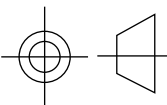
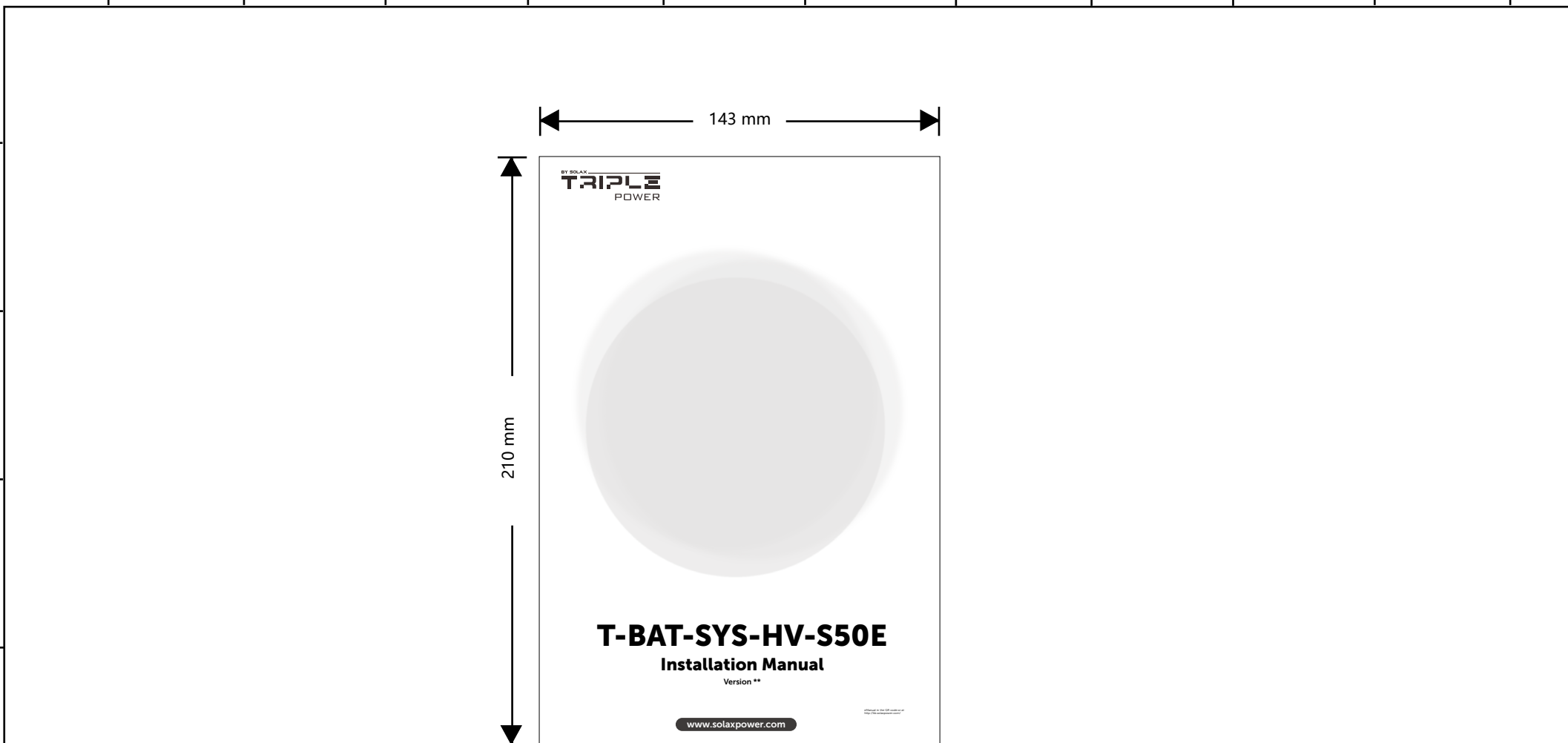


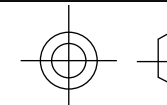
REV.	Description	REV.	Description
00	首次发行		
	某某某 2022/XX/XX		
1.0	1. 修改封底封面, 色号, contact info 页信息 2. 修改附件包表述方式		
	陈珍珍 2024/1/18		
2.0	2.2.2 增加无需外部接线 4.1 改为室内外安装 5.2 增加一分二线束包 6.2 增加公母端子通电说明 6.2.1 增加防尘罩注意事项 9.3 改为 storing, 增加维修报错 contact info 删去土耳其电话, 变更澳洲邮箱 修改封底		
	李杭钊 2024/8/28		

描述	说明书 XX series 英文版 SolaX				浙江艾罗网络能源技术股份有限公司 SolaX Power Network Technology (Zhejiang) Co., Ltd.
料号	320101XXXX00				
单位	mm	页次			



**技术要求:**

- 封面封底 157g 铜版纸覆哑膜彩打, 内部纸 80g 双胶纸黑白印刷, 正反打印;
- 装订方式: 胶装或骑马钉, 内页大于 60 页时须胶装;
- 未注尺寸公差按  $\pm 3$  mm;
- 图面、字体印刷清晰、无偏移、无毛边、不起边、油墨不脱落;
- 黑色字体颜色为 PANTONE BLACK C, 无边框, 底色为白色;
- 符合 ROHS 要求。

描述	说明书 XX series 英文版 SolaX			设计	某某某 2022/XX/XX
				审核	某某某 2022/XX/XX
材料	双胶纸			核准	施鑫淼 2022/XX/XX
料号	320101XXXX00				浙江艾罗网络能源技术股份有限公司
单位	mm	页次			





# **T-BAT-SYS-HV-S50E**

## **Installation Manual**

Version \*\*

[www.solaxpower.com](http://www.solaxpower.com)





# STATEMENT

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# About This Manual

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## Scope of Validity

This manual is an integral part of T-BAT Series. It describes the installation, electrical connection, commissioning, maintenance and troubleshooting of the product. Please read it carefully before operating.

BMS	Battery Module
TBMS-MCS0800E	TP-HS50E

**Note:**

In the case of one tower, there are 3 parts of the T-BAT system, which includes BMS, battery module(s) and Base. In case of two towers, there 4 parts of the system, such as, BMS, battery module(s), Base and Series Box. For details, please refer to the Chapter 11 [“Technical Data”](#).





## Target Tower

The installation and maintenance can only be performed by qualified personnel who

- Are licensed and/or satisfy state and local jurisdiction regulations.
- Have good knowledge of this manual and other related documents.

## Conventions

The symbols that may be found in this manual are defined as follows.

Symbol	Description
 <b>DANGER</b>	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 <b>WARNING</b>	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 <b>CAUTION!</b>	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
 <b>NOTICE!</b>	Provides tips for the optimal operation of the product.

## Change History

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# 1 Safety

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## 1.1 General Safety

The series rechargeable battery is well designed and tested to meet all applicable states and international safety standards. However, like all electrical and electronic equipment, safety precautions must be observed and followed during the installation of the rechargeable battery to reduce the risk of personal injury and to ensure a safe installation.

Before installing the device, carefully read, fully understand and strictly follow the detailed instruction of the *User Manual* and other related regulations. And the safety instructions in this document are only supplements to local laws and regulations.

SolaX shall not be liable for any consequences caused by the violation of the storage, transportation, installation, and operation regulations specified in this document, including, but not limited to:

- Rechargeable battery damage due to force majeure, such as earthquake, flooding, thunderstorm, lighting, fire hazard, volcanic eruption, overvoltage, etc.
- Rechargeable battery damage due to man-made cause
- Rechargeable battery used or operated against any items in local policy
- Failure to follow the operation instructions and safety precautions on the product and in this document
- Installation and use under improper environment or electrical condition
- Unauthorized modifications to the product or software
- Rechargeable battery damage caused during transportation by the customer
- Storage conditions that do not meet the requirements specified in this document
- Failure to adequately maintain the equipment. An on-site inspection should be carried out by a qualified technician after 120 months of continuous use. If more than 120 months have been passed since the date of commissioning, or the user cannot prove that the equipment has been adequately maintained
- Use of incompatible inverters or devices
- Installation and commissioning operated by unauthorized personnel who are not licensed and /or satisfy state and local jurisdiction regulations.

## 1.2 General Safety Precautions

- Overvoltage or wrong wiring may damage the battery module and cause combustion which may be extremely dangerous;
- Leakage of electrolytes or flammable gas may be occurred due to any type of product breakdown;
- Do not install the battery module in places where flammable and combustible materials are stored, and in which an explosive atmosphere is present;
- The battery module wiring must be carried out by qualified personnel;
- Battery module must be serviced by qualified personal;
- Ensure that the grounding cable is connected before handling the battery module.

## 1.3 Battery Handling Guide

### Do's

- DO keep the battery module away from flammables materials, heat sources, and water sources;
- DO keep the battery module out of reach of children and animals;
- DO practice proper battery storage by keeping the battery module in a clean environment, free of dust, dirt and debris;
- DO store the battery module in a cool and dry place;
- DO seal the outer cable connection hole to prevent ingress of foreign objects;
- DO confirm that the wiring of the device must be correct;
- DO install the device according to the local standards and regulations.

### Don'ts

- DON'T expose the battery module to an open flame, or the temperature in excess of 140°F/60°C;
- DON'T store or install the battery module in direct sunlight;
- DON'T install or operate the battery module in places where there is excessive moisture or liquids;
- DON'T place the battery module in a high-voltage environment;
- DON'T disconnect, disassemble or repair the device by unqualified personnel. Only a qualified personnel is allowed to handle, install and repair the device;
- DON'T damage the device by dropping, deforming, impacting, cutting or



penetrating with a sharp object. Otherwise, it may cause a fire or leakage of electrolytes;

- DON'T touch the device if liquid spill on it. There is a risk of electric shock;
- DON'T step on the packaging or the device may be damaged;
- DON'T place any objects on top of the battery module;
- DON'T charge or discharge a damaged battery module;
- DON'T dispose of the battery module in a fire. It may cause leakage or rupture;
- DON'T mix different types or makes of the battery module. It may cause leakage or rupture, resulting in personal injury or property damage.

## 1.4 Response to Emergency Situations

In case the battery module leaks electrolyte or any other chemical materials, or gas may be generated due to the leakage of battery module, be sure to avoid contact with the discharge at all times. In case of accidentally coming into contact with them, please do as follows:

- In case of inhalation: Leave the contaminated area immediately, and seek medical attention at once;
- In case of contact with eyes: Rinse eyes with running water for 15 minutes, and seek medical attention;
- In case of contact with skin: Wash the contacted area thoroughly with soap, and seek medical attention;
- In case of ingestion: Induce vomiting, and seek medical attention.

If a fire breaks out where the battery module is installed, please do as follows:

- In case the battery module is charging when the fire breaks out, provide it is safe to do so, disconnect the battery module circuit break to shut off the power charge;
- In case the device is not on fire yet, use a Class ABC fire extinguisher or a carbon dioxide extinguisher to extinguish the fire;
- If the battery module catches fire, do not try to put out the fire, and evacuate immediately.
- The battery module may catch fire when it is heated above 302°F/60°C; and in case of catching fire, it will produce noxious and poisonous gas, DO not approach and keep away.

### Effective ways to deal with accidents

- In case of the damaged battery module, place it into a segregated place, and call the local fire department at the place where the user lives or qualified personnel.
- If any part of the battery module, or wiring is submerged, DO stay out of the water and DON'T touch anything; If the battery module gets wet, DON'T touch it.
- If the battery module is damaged, DON'T use it. Otherwise, it may result in both personal injury and property damage.
- DON'T use the submerged battery module again, and contact the qualified personnel for assistance.
- DO contact SolaX immediately for assistance if the user suspects that the battery module is damaged.

#### WARNING!

- Do not crush or impact battery, and always dispose of it according to relevant safety regulations.
- The battery module may catch fire when heated above 150°C/302°F.
- In case of catching fire, the battery module will produce noxious and poisonous gases, and please keep away the battery.
- Damaged batteries may leak electrolyte or produce flammable gas. If users suspect that the battery is damaged, please immediately contact SolaX for advice and information.
- All operations of T-BAT SYS-HV relating to electrical connection and installation must be carried out by qualified personnel.

#### CAUTION!

- If the battery module is not installed within a month after receipt, it must be charged for maintenance. Non-operational batteries should be discarded according to the local regulations.

# 2 Product Overview

## 2.1 System Description

A battery management system (hereinafter referred to as BMS) is an electronic system that manages a rechargeable battery.

A battery module is a type of electrical battery which can charge or discharge loads.

Series Box is designed to connect the second tower in series through BMS wiring.

In case of a tower, the whole system mainly comprises a BMS, battery module(s) and Base. In case of two towers, the whole system comprises a BMS, battery modules, Bases and Series Box.

## 2.2 Appearance

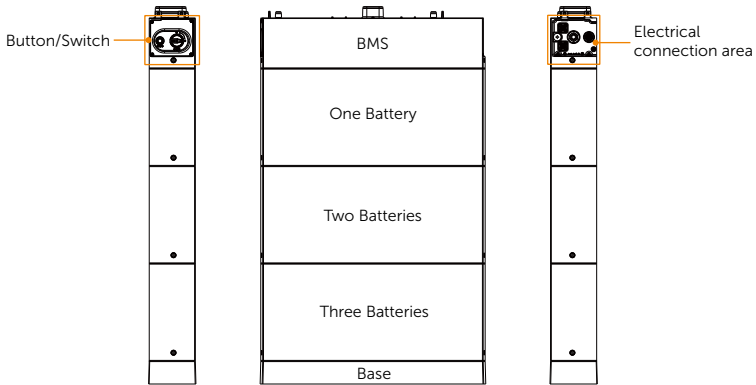


Figure 2-1 Appearance

Table 2-1 Description of appearance

Item	Description
Button/Switch	Power on or off the system. Please refer to <a href="#">"BMS (TBMS-MCS0800E)"</a> for details.
Electrical connection area	Including B+/B- ports, communication port, heat port, grounding port. Please refer to <a href="#">"BMS (TBMS-MCS0800E)"</a> for details.

### 2.2.1 Weight and Dimensions

Table 2-2 Weight and Dimension

	BMS (TBMS-MCS0800E)	Battery module (TP-HS50E)	Base	Series Box
Length (mm)	730	730	730	167
Width (mm)	150	150	150	121
Height (mm)	165	318	75	91.5
Net weight (kg)	9.3	47.0	3.9	1.3

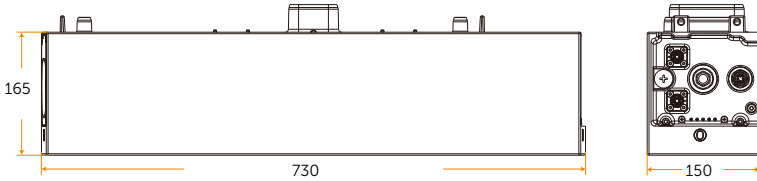


Figure 2-2 Dimension: BMS (TBMS-MCS0800E)

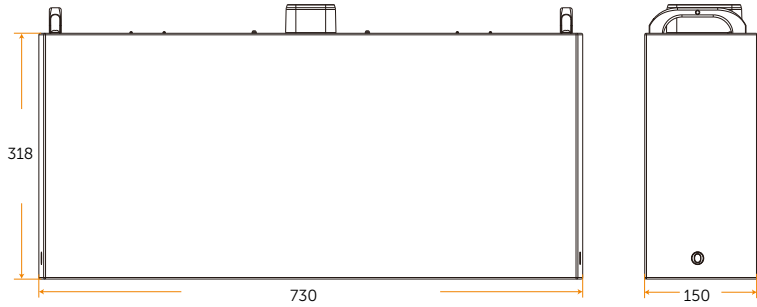


Figure 2-3 Dimension: Battery module (TP-HS50E)

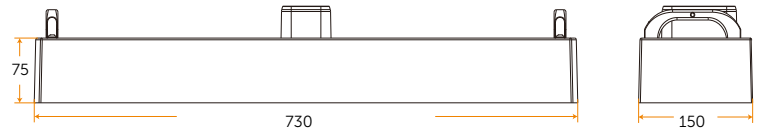


Figure 2-4 Dimension: Base

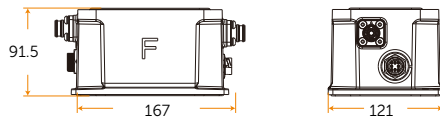


Figure 2-5 Dimension: Series Box

## 2.2.2 BMS (TBMS-MCS0800E)

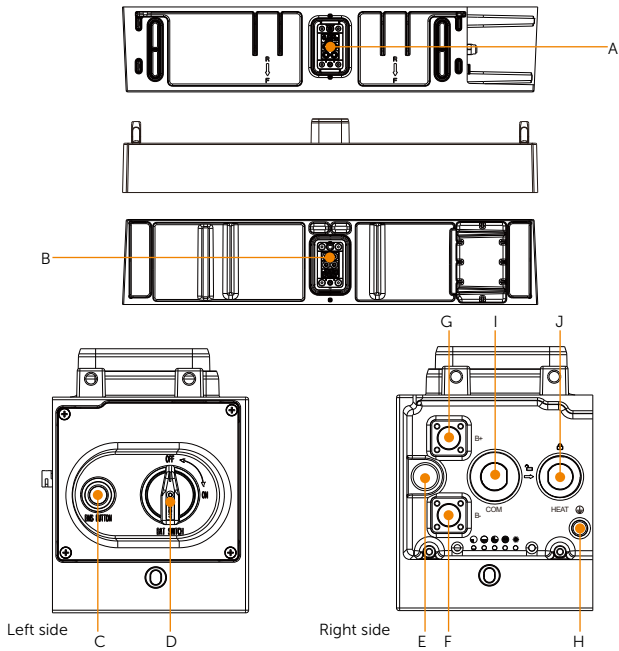


Figure 2-6 BMS (TBMS-MCS0800E)

Table 2-3 Description of ports

Item	Description
A*	The connector is connected to the inverter.
B	The connector interface is connected to the battery module.
C	BAT BUTTON: Start system.
D	BAT SWITCH: A switch for battery's input and output.
E	<a href="#">"DIP Switch"</a> : Realize battery's parallel function (a reserved function).
F	B-: Connect BMS's B- to BMS's B+ (or to the Series Box's B-)
G	B+: Connect BMS's B+ to BMS's B- (or to the Series Box's B+)
H	GND: Connect the grounding port of the Series Box (if any); or it doesn't need to be connected.
I	COM: Connect the COM port of the Series Box (if any); or it doesn't need to be connected
J	HEAT: Connect the HEAT port of the Series Box (if any), or a short-circuit plug must be inserted into the port.

**NOTICE!**

- The mark "\*" indicates that when stacking the inverter onto the BMS, the inverter-battery grounding and communications are connected directly through the connector. Hence, no additional external wiring is required.

**DIP Switch**

A DIP Switch is equipped on the BMS.

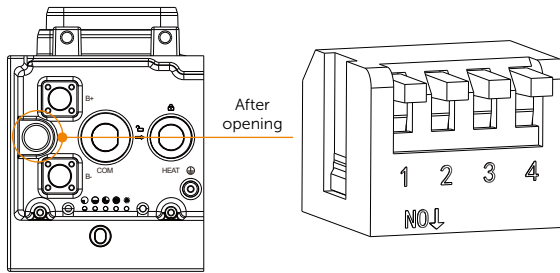


Figure 2-7 DIP Switch

Table 2-4 Definition of DIP switch

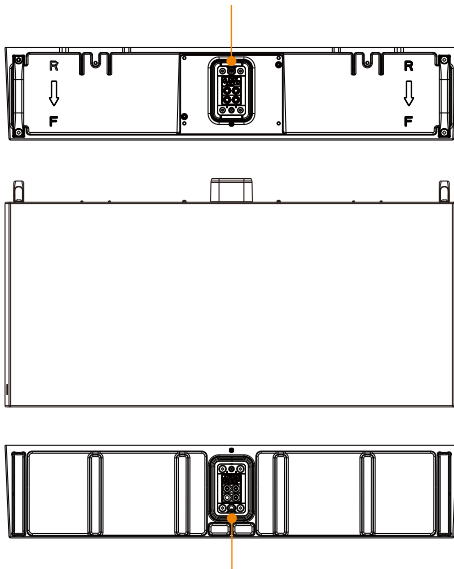
Description	
DIP Switch 1	A reserved function
DIP Switch 2	A reserved function
DIP Switch 3	A reserved function
DIP Switch 4	Terminal resistance

**NOTICE!**

- The DIP switch 4 shall be flipped down (open the circuit) when connecting the BMS to inverter.
- In case of parallel connection, only shall be the DIP switch 4 on the last BMS be flipped down (open the circuit), and the DIP switch 4 on the rest of BMS shall be flipped up (close the circuit).
- The DIP switch 4 is pressed at the factory settings.
- To adjust the DIP switch, a small flat-head screwdriver shall be prepared by users themselves.

### 2.2.3 Battery module (TP-HS50E)

A hot-plug interface that is connected to the bottom of the battery module or the BMS.



A hot-plug interface that is connected to the bottom of the battery module or the Base.

Figure 2-8 Details: Battery Module (TP-HS50E)

### 2.2.4 Base

A hot-plug interface that is connected to the bottom of the battery module.

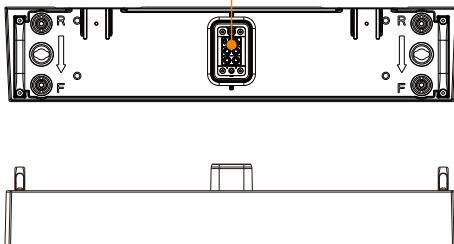


Figure 2-9 Details: Base

### 2.2.5 Series Box

The Series Box shall be installed in case the battery modules purchased exceed 4 sets (including 4).

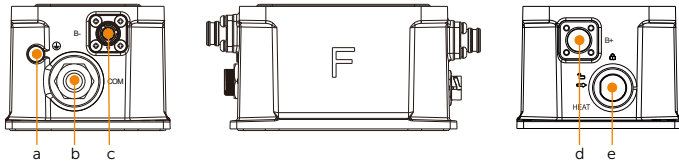


Figure 2-10 Details: Series Box

Table 2-5 Description of ports

Item	Description
a	GND: Connect to the grounding port of the BMS.
b	COM: Connect to the COM port of the BMS.
c	B-: Connect to the B- of the BMS.
d	B+: Connect to the B+ of the BMS.
e	HEAT: Connect to the HEAT port of the BMS.



## 2.2.6 Indicators

The power indicators show the current battery percentage. There are five indicators on the BMS, one status light and four SOC power indicators.

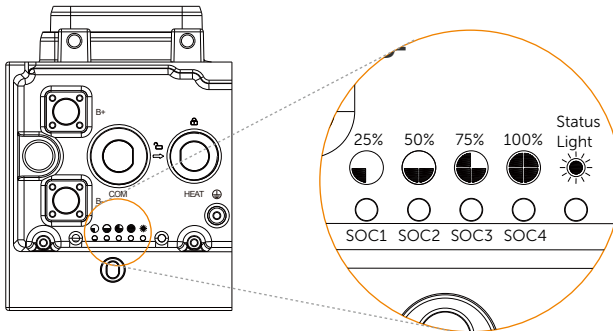


Figure 2-11 Indicators

Table 2-6 Definition of indicators

Status	Description
Startup	Press and hold the BAT BUTTON for about 1 to 2 seconds to activate the system, at this point, the status light flashes a yellow light every 0.1 seconds until finishing self test, of which the period lasts about 3 to 4 seconds. Then the status light flashes green light every 0.5 seconds after finishing self test. During the whole period, all the SOC power indicators were off. After successful communication to the inverter, the status light turns solid green light, and SOC power indicators come on solid green light based on the actual remaining capacity.
Shutdown	After pressing and holding the BMS BUTTON for more than 1 second, the status light comes on solid green light, and the SOC power indicators flash blue in turn. Then all lights are off within 2.4 seconds after releasing the button.
Standby	The status light flashes green for 1 second and turns off for 4 seconds. The SOC power indicators are off.
Charging	The status light comes on solid green light, and the state of SOC power indicators depends on the actual situation. For details, please refer to the following Table 2-7 <a href="#">"Indicator information while charging"</a> .
Discharging	The status light comes on solid green light, and the state of SOC power indicators depends on the actual situation. For details, refer to the following Table 2-8 <a href="#">"Indicator information while discharging"</a> .
Fault	In case of failure, the status light will remain on solid red light for 10 minutes, and then such red light will flash for 1 second and then turn off for 4 seconds. For details, please refer to Table 2-7 <a href="#">"Indicators information while reporting errors"</a> .
Warning	In case of warning, the status light will flash yellow light for 1 second, and then turn off for 4 seconds.
Black Start	For details, please refer to <a href="#">"Black Start"</a> .

Table 2-7 Indicator information while charging

SOC value	Status light	SOC1	SOC2	SOC3	SOC4
$0\% \leq \text{SOC} < 25\%$	Green	Flash	Light off	Light off	Light off
$\text{SOC} < 50\%$	Green	Light on	Flash	Light off	Light off
$\text{SOC} < 75\%$	Green	Light on	Light on	Flash	Light off
$\text{SOC} < 100\%$	Green	Light on	Light on	Light on	Flash
$\text{SOC} \geq 100\%$	Green	Light on	Light on	Light on	Light on

Table 2-8 Indicator information while discharging

SOC value	Status light	SOC1	SOC2	SOC3	SOC4
$\text{SOC} \geq 75\%$	Green	Flash	Flash	Flash	Flash
$\text{SOC} \geq 50\%$	Green	Flash	Flash	Flash	Light off
$\text{SOC} \geq 25\%$	Green	Flash	Flash	Light off	Light off
$\text{SOC} \geq 0\%$	Green	Flash	Light off	Light off	Light off

Table 2-9 Indicators information while reporting errors

Fault	SOC1	SOC2	SOC3	SOC4
Huge differential pressure	Flash	Off	Off	Off
Voltage fault (undervoltage and overvoltage of unit, overvoltage and undervoltage of total voltage)	Off	Flash	Off	Off
Temperature fault (high temperature, low temperature)	Flash	Flash	Off	Off
Current fault (overcurrent charging, overcurrent discharging)	Off	Off	Flash	Off
Hardware fault (MCU fault, external short circuit fault, AFE fault, voltage sampling disconnection fault, temperature sampling, or current sensor default)	Flash	Off	Flash	Off
Relay fault	Off	Flash	Flash	Off
Insulation fault	Flash	Flash	Flash	Off
Self test fault	Off	Off	Off	Flash
Communication loss of inverter	Flash	Off	Off	Flash
Communication loss of battery module	Off	Flash	Off	Flash

**NOTICE!**

In case of pressing and holding BMS BUTTON, there are two circumstances as follows:

- Press and hold BMS BUTTON for more than 5 seconds but less than 20 seconds, the system will enter a startup mode of inverter.
- Press and hold BMS BUTTON for more than 20 seconds, the system will enter the Black Start.

**Black Start**

The equipment can provide **Black Start** capacity, meaning that our energy storage inverter and battery can continue to run even if the power grid and photovoltaic panel are out of service. The startup procedure for **Black Start** is as follows:













- First stage: in case of pressing and holding the **BMS BUTTON** for less than 20 seconds, the status light will flash green light for 1 second and then turn off for 4 seconds, with a period of 5 seconds.
- Second stage: after pressing and holding the **BMS BUTTON** for more than 20 seconds, the status light will come on solid green light, and SOC power indicators will flash as follows:
  - » Firstly, the indicator SOC3 comes on blue, and the rest of the indicators are off;
  - » Secondly, the indicators SOC2 and SOC4 come on blue, and the rest of the indicators are off;
  - » Thirdly, the indicator SOC1 comes on blue, and the rest of the indicators are off;
  - » Finally, all SOC power indicators are off. The time interval between each step is 0.1 seconds.

**NOTICE!**

- In the case of the second stage, the **BMS BUTTON** should be released at anytime in the process.

## 2.2.7 Symbols on the Label

Table 2-10 Description of symbols

Symbol	Description
	CE mark. The rechargeable battery complies with the requirements of the applicable CE guidelines.
	TUV certified.
	RCM certified.
	The battery system must be disposed of at a proper facility for environmentally-safe recycling.
	The battery module may explode. The rechargeable battery can become hot during operation. Avoid contact during operation.
	Danger of high voltages. Danger to life due to high voltages in the rechargeable battery!
	Danger. Risk of electric shock!
	Observe enclosed documentation.
	The rechargeable can not be disposed together with the household waste.
	The rechargeable can not be disposed together with the household waste.
	Keep the battery system away from children.
	Keep the battery system away from open flames or ignition sources.

## 2.3 Features

The T-BAT SYS-HV is one of the most advanced energy storage systems on the market today, using state-of-the-art technology, and having the characteristics of high reliability and convenient control. Characteristics are shown as follows:

- 90% DOD;
- 95% Battery Round-trip Efficiency;
- Cycle Life > 6000 Cycles;
- Secondary Protection;
- IP66 Protection Level and Protection Class I;
- Safety & Reliability;
- Small Occupied Area;
- Floor Mounting and wall mounting.

## 2.4 Certifications

BAT system safety	CE, RCM, IEC 62619, IEC 63056, IEC 62620, IEC 62477-1, IEC 60730 Annex H, IEC 62040, VDE-AR-E2510, IEC 60529, UN38.3
UN number	UN 3480
Hazardous materials classification	Class 9
UN transportation testing requirements	UN 38.3
International protection marking	IP66, Protection Class I

# 3 Transportation and Storage

---

If the rechargeable battery are not put into use immediately, the transportation and storage requirements needs to be met:

## Transportation

- Observe the caution signs on the packaging of battery before transportation.
- Pay attention to the weight of the rechargeable battery. Be cautious to avoid injury when carrying battery module (net weight: 47 KG). Two installers are recommended.
- Wear protective gloves when carrying the equipment by hand to prevent injuries.
- When lifting up the rechargeable battery, hold the handle position and the bottom position of the battery. Keep the rechargeable battery horizontal in case of falling down due to tilt.

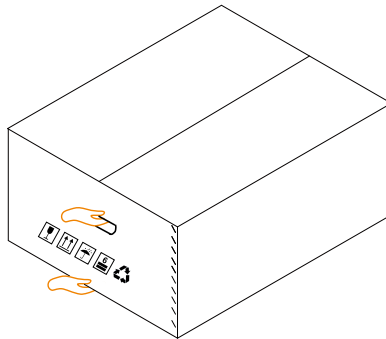


Figure 3-1 Handle position of carton

## Storage

- Do not remove the original packaging material and check the outer packaging material regularly.
- The required storage temperature: the service life may be up to 6 months in case the temperature is between 30°C and +50°C, or it may be up to 12 months in case the temperature is between -20°C and +30°C. The relative humidity should be between 5% and 95%.
- Stack the battery in accordance with the caution signs on the battery carton to prevent their falling down and device damage. Do not place it upside down.
- If the rechargeable battery has been stored for more than 1 year, it must be checked and tested by professionals before use.

# 4 Preparation before Installation

---

## 4.1 Selection of Installation Location

The installation location selected for the rechargeable battery is quite critical in the aspect of the guarantee of machine safety, service life and performance.

- Flaunting an IP66 enclosure, the battery can be used outdoors and indoors.
- The installation position shall be convenient for wiring connection, operation and maintenance.

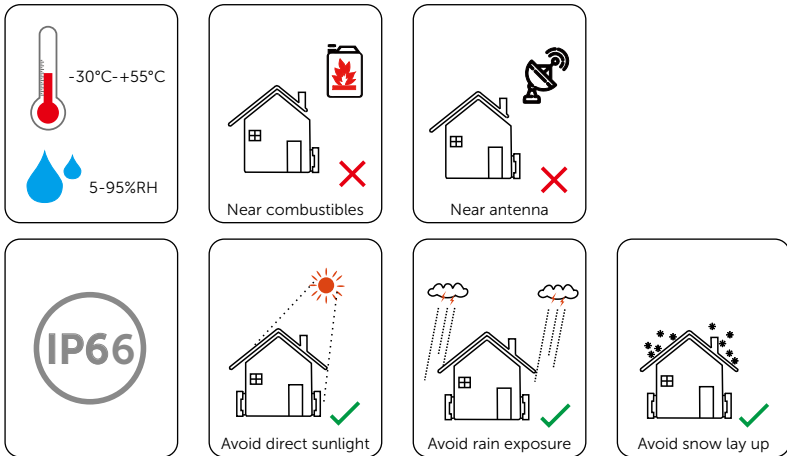
### 4.1.1 Environment Requirement

Make sure the installation site meets the following conditions:

- The ambient temperature:  $-30^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  ;
- The humidity shall be between 5-95%;
- Do not install the rechargeable battery in the areas where the altitude exceeds 3000 m;
- Install the rechargeable battery in a well-ventilated environment for heat dissipation;
- Do not install the rechargeable battery in areas with flammable, explosive and corrosive materials;
- Do not install the rechargeable battery in areas near combustibles and antenna
- You are recommended to install an awning over it. Direct sunlight, rain exposure and snow laying up is not allowed.

#### NOTICE!

- For outdoor installation, precautions against direct sunlight, rain exposure and snow layup are recommended.
- Exposure to direct sunlight raises the temperature inside the battery. This temperature rise poses no safety risks, but may impact the battery performance.



#### 4.1.2 Installation Carrier Requirement

The mounting location must be suitable for the weight and dimensions of the product and the support surface for installation must be made of a non-flammable material.

- Solid brick/concrete, or mounting surface with equivalent strength;
- Please ensure that the bearing capacity of the ground and the wall, respectively, that are used to install the battery system must be over 900 kg, which is determined based on option C. If option D is chosen by the user, the bearing capacity of the ground and the wall, respectively, must be over 1050 kg;
- Please ensure that the thickness of any part of the wall should not be less than 150 mm if the wall mounting is selected;
- The device must not be installed on the wood wall.



### 4.1.3 Clearance Requirement

To guarantee proper heat dissipation and ease of disassembly, the minimum space around the rechargeable battery must meet the standards indicated below.

- At least a distance not less than 710 mm high shall be provided to give access to install the inverter.
- A distance between 250 to 300 mm wide shall be provided on both sides of the device.
- Please reserve enough distance from the device to the ceiling (or the grounding) for capacity expansion.

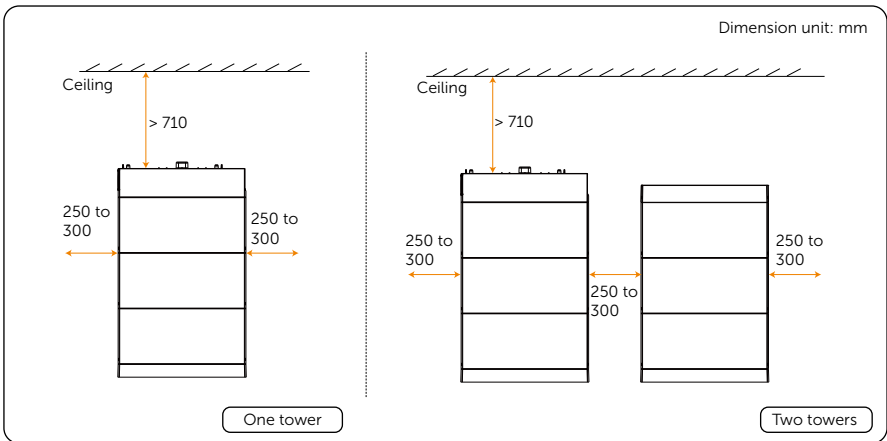


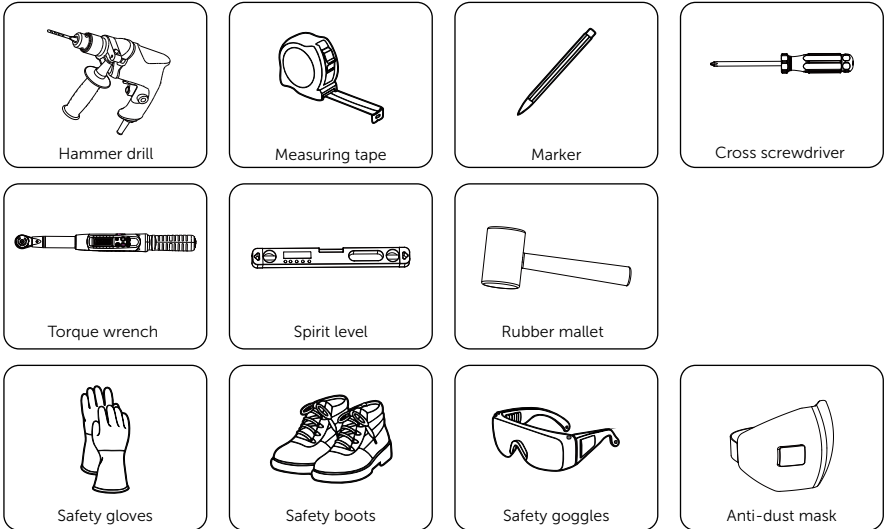
Figure 4-1 Clearance requirement

#### NOTICE!

- The distance from the BMS to the ceiling must be over 710 mm.

## 4.2 Tools Requirement

Installation tools include but are not limited to the following recommended ones. If necessary, use other auxiliary tools on site.



## 4.3 Additionally Required Materials

Table 4-1 Additionally required wires

No.	Required Material	Type	Diameter
1	Protective pipe	Corrugated pipe	External diameter: over 67.2 mm

# 5 Unpacking and Inspection

The number of cartons will be different due to different modes of mounting. Therefore, please check whether the number of cartons received are correct before unpacking. For details, please refer to the following table.

Table 5-1 Number of cartons

	One Tower	Two Towers
Floor Mounting	A BMS carton, and carton(s) of battery modules	A BMS carton, a Series Box carton, and carton(s) of battery modules
Wall Mounting	A BMS carton, a base support carton, and carton(s) of battery modules	A BMS carton, two base support cartons, a Series Box carton, and carton(s) of battery modules

### NOTICE!

- As for the number of cartons of battery modules, it depends on how many battery modules the users purchased.

## 5.1 Unpacking

- The rechargeable battery undergoes 100% testing and inspection before shipping from the manufacturing facility. However, transport damage may still occur. Before unpacking the rechargeable battery, please verify that the model and outer packing materials for damage, such as holes and cracks.
- Unpacking the BMS and battery module according to the following figures. If there are other cartons, such as the base support carton, and Series Box carton, the unpacking procedure can also be referred to the following figures.

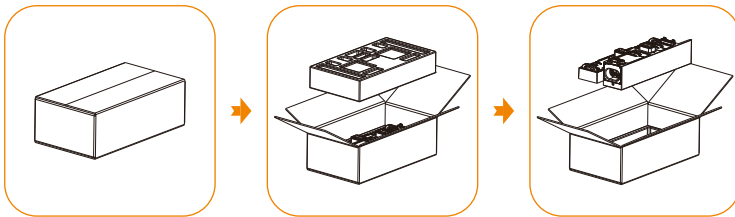


Figure 5-1 Unpacking the BMS

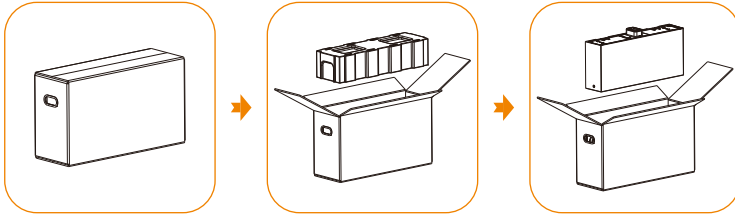


Figure 5-2 Unpacking the battery module

- Be careful when dealing with all package materials which may be reused for storage and relocation of the rechargeable battery in the future.
- Upon opening the package, check whether the appearance of the rechargeable battery is damaged or lack of accessories. If any damage is found or any parts are missing, contact your dealer immediately.

## 5.2 Scope of Delivery

### BMS (TBMS-MCS0800E)

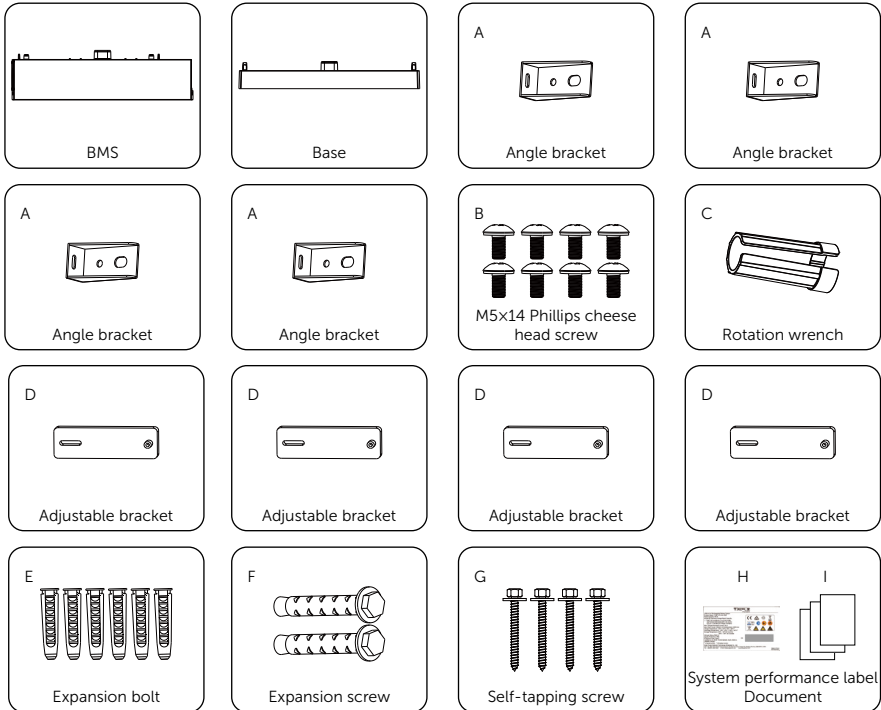


Table 5-1 Packing list of BMS

Item No.	Description	Quantity (Unit: pc)
/	BMS	1
/	Base	1
A	Angle bracket	4*
B	M5x14 Phillips cheese head screw	8
C	Rotation wrench	1
D	Adjustable bracket	4*
E	Expansion bolt	6
F	Expansion screw	2

## Unpacking and Inspection

Item No.	Description	Quantity (Unit: pc)
G	Self-tapping screw	4
H	System performance label	1
I	Document	/

### NOTICE!

- The accessory with the mark "\*" indicates that there are 4 totalling plastic bags, with 1 piece in each bag.

### One Battery Module (TP-HS50E × 1)

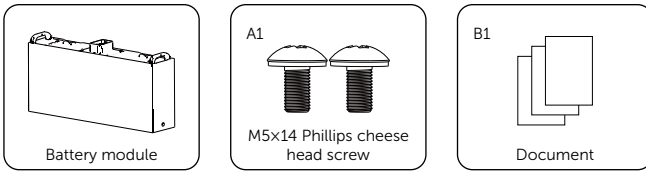
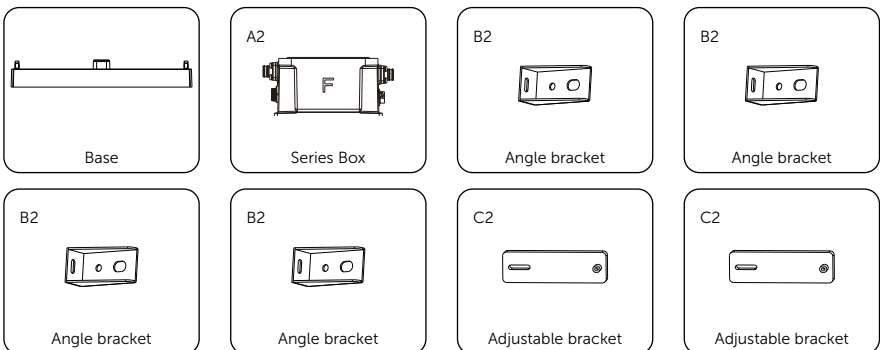


Table 5-2 Packing list of battery module

Item No.	Description	Quantity (Unit: pc)
/	Battery module	1
A1	M5×14 Phillips cheese head screw	2
B1	Document	/

### Series Box (For two towers only)



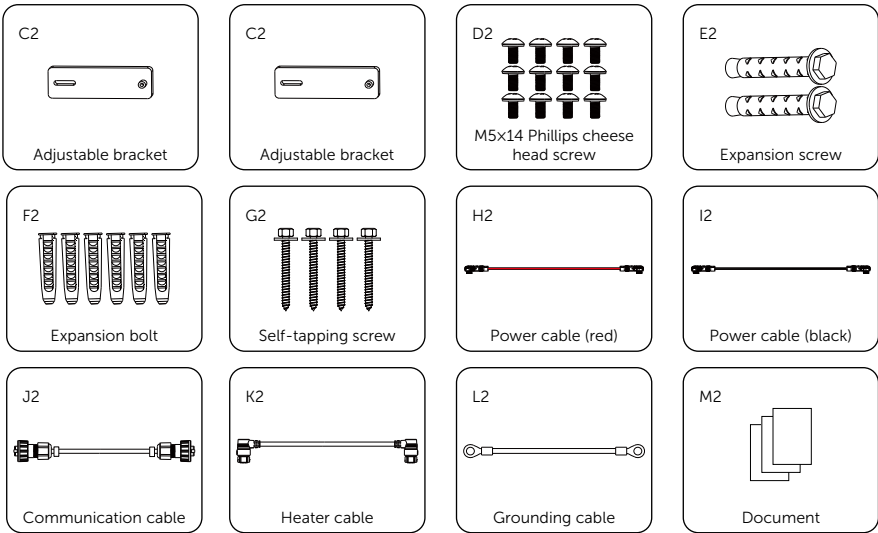


Table 5-3 Packing list of Series Box

Item No.	Description	Quantity (Unit: pc)
/	Base	1
A2	Series Box	1
B2	Angle bracket	4*
C2	Adjustable bracket	4*
D2	M5×14 Phillips cheese head screw	12
E2	Expansion screw	2
F2	Expansion bolt	6
G2	Self-tapping screw	4
H2	Power cable (red)	1
I2	Power cable (black)	1
J2	Communication cable	1
K2	Heater cable	1
L2	Grounding cable	1
M2	Document	/

NOTICE!

- The accessory with the mark "\*" indicates that there are 4 totalling plastic bags, with 1 piece in each bag.

Base Support (For wall mounting only)

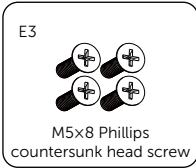
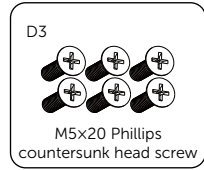
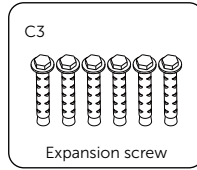
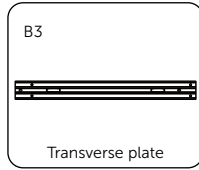
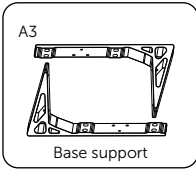
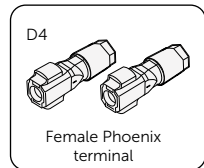
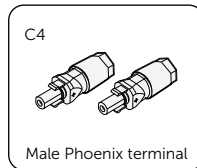
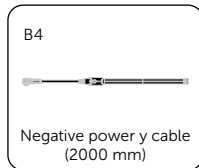
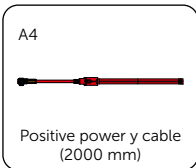


Table 5-4 Packing list of base support

Item No.	Description	Quantity (Unit: pc)
A3	Base support	2
B3	Transverse plate	1
C3	Expansion screw	6
D3	M5x20 Phillips countersunk head screw	6
E3	M5x8 Phillips countersunk head screw	4

Cable (Optional)





E4



RNB14-5 ring terminal

Item No.	Description	Quantity (Unit: pc)
A4	Positive power y cable (2000 mm)	1
B4	Negative power y cable (2000 mm)	1
C4	Male Phoenix terminal	2
D4	Female Phoenix terminal	2
E4	RNB14-5 ring terminal	2

## NOTICE!

- As for the installation steps for power y cables, please refer to the inverter's *User Manual*.
- Users can purchase the above-mentioned accessory kit based on their actual needs.
- Do not use the above-mentioned power y cables if the equipment is in parallel.
- The RNB14-5 ring terminal is suitable for 10 mm<sup>2</sup> grounding wire.

# 6 Mechanical Installation

## 6.1 Installation Options

### One Tower

Table 6-1 Height and weight

	Option A	Option B	Option C	Option D
Height (mm)	558	876	1194	1512
Net Weight (kg)	60.2	107.2	154.2	201.2

### NOTICE!

- The above-mentioned net weight just includes the weight of the BMS, battery module(s), and Base, not the base support and other accessories.

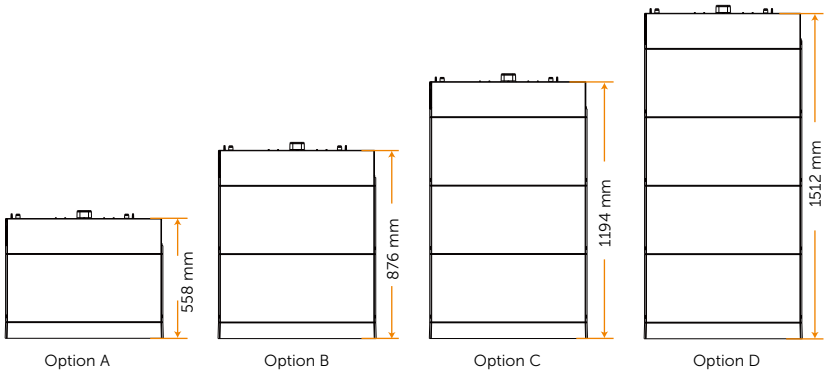


Figure 6-1 Installation option for one tower

## Two Towers

Table 6-2 Height and weight

	Option E		Option F		Option G		Option H	
	Left tower	Right tower	Left tower	Right tower	Left tower	Right tower	Left tower	Right tower
Height (mm)	876	809	1194	491	1194	809	1194	1127
Net Weight (kg)	107.2	100.5	154.2	53.5	154.2	100.5	154.2	143.6

## NOTICE!

- The above-mentioned net weight just includes the weight of the BMS, battery modules, Series Box (installed in the right tower), and Base, not the base support and other accessories.

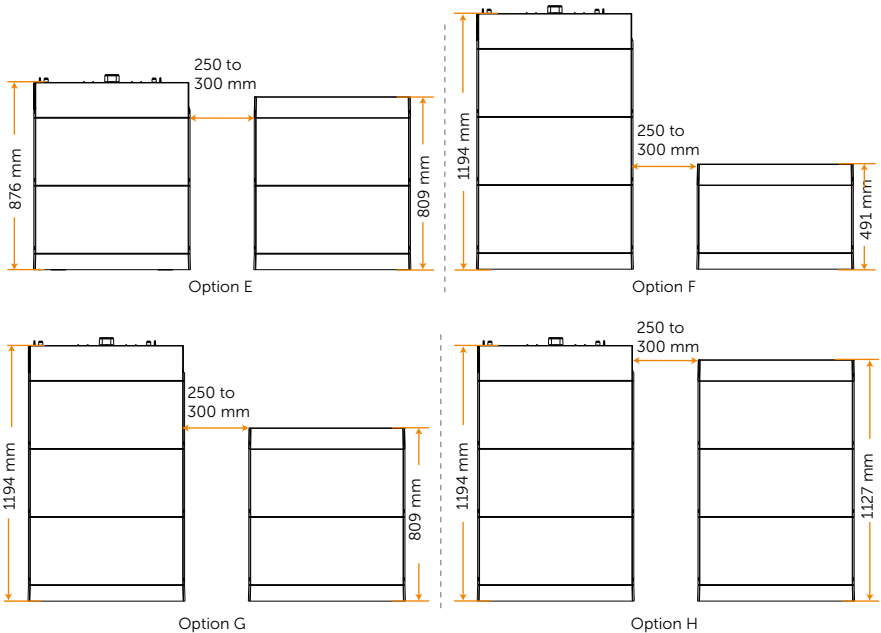


Figure 6-2 Installation option for two towers

## NOTICE!

- If the installation form of one tower is likely to be chosen, option C is recommended.
- The above-mentioned installation options apply to the modes of floor mounting and wall mounting.

## 6.2 Installation Procedure

### WARNING!

- Only the qualified personnel can perform the mechanical installation following the local standards and requirements.
- Check the existing power cables or other piping in the wall to prevent electric shock or other damage.

### CAUTION!

- Always be aware of the weight of the battery. Personal injuries may result if the battery is lifted improperly or dropped while being transported or mounted.
- Use insulated tools and wear individual protective tools when installing the battery.

### NOTICE!

- The users may choose one of the following options based on their actual installation condition and aesthetics.

Options Numbers of batteries	Option A	Option B	Option C	Option D	Option E	Option F	Option G	Option H
One battery	✓							
Two batteries		✓						
Three batteries			✓					
Four batteries				✓	✓	✓		
Five batteries							✓	
Six batteries								✓

- In the case of floor mounting, the assembled brackets (attaching angle bracket and adjustable bracket together) must be installed when assembling the Base and the uppermost battery module. In the case of wall mounting, the assembled brackets must be installed when installing the uppermost battery module.
- In case the number of battery modules in a tower is no more than 3 (including 3), please ensure that the bearing capacity of the supporting surface for the system must be over 900 kg.
- In the case of option D, please ensure the bearing capacity of the supporting surface for the system must be over 1050 kg.
- The device must not be installed on the wood wall.
- At least a distance not less than 710 mm high shall be provided to give access to install the inverter.
- At least two persons are required to move the battery module.
- Please reserve enough distance from the device to the ceiling (or the grounding) for capacity expansion.

## NOTICE!

- The connector of the BMS is completely insulated through insulating head.
- No circuit presents on male terminals until female terminals or another module connected.
- Access to directly touch female terminals by fingers is not available as they are IP2X rated.
- In case of measuring the battery's voltage, the battery must be placed on the base, ensuring male and female terminals are in contact before they present circuit.

## 6.2.1 Floor Mounting

### One Tower for Floor Mounting

## NOTICE!

- The mode of floor mounting is given priority for installation.
- Take the installation procedure for Option C as an example.

**Step 1:** Remove dust covers from the Base, battery module(s) and BMS before installation.

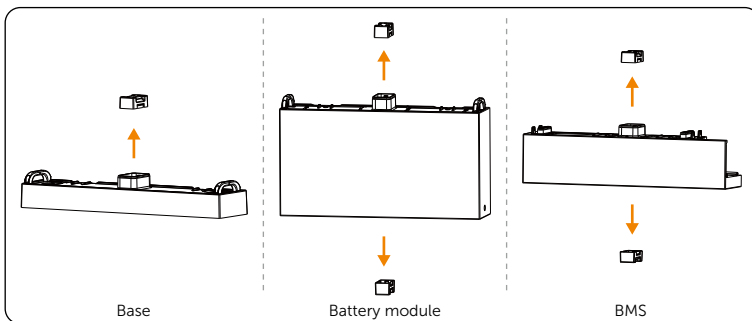


Figure 6-3 Removing dust covers

### CAUTION!

- The dust cover can only be removed during installation and must be reattached after removing the battery.
- Do not touch the terminals during installation or removal of the battery.

**Step 2:** Place a spirit level to check whether the Base is even. If yes, refer to the Step 4; if no, refer to the Step 3. The side with "R" shall be against the wall.

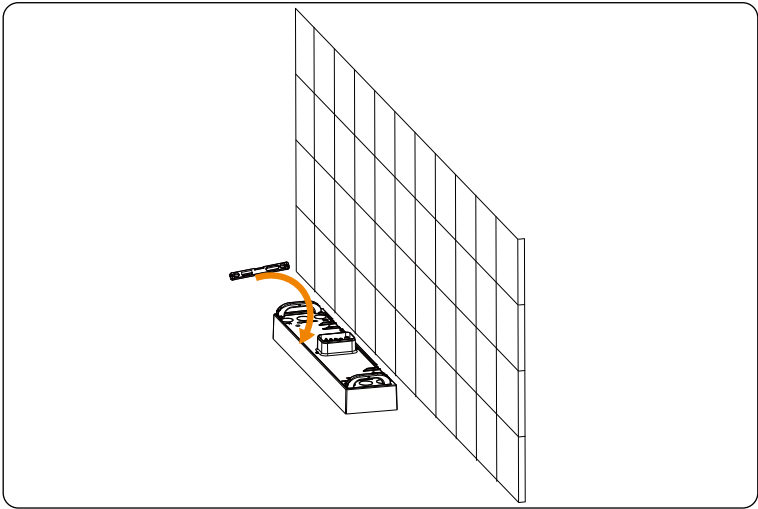


Figure 6-4 Determining whether the Base is level

**Step 3:** Rotate the adjustment screws clockwise to ensure that it is even.

Turn clockwise to lower the Base, and turn anticlockwise to raise the Base.

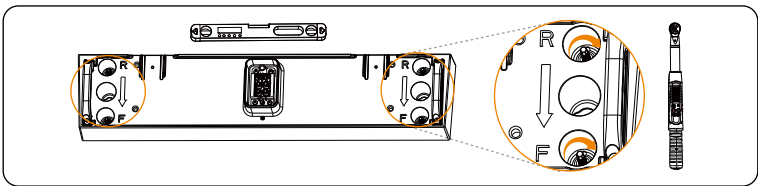


Figure 6-5 Rotating adjustment screws

**NOTICE!**

- Use a spirit level to measure both side of the Base to ensure that the base is even;
- If not, please rotate the adjustment screws by a torque wrench being to ensure that the Base is even.

**Step 4:** Locate the Base 90 mm away from the wall, accurately mark the location of the Base on both side with a marker.

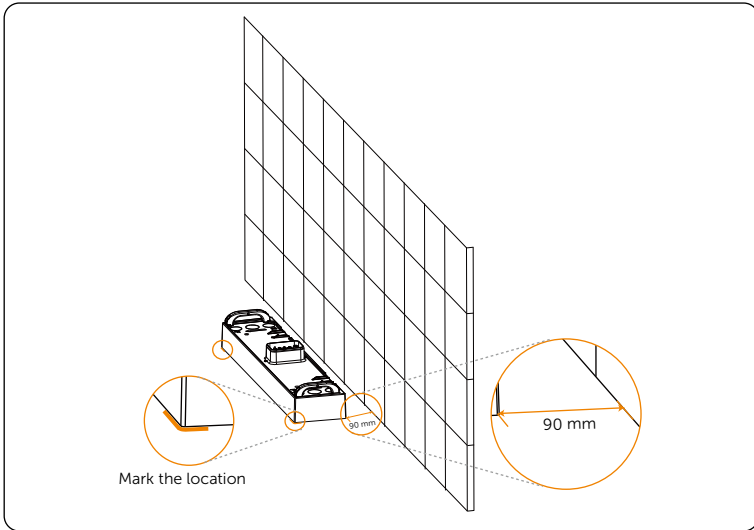


Figure 6-6 Placing the Base

**Step 5:** Attach the angle bracket (Part A) and adjustable bracket (Part D) together by using M5x14 Phillips cheese head screw (Part B), but do not fully tighten them.

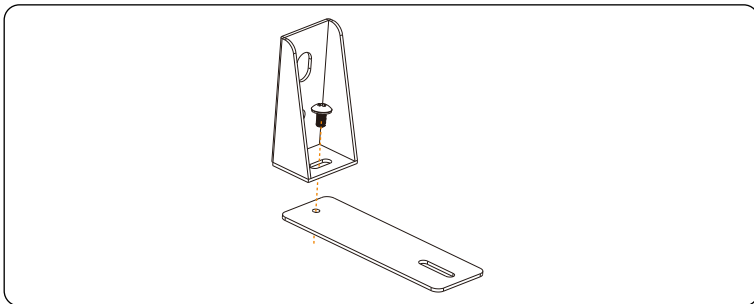


Figure 6-7 Attaching two brackets

**Step 6:** Place the assembled bracket on the wall, align the hole to the hole on the battery module; and circle along the inner ring of the holes on the angle brackets. Totalling 2 assembled brackets need to be installed.

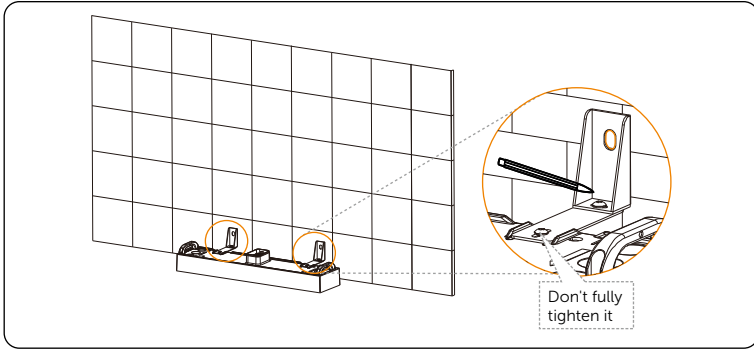


Figure 6-8 Circling inner ring of holes

**NOTICE!**

- Don't tighten screws fully until the angle bracket is secured on the wall.

**Step 7:** Remove the assembled bracket, and then drill two holes at a depth of more than 60 mm in the concrete wall by using a Drill (Ø10 mm).

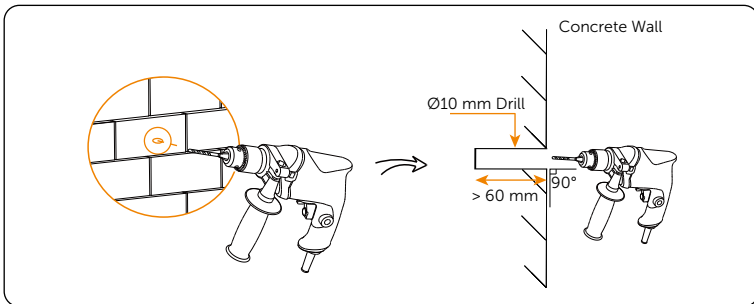


Figure 6-9 Drilling holes

**NOTICE!**

- An electric drill dust collector is recommended.
- To prevent dust from being released into the hot plug when drilling holes, users may use the package bag of the device or other materials to fully cover the battery module.



**Step 8:** Insert the expansion bolt (Part E) (x 2 pcs) into two holes, tighten the self-tapping screw (Part G) (x 2 pcs) to secure the assembled bracket on the wall (torque: 8-10 N·m), and then tighten M5x14 screws on both sides (torque: 2.2-2.5 N·m).

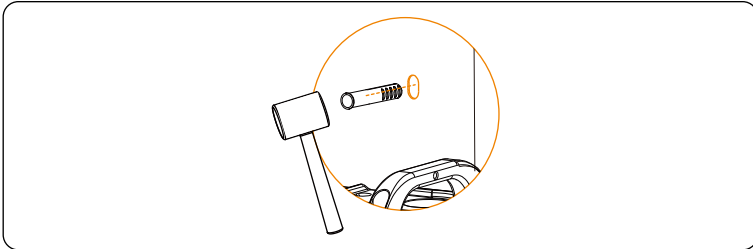


Figure 6-10 Inserting the expansion bolt

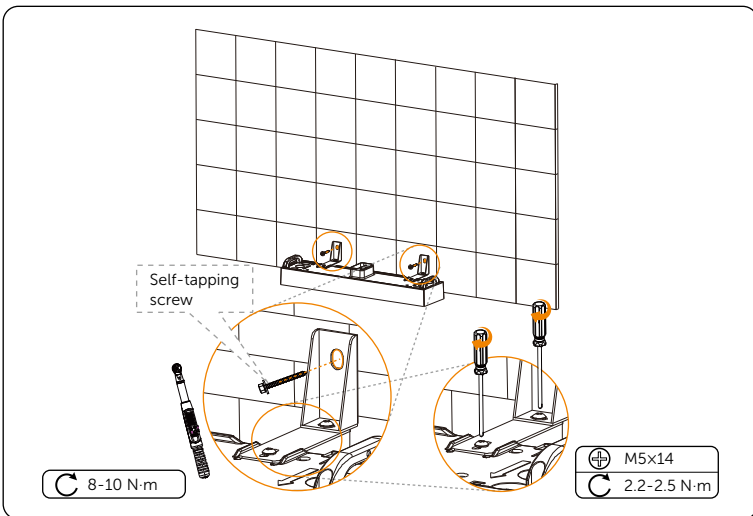


Figure 6-11 Securing the assembled bracket

**NOTICE!**

- If the Base is shifted before securing assembled bracket, move it to its original location according to the mark previously drawn.

**Step 9:** Place a battery module on the Base.

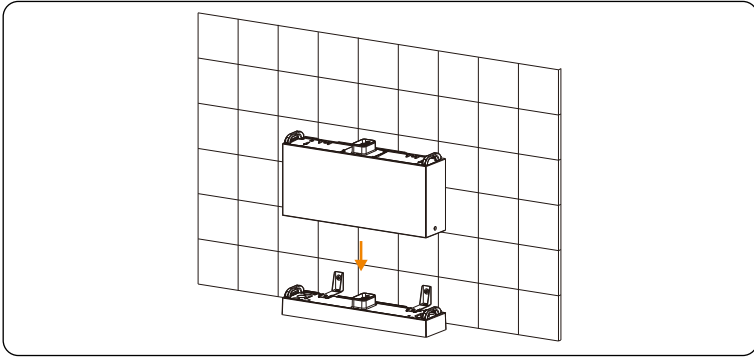


Figure 6-12 Placing the battery module

**NOTICE!**

- At least two persons are required to move the battery module.
- Please ensure that the side with "R" shall be against the wall.

**Step 10:** Insert and tighten M5x14 Phillips cheese head screw (Part A1) (x 2 pcs) on both sides (torque: 2.2-2.5 N·m).

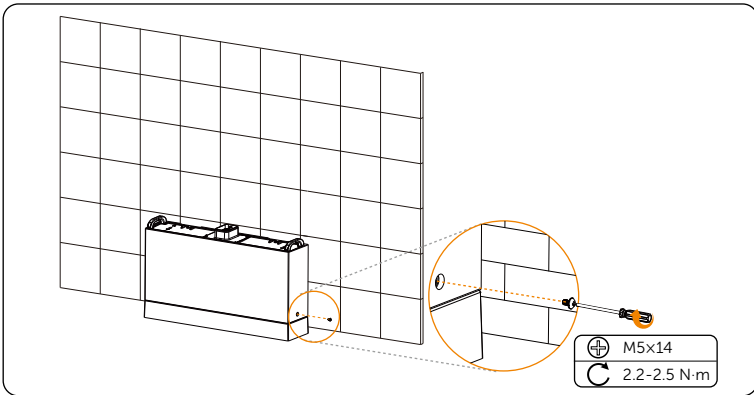


Figure 6-13 Tightening screws

**NOTICE!**

- Please make sure that the corners and edges of the Base and battery module are aligned before tightening screws.

**Step 11:** Place the second and third battery modules, and make sure that the corners and edges of the battery modules are aligned.

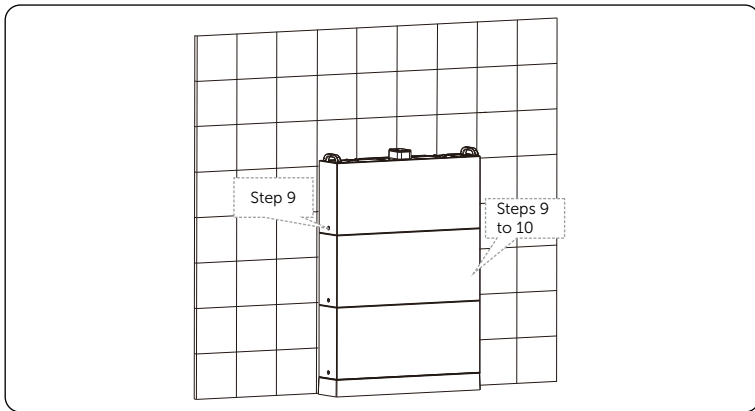


Figure 6-14 Placing battery modules

**Step 12:** Secure the assembled brackets on the wall.

1. Attach the angle bracket and adjustable bracket together;
2. Place such assembled bracket on the wall, and align its hole to the hole on the battery module;
3. Circle along the inner ring of two holes on the angle bracket;
4. Remove such assembled bracket, and then drill two holes at a depth of more than 60 mm in the concrete wall by using a Drill ( $\varnothing 10$  mm);
5. Insert the expansion bolts into such two holes;
6. Secure such assembled bracket using tapping screws and washers, and then tighten M5x14 screws.

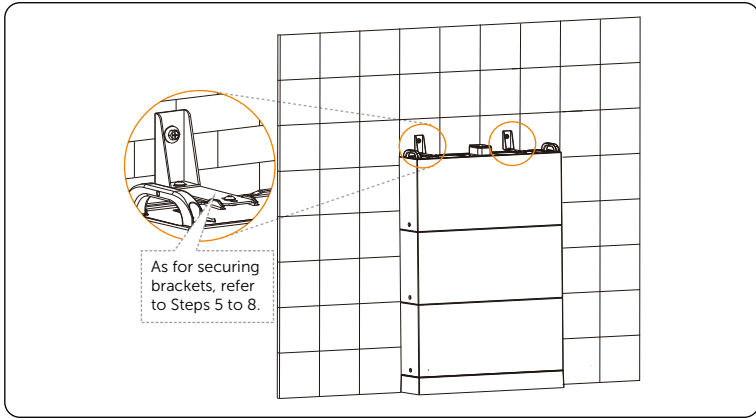


Figure 6-15 Securing assembled bracket

**NOTICE!**

- An electric drill dust collector is recommended.
- To prevent dust from being released into the hot plug when drilling holes, users may use the package bag of the device or other materials to fully cover the battery module.

**Step 13:** Place the BMS, and then tighten the M5x14 screws on both sides (torque: 2.2-2.5 N·m)

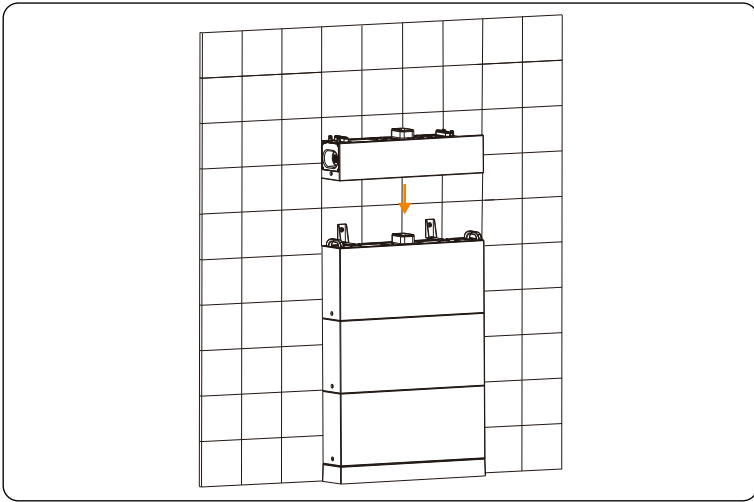


Figure 6-16 Placing the BMS

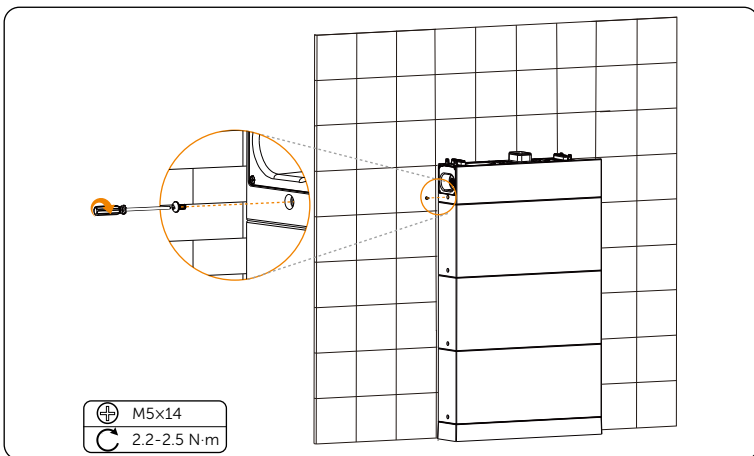


Figure 6-17 Tightening M5 screws

#### NOTICE!

- Please make sure that the corners and edges of the BMS and battery module are aligned before tightening screws.

Two Tower for Floor Mounting

NOTICE!

- Take the installation procedure for option H as an example.

**Step 1:** As for the installation steps for the following figure, please refer to the installation procedure for "[One Tower for Floor Mounting](#)" (Steps 1 to 13). The installation procedure for both left and right towers is the same.

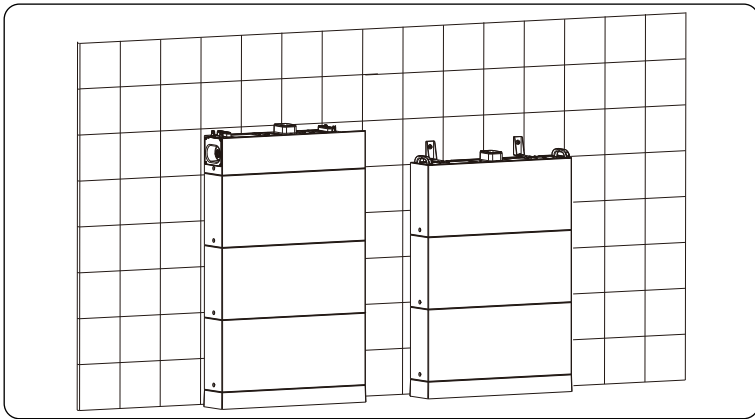


Figure 6-18 Installing two towers

**Step 2:** Place the Series Box, insert and tighten M5x14 screws (Part D2), with totalling 4 screws (torque: 2.2-2.5 N·m).

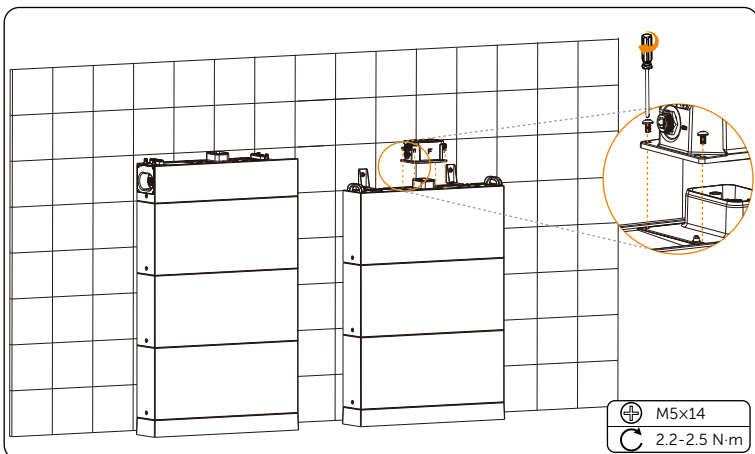


Figure 6-19 Placing the Series Box

## NOTICE!

- The side of the Series Box with "R" shall be against the wall.
- The cover that covers on the Series Box shall be installed after finishing wiring. As for the installation procedure of the cover, please refer to the section of "[Installation of Cover](#)".

## 6.2.2 Wall Mounting

## One Tower for Wall Mounting

## NOTICE!

- Take the installation procedure for three battery modules as an example.

**Step 1:** Remove dust covers from the Base, battery module(s) and BMS before conducting installation.

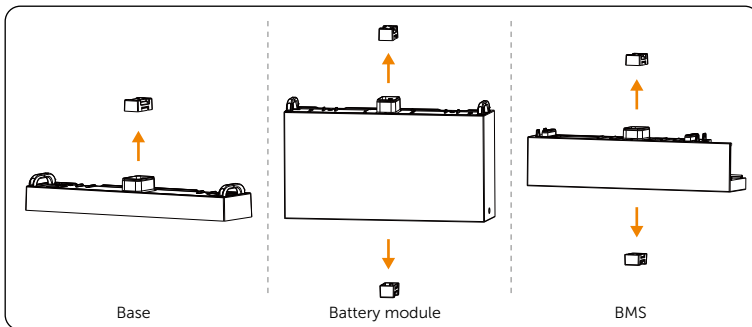


Figure 6-20 Removing dust covers

**Step 2:** Tighten M5x8 screws on both sides to attach the base support (Part A3) (x 2 pcs) and transverse plate (Part B3) together (torque: 2.2-2.5 N·m).

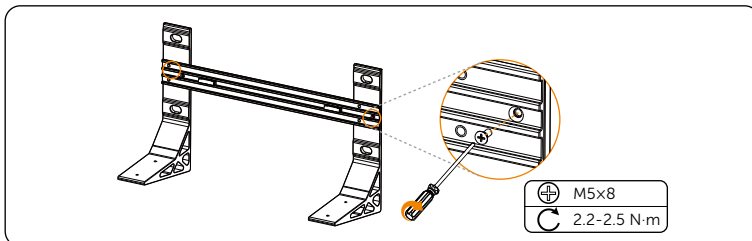


Figure 6-21 Attaching base support and transverse plate

**Step 3:** Place the assembled base support and transverse plate on the wall, check the cylindrical plastic bubble spirit level on the transverse plate. If the bubble isn't in the centre, slightly bow it to the horizontal.

Then circle along the inner ring of the four holes.

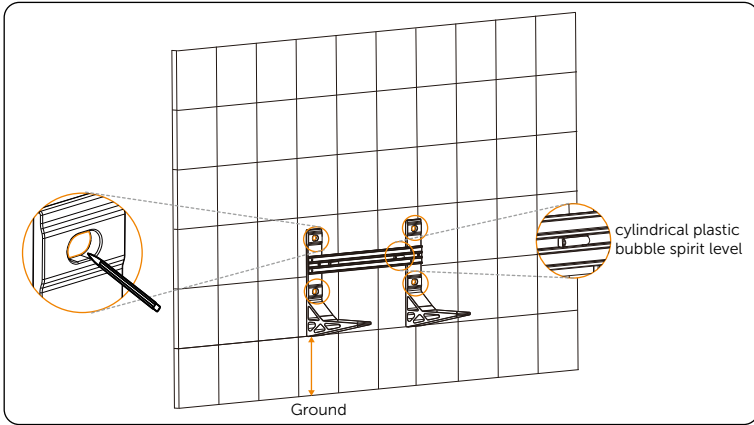


Figure 6-22 Drawing circles

**NOTICE!**

- The distance from the base support to the ground is decided according to the local regulations. And it is also the distance from the Base to the ground. For the safety concerns, it is suggested that the height from the ground not be too high.
- Please leave enough distance to the ceiling to install the inverter.

**Step 4:** Remove the assembled base support and transverse plate, and then drill four holes at a depth of at least 110 mm by using a Drill ( $\varnothing 15$  mm).

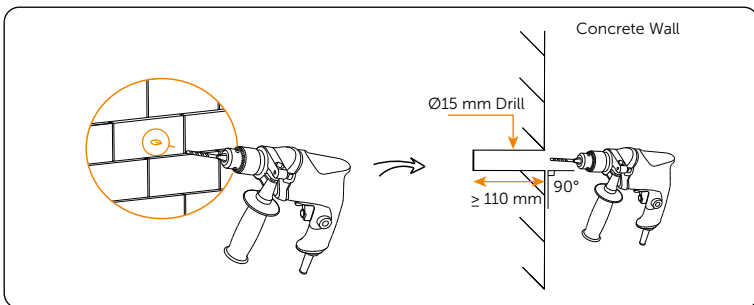


Figure 6-23 Drilling holes



## NOTICE!

- An electric drill dust collector is recommended.
- To prevent dust from being released into the hot plug when drilling holes, users may use the package bag of the device or other materials to fully cover the Base.

**Step 5:** Place the assembled base support and transverse plate on the wall again, and check whether the bubble is in the centre.

Attach the expansion screw (Part C3) (× 4 pcs) to such four holes, hit it by using rubber mallet, and then tighten it by using torque wrench (torque: 20-25 N·m)

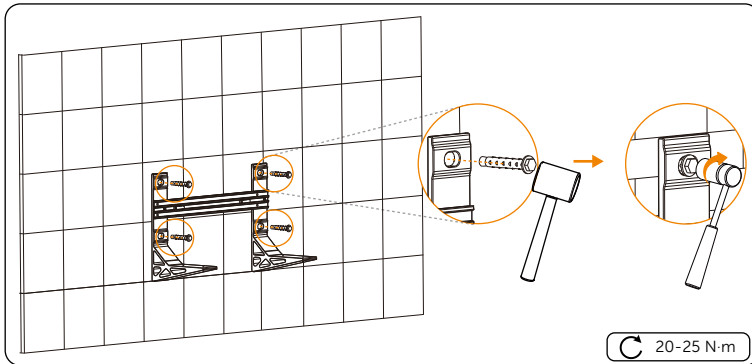


Figure 6-24 Tightening expansion screws

**Step 6:** Place the Base on the base support, and secure both left and right sides with M5×20 Phillips countersunk head screw (Part D3) (× 4 pcs) (torque: 2.2-2.5 N·m).

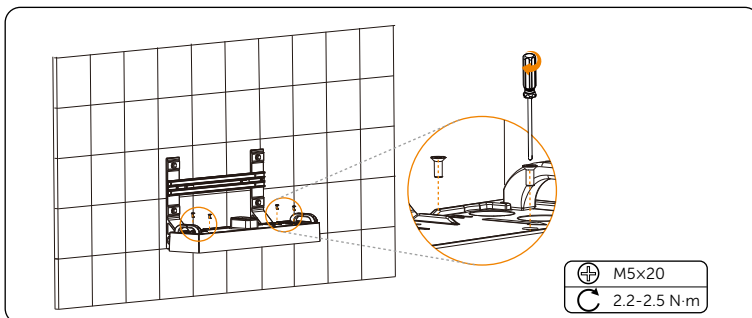


Figure 6-25 Securing the Base

**Step 7:** Place the battery module on the Base.

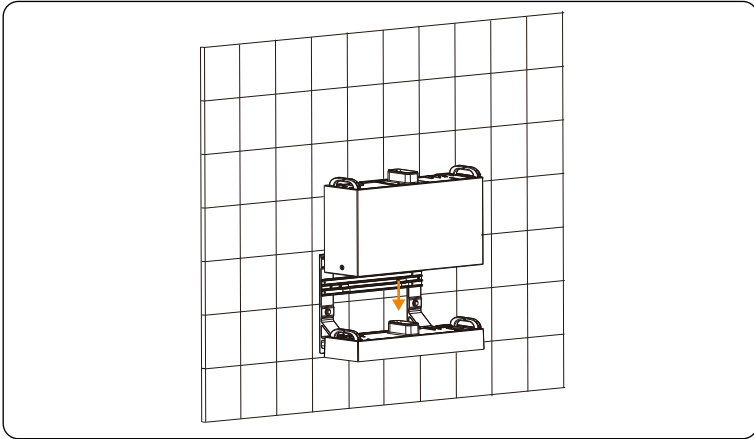


Figure 6-26 Placing battery module

**NOTICE!**

- At least two persons are required to move the battery module.
- Make sure that the side of the Series Box with "R" shall be against the wall.

**Step 8:** Insert and tighten M5×14 M5×14 Phillips cheese head screw (Part A1) (x 2 pcs) on both sides (torque: 2.2-2.5 N·m).

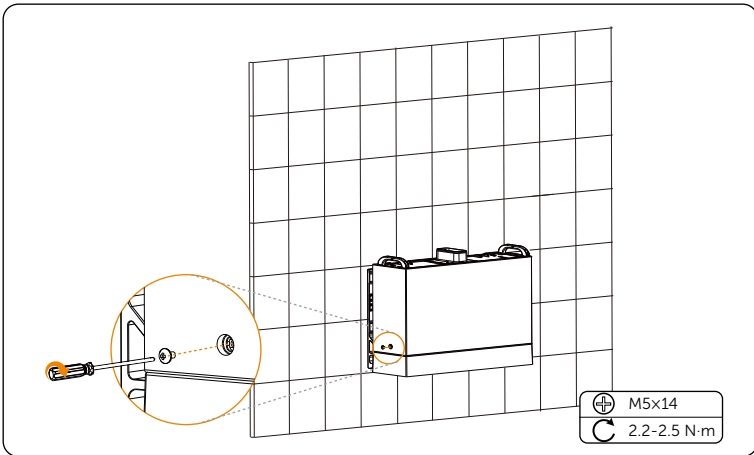


Figure 6-27 Tightening screws

**NOTICE!**

- Please make sure that the corners and edges of the Base and battery module are aligned before tightening screws.

**Step 9:** Place the second and third battery modules, and make sure that the corners and edges of the battery modules are aligned.

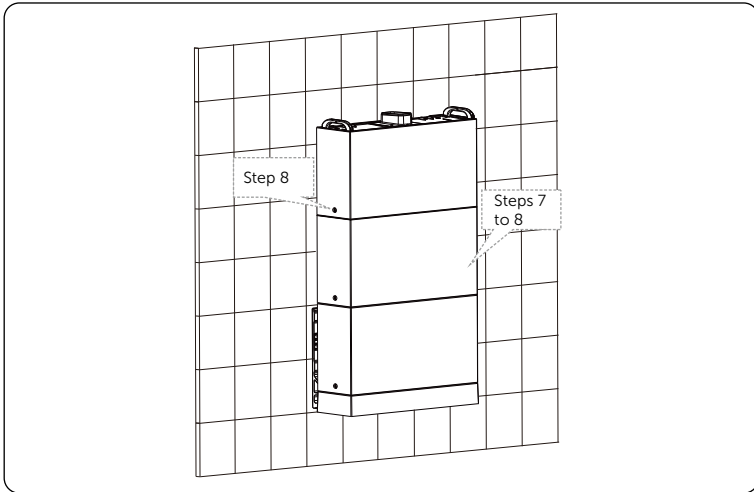


Figure 6-28 Placing battery modules

**Step 10:** Attach the angle bracket (Part A) and adjustable bracket (Part D) together by using M5×14 Phillips cheese head screw (Part B), but do not tighten them for a while.

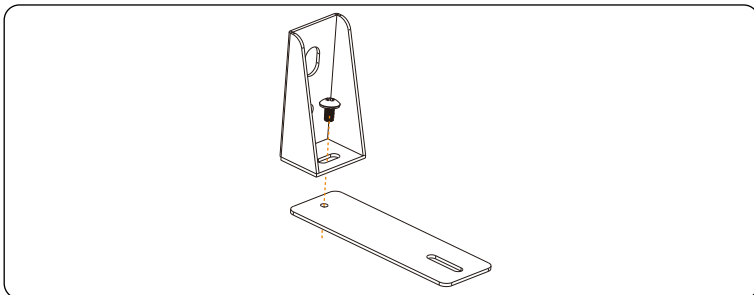


Figure 6-29 Attaching two brackets

**Step 11:** Place the assembled bracket on the wall, align the hole to the hole on the battery module; and circle along the inner ring of two holes on the angle brackets. Totalling 2 assembled brackets need to be installed.

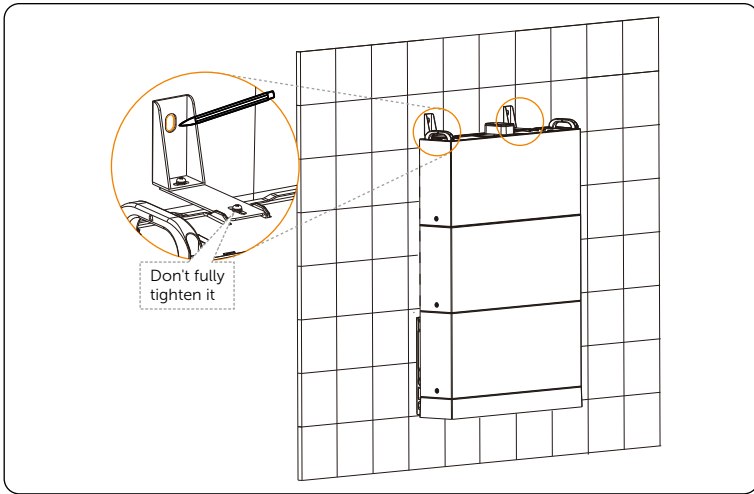


Figure 6-30 Circling inner ring of holes

**NOTICE!**

- Don't tighten screws fully until the angle bracket is secured on the wall.

**Step 12:** Remove the assembled brackets, and then drill two holes at a depth of more than 60 mm in the concrete wall by using a Drill ( $\varnothing 10$  mm).

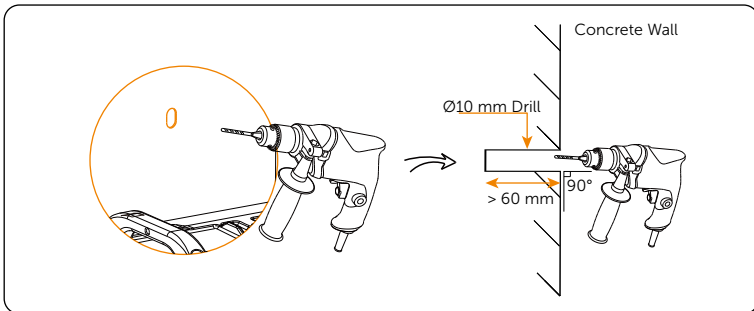


Figure 6-31 Drilling holes

## NOTICE!

- An electric drill dust collector is recommended.
- To prevent dust from being released into the hot plug when drilling holes, users may use the package bag of the device or other materials to fully cover the battery module.

**Step 13:** Insert the expansion bolt (Part E) (x 2 pcs) into such two holes, tighten the self-tapping screw (Part G) (x 2 pcs) to secure the assembled bracket on the wall (torque: 8-10 N·m), and then tighten M5x14 Phillips cheese head screw on both sides (torque: 2.2-2.5 N·m).

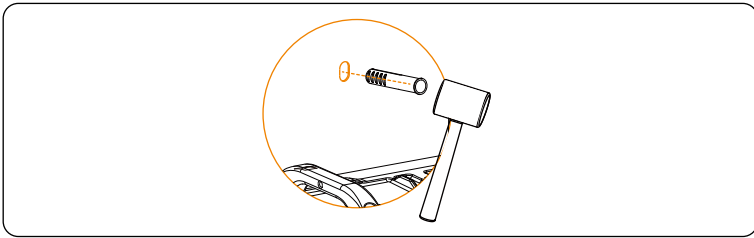


Figure 6-32 Inserting the expansion bolt

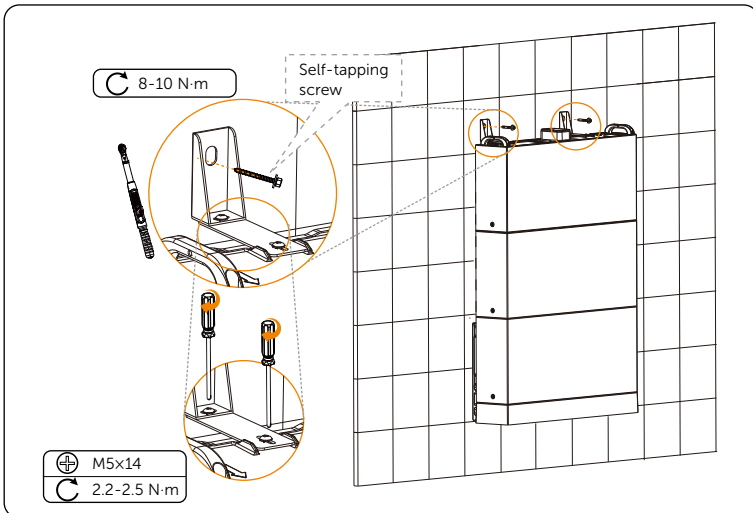


Figure 6-33 Securing the assembled bracket

**Step 14:** Place the BMS, and tighten the M5x14 screws on both sides (torque: 2.2-2.5 N·m)

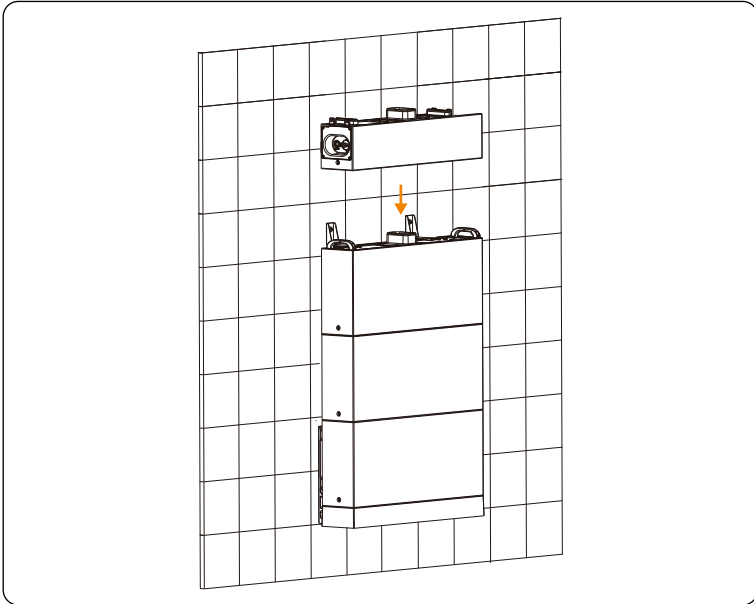


Figure 6-34 Placing the BMS

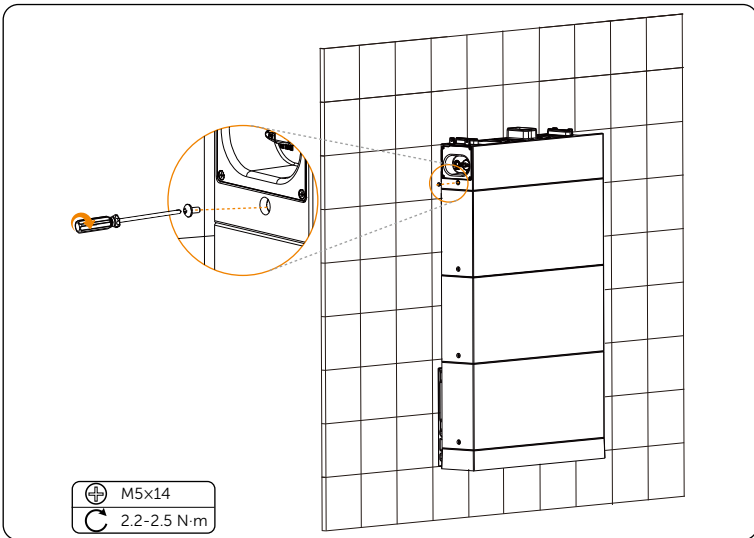


Figure 6-35 Tightening M5 screws

**NOTICE!**

- Please make sure that the corners and edges of the BMS and battery module are aligned before tightening screws.

**Two Towers for Wall Mounting****NOTICE!**

- Take the installation procedure for six battery modules as an example.

**Step 1:** As for the installation steps for the following figure, please refer to the installation procedure for [“One Tower for Wall Mounting”](#) (Steps 1 to 14). The installation procedure for both left and right towers is the same.

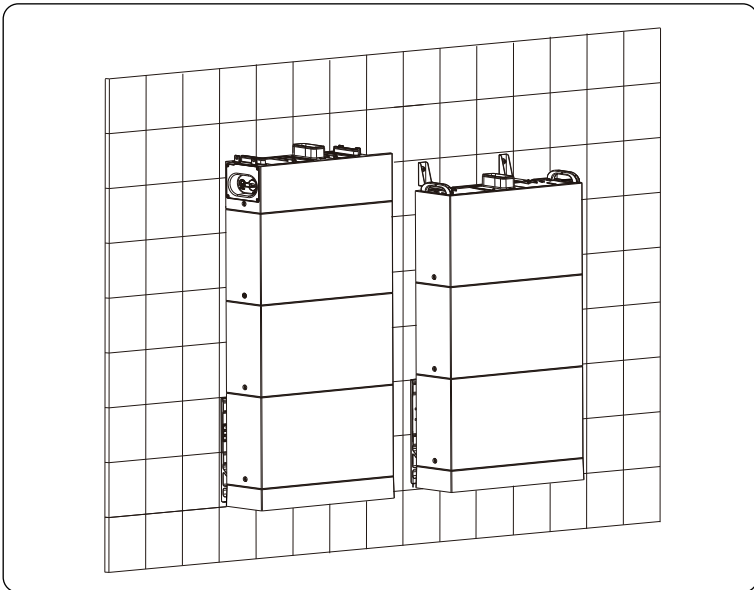


Figure 6-36 Installing two towers

**Step 2:** Place the Series Box, insert and tighten M5x14 screws, with totalling 4 screws (torque: 2.2-2.5 N·m).

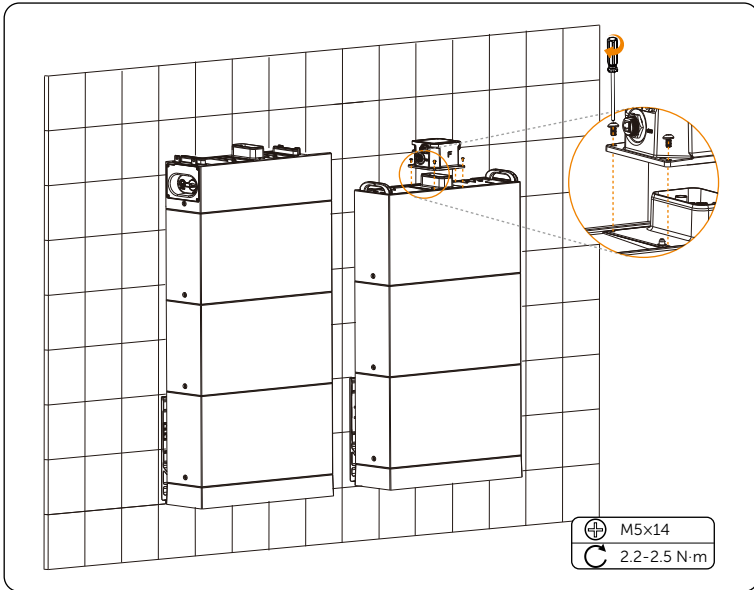


Figure 6-37 Placing the Series Box

**NOTICE!**

- The side of the Series Box with "R" shall be against the wall.
- The cover that covers on the Series Box shall be installed after finishing wiring. As for the installation procedure of the cover, please refer to the section of "[Installation of Cover](#)".

### 6.3 Battery Capacity Expansion

The device is allowed to increase the number of battery modules to achieve capacity expansion.

As for the battery capacity expansion, it may have to dismantle the inverter. In that case, please strictly follow the *User Manual* to remove or install the inverter.

**NOTICE!**

- Please confirm that there is enough space to increase the number of battery modules.
- Please make sure that the ground and wall that are used to install the new battery modules can handle the additional weight.



# 7 Wiring

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## 7.1 Details of Cables

Communication cable: There are two terminals at both ends. One connects to the COM port of the BMS, and the other connects to the COM port of the Series Box.

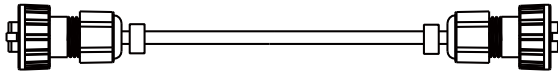


Figure 7-38 Communication cable

Heater cable: There are two terminals at both ends. One connects to the HEAT port of the BMS, and the other connects to the HEAT port of the Series Box.

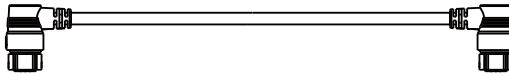


Figure 7-39 Heater cable

Power cable (black): There are two terminals with the same function at both ends. One connects to the "BAT-" of the BMS, and the other connects to the "BAT-" of the Series Box.



Figure 7-40 Power cable (black)

Power cable (red): There are two terminals with the same function at both ends. One connects to the "BAT+" of the BMS, and the other connects to the "BAT+" of the Series Box.



Figure 7-41 Power cable (red)

Grounding cable: There are two terminals at both ends. One connects the grounding port of the BMS, and the other connects to the grounding port of the Series Box.

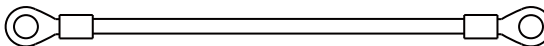


Figure 7-42 Grounding cable

### NOTICE!

- The above-mentioned cables are delivered with the **Accessories of Series Box**.

## 7.2 Wiring Procedure

### WARNING!

- Only the qualified personnel can perform the wiring.
- Follow this manual to wire connection. The device damage caused by incorrect cabling is not in the scope of warranty.

### CAUTION!

- Use insulated tools and wear individual protective tools when connecting cables.

### NOTICE!

- In the case of one tower, the BMS doesn't need to conduct wiring. The short power cable, short-circuit plug, and waterproof cap will be connected before delivery. In that case, the short power cable, short-circuit plug, or waterproof cap shall not be removed.
- The wiring procedure for both floor mounting and wall mounting is the same.
- Take the wiring procedure for two towers in the mode of floor mounting as an example.

**Step 1:** Before conducting wiring between the BMS and Series Box, press and hold the lock button to unplug the short power cable.

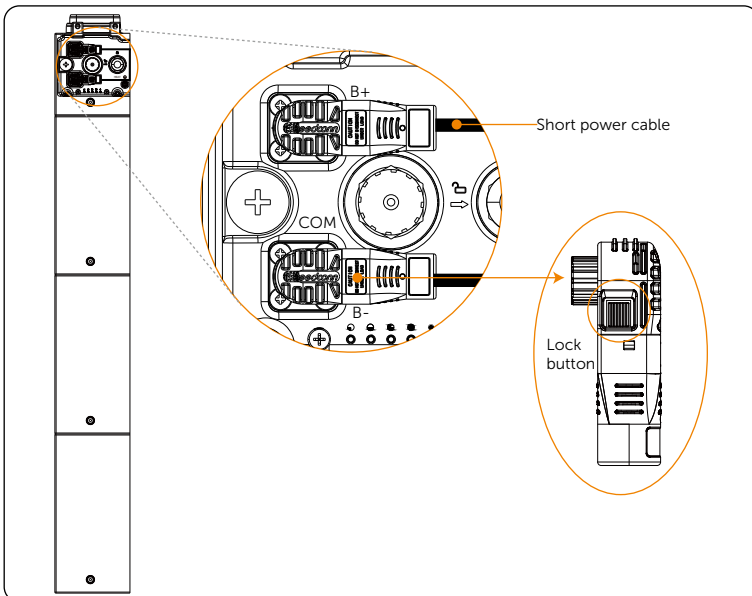


Figure 7-1 Removing short power cable

**Step 2:** Rotate the waterproof cap anti-clockwise to remove it. And rotate the short-circuit plug anti-clockwise. When the arrow on the rotating ring is aligned with the arrow on the panel, the short-circuit plug can be remove.

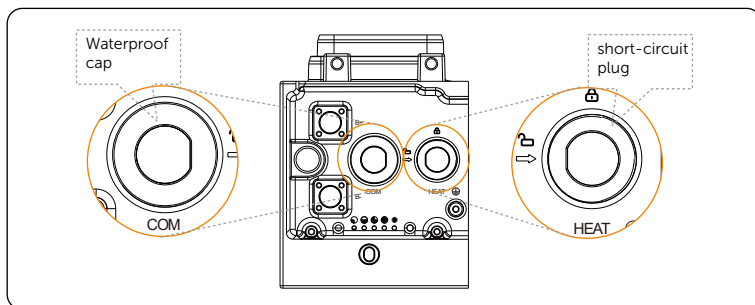


Figure 7-2 Removing waterproof cap

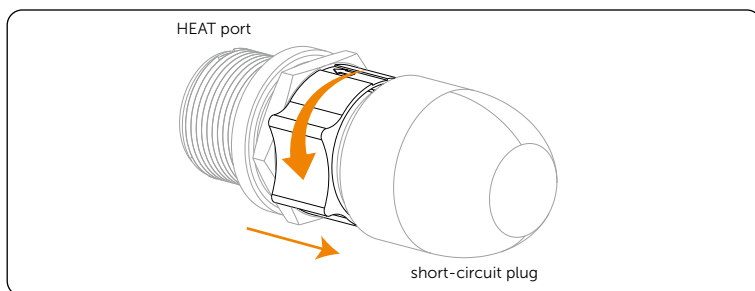


Figure 7-3 Closing short-circuit plug

#### NOTICE!

- Press and hold the lock button while unplugging the power cable, or it cannot be pulled out.
- Don't violently remove the short-circuit plug before the arrow on the rotating ring is aligned with the arrow on the panel.
- Don't violently remove the cable when it is locked.

- Step 3:** Connect B+ of the BMS to B+ of the Series Box with power cable (red) (Part H2);  
 Connect B- of the BMS to B- of the Series Box with power cable (black) (Part I2);  
 Connect COM port of the BMS to COM port of the Series Box with communication cable (Part J2) and tighten it by rotation wrench (Part C);  
 Connect HEAT port of the BMS to HEAT port of the Series Box with heater cable (Part K2);  
 Connect the grounding port of the BMS to the grounding port of the Series Box with grounding cable (Part L2).

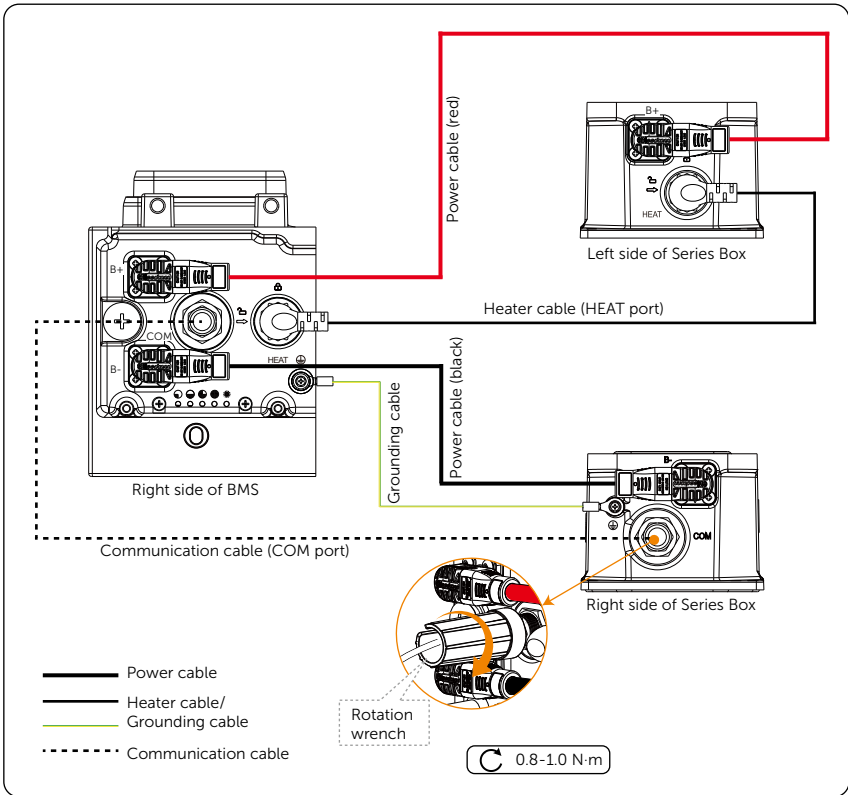


Figure 7-4 Connecting cables

**NOTICE!**

- There are two terminals on both ends of the power cable;
- Both ends of the communication cable shall be closed by using a rotation wrench.

**Step 4:** Pull cables through pipes after connecting cables to the BMS.

Pull the power cable (red) and heater cable through pipe 1, and pull the power cable (black), communication cable and grounding cable through pipe 2.

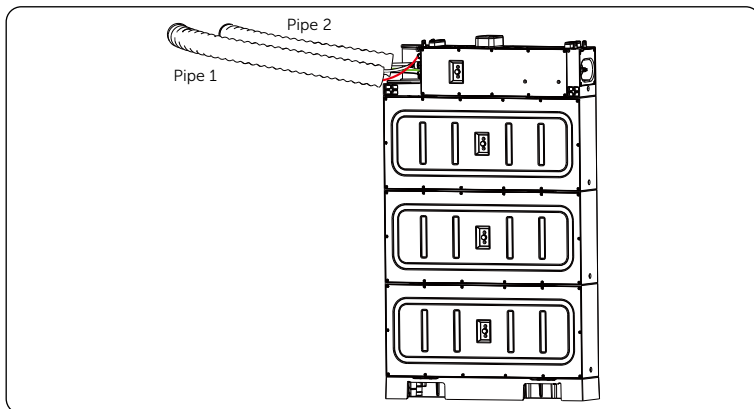


Figure 7-5 Pulling cables

#### NOTICE!

- A corrugated pipe should be prepared by the users themselves.

**Step 5:** Insert pipes into the holes on the cover, and then connect the cables to the Series Box.

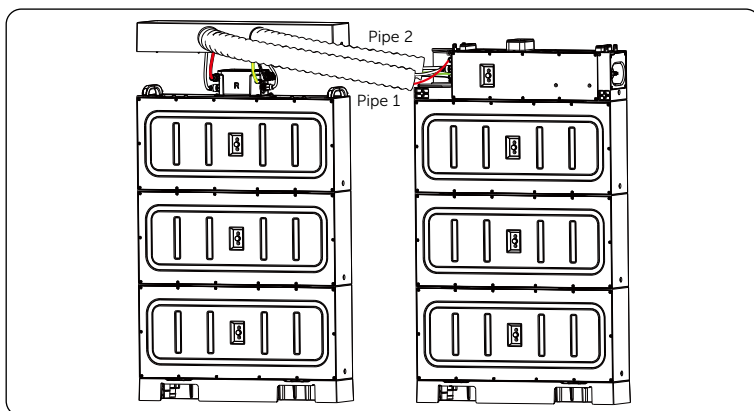


Figure 7-6 Inserting pipes into the cover

**Step 6:** Firstly rotate the rotating ring until the arrow on it is aligned with the arrow on the panel before removing the short-circuit plug, and then insert the heater cable into the HEAT port and rotate clockwise to close it.

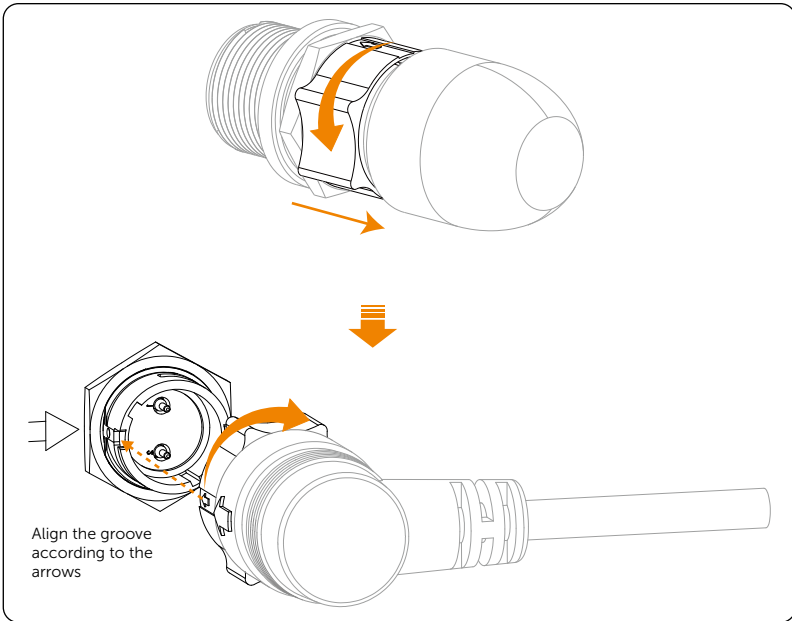


Figure 7-7 Locking heater cable

**NOTICE!**

- A rotation wrench is used to tighten both ends of the communication cable, and it may be removed after tightening.
- Don't violently remove the cable when it is locked.
- A corrugated pipe with an external diameter of 67.2 mm is recommended for use to keep cable insulation in place and avoid potential damages.

### 7.3 Installation of Cover

After finishing wiring, push the cover to the Series Box, and tighten M5x14 screws on both sides to secure the cover (torque: 2.2-2.5 N·m).

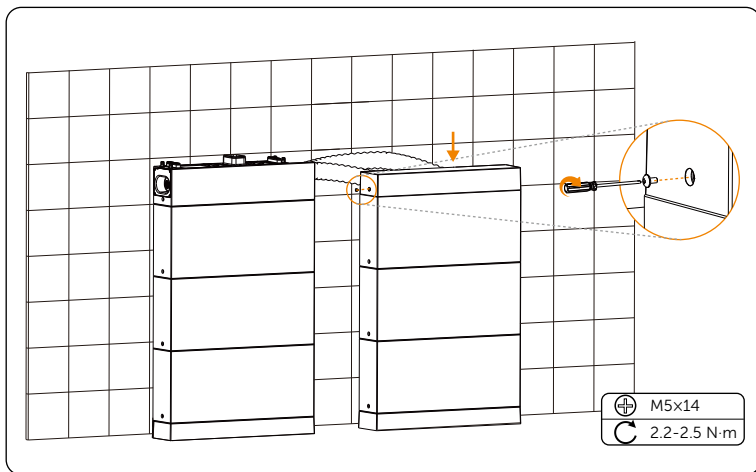


Figure 7-8 Tightening M5 screws

#### NOTICE!

- Please make sure that the corners and edges of the cover and battery module are aligned before tightening screws.
- The above steps for installing the cover also apply to the mode of wall mounting.

# 8 System Commissioning

## 8.1 Checking before Power-on

- a. Check the device installed correctly and securely;
- b. Make sure that all the BAT BUTTON and BAT SWITCH are OFF;
- c. All cables are connected correctly and securely;
- d. All unconnected port are covered;

## 8.2 Powering on the System

**Step 1:** Switch the BAT SWITCH to the "ON" position.

**Step 2:** Press and hold the BAT BUTTON for about 1 to 2 seconds to activate the system, at this point, the status light flashes a yellow light every 0.1 seconds until finishing self test, of which the period lasts about 3 to 4 seconds. Then the status light flashes green light every 0.5 seconds after finishing self test. During the whole period, all the SOC power indicators were off. After successful communication to the inverter, the status light turns solid green light, and SOC power indicators come on solid green light based on the actual remaining capacity.

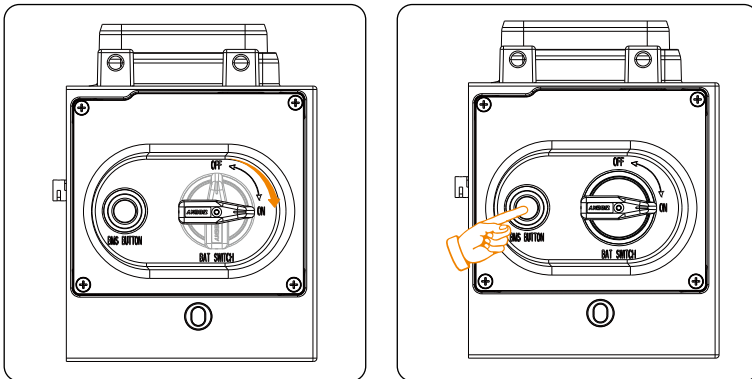


Figure 8-1 Power on

### NOTICE!

- A system problem may be encountered while pressing the button frequently. The user may need to wait at least 10 seconds and then try again.



# 9 Troubleshooting and Maintenance

## 9.1 Power off the System

**Step 1:** Press and hold the BAT BUTTON.

**Step 2:** Switch the BAT SWITCH to the "OFF" position.

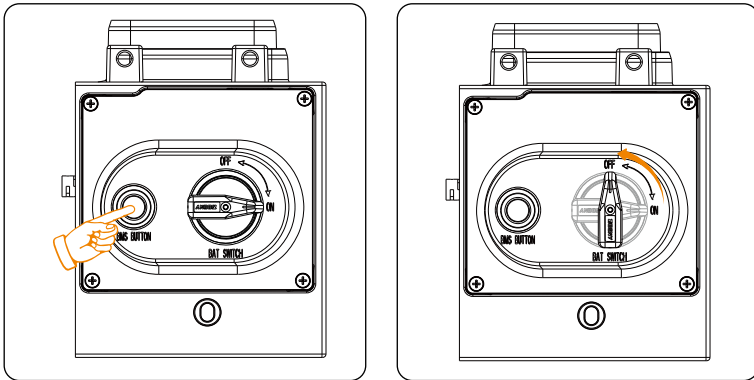


Figure 9-1 Power off

### WARNING!

- After the battery powers off, there will still be the remaining electricity and heat which may cause electric shocks and body burns. Please wear personal protective equipment (PPE) and begin servicing the battery five minutes after power off.

## 9.2 Troubleshooting

This section contains information and procedures for resolving possible problems with the rechargeable battery and provides the troubleshooting tips to identify and solve most problems that may occur. Please conform the state of the indicators to check the status of the T-BAT system, check the warning or fault information via the monitoring software on the inverter, and read the suggested solutions below when error occurs.

In case of the following circumstances, e.g. voltage or temperature exceeds the limit specified, a warning state will be triggered.

T-BAT system's BMS will periodically report its operating state to the inverter. Therefore, when a warning is reported, the inverter will stop working immediately.

Contact SolaX Customer Service for further assistance. Please be prepared to describe the details of your system installation and provide the model and serial number of the rechargeable battery.

Error Code	Fault	Diagnosis and Solution
BMS_Lost	External fault of BMS	Unable to establish communication with inverter. <ul style="list-style-type: none"> <li>Restart the BMS.</li> <li>Contact the after-sales personnel of our company.</li> </ul>
BMS_Internal_Err	Internal fault of BMS	Unable to establish communication among battery modules. <ul style="list-style-type: none"> <li>Restart the BMS.</li> <li>Check whether the wire connections among battery modules are correct.</li> <li>Contact the after-sales personnel of our company.</li> </ul>
BMS_OverVoltage	BMS overvoltage	Overvoltage of a single battery module. <ul style="list-style-type: none"> <li>Contact the after-sales personnel of our company.</li> </ul>
BMS_LowerVoltage	BMS undervoltage	Undervoltage of a single battery module. <ul style="list-style-type: none"> <li>Battery module is forced to charge through inverter.</li> <li>Contact the after-sales personnel of our company.</li> </ul>
BMS_ChargeOverCurrent	Overcurrent charging of BMS	Overcurrent charging of BMS. <ul style="list-style-type: none"> <li>Restart the BMS.</li> <li>Contact the after-sales personnel of our company.</li> </ul>
BMS_DischargeOverCurrent	Discharge overcurrent of BMS	Discharge overcurrent of BMS. <ul style="list-style-type: none"> <li>Restart the BMS.</li> <li>Contact the after-sales personnel of our company.</li> </ul>

Error Code	Fault	Diagnosis and Solution
BMS_TemHigh	High temperature of BMS	The temperature of the BMS is too high. <ul style="list-style-type: none"> <li>Cool down the BMS to normal temperature, and then restart it.</li> <li>Contact the after-sales personnel of our company.</li> </ul>
BMS_TemLow	Low temperature of BMS	The temperature of the BMS is too low. <ul style="list-style-type: none"> <li>Warm up the BMS, and restart it.</li> <li>Contact the after-sales personnel of our company.</li> </ul>
BMS_CellImbalance	Cell imbalance of BMS	Inconsistency of battery module. <ul style="list-style-type: none"> <li>Restart the BMS.</li> <li>Contact the after-sales personnel of our company.</li> </ul>
BMS_Circuit_Fault	Circuit fault	Circuit fault of the BMS. <ul style="list-style-type: none"> <li>Restart the BMS.</li> <li>Contact the after-sales personnel of our company.</li> </ul>
BMS_Insulation_Fault	Insulation fault	Insulation fault of the BMS. <ul style="list-style-type: none"> <li>Restart the BMS.</li> <li>Contact the after-sales personnel of our company.</li> </ul>
BMS_VoltSensor_Fault	Voltage sensor fault	Voltage sampling fault of the BMS. <ul style="list-style-type: none"> <li>Restart the BMS.</li> <li>Contact the after-sales personnel of our company.</li> </ul>
BMS_CurrSensor_Fault	Current sensor fault	Current sampling fault of the BMS. <ul style="list-style-type: none"> <li>Restart the BMS.</li> <li>Contact the after-sales personnel of our company.</li> </ul>
BMS_Relay_Fault	Relay fault	Relay contact adhesion fault of the BMS. <ul style="list-style-type: none"> <li>Restart the BMS.</li> <li>Contact the after-sales personnel of our company.</li> </ul>
BMS_CR_Unresponsive	Charging request not responded	Inverter does not respond the charging request. <ul style="list-style-type: none"> <li>Restart the BMS or the inverter.</li> <li>Contact the after-sales personnel of our company.</li> </ul>
BMS_536_Fault	536 fault of the BMS	BMS voltage sampling fault. <ul style="list-style-type: none"> <li>Restart the BMS.</li> <li>Contact the after-sales personnel of our company.</li> </ul>

Error Code	Fault	Diagnosis and Solution
BMS_Selfchecking_Fault	Self-test fault of the BMS	Self-test fault of the BMS. <ul style="list-style-type: none"><li>• Restart the BMS.</li><li>• Contact the after-sales personnel of our company.</li></ul>
BMS_Temdiff_Fault	Temperature different fault	BMS temperature varies greatly. <ul style="list-style-type: none"><li>• Restart the BMS.</li><li>• Contact the after-sales personnel of our company.</li></ul>
BMS_Break	Disconnection fault of the BMS	BMS sampling fault. <ul style="list-style-type: none"><li>• Restart the BMS.</li><li>• Contact the after-sales personnel of our company.</li></ul>
BMS_Precharge_Fault	BMS precharge fault	External short circuit of the BMS. <ul style="list-style-type: none"><li>• Check the external connection and restart the BMS.</li><li>• Contact the after-sales personnel of our company.</li></ul>

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### 9.3 Maintenance

In order to express the optimum device performance, please follow the instructions below when storing the battery. More frequent maintenance service is needed in the worse work environment. Please make records of the maintenance.

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#### Precautions

- If the ambient temperature for storage is between 30°C and 50°C (86°F to 122°F), please recharge the battery modules at least once every 6 months.
  - If the ambient temperature for storage is between -20°C and 30°C (-4°F to 86°F), please recharge the battery modules at least once every 12 months.
  - For the first installation, the interval among manufacture dates of battery modules shall not be exceed 3 months.
  - If a battery module is replaced or added for capacity expansion, each battery's SOC should be consistent. The max. SOC difference should be  $\pm 5\%$ .
  - If users want to increase their battery system capacity, please ensure that the SOC of the existing system capacity is about 40%. The manufacture date of the new battery module shall not exceed 6 months. If the manufacture date of the new one exceeds 6 months, please charge it to around 40%.
  - Batteries typically do not require maintenance by the installer or end user. If a battery is reporting an error message, SolaX can view the error message via Cloud online monitoring and then arrange for an on-site technical support engineer to go to the site to resolve the issue, as well as contacting an electrician if required.
-

# 10 Decommissioning

## 10.1 Disassembling the Battery



- When disassembling the battery, strictly follow the steps as below.

**Step 1:** Press the BAT BUTTON to shut down the system.

**Step 2:** Switch the BAT SWITCH to "OFF" position.

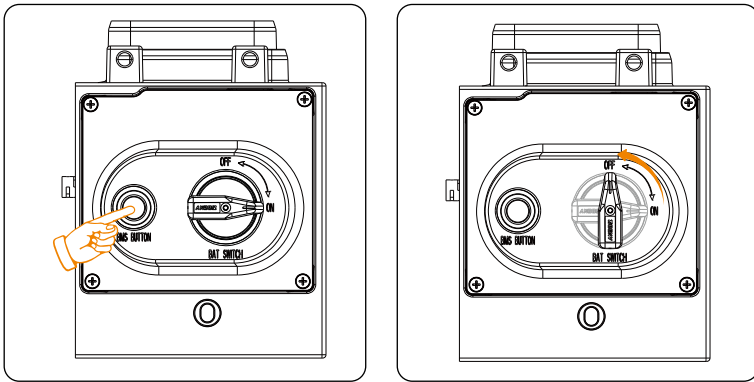


Figure 10-1 Pressing button and rotating switch

**Step 3:** Press and hold the lock button on the terminals to unplug the short power cable in the case of one tower;

Or press and hold the lock button on the terminals to unplug power cables in the case of two towers.

**Step 4:** Rotate the ring anti-clockwise to unplug the heater cable after two arrows are aligned in the case of two towers.

**Step 5:** Use and rotate anti-clockwise a rotation wrench to unplug the communication cable in the case of two towers.

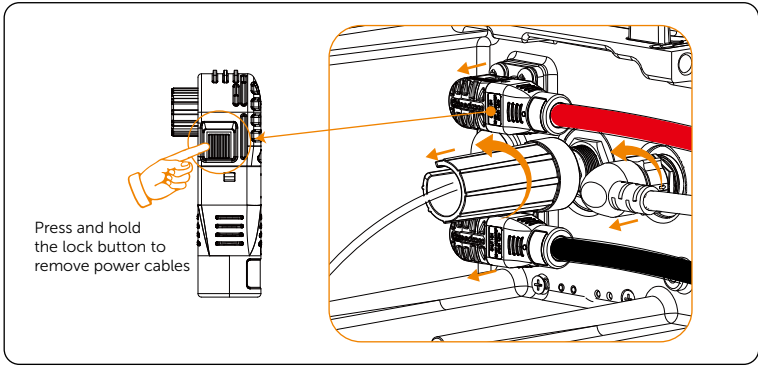


Figure 10-2 Unplugging cables

**Step 6:** Unscrew the screws to remove the grounding cable.

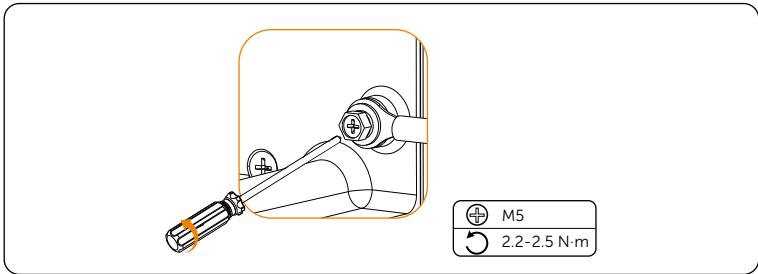


Figure 10-3 Removing grounding cable

**NOTICE!**

- The above steps for disconnecting cables apply to both the BMS and Series Box.

## 10.2 Packing

- Load the BMS and battery modules into the original packing material if possible.
- If the original packing material is not available, you can also use the packing material which meets the following requirements:
  - » Suitable for the weight of product.
  - » Easy to carry.
  - » Be capable of being closed completely.

## 10.3 Disposing of the Rechargeable Battery

Please dispose of the rechargeable battery or accessories in accordance with the disposal regulations for electronic waste which is applied at the installation site.

# 11 Technical Data

- Configuration List

Model	BMS	Battery Module	Nominal Energy (kWh)	Operating Voltage (Vdc)
T-BAT HS 5	TBMS-MCS0800E × 1	TP-HS50E × 1	5.1	90-116
T-BAT HS 10	TBMS-MCS0800E × 1	TP-HS50E × 2	10.2	180-232
T-BAT HS 15	TBMS-MCS0800E × 1	TP-HS50E × 3	15.3	270-348
T-BAT HS 20	TBMS-MCS0800E × 1	TP-HS50E × 4	20.4	360-464
T-BAT HS 25	TBMS-MCS0800E × 1	TP-HS50E × 5	25.6	450-580
T-BAT HS 30	TBMS-MCS0800E × 1	TP-HS50E × 6	30.7	540-696

- Performance Parameter

Module	T-BAT HS 5	T-BAT HS 10	T-BAT HS 15	T-BAT HS 20	T-BAT HS 25	T-BAT HS 30
Nominal Voltage (Vdc)	102.4	204.8	307.2	409.6	512	614.4
Operating Voltage (Vdc)	90-116	180-232	270-348	360-464	450-580	540-696
Nominal Capacity (Ah) <sup>1</sup>	50	50	50	50	50	50
Nominal Energy (kWh) <sup>1</sup>	5.1	10.2	15.3	20.4	25.6	30.7
Usable Energy 90% DOD (kWh) <sup>2</sup>	4.6	9.2	13.8	18.4	23.0	27.6
Max. Charge/Discharge Current (A) <sup>3</sup>	50	50	50	50	50	50
Recommend Charge/Discharge Current (A) <sup>4</sup>	30	30	30	30	30	30
Standard Power (kW)	3	6.1	9.2	12.2	15.3	18.4
Max. Power (kW)	5.1	10.2	15.3	20.4	25.6	30.7
Short-circuit current	3.57 kA (0.333 ms)					
Rated conditional short-circuit current on input ports	2.77 kA (0.690 ms)					
Battery Round-trip Efficiency (0.2C, 25°C) <sup>5</sup>	95%					
Expected Lifetime (25°C)	10 years					
Cycle Life 90% DOD (25°C)	6000 cycles					
Charge Temperature	0°C ~ 53°C (Off heating function) <sup>3</sup> / -30°C ~ 53°C (In heating function) <sup>3</sup>					
Discharge Temperature	-20°C ~ 53°C (Off heating function) <sup>3</sup> / -30°C ~ 53°C (In heating function) <sup>3</sup>					
Storage Temperature	30°C ~ 50°C (6 months); -20°C ~ 30°C (12 months)					
Ingress Protection	IP66					
Protection Class	I					



**NOTICE!**

1. Test conditions: 25°C, 100% depth of discharge (DoD), 0.2C charge & discharge.
2. System usable energy may vary with inverter different setting.
3. Discharge: In case of battery cell's temperature range of -20°C ~ 10°C and 45°C ~ 53°C, the discharge current will be reduced; Charge: In case of battery cell's temperature range of 0°C ~ 25°C and 45°C ~ 53°C, the charge current will be reduced. Product charge or discharge power depends on the actual temperature of the battery cell.
4. The battery can only be discharged and can not be charged when the battery cell's temperature range is between -20°C and 0°C.
5. Test conditions: 25°C, 100% depth of discharge (DoD), 0.2C charge & discharge.

# Contact Information



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