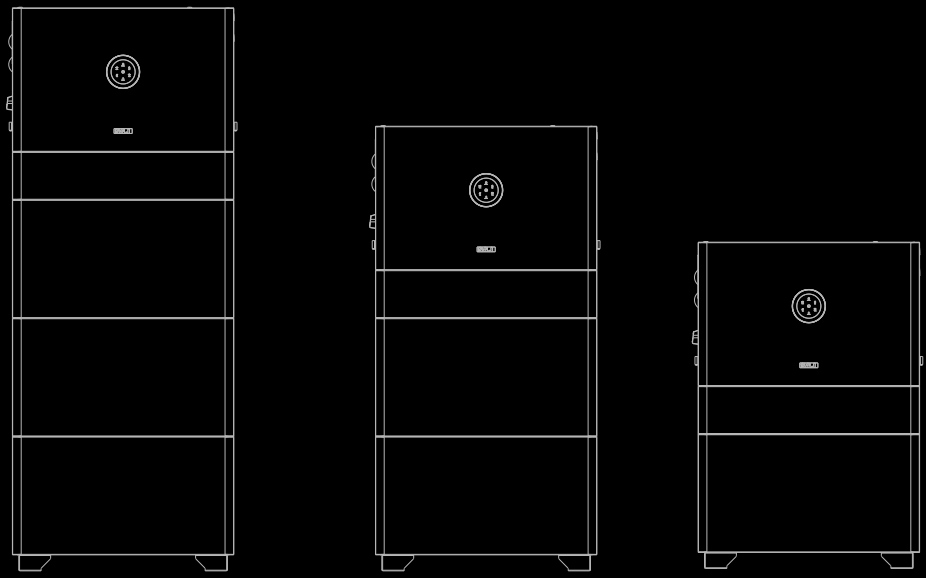


AS3 Series

SINGLE-PHASE ALL-IN-ONE ENERGY STORAGE SYSTEM USER MANUAL

Preface

Thank you for choosing SAJ products. We are pleased to provide you first-class products and exceptional service.

This manual provides information about installation, operation, maintenance, troubleshooting and safety. Please follow the instructions of this manual so that we can ensure delivery of our professional guidance and whole-hearted service.

Customer-orientation is our forever commitment. We hope this document proves to be of great assistance in your journey for a cleaner and greener world.

We make constant improvements on the products and their documentation. This manual is subject to change without notice; these changes will be incorporated in new editions of the publication. To access the latest documentation, visit the SAJ website at https://www.saj-electric.com/.

Guangzhou Sanjing Electric Co., Ltd.

TABLE OF CONTENTS

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 products listed in section 2.2 "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

DANGER
Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING
Indicates a hazardous situation which, if not avoided, can result in death or serious injury or moderate injury.

CAUTION
Indicates a hazardous situation which, if not avoided, can result in minor or moderate injury.

NOTICE
Indicates a situation that can result in potential damage, if not avoided.

1.2.2. Symbol explanation

Symbol	Description
	**DANGER:** 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.
	**WARNING:** No open flames Do not place or install near flammable or explosive materials.
	**DANGER:** Hot surface The components inside the battery will release a lot of heat during operation. Do not touch metal plate housing during operating.
	**ATTENTION:** Install the product out of reach of children.
	**ATTENTION:** Check the user manual before service. If an error has occurred, refer to the troubleshooting section to remedy the error.
	**ATTENTION:** This device shall NOT be disposed of in residential waste.
	**ATTENTION:** This battery module shall NOT be disposed of in residential waste.
	**CAUTION:** Risk of electric shock from energy stored in capacitor. Do not remove cover until 5 minutes after disconnecting all sources of supply.
	**CE Mark** Equipment with the CE mark fulfills the requirements of the Low Voltage Directive and Electro Magnetic Compatibility.
	**RoHS compliant mark** 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.

	**RCM compliant mark** Equipment with the RCM mark is in compliance with AS/NZS 4417.1 & 2 and the EESS.
	**Recyclable**

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.

DANGER

- Risk of fatal personnel injuries due to electrical shock and high voltage.
- Do not touch the surface of the equipment while the housing is wet, otherwise, it might cause electrical shock.
- Do not touch the operating component of the device; it might result in burning or death.
- To prevent risk of electric shock during installation and maintenance, please make sure that all AC and battery DC terminals are plugged out.
- Do not stay close to the equipment while there are severe weather conditions including storm, lighting, etc.
- Before opening the housing, the SAJ inverter must be disconnected from the grid; you must wait for at least five minutes to let the energy storage capacitors completely discharged after disconnecting from power source.
- Make sure that the system is powered off prior to any operations.
- Do not use the battery or the battery control unit if it is defective, broken or damaged.
- Do not subject the battery to any strong force.
- Do not place the battery near a heat source, such as direct sunlight or a fireplace.
- Do not expose the battery to temperatures in excess of 50℃.
- Keep inflammable and explosive dangerous items or flames away from the battery.
- Do not soak the battery in water or expose it to moisture or liquids.
- Do not use the battery in vehicles.
- Do not use the battery in areas where the ammonia content of the air exceeds 20 ppm.

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 AC circuit breaker, or keep it disconnect if it is tripped, and secure it against reconnection.
- Be sure that the inverter is 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.
- 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, battery damage can still occur. If a small amount of battery electrolyte is released because of severe outer casing damage, or if the battery explodes after a nearby fire and releases toxic gases such as carbon monoxide and carbon dioxide due to delayed treatment, 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 (CO2) 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

Abbreviations forms will be used throughout the documentation.

Product series	Abbreviation
AS3-(3K-6K)-S-(W, G)-P	AS3 inverter
AS3-(3K-6K)-S-(W, G)-P-BE/IE	
BU3-5.0-(TV1, TV2)-PRO-BASE	BU3 base battery
BU3-5.0-(TV1, TV2)-PRO	BU3 battery
BC3-TV	BC3 battery junction box

SAJ AS3 is a single-phase inverter which is applied to the residential energy storage system which stores the electricity for household future use.

BU3 battery is built internally with a battery management system (BMS), which is used to ensure efficiency of the BU3 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.

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.

2.2. Product models

2.2.1. System

Model type / **Communication mode**	**Professional model** ***X*:** Quantity of the battery modules, ranging from 1 to 8.
With a built-in AIO3 module	● AS3-3K-S-W-PX ● AS3-3.6K-S-W-PX ● AS3-4K-S-W-PX ● AS3-4.6K-S-W-PX ● AS3-5K-S-W-PX ● AS3-5K-S-W-PX-BE* ● AS3-6K-S-W-PX ● AS3-6K-S-W-PX-IE*
With a built-in 4G module	● AS3-3K-S-G-PX ● AS3-3.6K-S-G-PX

	● AS3-4K-S-G-PX ● AS3-4.6K-S-G-PX ● AS3-5K-S-G-PX ● AS3-5K-S-G-PX-BE* ● AS3-6K-S-G-PX ● AS3-6K-S-G-PX-IE*

2.2.2. Inverter

Model type / Communication mode	Professional model
With a built-in AIO3 module	● AS3-3K-S-W-P ● AS3-3.6K-S-W-P ● AS3-4K-S-W-P ● AS3-4.6K-S-W-P ● AS3-5K-S-W-P ● AS3-5K-S-W-P-BE* ● AS3-6K-S-W-P ● AS3-6K-S-W-P-IE*
With a built-in 4G module	● AS3-3K-S-G-P ● AS3-3.6K-S-G-P ● AS3-4K-S-G-P ● AS3-4.6K-S-G-P ● AS3-5K-S-G-P ● AS3-5K-S-G-P-BE* ● AS3-6K-S-G-P ● AS3-6K-S-G-P-IE*

2.2.3. Battery pack

Equipment	Professional model
Battery	● BU3-5.0-TV1-PRO ● BU3-5.0-TV2-PRO
Battery with a base	● BU3-5.0-TV1-PRO-BASE ● BU3-5.0-TV2-PRO-BASE

2.2.4. Battery junction box

BC3-TV

2.2.5. Charger

CU2-7.4K-S-I

2.2.6. Wall-mounting bracket

BT3-TV

2.3. Model description

- **System model**

AS3 - *x*K - S - *a* - *P* *X* - *b*

- **Inverter model**

AS3 - *x*K - S - *a* - *P* - *b*

AS3: Product model series.

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

S: Single phase.

***a*:** Communication module type in this model.

- **W**: With a built-in AIO3 module.
- **G**: With a built-in 4G module.

***P*:** Professional model.

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

***b*:** This model is applicable to this country or region. **BE** and **IE** indicate Belgium and Ireland respectively.

- **Battery model**

BU3 - 5.0 - TVx - PRO - BASE

BU3-5.0: Battery model series.

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

PRO: Professional model.

BASE: With a base. If a battery model name does not contain **BASE**, it is a battery pack without a base.

2.4. Dimension

2.3.1. AS3 inverter

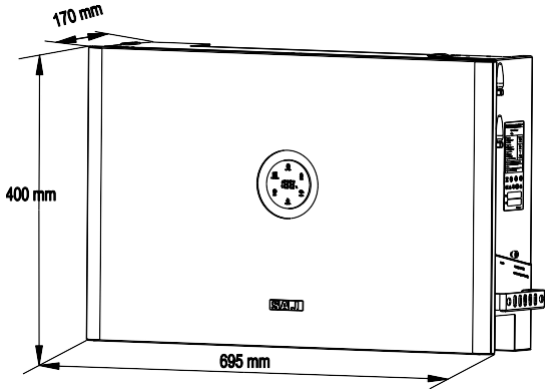


Figure 2.1. AS3 inverter dimension

2.3.2. BU3 battery pack

- **Battery pack with a base**

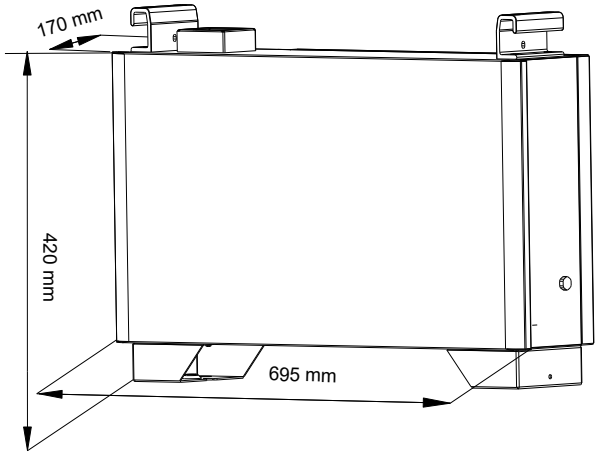


Figure 2.2. Dimension of the battery pack with a base

- **Battery pack without a base**

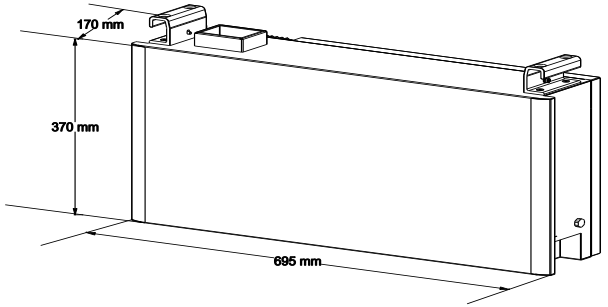


Figure 2.3. Dimension of the battery pack without a base

2.3.3. BC3 battery junction box

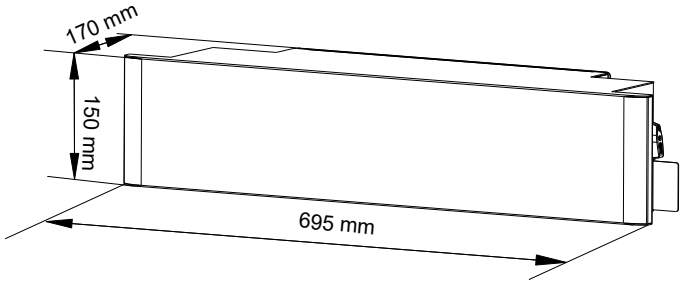


Figure 2.4. Dimension of the BC3 battery junction box

2.3.2. CU2 Charger

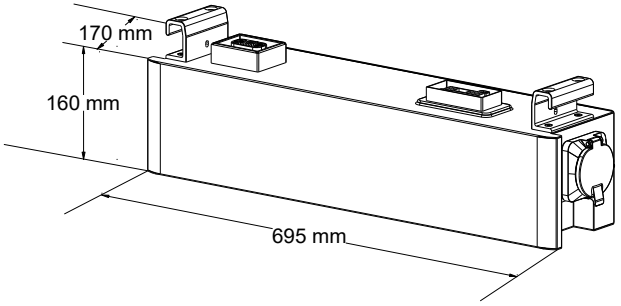


Figure 2.5. Dimension of the CU2 charger

2.4. Ports, switches, and LED on the AS3 inverter

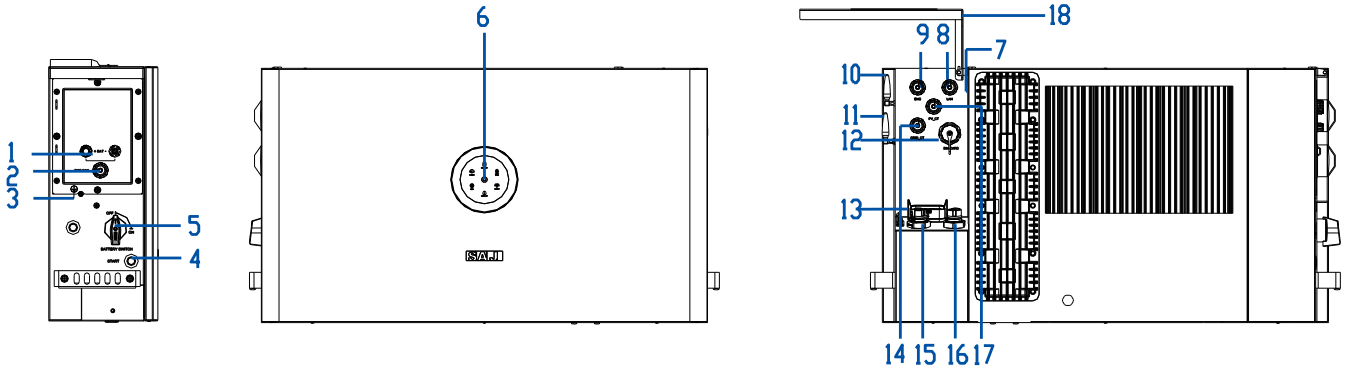


Figure 2.6. Ports, switches, and LED on the AS3 inverter

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

17	PV_CT	Port for connecting the CT on the solar inverter side. Only used in the AC-coupling scenario.
18	/	The protective cover of the cable terminal connections to prevent unexpected operations.

Table 2.1. Description of the ports, switches, and LED on the AS3 inverter

2.5. LED indicators on the AS3 inverter

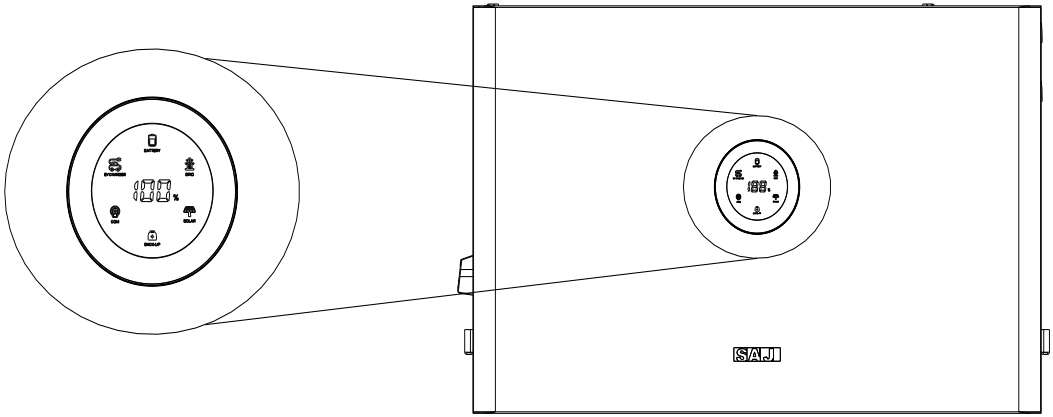


Figure 2.7. AS3 inverter LED

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.
 PV	Solid on	The PV inverter is working.
	Off	The PV inverter 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 1s	The EV charger is charging.
	On 1s, off 3s	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

DANGER
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.
- 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.
- 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 the device in a dry and well-ventilated environment and keep it away from heat sources.

Inverter-specific:

Storage environment requirements:

- Temperature range: -40 ℃ to +60 ℃
- Relative humidity: 5% to 95% RH

Battery-specific:

- Temporary storage environment requirements:
  - Temperature range: -10 ℃ to +40 ℃
  - Relative humidity: 5% to 95% RH

- Long-term (>3 months) storage environment requirements:
  - Temperature range: -25 ℃ to +25 ℃
  - Relative humidity: < 85% RH
- The battery should be installed within 6 months since delivered from the factory and used with compatible inverters.

NOTICE

- 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.

- The battery cannot be disposed of as household refuse. When the service life of the battery reaches its 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.

DANGER

- Dangerous to life due to potential fire or electricity shock.
- Do not install the inverter near any inflammable or explosive items.

NOTICE

- This equipment meets the pollution degree.
- Inappropriate or the harmonized installation environment may jeopardize the life span of the inverter.
- Installation directly exposed under intensive sunlight is not recommended.
- The installation site must be well ventilated.

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

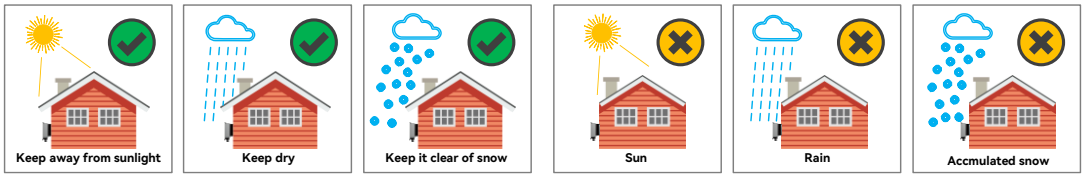


Figure 4.1. Installation location

- 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.
- Ensure the inverter is installed in a well-observed area where the LED display panel can be easily read for real-time status checks.

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.

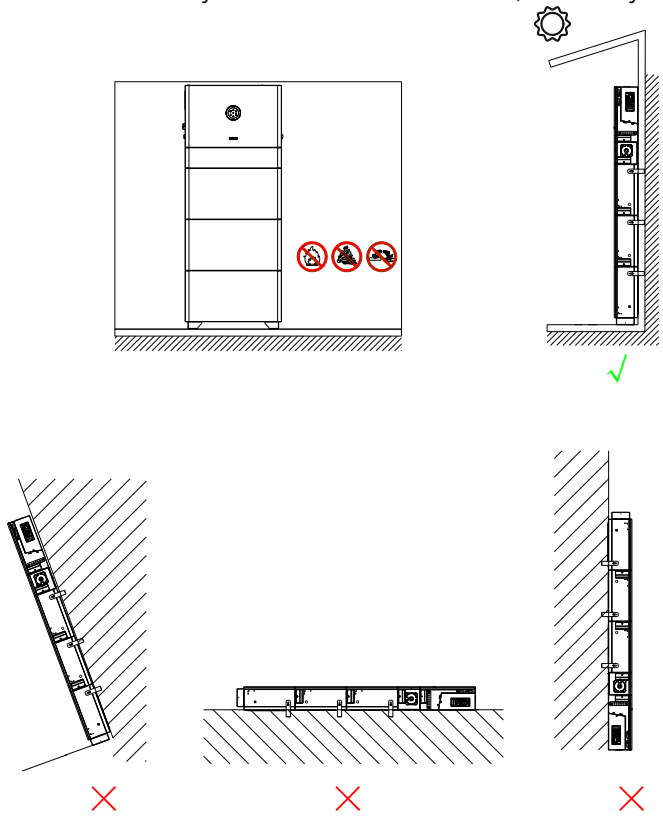


Figure 4.2. Installation limitations

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.

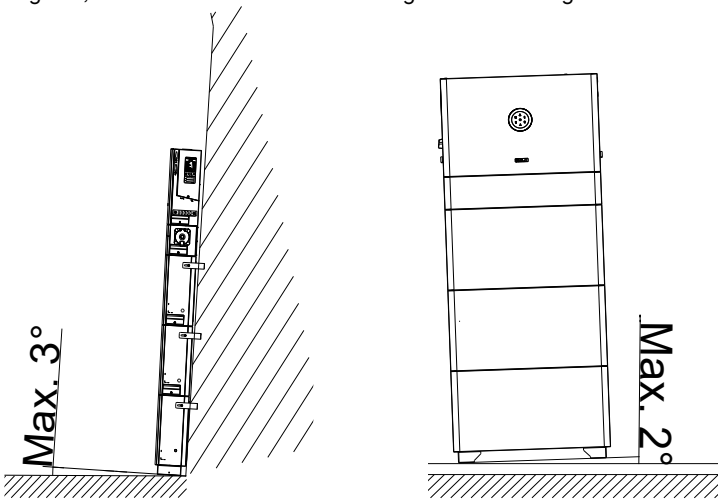


Figure 4.3. Installation angle

- 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.

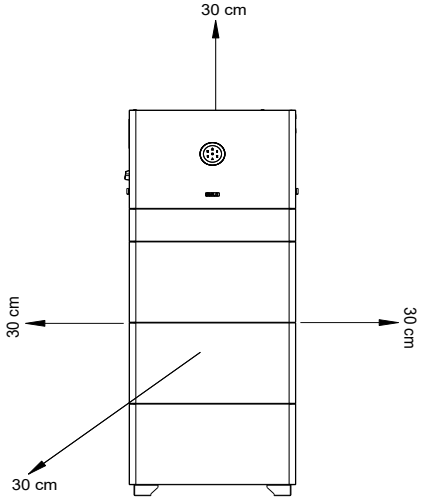


Figure 4.4. Installation clearance

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.

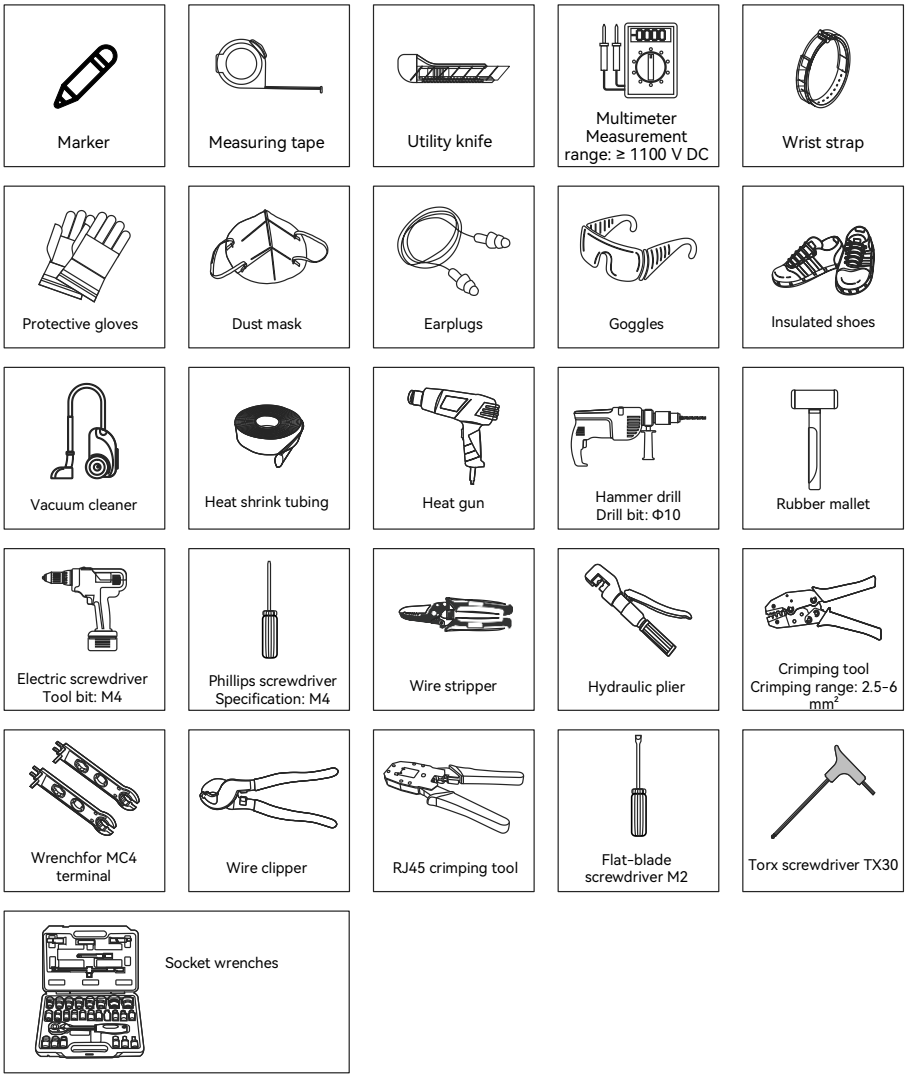


Figure 4.5. Suggested installation tools

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.

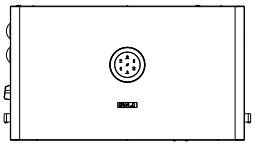
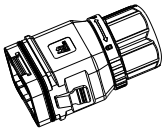
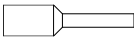
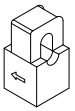
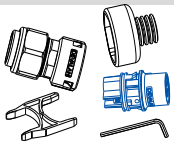
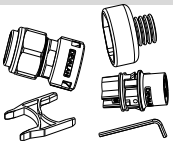
If any serious damage is found or the model is not what you requested, do not unpack the product, and contact your dealer as soon as possible.

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.

■ **AS3 inverter**

			
Inverter	24-pin communication cable connector	Insulated terminals x22	[1]Current transformer x2
			
[2]Backup load connector (blue) kit	[2]Grid connector (black) kit	Rubber plug x2	[3] Printed documents

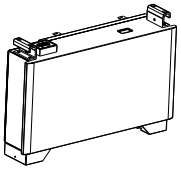
[1] A 10-meter cable is equipped for each CT.

[2] The waterproof cover is only available in some configurations.

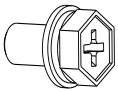
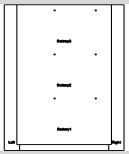
[3] The printed documents include a warranty card, a *Quick Guide*, and a *Configuration Instructions*.

- **BU3 battery pack**

  - Base battery

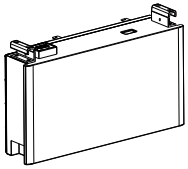


Battery module	Locking bracket x2	M6*80 expansion tube x2	M6*50 screw x2 Gasket x2

M5*14 screw x4	Cardboard

  - (Optional) Battery

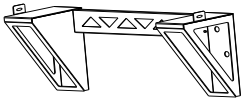
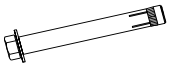
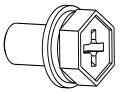


Battery module	Locking bracket x2	M6*80 expansion tube x2	M6*50 screw x2 Gasket x2

M5*14 screw x4

- **BT3-TV wall-mounting bracket**

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

Mounting bracket	M12*100 expansion bolt x6	M5*14 screw x2

- **BC3-TV battery junction box**

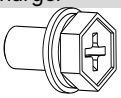
This is an optional package, depending on your system configuration.

Battery junction box	Communication cable	Positive cable Negative cable

- **CU2 Charger Package**

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

Charger	Holster	M4*32 screw x4	Expansion bolt x4



M5*14 screw x2

4.5. Installation

1. Plan the battery stack installation. For details, see section 4.5.1 "Plan the battery stacks".
2. Choose one of the following options to mount the battery stacks and the inverter:
   - Ground mounting, see section 4.5.2 "Ground mounting manner" on Page 34.
   - Wall mounting, see section 4.5.3 "Wall mounting manner" on Page 45.
3. Install the conjunction box when multiple battery stacks are installed. See section 4.5.4 "Install the conjunction box for multiple battery stacks" on Page 58.

4.5.1. Plan the battery stacks

One inverter supports up to eight batteries.

- For ground-mounting, a maximum of four batteries can be installed in one stack.
- For wall-mounting, a maximum of three batteries can be installed in one stack.

Besides the four or three batteries installed in the same stack as the inverter, the other batteries in each 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.

The following arrangement of battery stacks is applicable only for ground mounting:

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

The following arrangement of battery stacks is applicable for both ground mounting and wall-mounting:

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

4.5.2. Ground mounting manner

Before you start

Make sure that the ground is flat and has no inclination.

Procedure

Step 1. Install the BU3 base battery.

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 tubes into the drilled holes.

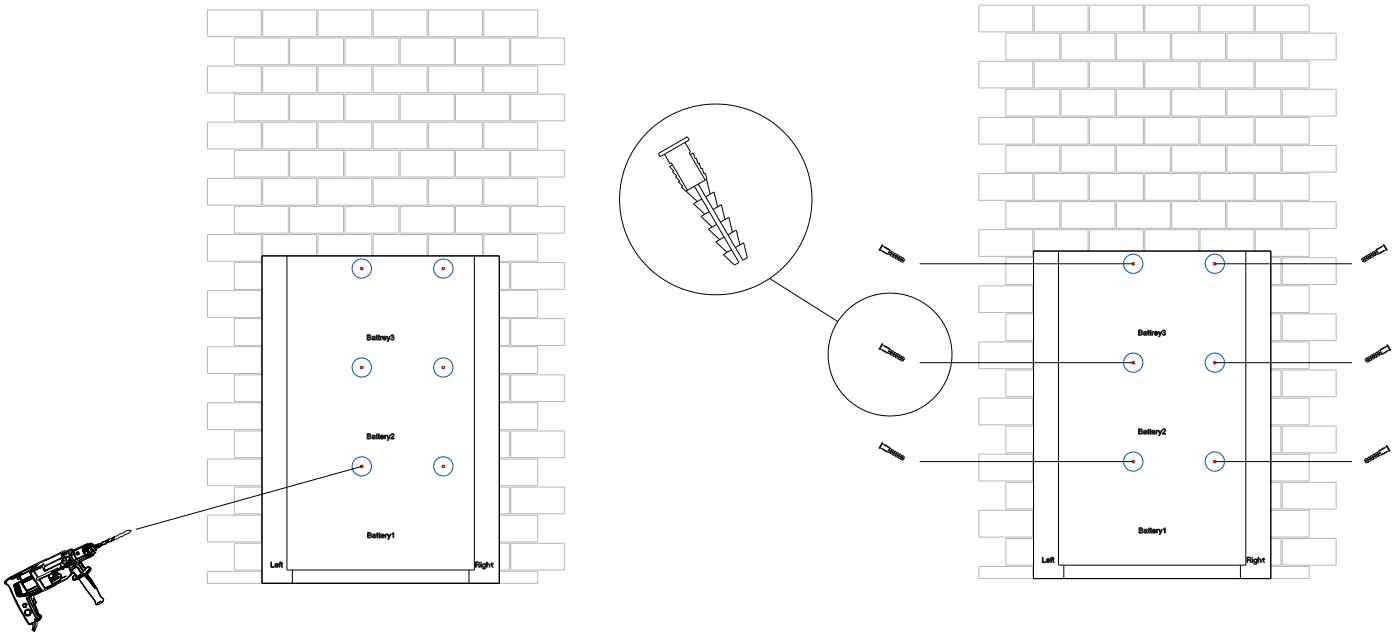


Figure 4.6. Marking and drilling holes on the wall

b. Use two M5*14 screws to install two locking brackets 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.

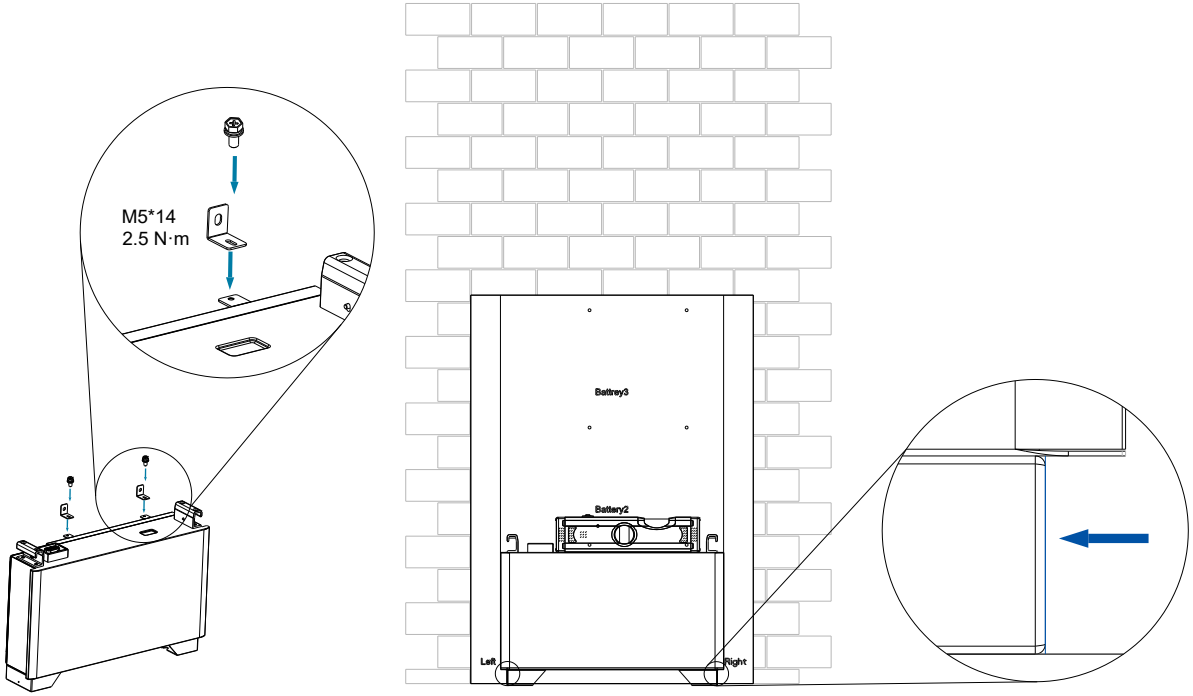


Figure 4.7. Installing the battery with the base

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.

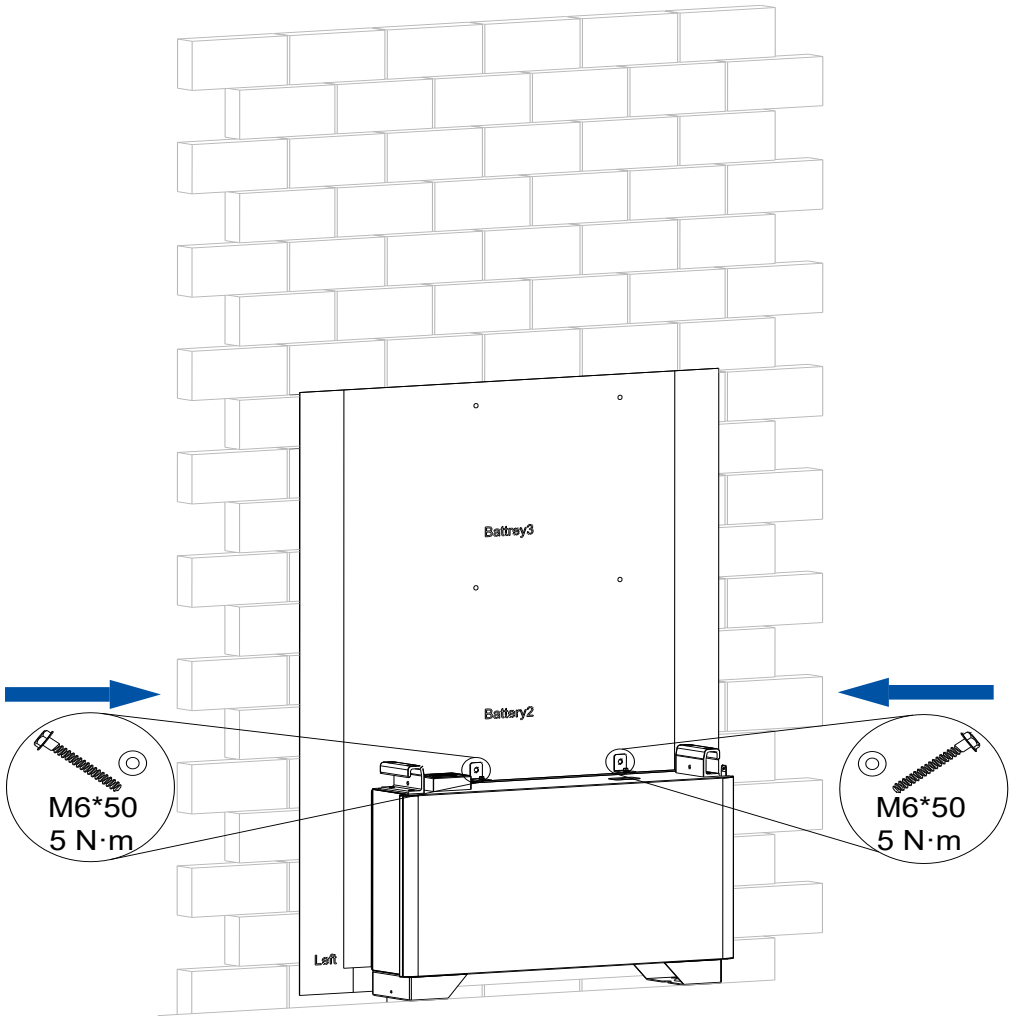


Figure 4.8. Securing the battery to the wall

Step 2. (Optional) Install other BU3 batteries.

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.

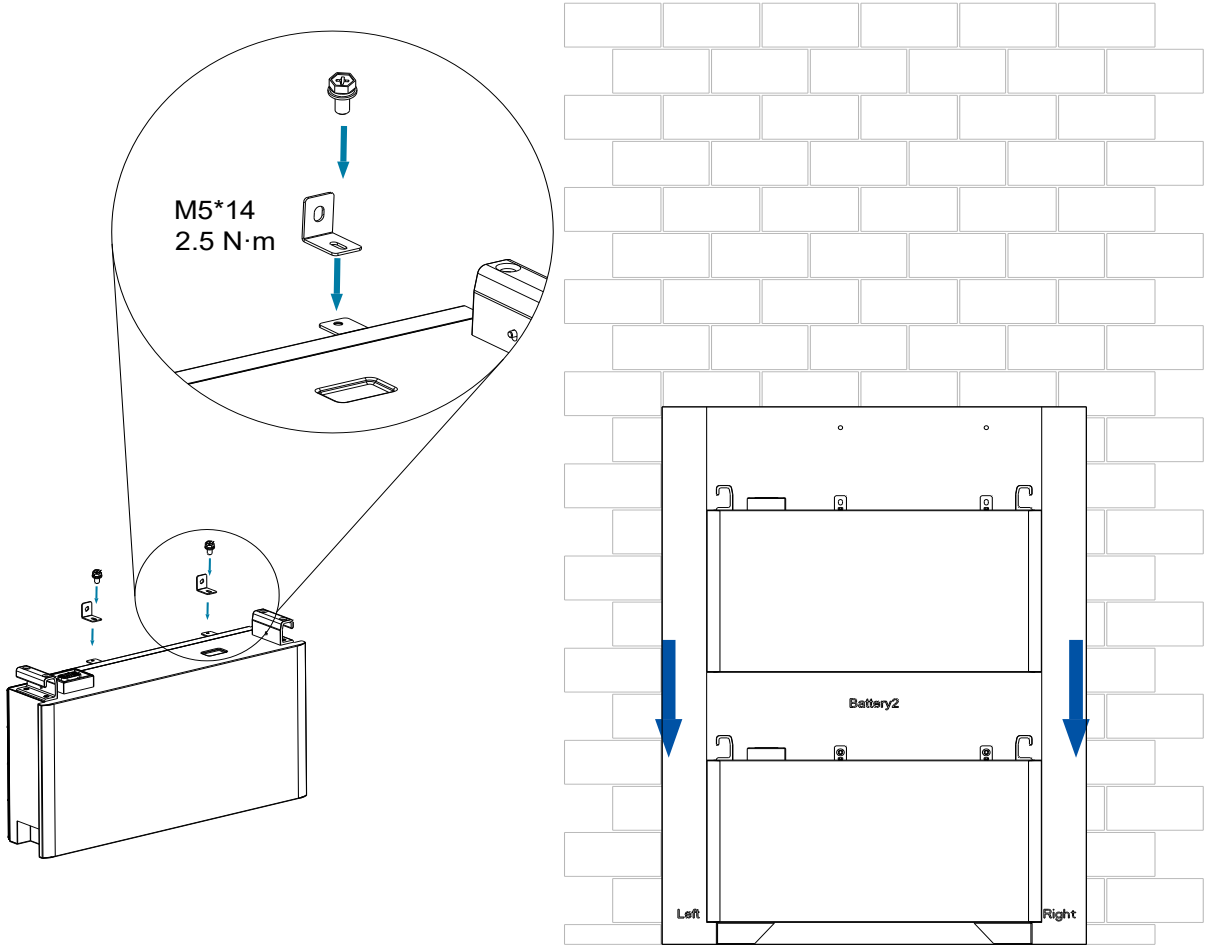


Figure 4.9. Installing the second battery

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.

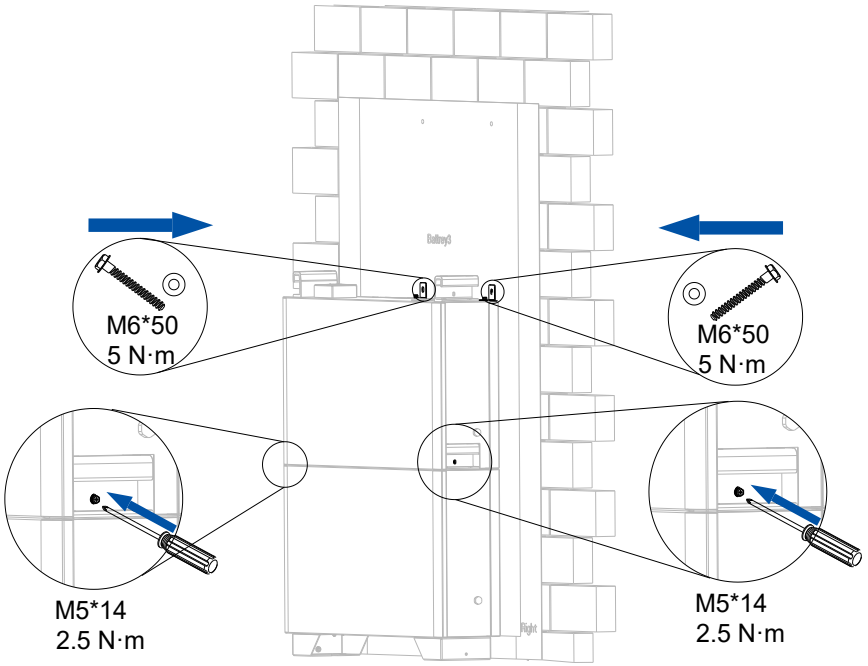


Figure 4.10. Securing the batteries

c. (Optional) If needed, install the third battery.

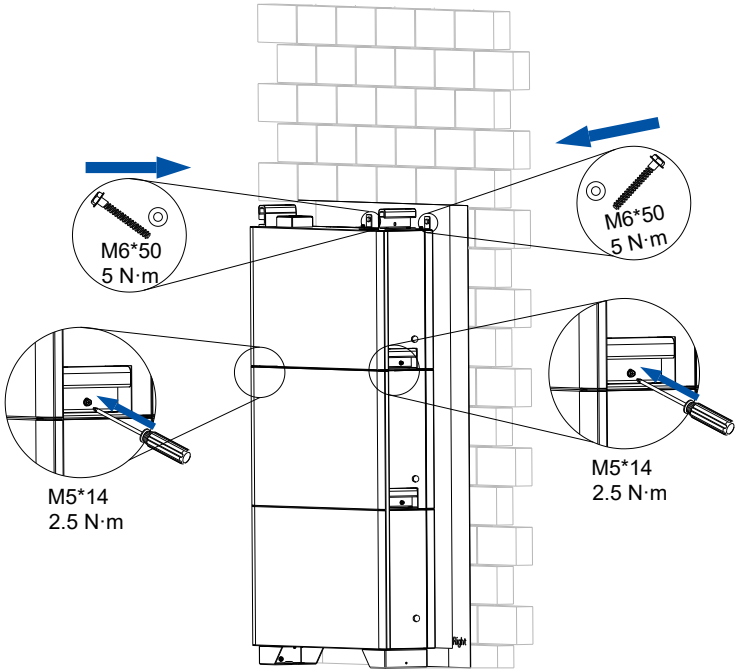


Figure 4.11. Installing the third battery

Step 3. (Optional) Install the charger.

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.

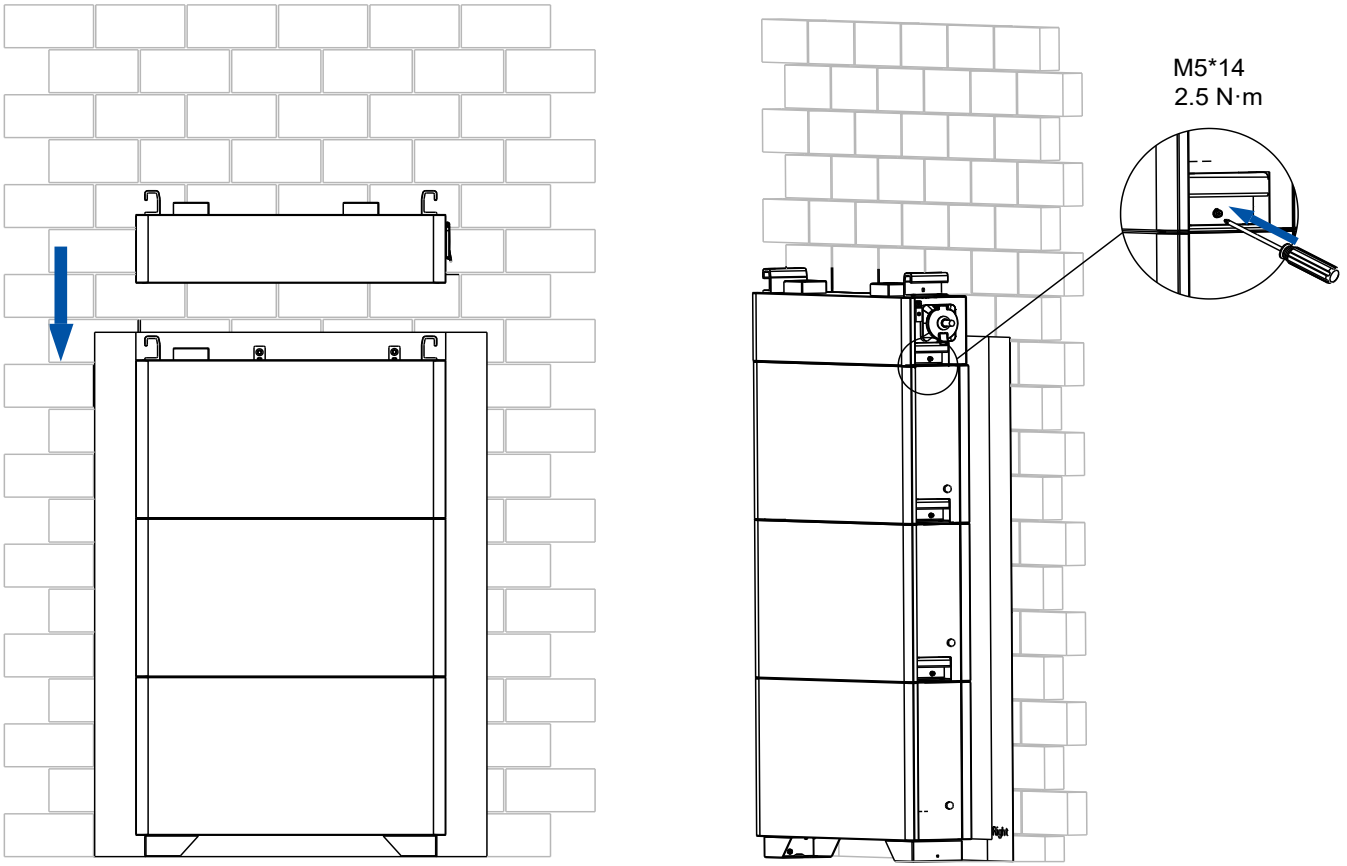


Figure 4.12. Installing the charger

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.

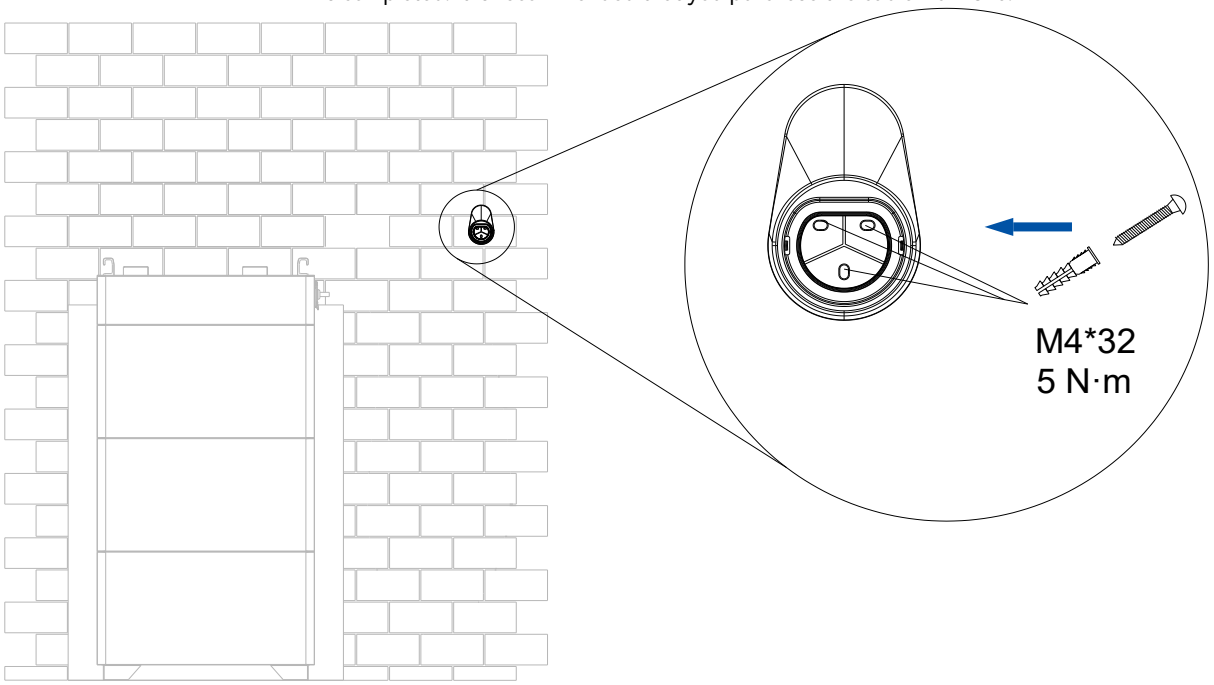


Figure 4.13. Installing the charger cable holster

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.

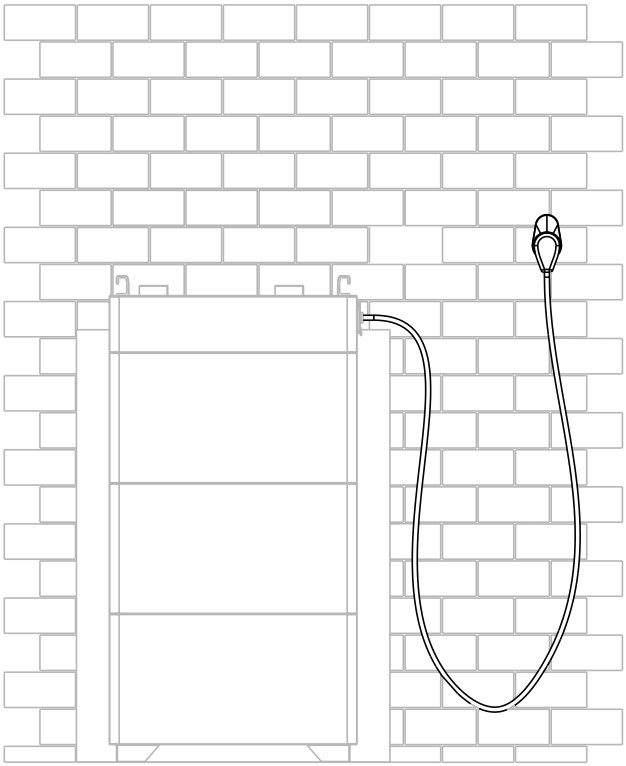
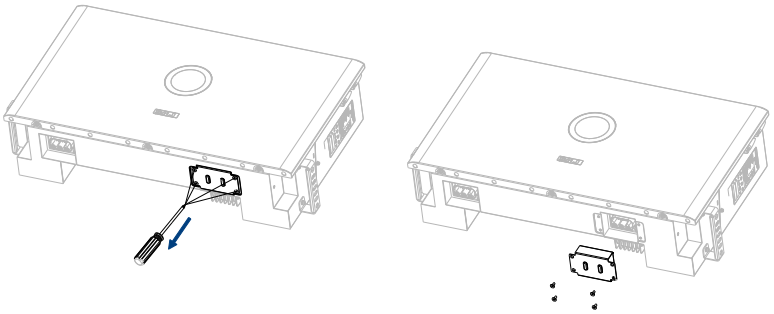


Figure 4.14. Connecting the charger cable

Step 4. Install the AS3 inverter.

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



b. Place the inverter onto the battery or charger (if available) and push it downwards. On the left and right bottom sides of the inverter, install M5*14 screws to secure the inverter to the beneath device.

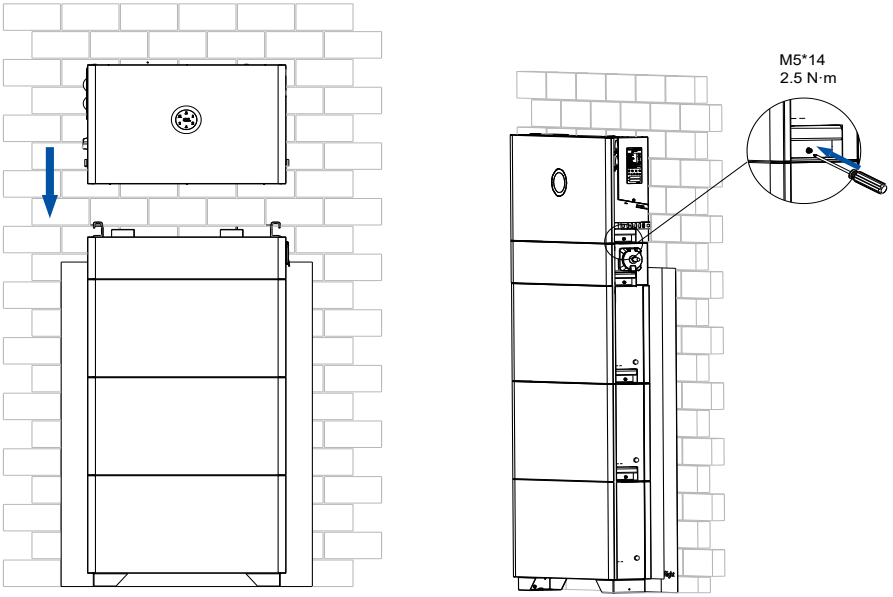


Figure 4.15. Installing the inverter

Installation completion view

Single stack: supporting 1 to 3 batteries

Example of 3 batteries:

Inverter + charger + batteries

Inverter + batteries

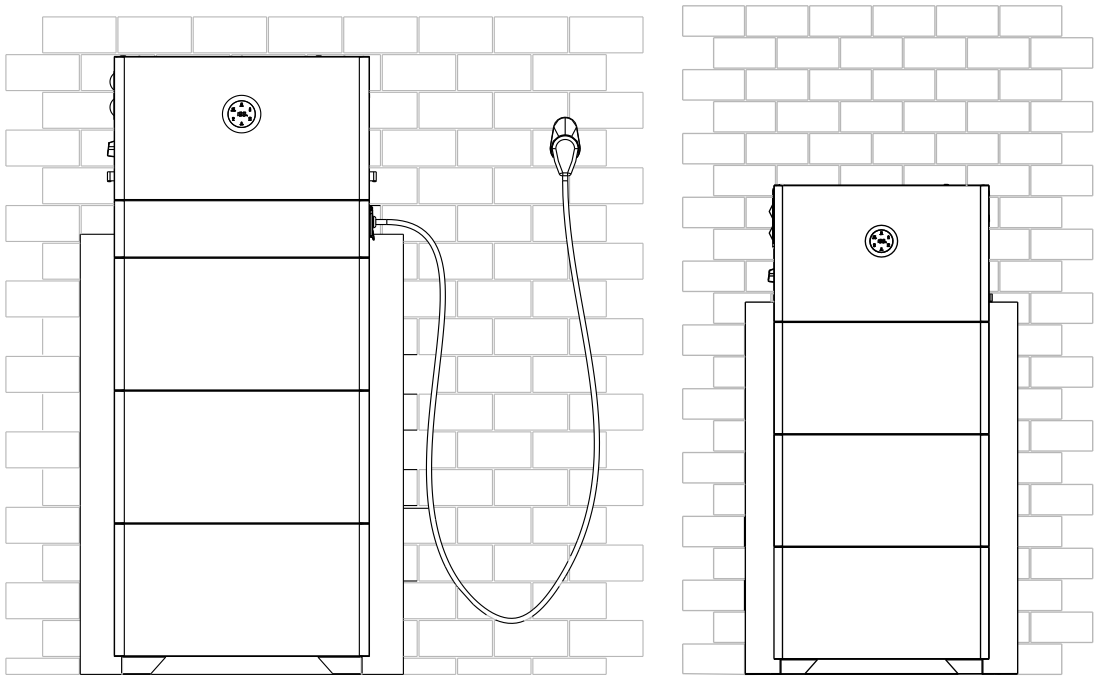


Figure 4.16. Completion view of a single stack

4.5.3. 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.

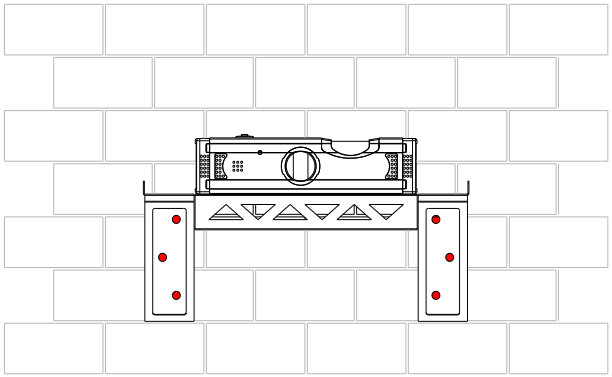


Figure 4.17. Marking the hole positions

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

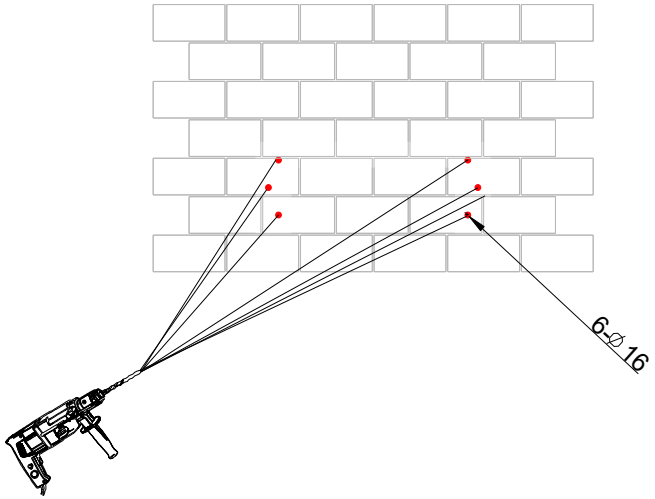


Figure 4.18. Drilling holes

c. Install the mounting bracket on to the wall.

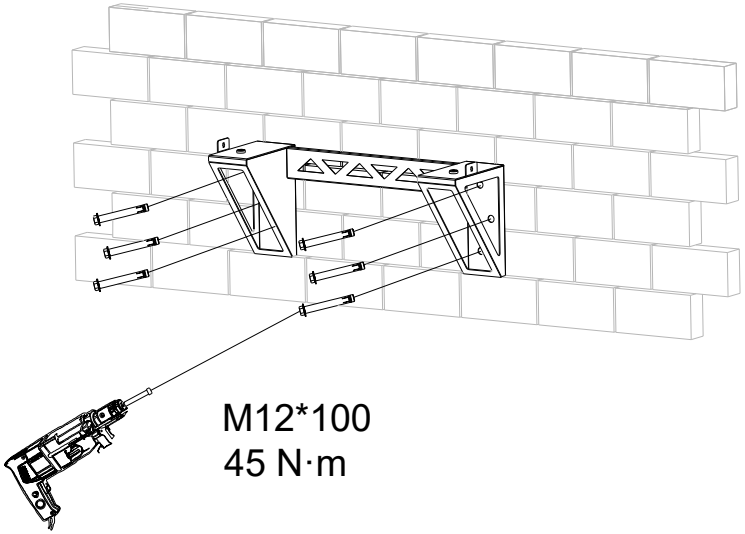


Figure 4.19. Installing the mounting bracket

Step 2. Install the base battery.

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.

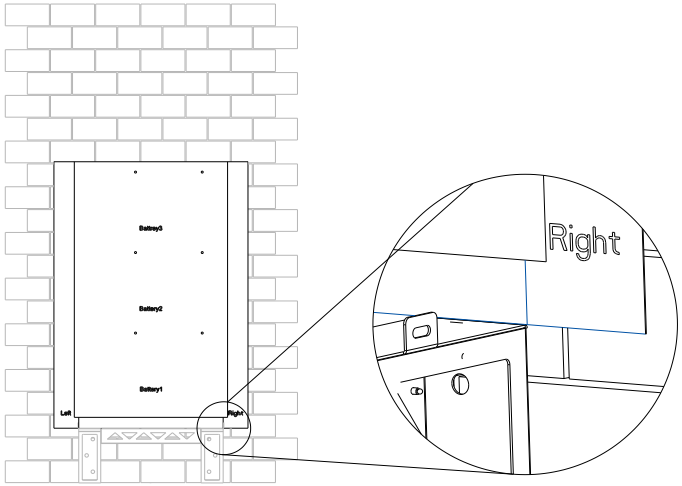


Figure 4.20. Aligning the cardboard with the bracket

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

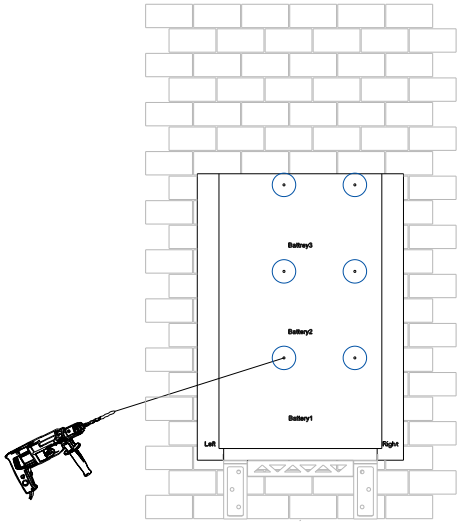


Figure 4.21. Drilling holes

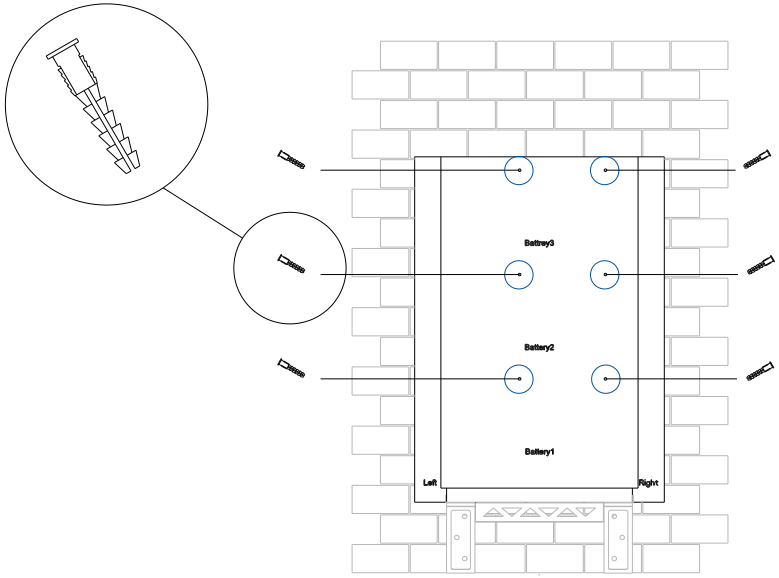
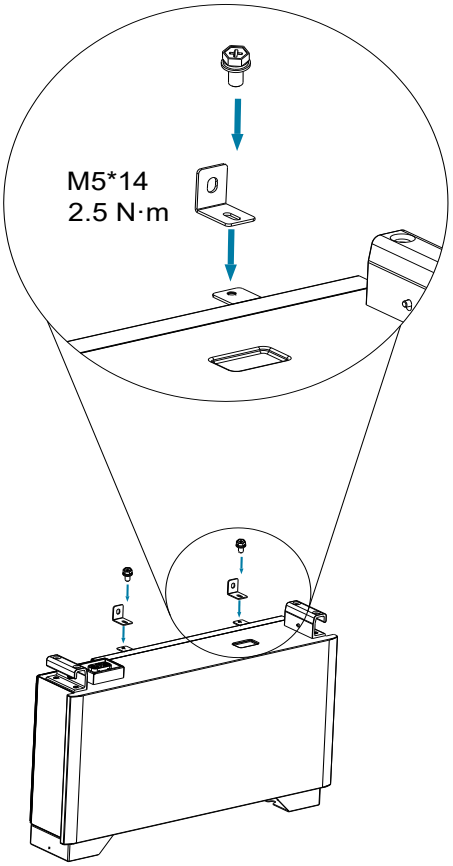


Figure 4.22. Installing expansion tubes

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.



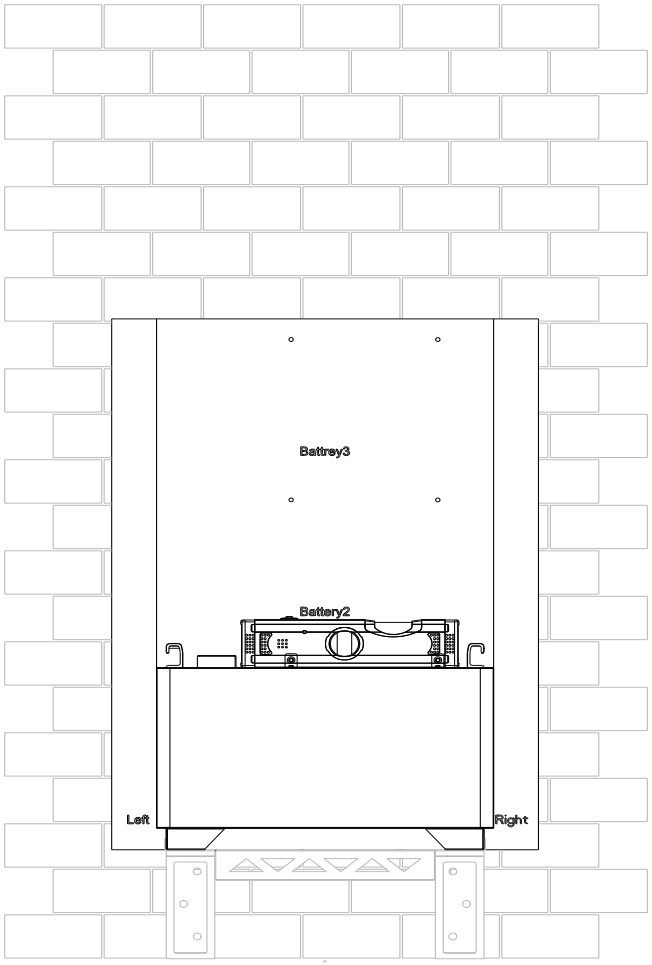


Figure 4.23. Installing the battery with the base

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.

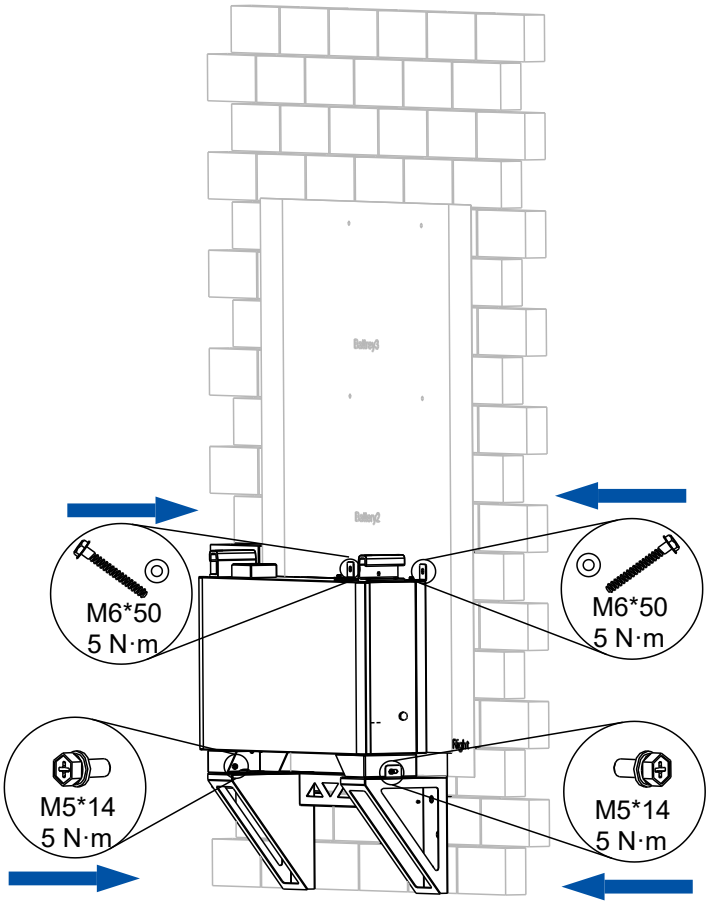


Figure 4.24. Securing the battery to the wall

Step 2. Install other BU3 batteries.

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.

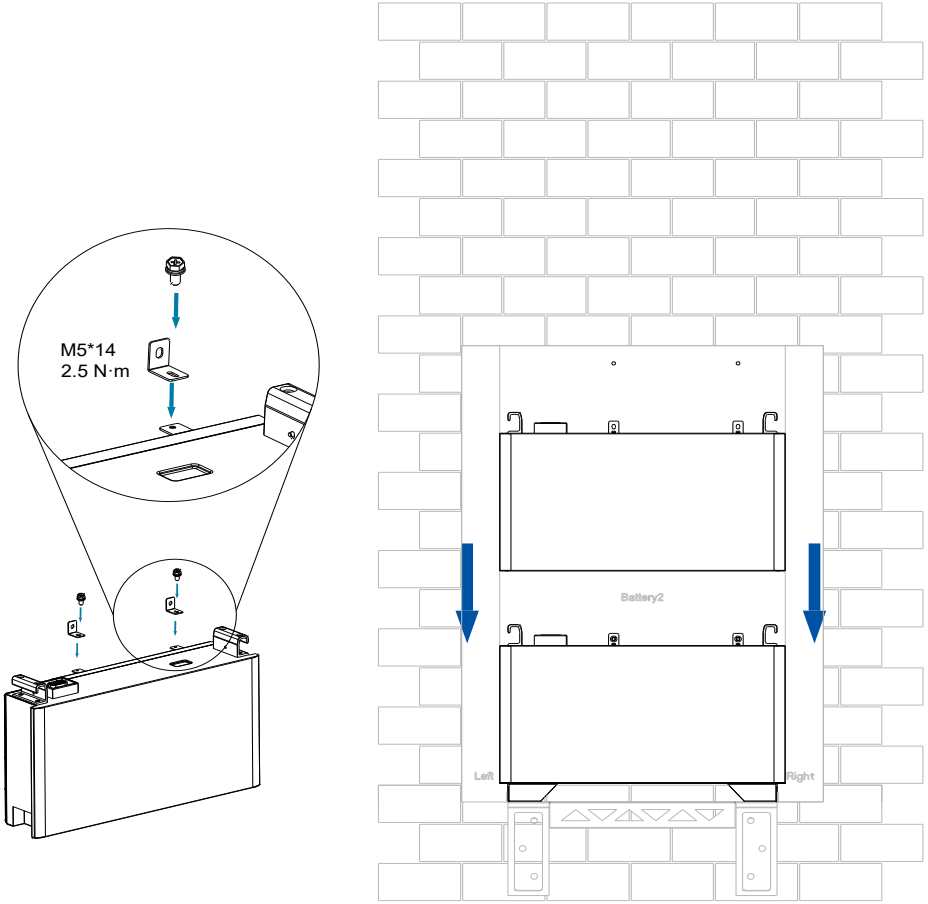


Figure 4.25. Installing the second battery without

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.

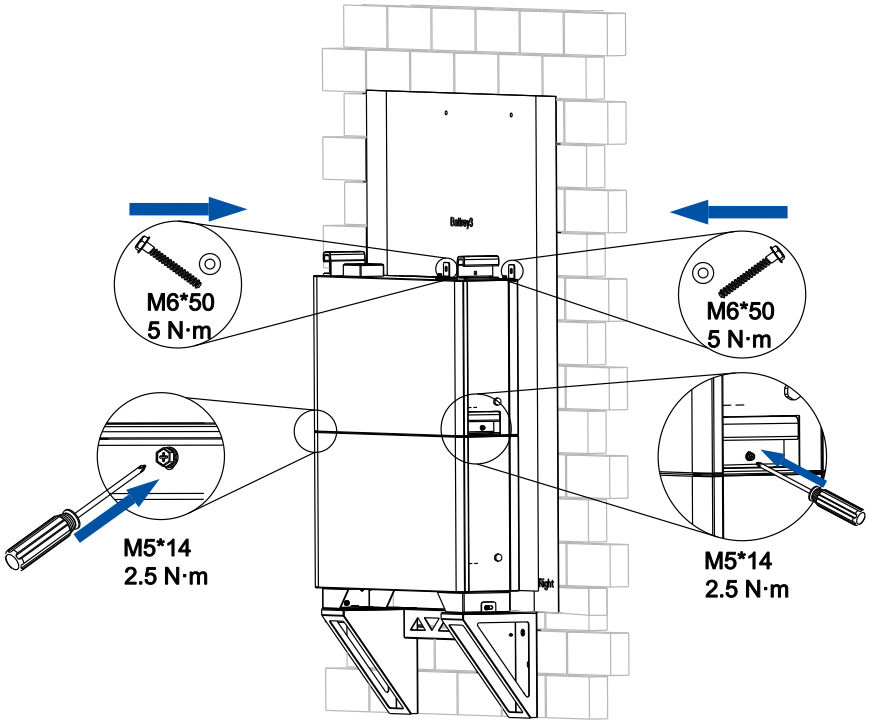


Figure 4.26. Securing the batteries

c. (Optional) If needed, install the third battery.

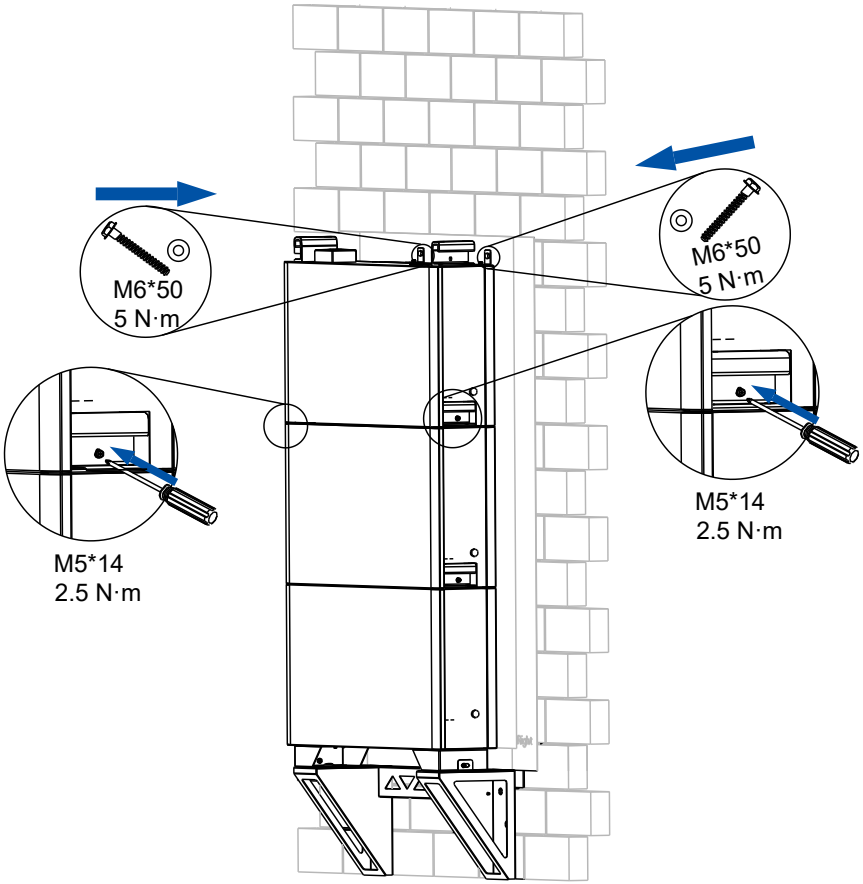


Figure 4.27. Installing the third battery

.

Step 3. (Optional) Install the charger.

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.

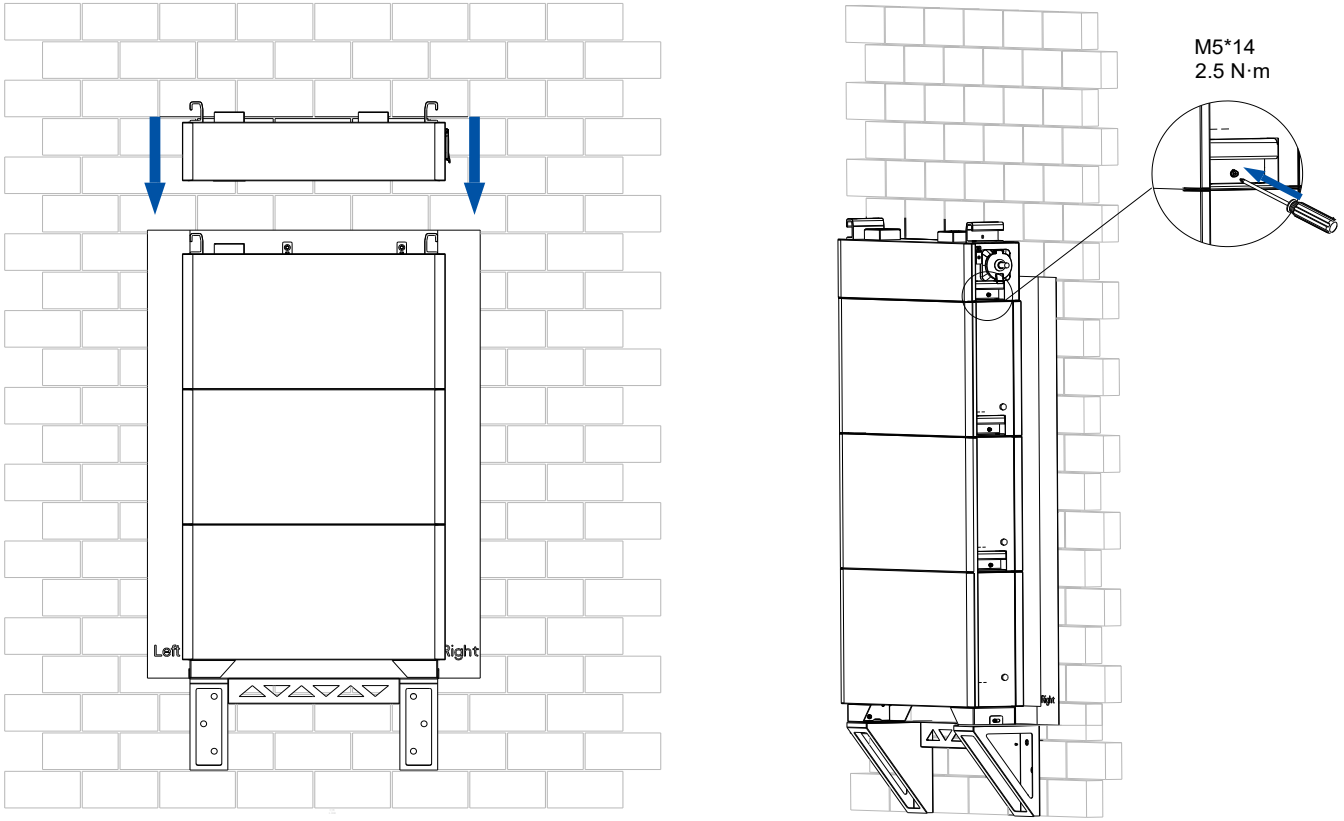


Figure 4.28. Installing the charger

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

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

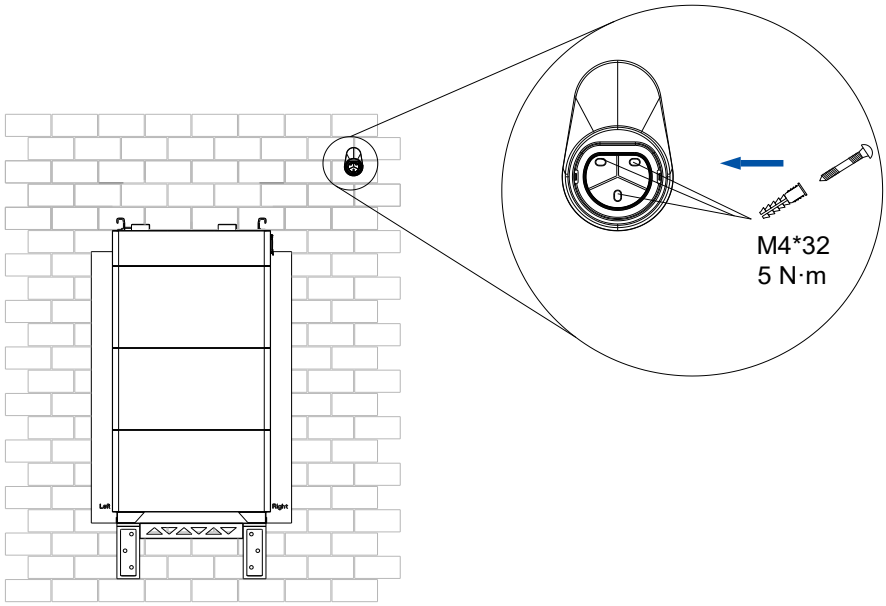


Figure 4.29. Installing the charger cable holster

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.

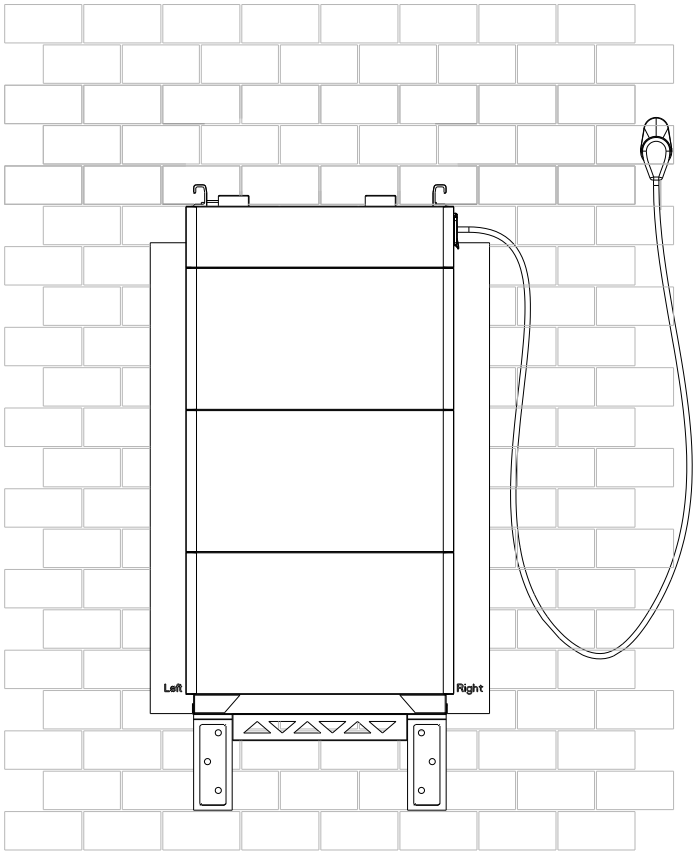


Figure 4.30. Connecting the charger cable

Step 4. Install the AS3 inverter

Place the inverter onto the battery 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.

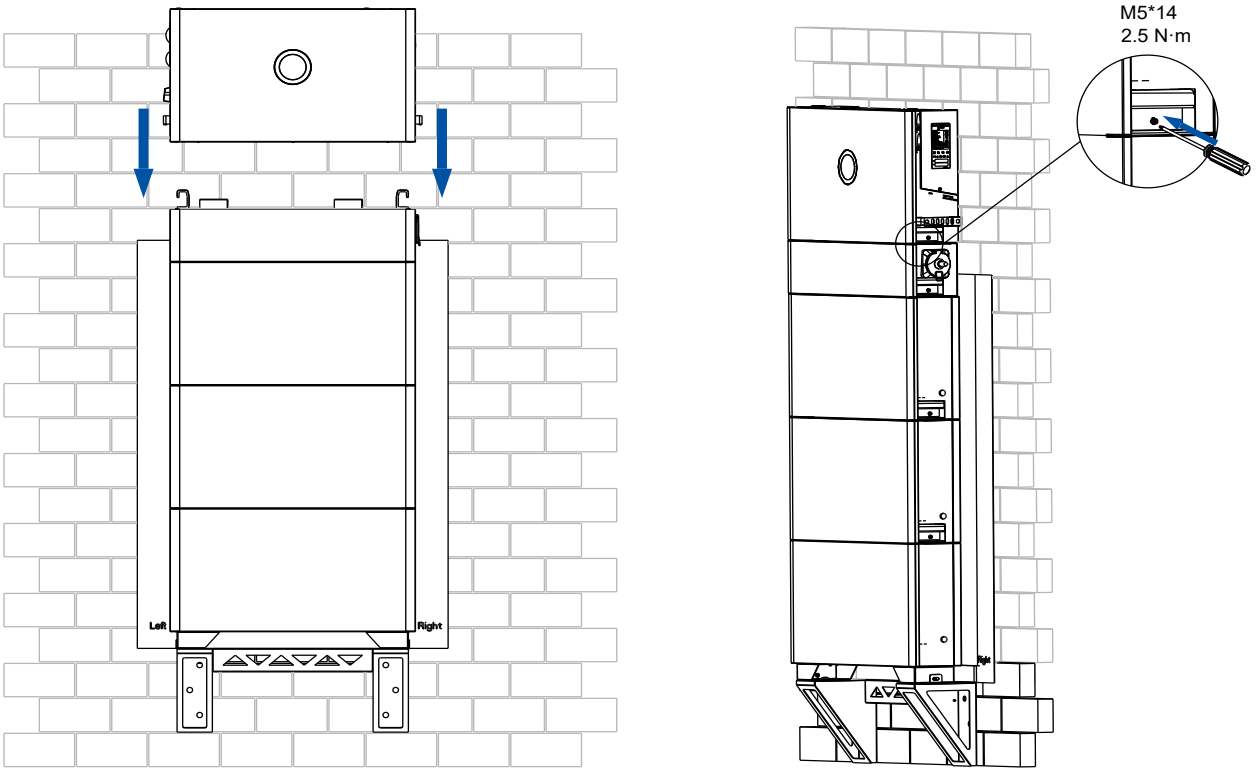


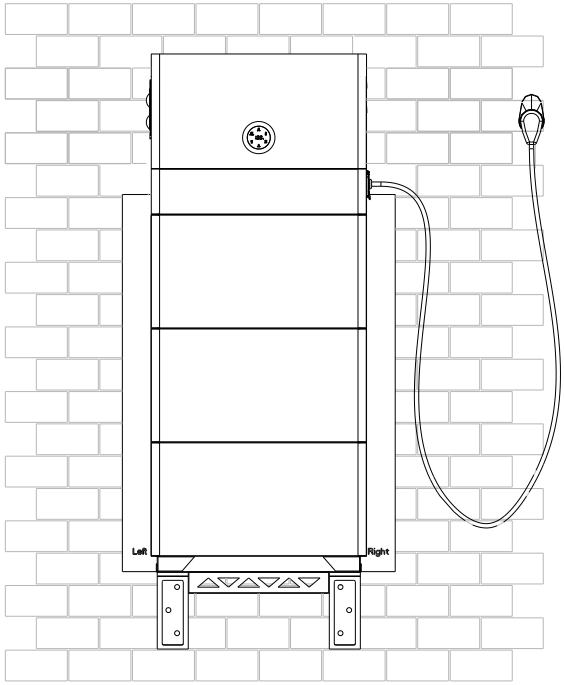
Figure 4.31. Installing the inverter

Installation completion view

Single stack: supporting 1 to 3 batteries

Example of 3 batteries:

Inverter + charger + batteries



Inverter + batteries

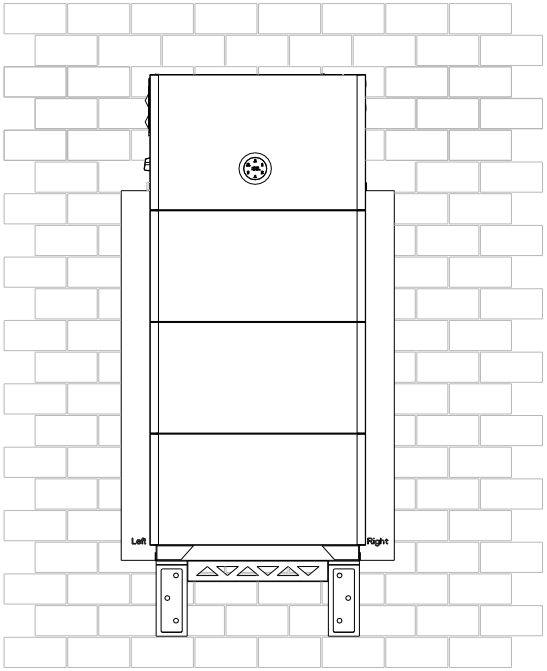


Figure 4.32. Completion view of a single stack

4.5.4. Install the conjunction box for multiple battery stacks

The installation of the conjunction box is similar for ground-mounting and wall-mounting.

Procedure

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

Step 2. Install screws on both lower sides of the junction box to secure the junction box to the beneath device. Install and secure the metal grounding plate on both sides.

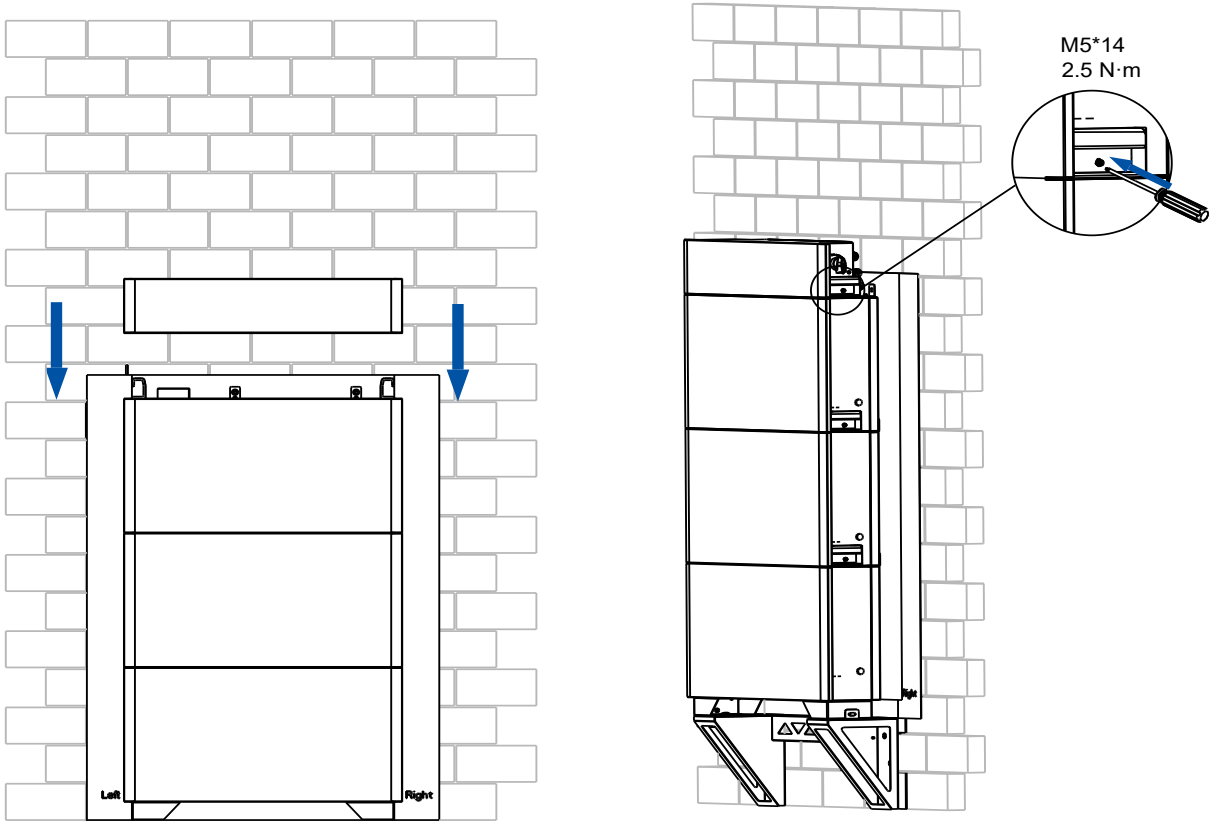


Figure 4.33. Installing a battery junction box

Installation completion view

Multiple battery stacks: supporting 4 to 8 batteries

Take eight batteries as an example:

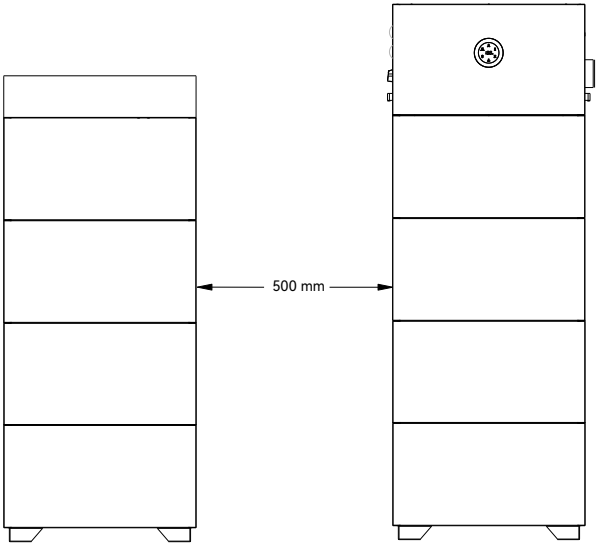


Figure 4.34. Completion view of two battery stacks

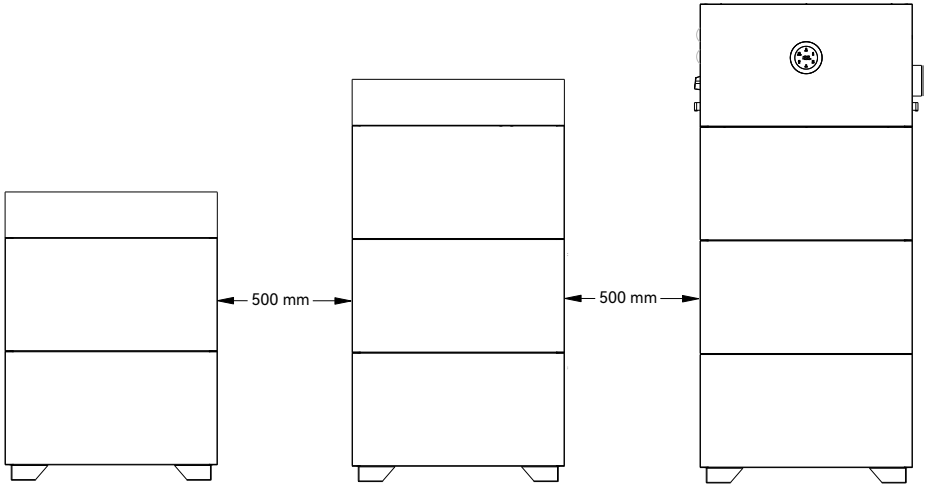


Figure 4.35. Completion view of three battery stacks

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.

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.

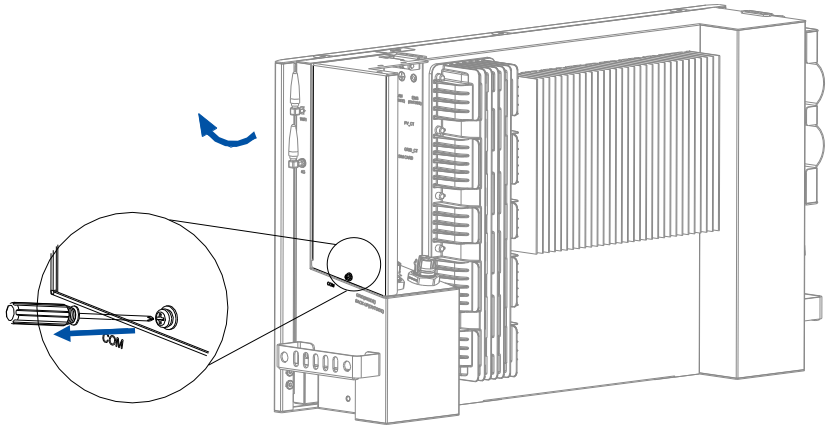


Figure 5.1. Opening the AC-side cover

5.2.2. Connect the grounding cable

About this task

This 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-mm2 conductor cross-sectional area of cable be used.

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.

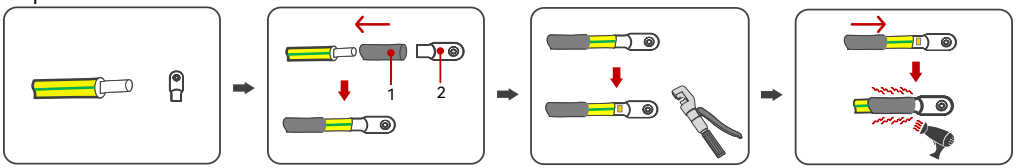


Figure 5.2. Preparing the grounding cable

1 Heat shrink tube 2 OT/DT terminal

Step 2. Remove the M4*10 screw from the grounding port. Connect and secure the grounding cable.

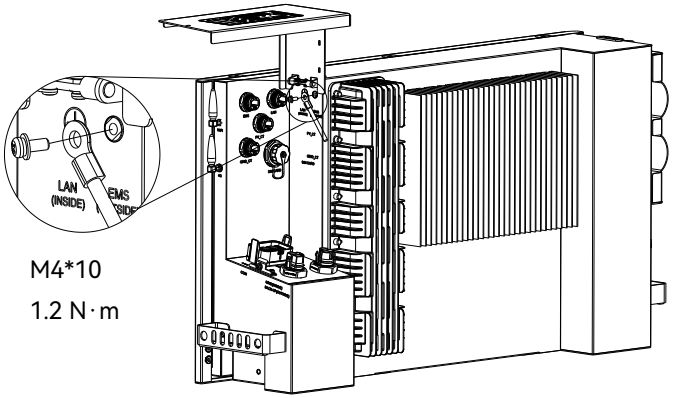


Figure 5.3. Connecting the additional grounding cable

5.2.3. (Optional) Install a SIM card

Only the 4G model provides the SIM card slot. For 4G model, the LAN port is not equipped.

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

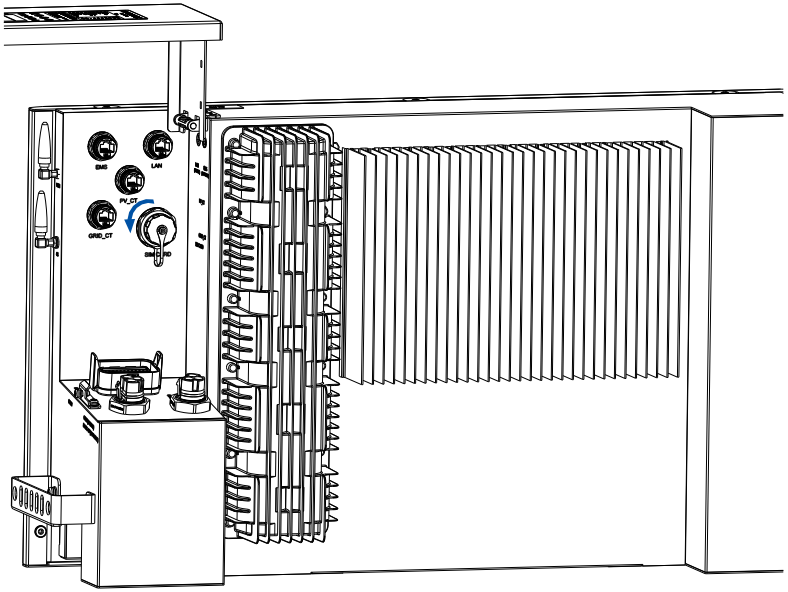


Figure 5.4. Loosening the cover on the SIM card slot

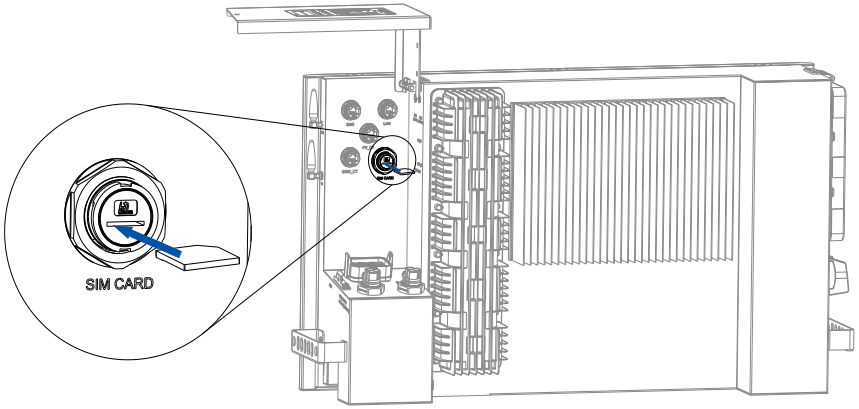


Figure 5.5. Inserting the SIM card

5.2.4. (Optional) Assemble the LAN electrical connection

About this task

Only the W (Wi-Fi) model provides the LAN port. For W model, the SIM card slot is not equipped.

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. Assembly the cable fastener.

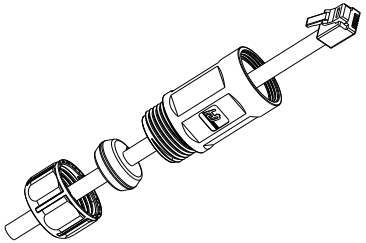


Figure 5.6. Preparing the LAN cable

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

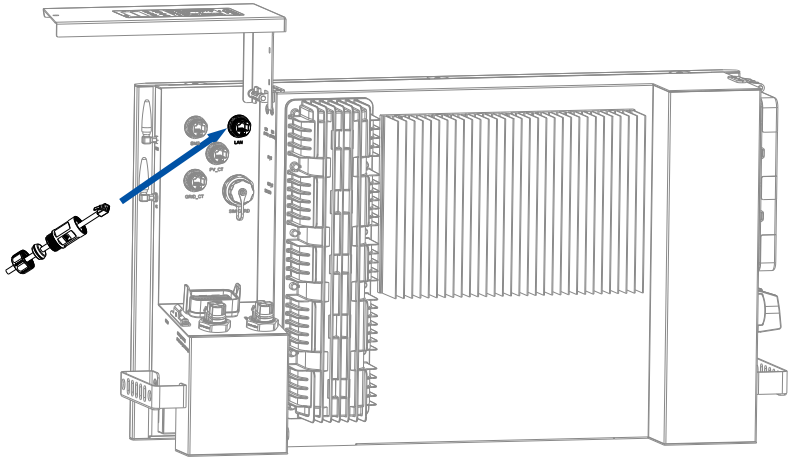


Figure 5.7. Connecting the LAN cable

5.2.5. Assemble the EMS electrical connection

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. Assembly the cable fastener.

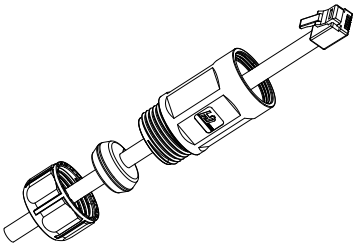


Figure 5.8. Preparing the EMS cable

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

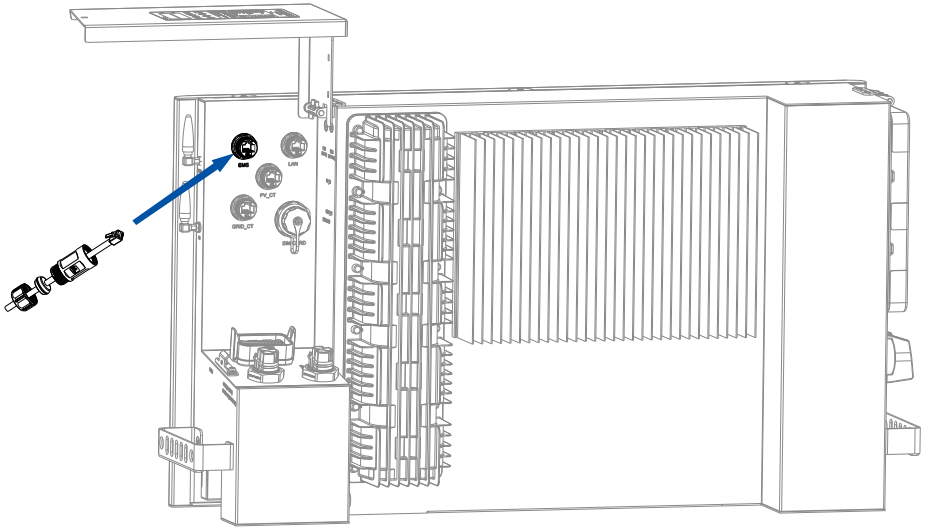


Figure 5.9. Connecting the EMS cable

5.2.6. Connect the CT cable on the grid side

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

Step 2. Insert the CT cable through the cable fastener as shown below.

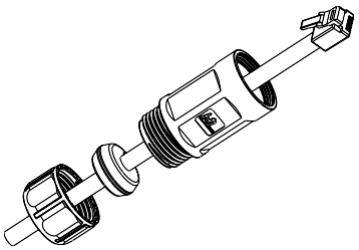


Figure 5.10. Preparing the CT cable

Step 3. Insert the RJ45 connector of the CT cable to the GRID_CT port on the inverter.

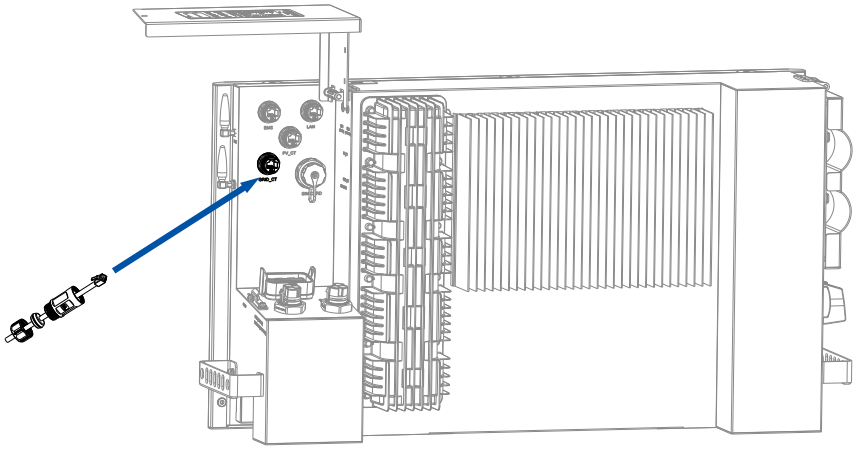


Figure 5.11. Connecting the CT cable

Step 4. Install the CT on the grid side.

5.2.7. (Optional) Connect the CT cable on the solar inverter side

About this task

This task is only applicable to the AC-coupling scenario in which the hybrid inverter and one or more solar inverters are installed in one ESS.

Procedure

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

Step 2. Insert the CT cable through the cable fastener as shown below.

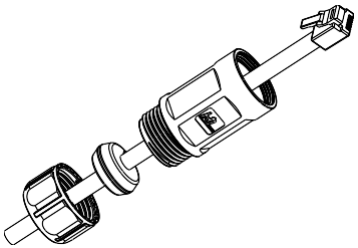


Figure 5.12. Preparing the CT cable

Step 3. Insert the RJ45 connector of the CT cable to the PV_CT port on the inverter.

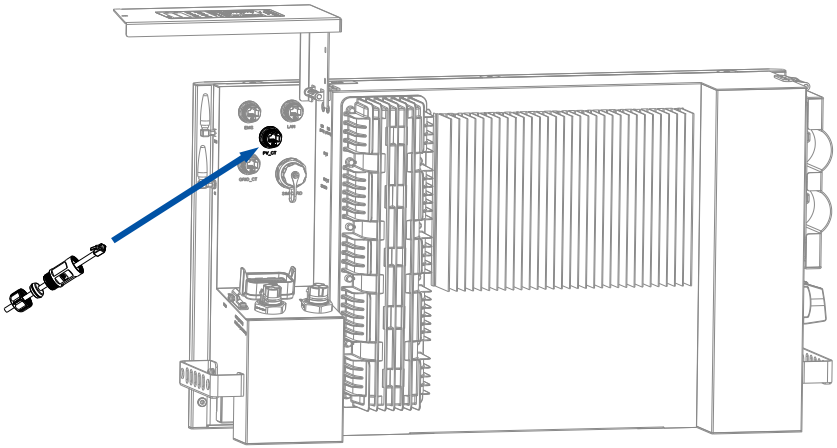


Figure 5.13. Connecting the CT cable

Step 4. Install the CT on the solar inverter side.

5.2.8. 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 parallel scenario, do NOT connect multiple inverters to one AC circuit breaker.

5.2.9. (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.

5.2.10. (Optional) Connect a smart meter

If you need to connect a smart meter, contact SAJ for consultation.

5.2.11. 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 thee-hole rubber plug (in the accessory bag). This task takes the one-hole rubber plug as an example. The three-hole rubber plug is used when you choose to use three separated cables for connection.

Before you start

Select cables according to the below recommended specification:

Cable type	Conductor cross-sectional area of cables		Conductor material	Cable diameter (with insulation)
	Range	Recommended value		
One three-wire cable	10–13.3 mm² or 7–6 AWG	10 mm² or 6 AWG	Copper	Range: 15–19 mm
Three separated cables	/	10 mm²		Range: 6.5–8.5 mm Double-layer insulation

Table 5.1. Recommended AC cable specification

Procedure

Step 1. On the cable end, strip off the insulation as shown below.

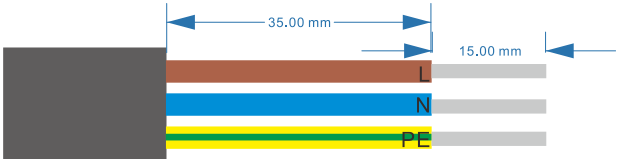


Figure 5.14. Stripping off the double-layer insulation

Step 2. Connect the cable to the grid or backup load connector.

Note: Depending on the configurations, the waterproof gland nut (callout **4** in the following illustration) may not be provided.

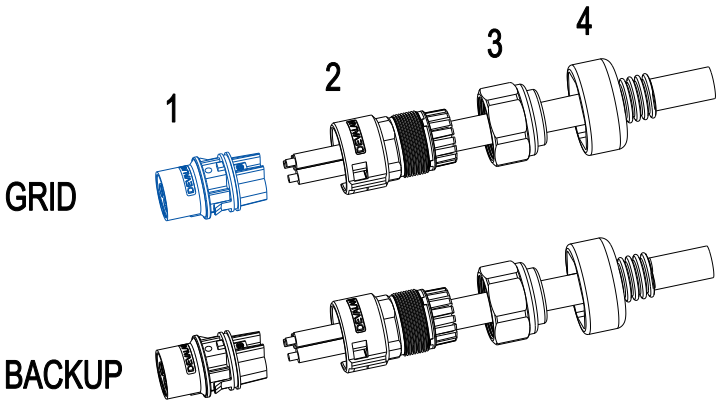


Figure 5.15. Preparing the cable

Step 3. Secure the cable to the connector. Then, assemble the connector.

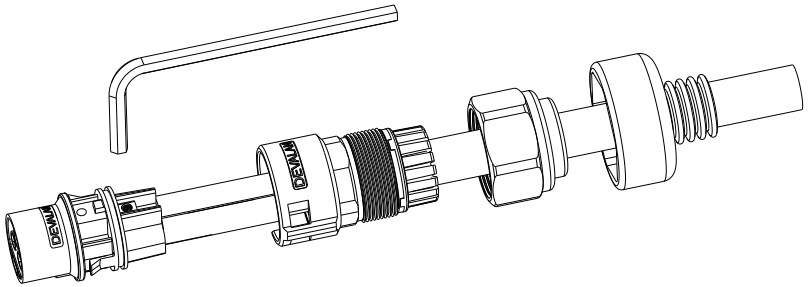


Figure 5.16. Assembling the connector

Step 4. Remove the dustproof covers from the GRID and BACK-UP ports.

a. Use a flathead screwdriver to press down the tab in the cover.

b. Rotate the cover anti-clockwise and pull it upwards.

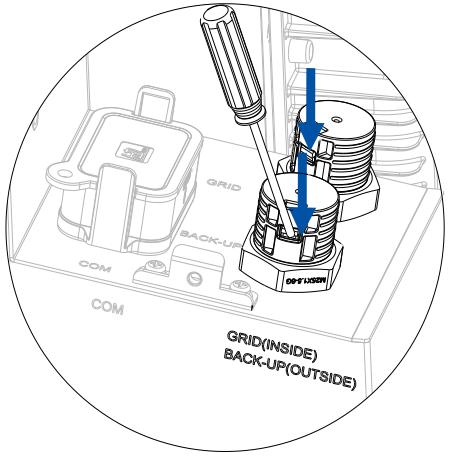


Figure 5.17. Removing the dustproof cover

Step 5. Use a flathead screwdriver to remove the dustproof covers from the GRID and BACK-UP ports. Then, connect the cables to the GRID and BACKUP ports on the inverter.

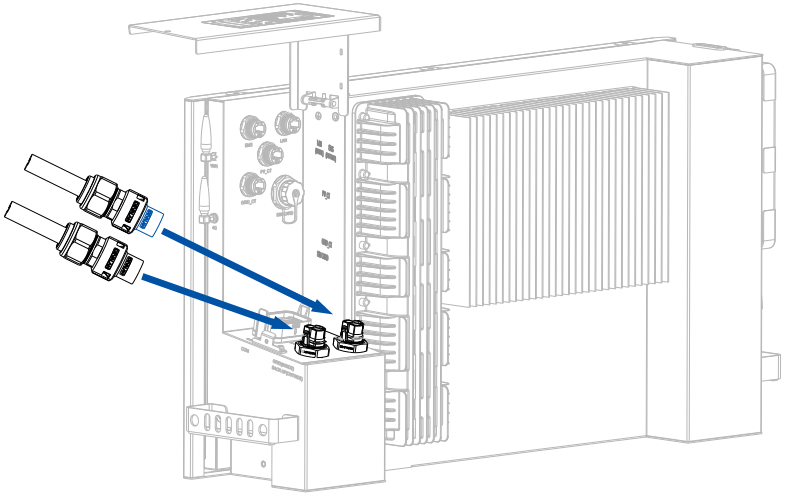


Figure 5.18. Connecting the grid and backup load cables

5.2.12. 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.

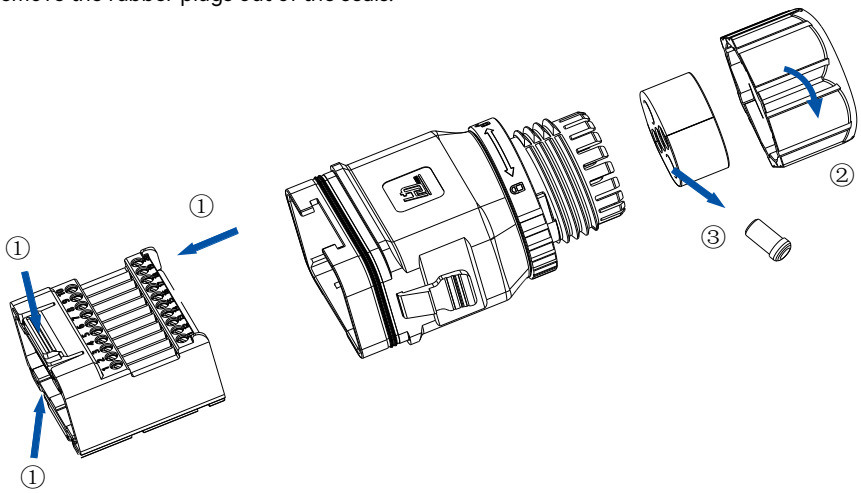


Figure 5.19. Disassembling the 24-pin communication cable connector

Step 2. Prepare cables according to the following suggested specifications:

Terminals	Cable diameter	Insulation off	
		External protective layer	Wire insulation
1-10	0.5-0.75 mm^2	55 mm	7.5 mm
11-20	0.2-0.5 mm^2	33 mm	7.5 mm

Step 3. Strip the insulation off and install the insulated crimp terminals on the cable ends.

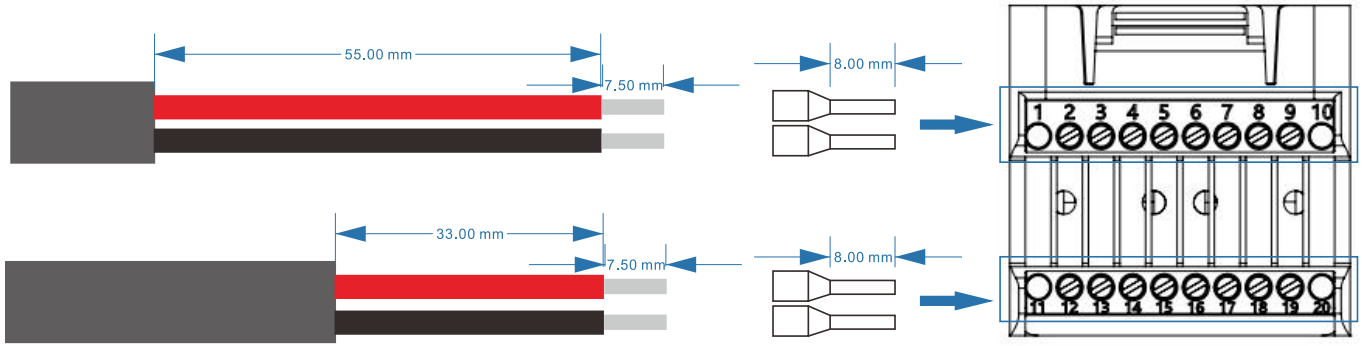


Figure 5.20. Stripping insulation off and installing the insulated crimp terminals on the cable ends

Step 4. Insert all communication cables through the nut, seals, and connector body.
Example:

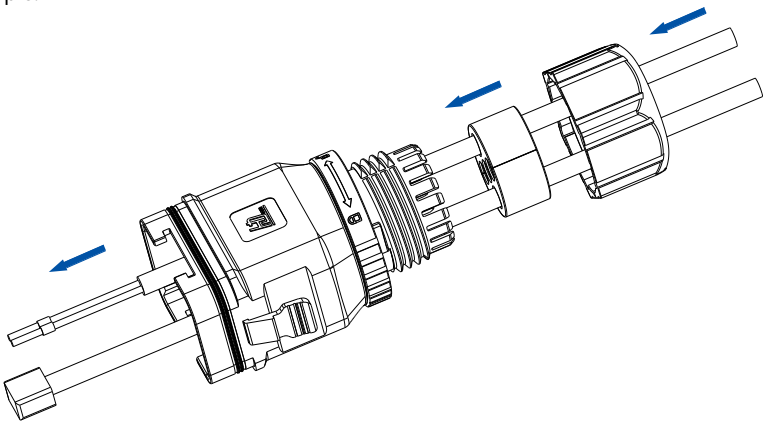


Figure 5.21. Inserting the cables through the connector

Step 5. 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 Ω resistor)	For parallel 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 contact output 1
	5	DO1-	Dry contact output 1
	6	DO2+	Dry contact output 2
	7	DO2-	Dry contact output 2
	11	RS485-A (with a 120 Ω resistor)	For external RS485 communication
	12	RS485-B	
	13	MET-A (with a 120 Ω resistor)	For meter communication
	14	MET-B	
	15	DI1+	Dry contact input 1
	16	DI1-	Dry contact input 1
	17	DI2+	Dry contact input 2
	18	DI2-	Dry contact input 2
	19	CAN_H (with a 120 Ω resistor)	For external CAN communication
	20	CAN_L	

Table 5.2. Ports and terminals on the connection terminal block

Step 6. 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 Ω 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.

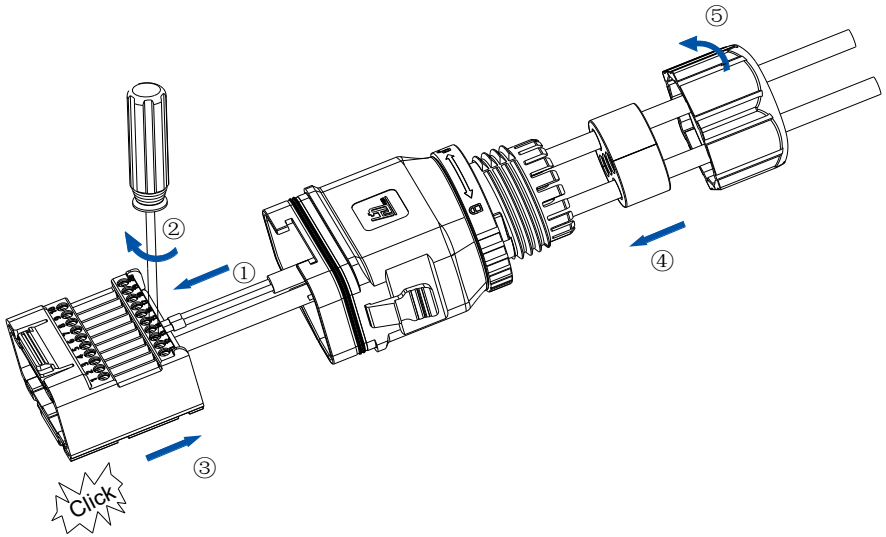


Figure 5.22. Assembling the connector

Step 7. Connect the assembled communication terminal connector to the COMM port on the inverter.

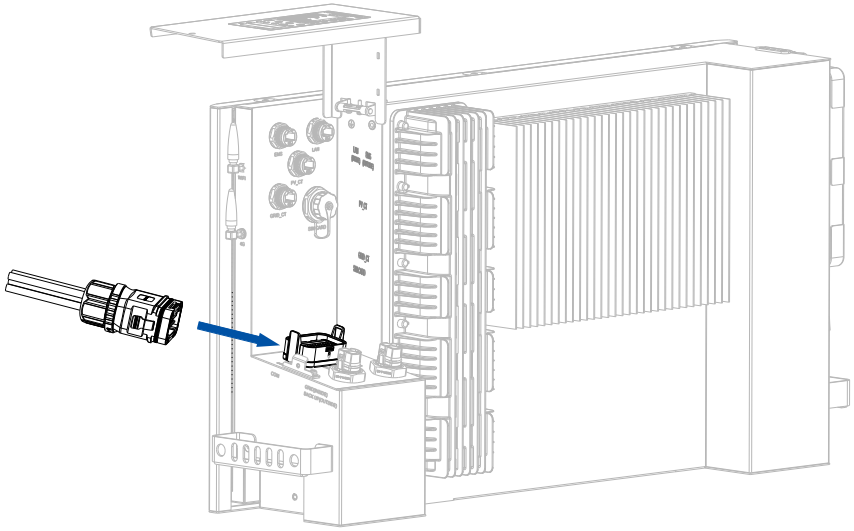


Figure 5.23. Connecting the connector to the inverter

Step 8. Connect the other end of the cables to external devices.

5.2.13. Close the AC-side cover

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

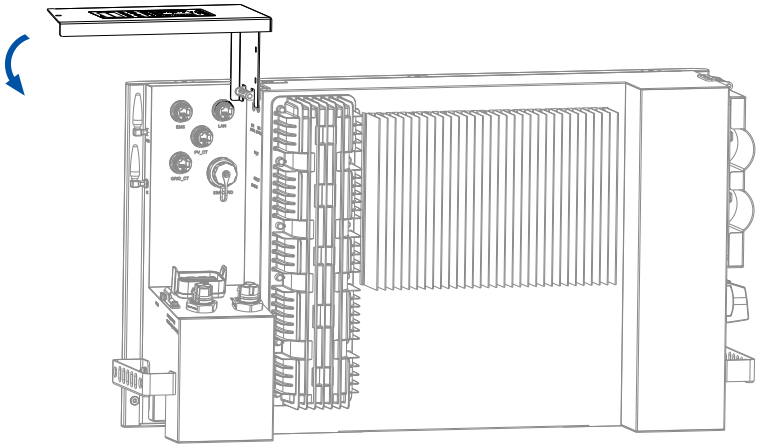


Figure 5.24. Closing the AC-side cover

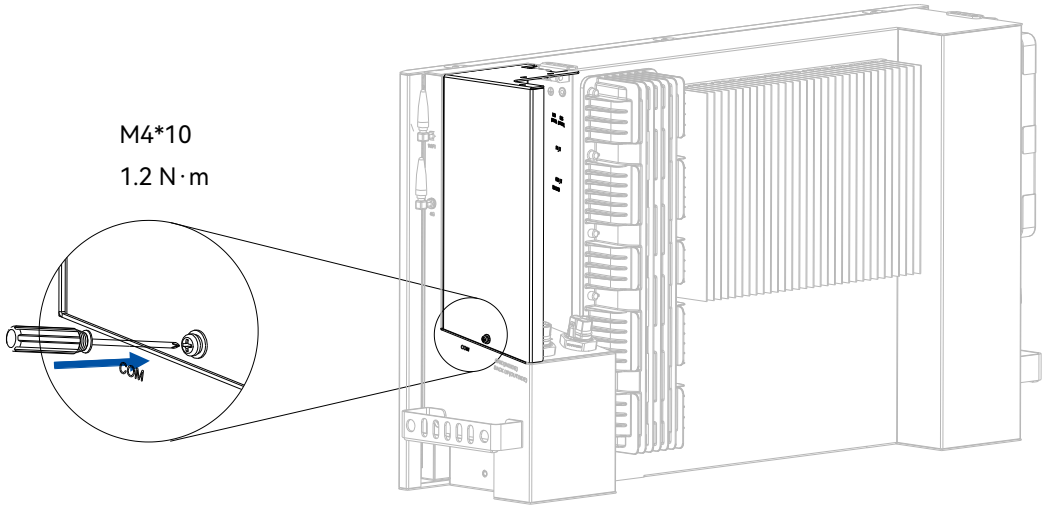


Figure 5.25. Securing the screw

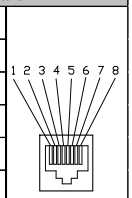
5.3. (Optional) Connect the battery cables between multiple stacks

About this task

This task is only applicable when four to eight batteries are connected to one inverter. On top of the first stack, an inverter is installed; while on top of other stacks, a battery junction box has been installed.

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

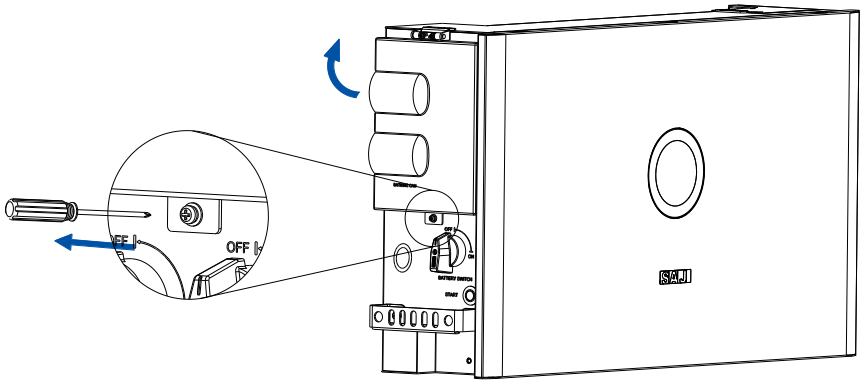


Figure 5.26. Opening the DC-side cover

Step 2. Prepare and connect the grounding cable to the battery junction box.

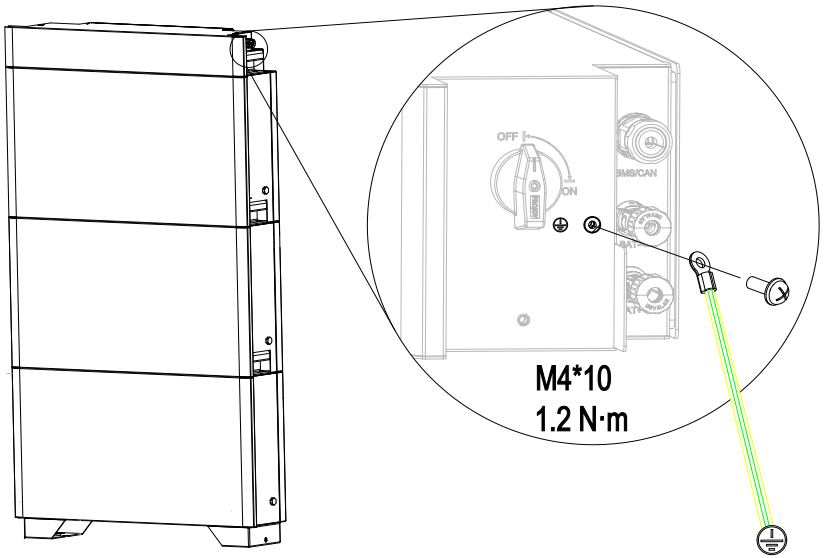


Figure 5.27. Connecting the grounding cable

Step 3. 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 5.3. 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:

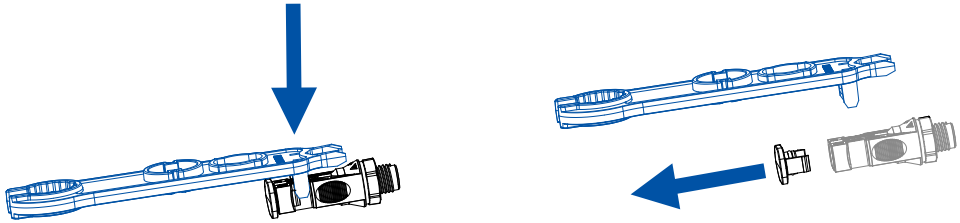


Figure 5.28. Removing the waterproof cover

- 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:

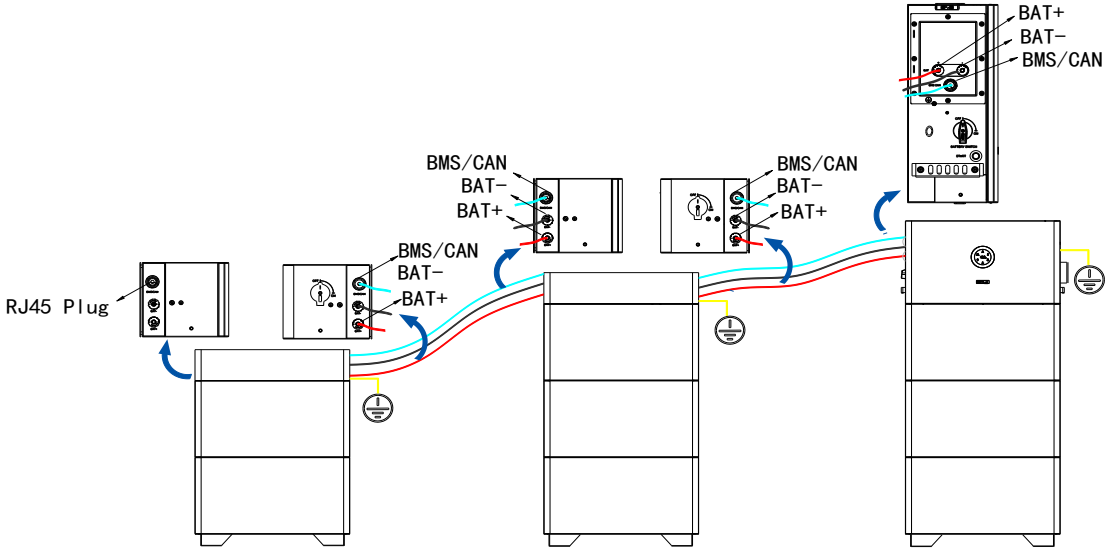


Figure 5.29. Connection of eight batteries in three stacks

Step 4. Push the cover downwards. Use a screwdriver to tighten the screw to lock the cover securely.

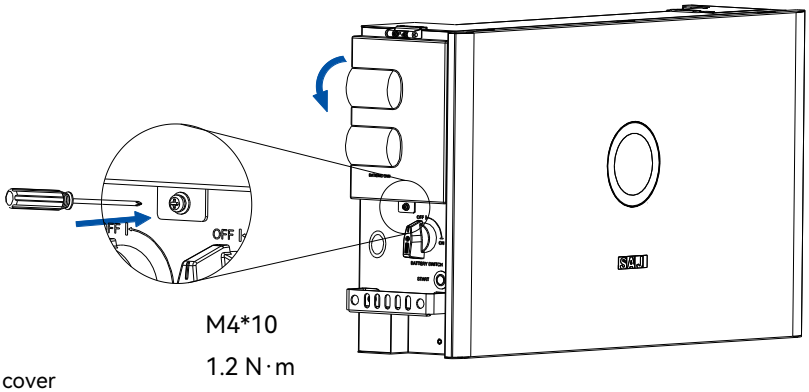


Figure 5.30. Closing the DC-side cover

5.4. System connection

The system connection for the grid system is as below:

Note:

- The backup PE line and earthing bar must be grounded properly. Otherwise, the backup function may be inactive during blackout.
- Connect the CT to the GRID-CT port on the inverter.

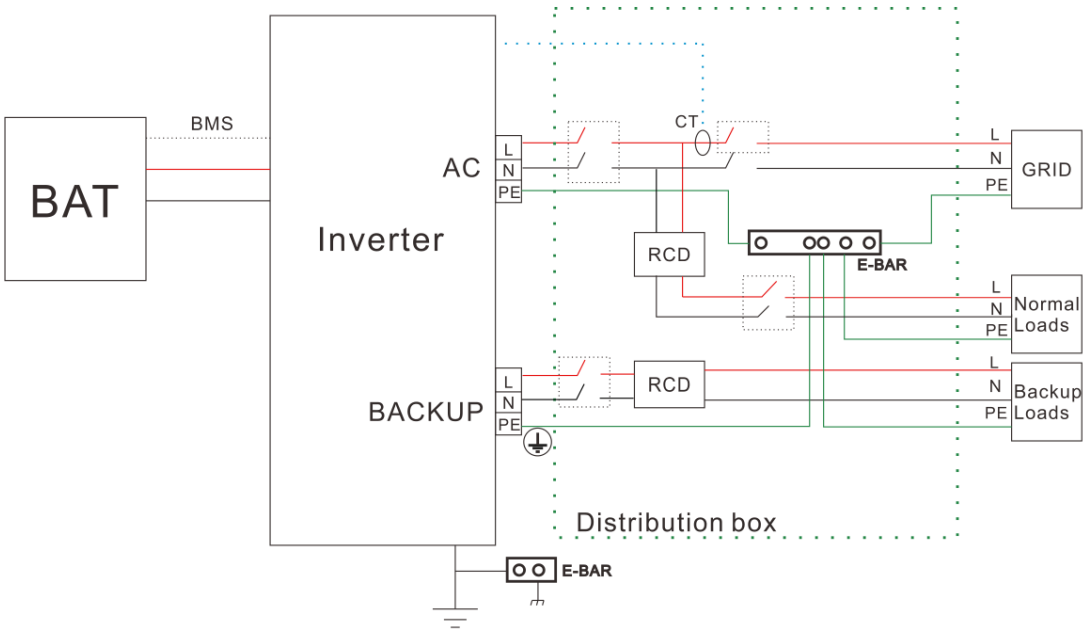


Figure 5.31. System connection

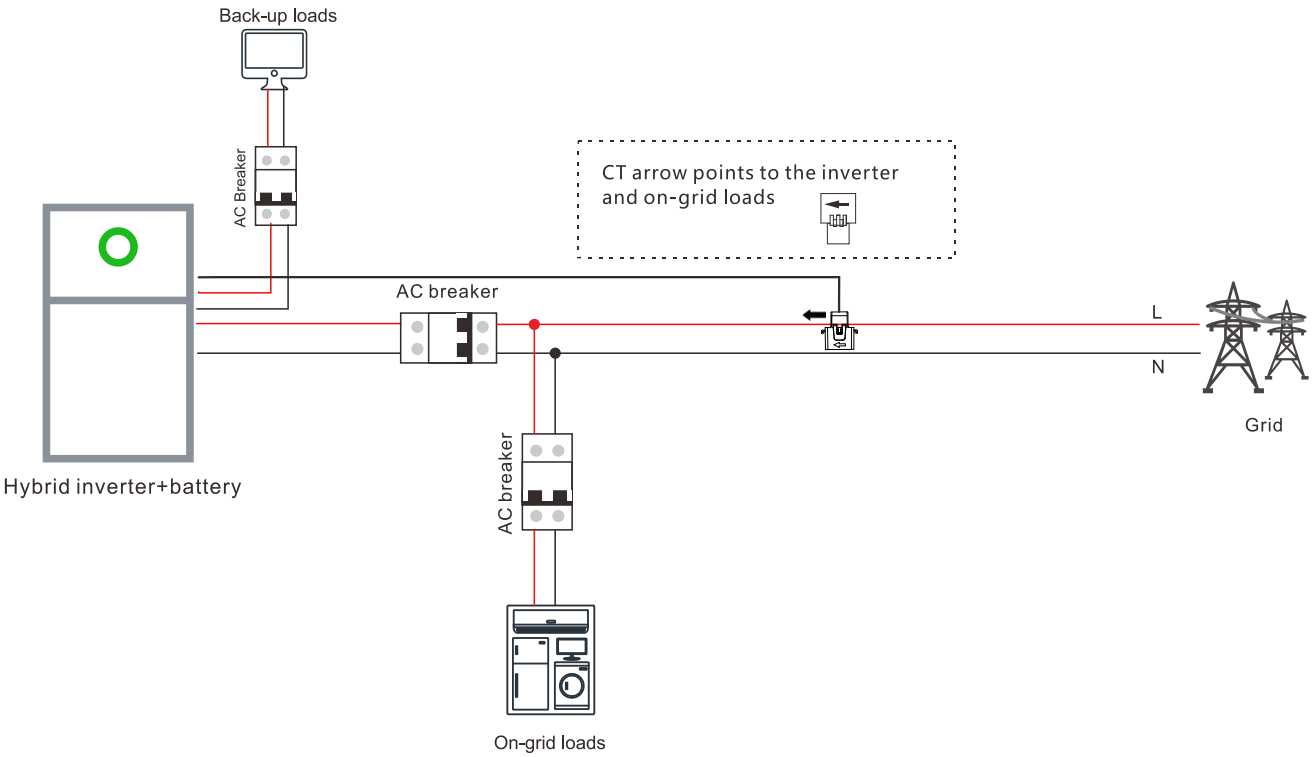
5.5. System connection diagram

The section describes the scenario in which only one AS3 hybrid inverter is used in the ESS. For other scenarios, refer to Chapter "System Connection: Single-phase hybrid inverter" in the *Configuration Instructions*.

- Multiple AS3 inverters (parallel scenario)
- One AS3 inverter working with a solar inverter (AC coupling scenario)
- Multiple AS3 inverters working with a solar inverter (AC coupling + parallel scenario)

■ **One AS3 in the single-phase grid**

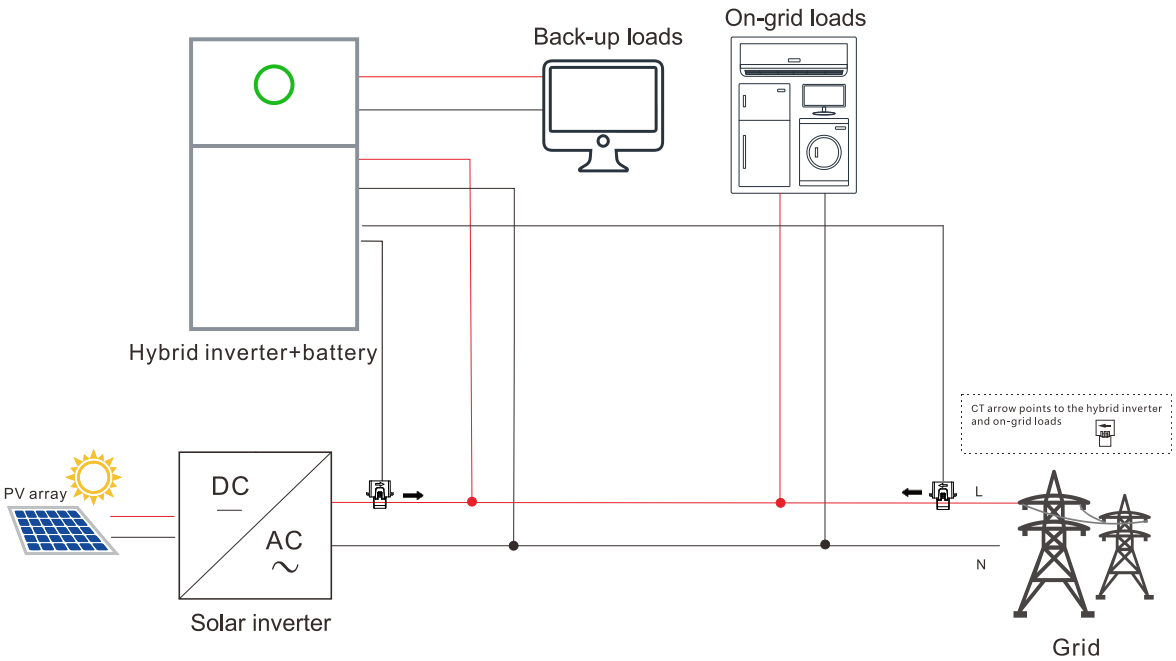
Note: Connect the CT to the GRID-CT port on the inverter.



■ **One AS3 and a solar inverter (AC coupling) in the single-phase grid**

Note:

- Connect the CT on the inverter side to the PV-CT port on the inverter.
- Connect the CT on the grid side to the GRID-CT port on the inverter.



6.

STARTUP AND SHUTDOWN

6.1. Startup

Step 1. Open the AC distribution box. Turn on the circuit breakers of the backup loads and grid.

Step 2. (Optional) If there are multiple battery stacks, turn on the battery switch on the right side of the battery junction box.

Step 3. On the left side of the inverter, perform as follows:

a. Turn on BATTERY SWITCH.

b. Press and hold the START button for five seconds until the LED indicator on the front panel is on .

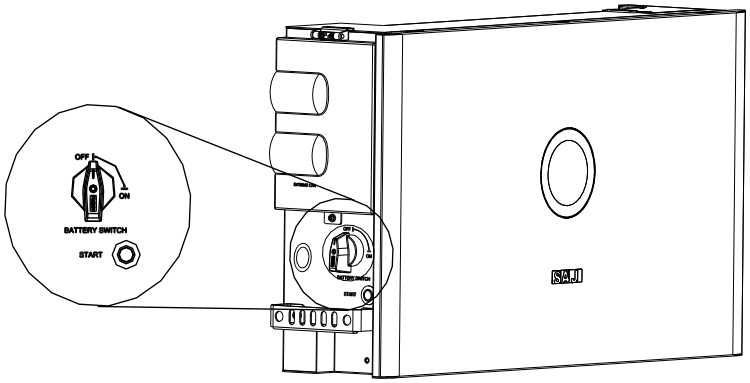


Figure 6.1. Switches on the left side of the inverter

Step 4. Check the LED indicator status on the inverter panel to ensure that the inverter is running properly.

Note: The LED indicator status label is on the left side of the inverter.

6.2. Shutdown

Step 1. Open the AC distribution box. Turn off the circuit breakers of the backup loads and grid.

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

a. 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  .

b. Turn off BATTERY SWITCH.

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
System 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. Detailed operations are as follows: 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 Detailed operations are as follows: Remove foreign objects from the fan. If the abnormal noise persists, replace the fan.	Once every 6 to 12 months
System running status	1. Check whether the inverter is damaged or deformed. 2. Check whether the inverter generates abnormal sound during operation. 3. Check whether all inverter parameters are correctly set during operation.	Once every 6 months
Electrical connection	1. Check whether cables are disconnected or loose. 2. Check whether cables are damaged, especially whether the	6 months after the first commissioning and once every 6 to 12 months after that

	cable sheath that contacts a metal surface is damaged.	
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
15	Master Voltage 10Min High
16	Master OffGrid Voltage Low
17	Master Output_Shorter
18	Master Grid Frequency High
19	Master Grid Frequency Low
21	Master Phase1 DCV Error
24	Master No Grid Error
25	DC ReverseConnect Ersror

Error code	Error message
26	Parallel machine CAN Com Error
27	Master GFCI Error
28	Master Phase1 DCI Error
31	Master ISO Error
33	Master Bus Voltage High
34	Master Bus Voltage Low
37	Master Islanding Error
38	Master HW Bus Voltage High
40	Master SelfTestFailed
41	Master HW Inv Current High
44	Master Grid NE Voltage Error
45	Master Fan1 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
55	BMS Lost.Conn Warn
59	Lost Communication between inverter and PV Meter
60	EV_Lost.Conn Warn
61	Slave Phase1 Voltage High
62	Slave Phase1 Voltage Low
67	Slave Frequency High
68	Slave Frequency Low
69	DCDC_Lost.Conn Warn
70	DCDC_ Device Error
73	Slave No Grid Error
78	Grid Power Emergency Disconnect
81	Lost Communication D<->C
85	Authority expires
86	DRM0 Error

Error code	Error message
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
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

Error code	Error message
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
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
249	Hardware Resonant Chamber Overcurrent Fault
250	Auxiliary Power Source Fault
251	Hardware Protection Signal Fault

Error code	Error message
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
263	Heatsink Temperature Sensor Line Faulty
264	PCB Temperature Sensor Line Faulty
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
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

Error code	Error message
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.

9.1. System

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

Parameter \ Model	AS3-3K-S-(W, G)-P*X*	AS3-3.6K-S-(W, G)-P*X*	AS3-4K-S-(W, G)-P*X*	AS3-4.6K-S-(W, G)-P*X*	AS3-5K-S-(W, G)-P*X*, AS3-5K-S-(W, G)-P*X*- BE	AS3-6K-S-(W, G)-P*X*, AS3-6K-S-(W, G)-P*X*- IE
Battery Port Connection						
Battery Type	LiFePO4					
Rated Voltage [V]	450					
Battery Voltage Range [V]	380–500					
Max. Charging Current [A]	7.9	9.5	10.5	12.1	13.2	• 15.8 • 15.1 (IE model)
Max. Discharging Current [A]	9.2	10	12.4	12.9	• 15.2 • 13.9 (BE model)	• 16.8 • 16 (IE model)
Scalability	Quantity of batteries connecting to one inverter: 1 to 8					
Battery Rated Energy [kWh]	***X***=1: 5.0	***X***=2: 10.0	***X***=3: 15.0	***X***=4: 20.0	***X***=5: 25.0	***X***=6: 30.0	***X***=7: 35.0	***X***=8: 40.0
Battery Usable Energy [kWh]	***X***=1: 4.8	***X***=2: 9.6	***X***=3: 14.4	***X***=4: 19.2	***X***=5: 24	***X***=6: 28.8	***X***=7: 33.6	***X***=8: 38.4
AC Output [On-grid]						
Rated AC Power [W]	3000	3600	4000	4600	5000	• 6000 • 5750 (IE model)
Rated Apparent Power [VA]	3000	3600	4000	4600	5000	• 6000 • 5750 (IE model)
Max. Apparent Power [VA]	3300	3600	4400	4600	• 5500 • 5000 (BE model)	• 6000 • 5750 (IE model)
Rated Output Current [A] @230 V AC	13.0	15.7	17.4	20.0	21.7	• 26.1 • 25 (IE model)
Max. Continuous Current [A]	14.3	15.7	19.1	20.0	• 23.9 • 21.7 (BE model)	• 26.1 • 25 (IE model)
Current Inrush [A]	75					
Max. AC Fault Current [A]	95					
Max. AC Over-Current Protection [A]	26.7	32.2	35.7	41	44.5	53.5
Connection Manner	L+N+PE					
Rated AC Voltage and Range [V AC]	220, 230, 240 180–280					
Rated Output Frequency and Range [Hz]	• 50 Hz, 45–55 • 60 Hz, 55–65					
Total Harmonic Distortion [THDi]	<3%					

Parameter \ Model	AS3-3K-S-(W, G)-P*X*	AS3-3.6K-S-(W, G)-P*X*	AS3-4K-S-(W, G)-P*X*	AS3-4.6K-S-(W, G)-P*X*	AS3-5K-S-(W, G)-P*X*, AS3-5K-S-(W, G)-P*X*- BE	AS3-6K-S-(W, G)-P*X*, AS3-6K-S-(W, G)-P*X*- IE
Power Factor [cos ϕ]	0.8 leading to 0.8 lagging					
AC Input [On-grid]						
Connection Manner	L+N+PE					
Rated AC Voltage / Range [V AC]	220, 230, 240 180–280					
Rated Input Frequency [Hz]	• 50 • 60					
Max. Input Current [A]	28.1① / 13.7②	32.1① / 16.5②	37.4① / 18.3②	41.1① / 21.1	• 46.8① / 22.9② • 44.6① / 22.9② (BE model)	• 53.5① / 27.5② • 51.3① / 26.3② (IE model)
	① Working for both battery charging and the bypass mode. ② Working for battery charging only.					
Max. Input Current (Inrush) [A]	75					
Power Factor [cos ϕ]	0.8 leading to 0.8 lagging					
AC Output [Back-up]						
Max. Apparent Power [VA]	3300	3600	4400	4600	• 5500 • 5000 (BE model)	• 6000 • 5750 (IE model)
Max. Continuous Current [A]	14.3	15.7	19.1	20	• 23.9 • 21.7 (BE model)	• 26.1 • 25 (IE model)
Peak Output Apparent Power [VA]	3600, 60s	4320, 60s	4800, 60s	5520, 60s	6000, 60s	7200, 60s
Connection Manner	L+N+PE					
Rated AC Voltage and Range [V AC]	220, 230, 240 180-280					
Rated Output Frequency/Range [Hz]	• 50 Hz, 45–55 • 60 Hz, 55–65					
Output THDv (@ Linear Load)	<3%					
Max. Output Current (Inrush) [A]	75					
Power Factor [cos ϕ]	0.8 leading to 0.8 lagging					
Efficiency						
Max. Efficiency	97.6%					
Protection						
Battery Input Reverse Polarity Protection	Integrated					
Overload Protection	Integrated					
AC Short Circuit Current Protection	Integrated					
AC Surge Protection	Integrated					
Anti-islanding Protection	Integrated (AFD)					
Connection and Communication						
AC Connection	Plug-in connector (Permanently connected equipment which requires a tool for disassembling)					
Battery Connection	Quick connector					

Parameter \ Model	AS3-3K-S-(W, G)-P*X*	AS3-3.6K-S-(W, G)-P*X*	AS3-4K-S-(W, G)-P*X*	AS3-4.6K-S-(W, G)-P*X*	AS3-5K-S-(W, G)-P*X*, AS3-5K-S-(W, G)-P*X*- BE	AS3-6K-S-(W, G)-P*X*, AS3-6K-S-(W, G)-P*X*- IE
Display	LED + App					
Communication	• Bluetooth (Bluetooth low energy, BLE) • Wi-Fi and Ethernet (W models using the AIO3 module) • 4G (4G models using the 4G module)					
Communication Port	• LAN • CAN • RS485 • Dry contact • CT					
General Parameters						
Topology	Transformer-less					
Operating Temperature Range	-30℃ to +50℃ >45 ℃ derating					
Storage Temperature Range	-10℃ to +40℃					
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]	Inverter: 400*695*170 Battery with base: 420*695*170 Battery without base: 370*695*170					
Weight [kg]	Inverter: 23.9 Battery with base: 53 Battery without base: 52					
Warranty [Year]	Refer to the warranty policy.					

9.2. 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]	4.8
Dimension (H*W*D) [mm]	• With base: 420*695*170 • Without base: 370*695*170

Weight [kg]	• With base: 53 • Without base: 52
Nominal Voltage [V]	450
Operating Voltage [V]	380–500
Max. Charging Current [A]	7.9
Max. Discharging Current [A]	7.9
Battery System Designation	IFpP51/161/120/[(1P16S) XP]M/-30+50/90 (X=1, 2, 3, 4, 5, 6, 7, or 8)
Ingress Protection	IP65
Mounting	• Ground-mounting • Wall-mounting
Operating Temperature Range	-30℃ to +50℃
Storage Temperature Range	-10℃ to +40℃
Relative Humidity (non-condensing)	5–95%
Max. Operating Altitude [m]	3000
Cooling Method	Natural convection
Communication	CAN
Warranty [Year]	Refer to the warranty policy.

9.3. Battery junction box

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

9.4. Charger

Model / Parameter	CU2-7.4K-S-I
Input	
Power supply	1P+N+PE
Rated Voltage [V AC]	230, ± 20%
Rated Current [A]	32
Frequency [Hz]	50/60
Output	
Output Voltage [V AC]	230, ± 20%
Max. Current [A]	32
Rated Output Power [kW]	7
Power Consumption (standby) [W]	7
Efficiency	
Euro Efficiency	≥99%
Power Metering	
Precision	2%
User Interface	
Charging Outlet	Type 2
Housing Material	• Chassis: SGCC (T=1.2 mm) • Cover: SGCC (T=2 mm)
Startup Mode	Plug and Play (PnP) + App
Communication	
Max. RF Output Power	<20 dBm (-10 dBW)
Safety	
Ingress Protection	IP54
Electrical Protection	• Over-current protection • Residual current protection • Surge protection • Over-current and under-voltage protection • Over-frequency and under-frequency protection • Over-temperature protection
Certification	• EN IEC 61851-1: 2019 • IEC 62955: 2018 • EN IEC 61851-21-2: 2021

	• EN 61000-6-1: 2019 • EN 61000-6-3: 2021
Warranty	Refer to the warranty policy.
Environment	
Working Temperature	-30℃ to +50℃
Storage Temperature	-40℃ to +60℃
Ambient Humidity	5-95% non-condensing
Max. Operating Altitude [m]	2000
Cooling Method	Natural convection
Package	
Dimension [mm] (H*W*D)	160*695*170
Weight [kg]	9

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.

10.1. Warranty

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

10.2. Contacting Support

Online technical support: Go to https://www.saj-electric.com/services-support-technical to check FAQs or send your message or product enquiry.

Call for assistance: For SAJ support telephone numbers, see https://www.saj-electric.com/locations for your region support details.

Headquarter: Guangzhou Sanjing Electric Co., LTD.

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

Tel: +86 20 6660 8588

E-mail: service@saj-electric.com

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

10.3. Trademark

SAJ is the trademark of Sanjing.

SAJ

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