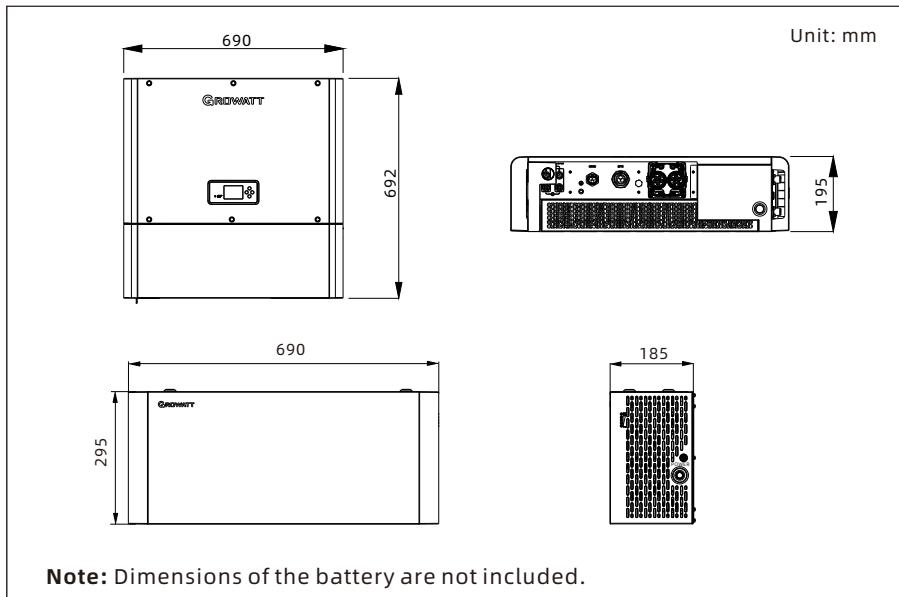
E. Multimeter

F. Hammer drill

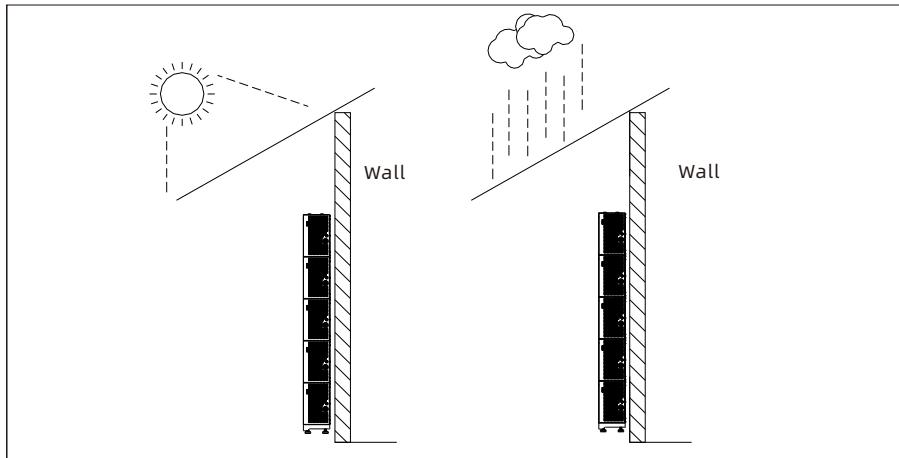
G. Marker

H. Level

## Dimensions



## Installation environment requirements

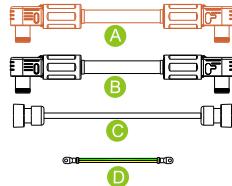
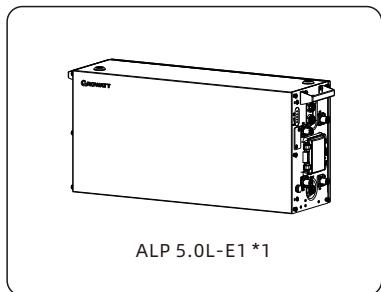


### Note:

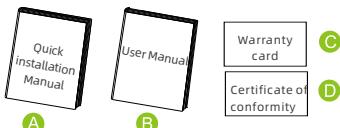
1. If the equipment is installed outdoors, please install a sun and rain shelter to protect the system from direct sunlight, rain and snow.
2. If the equipment is installed indoors, please ensure proper ventilation.
3. Keep the equipment far away from heat sources and the flammable and explosive materials.

## 1.Check

### 1-1 Packing list of the battery



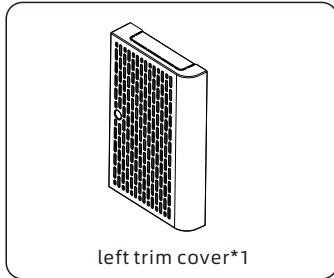
- A Positive Parallel Power cable\*1
- B Negative Parallel Power cable\*1
- C Parallel communication cable\*1
- D Parallel ground cable\*1



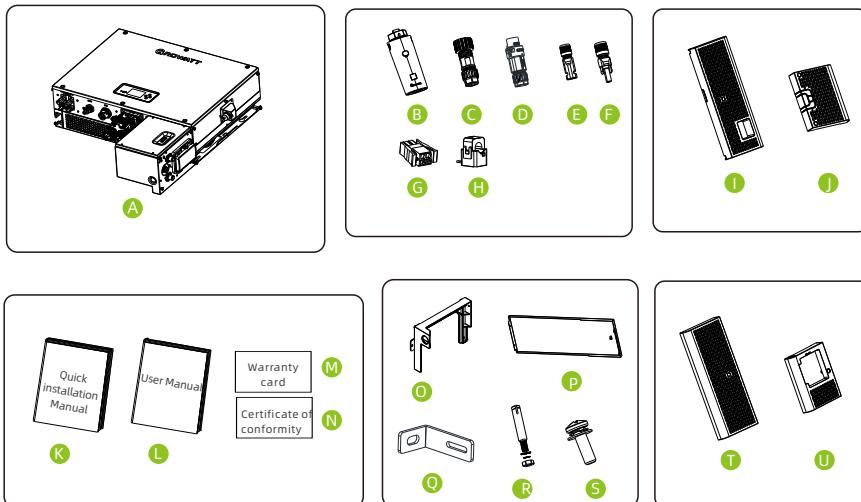
- A Quick installation Manual \*1
- B User Manual \*1
- C Warranty card \*1
- D Certificate of conformity \*1



- A Protective rubber ring \*4
- B Anti-tipping plate \*2
- C M6 expansion bolt \*2
- D M4x9 stainless steel screw \*8
- E Battery connecting piece \*2



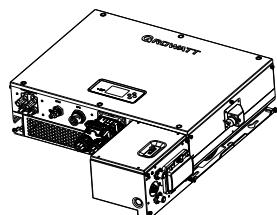
## 1-2 Packing list of the inverter



A	SPH TL-HUB*1	B	ShineWiFi*1
C	AC Grid connector*1	D	EPS connector*1
E	Mc4 connector*2	F	Dry contact connector*1
G	CT*1	H	Upper left decorative cover*1
I	Lower left decorative cover*1	J	Die cast bracket*1
K	Quick installation Manual *1	L	User Manual *1
M	Warranty card *1	N	Certificate of conformity *1
O	Die cast bracket*1	P	Small junction box decorative cover*1
Q	Anti-tip connecting piece*2	R	M6 expansion screw*2
S	M4 cross recessed pan head three combination screw*9	T	Upper right decorative cover*1
U	Lower right decorative cover*1		

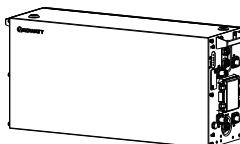
**NOTE:** The EPS connector has been pre-installed on the EPS port of the inverter before delivery.

### 1-3 Packing list of different system configuration



SPH 3000-6000TL-HUB

A



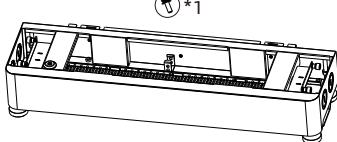
ALP 5.0L(AU)

B



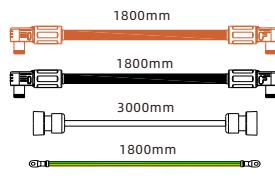
Wall bracket

C



Base

D



ALP 5.0L Parallel Cable

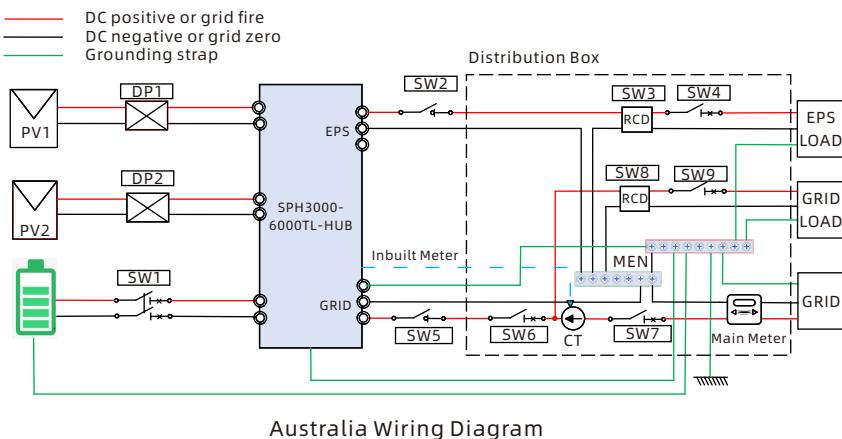
E

Installation Method	Compound Mode
Standard wall-mounted installation	A*N+B+D
Standard floor-mounted installation	A*N+C+D
Wall-mounted battery system stacked in two lines	A*N+B*2+D+E
Floor-mounted battery system stacked in two lines	A*N+C*2+D+E

#### NOTE:

1. "N" stands for the number of the battery module.
2. The SPH 3000-6000 TL-HUB All-in-One Inverter must work with at least one ALP 5.0L Battery Module (BM).

## 1-4 System Wiring Diagram



Australia Wiring Diagram

**NOTE:**

1. This figure is a wiring diagram for Australia, New Zealand and South Africa.
2. You are recommended to install the system following the system wiring diagram.

Switch type	Switch position	Switch selection
DC switch/ breaker	DP1/DP2	The inverter comes with a built-in PV input switch-disconnector compliant with requirements; follow local regulations to determine whether to install an external PV switch.
	SW1 (not required)	The inverter is equipped with the battery-side circuit breaker compliant with requirements; do not need to install an external one.
AC switch/breaker	SW5 (depends on on-site conditions)	Grid-side circuit breaker/switch-disconnector, to be installed close to the inverter side; recommended to install one when the distance between the inverter and the main distribution panel is greater than 3m or a blind spot exists between them; depends on the inverter capacity; recommended specification: ≤ 230VAC/35A

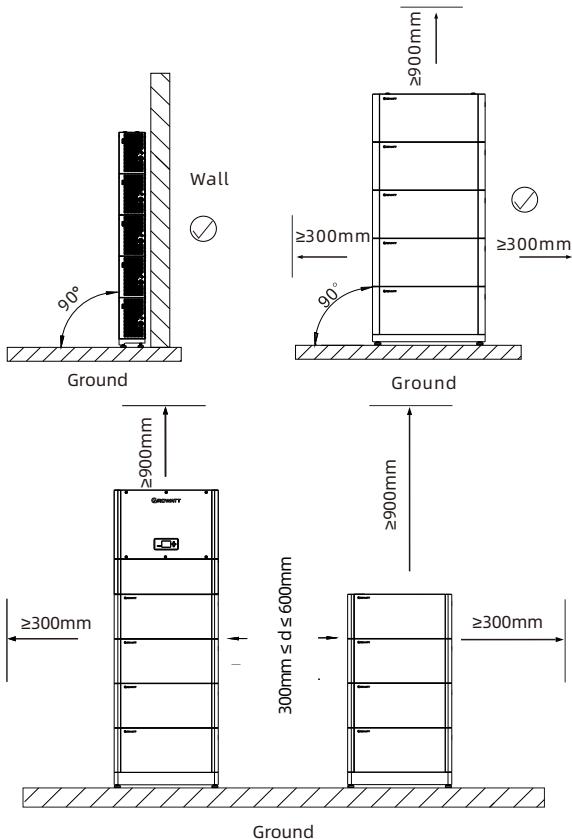
<b>Switch type</b>	<b>Switch position</b>	<b>Switch selection</b>
AC switch/breaker	SW6 (mandatory)	Grid-side circuit breaker connected to the inverter, installed in the main distribution panel; follow local regulations to determine whether to install one; depends on the inverter capacity, recommended specification: ≤ 230VAC/35A.
AC breaker	SW4/SW9 (mandatory)	Circuit breaker connected to loads, installed in customer's distribution panel; depends on the inverter capacity and the load power; recommended specification: ≤ 230VAC/35A.
	Sw2 (optional)	Off-grid output circuit breaker/switch-disconnector, to be installed close to the inverter side; not mandatory; depend on the inverter capacity and the load power; recommended specification: ≤ 230VAC/35A.
	SW7 (mandatory)	Grid input main circuit breaker, installed in the main distribution panel; depends on the inverter capacity and the household load power.
RCD	SW3/SW8 (mandatory)	Residual Current Device (RCD); recommended specifications: Type A, 30mA

## 2. Installation

### 2-1 Floor-mounted installation

**Step 1:** Make sure that the installation location is suitable for the dimensions of the system and the load-bearing capacity of the floor meets the requirements.

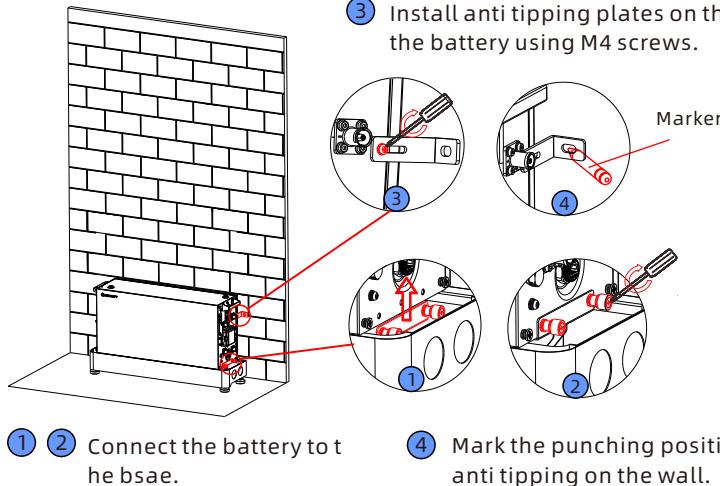
Unit: mm



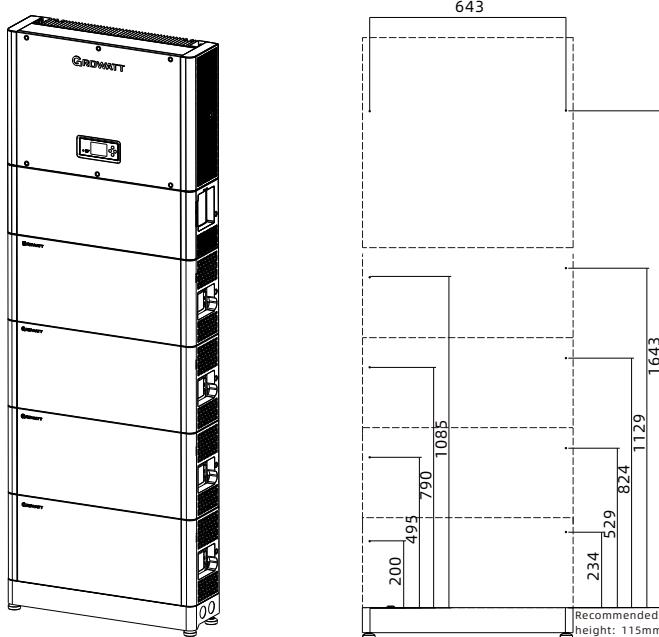
#### NOTE:

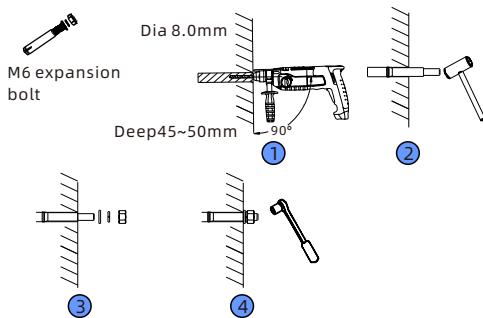
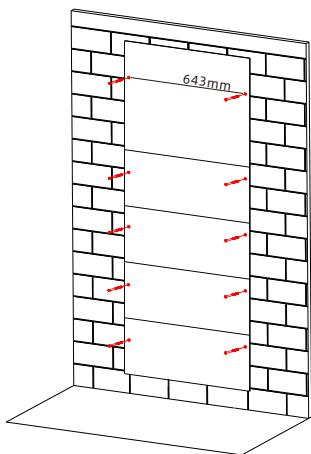
1. The battery base must be installed for floor-mounted installation.
2. A maximum of 4 battery modules can be stacked in one column. If more than 4 of them are to be configured, please install them in two columns.
3. If stacking 4 battery modules in one column cannot meet the clearance requirements, please install them in two columns.
4. When installing 4 battery modules in one column, the load-bearing capacity of the floor should be greater than or equal to 300 kg.

**Step 2:** Position the first BM onto the base and mark the hole positions for fixing the first BM using a marker.



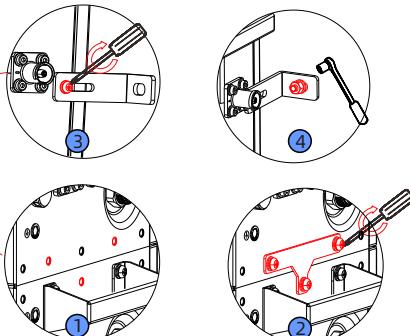
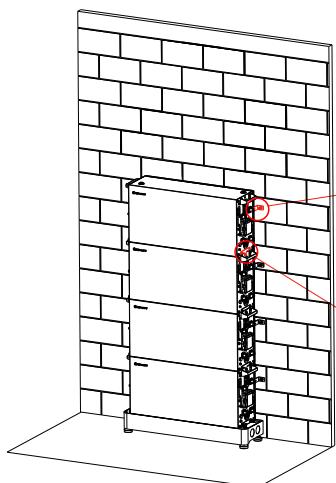
**Step 3:** Mark all hole positions with the paper drilling template and drill holes.





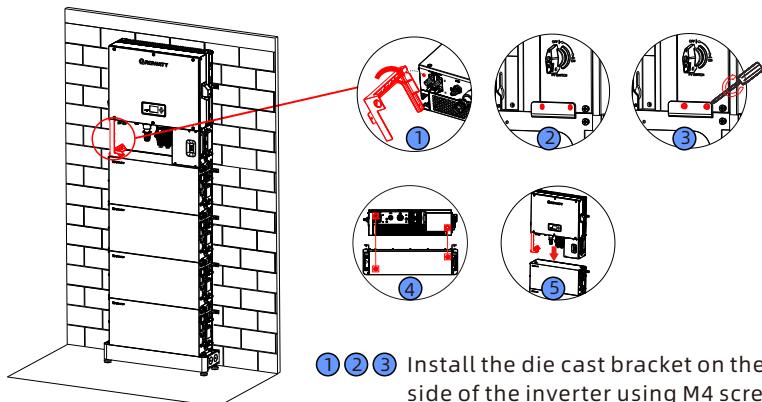
- ① Remove the battery, mark the hole positions to install the batteries.  
 ①②③④ Install the M6 expansion bolt and tighten the nut.

#### Step 4: Install and secure the BMs in turn.



- ①② Secure the connecting pieces on the both sides of the battery moudle using the M4 screws, and tighten the 6 screws.  
 ③ Install the connecting pieces on both sides and tighten the 2 screws.  
 ④ Install the anti-tipping plates on both sides to fix the modules to the wall.

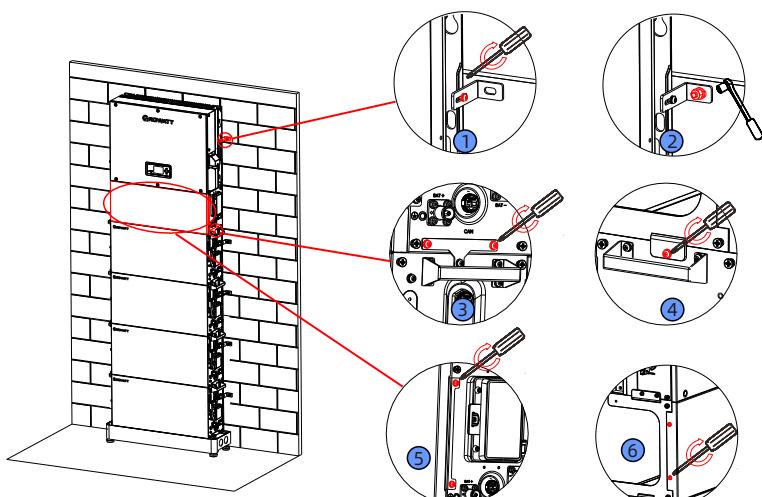
**Step 5:** Install the die cast bracket and the .



① ② ③ Install the die cast bracket on the left side of the inverter using M4 screws.

④ ⑤ When installing inverter, please note that the bottom depression of the inverter aligns with the protrusion of the battery.

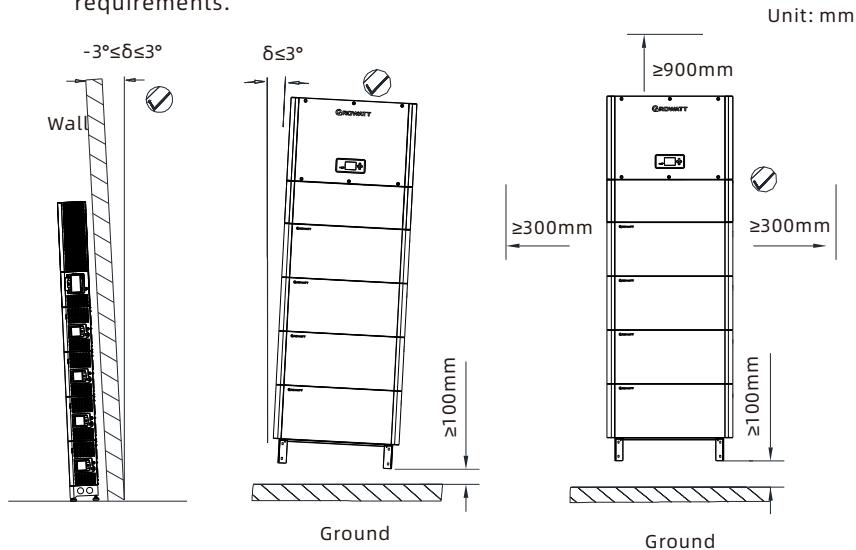
**Step 6:** Secure the inverter and install the decorative cover.



- ① ② Fix the anti tipping component to the inverter and wall using M4 screws and expansion screws respectively.  
③ Install the connecting piece between inverter and battery using M4 screws.  
④ Fix the inverter die-casting bracket to the battery using M4 screws.  
⑤ ⑥ Install the inverter front panel and secure it with M4 screws.

## 2-2 Wall-mounted installation

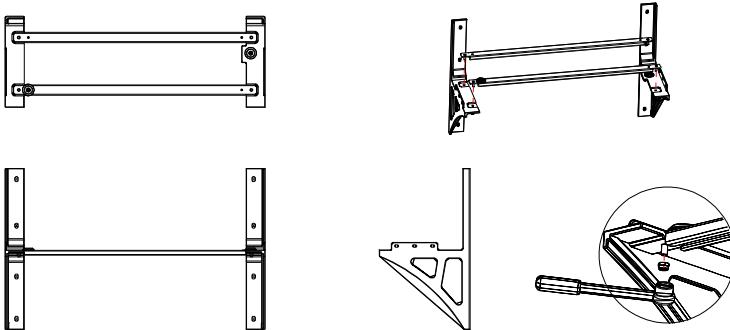
**Step 1:** Make sure that the installation location is suitable for the dimensions of the system and the load-bearing capacity of the wall meets the requirements.



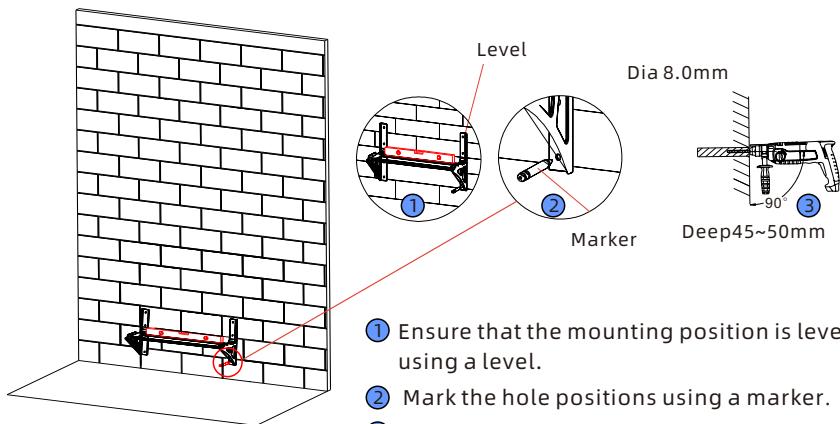
### NOTE:

1. A maximum of 4 battery modules can be stacked in one column. If more than 4 of them are to be configured, please install them in two columns.
2. When installing 4 battery modules in one column, the load-bearing capacity of the wall should be greater than or equal to 660 kg.

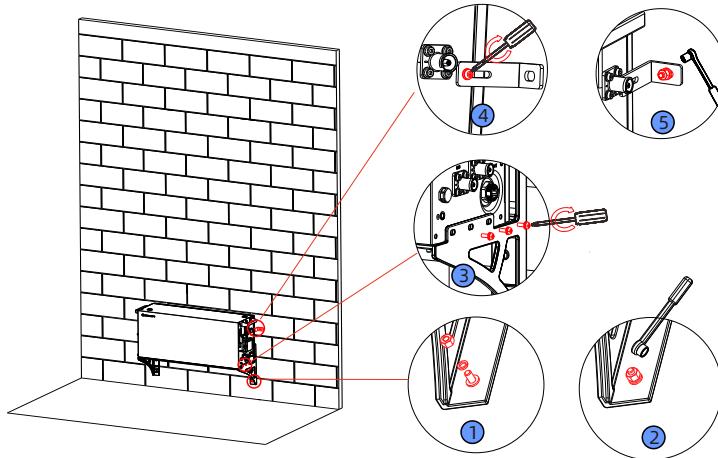
### Step 2: Assemble the wall mount bracket



**Step 3:** Confirm the mounting position of the wall mount bracket, mark the hole positions and drill holes.

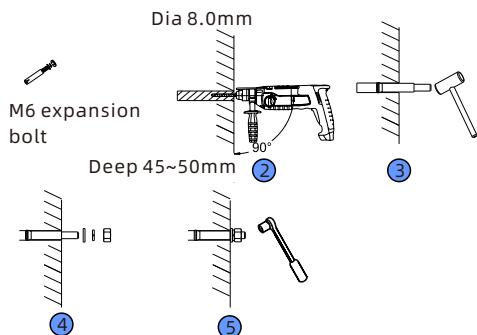
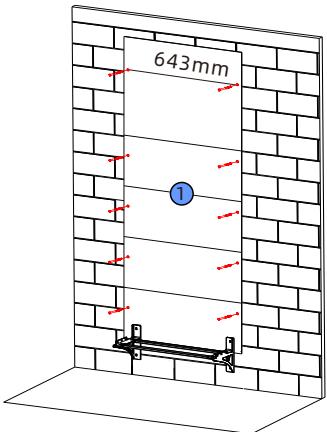


**Step 4:** Install the bracket and mark the hole positions to secure the first BM.



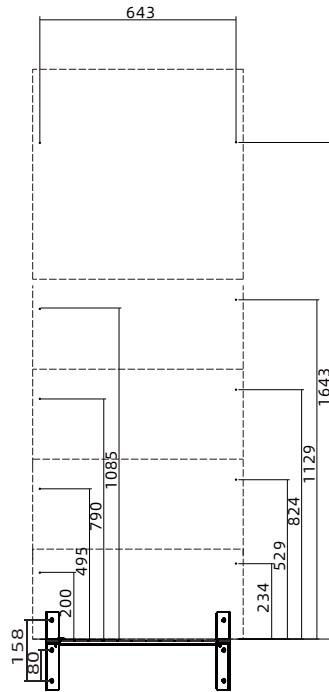
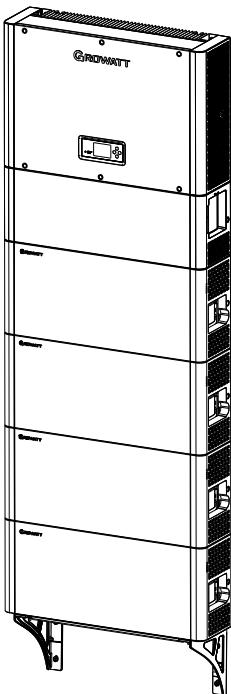
- ①② Fix the bracket to the wall using M6 expansion screws.
- ③ Fix the battery to the bracket using M4 screws.
- ④ Install anti tipping plates on the sides of the battery using M4 screws.
- ⑤ Mark the punching position of the anti tipping on the wall.

**Step 5: Mark all hole positions with the paper drilling template and drill holes.**

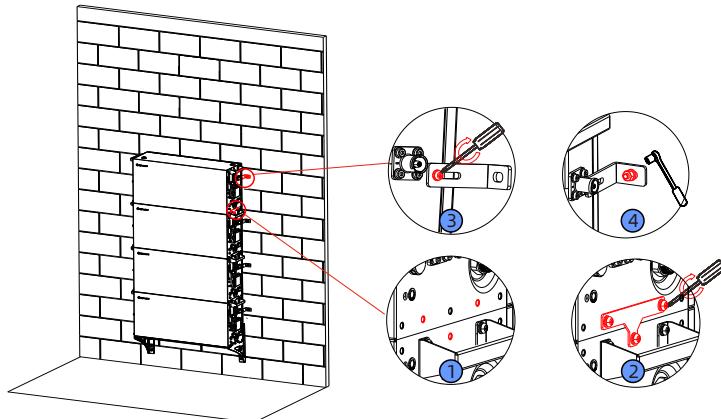


- ① Remove the battery, mark the hole positions to install the batteries.
- ② ③ ④ ⑤ Install the M6 expansion bolt and tighten the nut.

Unit: mm

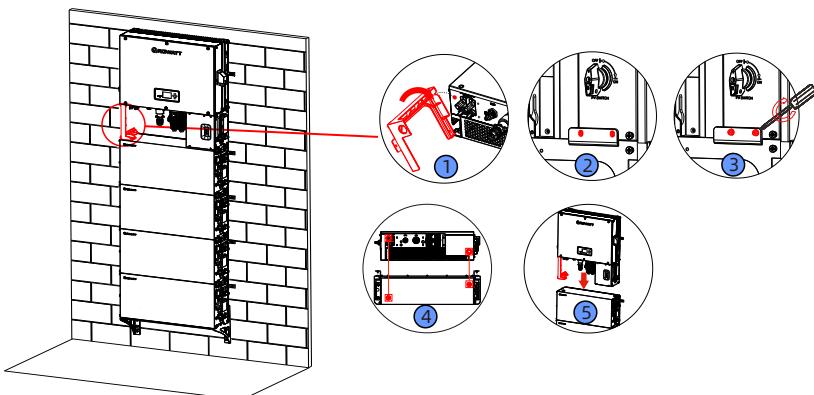


**Step 6:** Install and secure the BMs in turn.



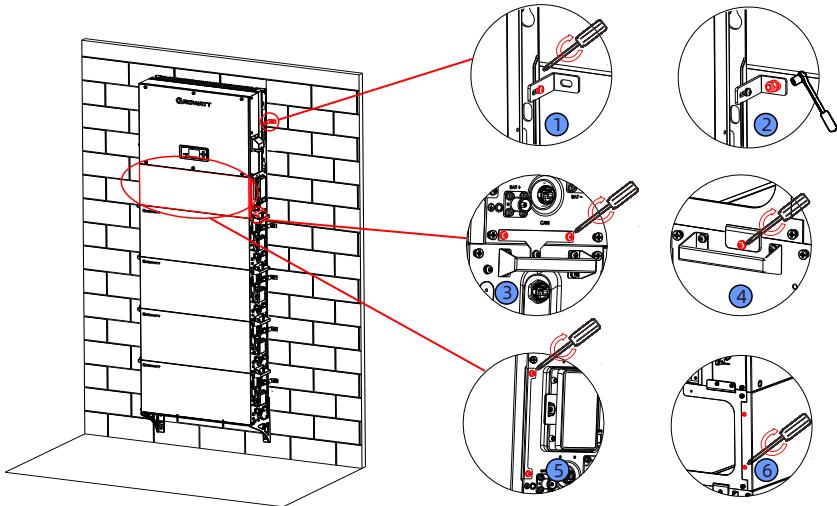
- ① ② Secure the connecting pieces on the both sides of the battery moudle using the M4 screws, and tighten the 6 screws.
- ③ Install the connecting pieces on both sides and tighten the 2 screws.
- ④ Install the anti-tipping plates on both sides to fix the modules to the wall.

**Step 7:** Install the die cast bracket and the inverter.



- ① ② ③ Install the die cast bracket on the left side of the inverter using M4 screws.
- ④ ⑤ When installing inverter, please note that the bottom depression of the inverter aligns with the protrusion of the battery.

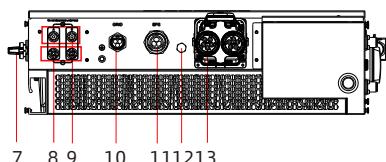
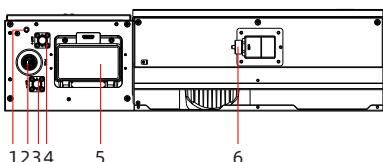
**Step 8:** Secure the inverter and install the decorative cover.



- ①② Fix the anti tipping component to the inverter and wall using M4 screws and expansion screws respectively.
- ③ Install the connecting piece between inverter and battery using M4 screws.
- ④ Fix the inverter die-casting bracket to the battery using M4 screws.
- ⑤⑥ Install the inverter front panel and secure it with M4 screws.

### 3. Connection area and terminal introduction

#### 3-1 Inverter

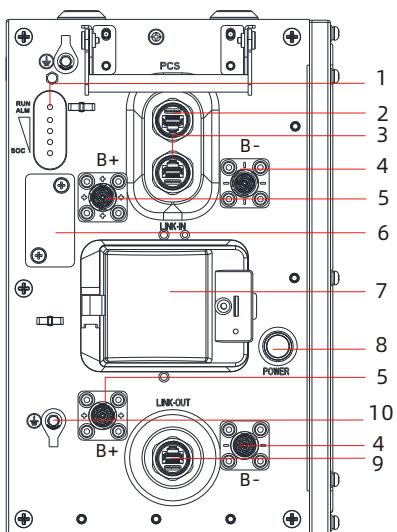


1	Ground point	Common ground point for the battery and the SPH inverter
2	CAN Port	Connected to the battery CAN communication port
3	BAT- terminal	Connected to the negative battery terminal
4	BAT+ terminal	Connected to the positive battery terminal
5	Battery circuit breaker	Used to turn on/off the battery overcurrent protection circuit breaker
6	USB Port	Connected to the datalogger and USB flash drive
7	PV Switch	Switch-disconnector to turn on/off the PV input
8	PV+ terminal	Connected to the positive input of the PV panel, including PVA+ and PVB+
9	PV- terminal	Connected to the negative input of the PV panel, including PVA- and PVB-
10	GRID terminal	Connected to the grid
11	EPS terminal	Supplying power to the loads
12	Ventilation valve	Maintaining the same pressure inside and outside of the equipment while keeping it watertight
13	Communication port	For communication and data transmission between the inverter and external devices

Description of the indicator and buttons:

Symbol	Designation	Description	
	Push button	Operate the display screen and set system parameters	
	SPH status indicator	Steady green	SPH runs normally
		Steady red	Fault state
		Blinking green	Alarm state
		Blinking red	2. Software updating

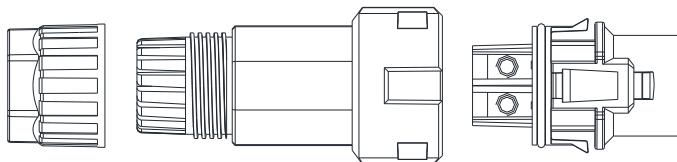
### 3-2 Battery



1	LED
2	PCS CAN communication port
3	LINK-IN CAN communication port
4	Negative battery terminal
5	Positive battery terminal
6	USB port
7	DC Breaker
8	Battery power button
9	LINK-OUT CAN communication port
10	Battery ground point

## 4. Install or remove the terminal

### 4-1 AC Grid terminal

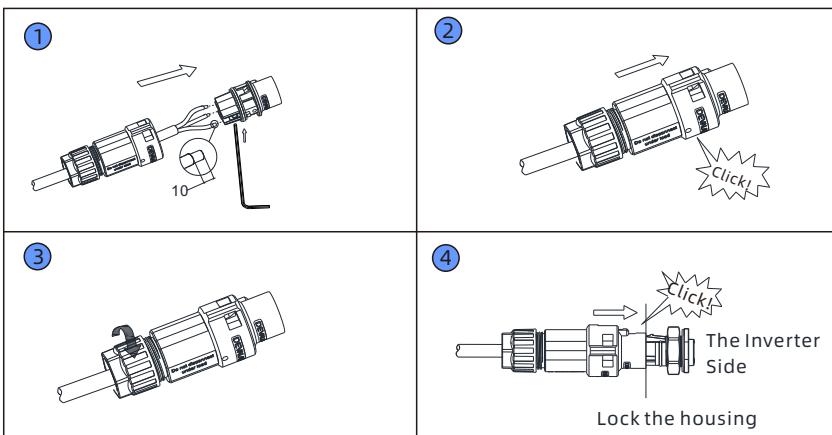


Locking nut

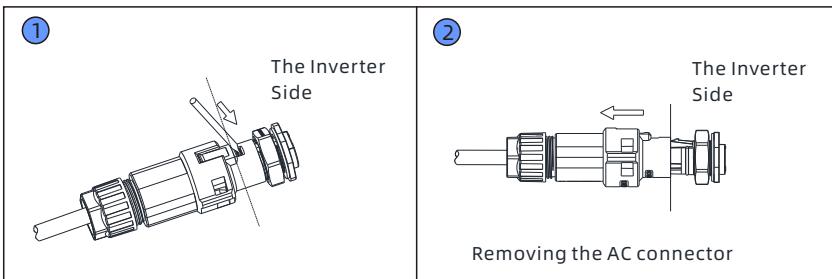
Sealing ring &  
threaded sleeve

Connection terminal

#### 4.1.1 Install the AC Grid connector

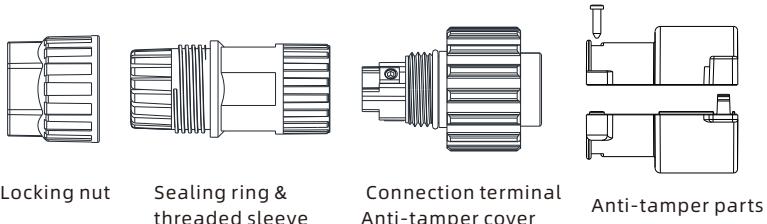


#### 4.1.2 Remove the AC Grid connector

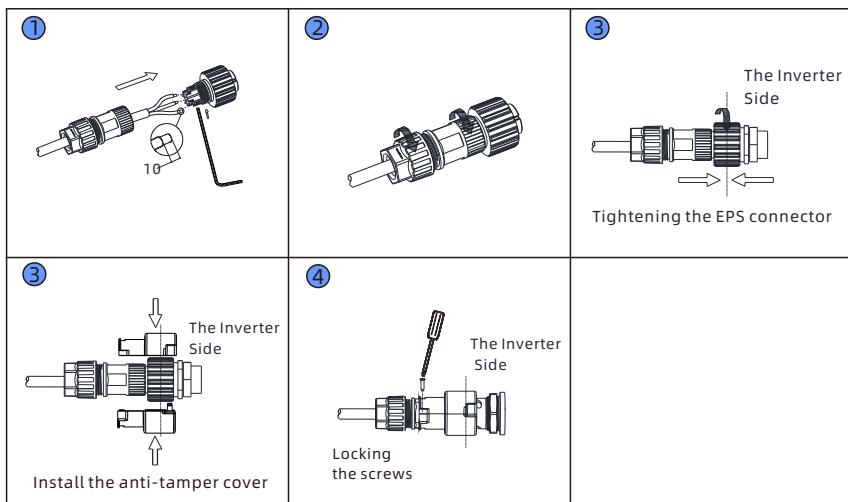


**Note:** Removing the AC Grid connector requires the use of a tool.

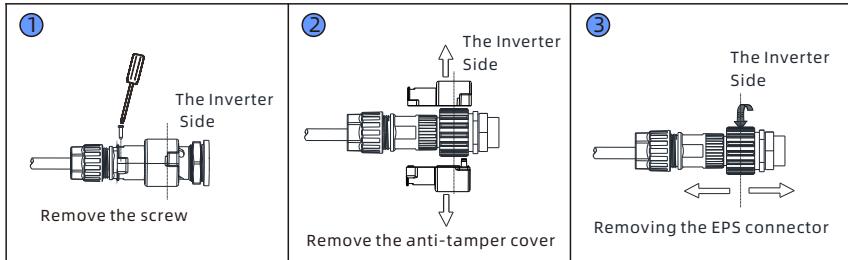
## 4-2 EPS connector (off-grid)



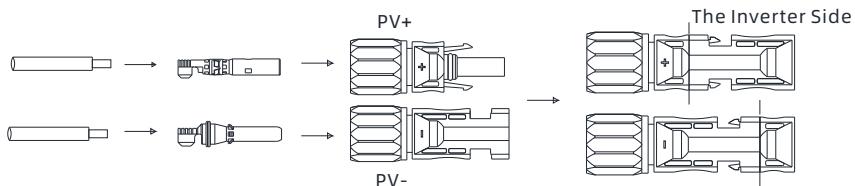
### 4.2.1 Install the EPS connector



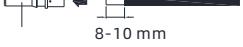
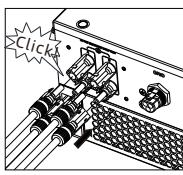
### 4.2.2 Remove the EPS connector



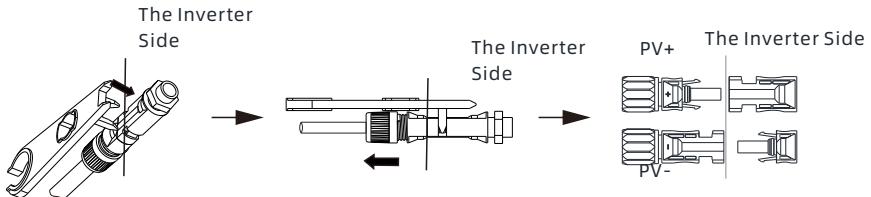
#### 4-3 PV connectors



##### 4.3.1 Install the PV connectors

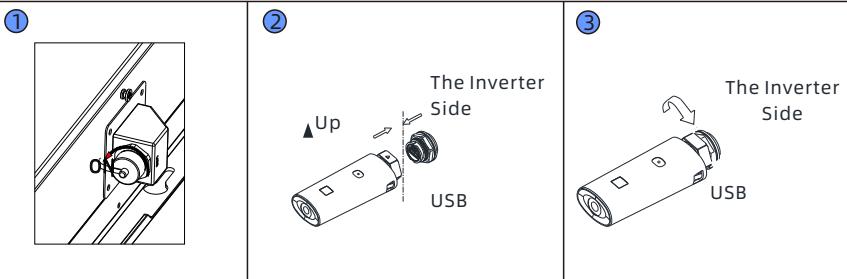
<b>1</b> Positive metal contact  Negative metal contact 	<b>2</b>  Ensure that the cable cannot be pulled out after being crimped.	<b>3</b> Positive connector  Negative connector Give the wire and crimp a slight tug to make sure they are secure.
<b>4</b> Tighten the locking nut. 	<b>5</b>  Make sure the cable polarity is correct.	<b>6</b> 

##### 4.3.2 Remove the PV connectors



## 5 Install other components

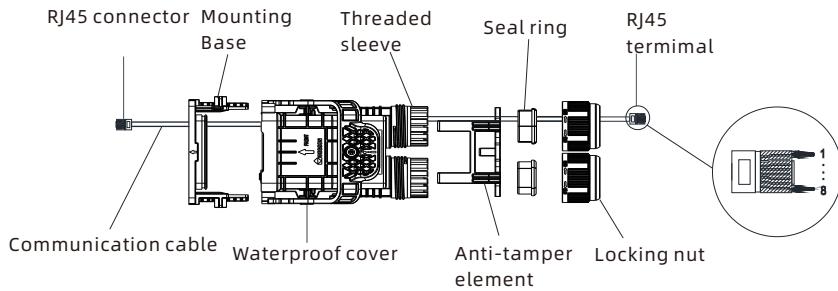
### 5-1 Install the datalogger



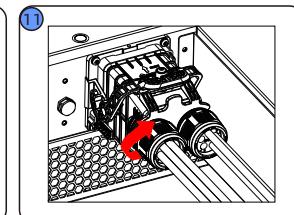
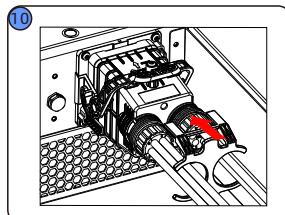
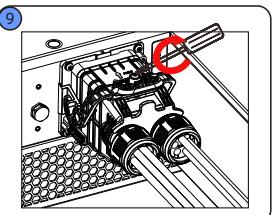
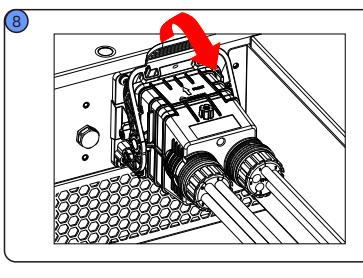
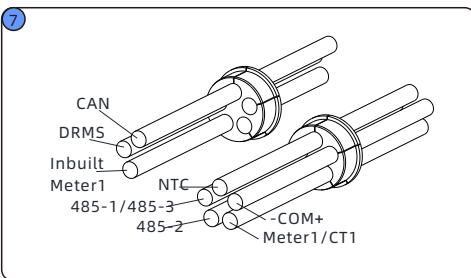
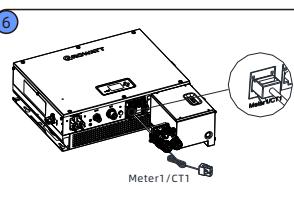
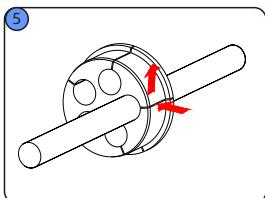
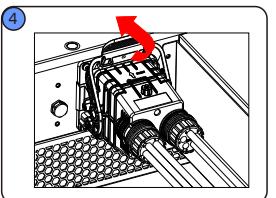
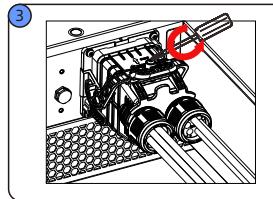
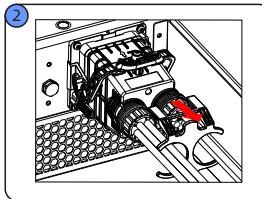
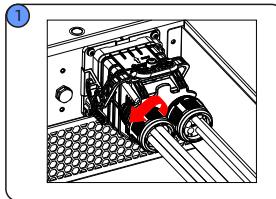
Follow the installation steps:

1. Remove the waterproof cover from the USB port.
2. Plug in the datalogger.
3. Secure the datalogger.

### 5-2 Install the communication terminal waterproof cover



### 5.2.1 Install the communication cables



- ① Unscrew the two swivel nuts from the waterproof cover by turning them counterclockwise.
- ② Remove the anti-tamper element.
- ③ Loosen the screws on the snap handle.
- ④ Turn the handle toward the inverter to remove the waterproof cover.
- ⑤ Thread the external communication cable through the swivel nut, cable support sleeve and waterproof cover in turn.

- ⑥ Connect the RJ45 connector with the communication cable and plug it into the corresponding communication port on the inverter.
- ⑦ Connect all communication cables as required following Steps 4-5.
- ⑧ Align the waterproof cover with the locating pins on the base and insert it into the mounting base. Secure the snap handle by turning it in the opposition direction.
- ⑨ Secure the screws on the handle.
- ⑩ Install the anti-tamper element.
- ⑪ Plug the empty support sleeve with the waterproof plug and tighten the swivel nut clockwise.

**NOTE:**

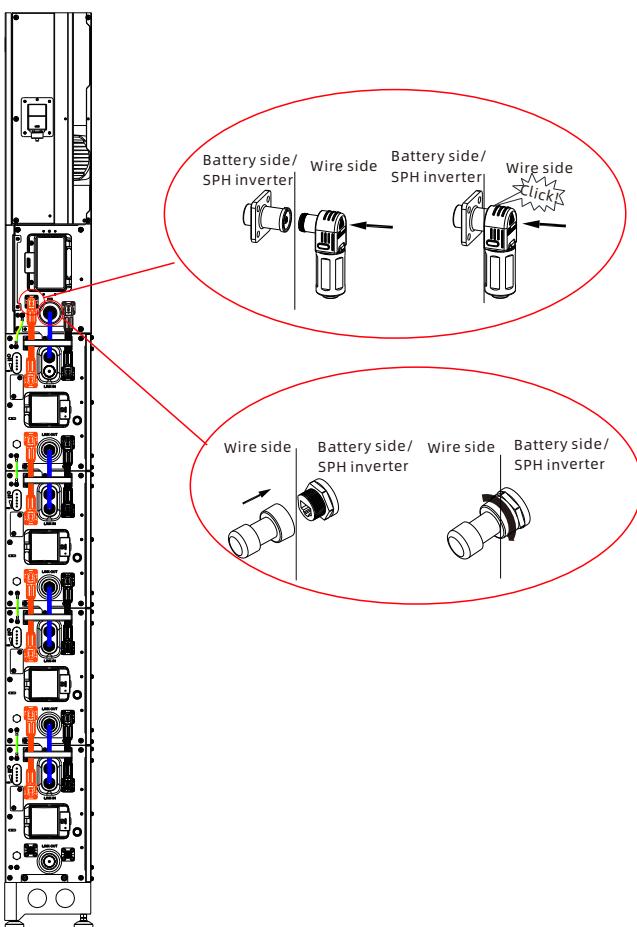
After connecting the communication cable, please ensure that the communication waterproof box has been secured and the screws have been tightened, so that it is tamper-proof and water-proof.

### 5.2.2 Communication port description

NO.	CAN	DRMS	Inbuilt Meter	NTC	485-1 /485-3	485-2	Meter/CT	COM
Pin1	/	DRM1/5		GND.S	485-1_B	485-1_B	RS485_B	DRY+
Pin2	/	DRM2/6		GND.S	GND.S	GND.S	CT1_Pin2	DRY-
Pin3	/	DRM3/7	Ct2+	GND.S	/		CT1_Pin2	/
Pin4	CAN_H	DRM4/8	Ct1+	GND.S	485-1_B	485-1_B	RS485_B	/
Pin5	CAN_L	REF	Ct1-	NTC	485-1_A	485-1_A	RS485_A	/
Pin6	GND.S	COM	Ct2	NTC	/	/	CT_Check	/
Pin7	GND.S	Short-circuit with Pin8		NTC	RS485_3B	RS485_3B	GND.S	/
Pin8	WAKE.UP	Short-circuit with Pin7		NTC	RS485_3A	RS485_3A	CT1_Pin1	/

## 5-3 System installation

### Single-column installation



#### Note:

1. It is not allowed to install the system with the battery in operation. The RUN indicators of the BMS must be off before installation.
2. For system security, do not forget to install the PE cables.
3. The positive power cable connected to the PCS comes from the top BM, while the negative one comes from the bottom BM.
4. The decorative cover serves as an anti-tamper element for the battery terminals as it requires a tool to remove it.

#### 5-4 Two-column installation

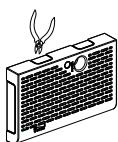
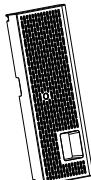
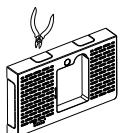


**Note:**

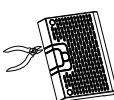
Other installations are the same as the single-column installation.

## 5-5 Prepare the decorative cover

Remove the excess part from the decorative cover.



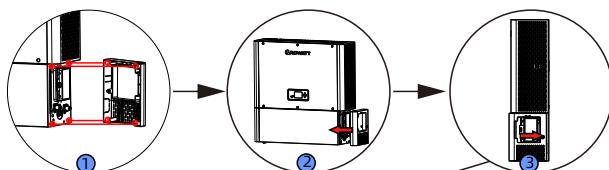
Bottom battery



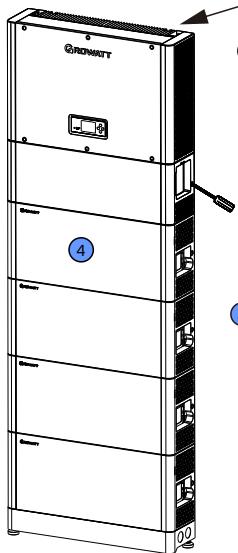
Handle the battery decorative cover

Handle the SPH decorative cover

## 5-6 Install the decorative cover



① ② ③ Insert the inverter-side stopper screw into the slot of the decorative cover.



④ Tighten the screws to secure the inverter decorative cover using a screwdriver, and secure the battery decorative cover with screws after installing it.

## 6. Power on/off the system

### 6-1 Power on the system

- Step 1: Check if all cables are properly connected as required.
- Step 2: Check if the PV and grid voltage are within the specified range.
- Step 3: Turn on the breaker between the inverter and the grid, the breaker on the inverter's battery side, and the inverter's PV switch.
- Step 4: When the inverter indicator is green and the battery indicator is blue, it indicates that the system is powered on successfully.

### 6-2 Power off the system

- Step 1: Press the Power button on the battery to shut it down, the five LED indicators will flash three times
- Step 2: Disconnect the switch between the inverter and the battery.
- Step 3: Disconnect the switch between the inverter and PV.
- Step 4: Disconnect the switch between the inverter and the grid.  
For more information about the inverter configuration, see the User Manual of the inverter.

## 7. Service and contact

Shenzhen Growatt New Energy Co., Ltd.

4-13/F, Building A, Sino-German (Europe) Industrial Park,  
Hangcheng Blvd, Bao'an District, Shenzhen, China

T +86 755 2747 1942

E service@ginverter.com

W en.growatt.com



Growatt New Energy

Download  
Manual

Shenzhen Growatt New Energy Co., Ltd.

4-13/F, Building A, Sino-German (Europe) Industrial Park,  
Hangcheng Blvd, Bao'an District, Shenzhen, China

T +86 755 2747 1942

E service@ginverter.com

W en.growatt.com.com

GR-UM-434-A-00 (PN: 044.0123800)