

# HS3 Series

**THREE-PHASE ALL-IN-ONE ENERGY STORAGE SYSTEM  
USER MANUAL**

HS3-(5K-13K)-T2-(W, G)-(B, P)X



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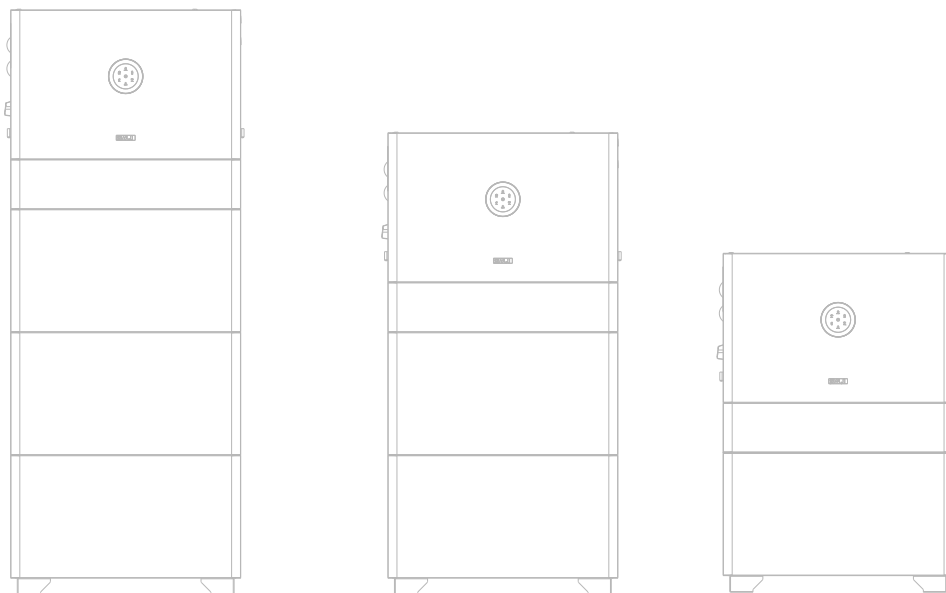
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1.

**SAFETY  
PRECAUTIONS**





## 1.1. About this document

### 1.1.1. Overview

This *User Manual* provides introductions and instructions of installing, operating, maintaining, and troubleshooting of the SAJ system HS3-(5K-12K)-T2-(W, G)-(B, P)X. It is a three-phase all-in-one energy storage system which includes the SAJ products listed in section 2.2.2.3.2 "Product models".

Read the user manual carefully before any installation, operation and maintenance and follow the instructions during installation and operation. Keep this manual all time available in case of emergency.

### 1.1.2. Target audience

This document is applicable to:


- Installers
- Users

## 1.2. Safety


### CAUTION:


**ONLY qualified and trained electricians who have read and fully understood all safety regulations contained in this manual can install, maintain, and repair the equipment. Access to the equipment is by the use of a tool, lock and key, or other means of security.**

### 1.2.1. Safety levels











 <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, can result in death or serious injury or moderate injury.

 <b>CAUTION</b>
Indicates a hazardous condition which, if not avoided, can result in minor or moderate injury.

 <b>NOTICE</b>
Indicates a situation that can result in potential damage, if not avoided.


## 1.2.2. Symbol explanation

Symbol	Description
	<b>Danger:</b> Electrical shock hazard This device is directly connected to public grid and thus all work to the battery shall only be carried out by qualified personnel.
	<b>WARNING:</b> No open flames Do not place or install near flammable or explosive materials.
	<b>Danger:</b> Hot surface The components inside the battery will release a lot of heat during operation. Do not touch metal plate housing during operating.
	<b>Attention:</b> Install the product out of reach of children.
	<b>Attention:</b> Check the user manual before service. If an error has occurred, refer to the troubleshooting section to remedy the error.
	<b>Attention:</b> This device shall NOT be disposed of in residential waste.
	<b>Attention:</b> This battery module shall NOT be disposed of in residential waste.
	<b>CAUTION:</b> Risk of electric shock from energy stored in capacitor. Do not remove cover until 5 minutes after disconnecting all sources of supply
	<b>CE Mark</b> Equipment with the CE mark fulfills the requirements of the Low Voltage Directive and Electro Magnetic Compatibility.
	<b>RoHS compliant mark</b> Equipment with the RoHS mark does not exceed the allowable amounts of the restricted substances defined in Restriction of Hazardous Substances in Electrical and Electronic Equipment.

	<p><b>RCM compliant mark</b> Equipment with the RCM mark is in compliance with AS/NZS 4417.1 &amp; 2 and the EESS.</p>
	<p><b>Recyclable</b></p>

### 1.2.3. Safety instructions

For safety, be sure to read all the safety instructions carefully prior to any works, and please observe the appropriate rules and regulations of the country or region where you installed all-in-one energy storage system.

 <b>DANGER</b>
<ul style="list-style-type: none"> <li>• Risk of fatal personnel injuries due to electrical shock and high voltage.</li> <li>• Do not touch the surface of the equipment while the housing is wet, otherwise, it might cause electrical shock.</li> <li>• Do not touch the operating component of the device; it might result in burning or death.</li> <li>• To prevent risk of electric shock during installation and maintenance, please make sure that all AC and DC terminals are plugged out.</li> <li>• Do not stay close to the equipment while there are severe weather conditions including storm, lightning, etc.</li> <li>• Before opening the housing, the SAJ inverter must be disconnected from the grid and PV generator; you must wait for at least five minutes to let the energy storage capacitors completely discharged after disconnecting from power source.</li> <li>• Make sure that the system is powered off prior to any operations.</li> <li>• Do not use the battery or the battery control unit if it is defective, broken or damaged.</li> <li>• Do not subject the battery to any strong force.</li> <li>• Do not place the battery near a heat source, such as direct sunlight, a fireplace.</li> <li>• Do not expose the battery to temperatures in excess of 50°C.</li> <li>• Keep inflammable and explosive dangerous items or flames away from the battery.</li> <li>• Do not soak the battery in water or expose it to moisture or liquids.</li> <li>• Do not use the battery in vehicles.</li> <li>• Do not use the battery in areas where the ammonia content of the air exceeds 20 ppm.</li> </ul>

 **WARNING**

- Any unauthorized actions including modification of product functionality of any form may cause lethal hazard to the operator, third parties, the units or their property. SAJ is not responsible for the loss and these warranty claims.
- Do not touch non-insulated parts or cables.
- For personal and property safety, do not short-circuit the positive (+) and negative (-) electrode terminals.
- Disconnect the PV array from the inverter by using an external disconnection device. If no external disconnection device is available, wait until no more DC power is applied to the inverter.
- Disconnect the AC circuit breaker, or keep it disconnected if it is tripped, and secure it against reconnection.
- The SAJ inverter must only be operated with the PV generator. Do not connect any other source of energy to the SAJ inverter.
- Be sure that the PV generator and inverter are well grounded in order to protect properties and persons.

 **CAUTION**

- Only qualified personnel who has full knowledge of local safety regulations and local standards on battery can install, maintain, retrieve, and process this product.
- Only use the battery as intended and designed. Do not change any components in the battery.
- Risk of damage due to improper modification
- Use professional tools when operating the products.
- The inverter will become hot during operations. Do not touch the heat sink or peripheral surface during or shortly after operation.

 **NOTICE**

- During installation of the battery, the circuit breaker must be disconnected from the battery pack wiring.

## 1.3. Safe handling

### 1.3.1. Inverter

- Only qualified electricians who have read and fully understood all safety regulations in this manual can install, maintain, and repair the inverter.
- When the inverter is working, do not touch the internal components or cables to avoid electric shock.

- When the inverter is working, do not plug in or out the cables.
- Make sure that the AC input voltage and current are compatible with the rated voltage and current of the inverter; otherwise, components might be damaged, or the device cannot work properly.

### 1.3.2. Battery

- Operate and use the battery properly according to the user manual. Any attempts to modify battery without the permission from SAJ will void the limit warranty for the battery.
- The battery must be installed at a suitable location with sufficient ventilation.
- Do not use the battery if it is defective, damaged, or broken.
- Only use the battery with a compatible inverter.
- Use batteries of the same type in an ESS. Do not mix the battery with other types of battery.
- Make sure that the battery is grounded prior to use.
- Do NOT pull out any cables or open the battery enclosure when the battery is powered on.
- Only use the battery as intended and designed. Do not change any components in the battery.
- It is recommended not to mix old and new battery modules, because doing so will not only cause capacity mismatch, but also affect battery performance and service life.
- It is recommended not to mix batteries with different SOC states, and better to use batteries from the same production batch together, because this can reduce the risk of abnormalities.
- If the user wants to expand the capacity later, it is recommended to add a cluster of batteries with the same configuration and use them in parallel with the original batteries.

## 1.4. Emergency

Despite of its careful and professional protection design against any hazards, damage of the battery may still possible. If a small amount of battery electrolyte is released due to a serious damage of the outer casing; or if the battery explodes due to not being treated timely after a fire breaks out nearby, and leaks out poisonous gases such as carbon monoxide, carbon dioxide and etc., the following actions are recommended:

- Eye contact: Rinse eyes with a large amount of running water and seek medical advice.
- Contact with skin: Wash the contacted area with soap thoroughly and seek medical advice.
- Inhalation: If you feel discomfort, dizziness, or vomiting, seek medical advice immediately.
- Use a FM-200 or Carbon Dioxide (CO<sub>2</sub>) fire extinguishers to extinguish the fire if there is a fire in the

area where the battery pack is installed. Wear a gas mask and avoid inhaling toxic gases and harmful substances produced by the fire.

- Use an ABC fire extinguisher, if the fire is not caused by battery and not spread to it yet.

 **WARNING**

- If a fire has just occurred, try to disconnect the battery circuit breaker, and cut off the power supply first, but only if you can do so without endangering yourself.
- If the battery is on fire, do not attempt to extinguish the fire but evacuate the crowd immediately.

Potential danger of damaged battery:

- **Chemical Hazard:**

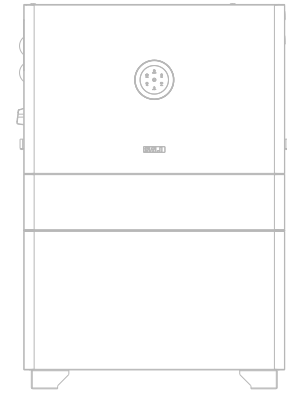
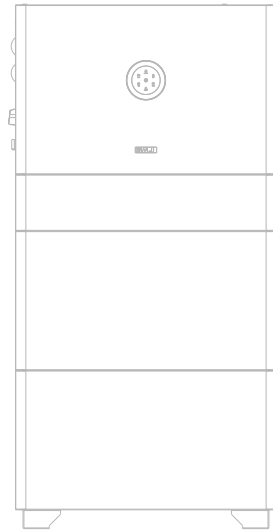
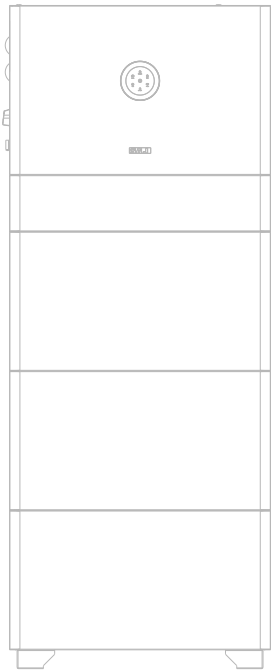
Despite of its careful and professional protection design against any hazard results, rupture of battery may still occur due to mechanical damage, internal pressure etc., and may result in a leakage of battery electrolyte. The electrolyte is corrosive and flammable. When there is fire, the toxic gases produced will cause skin and eyes irritation, and discomfort after inhalation. Therefore:

- Do not open damaged batteries.
- Do not damage the battery again (shock, fall, trample, etc.).
- Keep damaged batteries away from water (except to prevent an energy storage system from catching fire).
- Do not expose the damaged battery to the sun to prevent internal heating of the battery.

- **Electrical hazard:**

The reason of fire and explosion accidents in lithium batteries is battery explosion. Here are the main factors of battery explosion:

- Short-circuit of battery. Short circuit will generate high heat inside battery, resulting in partial electrolyte gasification, which will stretch the battery shell. The temperature reaching ignition point of internal material will lead to explosive combustion.
- Overcharge of battery. Overcharge of battery may precipitate lithium metal. If the shell is broken, it will come into direct contact with the air, resulting in combustion. The electrolyte will be ignited at the same time, resulting in strong flame, rapid expansion of gas and explosion.



2.

**PRODUCT  
INFORMATION**





## 2.1. General introduction

SAJ system HS3-(5K-12K)-T2-(W, G)-(B, P)*X* contains at least one HS3 inverter and one BU3 battery pack. It is a three-phase all-in-one energy storage system which is applied to the residential photovoltaic energy storage system which stores the electricity for household future use.

SAJ HS3 inverter is built internally with a battery management system (BMS), which is used to ensure efficiency of the battery and protect the battery from operating outside its specified limitations. Working with an optional BC3 battery junction box, up to 8 battery packs can be used for storage expansion. Working with an optional CU2 charger, it provides power to the EV charger.

SAJ BU3 battery has the detection mechanism to report the insulation fault alarm. After system startup and commissioning, if a battery insulation error occurs, an error code <112> will be reported on the Elekeeper App.

**Note:** *X* is the quantity of the battery modules, ranging from 1 to 8.

## 2.2. Models

### 2.3.2. Product models

The following tables list the device models of the HS3-(5K-12K)-T2-(W, G)-(B, P)*X* system with an optional battery junction box or a charger.

#### ■ Inverter (European version)

Model type Communication mode	Basic model	Professional model
With a built-in AIO3 module	<ul style="list-style-type: none"> <li>● HS3-3K-T2-W-B</li> <li>● HS3-4K-T2-W-B</li> <li>● HS3-5K-T2-W-B</li> <li>● HS3-6K-T2-W-B</li> <li>● HS3-8K-T2-W-B</li> <li>● HS3-10K-T2-W-B</li> <li>● HS3-10K-T2-W-B-BE*</li> <li>● HS3-12K-T2-W-B</li> <li>● HS3-12K-T2-W-B-IE*</li> </ul>	<ul style="list-style-type: none"> <li>● HS3-3K-T2-W-P</li> <li>● HS3-4K-T2-W-P</li> <li>● HS3-5K-T2-W-P</li> <li>● HS3-6K-T2-W-P</li> <li>● HS3-8K-T2-W-P</li> <li>● HS3-10K-T2-W-P</li> <li>● HS3-10K-T2-W-P-BE*</li> <li>● HS3-12K-T2-W-P</li> <li>● HS3-12K-T2-W-P -IE*</li> </ul>
With a built-in 4G module	<ul style="list-style-type: none"> <li>● HS3-3K-T2-G-B</li> </ul>	<ul style="list-style-type: none"> <li>● HS3-3K-T2-G-P</li> </ul>

	<ul style="list-style-type: none"> <li>● HS3-4K-T2-G-B</li> <li>● HS3-5K-T2-G-B</li> <li>● HS3-6K-T2-G-B</li> <li>● HS3-8K-T2-G-B</li> <li>● HS3-10K-T2-G-B</li> <li>● HS3-10K-T2-G-B-BE*</li> <li>● HS3-12K-T2-G-B</li> <li>● HS3-12K-T2-G-B-IE*</li> </ul>	<ul style="list-style-type: none"> <li>● HS3-4K-T2-G-P</li> <li>● HS3-5K-T2-G-P</li> <li>● HS3-6K-T2-G-P</li> <li>● HS3-8K-T2-G-P</li> <li>● HS3-10K-T2-G-P</li> <li>● HS3-10K-T2-G-P-BE*</li> <li>● HS3-12K-T2-G-P</li> <li>● HS3-12K-T2-G-P-IE*</li> </ul>
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■ Inverter (Australian version)

Model type Communication mode	Professional model
With a built-in AIO3 module	<ul style="list-style-type: none"> <li>● HS3-5K-T2-W-P</li> <li>● HS3-8K-T2-W-P</li> <li>● HS3-10K-T2-W-P-BE</li> </ul>

■ Battery pack

Equipment	Basic model	Professional model
Battery	<ul style="list-style-type: none"> <li>● BU3-5.0-TV1</li> <li>● BU3-5.0-TV2</li> </ul>	<ul style="list-style-type: none"> <li>● BU3-5.0-TV1-PRO</li> <li>● BU3-5.0-TV2-PRO</li> </ul>
Battery with a base	<ul style="list-style-type: none"> <li>● BU3-5.0-TV1-BASE</li> <li>● BU3-5.0-TV2-BASE</li> </ul>	<ul style="list-style-type: none"> <li>● BU3-5.0-TV1-PRO-BASE</li> <li>● BU3-5.0-TV2-PRO-BASE</li> </ul>

■ Battery junction box

BC3-TV

■ Charger

CU2-11K-T-I

● Wall-mounting bracket

BT3-TV

### 2.3.3. Model description

**HS3 - xK - T2 - W - **B** **X** - **IE****  
**HS3 - xK - T2 - G - **P** **X** - **BE****

**HS3:** Inverter model series

**xK:** Rated power. For example, 6K indicates the rated power of the inverter is 6 kW.

**T2:** Three phases with 2 MPPT

**W:** This model uses a built-in AIO3 module.

**G:** This model uses a built-in 4G module.

**B:** Basic model

**P:** Professional model

**X:** Quantity of the battery modules, ranging from 1 to 8.

**IE:** This model is applicable to Ireland.

**BE:** This model is applicable to Belgium.

**BU3 - 5.0 - **TVx** - PRO - **BASE****

**BU3:** Battery model series

**5.0:** The rated energy of the battery is 5.0 kWh.

**TVx:** **TV** indicates a pack-level optimizer. **x** indicates the battery cell manufacturer.

**PRO:** Professional model

**BASE:** With a base

## 2.3. Dimension

### 2.3.1. HS3 inverter

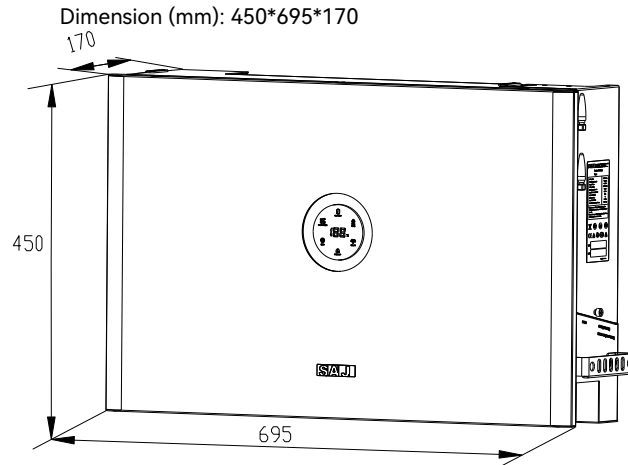


Figure 2.1. HS3 inverter dimension

### 2.3.2. BU3 battery pack

#### ■ BU3 battery pack—Type A

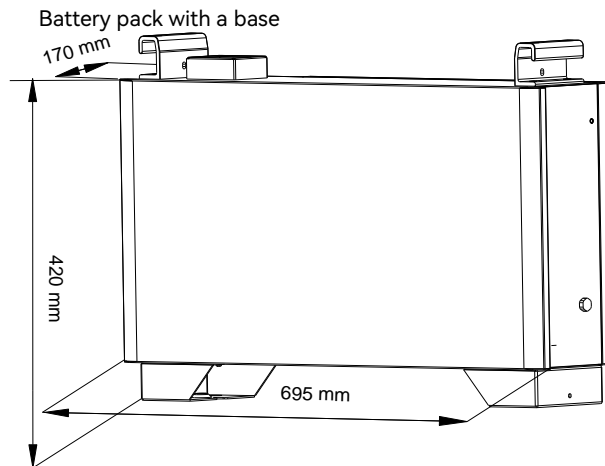


Figure 2.2. Dimension of the type A battery pack with a base

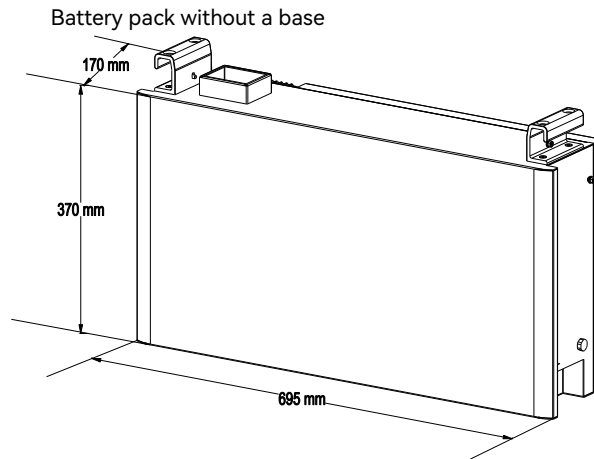


Figure 2.3. Dimension of the type A battery pack without a base

■ BU3 battery pack—Type B

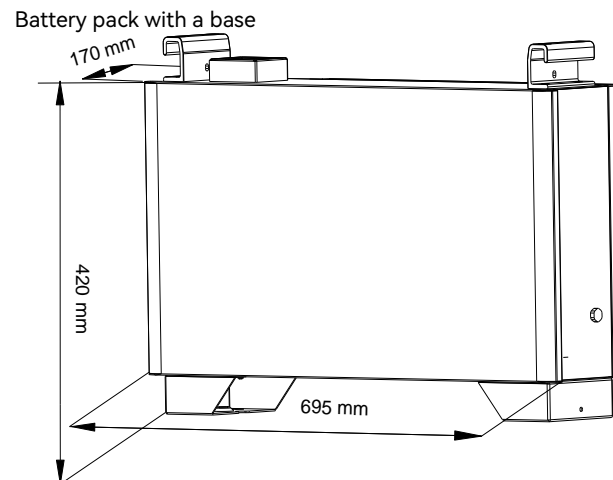


Figure 2.4. Dimension of the type B battery pack with a base

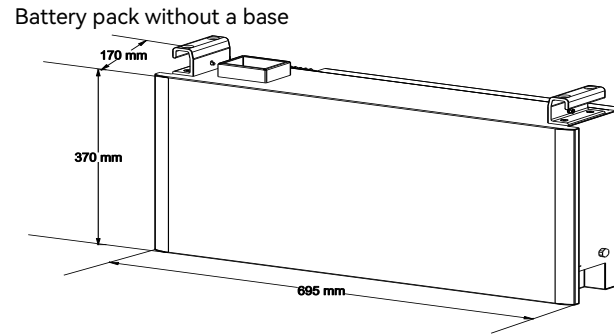


Figure 2.5. Dimension of the type B BU3 battery pack without a base

### 2.3.2. BC3 battery junction box

Dimension (mm): 150\*695\*170

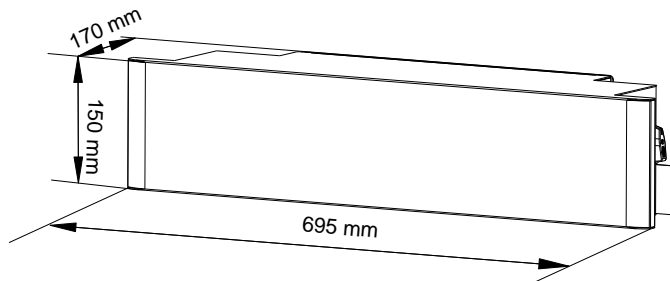


Figure 2.6. Dimension of the BC3 battery junction box

### 2.3.3. CU2 charger

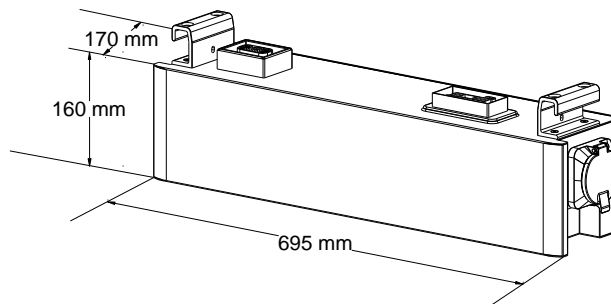


Figure 2.7. Dimension of the CU2 charger

## 2.4. Ports, switches, and LED on the HS3 inverter

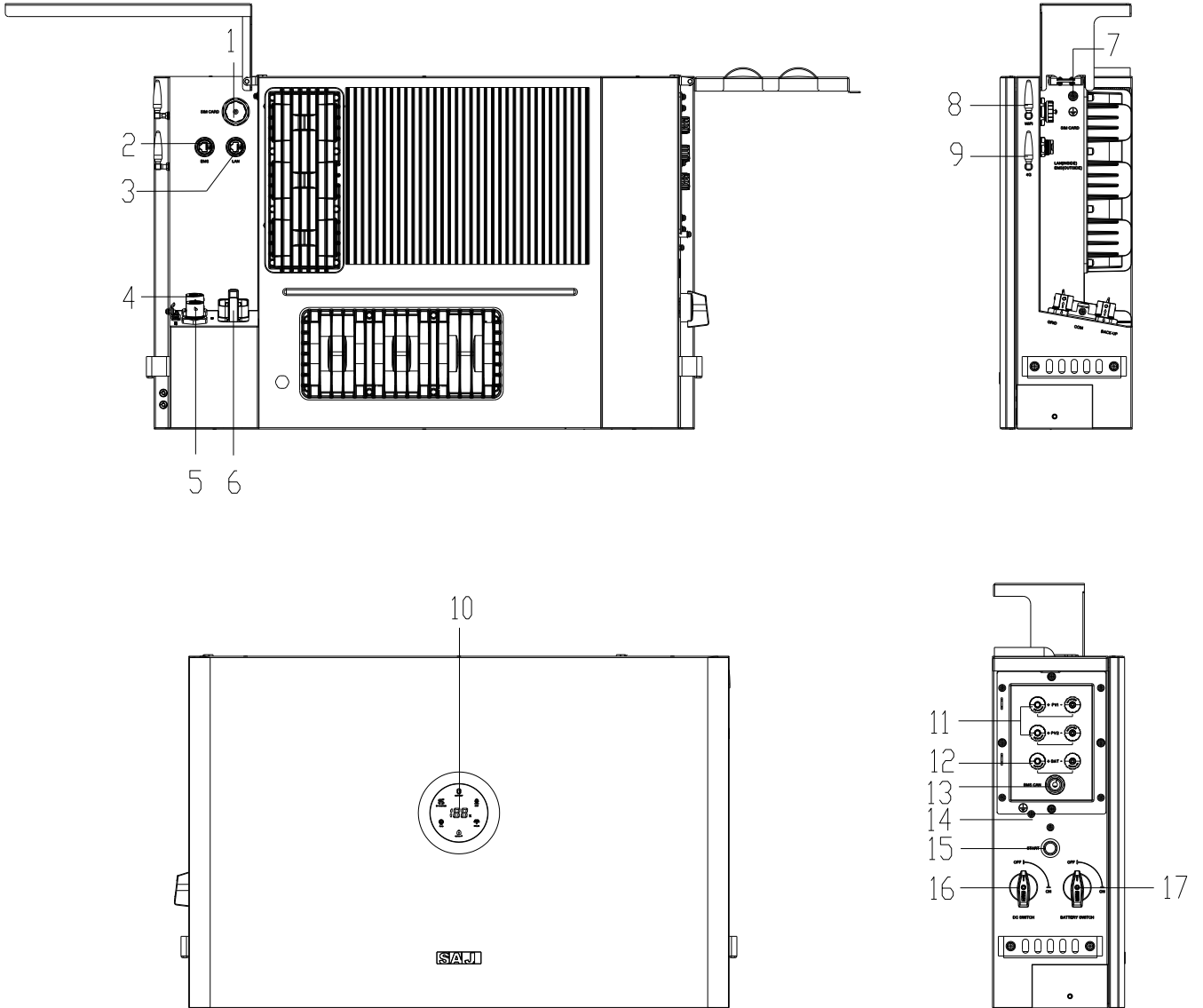


Figure 2.8. Ports, switches, and LED on the HS3 inverter

Callout	Silkscreen	Description
1	SIM CARD	SIM card slot Only available when a 4G module is embedded in the inverter.
2	EMS	Port for connecting an Energy management system (EMS) device Used in the paralleling scenario.
3	LAN	LAN port Only available when an AIO3 module is embedded in the inverter. It is used by the AIO3 module for communication.
4	GRID	Port for connecting to the grid utility
5	BACK-UP	Port for connecting to the backup loads
6	COMM	Communication port
7	/	Grounding port
8	WIFI	Wi-Fi antenna
9	4G	4G antenna. Only available when a 4G module is embedded in the inverter.
10	/	LED panel
11	PV1 (+, -), PV2 (+, -)	PV input ports
12	BAT (+, -)	BAT+ and BAT- ports Used for paralleling connection
13	BMS CAN	Battery communication port
14	/	Grounding port
15	START	Start button
16	DC SWITCH	Switch for controlling the DC input
17	BATTERY SWITCH	Switch for controlling battery power input and output

Table 2.1. Description of the ports, switches, and LED on the HS3 inverter



## 2.5. LED indicators on the HS3 inverter

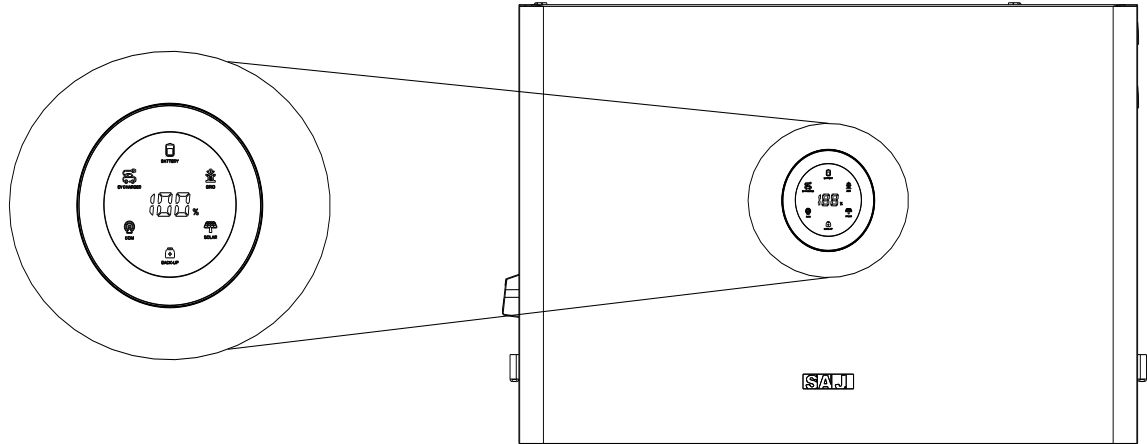









Figure 2.9. HS3 inverter LED

LED indicator	Status	Description
	Off	The inverter is powered off.
	Breathing 6s	The inverter is in initialization or standby state.
	Solid on	The inverter is working properly.
	Breathing 3s	The inverter is upgrading.
	Solid on	The inverter is not working properly.
	Integer (example, 50)	Battery average SOC (for example, 50%)
	--	The battery communication is lost.
 BATTERY	Solid on	The battery is working properly.
	On 1s, off 1s	The battery is not working properly.
	Off	The battery is disconnected or inactive.






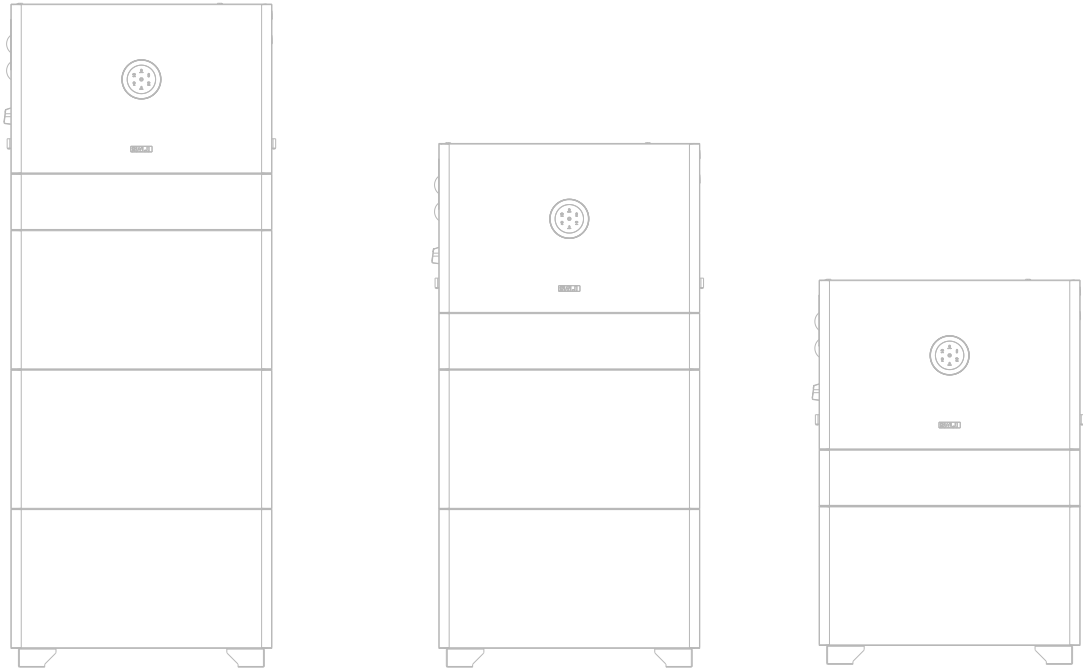
 GRID	Solid on	The grid is connected and working properly.
	On 1s, off 1s	The grid is not working properly.
	Off	No grid is detected.
 SOLAR	Solid on	The PV array is working properly.
	On 1s, off 1s	The PV array is not working properly.
	Off	The PV array is not working.
 BACK-UP	Solid on	The AC-side load is working properly.
	On 1s, off 1s	The AC-side load is overloaded.
	Off	The AC-side load is disconnected or off.
 COM	Solid on	In good communication with the meter, BMS, and cloud.
	On 1s, off 1s	Lost communication with the meter, BMS, or cloud.
	Off	Lost communication with all the meter, the BMS, and cloud.
 EV CHARGER	Solid on	The EV charger is in standby mode and working properly.
	On 1s, off 3s	The EV charger is charging.
	On 1s, off 1s	The EV charger is not working properly.
	Off	The EV charger is disconnected.

Table 2.2. LED description



3.

# TRANSPORTATION AND STORAGE



### 3.1. Transportation



Load or unload batteries with caution. Otherwise, the batteries may be short-circuited or damaged (such as leakage and crack), catch fire, or explode.

- Batteries have passed the test of UN38.3. This product meets the transportation requirements for dangerous goods for lithium batteries.
- The transportation service provider must be qualified to transport dangerous goods.
- Before transportation, check that the battery package is intact and that there is no abnormal odor, leakage, smoke, or sign of burning. Otherwise, the batteries must not be transported.
- Keep less than 4 cartons of inverter in one stack and keep less than 4 cartons of battery in one stack.
- After the installation of the battery on site, the original packaging (contains the lithium battery identification) should be kept. When the battery needs to be returned to the factory for repair, use the original packing for battery transportation.

### 3.2. Storage

- Store it in a dry and ventilated environment and keep it away from heat sources.

**Inverter-specific:**

- Keep the inverter in an environment with storage temperature as  $-40^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ , humidity 5% to 95% RH.

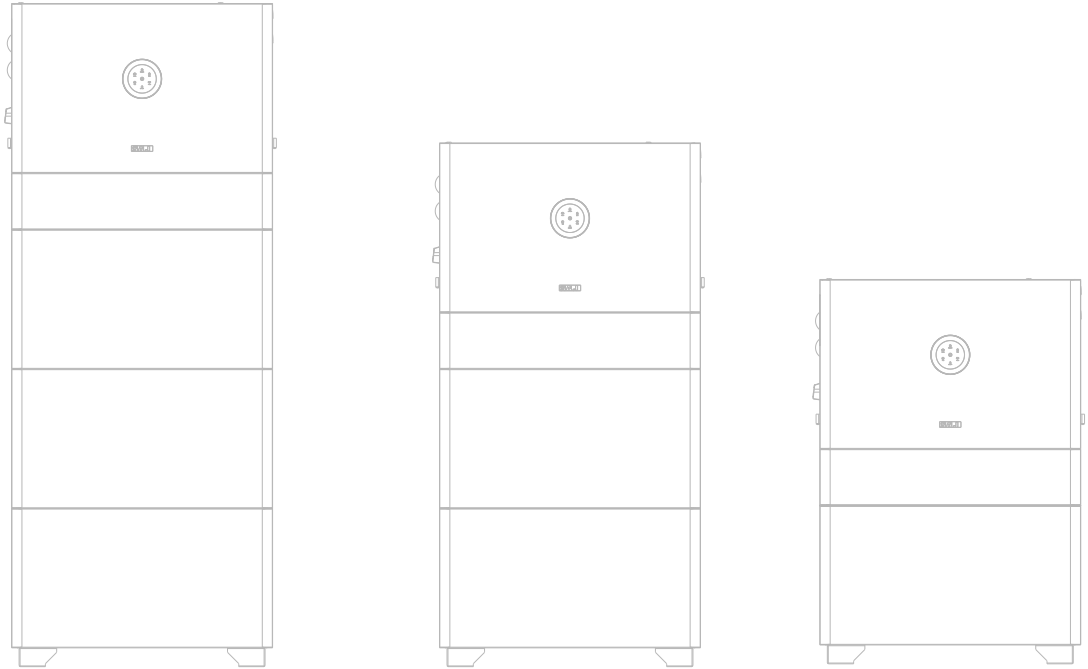
**Battery-specific:**

- Keep the battery in an environment with storage temperature as  $-10^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ , humidity 5% to 95% RH.
- For long-term storage (>3 months), put the battery in an environment with a temperature of  $-25^{\circ}\text{C}$  to  $25^{\circ}\text{C}$  and a humidity of < 85% RH.
- The battery should be installed within 6 months since delivered from the factory and used with compatible inverters.



- The battery remains 50% power when it is sent from the factory.
- The longer the battery is stored, the lower the SOC. When the battery remaining voltage fails to reach the startup voltage requirement, the battery may be damaged.

- Close the battery breaker switch and press the main switch. If the LED light is in solid green, it is running normally. If the LED light is in solid red or off, the battery is not working properly.
  
- The battery cannot be disposed of as household refuse. When the service life of the battery reaches to the limit, it is not required to return it to the dealer or SAJ, but it must be recycled to the special waste lithium battery recycling station in the area.



4.



# INSTALLATION





## 4.1. Precautions

For safety, be sure to read all the safety instructions carefully prior to any works and observe the appropriate rules and regulations of the country or region where you installed the energy storage system.

 <b>DANGER</b>
<ul style="list-style-type: none"> <li>• Dangerous to life due to potential fire or electricity shock.</li> <li>• Do not install the inverter near any inflammable or explosive items.</li> </ul>
 <b>NOTICE</b>
<ul style="list-style-type: none"> <li>• This equipment meets the pollution degree.</li> <li>• Inappropriate or the harmonized installation environment may jeopardize the life span of the inverter.</li> <li>• Installation directly exposed under intensive sunlight is not recommended.</li> <li>• The installation site must be well ventilated.</li> </ul>

## 4.2. Determine the installation site

Read the following sections to cautiously determine the installation site.

The safety regulations vary in different countries and regions. Follow local safety regulations.

### 4.2.1. Installation environment requirements

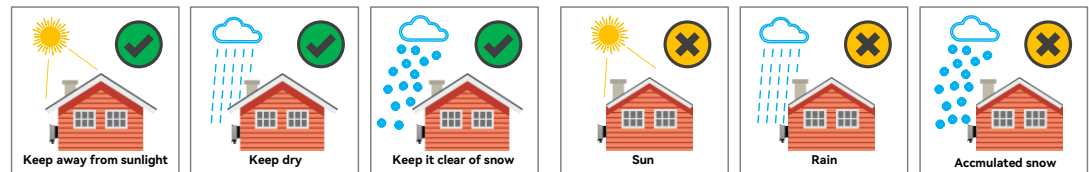


Figure 4.1. Installation location

- Do not expose the device to direct solar irradiation as this could cause power derating due to overheating.
- The installation environment must be free of inflammable or explosive materials.
- The device must be installed in a place away from any heat source.
- Do not install the device at a place where the temperature changes extremely.
- Keep the device away from children.
- Do not install the device in the bedroom, toilet, or bathroom.
- When installing the device at the garage, keep it away from the driveway.
- Keep the device from water sources such as taps, sewer pipes and sprinklers to prevent water

seepage.

- The product is to be installed in a high traffic area where the fault is likely to be seen.

#### 4.2.2. Installation location requirements

- The device employs natural convection cooling, and it can be installed indoor or outdoor.
  - Indoor requirement: The battery CANNOT be installed in the habitable rooms.
  - Outdoor requirement: The height of the device from the ground should be considered to prevent the device from soaking in water. The specific height is determined by the site environment.
- Install the device vertically. Do not install it forward-tilted, horizontally or upside down.

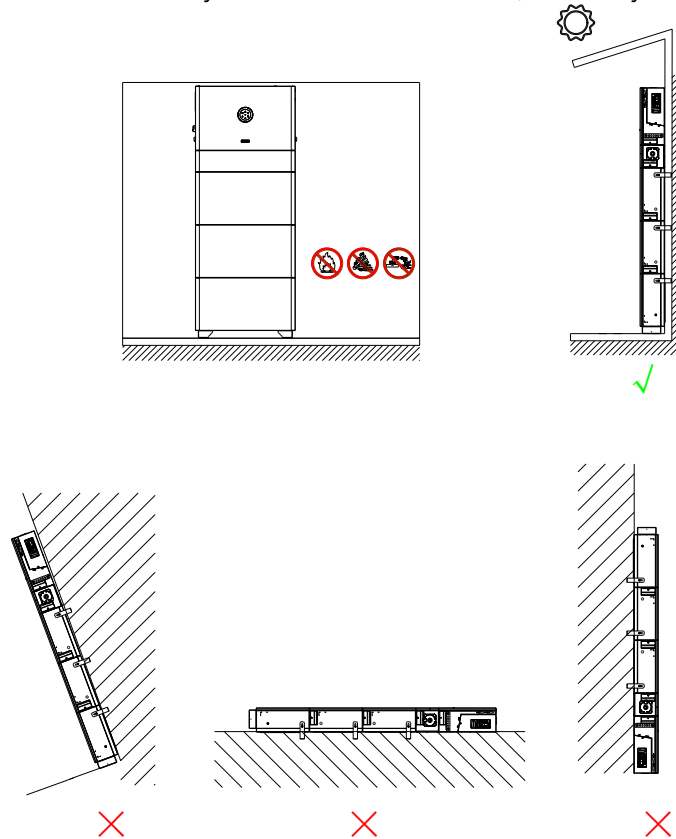


Figure 4.2. Installation limitations

In some restricted conditions, the allowable backward-tilted angle must not be greater than 3 degrees, and the allowable side-tilted angle must not be greater than 2 degrees.

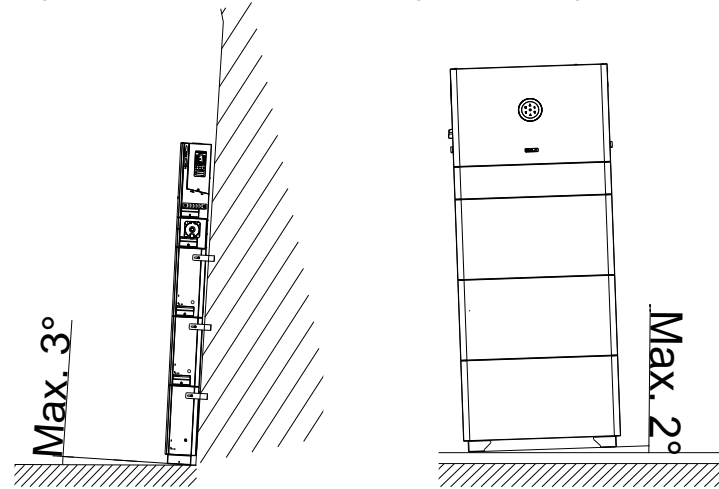


Figure 4.3. Installation angle

- Choose a solid and smooth wall to ensure that the inverter can be installed securely on the wall. Make sure that the wall can bear the weight of the inverter and accessories.
- Reserve enough clearance around the inverter to ensure a good air circulation at the installation area, especially when multiple inverters need to be installed in the same area.

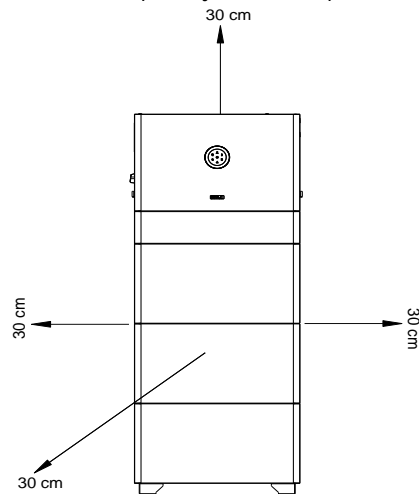


Figure 4.4. Installation clearance

### 4.3. Preparing installation tools

The tools illustrations are for your reference. Installation tools include but are not limited to the following recommended ones. Use other auxiliary tools based on site requirements.



Figure 4.5. Suggested installation tools

## 4.4. Unpacking

### 4.4.1. Check the outer packing

Although SAJ's products have thoroughly tested and checked before delivery, there is possibility that the products may suffer damages during transportation.

1. Check the outer packing package for any damage, such as holes and cracks.
2. Check the equipment model.

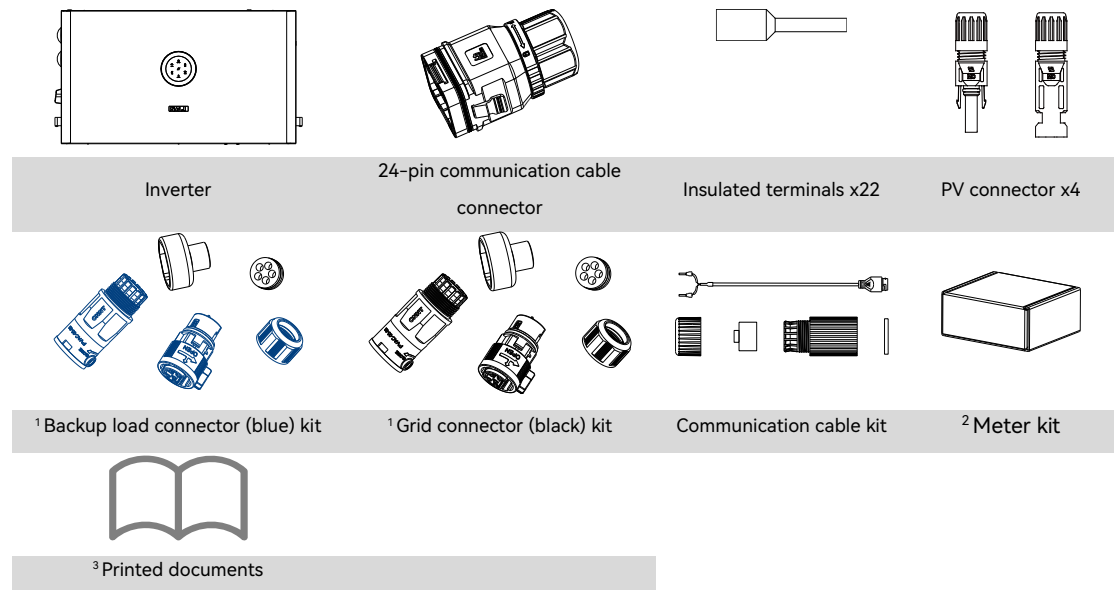
If any serious damage is found or the model is not what you requested, do not unpack the product, and contact your dealer as soon as possible.

### 4.4.2. Check the package contents

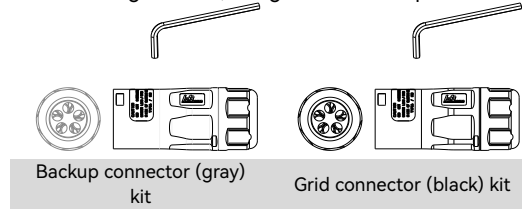
1. Verify that the shipment contains everything that you expected to receive. Contact after sales if there are missing or damaged components.
2. Place the accessories separately after unpacking to avoid confusion for connection of cables.

Contents in your shipment are order-dependent. Not all packages listed below may be in your shipment.

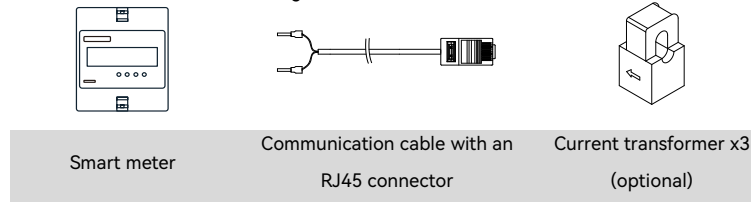
#### ■ HS3 inverter



<sup>1</sup>In some configurations, the grid and backup load connector kits might be different.



<sup>2</sup>The meter kit contains the following items:

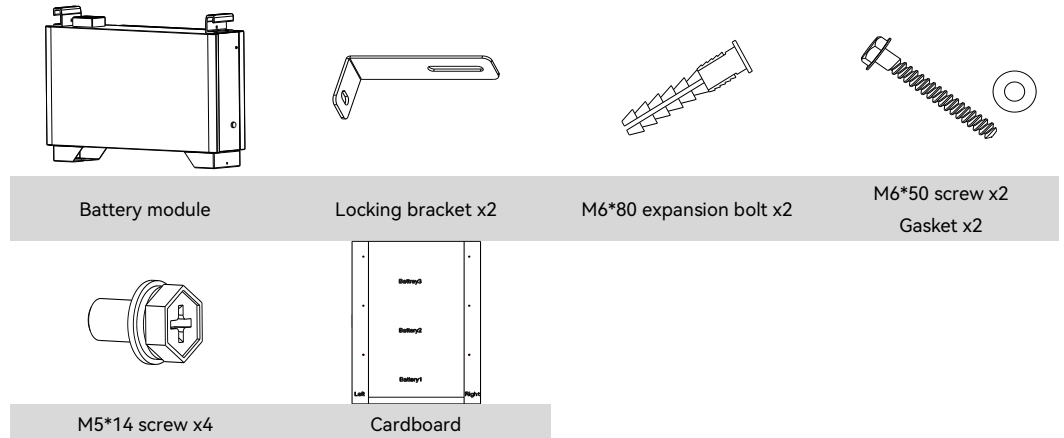


<sup>3</sup>The printed documents include a warranty card, a *Quick Guide*, and a *Configuration Instructions*.

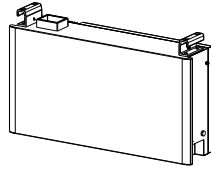
■ **BU3 battery pack—Type A**

Type A battery has two holes on the left and right sides.

- Battery pack with a base (BU3-5.0-(TV1, TV2)-BASE or BU3-5.0-(TV1, TV2)-PRO-BASE)



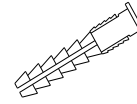
- (Optional) Battery without a base (BU3-5.0-(TV1, TV2) or BU3-5.0-(TV1, TV2)-PRO)



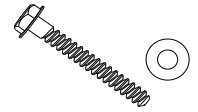
Battery module



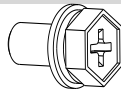
Locking bracket x2



M6\*80 expansion bolt x2



M6\*50 screw x2  
Gasket x2

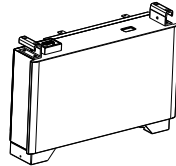


M5\*14 screw x4

■ **BU3 battery pack—Type B**

Type B battery pack has two mounting ears on the rear cover.

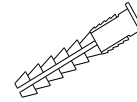
- Battery pack with a base (BU3-5.0-(TV1, TV2)-BASE or BU3-5.0-(TV1, TV2)-PRO-BASE)



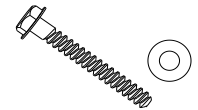
Battery module



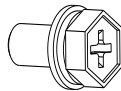
Locking bracket x2



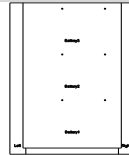
M6\*80 expansion bolt x2



M6\*50 screw x2  
Gasket x2



M5\*14 screw x4



Cardboard

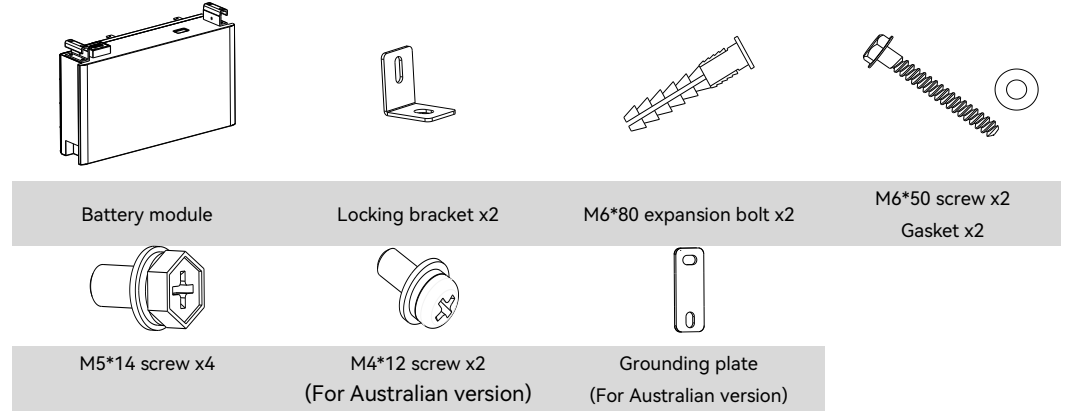


M4\*12 screw  
(For Australian version)



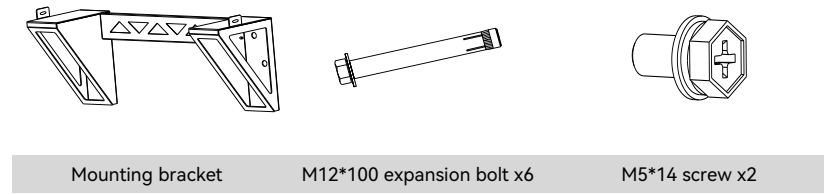
Grounding plate  
(For Australian version)

- (Optional) Battery without a base (BU3-5.0-(TV1, TV2) or BU3-5.0-(TV1, TV2)-PRO)



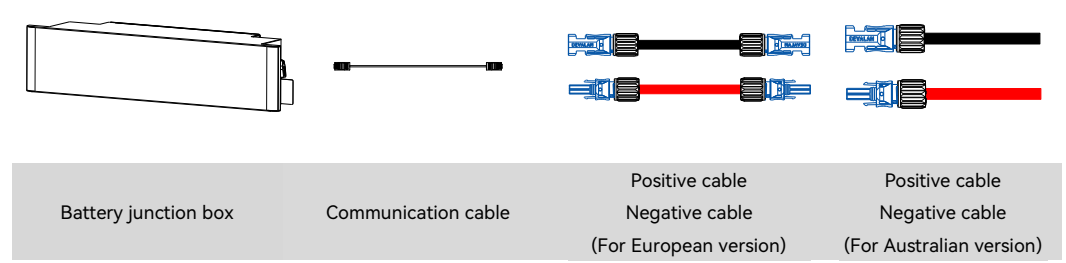
■ **BT3-TV wall-mounting bracket**

This is an optional package, depending on your system configuration.

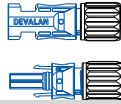


■ **BC3-TV battery junction box**

This is an optional package, depending on your system configuration.







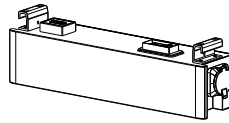
Positive connector  
Negative connector  
(For Australian version)



M4\*12 screw  
(For Australian version)

#### ■ CU2-11K-T-1 EV charger

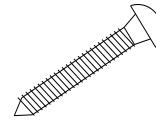
This is an optional package, depending on your system configuration.



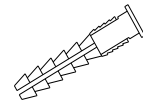
Charger



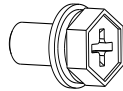
Holster



M4\*32 screw x4



Expansion bolt x4



M5\*14 screw x2



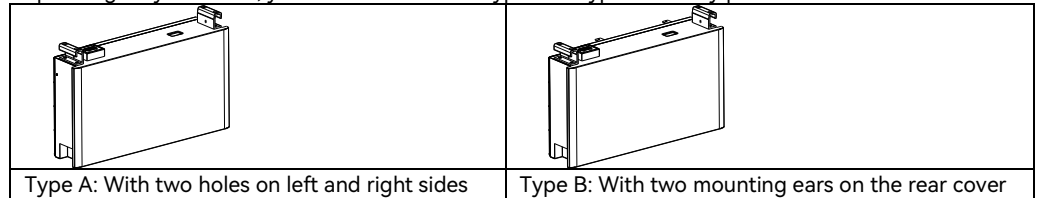
M4\*12 screw x2  
(For Australian version)



Grounding plate  
(For Australian version)

## 4.5. Installation

Depending on your order, you will receive either type A or type B battery pack.



Depending on the battery pack type and mounting manner, choose the following installation procedure:

- Section 4.5.1 "Type A battery pack: ground mounting manner" on Page 36
- Section 4.5.2 "Type B battery pack: ground mounting manner" on Page 47
- Section 4.5.3 "Type B battery pack: wall mounting manner" on Page 62

### 4.5.1. Type A battery pack: ground mounting manner

#### Before you start

Make sure that the ground should be flat and no inclination.

#### Procedure

Step 1. Install the base battery (BU3-5.0-(TV1, TV2)-BASE or BU3-5.0-(TV1, TV2)-PRO-BASE).

- a. Get the cardboard from the base battery package. Place the cardboard on to the wall. Drill six holes (8 mm in diameter and 55 mm in depth) on the marked positions on the cardboard. Install the provided expansion bolts into the drilled holes.

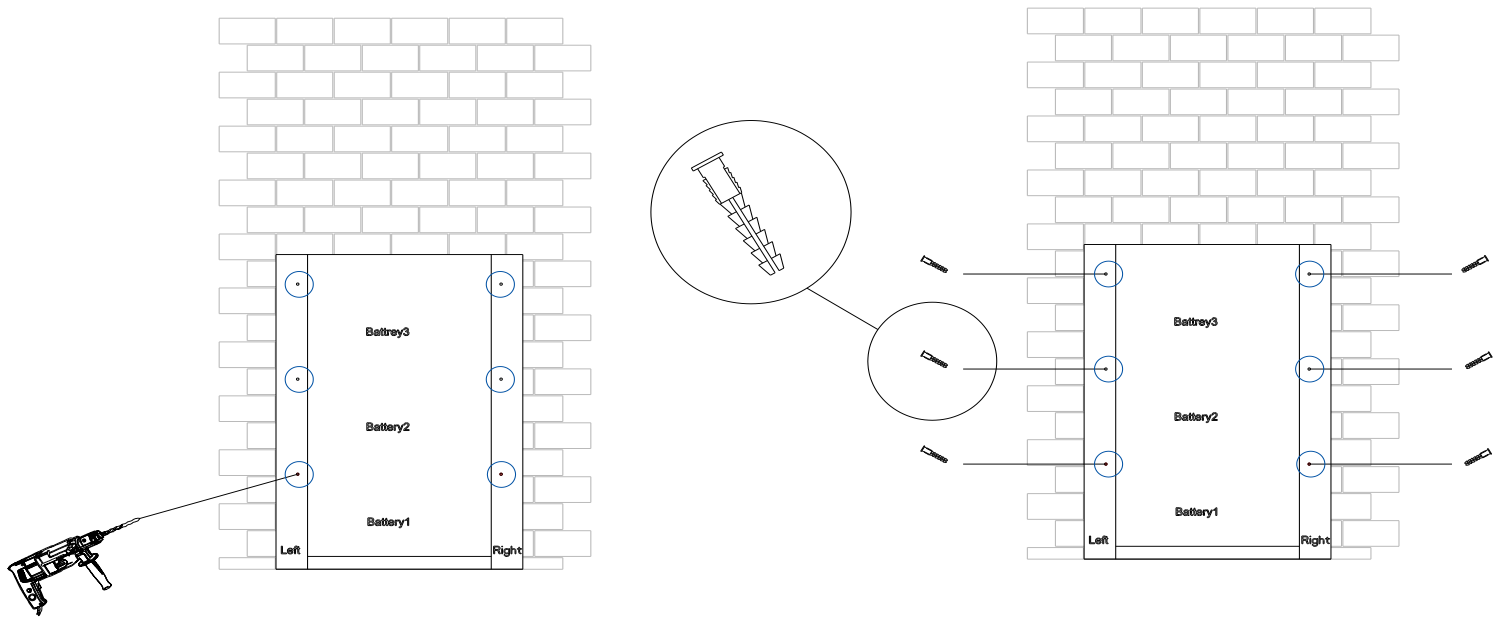


Figure 4.6. Marking and drilling holes on the wall

- b. Use two M5\*14 screws to install two locking brackets on the left and right sides of the battery pack. On the desired installation site, place the base battery on the floor. Make sure that:
- The left and right battery bases are aligned with the vertical black lines on the cardboard.
  - The battery pack is placed horizontally. (It is recommended that a gradienter be used.)
  - The space between the battery back and the wall surface is 50–65 mm.

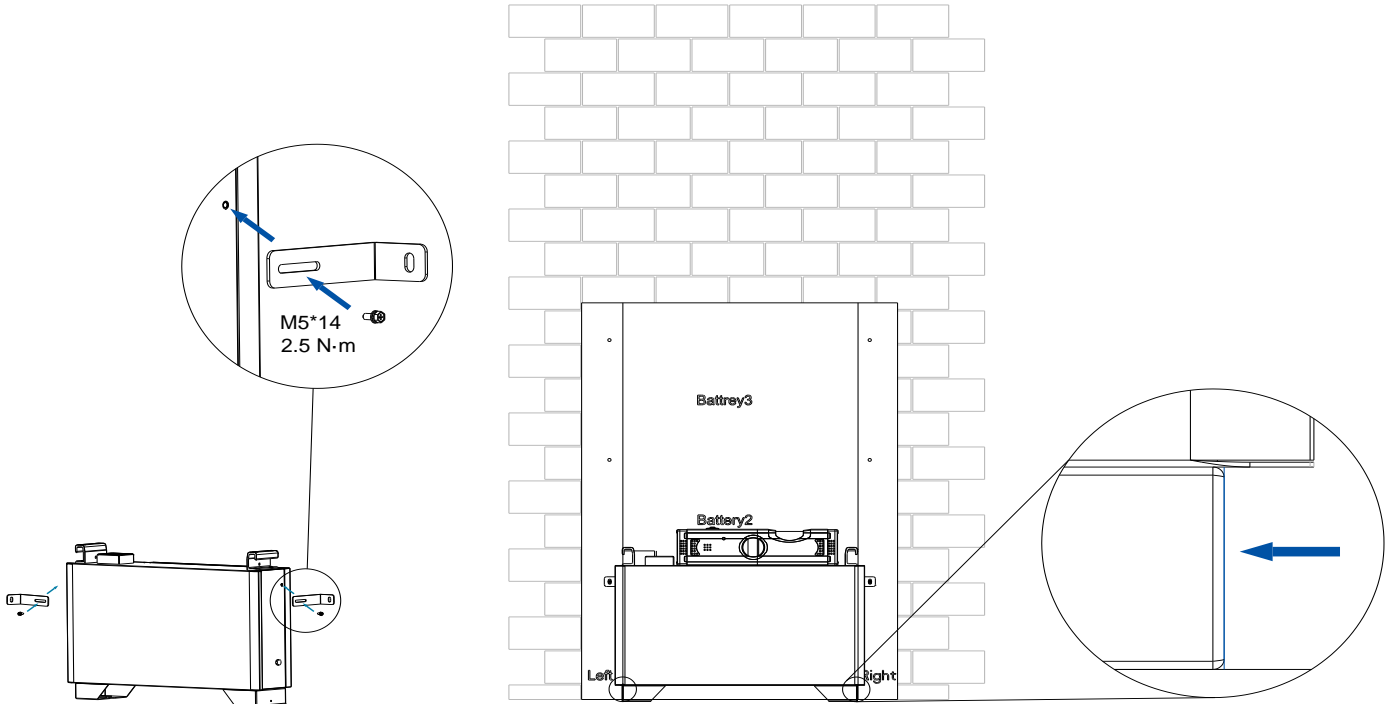


Figure 4.7. Installing the battery with the base

- c. On the left and right upper sides of the battery pack, align the locking brackets to the drill holes and install M6\*50 screws to secure the locking brackets to the wall.
- Note:** If the battery is installed outdoors, it is suggested to remove the cardboard which is not waterproof.

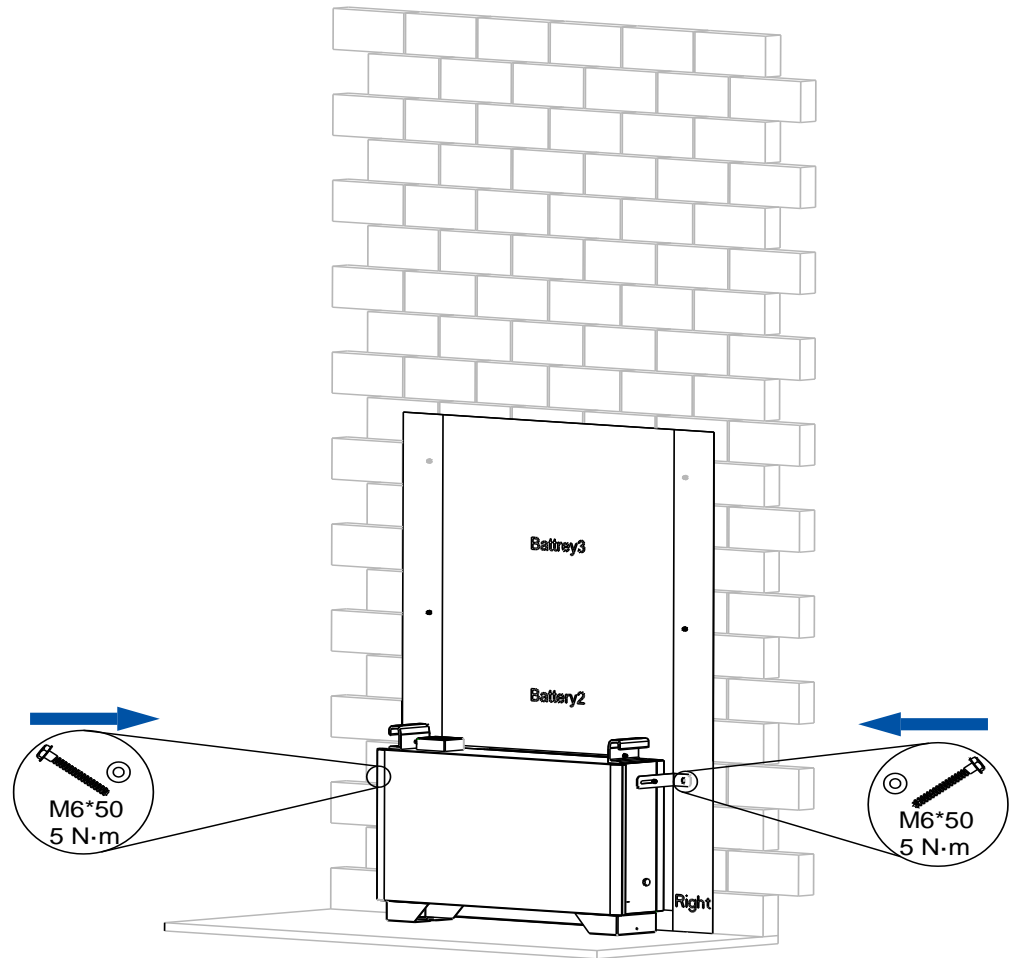


Figure 4.8. Securing the battery to the wall

Step 2. (Optional) Install other batteries (BU3-5.0-(TV1, TV2) or BU3-5.0-(TV1, TV2)-PRO).

**Note:** In one stack, up to three batteries are supported.

- a. Use two M5\*14 screws to install two locking brackets on the left and right sides of the battery pack. Place this battery onto the base battery and push it downwards.

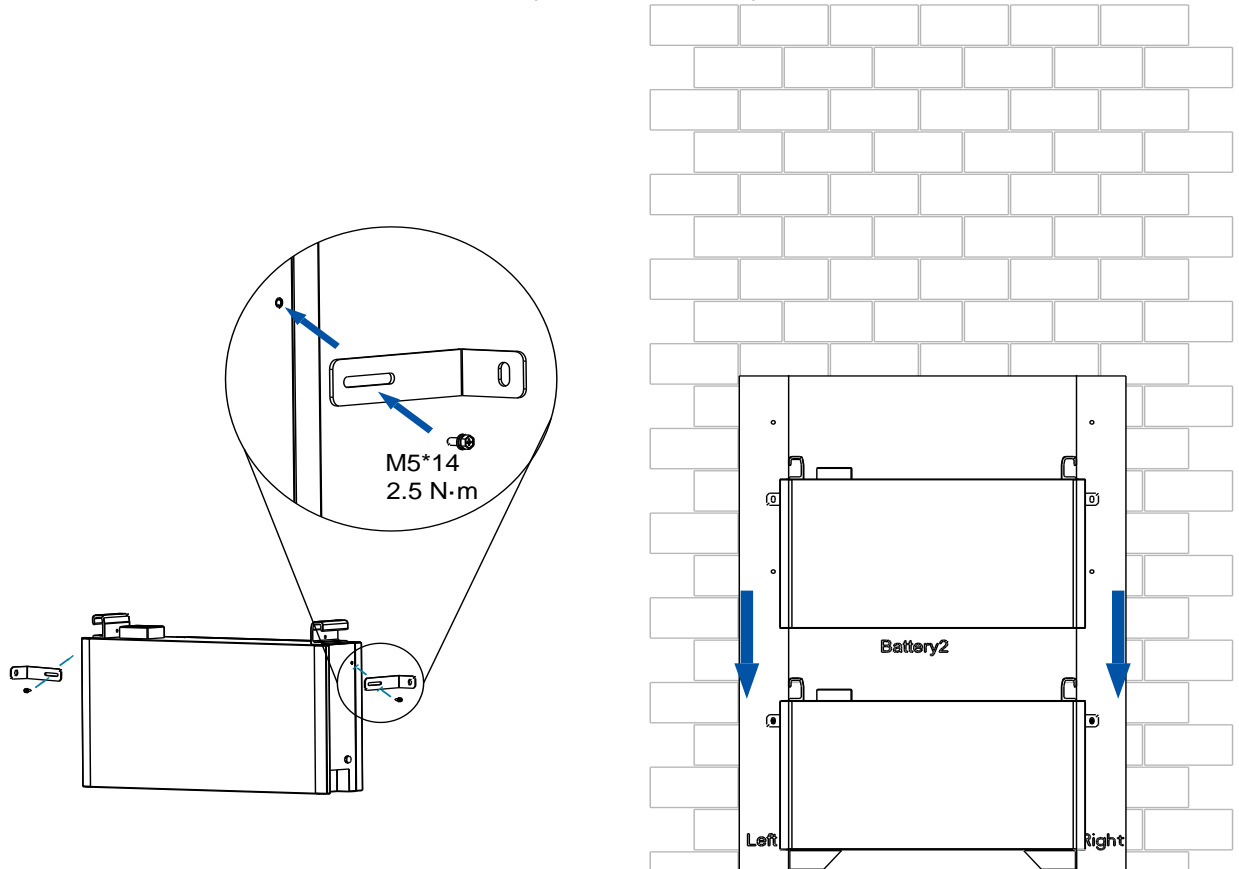


Figure 4.9. Installing the second battery

- b. On the left and right upper sides of the battery pack, align the locking brackets to the drilled holes and install the gaskets and M6\*50 screws to secure the battery pack to the wall.
- On the left and right bottom sides of the battery pack: Install two M5\*14 screws to secure two batteries.

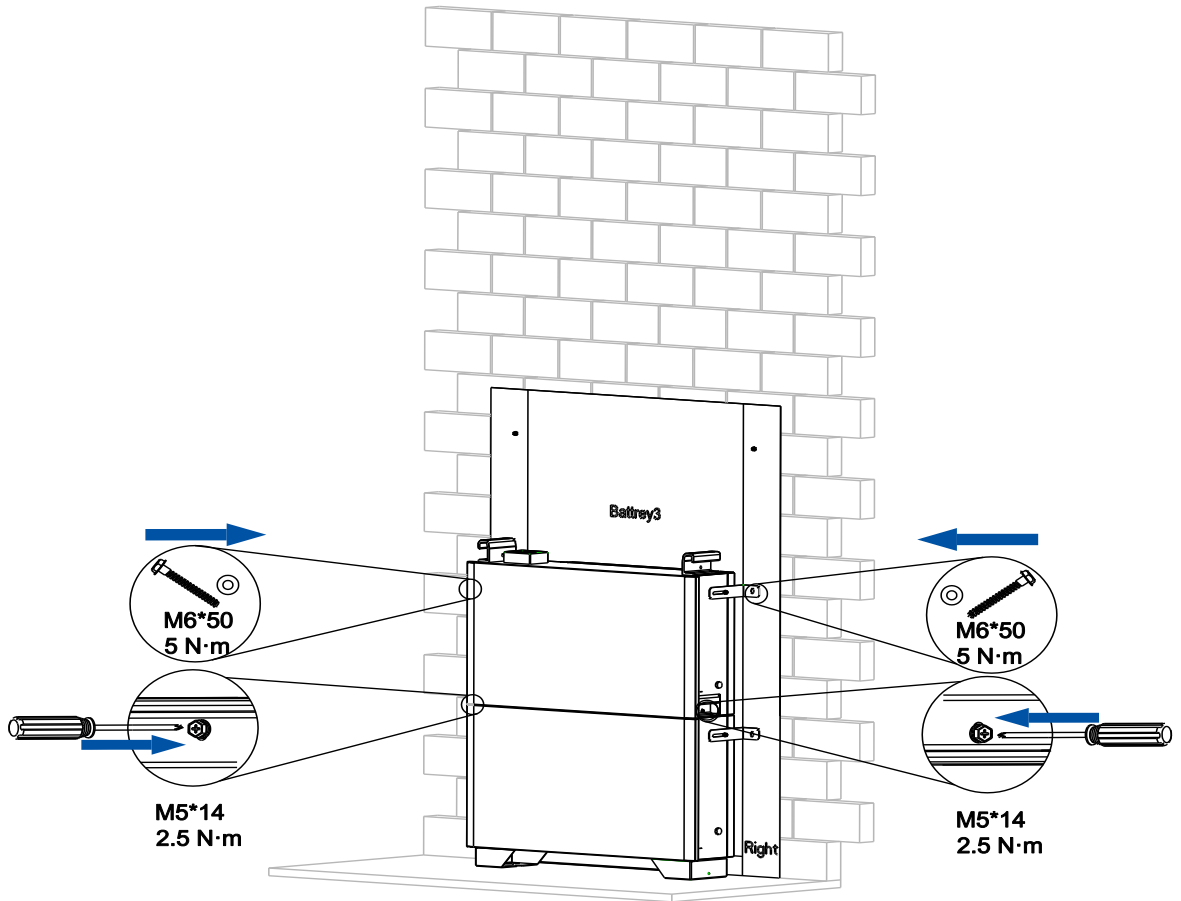


Figure 4.10. Securing the batteries

- a. (Optional) If needed, repeat steps a and b to install the third battery.

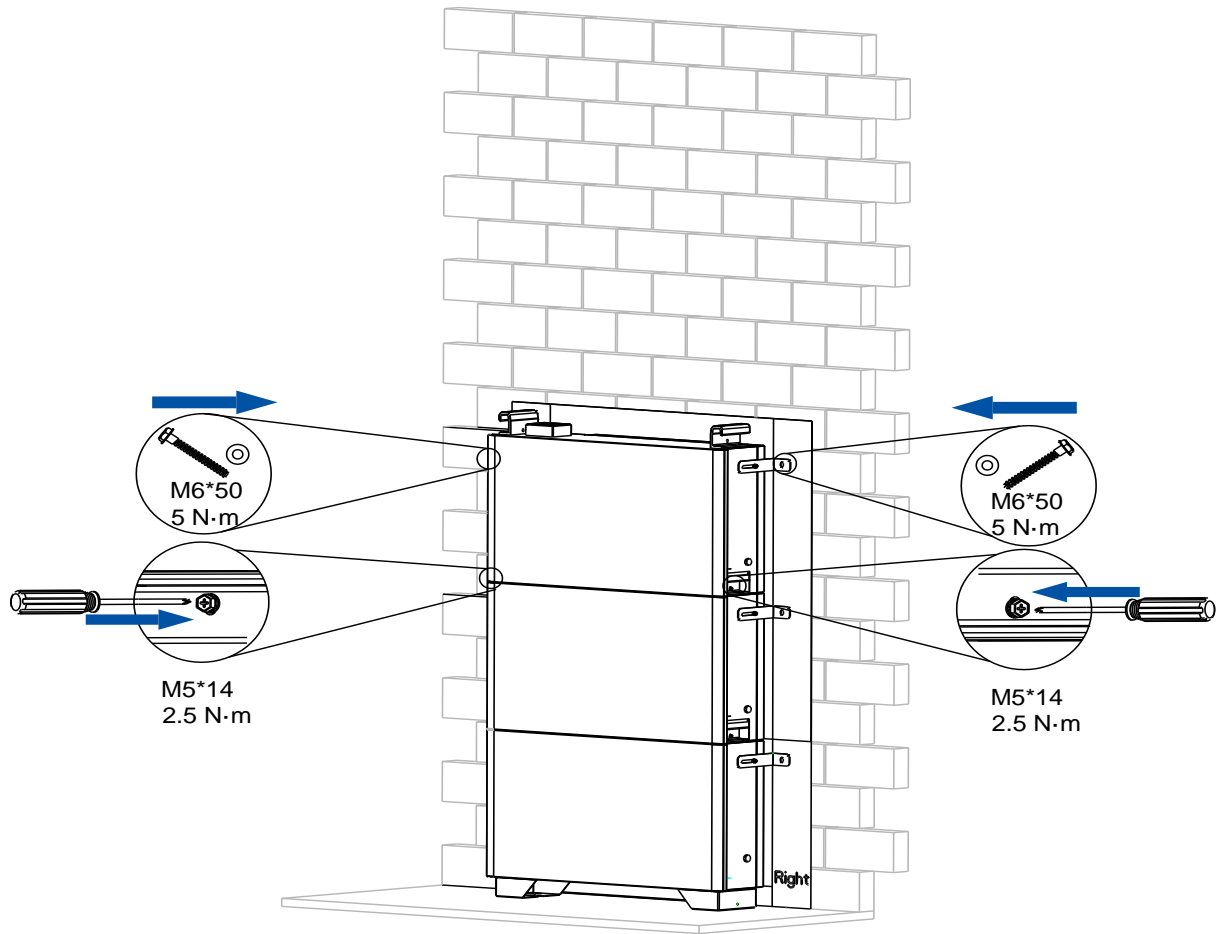


Figure 4.11. Installing the third battery

Step 3. (Optional) Install the EV charger (CU2-11K-T-1).

- a. Get the holster from the charger package. Install the holster onto the right side of the charger.
- b. Place the charger onto the battery. Push it downwards.
- c. On the left and right bottom sides, install M5\*14 screws to secure the charger to the beneath battery.

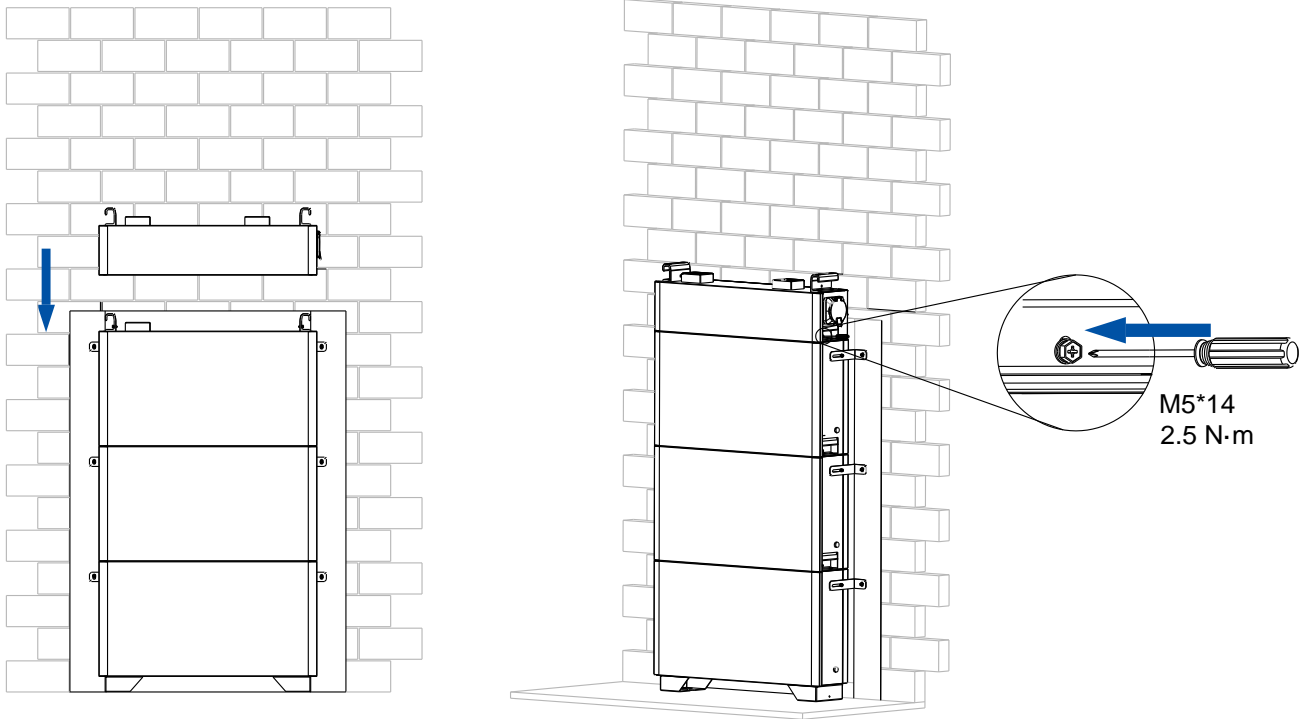


Figure 4.12. Installing the charger



- d. Install the holster on the wall by using three M4\*32 screws.

**Note:** The holster is used to secure the charger cable. You can connect the cable after all installation is completed. It is recommended that you purchase the cable from SAJ.

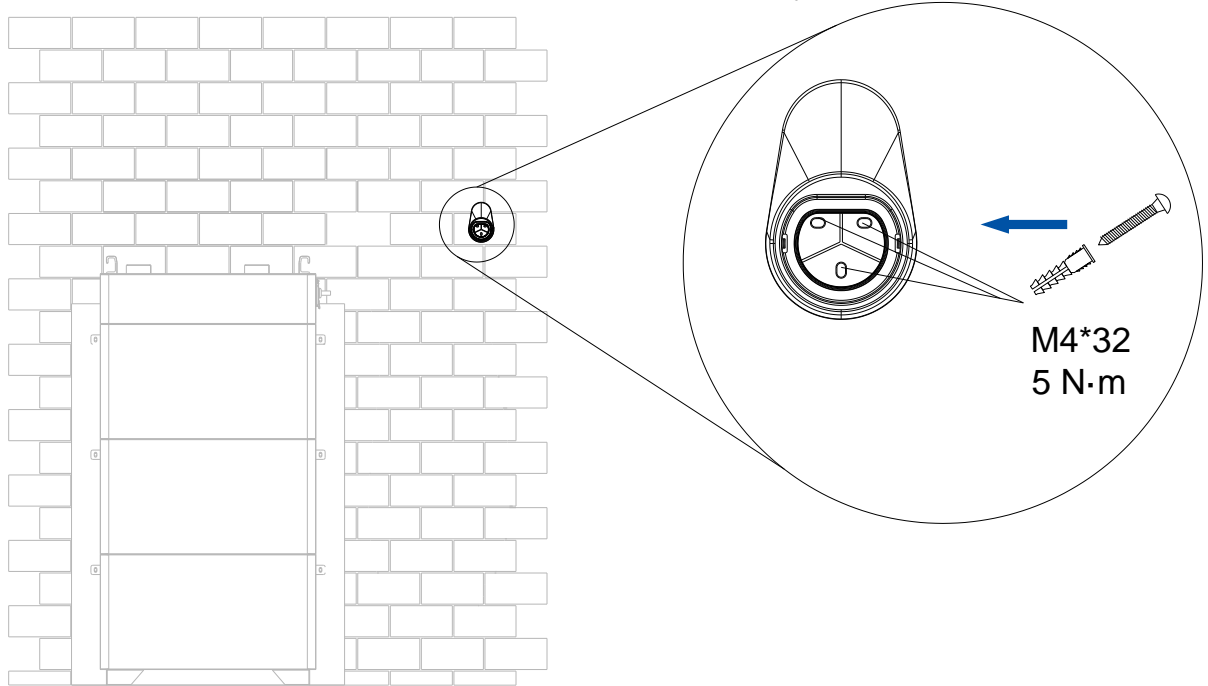


Figure 4.13. Installing the charger cable holster

- e. (Optional) Connect the charger cable.

**Notes:**

- It is recommended that you connect the cable after all device installation is completed.
- It is recommended that you purchase the cable from SAJ.
- For a long cable, you can wrap the cable on the holster.

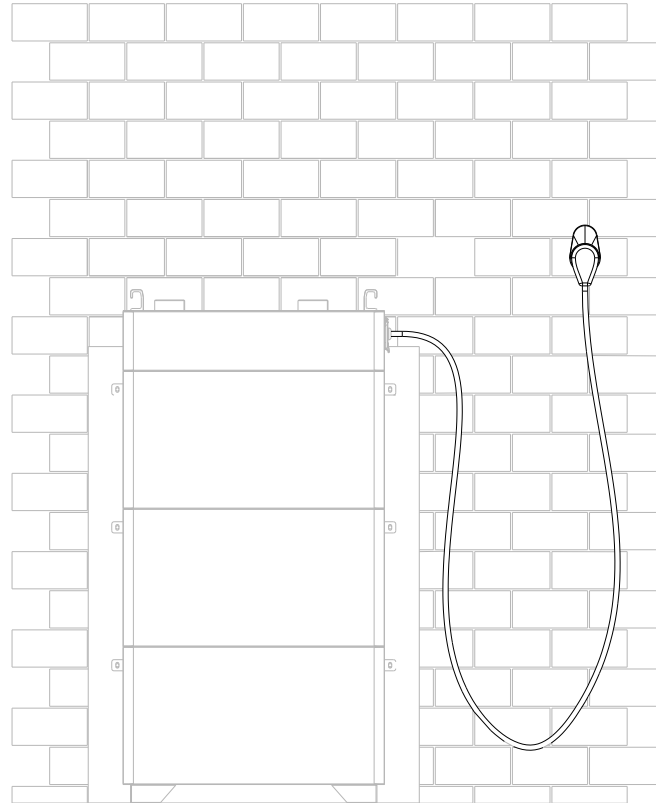


Figure 4.14. Connecting the charger cable

- Step 4. Install the inverter (HS3-*xk*-T2-W-B, HS3-*xk*-T2-W-P, HS3-*xk*-T2-G-B, or HS3-*xk*-T2-G-P).
- (Optional) If you have installed a charger, loosen the screws on the inverter, and remove the port cover, as shown below:

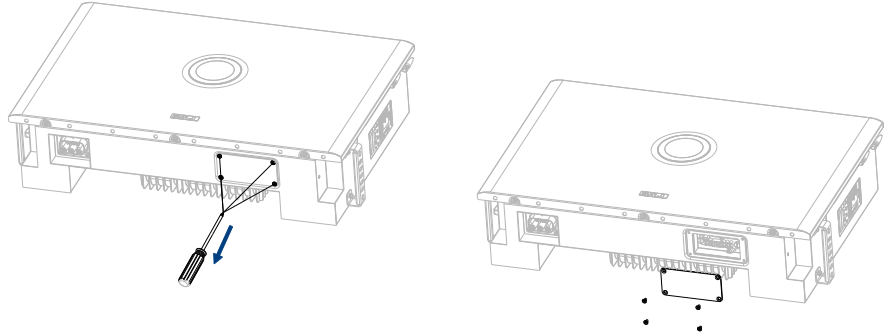


Figure 4.15. Removing the port cover

- Place the inverter onto the battery or charger (if available) and push it downwards. Install screws on both lower sides of the inverter to secure the inverter to the beneath device (battery or charger; here takes a charger as an example).

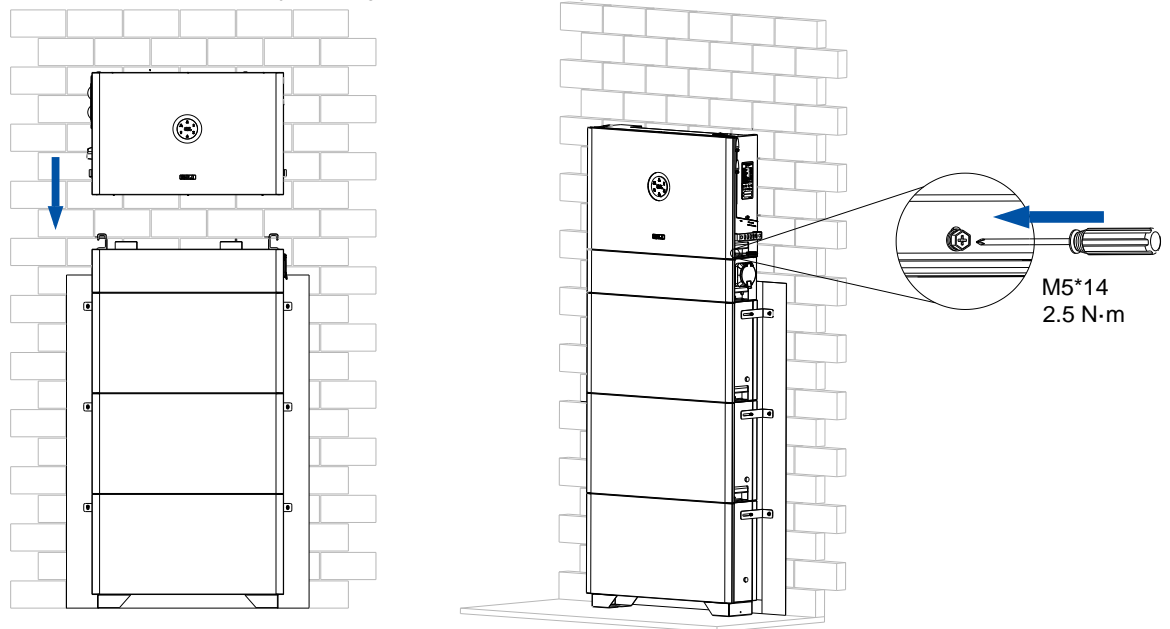
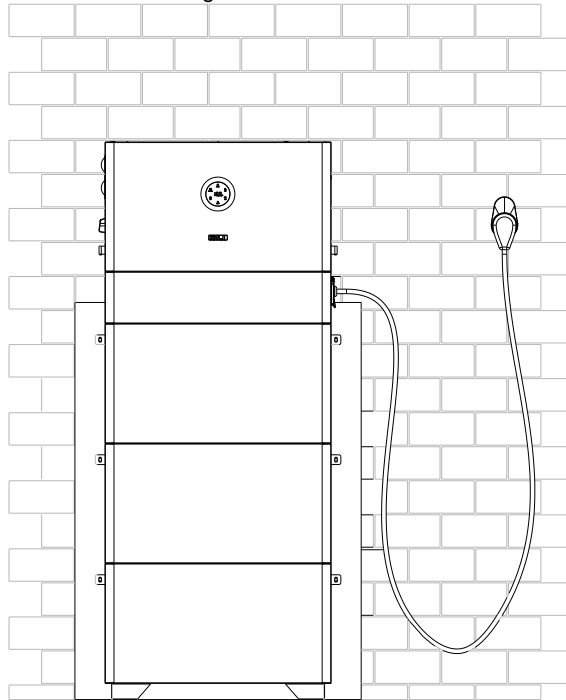


Figure 4.16. Installing the inverter

**Installation completion view****Single stack: supporting 1 to 3 batteries**

Example of 3 batteries:

Inverter + charger + batteries



Inverter + batteries

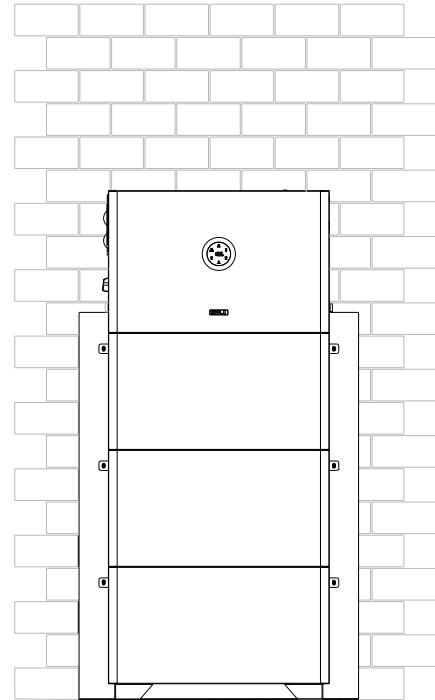


Figure 4.17. Completion view of a single stack

## 4.5.2. Type B battery pack: ground mounting manner

### Before you start

Make sure that the ground should be flat and no inclination.

### Procedure

Step 1. Install the base battery (BU3-5.0-(TV1, TV2)-BASE or BU3-5.0-(TV1, TV2)-PRO-BASE).

- a. Get the cardboard from the base battery package. Place the cardboard on to the wall. Drill six holes (8mm in diameter and 55mm in depth) on the marked positions on the cardboard. Install the provided expansion bolts into the drilled holes.

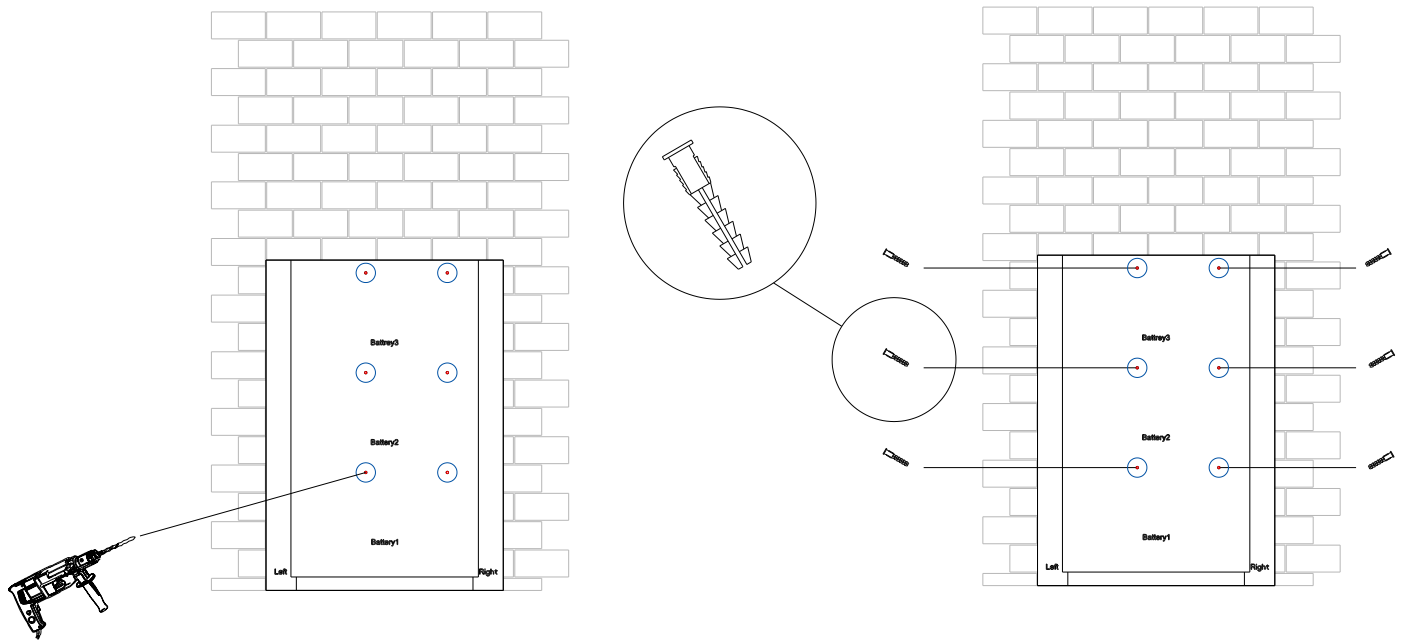


Figure 4.18. Marking and drilling holes on the wall

- b. Use two M5\*14 screws to install two locking brackets to the mounting ears on the top of the battery pack. On the desired installation site, place the base battery on the floor. Make sure that:
- The left and right battery bases are aligned with the vertical black lines on the cardboard.
  - The battery pack is placed horizontally. (It is recommended that a gradienter be used.)
  - The space between the battery back and the wall surface is 50–65 mm.

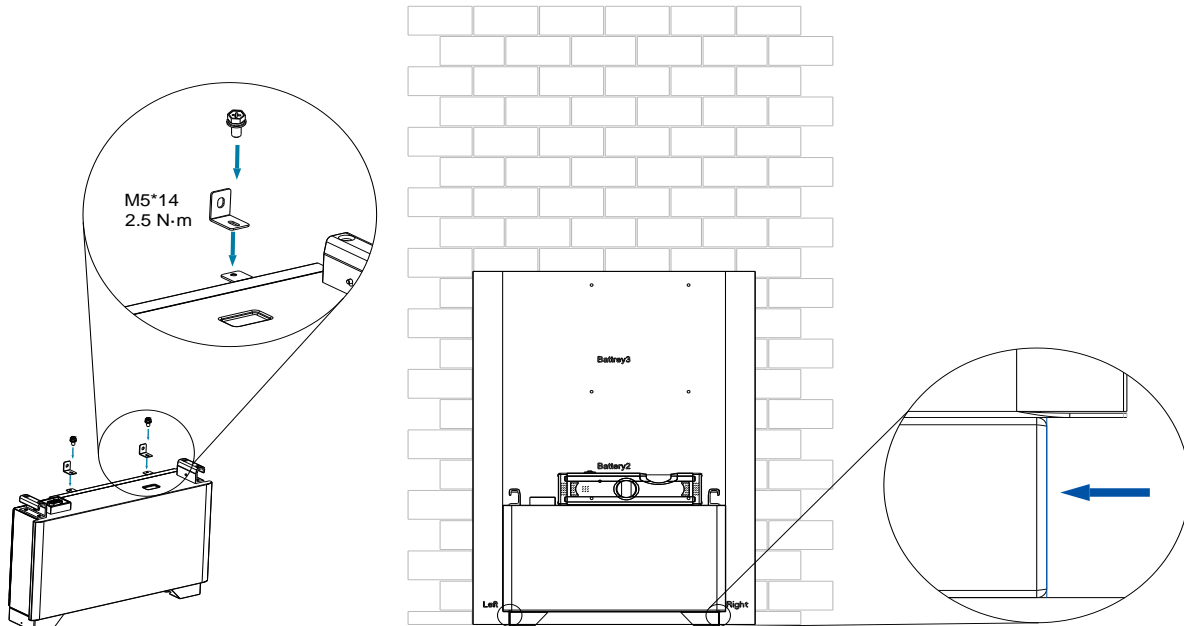


Figure 4.19. Installing the battery with the base

- c. On the top of the battery pack, align the locking brackets to the drilled holes and install M6\*50 screws to secure the locking brackets to the wall.
- Note:** If the battery is installed outdoors, it is suggested to remove the cardboard which is not waterproof.

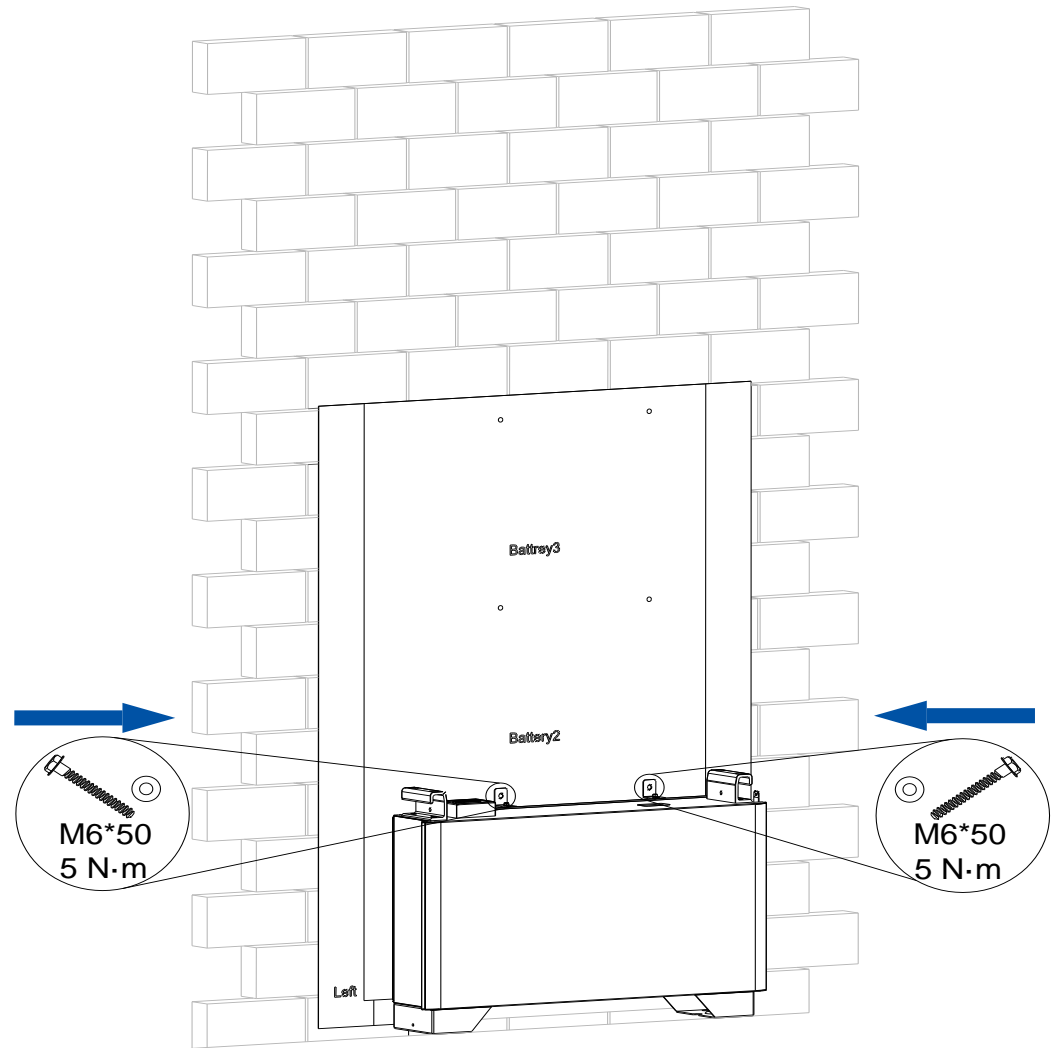


Figure 4.20. Securing the battery to the wall

Step 2. (Optional) Install other batteries (BU3-5.0-(TV1, TV2) or BU3-5.0-(TV1, TV2)-PRO).

**Note:** In one stack, up to three batteries are supported.

- a. Use two M5\*14 screws to install two locking brackets to the mounting ears on the top of the battery pack. Place this battery onto the base battery and push it downwards.

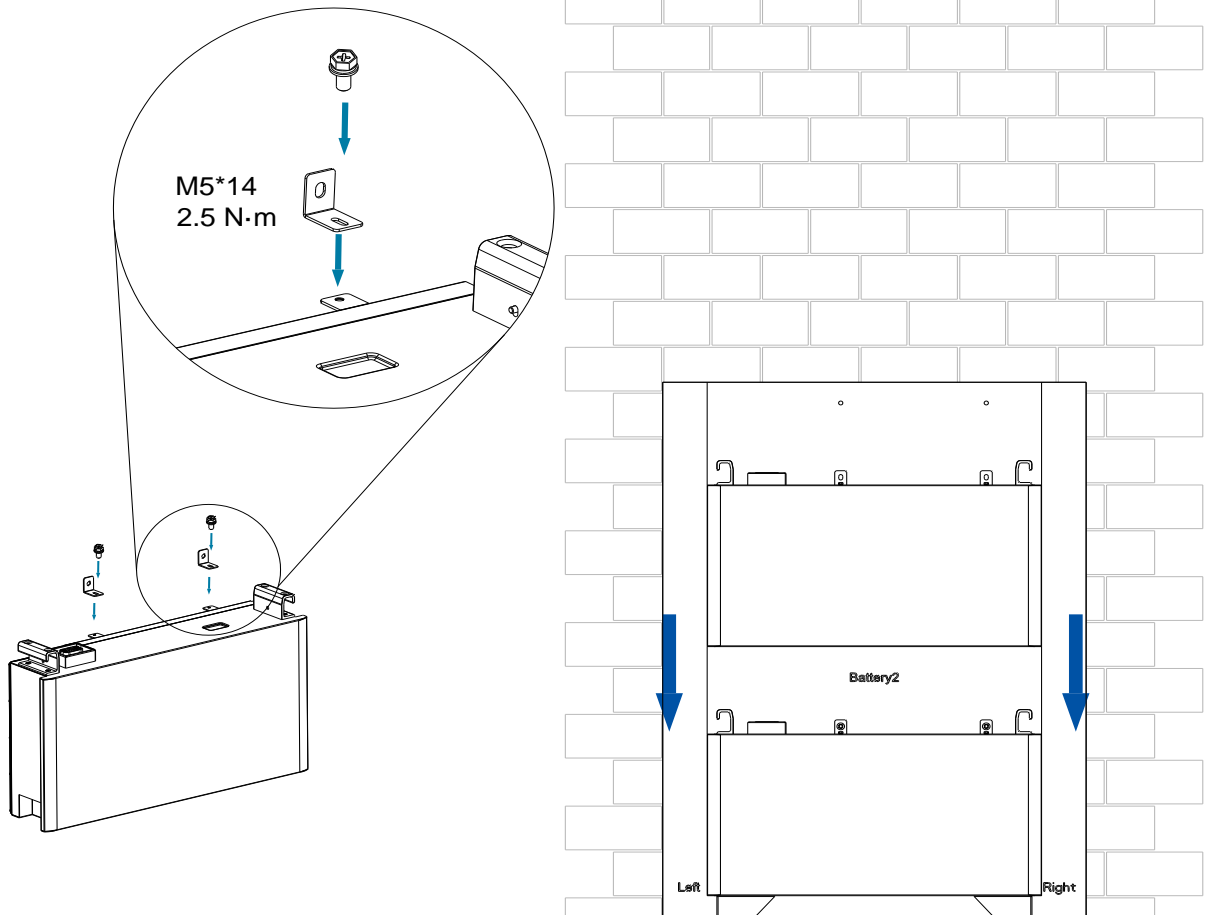


Figure 4.21. Installing the second battery



- b. On the top of the battery pack, align the locking brackets to the drilled holes and install the gaskets and M6\*50 screws to secure the battery pack to the wall.

On the left and right bottom sides of the battery pack, install M5\*14 screws to secure two batteries.

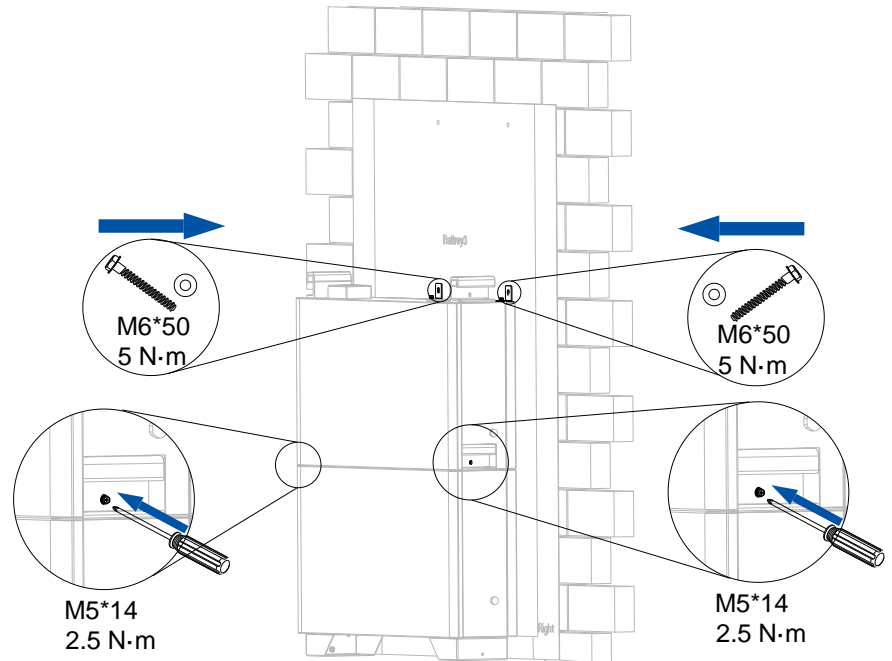


Figure 4.22. Securing the batteries

**For Australian version:** Install and secure the metal grounding plate on both sides.

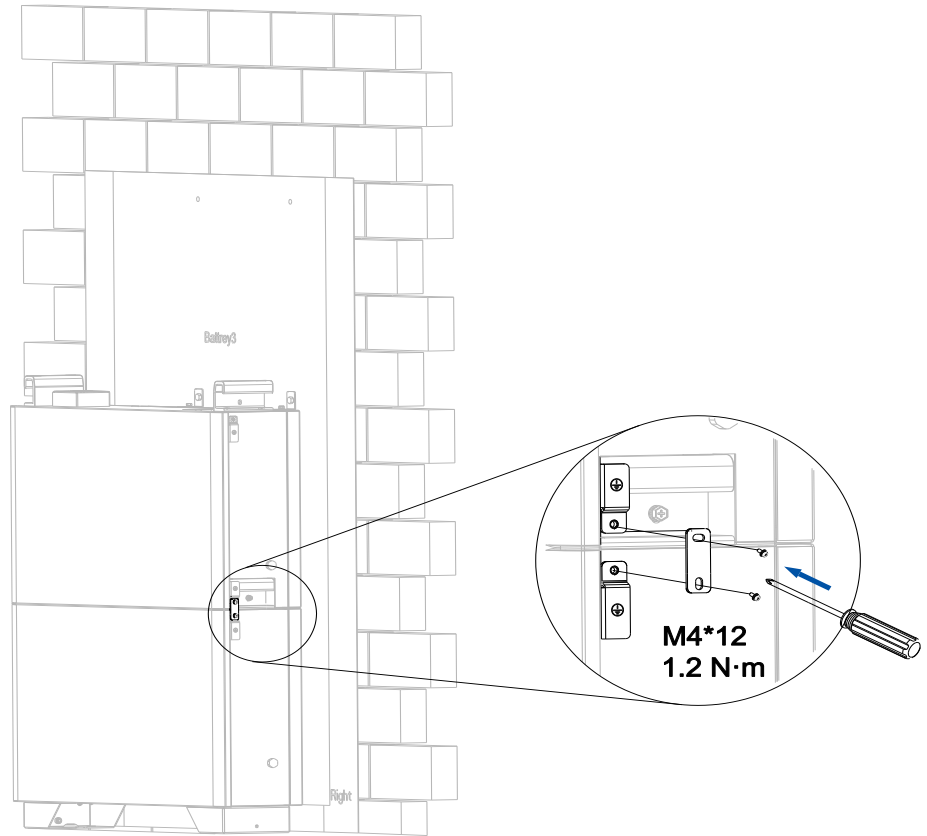


Figure 4.23. Installing the grounding plate

- c. (Optional) If needed, repeat steps a and b to install the third battery.

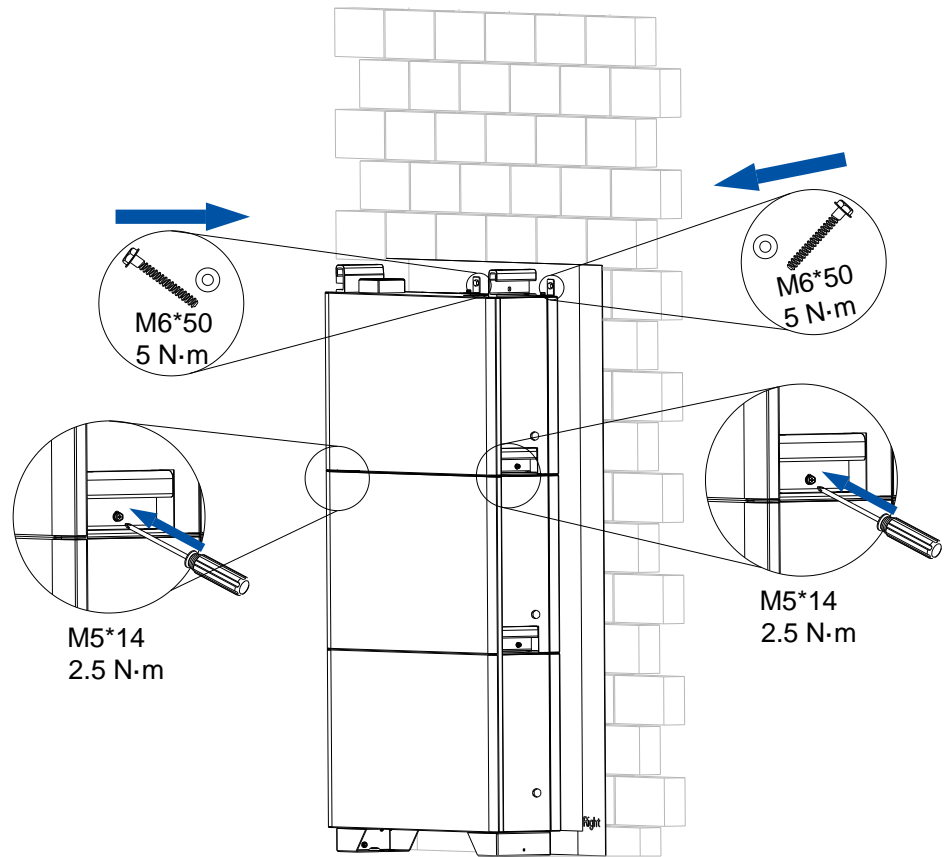


Figure 4.24. Installing the third battery

**For Australian version:** Install and secure the metal grounding plate on both sides.

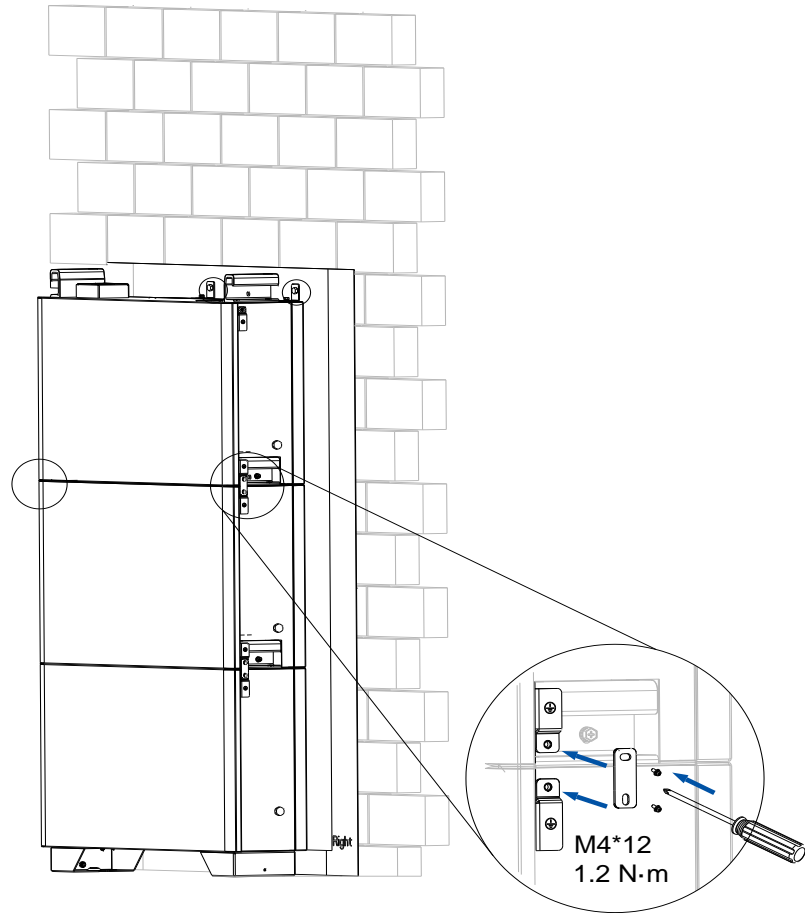


Figure 4.25. Installing the grounding plate

Step 3. (Optional) Install the EV charger (CU2-11K-T-1).

- a. Get the holster from the charger package. Install the holster onto the right side of the charger.
- b. Place the charger onto the battery. Push it downwards.
- c. On the left and right bottom sides, install M5\*14 screws to secure the charger to the battery.

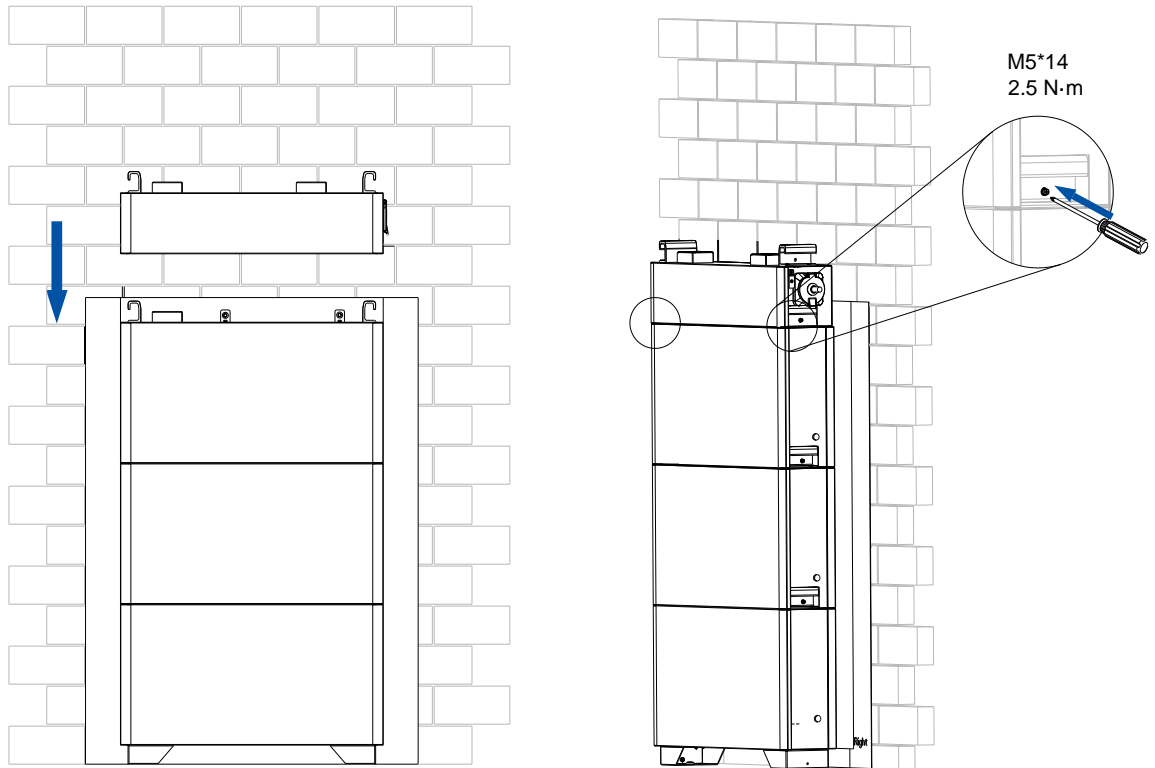


Figure 4.26. Installing the charger

**For Australian version:** Install and secure the metal grounding plate on both sides.

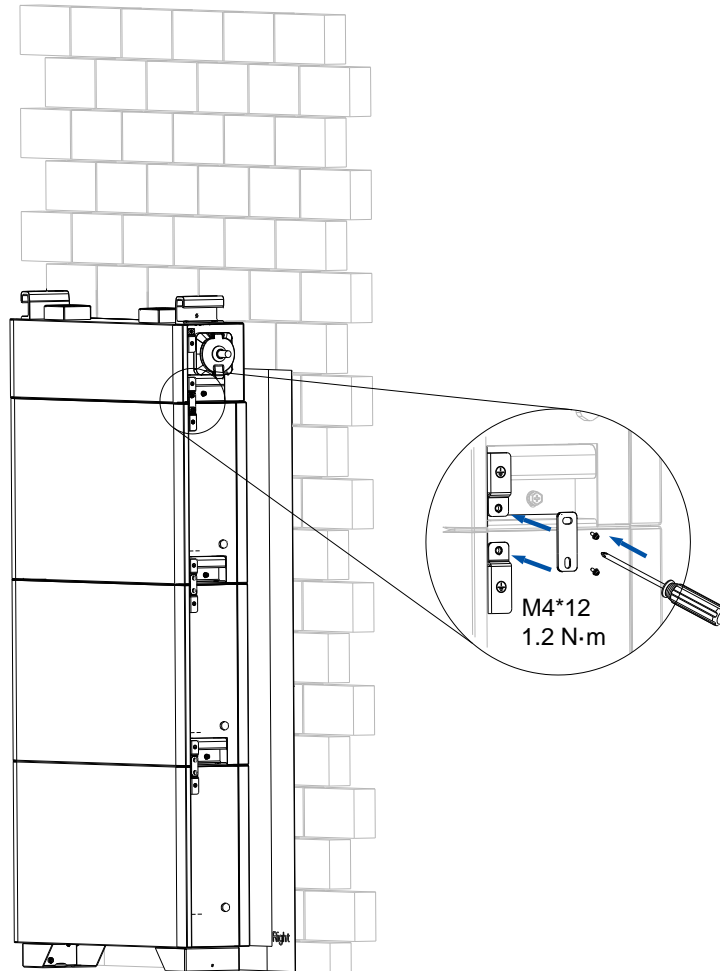


Figure 4.27. Installing the grounding plate

- d. Install the holster on the wall by using three M4\*32 screws.

**Note:** The holster is used to the charger cable. You can connect the cable after all installation is completed. It is recommended that you purchase the cable from SAJ.

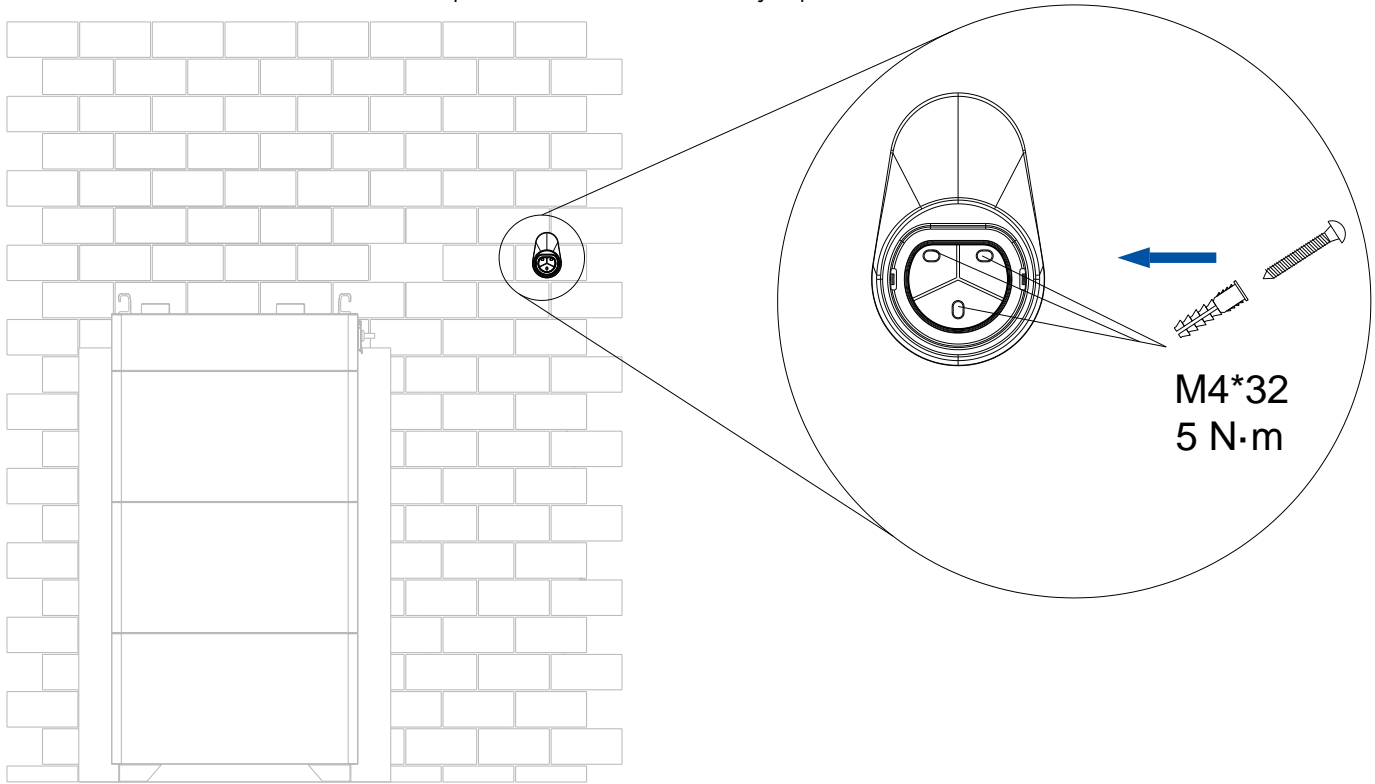


Figure 4.28. Installing the charger cable holster

- f. (Optional) Connect the charger cable.

**Notes:**

- It is recommended that you connect the cable after all device installation is completed.
- It is recommended that you purchase the cable from SAJ.
- For a long cable, you can wrap the cable on the holster.

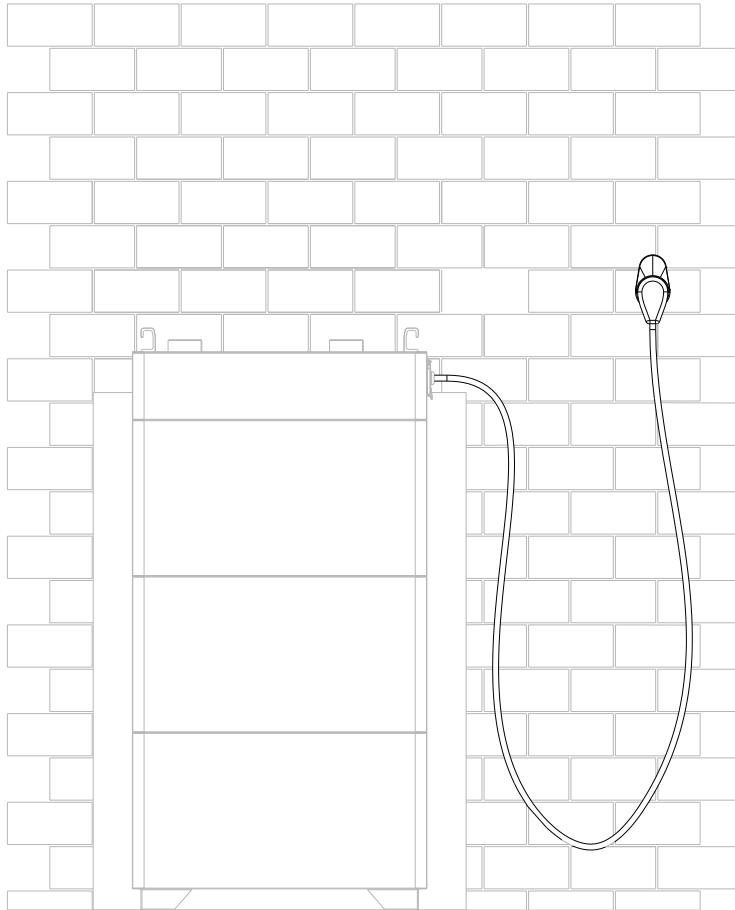


Figure 4.29. Connecting the charger cable



- Step 4. Install the inverter (HS3-*xk*-T2-W-B, HS3-*xk*-T2-W-P, HS3-*xk*-T2-G-B, or HS3-*xk*-T2-G-P).
- (Optional) If you have installed a charger, loosen the screws on the inverter, and remove the port cover, as shown below:

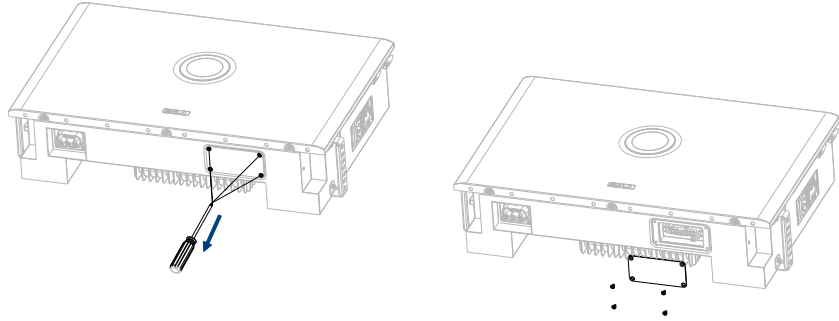


Figure 4.30. Removing the port cover

- Place the inverter onto the battery or charger (if available) and push it downwards. On the left and right bottom sides of the battery pack, install M5\*14 screws to secure the inverter to the beneath device (battery or charger; here takes a charger as an example).

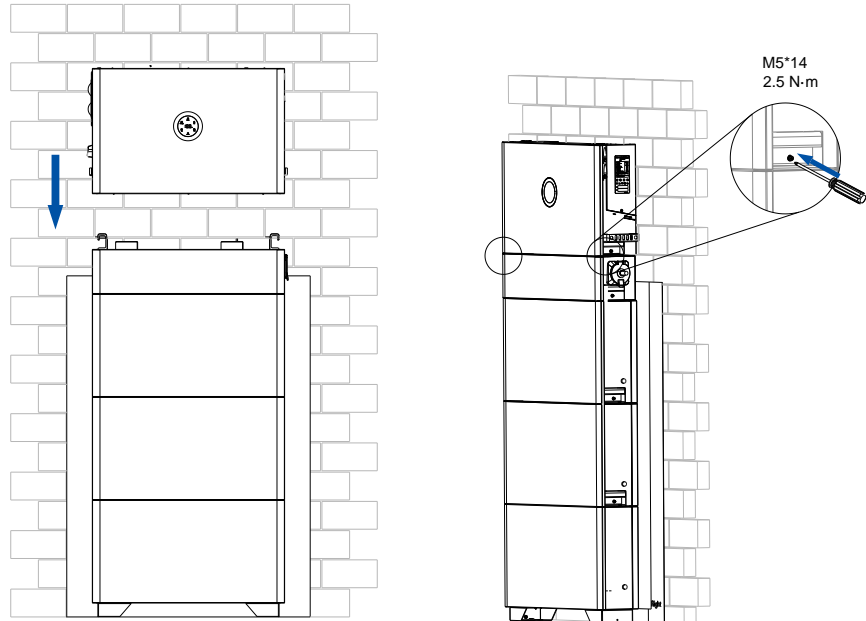


Figure 4.31. Installing the inverter

**For Australian version:** Install and secure the metal grounding plate on both sides.

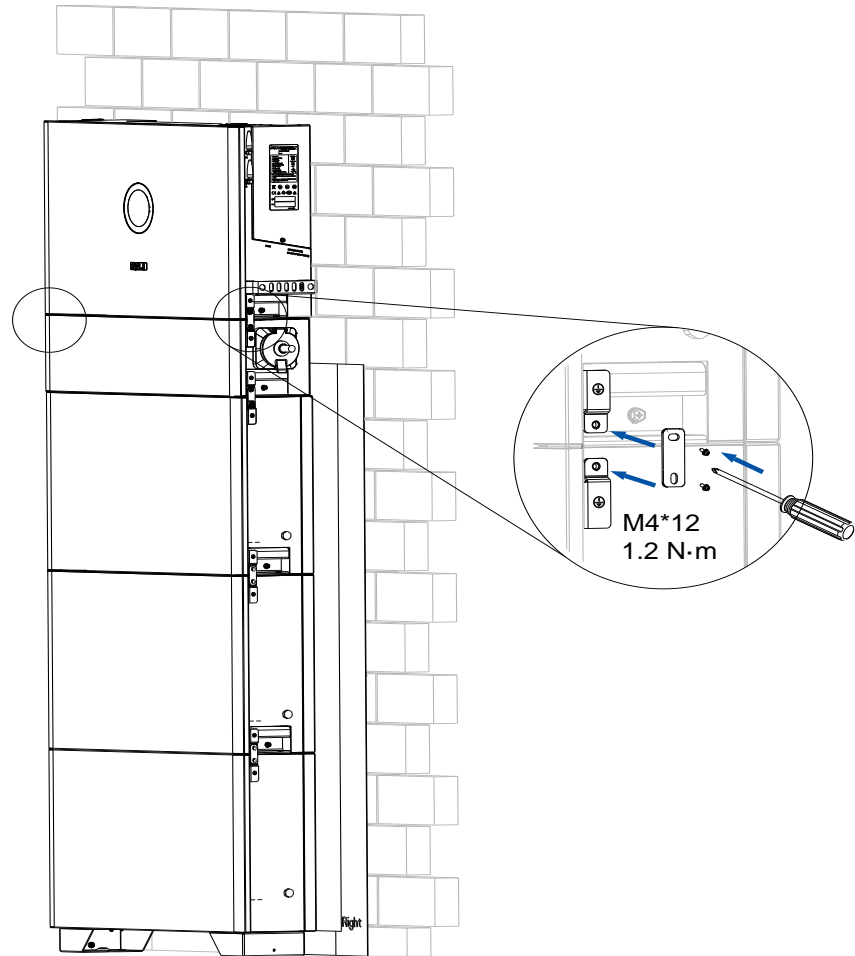
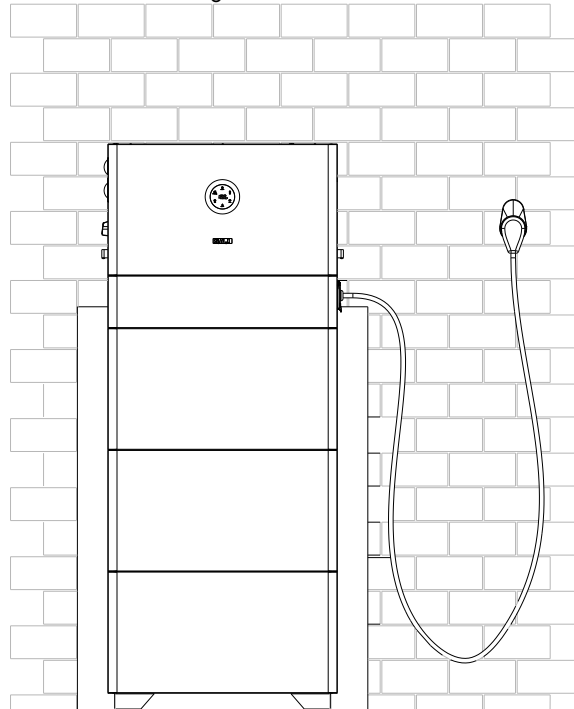


Figure 4.32. Installing the grounding plate

**Installation completion view****Single stack: supporting 1 to 3 batteries**

Example of 3 batteries:

Inverter + charger + batteries



Inverter + batteries

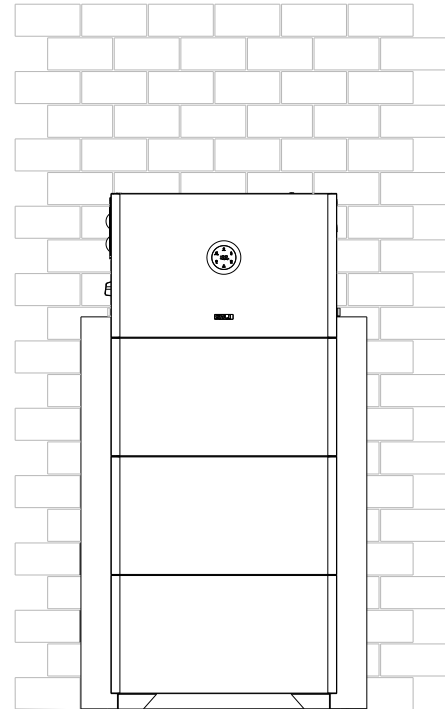


Figure 4.33. Completion view of a single stack

### 4.5.3. Type B battery pack: wall mounting manner

#### Before you start

Make sure that the wall can bear the weight of the inverter and accessories.

#### Procedure

Step 1. Install the wall-mounting bracket.

- a. Place the mounting bracket onto the wall. Mark six holes. Remove the bracket.

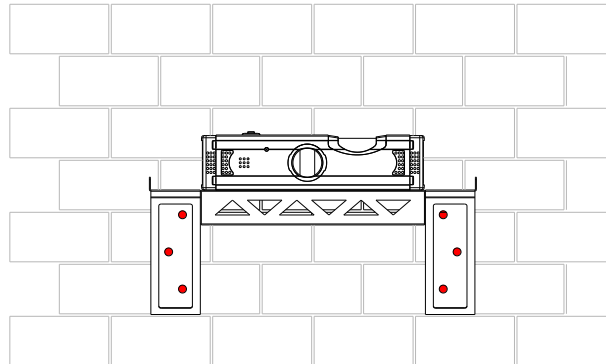


Figure 4.34. Marking the hole positions

- b. Drill six holes according to the marked positions on the wall.

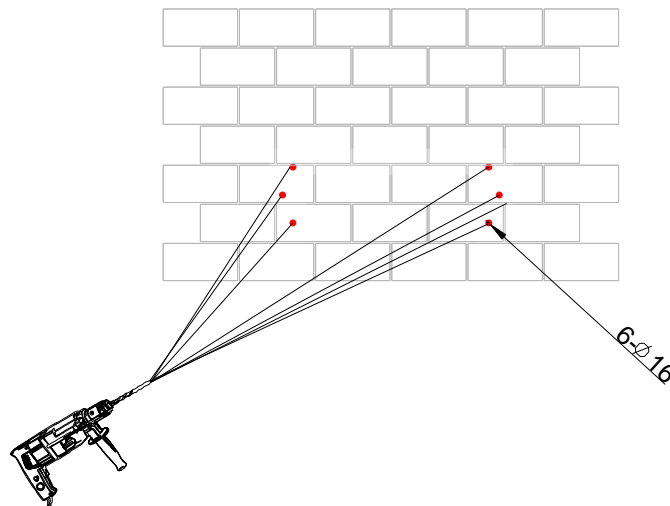


Figure 4.35. Drilling holes

- c. Install the mounting bracket on to the wall.

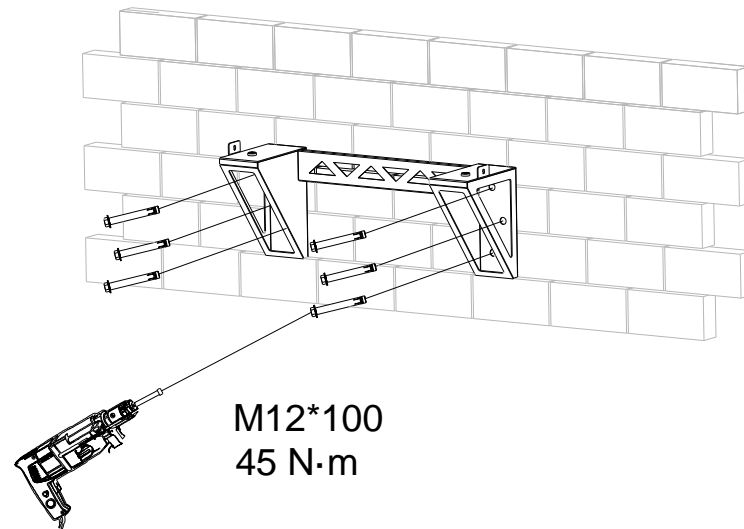


Figure 4.36. Installing the mounting bracket

Step 1. Install the base battery (BU3-5.0-(TV1, TV2)-BASE or BU3-5.0-(TV1, TV2)-PRO-BASE).

- a. Get the cardboard from the base battery package. Place the cardboard onto the wall and align the vertical lines on the cardboard with the bracket edges.

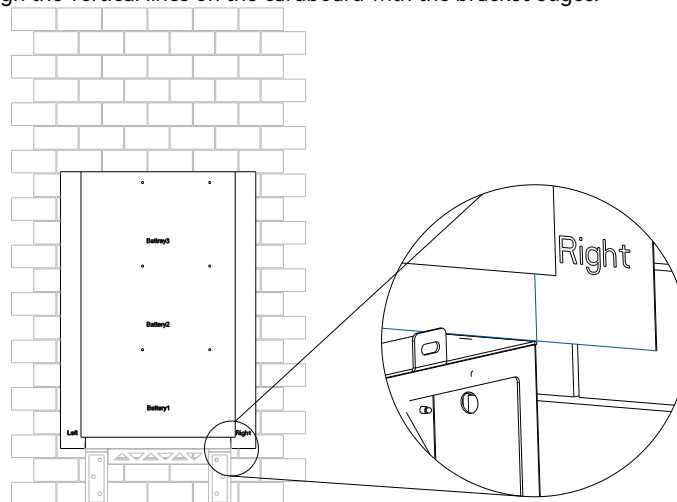


Figure 4.37. Aligning the cardboard with the bracket

- b. Drill six holes (8mm in diameter and 55mm in depth) on the marked positions on the cardboard. Install the provided expansion bolts into the drilled holes.

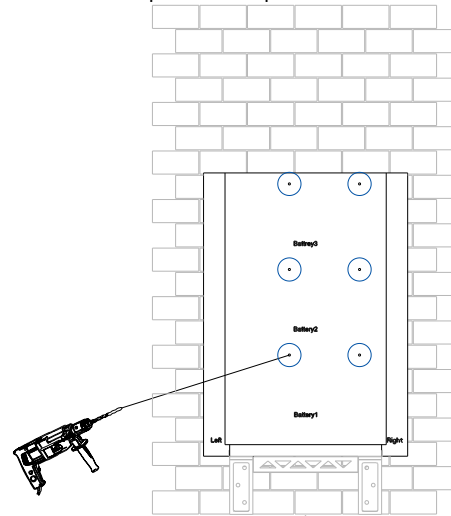


Figure 4.38. Drilling holes

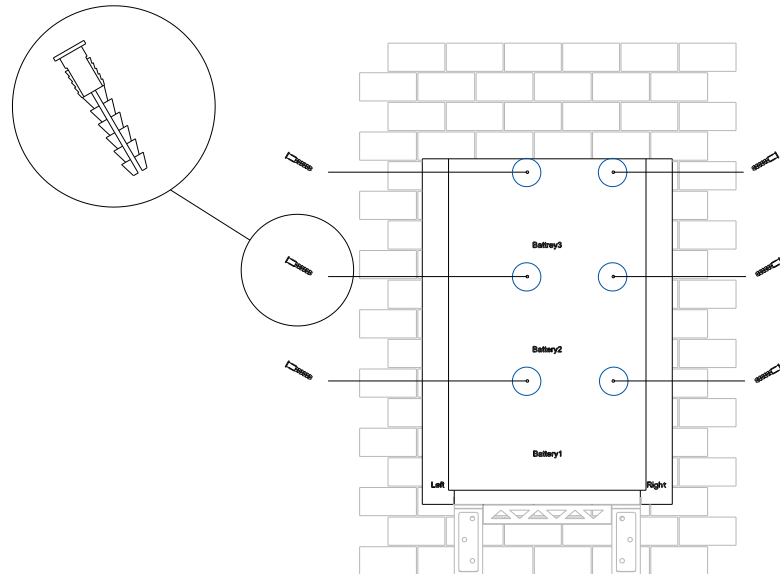


Figure 4.39. Installing expansion bolts

- c. Use two M5\*14 screws to install two locking brackets to the mounting ears on the top of the battery pack. Place the base battery onto the floor. Make sure that:
- The battery feet are aligned with the vertical black line on the cardboard.
  - The battery pack is placed horizontally. (It is recommended that a gradienter be used.)
  - The space between the battery back and the wall surface is 50–65 mm.

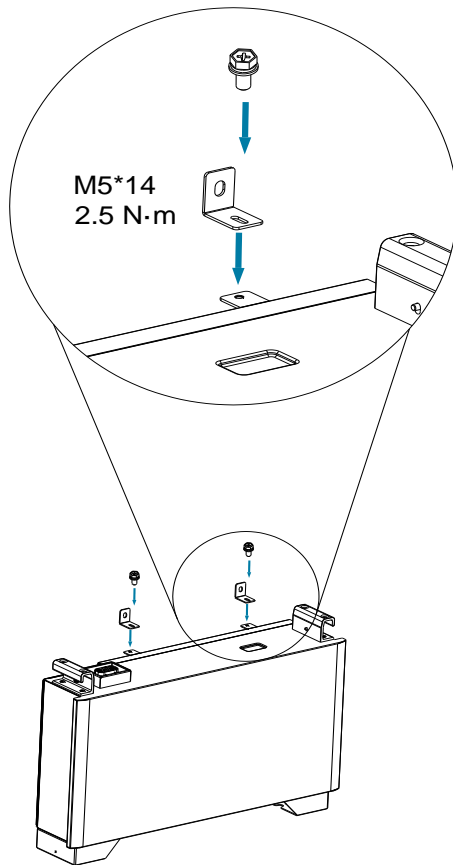
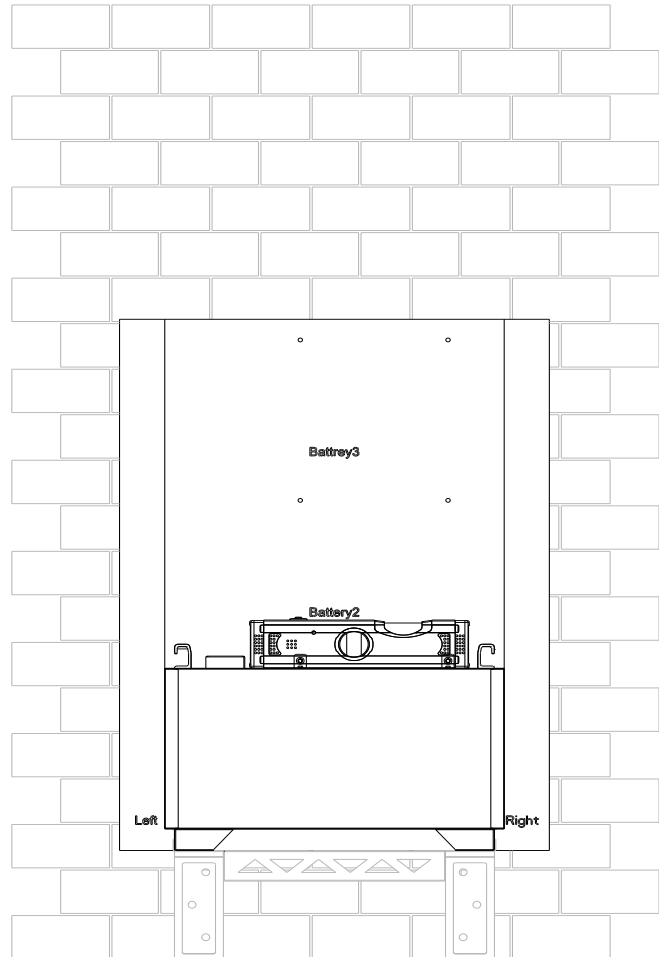


Figure 4.40. Installing the battery with the base



- d. On the top of the battery pack, align the locking brackets to the drilled holes and install M6\*50 screws to secure the locking brackets to the wall. Secure battery to the wall-mounting bracket by tightening two M5\*14 screws.

**Note:** If the battery is installed outdoors, it is suggested to remove the cardboard which is not waterproof.

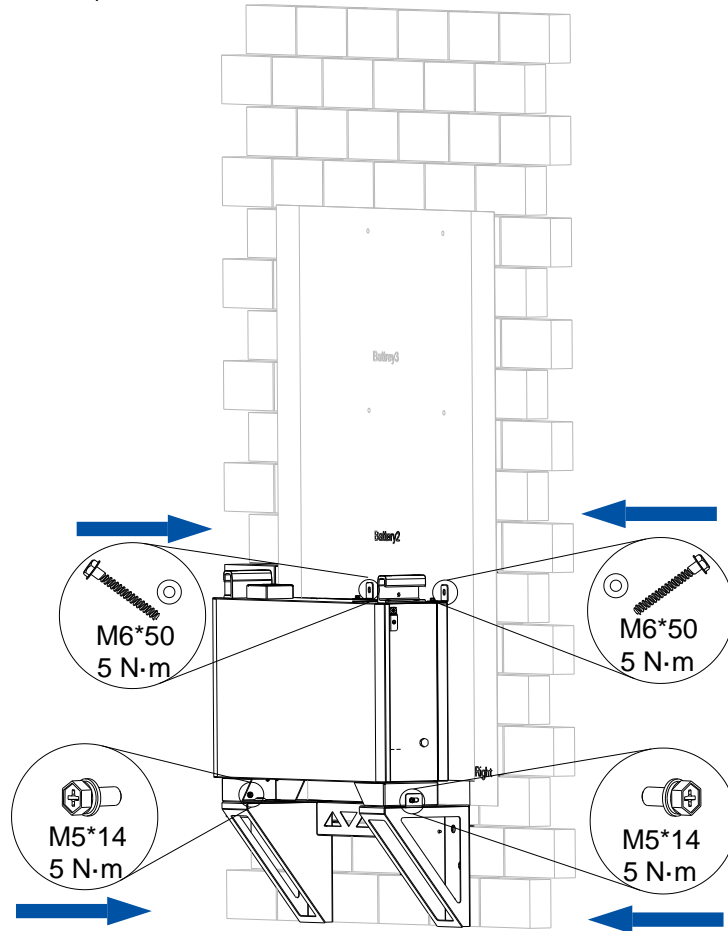


Figure 4.41. Securing the battery to the wall



Step 2. Install other batteries (BU3-5.0-(TV1, TV2) or BU3-5.0-(TV1, TV2)-PRO).

**Note:** In one stack, up to three batteries are supported.

- a. Use two M5\*14 screws to install two locking brackets to the mounting ears on the top of the battery pack. Place this battery onto the base battery. Push it downwards.

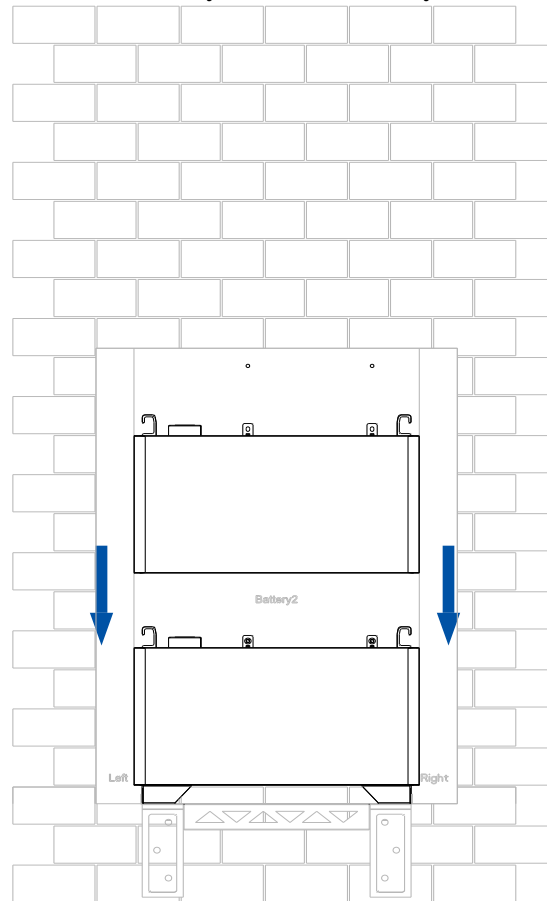
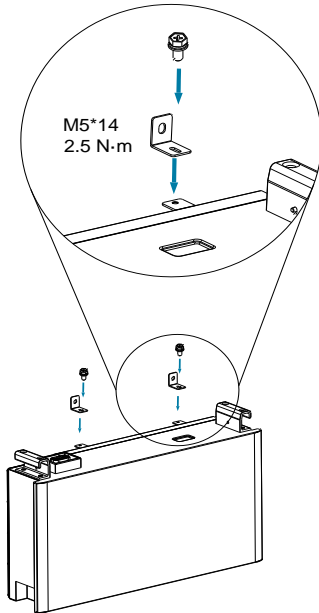


Figure 4.42. Installing the second battery without

- b. On the top of the battery pack, align the locking brackets to the drilled holes and install the gaskets and M6\*50 screws to secure the battery pack to the wall.

On the left and right bottom sides of the battery pack, install M5\*14 screws to secure two batteries.

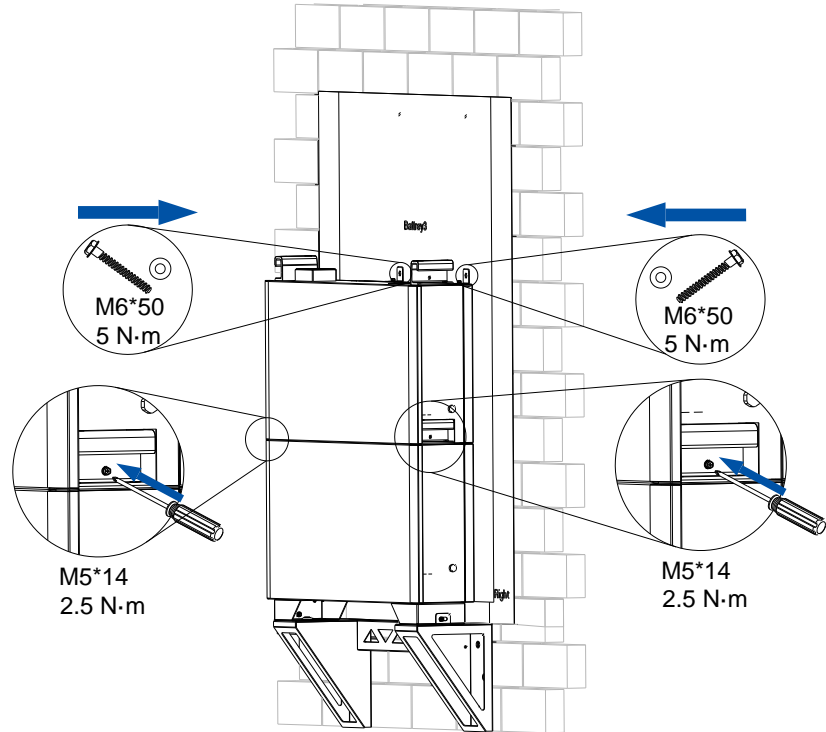


Figure 4.43. Securing the batteries

**For Australian version:** Install and secure the metal grounding plate on both sides.

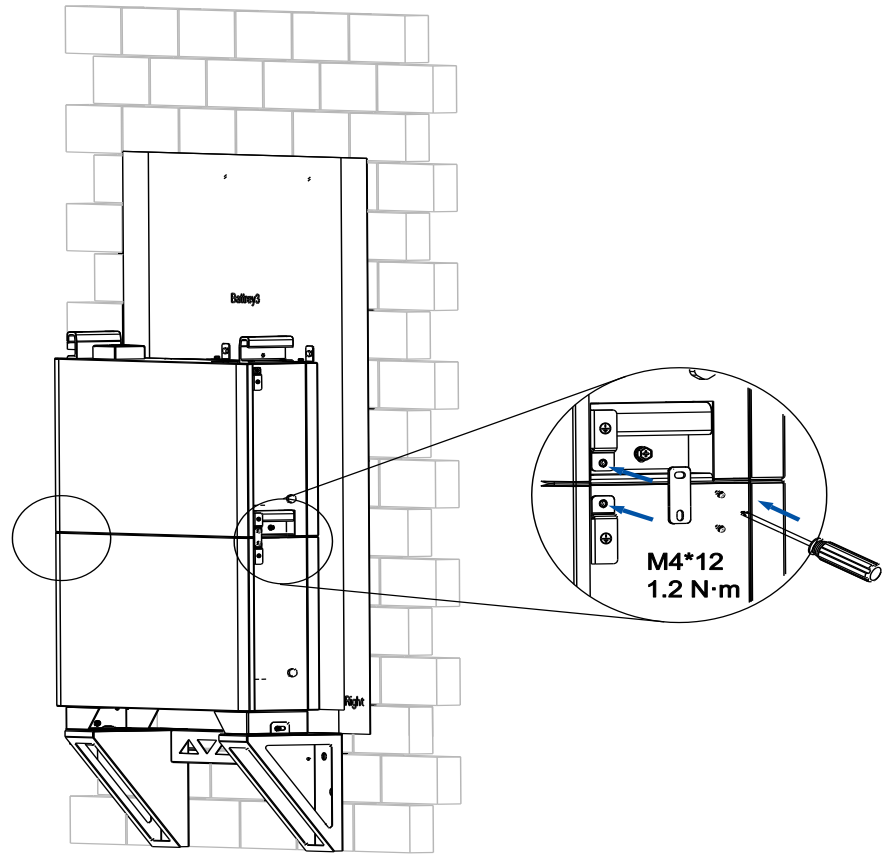


Figure 4.44. Installing the grounding plate

- c. (Optional) If needed, repeat steps a and b to install the third battery.

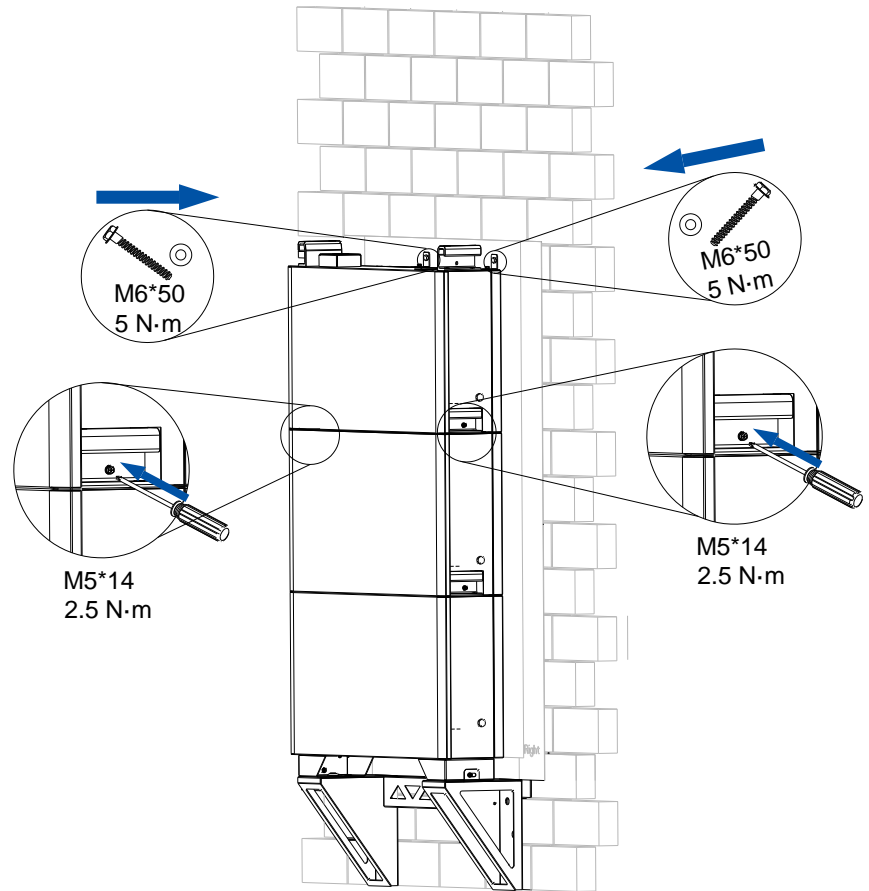


Figure 4.45. Installing the third battery

**For Australian version:** Install and secure the metal grounding plate on both sides.

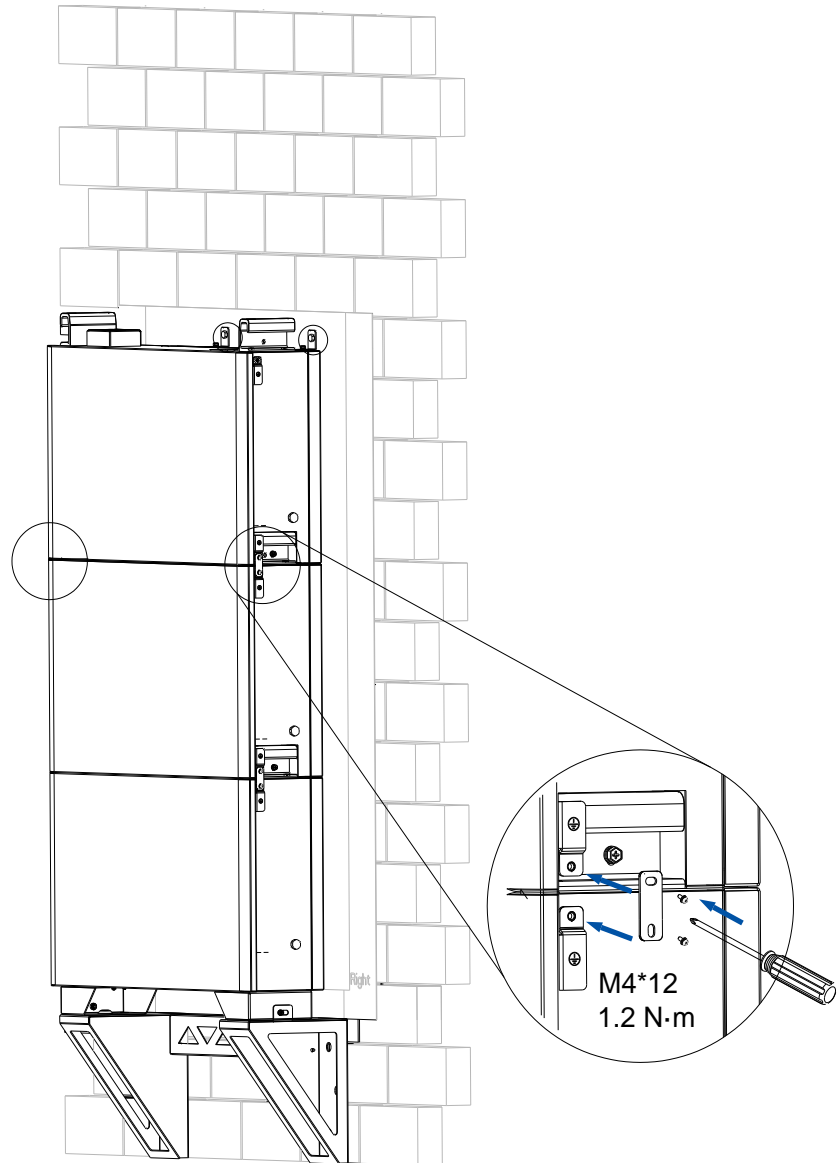


Figure 4.46. Installing the grounding plate

Step 3. (Optional) Install the EV charger (CU2-11K-T-1).

- a. Get the holster from the charger package. Install the holster onto the right side of the charger.
- b. Place the charger onto the battery. Push it downwards.
- c. On the left and right bottom sides of the battery pack, install M5\*14 screws to secure the charger to the battery.

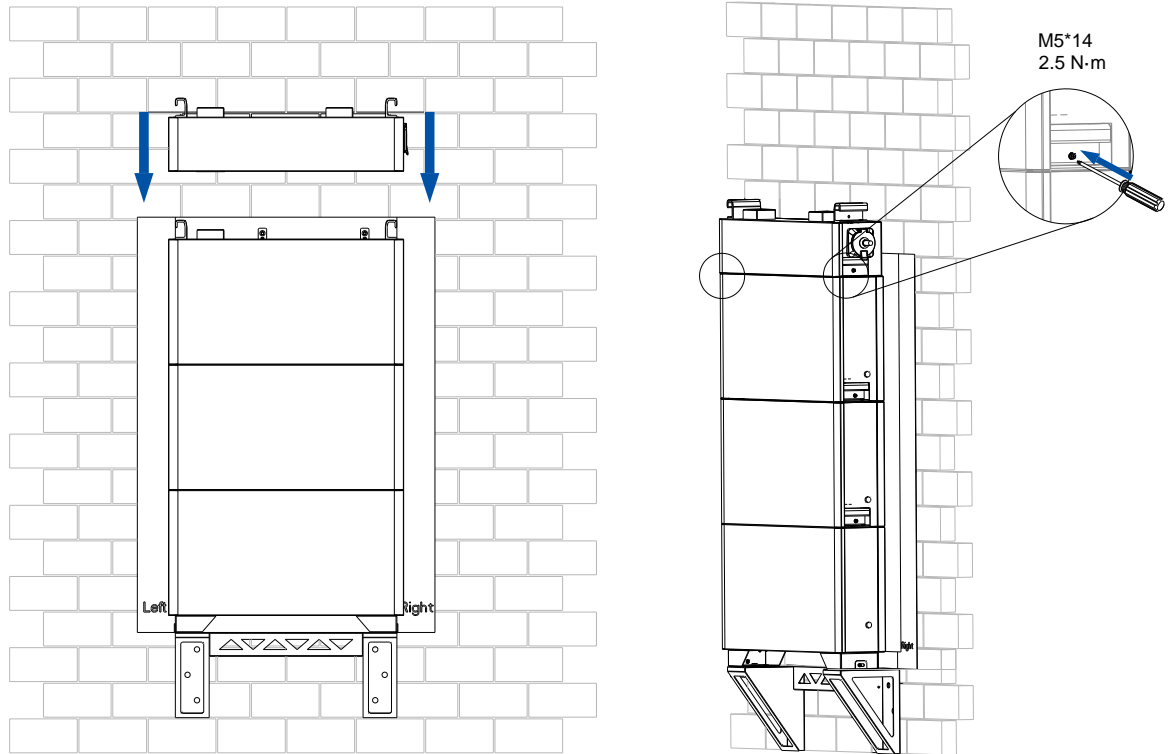


Figure 4.47. Installing the charger

**For Australian version:** Install and secure the metal grounding plate on both sides.

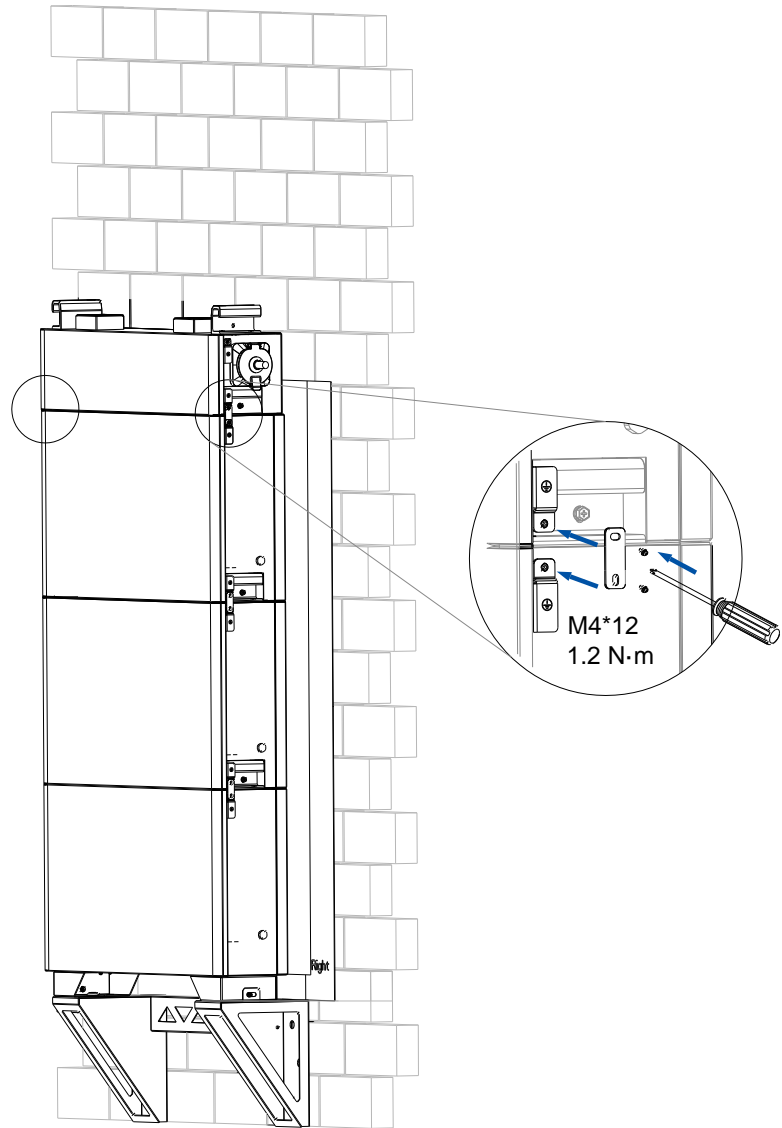


Figure 4.48. Installing the grounding plate

- e. Install the holster on the wall by using three M4\*32 screws.

**Note:** The holster is used to secure the charger cable. It is recommended that you purchase the cable from SAJ and connect the cable after all devices are installed.

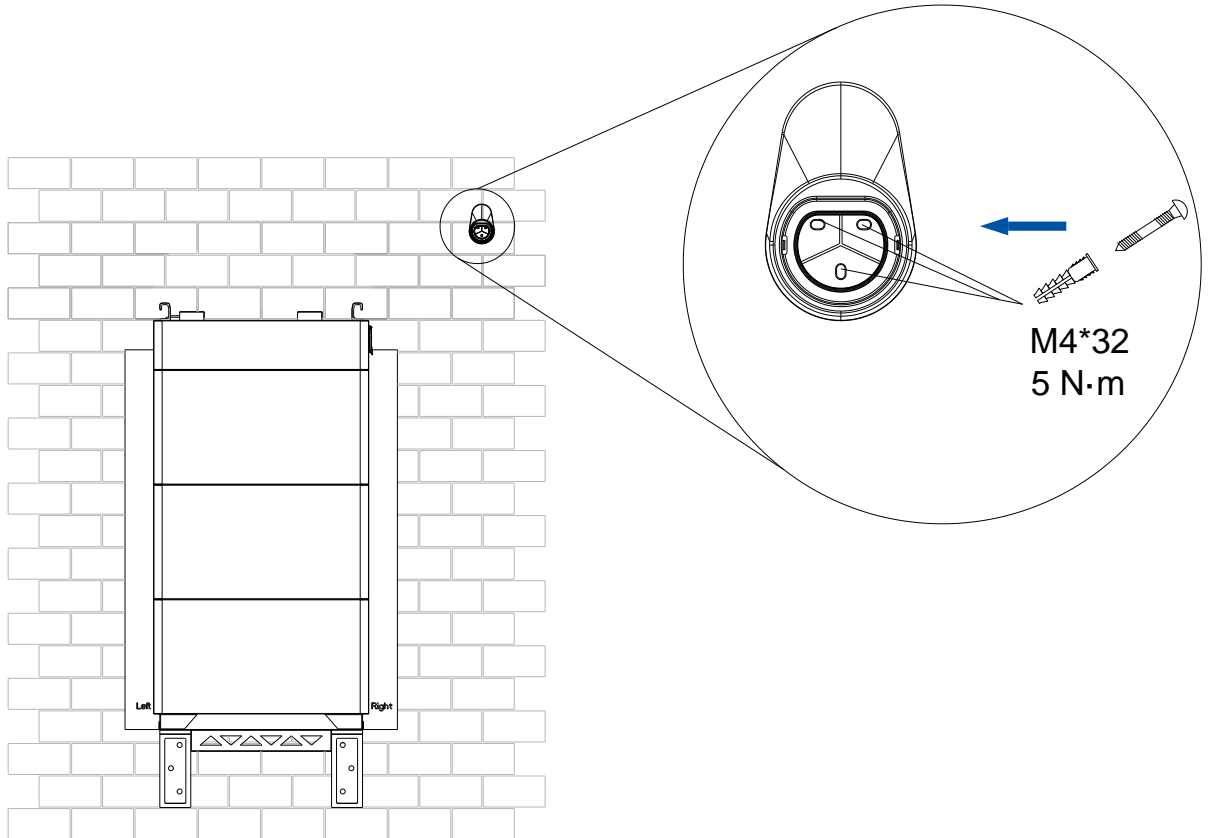


Figure 4.49. Installing the charger cable holster



- f. (Optional) Connect the charger cable.

**Notes:**

- It is recommended that you connect the cable after all device installation is completed.
- It is recommended that you purchase the cable from SAJ.
- For a long cable, you can wrap the cable on the holster.

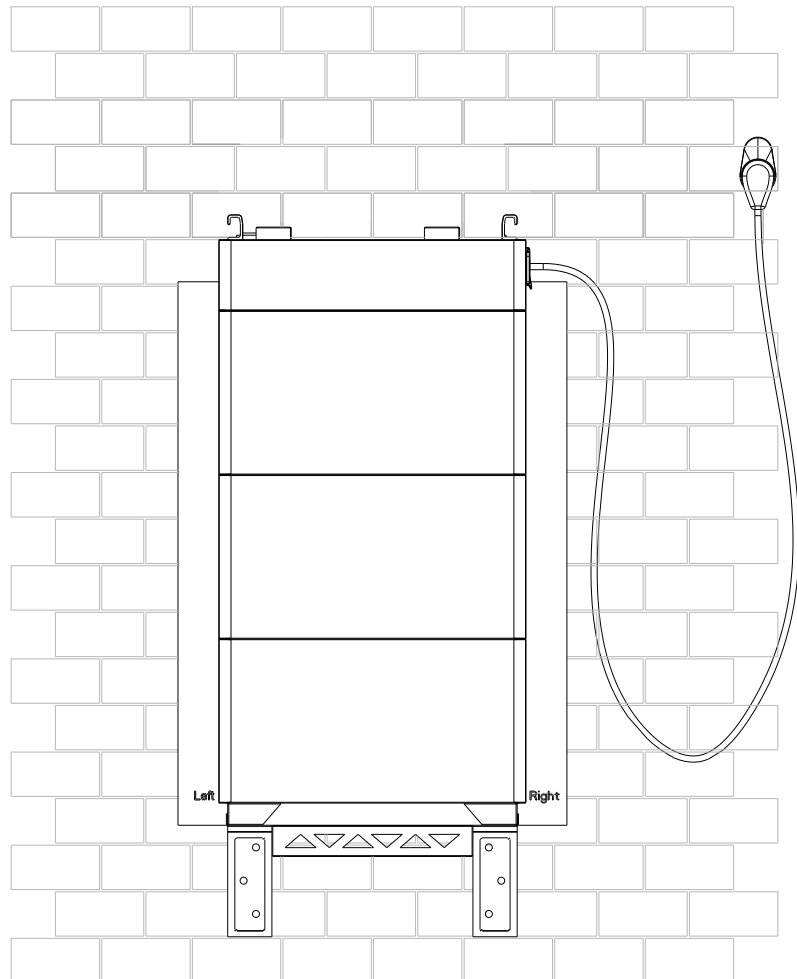


Figure 4.50. Connecting the charger cable

Step 4. Install the inverter (HS3-*xk*-T2-W-B, HS3-*xK*-T2-W-P, HS3-*xk*-T2-G-B, or HS3-*xK*-T2-G-P).

- a. (Optional) If you have installed a charger, loosen the screws on the inverter, and remove the port cover, as shown below:

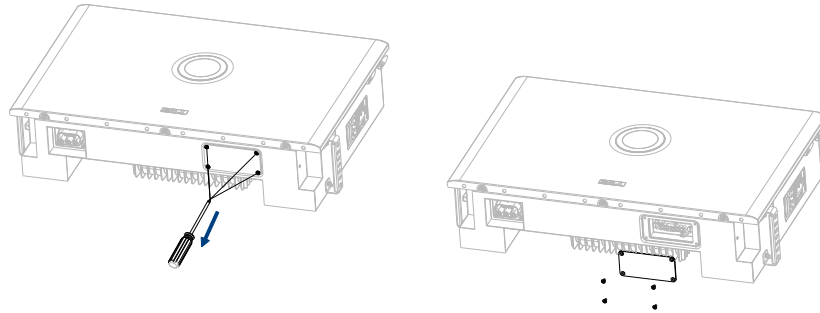


Figure 4.51. Removing the port cover

- b. Place the inverter onto the battery or charger (if available) and push it downwards. On the left and right bottom sides of the battery pack, install M5\*14 screws to secure the inverter to the beneath device (battery or charger; here takes a charger as an example).

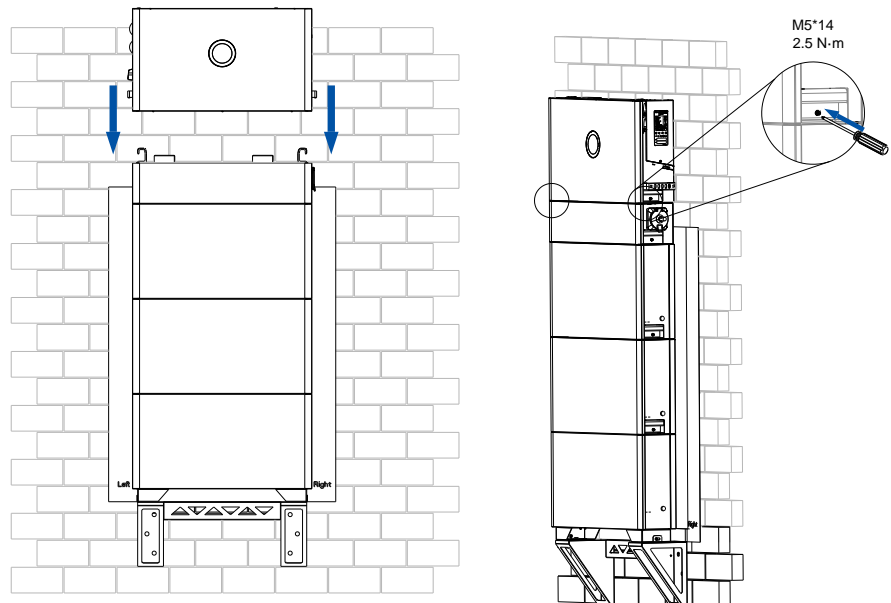


Figure 4.52. Installing the inverter

**For Australian version:** Install and secure the metal grounding plate on both sides.

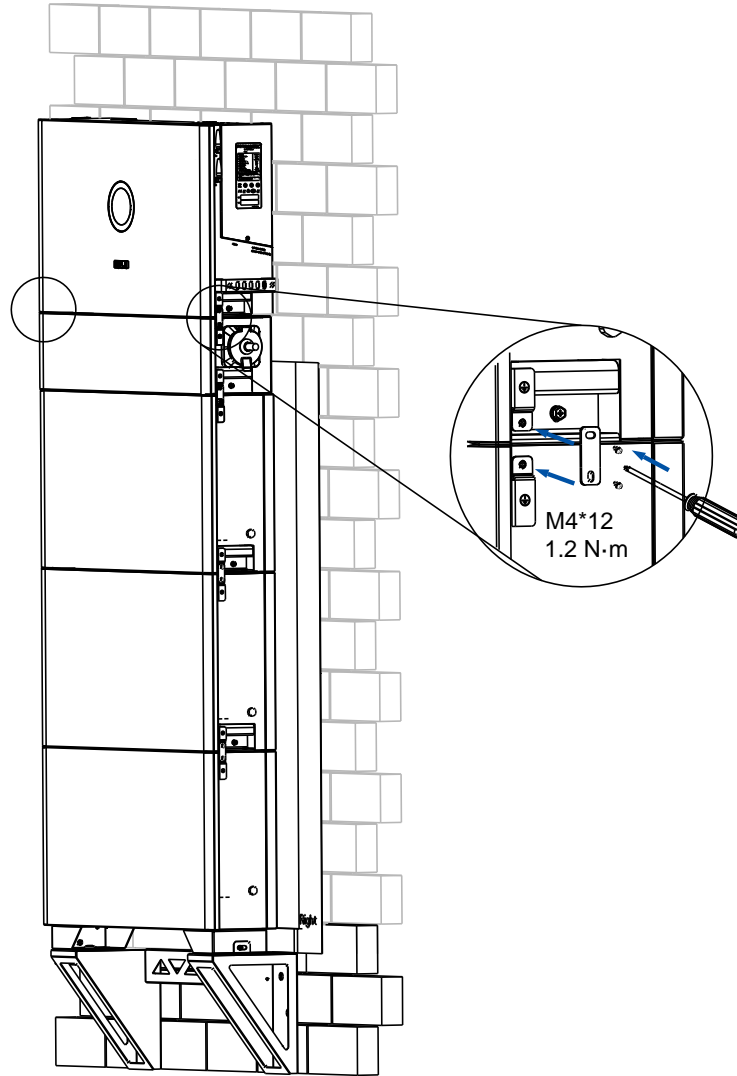
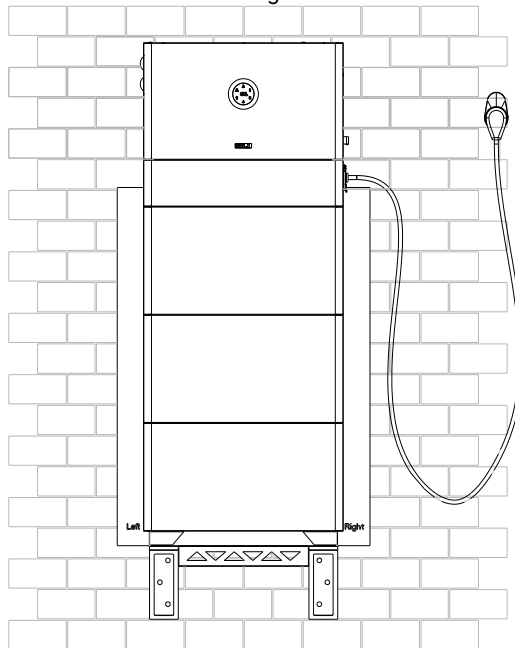


Figure 4.53. Installing the grounding plate

**Installation completion view****Single stack: supporting 1 to 3 batteries**

Example of 3 batteries:  
Inverter + charger + batteries



Inverter + batteries

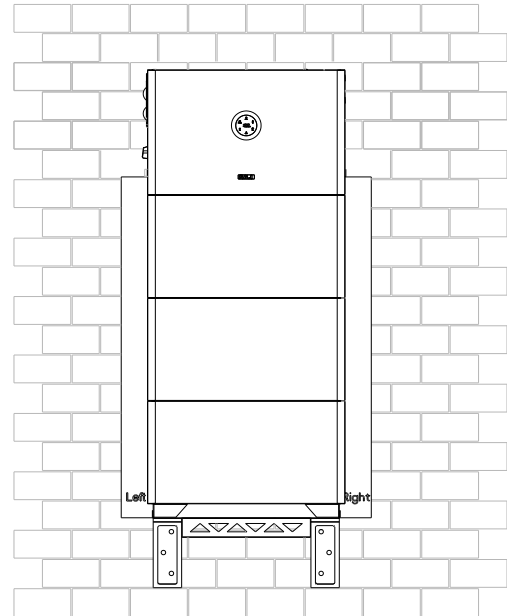


Figure 4.54. Completion view of a single stack

#### 4.5.4. (Optional) Installation of multiple battery stacks

##### About this task

One inverter supports up to eight batteries; however, for safety reason, a maximum of three batteries can be installed vertically in one stack. Therefore, extra batteries must be installed in other stack(s) and the extra battery stack must be installed with a battery junction box (BC3-TV). Due to the cable length limitations, the distance between each battery stack is 0.5 meter.

It is recommended that the batteries be assembled in different stacks as follows:

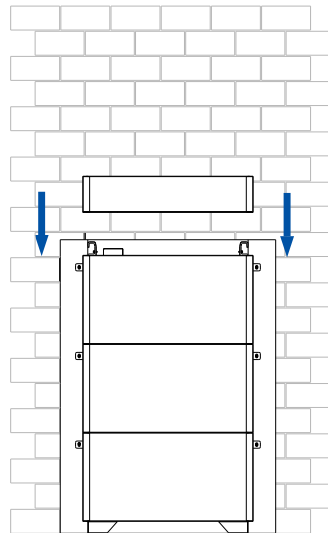
Quantity of batteries supported by one inverter	Quantity of battery stacks	Quantity of batteries in each stack
1, 2, or 3 batteries	1	1, 2, or 3
4 batteries	2	2, 2
5 batteries	2	3, 2
6 batteries	2	3, 3
7 batteries	3	3, 2, 2
8 batteries	3	3, 3, 2

The procedures in the ground-mounting manner and the wall-mounting manner are the same.

##### Procedure

Step 1. Place the junction box onto the battery. Push it downwards.

On a type A battery pack



On a type B battery pack

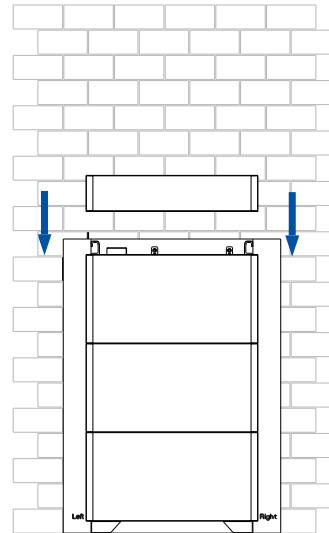


Figure 4.55. Installing a battery junction box

Step 2. Depending on the battery type, perform as follows:

- Type A battery pack: Install screws on both lower sides of the junction box to secure the junction box to the beneath battery.

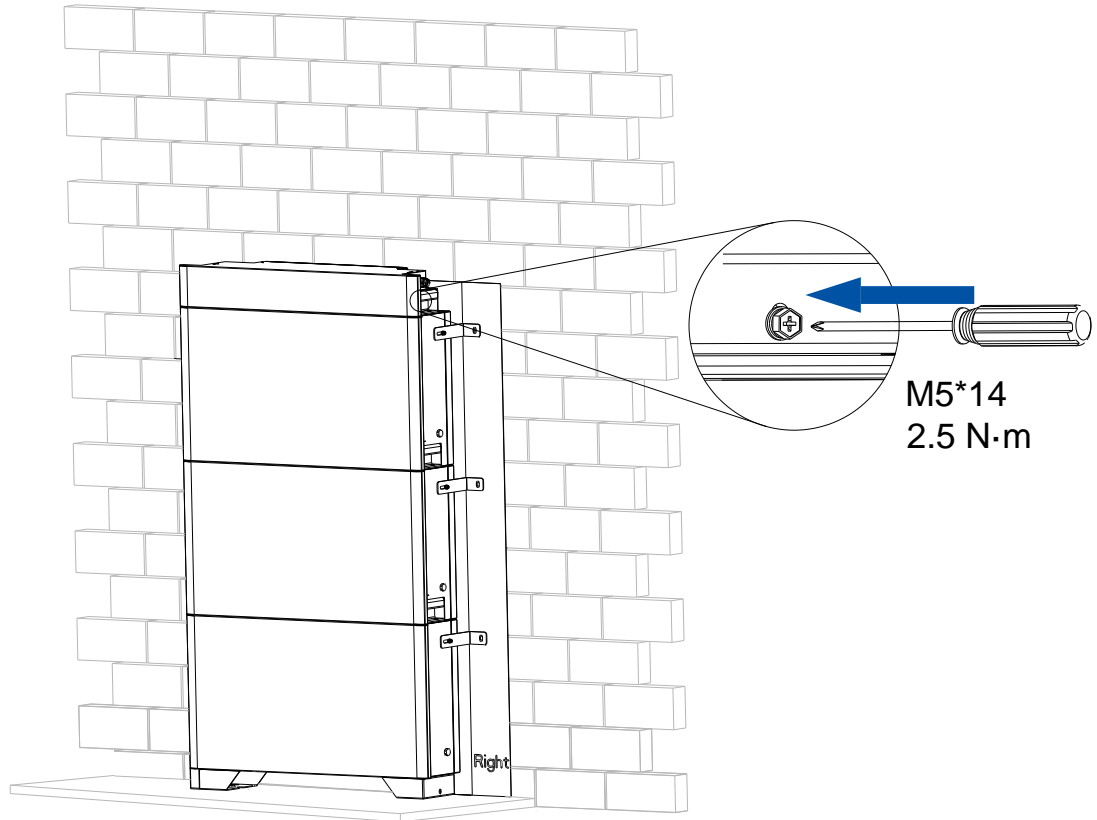


Figure 4.56. Installing a battery junction box

- Type B battery pack: Install screws on both lower sides of the junction box to secure the junction box to the beneath battery.

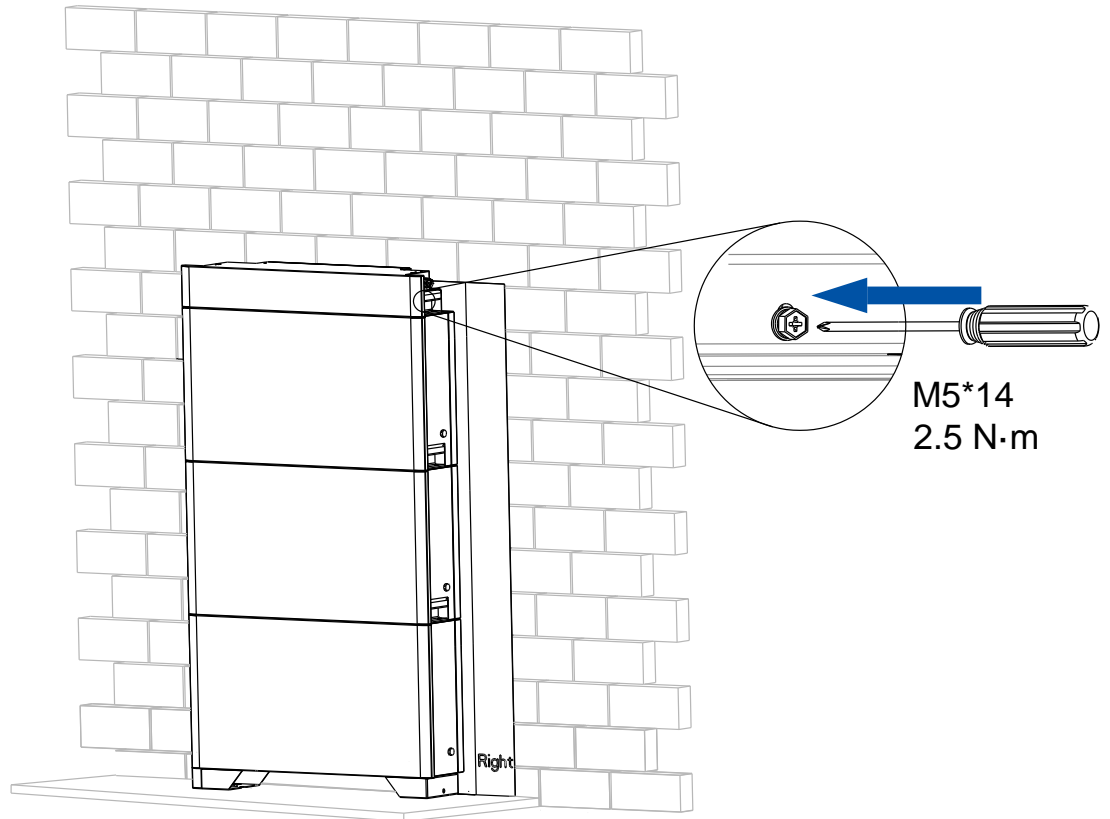


Figure 4.57. Installing a battery junction box

**For Australian version:** Install and secure the metal grounding plate on both sides.

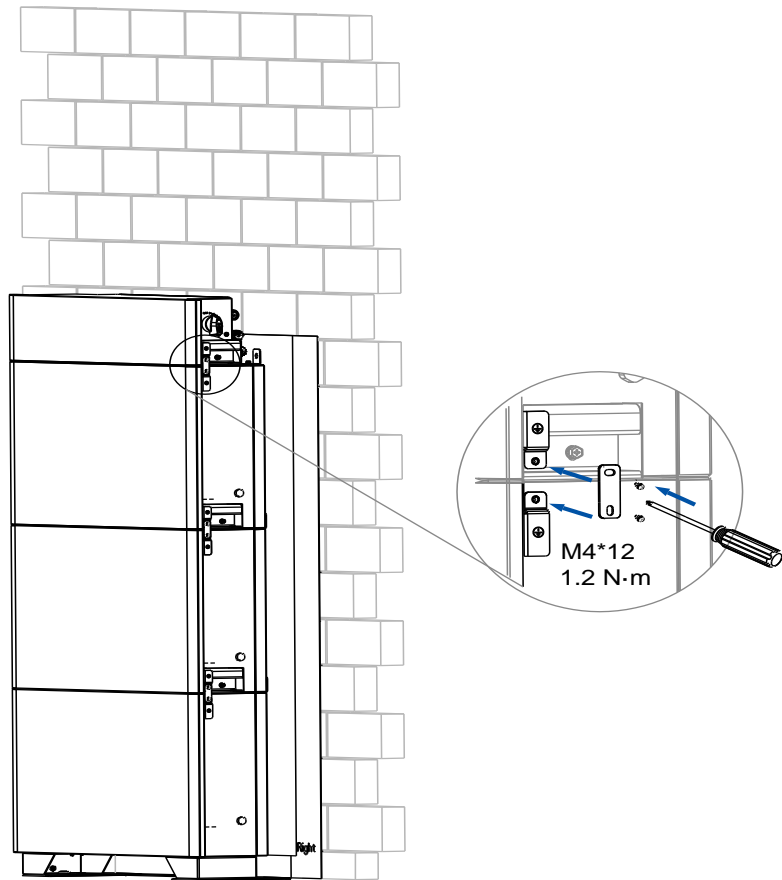


Figure 4.58. Installing the grounding plate



**Installation completion view****Multiple battery stacks: supporting 4 to 8 batteries**

Take eight batteries as an example. Quantities of the batteries in different stacks are 2, 3, and 3, as shown below. The distance between each stack is 0.5 meter.

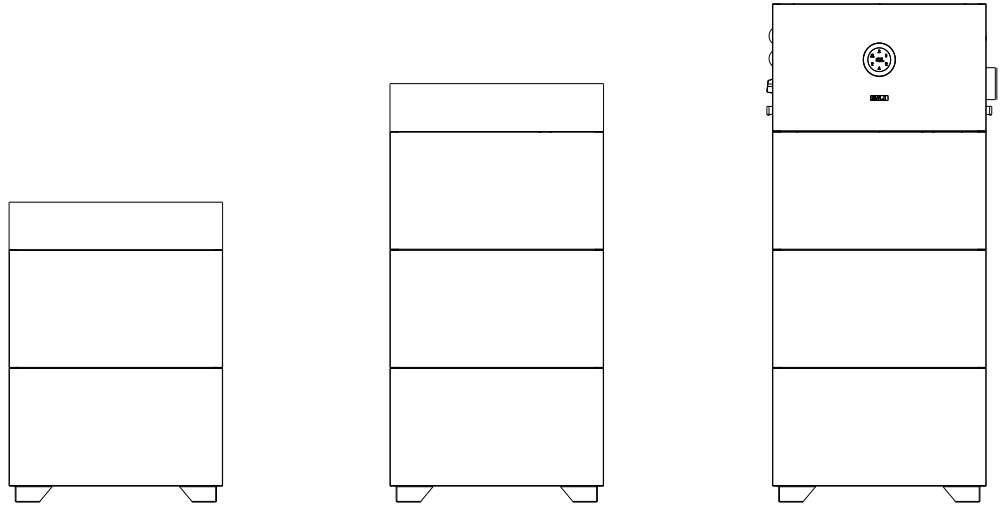


Figure 4.59. Completion view of three battery stacks

5.

# ELECTRICAL CONNECTION



## 5.1. Safety instructions

Electrical connection must only be operated on by professional technicians. Operators must be aware that the inverter is a bi-power supply equipment. Before connection, necessary protective equipment must be employed by technicians including insulating gloves, insulating shoes, and safety helmet.

### DANGER

- Dangerous to life due to potential fire or electricity shock.
- Do not install the inverter near any inflammable or explosive items.
- Dangerous to life due to potential fire or electricity shock.
- When it is powered on, the equipment should in conformity with national rules and regulations.
- The direct connection between the inverter and high voltage power systems must be operated by qualified technicians in accordance with local and national power grid standards and regulations.
- The PV arrays will produce lethal high voltage when exposed to sunlight.

### NOTICE

Any improper operation during cable connection can cause device damage or personal injury

## 5.2. Assemble the AC-side connection

### 5.2.1. Open the AC-side cover

Loosen the screw that locks the cover. Then, lift the cover upwards.

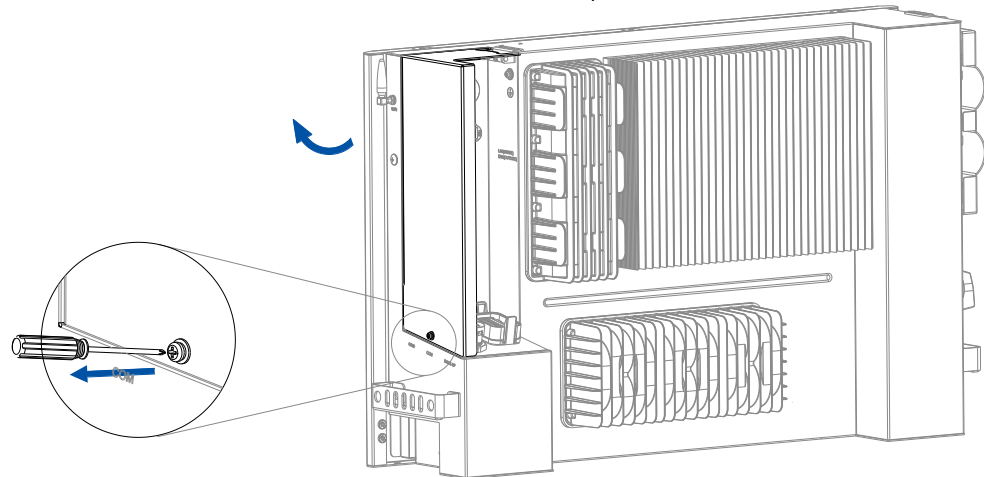


Figure 5.1. Opening the AC-side cover

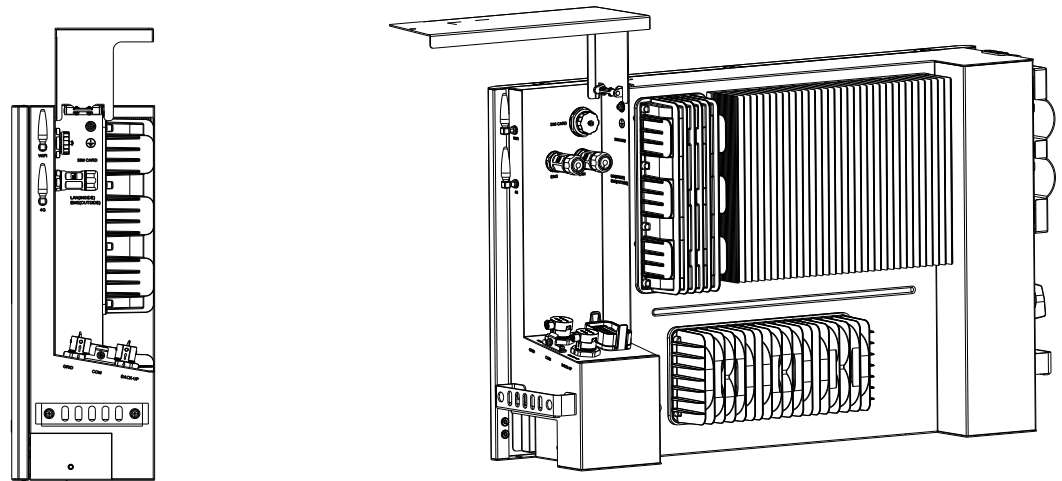


Figure 5.2. AC-side cover opened

## 5.2.2. Connect the grounding cable

### About this task

This additional grounding cable must be connected before other electrical connection.

This inverter complies with IEC 62109-2 clause 13.9 for earth fault alarm monitoring. After system startup and commissioning, if a grounding error occurs, the ring light on the inverter LED panel will be lit up in red and an error code <44> can be viewed on the Elekeeper App.

The cable needs to be prepared by the user. It is recommended that a 6-mm<sup>2</sup> conductor cross-sectional area of cable be used.

Note: The inverter cannot be used with functionally earthed PV arrays.

You can use the grounding point on either AC-side or DC side. Here takes the grounding point on the AC-side as an example.

**Procedure**

Step 1. Assemble the cable and OT/DT terminal.

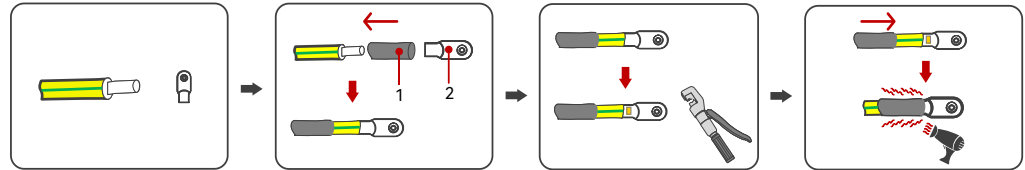


Figure 5.3. Preparing the grounding cable

1	Heat shrink tube	2	OT/DT terminal
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Step 2. Remove the M4\*10 screw from the grounding port. Connect and secure the grounding cable.

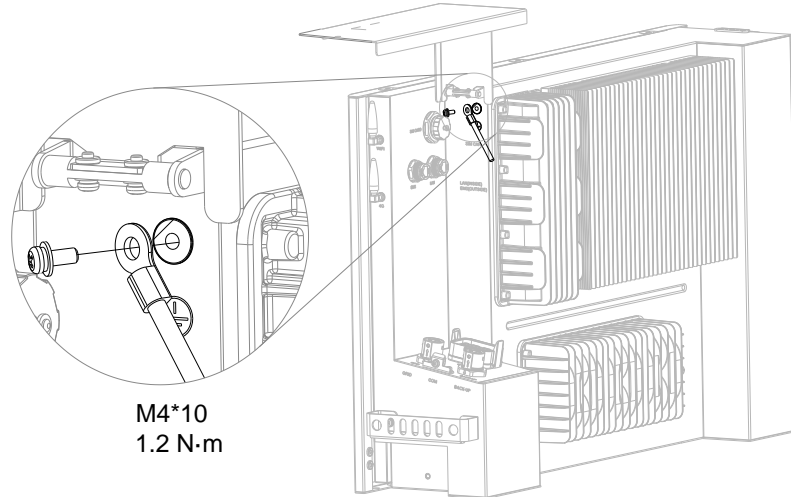


Figure 5.4. Connecting the additional grounding cable

### 5.2.3. (Optional) Install a SIM card

Only the 4G model provides the SIM card slot.

Loosen the cover of the SIM card slot. Then, insert the SIM card into the slot.

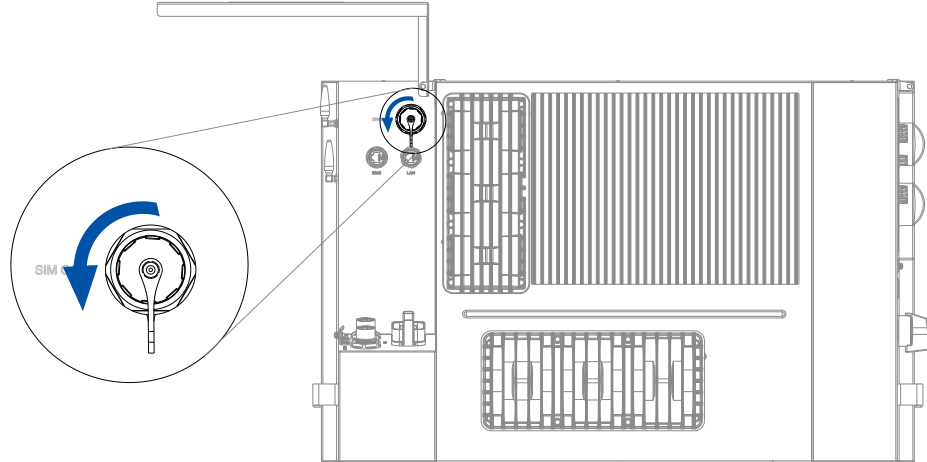


Figure 5.5. Loosening the cover on the SIM card slot

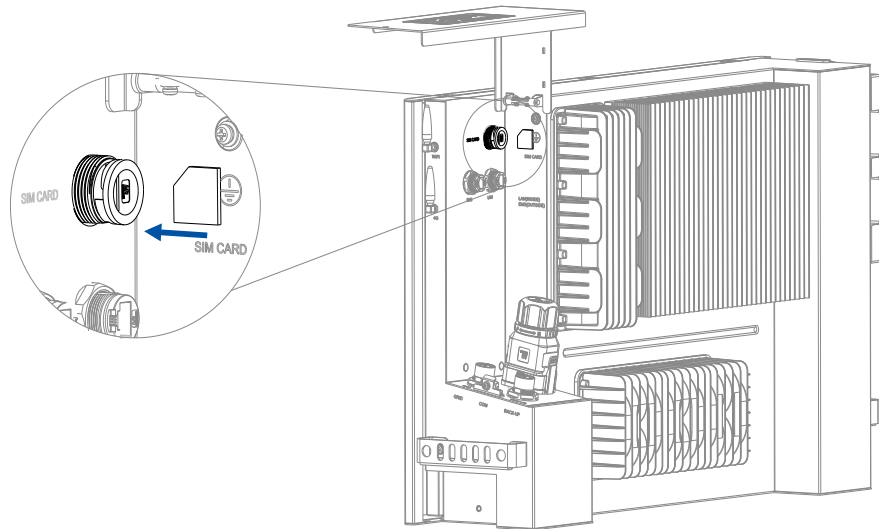


Figure 5.6. Inserting the SIM card

## 5.2.4. (Optional) Assemble the LAN electrical connection

### About this task

Only the W (Wi-Fi) model provides the LAN port.

If you choose to use Wi-Fi connection manner or has an EMS connected in the ESS, no need to connect the LAN cable. If you choose to use Ethernet connection manner, perform as follows:

### Procedure

Step 1. Remove the RJ45 cable fastener from the LAN port.

Step 2. Use a standard RJ45 cable. Insert the cable through the cable fastener as shown below. Assemble the cable fastener.

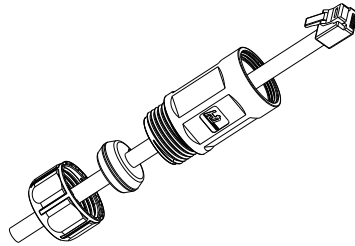


Figure 5.7. Preparing the LAN cable

Step 3. Connect the LAN cable from the LAN port on the inverter to the router.

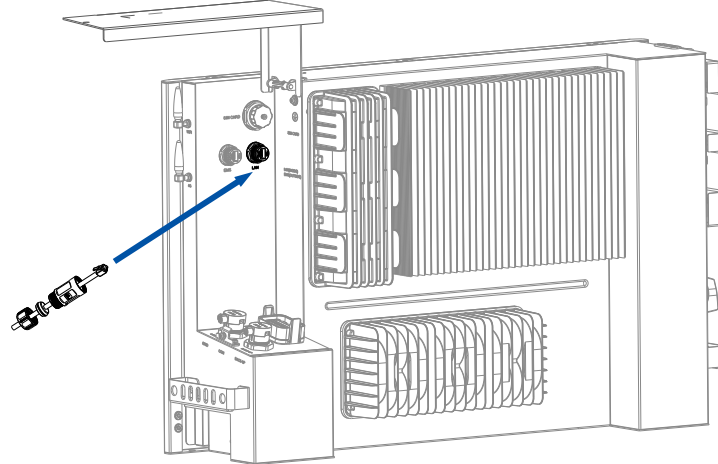


Figure 5.8. Connecting the LAN cable

## 5.2.5. Assemble the EMS electrical connection

To connect an EMS to the inverter, perform as follows:

Step 1. Remove the RJ45 cable fastener from the EMS port.

Step 2. Use a standard RJ45 cable. Insert the cable through the cable fastener as shown below. Assemble the cable fastener.

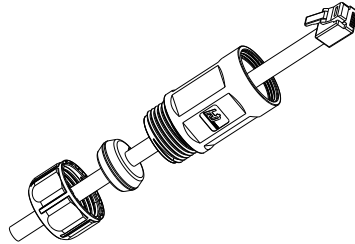


Figure 5.9. Preparing the EMS cable

Step 3. Connect the cable from the EMS port on the inverter to the EMS port on SAJ eManager (EMS).

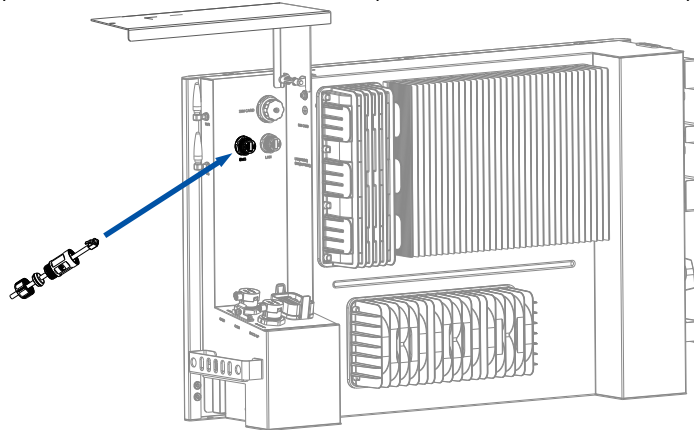


Figure 5.10. Connecting the EMS cable



### 5.2.6. Install a circuit breaker

For safety operation and regulation compliance, install a 63 A or higher air circuit breaker between the grid and the inverter.

By installing a circuit breaker, the inverter can be disconnected from the grid quickly and safely when the leakage current detector embedded in the inverter detects that the leakage current exceeds the limitation.

**Notice:** In parallelling scenario, do NOT connect multiple inverters to one AC circuit breaker.

### 5.2.7. (Optional) Install an RCD

An external residential current device (RCD) is not mandatory since the inverter is integrated with a residential current monitoring unit (RCMU). However, if the external RCD must be installed according to the local regulations, either type A or type B RCD can be installed with the action current 300 mA or higher.

### 5.2.8. Connect the smart meter

Connect the smart meter as shown in section 5.5 “System connection diagram”.

A meter has been shipped with the inverter. By using this meter, many functions can be implemented, such as the export limitation function.

The meter specifications are as follows:

Manufacturer	Zhejiang Chint Instrument & Meter Co., Ltd.
Model	DTSU666
Application	3-phase
Nominal voltage	230 V
Max. current	100 A per line conductor
Class of accuracy	1
Communication type	RS485

If you need to use other meters, contact SAJ for consultation.

## 5.2.9. Connect the grid and backup loads

### About this task

- Depending on your system configuration, the grid and backup load ports on the inverter are different. Accordingly, the grid and backup load connector kits are different in the accessory bags.
- Each connector kit provides a one-hole rubber plug (in the connector body) and a five-hole rubber plug (in the accessory bag). This task takes the one-hole rubber plug as an example. The five-hole rubber plug is used when you choose to use five separated cables for connection.

### Before you start

Select cables according to the below recommended specification:

Conductor cross-sectional area of cables		Conductor material
Scope	Recommended value	Copper
4–6 mm <sup>2</sup> or 12–10 AWG	6 mm <sup>2</sup> or 10 AWG	

Note the required cable diameter of different rubber plugs.

Rubber plug	Hole diameter
One-hole plug (in the connector by default)	14–17.5 mm
Five-hole plug (in the accessory bag)	4.0–5.5 mm

Table 5.1 Recommended AC cable specification

## ■ Type A ports

### Procedure

Step 1. Strip the insulation off (13-mm length) the cables.

Step 2. Insert the cables through the dustproof cover, nut, and connector body of the connector and secure the cables to the terminal block with a spanner.

**Note:** The black connector is for grid connection. The gray connector is for backup load connection.

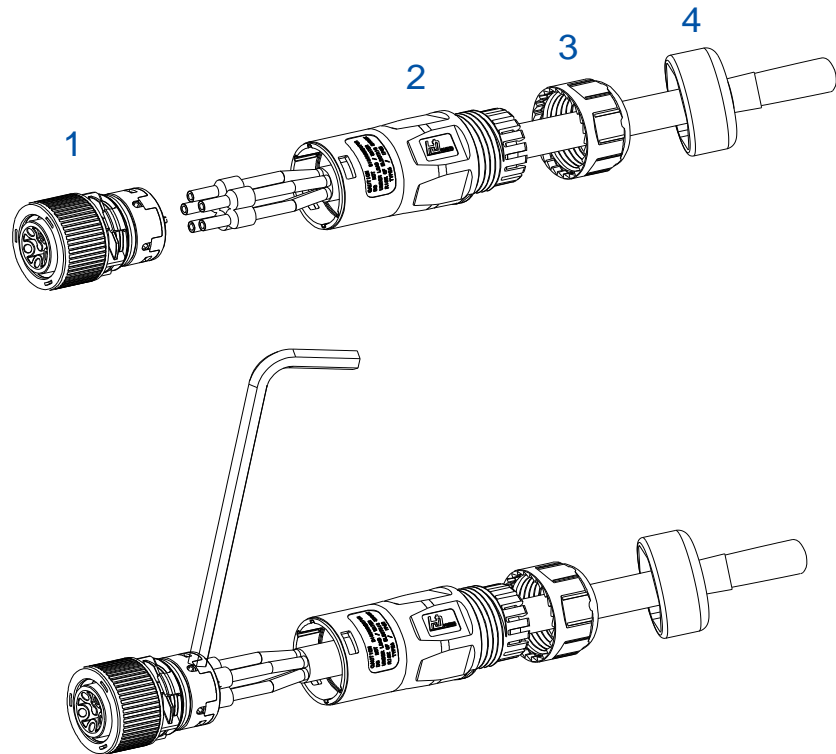


Figure 5.11. Preparing the cable

- Step 3. Remove the dustproof covers from the GRID and BACK-UP ports.
- Use a flathead screwdriver to press down the tab in the cover.
  - Rotate the cover anti-clockwise and pull it upwards.

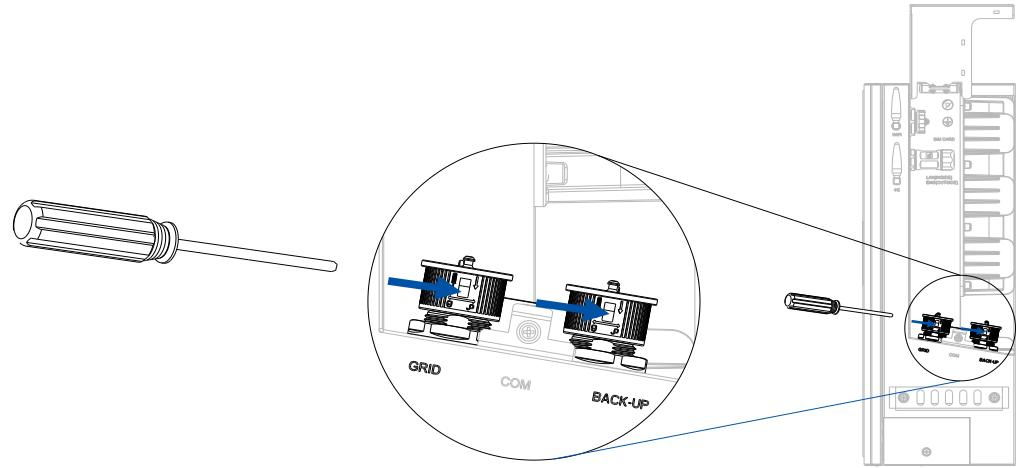


Figure 5.12. Removing the dustproof covers

- Step 4. Connect the cables to the GRID and BACKUP ports on the inverter.

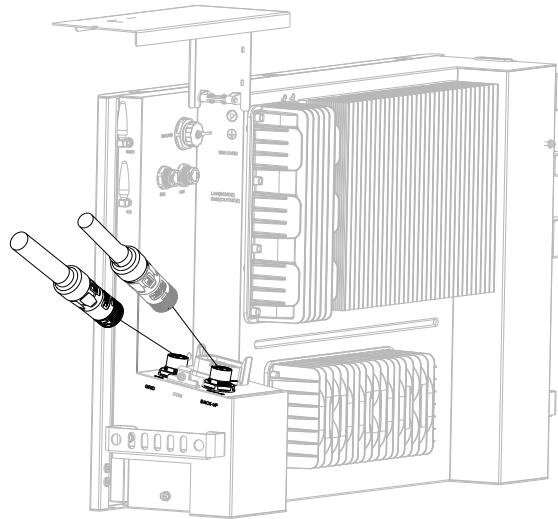


Figure 5.13. Connecting the grid cable

## ■ Type B ports

### Procedure:

Step 1. Strip the insulation off (13-mm length) the cables.

Step 2. Insert the cables through the dustproof cover, nut, and connector body of the connector and secure the cables to the terminal block with a spanner.

**Note:** The black connector is for grid connection. The blue connector is for backup load connection.

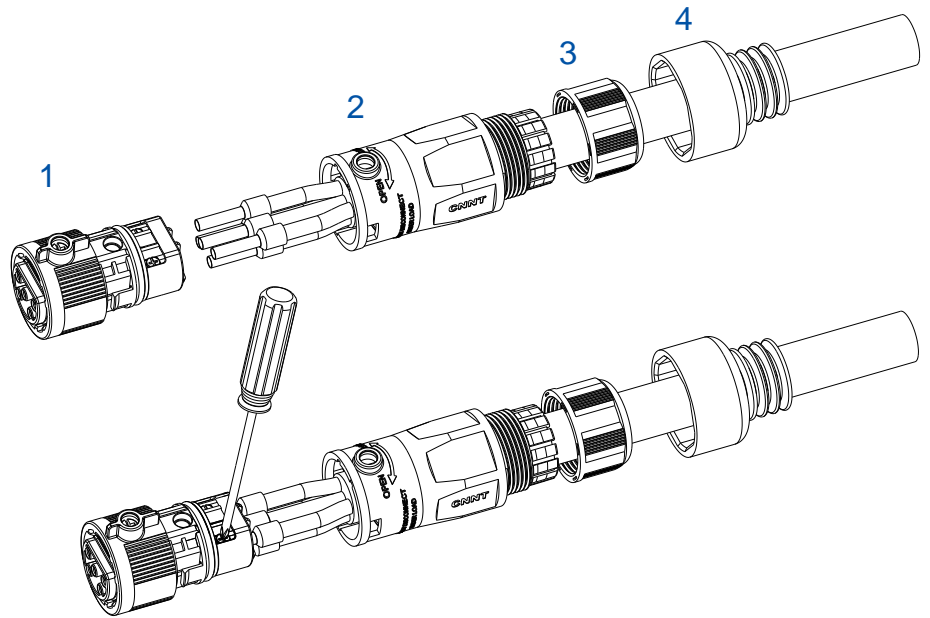


Figure 5.14. Preparing the cable

- a. Remove the dustproof covers from the GRID and BACK UP ports.
  - a. Use a screwdriver to loosen the screw of the dustproof cover.
  - b. Pull the covers upwards.

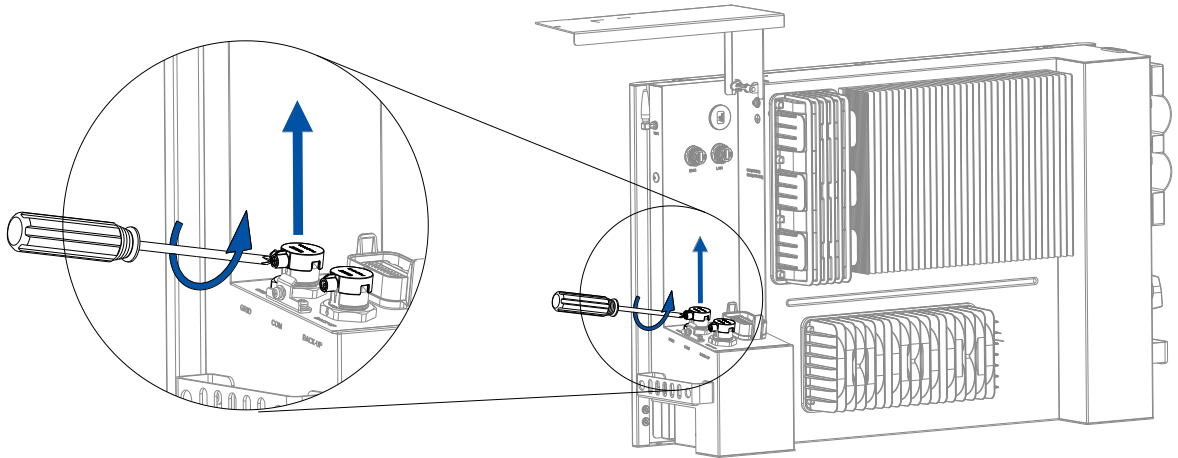


Figure 5.15. Removing the dustproof cover

Step 3. Connect the cables to the GRID and BACKUP ports on the inverter.

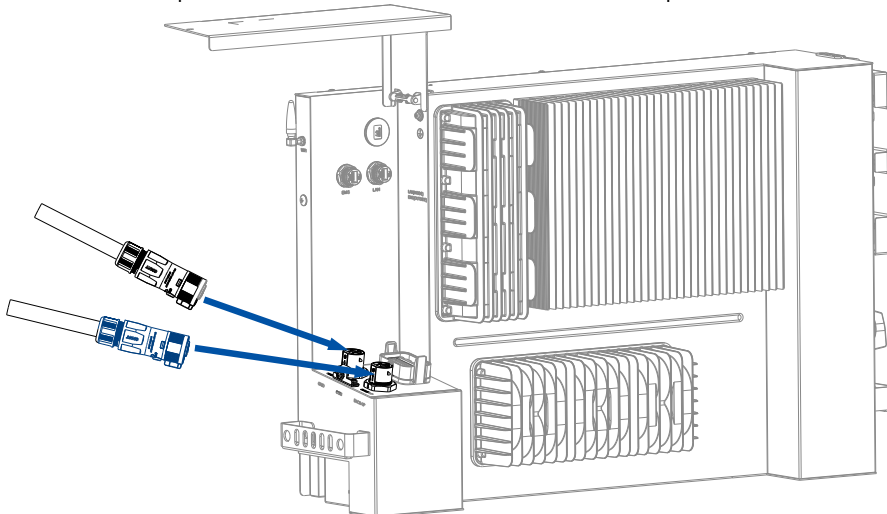


Figure 5.16. Connecting the grid and backup load cables

Step 4. Tighten the screws of the GRID and BACKUP ports on the inverter.

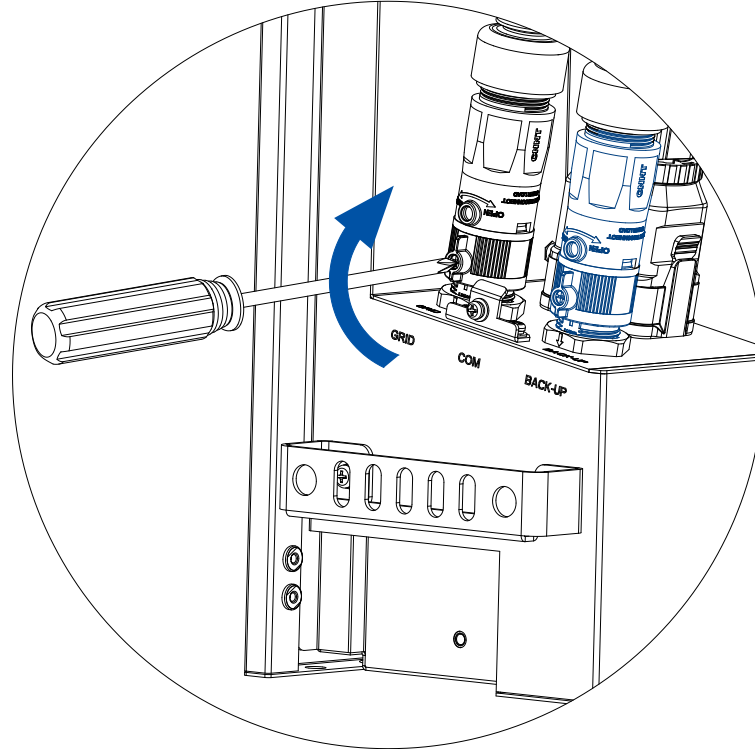


Figure 5.17. Securing the grid and backup load connectors

## 5.2.10. Assemble the communication connection

Step 1. Disassemble the communication cable connector.

- ① Press the tabs on two sides of the connector terminal inwards and pull out the terminal from the connector body.
- ② Rotate the nut anti-clockwise and remove it from the connector body.
- ③ Remove the rubber plugs out of the seals.

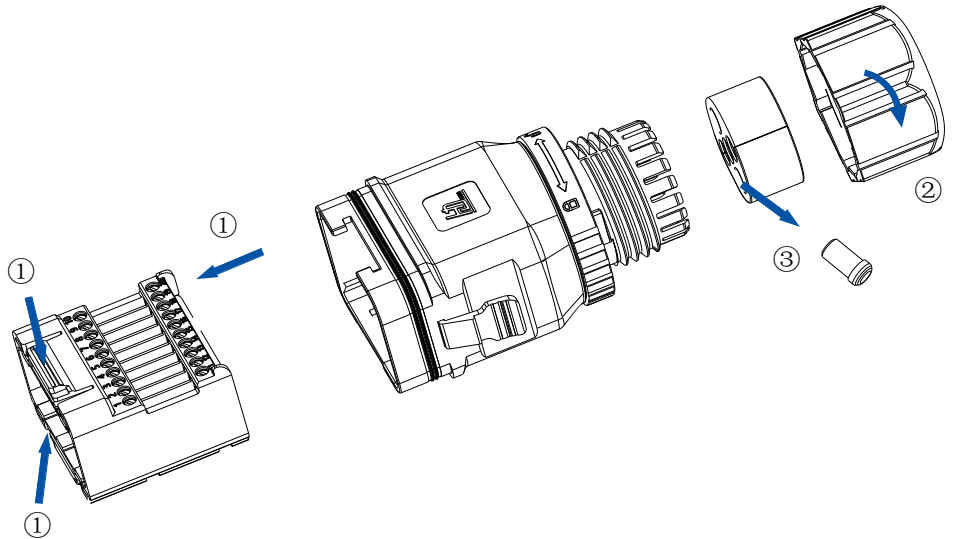


Figure 5.18. Disassembling the 24-pin communication cable connector

Step 2. Prepare cables.

- Meter communication: Use the provided communication cable kit. It contains a communication cable and cable fastener parts. The cable provides an RJ45 port and two assembled terminals.

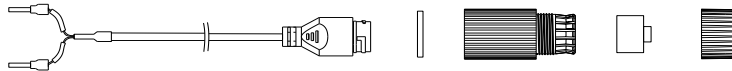


Figure 5.19. Communication cable kit

- Other terminal connection: Per you needs, prepare cables. Strip the insulation around 7.5 mm on cable ends and use provided insulated crimp terminals on the cable ends.

Suggested cable specifications:

- DO: 0.5-0.75 mm<sup>2</sup>
- Others: 0.2-0.5 mm<sup>2</sup>



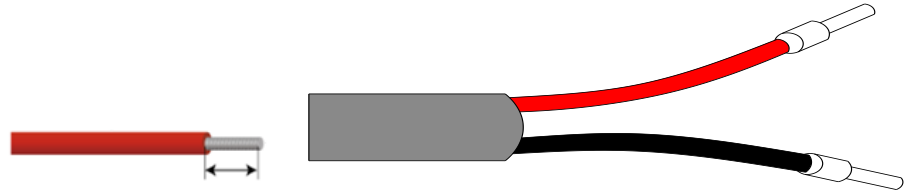


Figure 5.20. Installing the insulated crimp terminals on the cable ends

Step 3. Insert all communication cables through the nut, seals, and connector body.

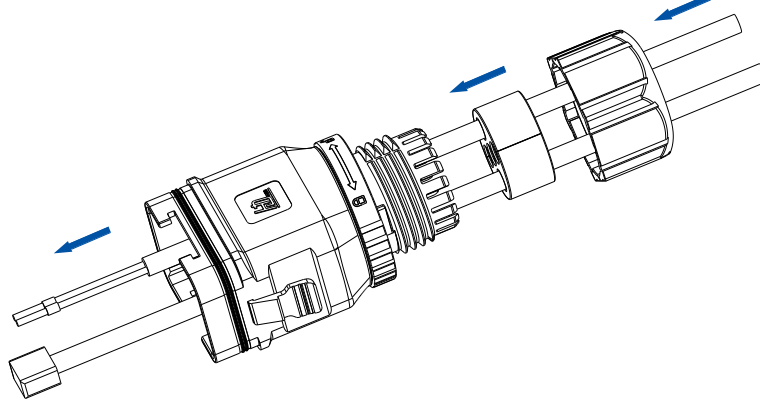


Figure 5.21. Inserting the cables through the connector

Step 4. Locate the ports and terminals on the connection terminal block according to their silkscreens.

Connect all communication cables to the communication cable connector.

Name	Number	Pin definition	Description
PORT (RJ45 port)	/	1: CAN-H (with a 120 $\Omega$ resistor)	For parallelling connection scenario
		2: CAN-L	
		3: GND_W	
		4: SYN	
		5: GND_W	
		6: HOST	
		7: GND_W	
		8: TRF	
DRMs (RJ45 port)	/	1: DRM1/5	For RCR
		2: DRM2/6	For RCR

		3: DRM3/7	For RCR
		4: DRM4/8	For RCR
		5: REF D/0	/
		6: COM D/0	/
		7: NC	/
		8: NC	/
Terminals	4	DO1+	Dry output 1
	5	DO1-	Dry output 1
	6	DO2+	Dry output 2
	7	DO2-	Dry output 2
	11	RS485-A (with a 120 $\Omega$ resistor)	For external RS485 communication
	12	RS485-B	
	13	MET-A (with a 120 $\Omega$ resistor)	For meter communication
	14	MET-B	
	15	DI1+	Dry input 1
	16	DI1-	Dry input 1
	17	DI2+	Dry input 2
	18	DI2-	Dry input 2
	19	CAN_H (with a 120 $\Omega$ resistor)	For external CAN communication
20	CAN_L		

Table 5.1. Ports and terminals on the connection terminal block

Step 5. Connect and secure the cables to the connection terminal block. Then, assemble the communication cable connector.

- a. Connect cables to corresponding terminals and RJ45 ports based on your needs.
- b. Use a screwdriver to secure the cables connected to the terminals.

**Note:** If any terminal that has been equipped with a 120  $\Omega$  resistor, such as METER-A, needs to be connected by a cable with the length longer than 20 meters, switch the resistor to ON status.

- c. Insert the connection terminal block back to the connector body until you hear a click sound.
- d. Insert the seals and nut back to the connector body.
- e. Rotate the nut clockwise until it is secured to the connector body.

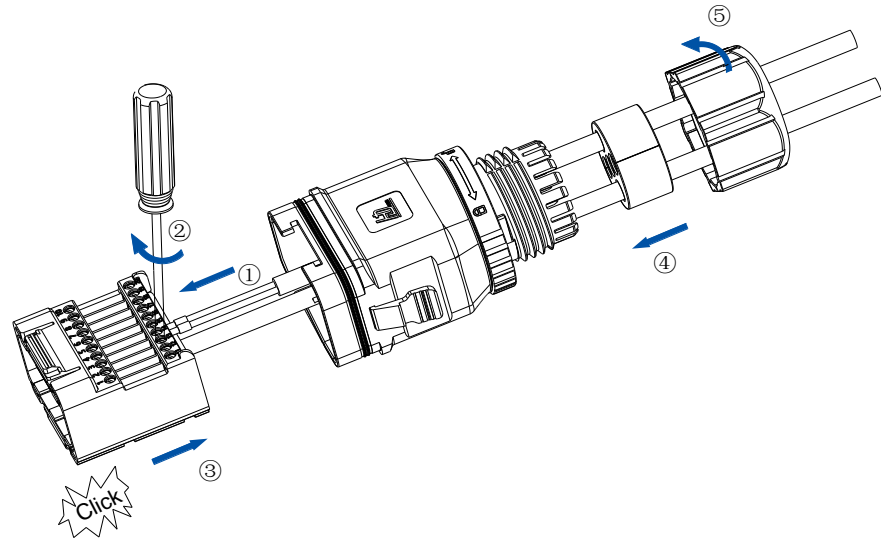


Figure 5.22. Assembling the connector

Step 6. Connect the assembled communication terminal connector to the COMM port on the inverter.

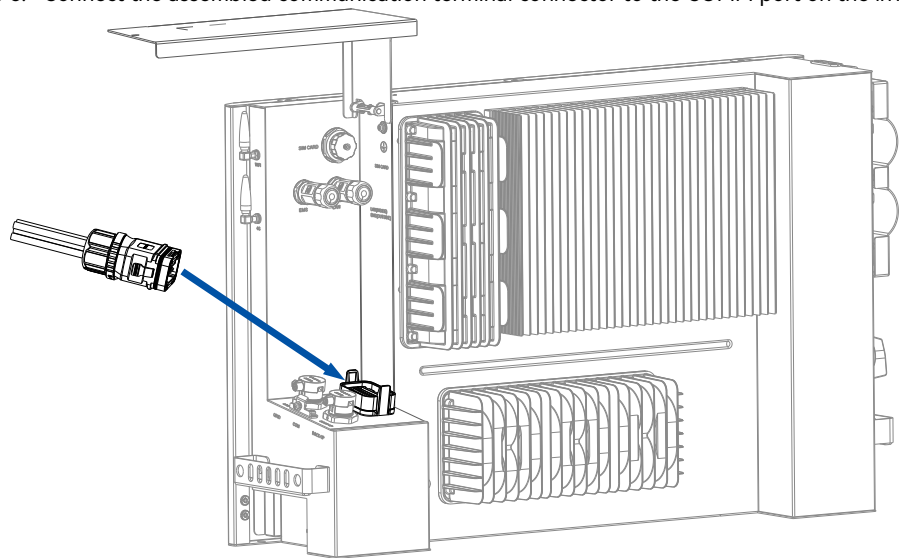


Figure 5.23. Connecting the connector to the inverter

Step 7. Connect the other end of the cables to external devices.

Meter connection:

- a. Take the communication cable (A) and smart meter out of the meter kit. For details, refer to the inverter package in section 4.4.2 "Check the package contents".
- b. Connect the RJ45 connector of the cable to the RJ45 port of the meter communication cable (B).
- c. Connect the two crimped cable ends of the cable to ports 24 and 25 on the meter. For detailed meter connection, refer to section 5.5 "System connection diagram".

24-pin terminal	Meter cable connection	Smart meter
MET_A		Port 24
MET_B		Port 25

Table 5.2. Assembling the meter connection

Callout	Description	RJ45 pin definition
<b>A</b>	Communication cable with an RJ45 connector	<ul style="list-style-type: none"> <li>● Pin 1: A1</li> <li>● Pin 2: B1</li> <li>● Pins 3 to 8: NC</li> </ul>
<b>B</b>	Communication cable kit	<ul style="list-style-type: none"> <li>● Pin 1: For MET-A</li> <li>● Pin 2: For MET-B</li> <li>● Pins 3 to 8: NC</li> </ul>

Table 5.3. Cables and parts used in the meter connection

### 5.2.11. Close the AC-side cover

Push the cover downwards. Use a screwdriver to tighten the screw to lock the cover securely.

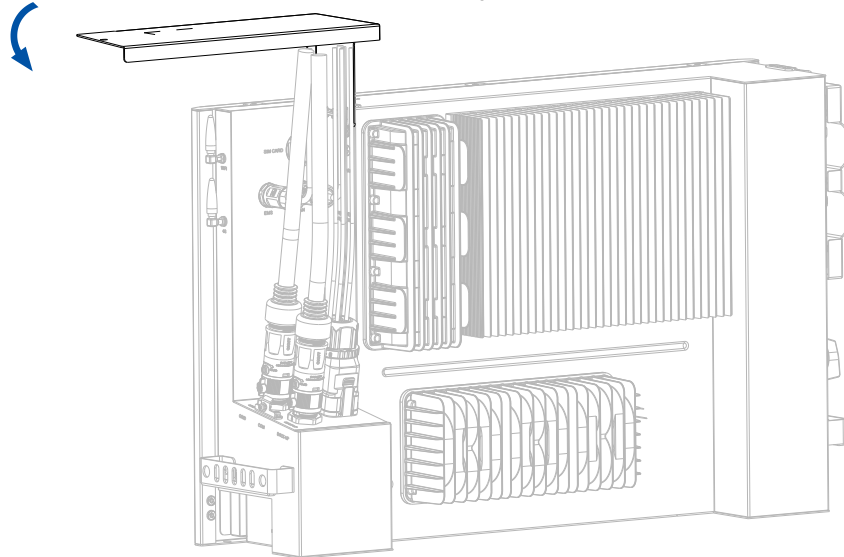


Figure 5.24. Closing the AC-side cover

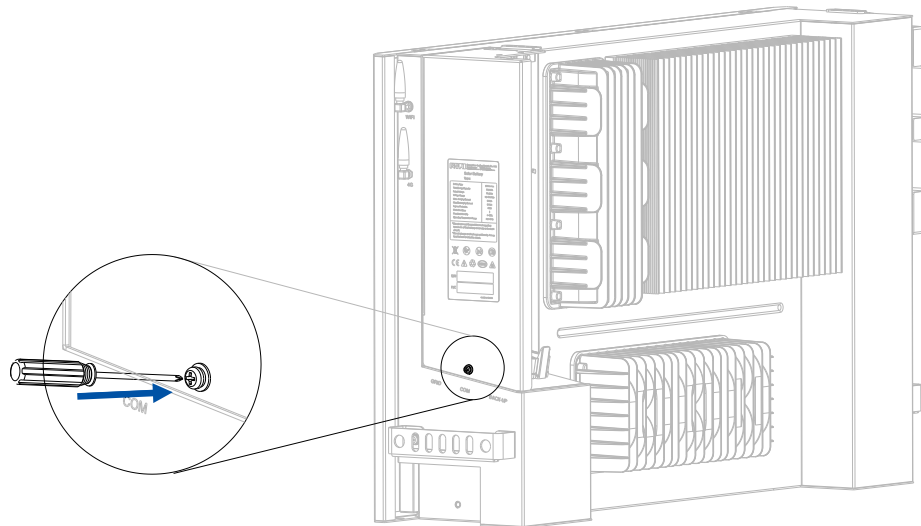


Figure 5.25. Securing the screw

## 5.3. Assemble the DC-side connection

### 5.3.1. Open the DC-side cover

Loosen the screw that locks the cover. Then, lift the cover upwards.

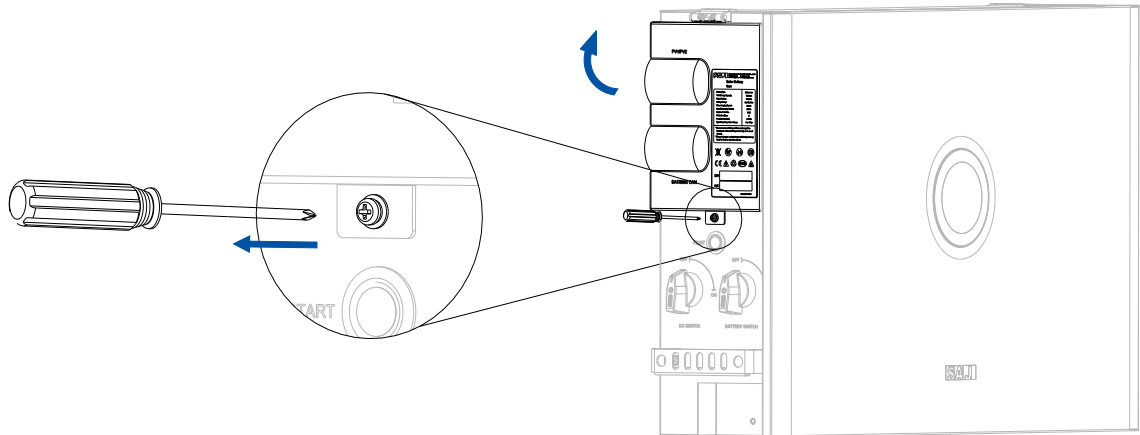


Figure 5.26. Opening the DC-side cover

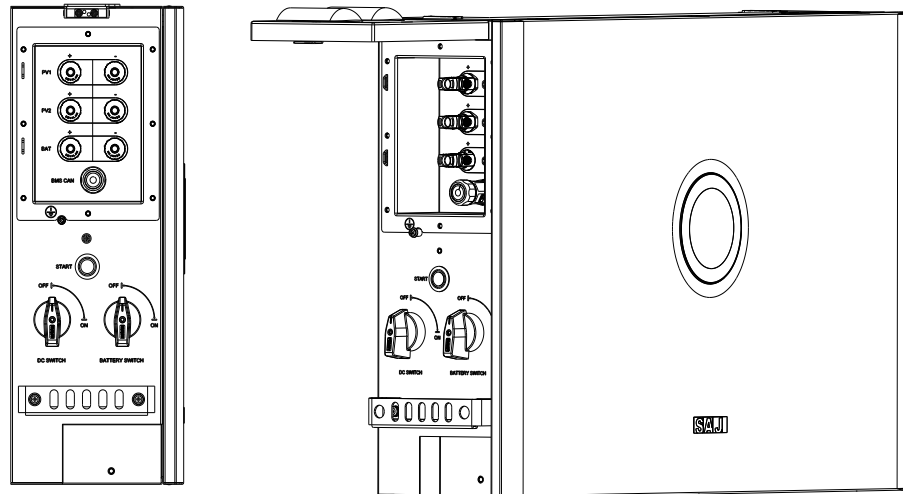




Figure 5.27. DC-side cover opened

### 5.3.2. Connect the PV cables

#### About this task

- Read the safety instructions first before operations.

 <b>DANGER</b>
<ul style="list-style-type: none"> <li>• Dangerous to life due to electric shock when live components or DC cables are touched.</li> <li>• The PV panel string will produce lethal high voltage when exposed to sunlight. Touching live DC cables results in death or lethal injuries.</li> <li>• DO NOT touch non-insulated parts or cables.</li> </ul>

 <b>WARNING</b>
<ul style="list-style-type: none"> <li>• Disconnect the inverter from voltage sources.</li> <li>• DO NOT disconnect DC connectors under load.</li> <li>• Wear suitable personal protective equipment for all work.</li> </ul>

- The inverter cannot be used with functionally earthed PV arrays.
- A positive connector and a negative connector are provided in the accessory bag.

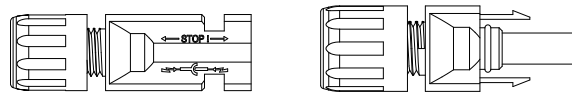


Figure 5.28. Positive and negative PV connectors

#### Before you start

- Make sure that the PV array is properly insulated to ground before it is connected to the inverter. Otherwise, after the PV array is connected, an error code <31> will be reported on the App after system startup and commissioning.
- Select cables according to the below specification.

Conductor cross-sectional area of cables (mm <sup>2</sup> )		Conductor material
Scope	Recommended value	Outdoor copper wire cable, complying with 600 V DC
5.0–6.0	6.0	

Table 5.4. Recommended specifications of DC cable

- Connect one end of the positive cable to the positive side of the solar panels and connect one end of the negative cable to the negative side of the solar panels.
- Make sure that the DC switch on the inverter is in OFF position to avoid short circuit caused by maloperations.

**For Australian version:** To comply with local regulations and for further safety consideration, use a reliable tool (such as a lock with a key) to lock the switch, so that others cannot unlock it easily.

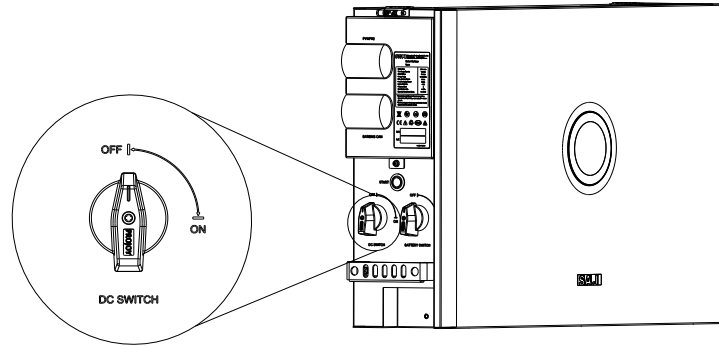


Figure 5.29. DC switch in OFF position

#### Procedure

Step 1. Use a 3-mm wide-bladed screwdriver to strip the insulation layer around 8 to 10 mm length from one end of each cable.

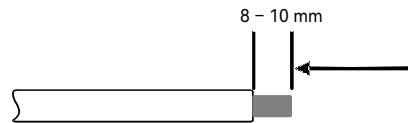


Figure 5.30. Stripping the insulation

Step 2. Insert the cable ends to the sleeves. Use a crimping plier to assembly the cable ends.

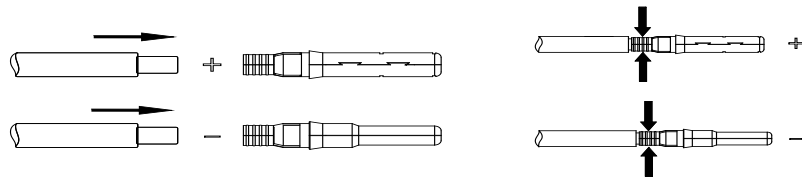


Figure 5.31. Assembling the cable ends



Step 3. Insert the assembled cable ends into the blue positive and negative connectors. Gently pull the cables backwards to ensure firm connection.

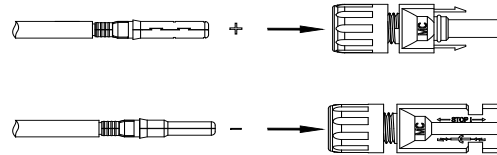


Figure 5.32. Assembling the positive and negative cables

Step 4. Tighten the lock screws on the positive and negative cable connectors.

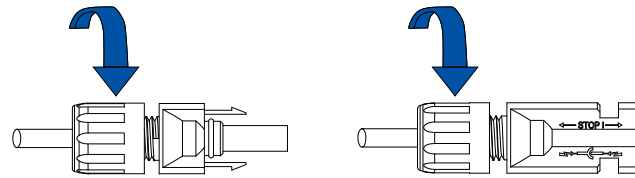
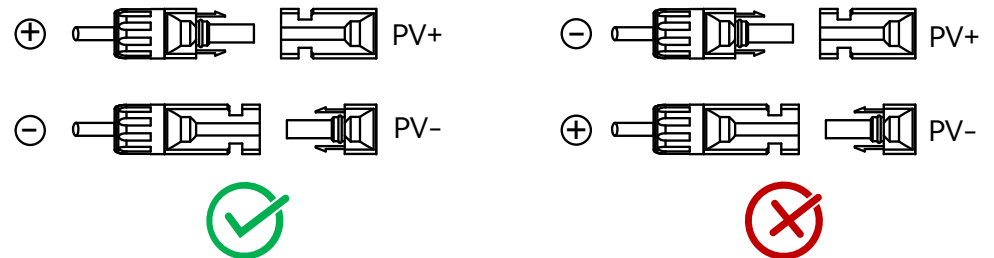


Figure 5.33. Securing the positive and negative cables

Step 5. Insert the positive and negative cable connectors into the positive and negative PV ports on the inverter until you hear a “click” sound to ensure firm connection.



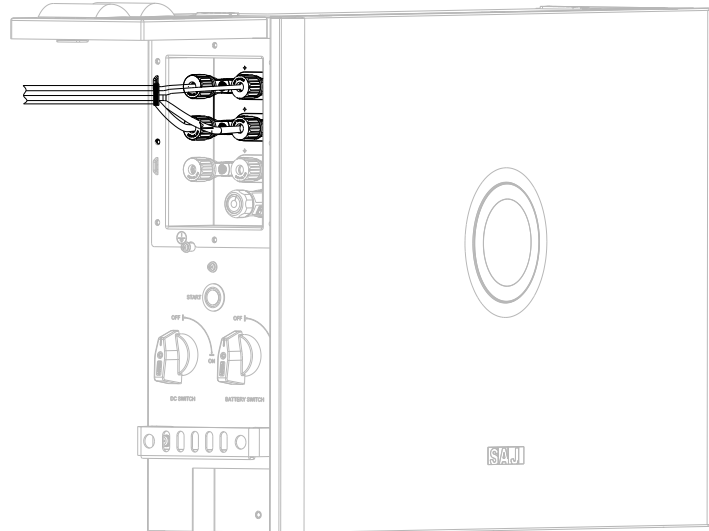


Figure 5.34. Connecting the PV cables

### 5.3.3. (Optional) Connecting the battery cables between multiple stacks

#### About this task

This task is only applicable to the scenario in which four to eight batteries are connected to one inverter. On top of the first stack, an inverter is installed; while in the top of other stacks, a battery junction box has been installed on top of the stack. For details, refer to section 4.5.4 "(Optional) Installation of multiple battery stack".

Pin definitions of the BMS CAN port are as follows:

BMS CAN		
1	NC	
2	NC	
3	NC	
4	CANH	
5	CANL	
6	NC	
7	NC	
8	NC	

### Prerequisite

For the battery stack without an inverter, a battery junction box (BC3-TV) has been installed on top of the stack.

### Procedure

Step 1. Prepare and connect the grounding cable to the battery junction box.

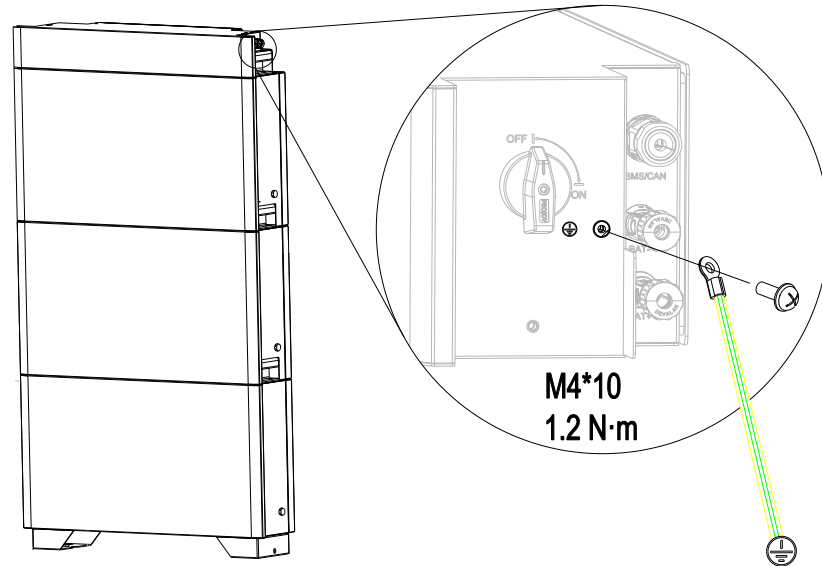


Figure 5.35. Connecting the grounding cable

Step 2. Use the provided positive and negative power cables and the communication cable. Connect the cables from the junction box to the inverter, as listed below:

Cable	From the junction box	To the inverter
Positive and negative power cables	BAT+ and BAT- ports	BAT+ and BAT- ports
Communication cable	BMS/CAN port	BMS CAN port

Table 5.5. Cable connection between multiple stacks

### Notes:

- The BMS/CAN port on the inverter has been installed with an RJ45 connector plug. In this case, remove this plug and insert it into the BMS/CAN port on the battery junction box on the left stack.

- The BAT+ and BAT- ports on the inverter and battery junction box are protected by waterproof covers. To remove the cover, perform as follows:  
The positive connector is used as an example:

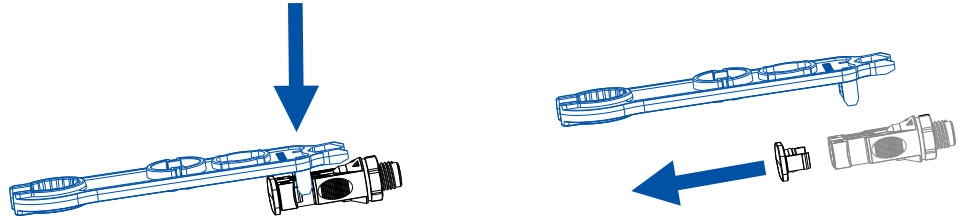


Figure 5.36. Removing the waterproof cover

- The provided cables have been assembled with connectors. In some special cases, if you need to use your own cables, contact SAJ for technical support.  
Taking eight batteries connecting to one inverter as an example:

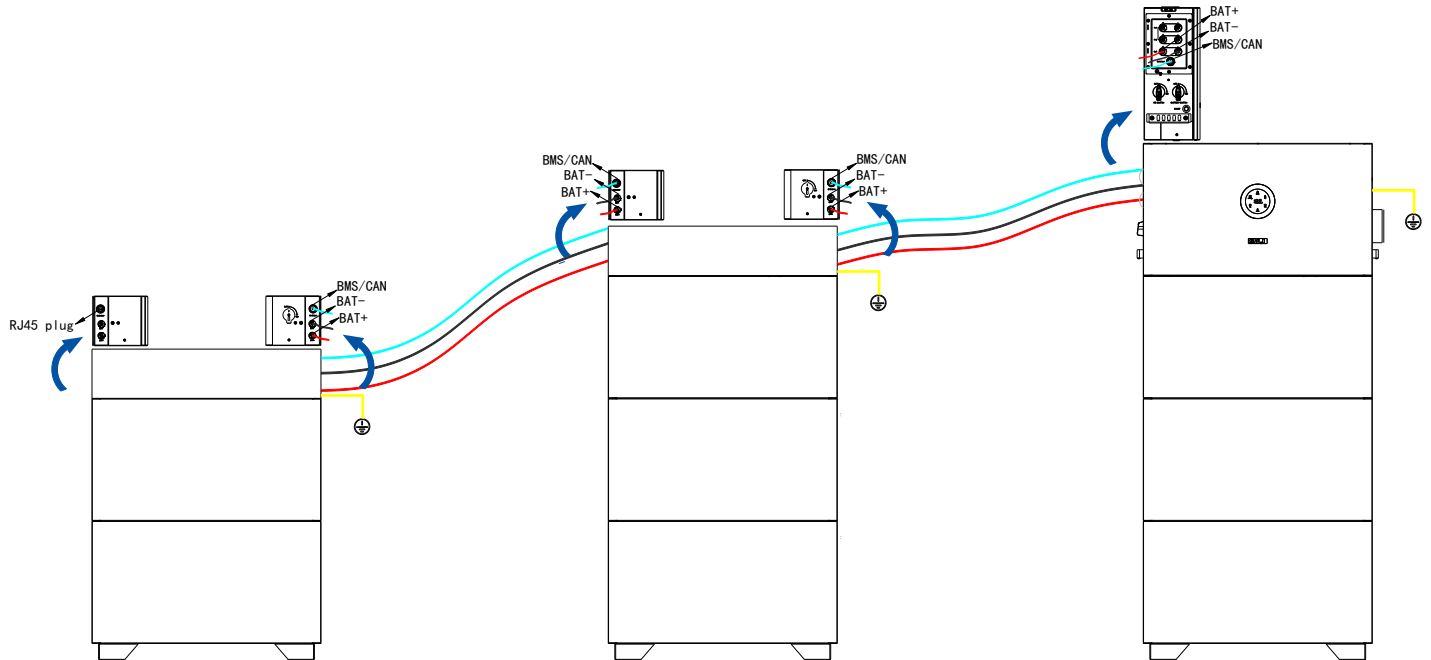


Figure 5.37. Connection of eight batteries in three stacks

### 5.3.4. Close the DC-side cover

Push the cover downwards. Use a screwdriver to tighten the screw to lock the cover securely.

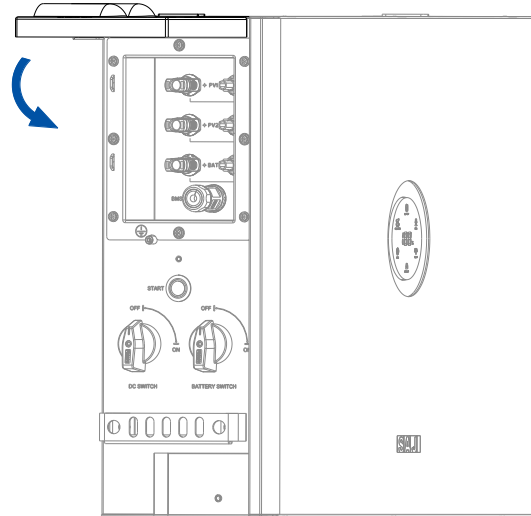


Figure 5.38. Closing the DC-side cover

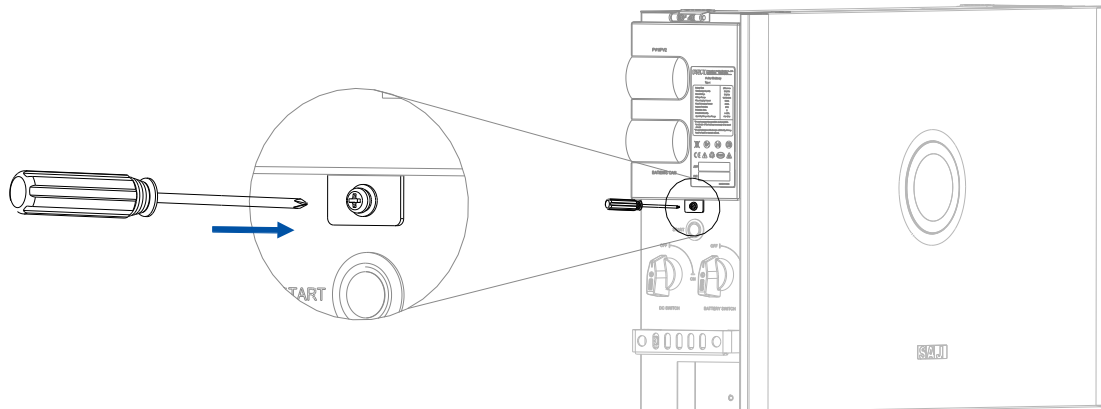


Figure 5.39. Securing the screw

## 5.4. System connection

### 5.4.1. For Europe

The system connection for the grid system without special requirements is as below:

**Note:** The backup PE line and earthing bar must be grounded properly. Otherwise, the backup function may be inactive during blackout.

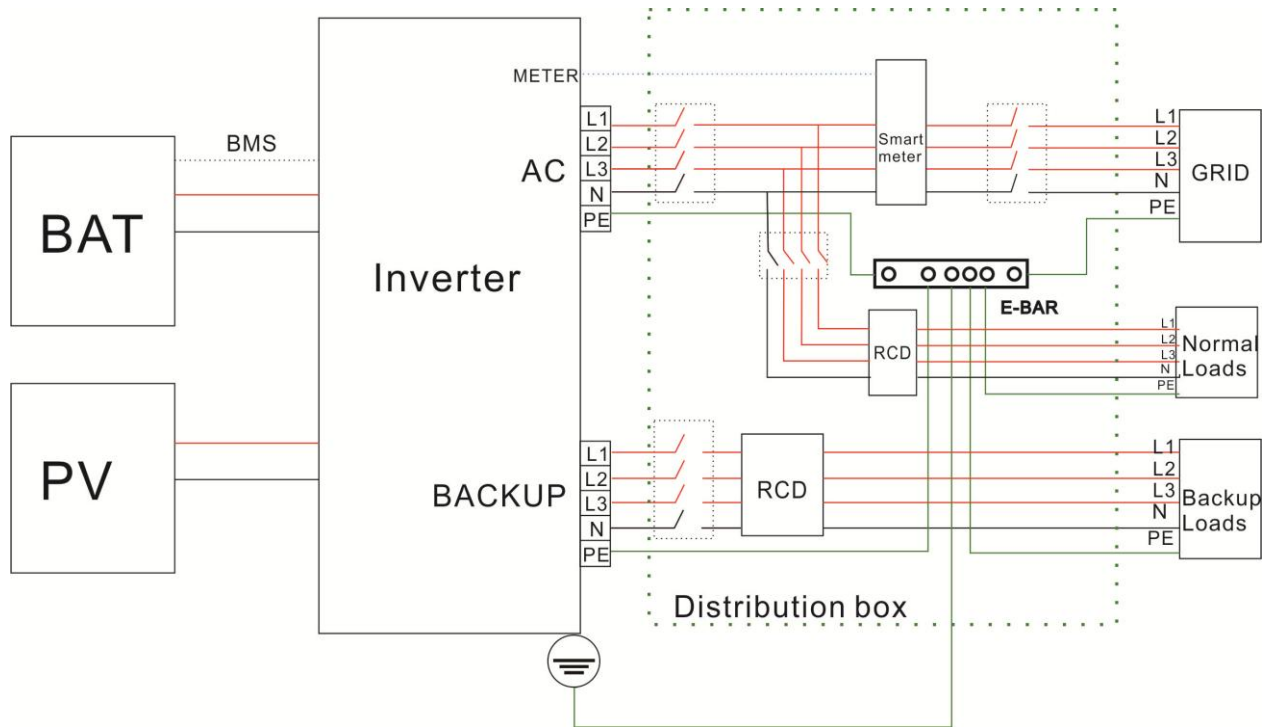


Figure 5.40. System connection in other countries and regions

## 5.4.2. For Australia and New Zealand

### Notes:

- For safety, the neutral cable of AC and backup side must be connected together.
- DO NOT connect the PE terminal of the BACKUP side.
- The E-BAR and the N-BAR must be short-circuited.

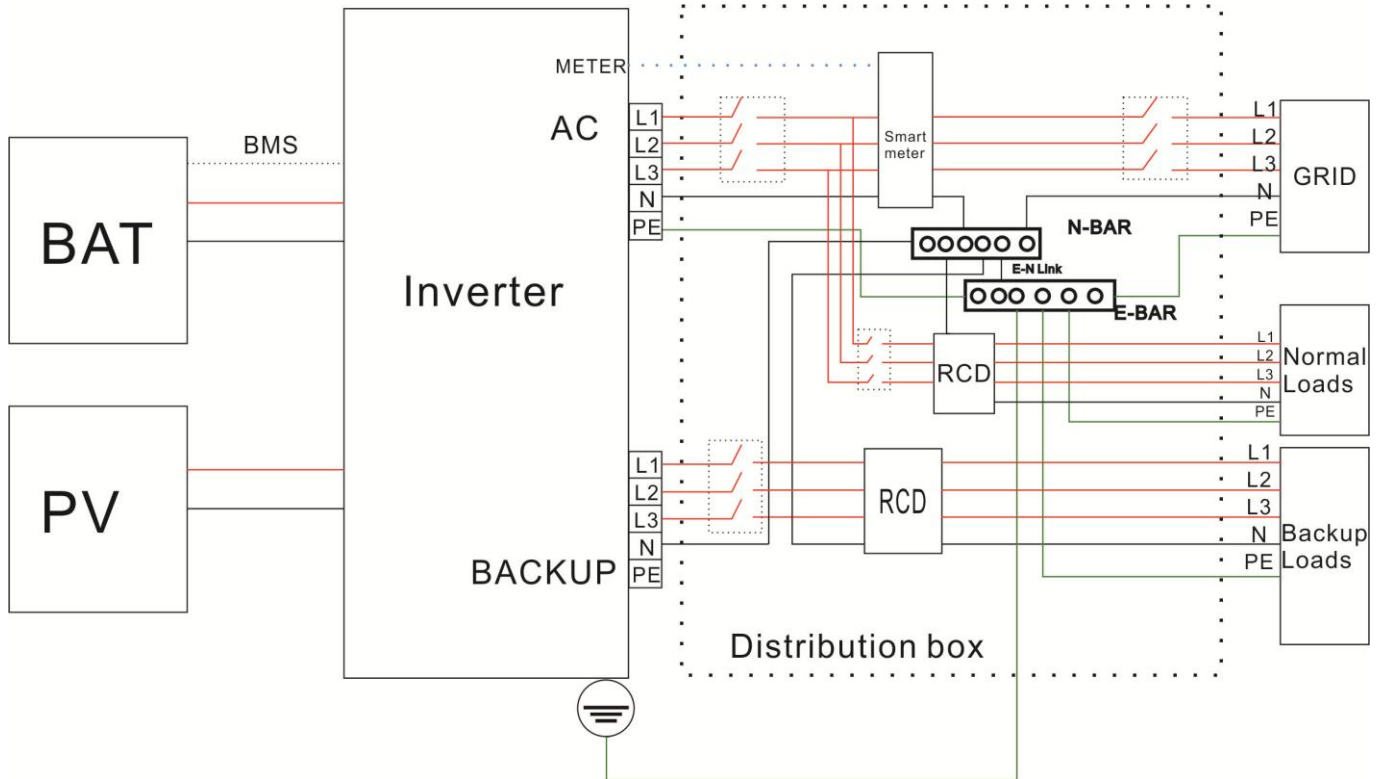


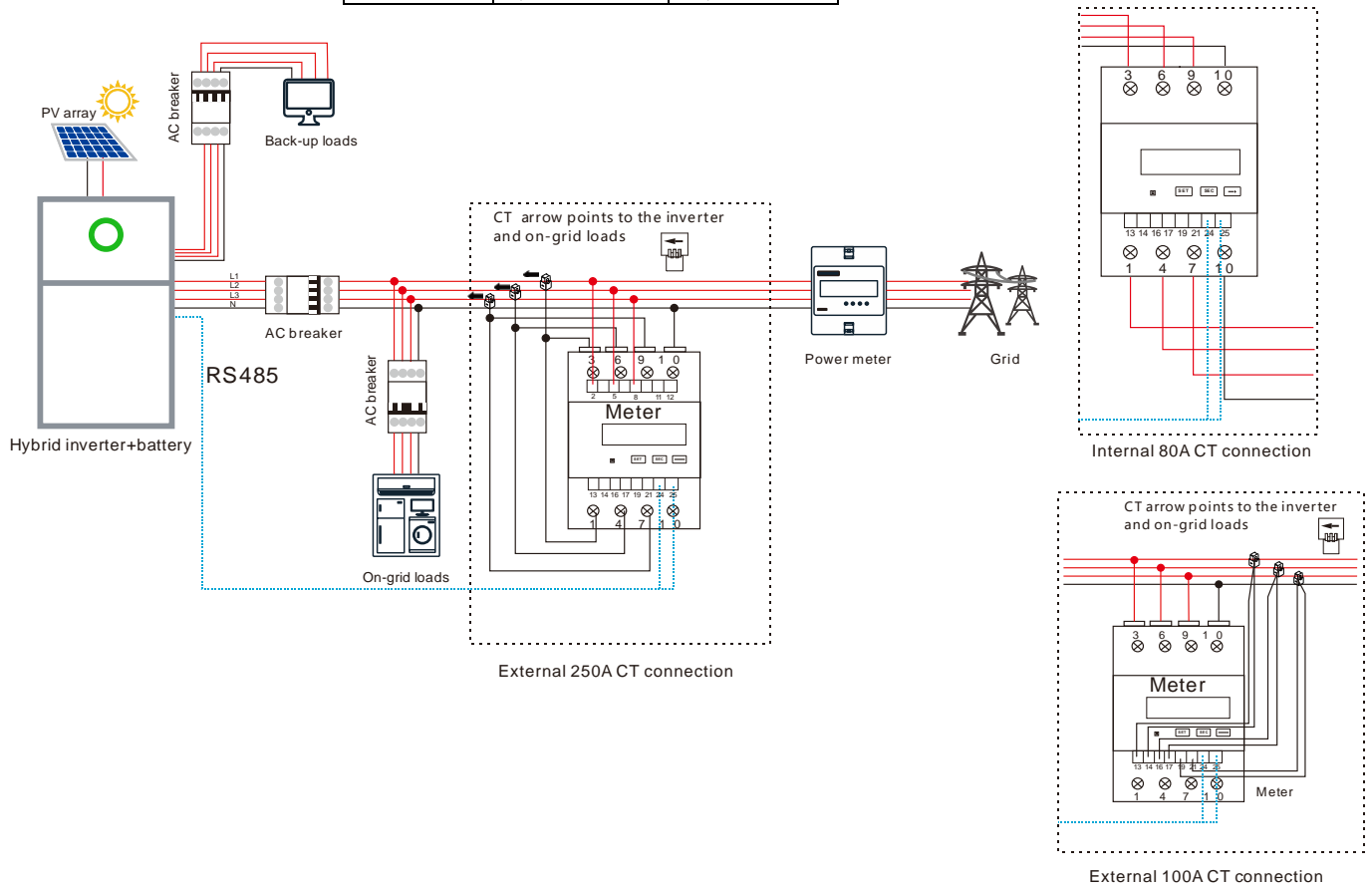
Figure 5.41. System connection in Australia and New Zealand

## 5.5. System connection diagram

If the length of the RS485 cable between the inverter and the meter exceeds 20 meters, connect a 120Ω resistor to ports 24 and 25 on the meter.

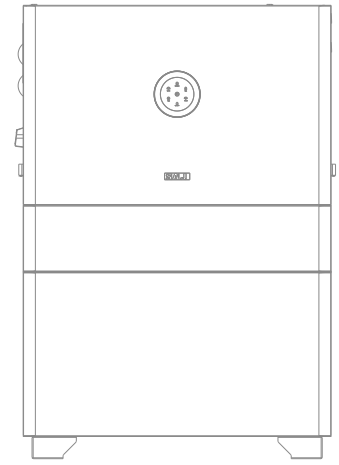
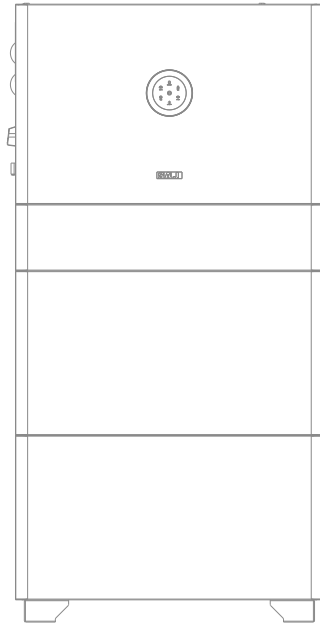
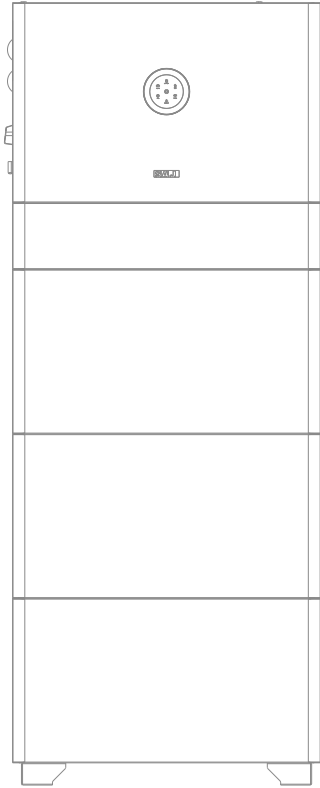
- One HS3

CT wire	250 A meter	100 A meter
CT-A	1, 3	13, 14
CT-B	4, 6	16, 17
CT-C	7, 9	19, 21





- For other scenarios, refer to Chapter 4 “System Connection: Three-phase hybrid inverter” in the *Configuration Instructions*.
  - Multiple HS3 (paralleling scenario)
  - One HS3 working with a solar inverter (AC coupling scenario)
  - Multiple HS3 working with a solar inverter (AC coupling + paralleling scenario)




6.

**STARTUP AND  
SHUTDOWN**

## 6.1. Startup

Step 1. (Optional) If there are multiple battery stacks, turn on the battery switch on the right side of the battery junction box.

Step 2. On the left side of the inverter, perform as follows:

- a. Turn on BATTERY SWITCH.
- b. Turn on DC SWITCH.
- c. Press and hold the START button around three seconds until the LED indicator on the front panel is on .

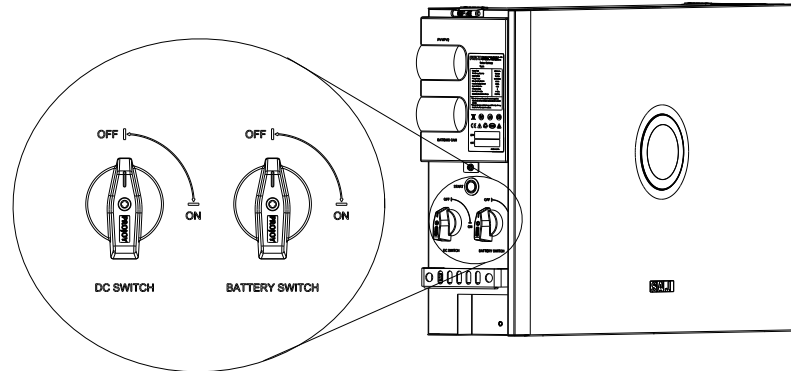


Figure 6.1. Switches on the left side of the inverter

Step 3. Check the LED indicator status on the inverter panel to ensure that the inverter is running properly.


For details, refer to section 2.5 "LED indicators on the HS3 inverter".

## 6.2. Shutdown

On the left side of the inverter, perform as follows:

Step 1. Turn off DC SWITCH.

Step 2. Turn off BATTERY SWITCH.

Step 3. Press and hold the START button around five seconds. Then, release the button and wait until the LED indicator on the front panel is off .

7.

# COMMISSIONING



## 7.1. About the Elekeeper App

The Elekeeper App can be used for both nearby and remote monitoring.

Depending on the communication module used, it supports Bluetooth/4G or Bluetooth/Wi-Fi to communicate with your energy storage system (ESS).

## 7.2. Download the App

On your mobile phone, search for “Elekeeper” in the App store and download the App.

Alternatively, you can scan the below QR code to download the App.



## 7.3. Use the App

To perform commissioning operations on the App, refer to the *SAJ Configuration Instructions*.

**Note:** The detailed operations on the App might vary, depending on the version you are using.

8.

**SYSTEM  
MAINTENANCE**



## 8.1. Routine maintenance

To ensure that the system can operate properly for a long term, routine maintenance is recommended.

To purchase the routine maintenance service, contact the installer, distributor, or SAJ after sales.

Check item	Check method	Maintenance interval
Cleanliness	Check periodically whether the heat sinks are blocked or dirty.	Once every 6 to 12 months
Cleanness of air intake and exhaust vents	Check periodically whether there is dust or foreign objects at the air intake and exhaust vents.	Power off the system and remove dust and foreign objects. If necessary, remove the baffle plates from the air intake and exhaust vents for cleaning.  Once every 6 to 12 months (or once every 3 to 6 months based on the actual dust conditions in the environment)
Fan	Check whether the fan generates abnormal noise during operation.	Remove foreign objects from the fan.  If the abnormal noise persists, replace the fan.  Once every 6 to 12 months
System running status	<ol style="list-style-type: none"> <li>1. Check whether the inverter is damaged or deformed.</li> <li>2. Check whether the inverter generates abnormal sound during operation.</li> <li>3. Check whether all inverter parameters are correctly set during operation.</li> </ol>	Once every 6 months
Electrical connection	<ol style="list-style-type: none"> <li>1. Check whether cables are disconnected or loose.</li> <li>2. Check whether cables are damaged, especially whether the cable sheath that contacts a metal surface is damaged.</li> </ol>	6 months after the first commissioning and once every 6 to 12 months after that



Grounding reliability	Check whether the PE cable is securely connected.	6 months after the first commissioning and once every 6 to 12 months after that
Sealing	Check whether all terminals and ports are properly sealed.	Once a year

## 8.2. Troubleshooting

For any errors reported as below, contact the after-sales for service support. The operations and maintenance must be performed by authorized technicians.

The following table lists the error codes and corresponding messages:

Error code	Error message
1	Master Relay Error
2	Master EEPROM Error
3	Master Temperature High Error
4	Master Temperature Low Error
5	Master Lost Communication M<->S
6	Master GFCI Device Error
7	Master DCI Device Error
8	Master Current Sensor Error
9	Master Phase1 Voltage High
10	Master Phase1 Voltage Low
11	Master Phase2 Voltage High
12	Master Phase2 Voltage Low
13	Master Phase3 Voltage High
14	Master Phase3 Voltage Low
15	Master Voltage 10Min High
16	Master OffGrid Voltage Low
17	Master Output_Shorter
18	Master Grid Frequency High
19	Master Grid Frequency Low
20	BATInputMode Error

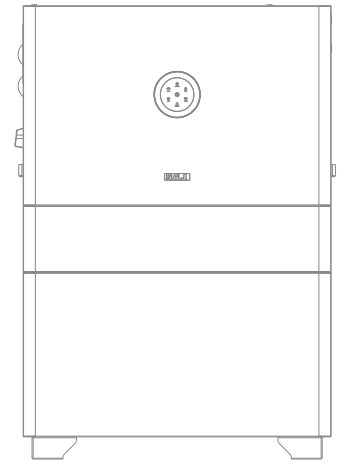
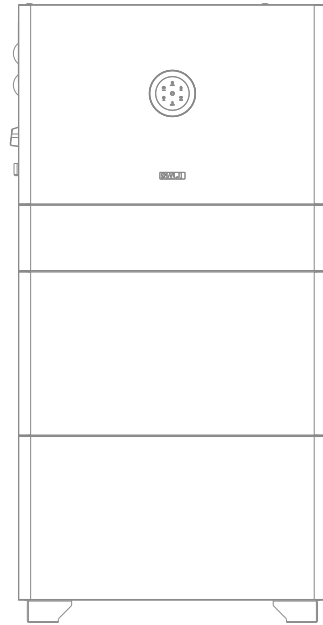
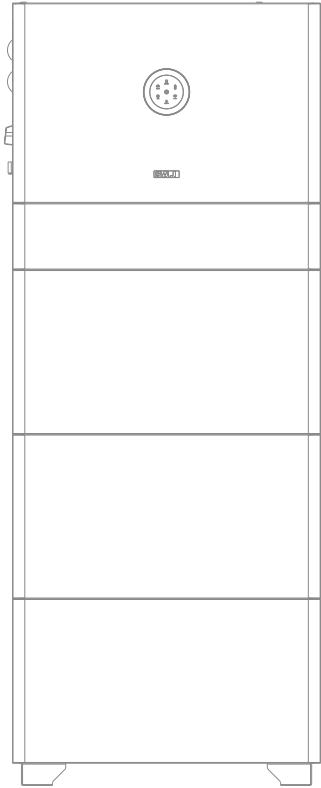
Error code	Error message
21	Master Phase1 DCV Error
22	Master Phase2 DCV Error
23	Master Phase3 DCV Error
24	Master No Grid Error
25	DC ReverseConnect Error
26	Parallel machine CAN Com Error
27	Master GFCI Error
28	Master Phase1 DCI Error
29	Master Phase2 DCI Error
30	Master Phase3 DCI Error
31	Master ISO Error
32	Master Bus Voltage Balance Error
33	Master Bus Voltage High
34	Master Bus Voltage Low
35	Master Grid Phase Error
36	Master PV Voltage High Error
37	Master Islanding Error
38	Master HW Bus Voltage High
39	Master HW PV Current High
40	Master SelfTestFailed
41	Master HW Inv Current High
44	Master Grid NE Voltage Error
45	Master Fan1 Error
46	Master Fan2 Error
47	Master Fan3 Error
48	Master Fan4 Error
49	Lost Communication between DSP and PowerMeter
50	Lost Communication between M<->S
51	Lost Communication between inverter and Grid Meter
52	HMI EEPROM Error
53	HMI RTC Error

Error code	Error message
55	BMS Lost.Conn Warn
57	AFCI Lost Com.Err
59	Lost Communication between inverter and PV Meter
60	EV_Lost.Conn Warn
69	DCDC_Lost.Conn Warn
70	DCDC_ Device Error
78	Grid Power Emergency Disconnect
81	Lost Communication D<->C
83	Master Arc Device Error
84	Master PV Mode Error
85	Authority expires
86	DRM0 Error
87	Master Arc Error
88	Master SW PV Current High
89	Master Battery Voltage High
90	Master Battery Current High
91	Master Battery Charge Voltage High
92	Master Battery OverLoad
93	Master Battery SoftConnet TimeOut
94	Master Output OverLoad
95	Master Battery Open Circuit Error
96	Master Battery Discharge Voltage Low
97	BMS Internal Communication Error
98	Bat Sequence Error
99	Discharge Over Current Protect
100	Charge Over Current Protect
101	Module Under Voltage Protect
102	Module Over Voltage Protect
103	Single Cell Under Voltage Protect
104	Single Cell Over Voltage Protect
105	BMS Hardware Error

Error code	Error message
106	Charge Cell Under Temperature Protect
107	Charge Cell Over Temperature Protect
108	Discharge Cell Under Temperature Protect
109	Discharge Cell Over Temperature Protect
110	Relay Error
111	Pre-charge Error
112	Insulation Error
113	BMS supplier Incompatibility
114	Battery cell supplier Incompatibility
115	Battery cell Incompatibility
116	Battery pack models or grades are inconsistent
117	Circuit Breaker Is Open
118	Temperature Difference Is Too Wide
119	Voltage Difference Is Too Wide
120	Voltage Difference Is Too Wide
121	BMS Over Temperature Protect
122	Short Circuit Protect
123	Total voltage match failed
124	The system is locked
125	FUSE error protection
126	Battery Port Voltage Abnormal Protection
127	Heating Film Overtemperature Protection
128	Abnormal Temperature Increases
225	Battery Software Overvoltage Fault
226	Battery Software Undervoltage Fault
227	Battery Discharge Software Overcurrent Fault
228	Battery Charge Software Overcurrent Fault
229	Battery Discharge Overpower Fault
230	Battery Charge Overpower Fault
233	Battery Hardware Overvoltage Fault
234	Battery Hardware Overcurrent Fault

Error code	Error message
237	Battery Voltage Exceeds BMS Upper Limit Fault
238	Battery Voltage Exceeds BMS Lower Limit Fault
239	Battery Side Precharge Fault
241	Bus Voltage Overvoltage Fault
242	Bus Voltage Undervoltage Fault
243	Bus Discharge Overcurrent Fault
244	Bus Charge Overcurrent Fault
245	Bus Discharge Overpower Fault
246	Bus Charge Overpower Fault
247	Bus Hardware Overvoltage Fault
248	Bus Hardware Overcurrent Fault
250	Auxiliary Power Source Fault
251	Hardware Protection Signal Fault
252	Bus Voltage Differential Fault
253	BMS Protection Signal Fault
254	Software Resonant Chamber Overcurrent Fault
255	Soft Start Abnormal Fault
257	Heatsink High Temperature Fault
258	Heatsink Low Temperature Fault
259	PCB High Temperature Fault
260	PCB Low Temperature Fault
261	Fan Fault
262	Heating Film Fault
274	Inverter CAN communication failure
275	Battery pack internal CAN communication fault
276	Memory fault
278	Button failure fault
289	Relay over temperature
290	Overload
291	AC over voltage
292	AC under voltage

Error code	Error message
293	AC over current
294	AC over frequency
295	AC under frequency
296	DC residual current exception A
297	Emergency Stop
298	Under temperature
299	AC residual current
300	Input terminal over temperature
301	Bluetooth fault
302	DC residual current exception B
303	Relay exception
304	Grounding error
305	Phase twisted
306	RCD circuit exception
307	RS485 Com time out
308	Electricity exception
311	Meter fault
312	cp exception, cp lower than 2V
318	Connector lock exception
319	Connector current exception
320	DC residual current exception C



9.

# PRODUCT SPECIFICATIONS





**NOTICE**

Depending on the countries or regions, the specifications of the products might vary due to local regulations.

## 10.1. European version

### 9.2.2. System

Parameter \ Model	HS3-3K-T2-(W, G)-(B, P)X	HS3-4K-T2-(W, G)-(B, P)X	HS3-5K-T2-(W, G)-(B, P)X	HS3-6K-T2-(W, G)-(B, P)X	HS3-8K-T2-(W, G)-(B, P)X	HS3-10K-T2-(W, G)-(B, P)X, HS3-10K-T2-(W, G)-(B, P)X-BE	HS3-12K-T2-(W, G)-(B, P)X, HS3-12K-T2-(W, G)-(B, P)X-IE
<b>DC Input</b>							
Max. PV Array Power [Wp]@STC	<ul style="list-style-type: none"> <li>• <b>B model:</b> 3000</li> <li>• <b>P model:</b> 6000</li> </ul>	<ul style="list-style-type: none"> <li>• <b>B model:</b> 4000</li> <li>• <b>P model:</b> 8000</li> </ul>	<ul style="list-style-type: none"> <li>• <b>B model:</b> 7500</li> <li>• <b>P model:</b> 10000</li> </ul>	<ul style="list-style-type: none"> <li>• <b>B model:</b> 9000</li> <li>• <b>P model:</b> 12000</li> </ul>	<ul style="list-style-type: none"> <li>• <b>B model:</b> 12000</li> <li>• <b>P model:</b> 12000</li> </ul>	<ul style="list-style-type: none"> <li>• <b>B model:</b> 15000</li> <li>• <b>P model:</b> 15000</li> </ul>	<ul style="list-style-type: none"> <li>• <b>B model:</b> 15000</li> <li>• <b>P model:</b> 15000</li> </ul>
Max. Input Voltage [V]	1000						
Start Voltage / Min. Input Voltage[V]	180						
Rated Input Voltage [V]	600						
MPPT Voltage Range [V]	180-900						
Max. Input Current [A]	<ul style="list-style-type: none"> <li>• <b>B model:</b> 16/16</li> <li>• <b>P model:</b> 20/20</li> </ul>						
Max. Short Circuit Current [A]	<ul style="list-style-type: none"> <li>• <b>B model:</b> 20/20</li> <li>• <b>P model:</b> 25/25</li> </ul>						
MPPT Quantity	2						
Power Factor [cos φ]	0.8 leading to 0.8 lagging						
<b>Battery Port Connection</b>							
Battery Type	LiFePO4						
Battery Voltage Range [V]	380-500						
Max. Charging Current [A]	30						
Max. Discharging Current [A]	9.2	12.4	15.8	18.4	25	30	30
Scalability	Quantity of batteries connecting to one inverter: 1 to 8 <b>Note:</b> A maximum of 3 batteries can be installed in one stack.						
<b>AC Output [On-grid]</b>							

Parameter \ Model	HS3-3K-T2-(W, G)-(B, P)X	HS3-4K-T2-(W, G)-(B, P)X	HS3-5K-T2-(W, G)-(B, P)X	HS3-6K-T2-(W, G)-(B, P)X	HS3-8K-T2-(W, G)-(B, P)X	HS3-10K-T2-(W, G)-(B, P)X, HS3-10K-T2-(W, G)-(B, P)X-BE	HS3-12K-T2-(W, G)-(B, P)X, HS3-12K-T2-(W, G)-(B, P)X-IE
Rated AC Power [W]	3000	4000	5000	6000	8000	10000	<ul style="list-style-type: none"> <li>• 12000</li> <li>• 11000 (IE model)</li> </ul>
Max. Apparent Power [VA]	3300	4400	5500	6600	8800	<ul style="list-style-type: none"> <li>• 11000</li> <li>• 10000 (BE model)</li> </ul>	<ul style="list-style-type: none"> <li>• 12000</li> <li>• 11000 (IE model)</li> </ul>
Rated Output Current [A] @230 V AC	4.4	5.8	7.2	8.7	11.6	14.5	<ul style="list-style-type: none"> <li>• 17.4</li> <li>• 15.9 (IE model)</li> </ul>
Max. Continuous Current [A]	4.8	6.4	8.0	9.6	12.8	<ul style="list-style-type: none"> <li>• 15.9</li> <li>• 14.5 (BE model)</li> </ul>	<ul style="list-style-type: none"> <li>• 17.4</li> <li>• 15.9 (IE model)</li> </ul>
Current Inrush [A]	52						
Max. AC Fault Current [A]	45						
Max. AC Over-Current Protection [A]	12.54	16.72	20.8	25	33.3	41.8	41.8
Connection Manner	3L+N+PE						
Rated AC Voltage and Range [V AC]	220/380, 230/400, 240/415 180-280/312-485						
Rated Output Frequency and Range [Hz]	<ul style="list-style-type: none"> <li>• 50 Hz: 45-55</li> <li>• 60 Hz: 55-65</li> </ul>						
Power Factor [cos $\phi$ ]	0.8 leading to 0.8 lagging						
Total Harmonic Distortion [THDi]	<3%						
<b>AC Input [On-grid]</b>							
Connection Manner	3L+N+PE						
Rated AC Voltage / Range [V AC]	230/400						
Rated Input Frequency [Hz]	50, 60						
Max. Input Current [A]	29.0						
Max. Input Current (Inrush) [A]	52						
Max. Inverter Backfeed Current to the Array [A]	0						
Power Factor [cos $\phi$ ]	0.8 leading to 0.8 lagging						

Parameter \ Model	HS3-3K-T2-(W, G)-(B, P)X	HS3-4K-T2-(W, G)-(B, P)X	HS3-5K-T2-(W, G)-(B, P)X	HS3-6K-T2-(W, G)-(B, P)X	HS3-8K-T2-(W, G)-(B, P)X	HS3-10K-T2-(W, G)-(B, P)X, HS3-10K-T2-(W, G)-(B, P)X-BE	HS3-12K-T2-(W, G)-(B, P)X, HS3-12K-T2-(W, G)-(B, P)X-IE
<b>AC Output [Back-up]</b>							
Max. Apparent Power [VA]	3300	4400	5500	6600	8800	<ul style="list-style-type: none"> <li>• 11000</li> <li>• 10000 (BE model)</li> </ul>	<ul style="list-style-type: none"> <li>• 12000</li> <li>• 11000 (IE model)</li> </ul>
Max. Continuous Current [A]	4.8	6.4	8.0	9.6	12.8	<ul style="list-style-type: none"> <li>• 15.9</li> <li>• 14.5 (BE model)</li> </ul>	<ul style="list-style-type: none"> <li>• 17.4</li> <li>• 15.9 (IE model)</li> </ul>
Peak Output Apparent Power [VA]	6000, 60s	8000, 60s	10000, 60s	12000, 60s	16000, 60s	16500, 60s	16500, 60s
Connection Manner	3L+N+PE						
Rated AC Voltage and Range [V AC]	220, 230, 240 Range: 180-280						
Rated Output Frequency/Range [Hz]	<ul style="list-style-type: none"> <li>• 50 Hz: 45-55</li> <li>• 60 Hz: 55-65</li> </ul>						
Output THDv (@ Linear Load)	<3%						
<b>Efficiency</b>							
Max. Efficiency	98.0%						
Euro Efficiency	97.6%						
<b>Protection</b>							
Battery Input Reverse Polarity Protection	Integrated						
Overload Protection	Integrated						
AC Short Circuit Current Protection	Integrated						
DC Surge Protection	Integrated						
AC Surge Protection	Integrated						
Anti-islanding Protection	Integrated (AFD)						
AFCI Protection	Integrated						
RSD Protection	Optional, compatible with an external protection equipment						
<b>Connection and Communication</b>							
PV Connection	<ul style="list-style-type: none"> <li>• D4</li> </ul> - Connectors: VP-D4B-CHSF4 and VP-D4B-CHSM4						

Parameter \ Model	HS3-3K-T2-(W, G)-(B, P)X	HS3-4K-T2-(W, G)-(B, P)X	HS3-5K-T2-(W, G)-(B, P)X	HS3-6K-T2-(W, G)-(B, P)X	HS3-8K-T2-(W, G)-(B, P)X	HS3-10K-T2-(W, G)-(B, P)X, HS3-10K-T2-(W, G)-(B, P)X-BE	HS3-12K-T2-(W, G)-(B, P)X, HS3-12K-T2-(W, G)-(B, P)X-IE
	<ul style="list-style-type: none"> <li>- Ports on the inverter: VP-D4B-PHSM4 and VP-D4B-PHSF4</li> <li>• MC4 (optional)</li> <li>- Connectors: PV-KST4/6I-UR and PV-KBT4/6I-UR</li> <li>- Ports on the inverter: PV-ADSP4-S2-UR and PV-ADBP4-S2-UR</li> </ul>						
AC Connection	Plug-in connector						
Battery Connection	Quick connector						
Display	LED + App						
Communication	<ul style="list-style-type: none"> <li>• Bluetooth (Bluetooth low energy, BLE)</li> <li>• Wi-Fi and Ethernet (W models using the AIO3 module)</li> <li>• 4G (4G models using the 4G module)</li> </ul>						
Communication Port	<ul style="list-style-type: none"> <li>• LAN</li> <li>• CAN</li> <li>• RS485</li> <li>• Dry contact</li> </ul>						
<b>General Parameters</b>							
Topology	Transformer-less						
Operating Temperature Range	<ul style="list-style-type: none"> <li>• <b>B model:</b> <ul style="list-style-type: none"> <li>- Charging: 0°C to 50°C</li> <li>- Discharging: -10°C to +50°C</li> </ul> </li> <li>• <b>P model:</b> -30°C to +50°C</li> </ul> >45 °C derating						
Storage Temperature Range	-10°C to +40°C						
Cooling Method	Natural convection						
Relative Humidity (non-condensing)	5-95% RH						
Altitude [m]	0-3000						
Noise [dBA]	<35						
Overvoltage Category	II (DC), III (AC)						
Protective Class	I						
Ingress Protection (IP) Rating	IP65						
Dimensions [H*W*D] [mm]	450*695*170						

Parameter \ Model	HS3-3K-T2-(W, G)-(B, P)X	HS3-4K-T2-(W, G)-(B, P)X	HS3-5K-T2-(W, G)-(B, P)X	HS3-6K-T2-(W, G)-(B, P)X	HS3-8K-T2-(W, G)-(B, P)X	HS3-10K-T2-(W, G)-(B, P)X, HS3-10K-T2-(W, G)-(B, P)X-BE	HS3-12K-T2-(W, G)-(B, P)X, HS3-12K-T2-(W, G)-(B, P)X-IE
Weight [kg]	34						
Warranty [Year]	Refer to the warranty policy.						

### 9.2.3. Battery pack

Parameter \ Model	BU3-5.0-(TV1, TV2), BU3-5.0-(TV1, TV2)-BASE	BU3-5.0-(TV1, TV2)-PRO, BU3-5.0-(TV1, TV2)-PRO-BASE
Rated Capacity [Ah]	100	
Rated Energy [kWh]	5.0	
Usable Energy [kWh]	4.5	
Dimension (H*W*D) [mm]	<ul style="list-style-type: none"> <li>With the base: 420*695*170</li> <li>Without the base: 370*695*170</li> </ul>	
Weight [kg]	<ul style="list-style-type: none"> <li>With the base: 53</li> <li>Without the base: 52</li> </ul>	
Nominal Voltage [V]	450	
Operating Voltage [V]	380-500	
Max. Charging Current [A]	7.9	
Max. Discharging Current [A]	7.9	
Battery Designation	IFpP170/695/370/(1P16S) M/-10+50/90	
Ingress Protection	IP65	
Mounting	<ul style="list-style-type: none"> <li>Ground-mounting</li> <li>Wall-mounting</li> </ul>	
Operating Temperature Range	<ul style="list-style-type: none"> <li>Charging: 0°C to 50°C</li> <li>Discharging: -10°C to +50°C</li> </ul>	-30°C to +50°C
Storage Temperature Range	-10°C to +40°C	
Relative Humidity (non-condensing)	5-95%	
Max. Operating Altitude [m]	3000	
Cooling Method	Natural convection	
Communication	CAN	
Warranty [Year]	Refer to the warranty policy.	

### 9.2.4. Battery junction box

Parameter	Model	BC3-TV
Communication Port		CAN
Dimension [mm] (H*W*D)		150*695*170
Weight [kg]		5.3

### 9.2.5. Charger

Parameter	Model	CU2-11K-T-I
<b>Input</b>		
Power supply		3L+N+PE
Rated Voltage [V AC]		230/400, ± 20%
Rated Current [A]		16
Frequency [Hz]		50/60
<b>Output</b>		
Output Voltage [V AC]		400, ± 20%
Max. Current [A]		16
Output Power [kW]		11
Power Consumption (standby) [W]		5
<b>Efficiency</b>		
Euro Efficiency		≥99%
<b>Power Metering</b>		
Precision		2%
<b>User Interface</b>		
Charging Outlet		Type 2
Housing Material		<ul style="list-style-type: none"> <li>● Chassis: SGCC (T=1.2 mm)</li> <li>● Cover: SGCC (T=2 mm)</li> </ul>
Start Mode		Plug and Play (PnP) + App
<b>Communication</b>		

Communication	Wi-Fi 2.4G only
Max. RF Output Power	<20 dBm (-10 dBW)
<b>Safety</b>	
Ingress Protection	IP54
Electrical Protection	<ul style="list-style-type: none"> <li>● Over-current protection</li> <li>● Residual current protection</li> <li>● Surge protection</li> <li>● Over-voltage and under-voltage protection</li> <li>● Over-frequency and under-frequency protection</li> <li>● Over temperature protection</li> </ul>
Certification	<ul style="list-style-type: none"> <li>● EN IEC 61851-1: 2019</li> <li>● IEC 62955: 2018</li> <li>● EN IEC 61851-21-2: 2021</li> <li>● EN 61000-6-1: 2019</li> <li>● EN 61000-6-3: 2021</li> <li>● EN 300 328 V2.2.2:2019</li> <li>● EN 301 489-1 V2.2.3:2019</li> <li>● EN 301 489-3 V2.1.1:2019</li> <li>● EN 301 489-17 V3.2.0:2017</li> </ul>
Warranty	Refer to the warranty policy.
<b>Environment</b>	
Working Temperature	-30°C to +50°C
Storage Temperature	-40°C to +60°C
Relative Humidity (non-condensing)	5-95%
Max. Operating Altitude [m]	2000
Cooling Method	Natural convection
<b>Package</b>	
Product Dimension [mm] (H*W*D)	160*695*170
Weight [kg]	9

## 10.2. Australian version

### 9.2.1. System

Model	HS3-5K-T2-W-PX	HS3-8K-T2-W-PX	HS3-10K-T2-W-PX-BE
<b>Parameter</b>			
<b>DC Input</b>			
Max. PV Array Power [Wp]@STC	10000	12000	15000
Max. Input Voltage [V]	1000		
Start Voltage / Min. Input Voltage[V]	180		
Rated Input Voltage [V]	600		
MPPT Voltage Range [V]	180–900		
Max. Input Current [A]	20/20		
Max. Short Circuit Current [A]	25/25		
MPPT Quantity	2		
Power Factor [cos $\phi$ ]	0.8 leading to 0.8 lagging		
<b>Battery Port Connection</b>			
Battery Type	LiFePO4		
Battery Voltage Range [V]	380–500		
Max. Charging Current [A]	30		
Max. Discharging Current [A]	15.8	25	30
Scalability	Quantity of batteries connecting to one inverter: 1 to 8 <b>Note:</b> A maximum of 3 batteries can be installed in one stack.		
<b>AC Output [On-grid]</b>			
Rated AC Power [W]	5000	8000	10000
Max. Apparent Power [VA]	5500	8800	10000
Rated Output Current [A] @230 V AC	7.2	11.6	14.5
Max. Continuous Current [A]	8.0	12.8	14.5
Current Inrush [A]	52		



Parameter \ Model	HS3-5K-T2-W-PX	HS3-8K-T2-W-PX	HS3-10K-T2-W-PX-BE
Max. AC Fault Current [A]	45		
Max. AC Over-Current Protection [A]	20.8	33.3	41.8
Connection Manner	3L+N+PE		
Rated AC Voltage / Range [V AC]	220/380, 230/400, 240/415 180-280/312-485		
Rated Output Frequency and Range [Hz]	<ul style="list-style-type: none"> <li>• 50 Hz: 45-55</li> <li>• 60 Hz: 55-65</li> </ul>		
Power Factor [cos $\phi$ ]	0.8 leading to 0.8 lagging		
Total Harmonic Distortion [THDi]	<3%		
<b>AC Input [On-grid]</b>			
Connection Manner	3L+N+PE		
Rated AC Voltage / Range [V AC]	230/400		
Rated Input Frequency [Hz]	50, 60		
Max. Input Current [A]	29.0		
Max. Input Current (Inrush) [A]	52		
Max. Inverter Backfeed Current to the Array [A]	0		
<b>Power Factor [cos <math>\phi</math>]</b>	<b>0.8 leading to 0.8 lagging</b>		
<b>AC Output [Back-up]</b>			
Max. Apparent Power [VA]	5500	8800	10000
Max. Continuous Current [A]	8.0	12.8	14.5
Peak Output Apparent Power [VA]	10000, 60s	16000, 60s	16500, 60s
Connection Manner	3L+N+PE		
Rated AC Voltage / Range [V AC]	220, 230, 240 180-280		
Rated Output Frequency/Range [Hz]	<ul style="list-style-type: none"> <li>• 50 Hz: 45-55</li> <li>• 60 Hz: 55-65</li> </ul>		
Output THDv (@ Linear Load)	<3%		

Parameter \ Model	HS3-5K-T2-W-PX	HS3-8K-T2-W-PX	HS3-10K-T2-W-PX-BE
Power Factor [cos $\phi$ ]	0.8 leading to 0.8 lagging		
<b>Efficiency</b>			
Max. Efficiency	98.0%		
Euro Efficiency	97.6%		
<b>Protection</b>			
Battery Input Reverse Polarity Protection	Integrated		
Overload Protection	Integrated		
AC Short Circuit Current Protection	Integrated		
DC Surge Protection	Integrated		
AC Surge Protection	Integrated		
Anti-islanding Protection	Integrated (AFD)		
AFCI Protection	Integrated		
RSD Protection	Optional, compatible with an external protection equipment		
<b>Connection and Communication</b>			
PV Connection	<ul style="list-style-type: none"> <li>• D4 <ul style="list-style-type: none"> <li>- Connectors: VP-D4B-CHSF4 and VP-D4B-CHSM4</li> <li>- Ports on the inverter: VP-D4B-PHSM4 and VP-D4B-PHSF4</li> </ul> </li> <li>• MC4 (optional) <ul style="list-style-type: none"> <li>- Connectors: PV-KST4/6I-UR and PV-KBT4/6I-UR</li> <li>- Ports on the inverter: PV-ADSP4-S2-UR and PV-ADBP4-S2-UR</li> </ul> </li> </ul>		
AC Connection	Plug-in connector		
Battery Connection	Quick connector		
Display	LED + App		
Communication	<ul style="list-style-type: none"> <li>• Bluetooth (Bluetooth low energy, BLE)</li> <li>• Wi-Fi and Ethernet (W models using the AIO3 module)</li> <li>• 4G (4G models using the 4G module)</li> </ul>		
Communication Port	<ul style="list-style-type: none"> <li>• LAN</li> </ul>		

Parameter \ Model	HS3-5K-T2-W-PX	HS3-8K-T2-W-PX	HS3-10K-T2-W-PX-BE
	<ul style="list-style-type: none"> <li>CAN</li> <li>RS485</li> <li>Dry contact</li> </ul>		
<b>General Parameters</b>			
Topology	Transformer-less		
Operating Temperature Range	-30°C to +50°C >45 °C derating		
Storage Temperature Range	-10°C to +40°C		
Cooling Method	Natural convection		
Ambient Humidity	5-95% non-condensing		
Max. Operating Altitude [m]	3000		
Noise [dBA]	<35		
Overvoltage	II (DC), III (AC)		
Protective Class	I		
Ingress Protection	IP65		
Dimensions [H*W*D] [mm]	450*695*170		
Weight [kg]	34		
Warranty [Year]	Refer to the warranty policy.		

## 9.2.2. Battery Pack

Parameter \ Model	BU3-5.0-(TV1, TV2)-PRO BU3-5.0-(TV1, TV2)-PRO-BASE
Rated Capacity [Ah]	100
Rated Energy [kWh]	5.0
Usable Energy [kWh]	4.5
Dimension (H*W*D) [mm]	<ul style="list-style-type: none"> <li>With the base: 420*695*170</li> <li>Without the base: 370*695*170</li> </ul>
Weight [kg]	<ul style="list-style-type: none"> <li>With the base: 53</li> </ul>

	<ul style="list-style-type: none"> <li>Without the base: 52</li> </ul>
Nominal Voltage [V]	450
Operating Voltage [V]	380–500
Max. Charging Current [A]	7.9
Max. Discharging Current [A]	7.9
Battery Designation	IFpP170/695/370/(1P16S) M/-10+50/90
Ingress Protection	IP65
Mounting	<ul style="list-style-type: none"> <li>Ground-mounting</li> <li>Wall-mounting</li> </ul>
Operating Temperature Range	-30°C to +50°C
Storage Temperature Range	-10°C to +40°C
Relative Humidity (non-condensing)	5–95%
Max. Operating Altitude [m]	3000
Cooling Method	Natural convection
Communication	CAN
Warranty [Year]	Refer to the warranty policy.

### 9.2.3. Battery junction box

Refer to section 9.2.4 "Battery junction box".

### 9.2.4. EV charger

Refer to section 9.2.5 "Charger".

# 10.

## APPENDIX



## 10.1. Recycling and disposal

This device should not be disposed as a residential waste.

An inverter that has reached the end of its operation life is not required to be returned to your dealer; instead, it must be disposed by an approved collection and recycling facility in your area.

## 10.2. Warranty

Check the product warranty conditions and terms on the SAJ website: <https://www.saj-electric.com/>

## 10.3. Contacting support

### Guangzhou Sanjing Electric Co., Ltd.

Address: SAJ Innovation Park, No.9, Lizhishan Road, Guangzhou Science City, Guangdong, P.R.China.

Postcode: 510663

Website: <https://www.saj-electric.com/>

### Technical Support & Service

Tel: +86 20 6660 8588

Fax: +86 206660 8589

E-mail: [service@saj-electric.com](mailto:service@saj-electric.com)

### International Sales

Tel: 86-20-66608618/66608619/66608588/66600086

Fax: 020-66608589

E-mail: [info@saj-electric.com](mailto:info@saj-electric.com)

### China Sales

Tel: 020-66600058/66608588

Fax: 020-66608589

## 10.4. Trademark

SAJ is the trademark of Sanjing.



**GUANGZHOU SANJING ELECTRIC CO.,LTD**



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