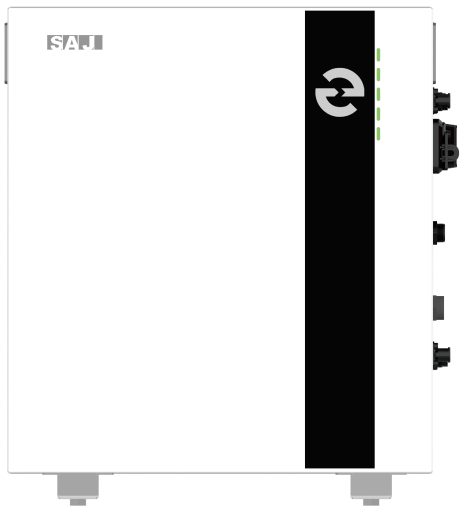
EK60 series

Low-voltage Battery

EK60 B3-5.0-LV
EK60 B3-5.0-LV-Plus
EK60 B3-5.0-LV-Pro

User Manual



Version 1.0

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Warranty

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

About this document

This user manual provides introductions and instructions of operating, maintaining, and troubleshooting the following SAJ product:

- EK60 B3-5.0-LV-(Plus,Pro)

You can find the latest version of this document as eManual at https://www.saj-electric.com/, or scan the QR code below.

Scan for eManuals

Note: Illustrations in this document show only essential details and may differ from the actual product.

Target Audience

This document is applicable to the personnel that transport, install, and operate on the product. The personnel are required to have the following qualifications:

- A certain level of expertise in electronics, electrical wiring, and mechanical knowledge in electrical and mechanical schematics.
- Being familiar with the composition and working principles of the product and its upstream and downstream equipment.
- Professional training related to the installation and commissioning of electrical equipment.
- The ability to respond urgently to dangers or emergencies that may arise during installation or commissioning.
- Being familiar with relevant standards and regulations in the country or region where the project is located.
- Being familiar with the contents in this manual.

Use of the Manual

Read the user manual carefully before any installation, operation and maintenance and follow the instructions during installation and operation. Always keep the printed manual available for future reference.

Levels of Warning Messages

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, will result in serious injury or moderate injury.

CAUTION

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

NOTICE

Indicates a situation which, if not avoided, can result in property damage.

Revision history

Version	Date	Changes
V1.0	2026-9-24	Second version. Updated contents of the following sections: 2.1. General introduction *(on page 6)*, 2.4. Electrical terminals *(on page 8)*, 2.5. LED indicators *(on page 9)*, 5.3. Communication connection *(on page 28)*, 5.5. Connect battery to inverter *(on page 30)*, 8.2. Troubleshooting *(on page 48)*, and 9. Product specification *(on page 51)*.
V0.0	2026-08-29	First version.

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1. Safety instructions

1.1. Safety symbols

Symbol	Description
	**Danger:** Electrical shock hazard This device is directly connected to public grid and thus all work to the system shall only be carried out by qualified personnel.
	**Danger:** Hot surface The components inside the battery will release a lot of heat during operation. Do not touch metal plate housing during operating.
	**Danger:** Risk of electric shock from energy stored in capacitor. Do not open the cabinet door until 5 minutes after disconnecting all sources of supply.
	**Warning:** No open flames Do not place or install near flammable or explosive materials.
	**Caution** Keep the product out of reach of children.
	**Caution:** Check the user manual before service If an error has occurred, refer to the troubleshooting instructions to remedy the error.
	**Caution** This device shall NOT be disposed of in residential waste.
	**Caution** This battery module shall NOT be disposed of in residential waste.
	**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. Battery safety instructions

DANGER

Risk of electric shock, short circuit, or equipment damage

Performing operations on live / defective equipment or improper grounding connection cause electric shock.

- 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.
- Keep the power off prior to any operations.
- 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.

DANGER

Risk of reduced life cycle, fire, or explosion

Excessive heat or direct exposure to heat sources destabilizes the battery chemistry.

- Do not expose the battery to temperatures more than 50℃.
- Do not place the battery near a heat source, such as direct sunlight, a fireplace.
- Keep inflammable and explosive dangerous items or flames away from the battery.

DANGER

Risk of short circuit, corrosion, internal damage, or malfunction

Water, moisture, or specific corrosive gases can damage electronics and battery components.

- Do not soak the battery in water or expose it to moisture or liquids.
- Do not use the battery in areas where the ammonia content of the air exceeds 20 ppm.

WARNING

Severe injury, death, equipment damage, system failure, and voided warranty

Improper handling by unqualified individuals can lead to electrical hazards.

- Only qualified personnel with a thorough understanding of local safety regulations and battery standards may install, maintain, remove, or dispose of this product.
- **SAJ** Electric shall not be held liable for any loss or warranty claims resulting from unauthorized product modifications that could lead to fatal injury, harm to third parties, or impaired equipment performance.
- 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.

WARNING

Risk of fire, explosion, severe burns, equipment destruction

Short circuit allows high current to flow and generate intense heat.

- To ensure personal and property safety, never short-circuit the positive (+) and negative (-) terminals.

⚠ CAUTION

System malfunction, accelerated battery degradation, risk of overheating, and potential safety hazards

Incompatible components or mixed battery types can lead to improper charging/discharging, voltage imbalance, and communication failures.

- Use this battery only with inverters specified as compatible by the manufacturer.
- Do not mix batteries of different models or specifications in a single energy storage system.

NOTICE

For optimal performance and safety, use batteries from the same production batch to minimize the risk of operational abnormalities.

1.3. Emergency

Despite its careful and professional protection design against any hazards, damage of the battery may still be possible. The causes, potential hazards, and handling measures of damaged batteries are as follows.

Risk of Electrolyte Leakage and Hazardous Gas Release

- **Causes:** Battery rupture may occur due to mechanical damage or excessive internal pressure, resulting in the leakage of electrolyte and the release of hazardous gas.
- **Hazards:** The battery electrolyte is corrosive and flammable. Toxic gases released can cause irritation to the skin and eyes, as well as discomfort upon inhalation.
- **Response Measures:**
  - **General Handling Procedures for a Damaged Battery:**
    - Do not open the damaged battery.
    - Avoid causing further damage (e.g., shock, impact, crushing, or trampling).
    - Keep the damaged battery away from water sources, unless water is necessary to prevent an energy storage system fire.
    - Do not expose the damaged battery to direct sunlight to prevent internal overheating.
  - **Emergency Procedures for Electrolyte Leakage or Gas Release:**
    - 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.
    - Fire response: If a fire occurs within the battery pack area, extinguish it using an FM-200 or Carbon Dioxide (CO_2) fire extinguisher. Always wear a gas mask to avoid inhaling toxic gases and harmful combustion products.
    - If the fire is not caused by battery and has not yet spread to the battery, use an ABC-type fire extinguisher.

Risk of Fire and Explosion

- **Causes**: Batteries present a risk of fire or explosion if subjected to damage, misuse, or improper handling.
- **Hazards:** Such incidents can result in rapid fire spread, the release of toxic fumes, and potential projectile hazards from battery rupture.
- **Response Measures:**

- 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 already on fire, do not attempt to extinguish the fire. Evacuate the crowd immediately.
- If a fire occurs within the battery pack area, extinguish it using an FM-200 or Carbon Dioxide (CO_2) fire extinguisher. Always wear a gas mask to avoid inhaling toxic gases and harmful combustion products.
- If the fire is not caused by battery and has not yet spread to the battery, use an ABC-type fire extinguisher.

1.4. Recycling and disposal

NOTICE

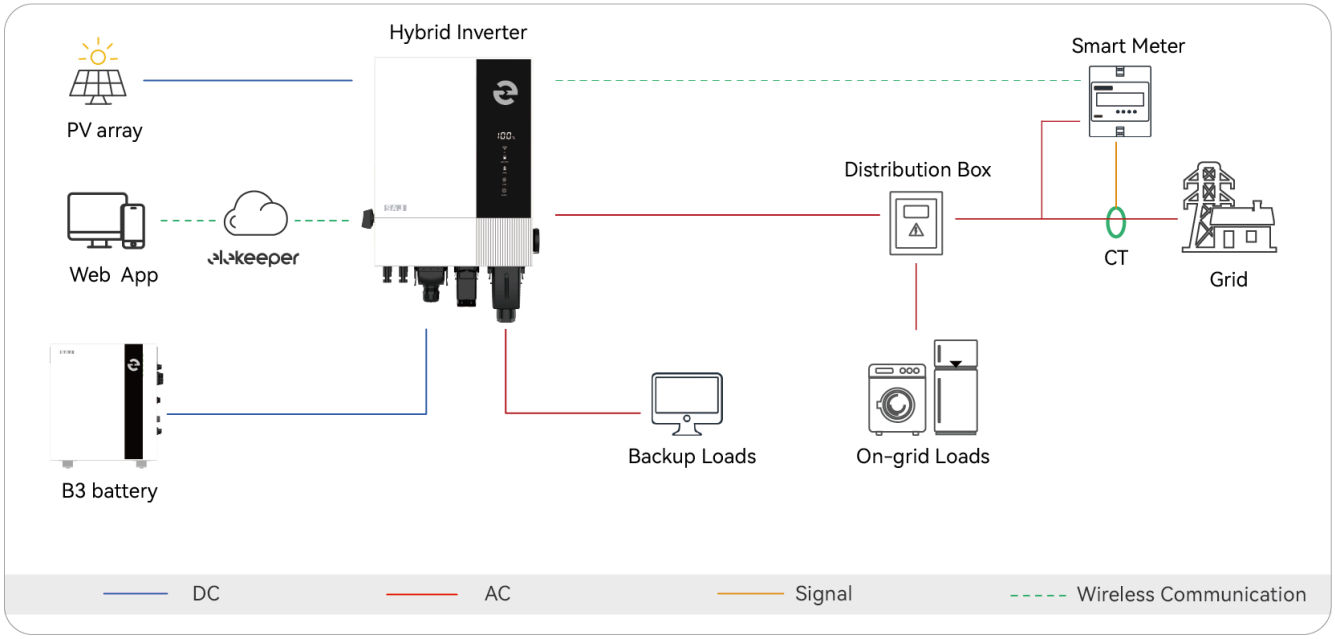
This product should not be disposed as a residential waste.

Some components inside the equipment can be recycled and reused, while others may pose a pollution risk to the environment. Please contact a locally authorized professional recycling agency for the proper handling of the product and its internal components.

2. Product introduction

2.1. General introduction

- The battery is applied to the residential photovoltaic energy storage system which stores electricity for future use.
- The battery is a low voltage battery system and employs modular design for easy installation and wiring.
- The battery 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.
- The battery can only operate with inverters that support the Pylontech 2.0 protocol, such as SAJ H2 low voltage series hybrid inverter.



2.2. Product model

Model description

EK60 B3 - 5.0 - LV - (Plus / Pro)
① ② ③ ④ ⑤

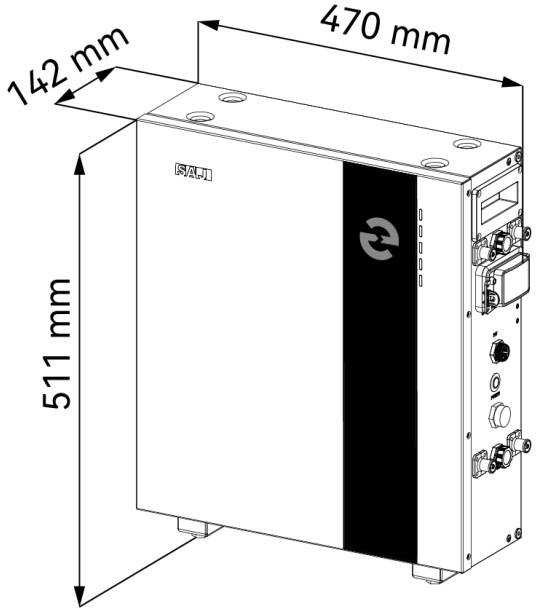
①	**EK60**	Product series.
②	**B3**	Battery model.
③	**5.0**	The nominal energy of the battery is 5 kWh.
④	**LV**	Low-voltage battery.
⑤	/	It can be blank, denoting the standard basic model.
	Plus	Upgraded model with fire protection module.
	Pro	Premium model with fire protection module and heating film.

Product models

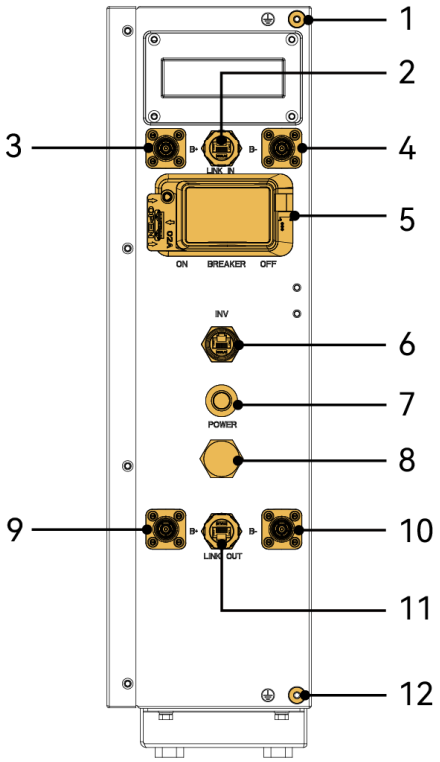
- EK60 B3-5.0-LV
- EK60 B3-5.0-LV-Plus
- EK60 B3-5.0-LV-Pro

2.3. Dimensions

Dimensions: (H*W*D): 511*470*142 mm

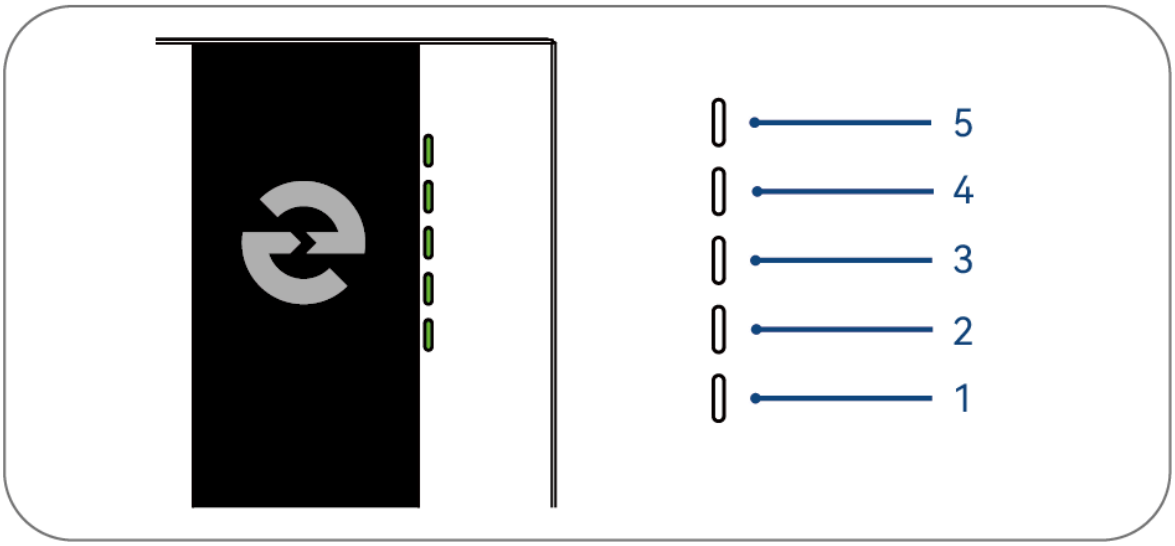


2.4. Electrical terminals



Callout	Silkscreen	Description
1	⏚	Protective earth (PE) port for connecting the battery to the ground.
2	**LINK IN**	Communication port for single-stack or multi-stack parallel configuration.
3	**B+**	Positive battery terminal for connecting the battery to an inverter.
4	**B-**	Negative battery terminal for connecting the battery to an inverter.
5	**BREAKER**	Circuit breaker to protect the battery from overcurrent and short-circuit conditions.
6	**INV**	Communication port for connecting the battery to an inverter.
7	**POWER**	Switch to power on/off the battery.
8	⬡	Explosion-proof vent valve.
9	**B+**	Positive battery terminal for connecting the battery to the next battery in parallel configuration.
10	**B-**	Negative battery terminal for connecting the battery to the next battery in parallel configuration.
11	**LINK OUT**	Communication port for single-stack or multi-stack parallel configuration.
12	⏚	Protective earth (PE) port for connecting the battery to the next battery in parallel configuration.

2.5. LED indicators



Green lights (normal status)

Status	SOC	Description
Light 1 on	10-20%	• Solid on: The battery is charging or in no-charge / no-discharge state. • Last light breathing: The battery is discharging. For example, when lights 1-2 are solid on and light 3 is breathing, it indicates that the battery is discharging with SOC of 40-60%. • All lights breathing: The battery is standby. For example, when lights 1-3 are breathing, it indicates that the battery is standby with SOC of 40-60%.
Lights 1-2 on	20-40%	
Lights 1-3 on	40-60%	
Lights 1-4 on	60-80%	
Lights 1-5 on	80-100%	
Lights 1-5 chasing	/	Upgrade in progress. Do not power off during upgrade.

Table 2.1. Descriptions of green lights

Yellow lights (abnormal status)

Status	SOC	Description
Light 1 flashing (3s interval)	/	The battery voltage is low and forced charging is required.
Light 1 on	0-20%	• Solid on: A communication error occurred. • Flashing (1s interval): The battery is charging at a low temperature.
Lights 1-2 on	20-40%	
Lights 1-3 on	40-60%	
Lights 1-4 on	60-80%	

Status	SOC	Description
Lights 1-5 on	80-100%	

Table 2.2. Descriptions of yellow lights (abnormal status)

Red lights (warning or fault status)

Status	SOC	Description
Light 1 on	0-10%	Low battery charge. • Solid on: The battery is charging or in no-charge / no-discharge state. • Breathing: The battery is discharging or standby.
All lights on	/	A protection fault occurred, excluding the following special faults: • The battery is charging at a low temperature. • The battery voltage is low and forced charging is required.

Table 2.3. Descriptions of red lights (warning or fault Status)

3. Transportation and storage

3.1. Transportation safety instruction

WARNING

- The product has passed the UN38.3 test and meets the transportation requirements for dangerous goods, including lithium-ion batteries.
- The transportation service provider must be qualified to transport dangerous goods.
- Before transportation, check that the battery package is intact and that there are no abnormal odour, leakage, smoke or signs of burning. Otherwise, the batteries must not be transported.
- Keep no more than 6 cartons of batteries in one stack during transportation.
- Do not place other items on top of the battery during transportation.
- Load or unload batteries with caution. Otherwise, the batteries may short circuit or become damaged like leakage or cracking, catch fire or explode.
- When using hand truck to transport the battery, place the battery evenly and securely. Otherwise, the hand truck may tip over, leading to personal injury or battery damage.

NOTICE

After installing the battery on site, keep the original packaging containing the lithium-ion battery identification. When the battery needs to be returned to the factory for repair, use the original packaging to transport it.

3.2. Storage safety instruction

WARNING

- Store the battery in a dry and ventilated environment and keep it away from heat sources.
- For daily use or short-term storage, keep the battery at temperatures between -10℃ and 50℃, with relative humidity from 0% to 95%.
- For long-term storage (3–6 months), store the battery at temperatures between -20℃ and 25℃, and keep relative humidity below 85%.
- Avoid rapid temperature changes to stop moisture from forming inside the device. Condensation can cause short circuits, corrosion, or failure.

NOTICE

- When shipped from the factory, the battery retains 40% of its charge.
- The State of Charge (SOC) decreases over time during storage. If the remaining battery voltage falls below the required startup voltage, the battery may become damaged.
- To check operation, close the circuit breaker and press the switch. A solid green light indicates normal operation. A solid red or yellow light indicates malfunction.
- The battery should be installed within 6 months and used only with compatible inverters.
- This battery must not be disposed of as household waste. Once the battery reaches the end of its service life, it does not need to be returned to the dealer or **SAJ**, but must be taken to a designated waste lithium battery recycling facility in your area.

4. Installation

4.1. Safety instruction

DANGER

Risk of fatal electric shock

Battery terminals and cables may be energized at lethal voltages when the inverter is off.

- Disconnect all AC and DC power sources before installation.
- Verify no voltage is present using a voltmeter.
- Never handle terminals or tools with wet hands or while standing on a wet surface.
- Remove all rings, watches, and other metal objects before installation.
- Use insulated tools and wear personal protective equipment.

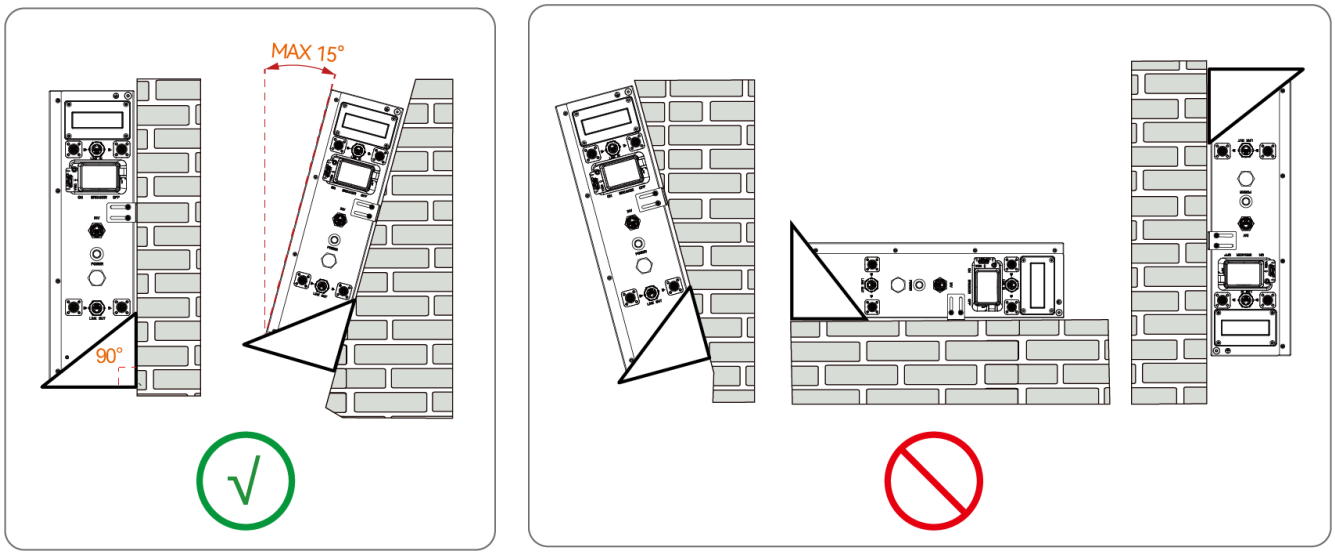
4.2. Installation environment requirements

- 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. The installation site must be at least 1.2 meters away from the emergency exit.
- 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.
- For outdoor installation, keep the device away from direct sunlight, rain and snow.
- Keep the air inlet and outlet at the installation site clear. If natural airflow is insufficient, add extra ventilation and consult SAJ for assistance.
- Ensure the inverter is installed in a well-observed area where the LED display panel can be easily read for real-time status check.

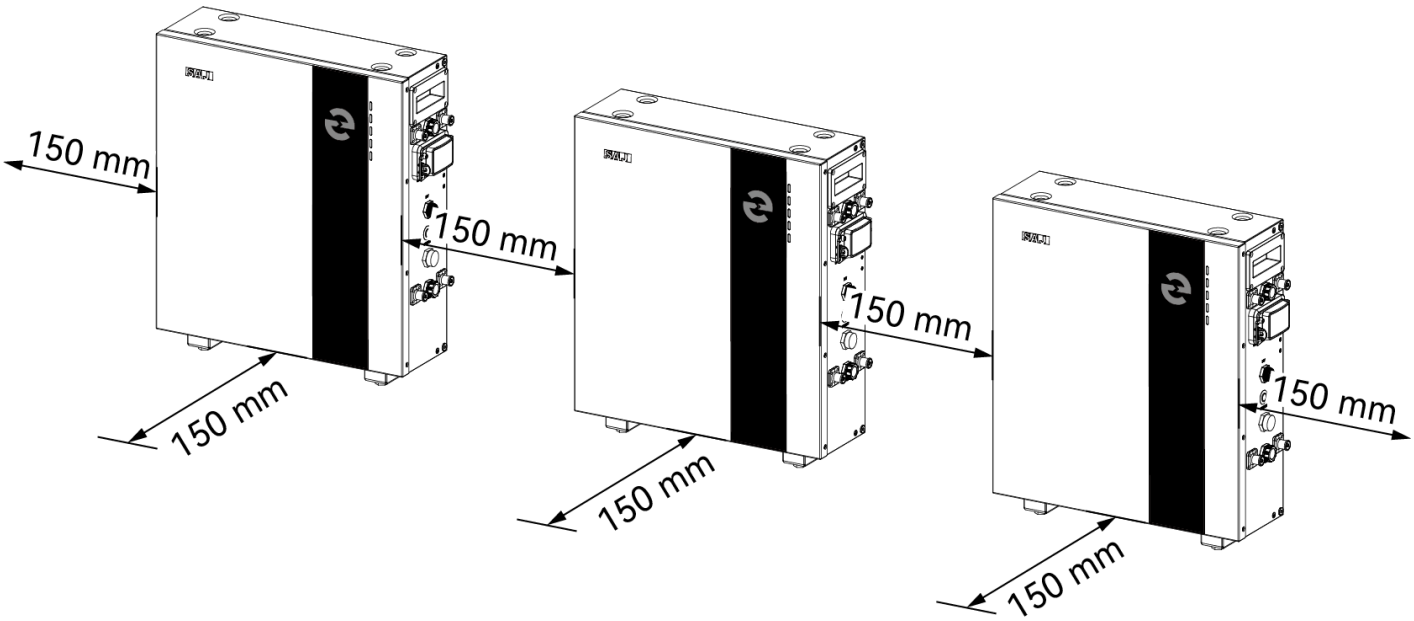


4.3. Installation location requirements

- The device employs natural convection cooling and must be installed in a non-habitable indoor location.
- To prevent overheating of the device, install the device in an environment with an ambient temperature preferably below 40 °C. Keep the battery at least 1 m away from heat sources.
- For wall-mounting method, choose a solid and smooth wall to ensure that the device can be installed securely on the wall. Make sure that the wall can bear the weight of the device and accessories.
- Install the device vertically. Do not install it forward-tilted, horizontally or upside down.



- Reserve enough clearance around the device to ensure a good air circulation at the installation area, especially when multiple devices need to be installed in the same area.



4.4. Installation tools

Installation tools include but are not limited to the following recommended ones. Use other auxiliary tools on site if necessary.

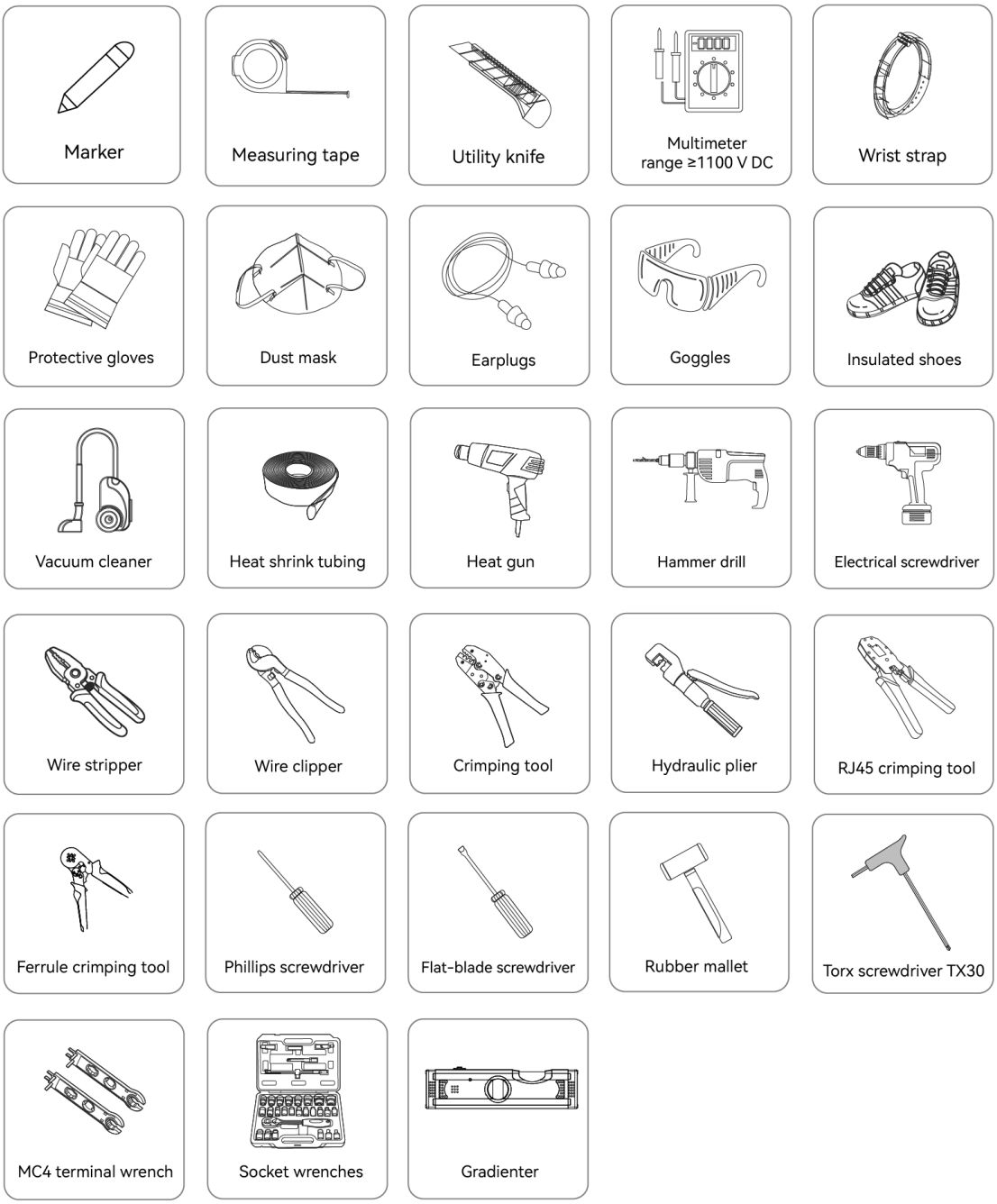


Figure 4.1. Suggested installation tools

4.5. Unpacking

Procedure

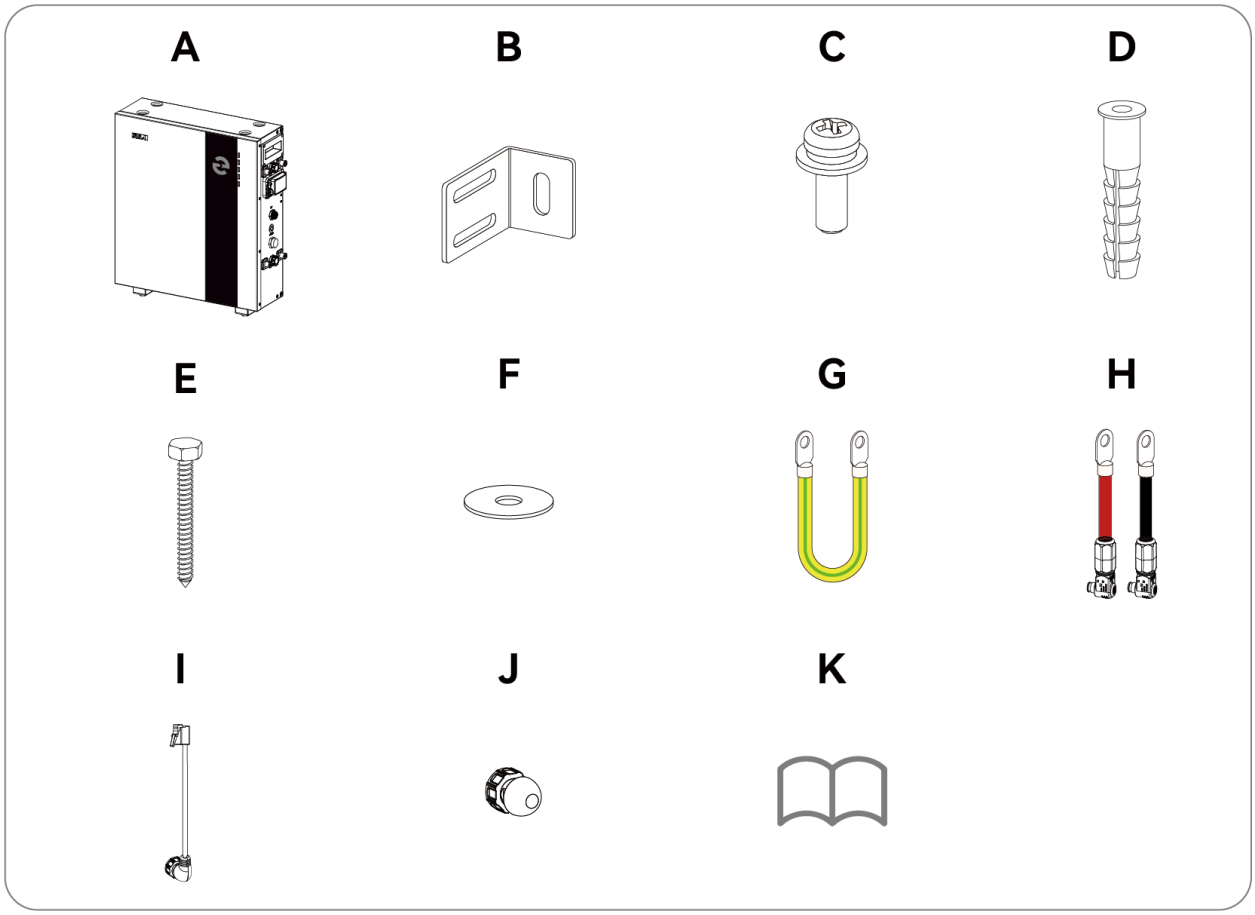
1. Check the outer packing.
   a. Check the outer packing package for any damage, such as holes and cracks.
   b. Check whether the equipment model is what you requested or not.

   Note: 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.
2. Check the package contents.
   a. Verify that the shipment contains everything that you expected to receive. Contact after sales if there are missing or damaged components.
   b. Place the accessories separately to avoid confusion.

4.6. Packing list

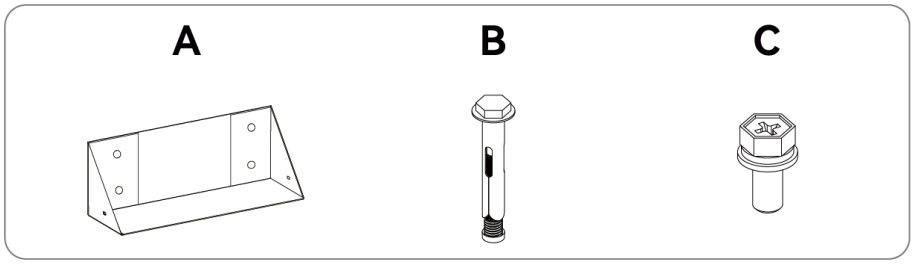
Single battery pack

- For floor-standing installation



Number	Quantity	Designation
A	1	Battery pack
B	2	Locking bracket
C	4	M4×12 screw for locking bracket
D	2	M6×80 expansion tube for locking bracket
E	2	M6×80 screw for locking bracket
F	2	M6×80 flat washer for locking bracket
G	1	Grounding cable with cable lugs
H	1	Positive and negative power cables
I	1	Communication cable
J	1	Communication port RJ45 plug
K	1	Documentation

- Additional accessories for wall-mounting installation



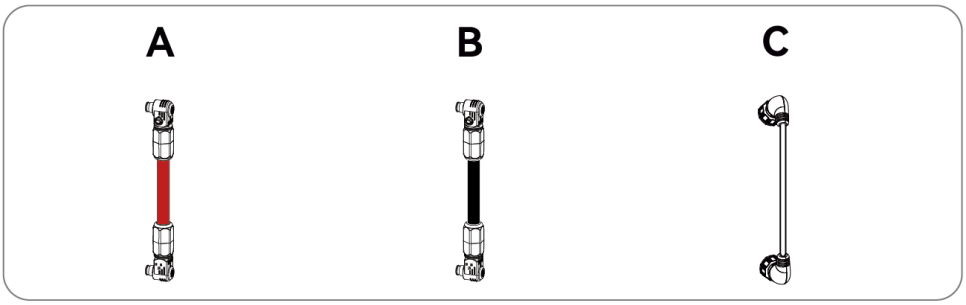
Number	Quantity	Designation
A	1	Wall-mounting bracket
B	4	M12×80 expansion bolt for wall-mounting bracket
C	2	M4×12 screw for wall-mounting bracket

Multiple battery packs

Additional accessories are provided for parallel connection of multiple battery packs.

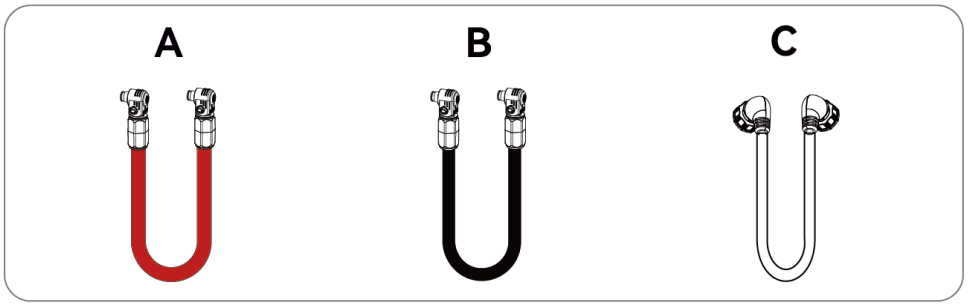
Note: Actual quantities shall be subject to delivered goods.

- For parallel configuration (≤3 batteries)



Number	Designation
A	Positive power cable for parallel connection of battery packs within one stack
B	Negative power cable for parallel connection of battery packs within one stack
C	Communication cable for parallel connection of battery packs within one stack

- Additional accessories for parallel configuration (≥3 batteries)

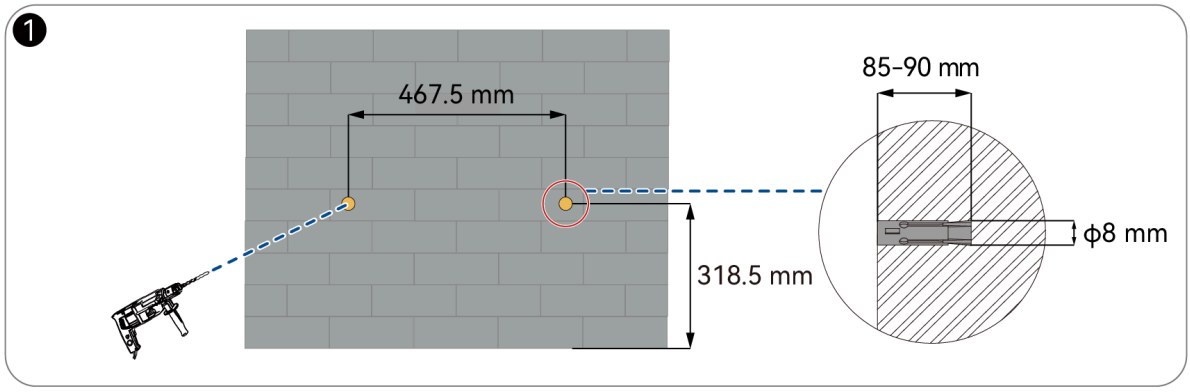


Number	Designation
A	1.5 m positive power cable for parallel connection between battery stacks
B	1.5 m negative power cable for parallel connection between battery stacks
C	1.5 m communication cable for parallel connection between battery stacks

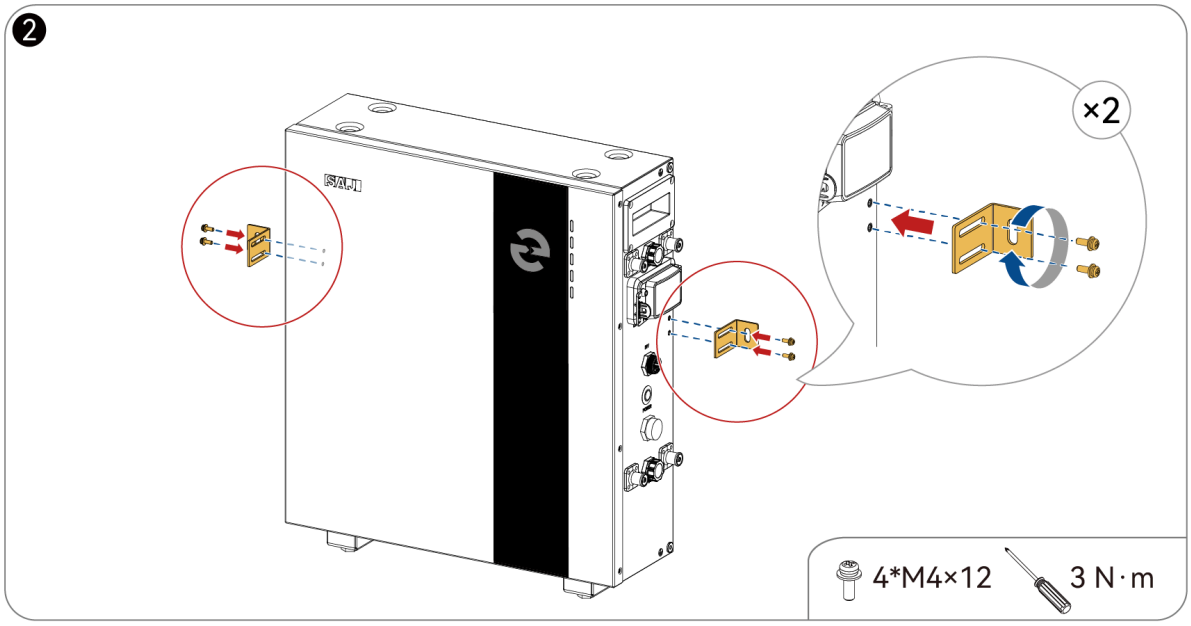
4.7. Install battery on the floor

Procedure

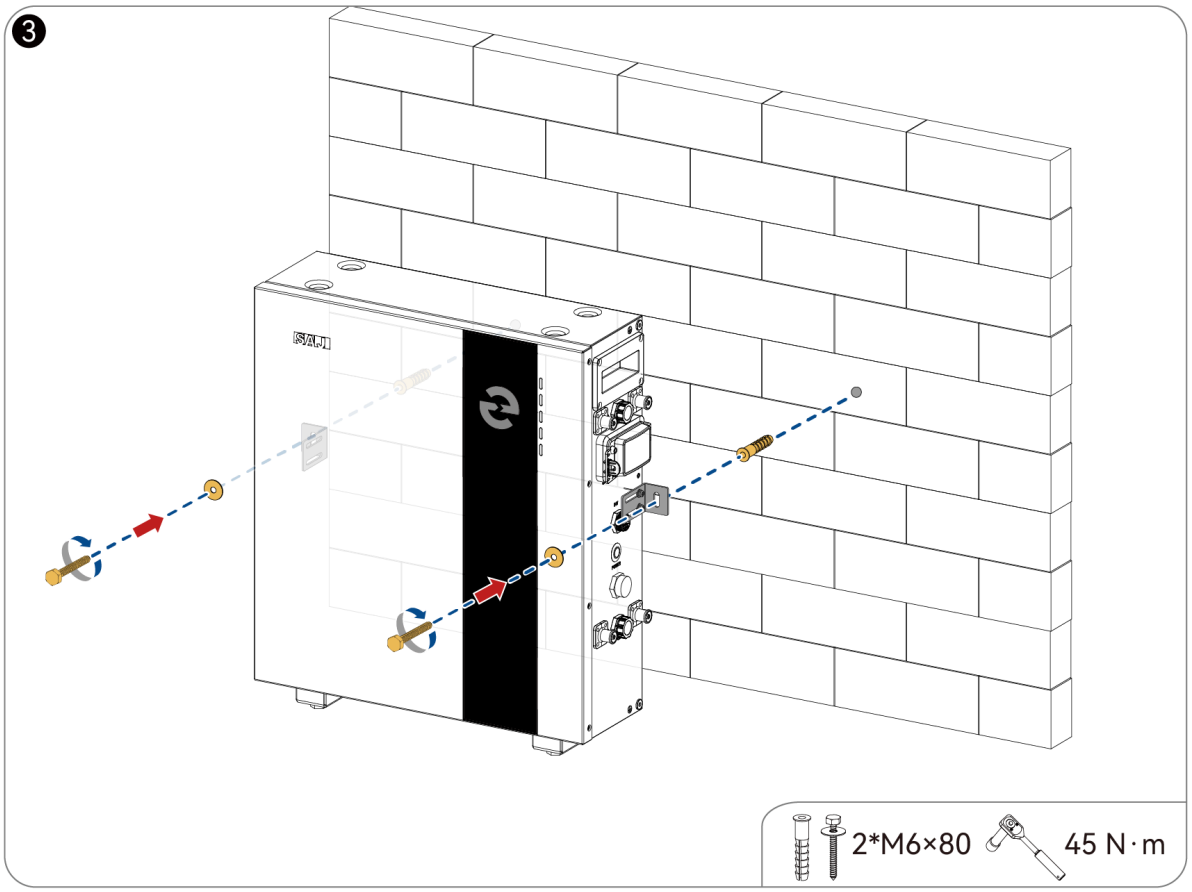
1. Mark and drill two holes on the wall.



2. Secure a locking bracket to each side of the battery.



3. Move the battery to align both locking bracket holes with the drilled holes. Insert two expansion screw sets into the holes and tighten the screws firmly with a socket wrench.

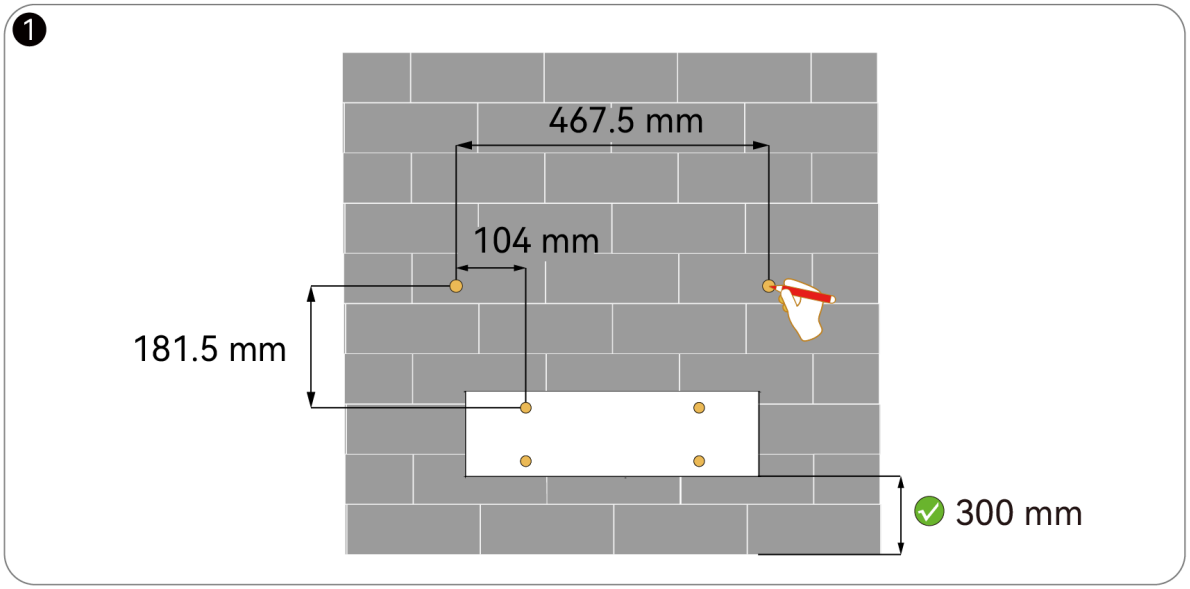


4.8. Install battery on the wall

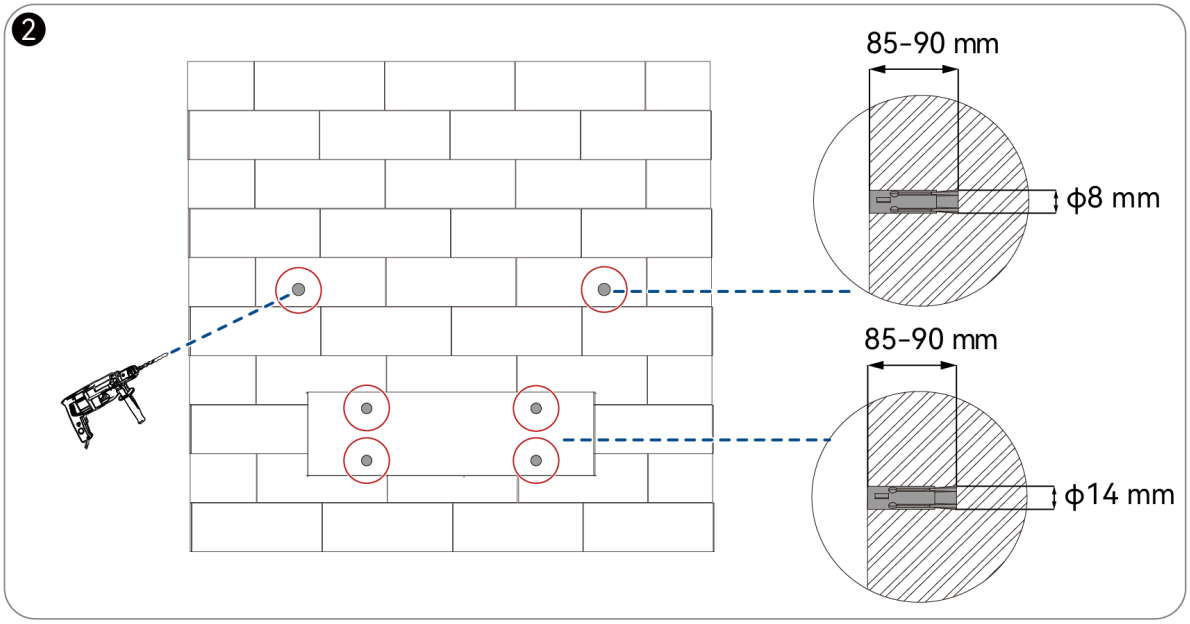
Procedure

1. Use a level gauge to position the wall-mounting bracket against the wall at the desired height. Mark four holes on the wall through the wall-mounting bracket. Then, mark another two holes for the locking brackets.

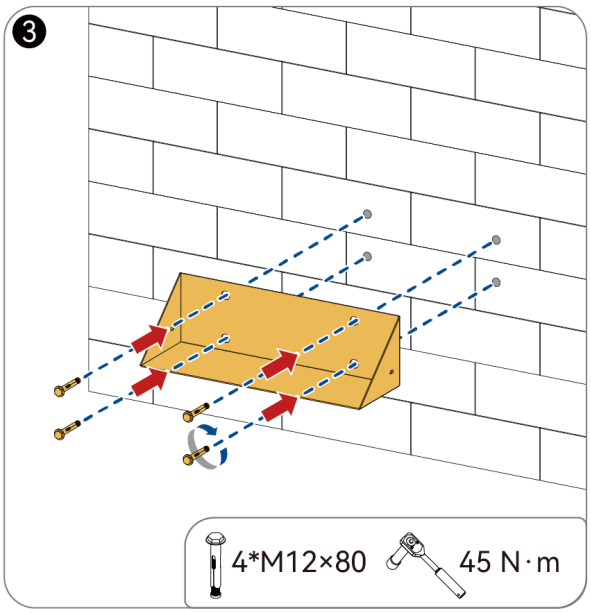
> **⚠ CAUTION**
>
> The recommended height for the mounting bracket is 300 mm.

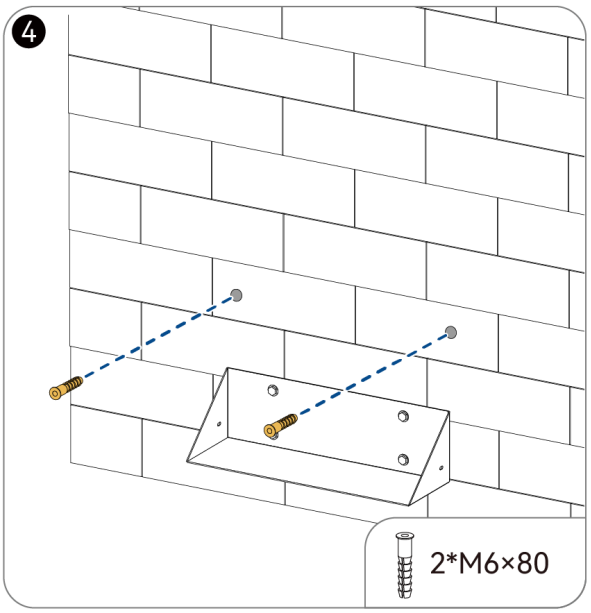


2. Drill six holes according to the marks.

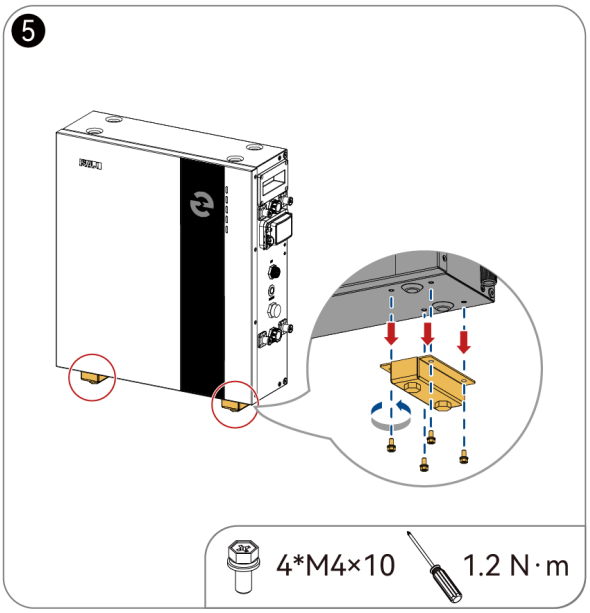


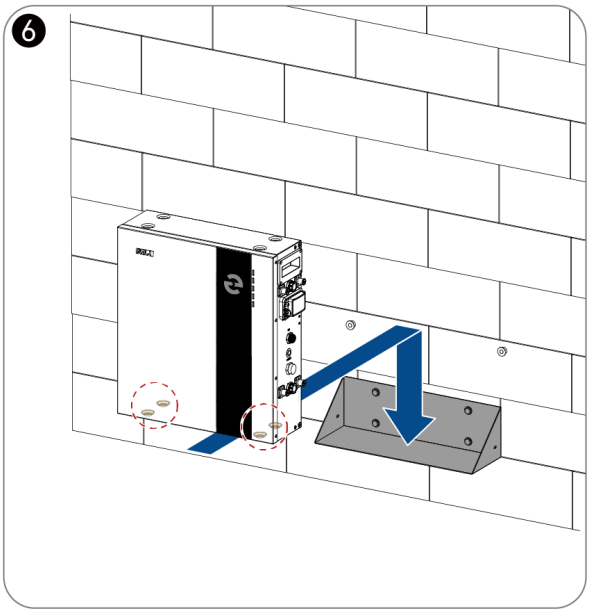
3. Align the wall-mounting bracket with the four lower holes. Insert an expansion bolt into each hole. Tighten the bolts to secure the bracket against the wall.
4. Insert two expansion tubes into the two upper holes.



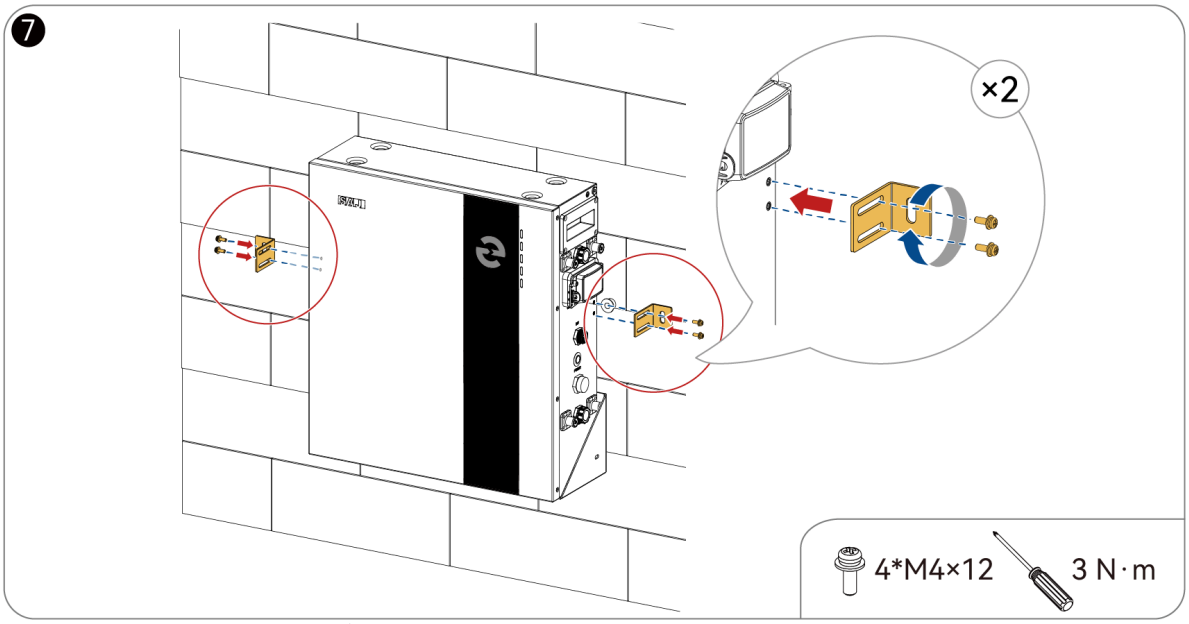


5. Loosen the four screws on the base and remove the base.
6. Place the battery onto the wall-mounting bracket.

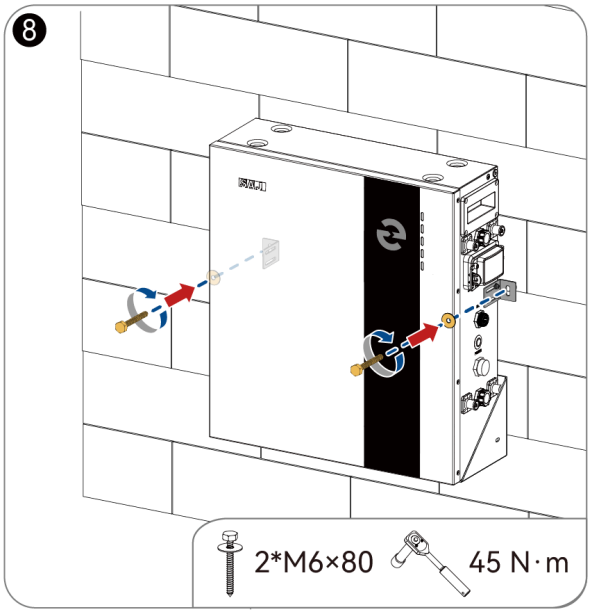


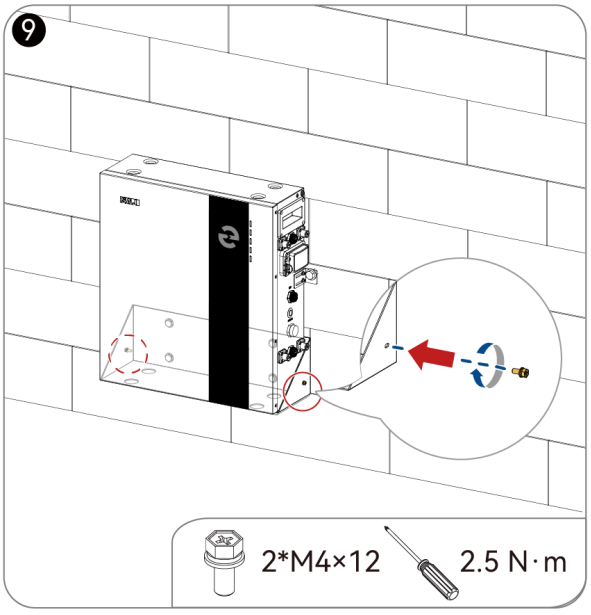


7. Secure a locking bracket to each side of the battery.



8. Align both locking bracket holes with the drilled holes. Insert two screws into the holes and tighten them firmly with a socket wrench.
9. Insert a screw to each side of the bracket to secure the bracket and battery.





5. Electrical connection

5.1. Safety instruction

DANGER

Dangerous to life due to potential fire or electric shock

- Electrical connection must only be performed by professional technicians.
- Before connecting, necessary protective equipment must be used by technicians including insulating gloves, insulating shoes, and safety helmet.
- Before connecting, ensure the battery system is powered off.
- When it is powered on, the equipment should be in conformity with national rules and regulations.
- Any improper operation during cable connection may cause short citcuit, device damage or personal injury.

WARNING

Risk of electric shock and burn

Improper wiring or connection can cause overheating, arcing, or fire.

- Ensure all connections are clean, tight, and torque to the manufacturer's specification.
- Use only cables of the correct gauge and type as specified.
- Observe correct polarity (+/-). Reverse polarity can permanently damage equipment.

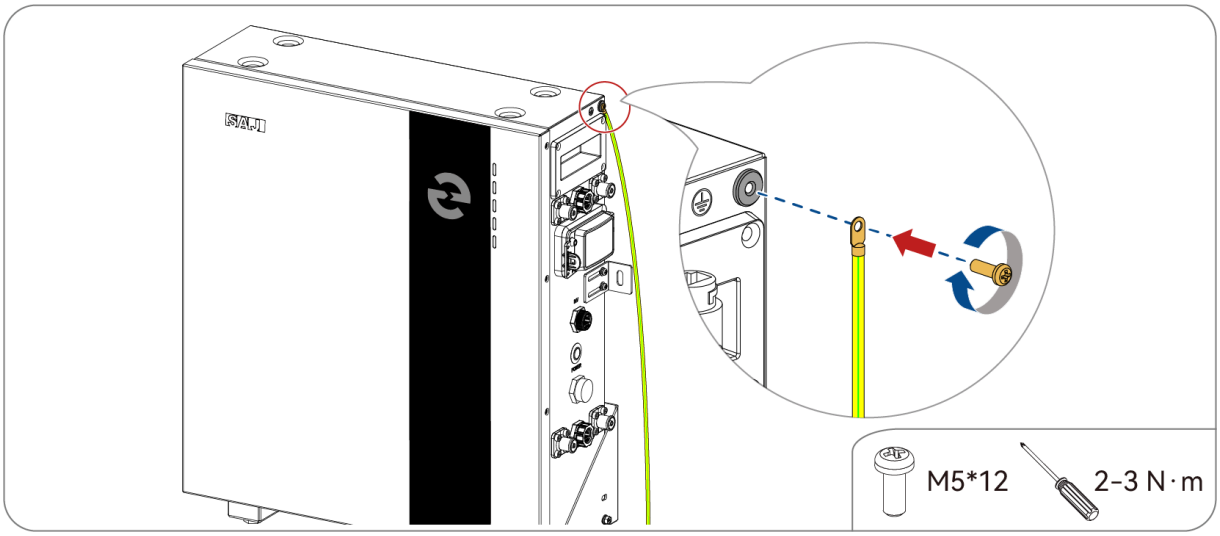
5.2. Grounding connection

CAUTION

The grounding cable must be connected before other electrical connections. The grounding cable is provided in the product package.

Procedure

1. Pass the screw through the cable lug and fasten it to the grounding terminal to secure the grounding cable in place.



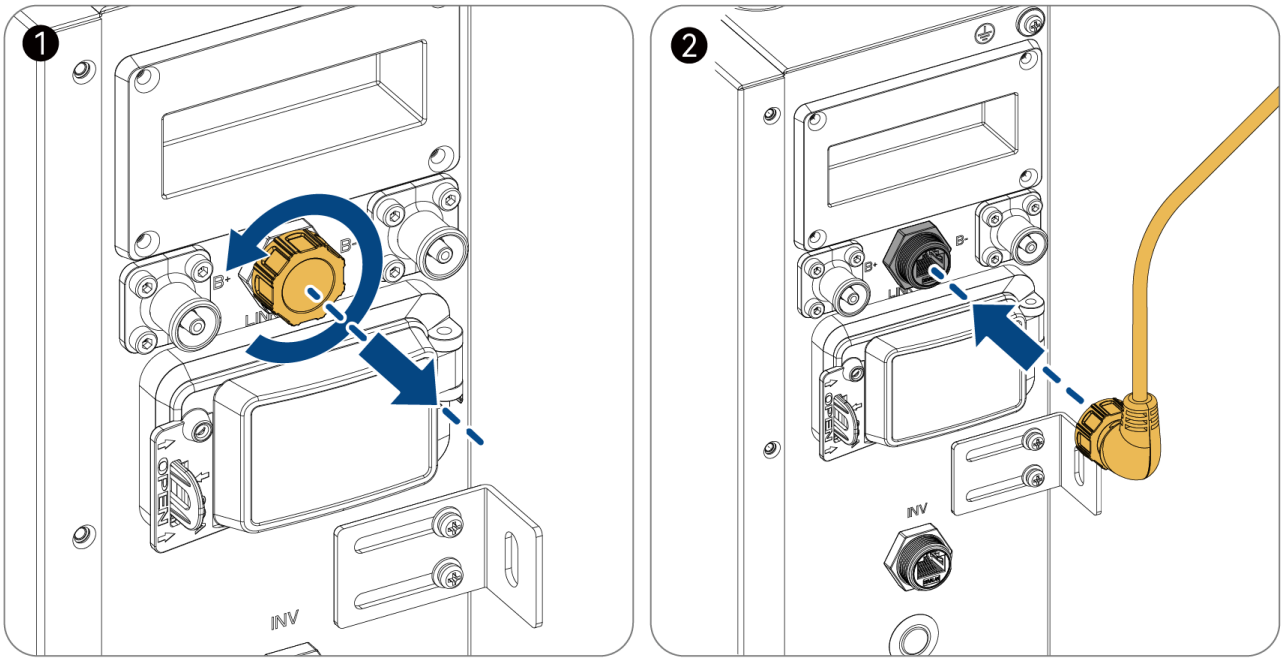
2. Connect the other end of the grounding cable to the PE busbar.

5.3. Communication connection

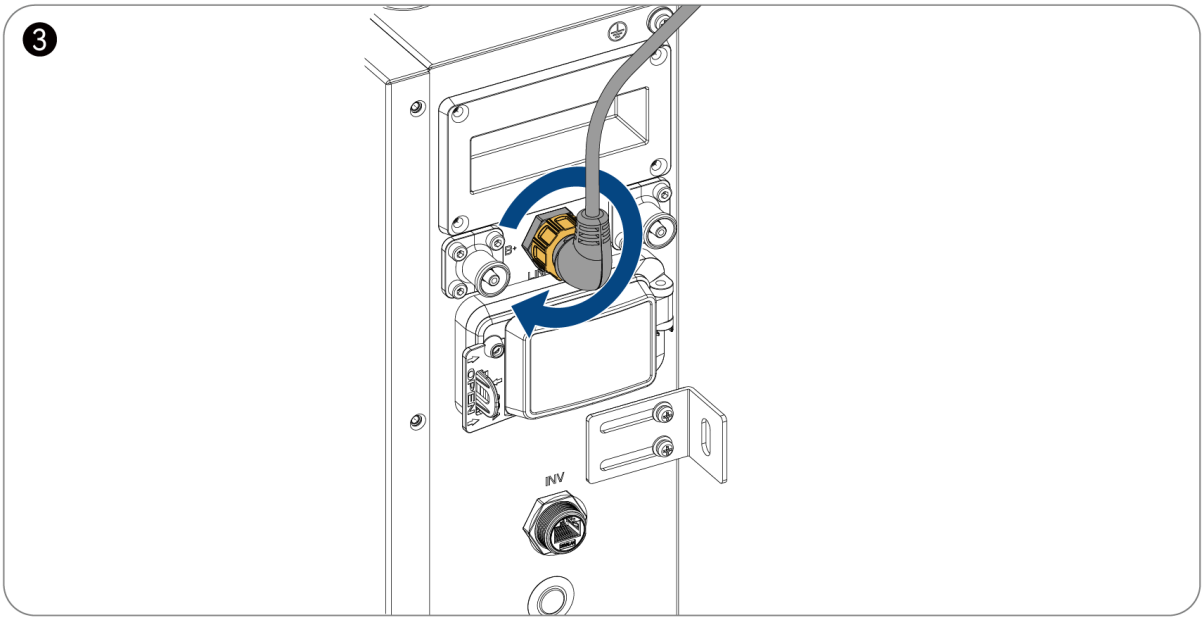
Follow the steps to assemble the communication cable and connect it to one of the communication ports. This section uses **LINK IN** as an example.

Procedure

1. Loosen the lock nut of the port.
2. Take the communication cable out of the package. Insert the communication cable into the port.



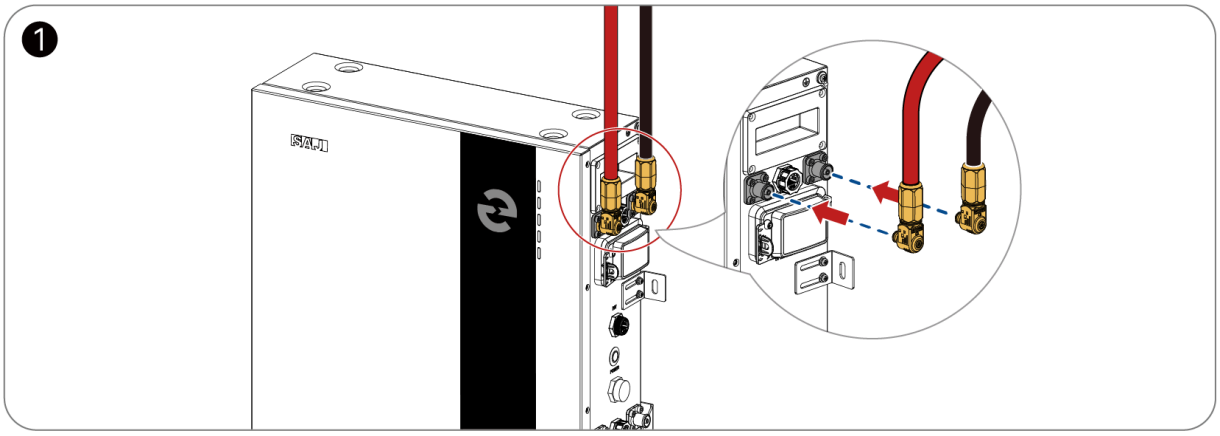
3. Tighten the lock nut to secure the communication cable to the port.



5.4. Power connection

Procedure

1. Install the positive and negative power cables to the **B+** and **B-** ports.



2. Connect the other end of the power cables to the inverter's battery terminals.

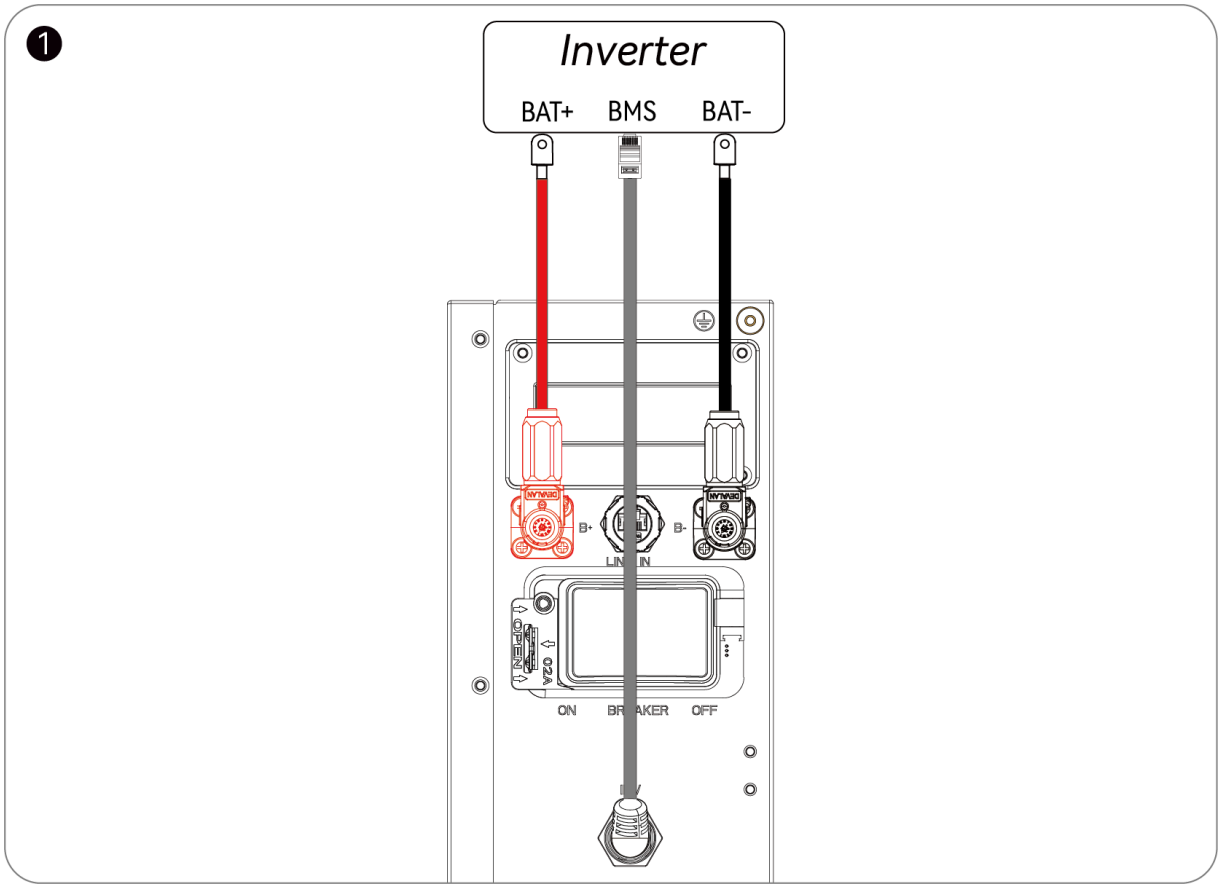
5.5. Connect battery to inverter

Connect a single battery pack

1. Connect the power cables and communication cable between the battery and an inverter.

Note:

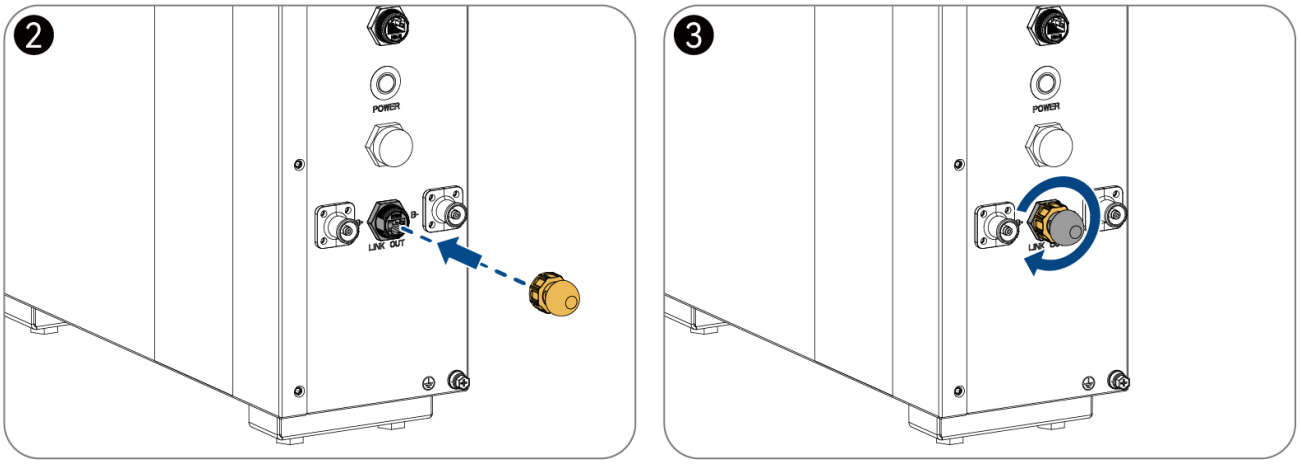
Do not intertwine the communication cable and power cables.



Cable	Port on battery	Port on inverter
Positive power cable	**B+**	BAT+
Negative power cable	**B-**	BAT-
Communication cable	**INV**	BMS

2. Insert an RJ45 plug to the **LINK OUT** port.

3. Tighten the lock nut to secure the plug to the port.



Connect multiple batteries in parallel

WARNING

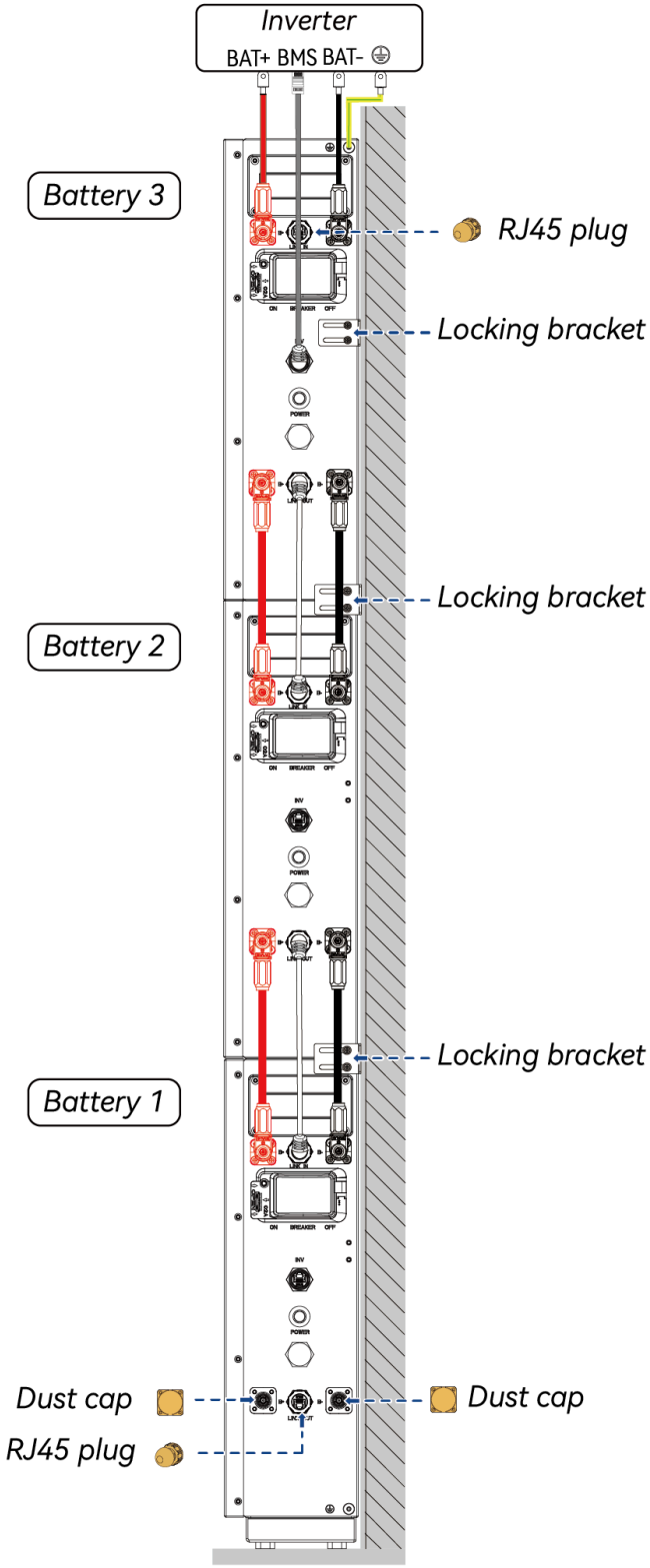
- A single cluster supports stacking a maximum of three battery packs.
- Remove the base of the upper battery pack before stacking it onto the lower battery pack. For details on removing the base, refer to ***Step. 5*** of 4.8. Install battery on the wall *(on page 23)*.

NOTICE

Batteries of different series or models must not be connected in parallel. The latest EK60 B3-5.0-LV-(Plus,Pro) batteries cannot be connected to those that do not support third-party inverters. You can identify the latest EK60 B3-5.0-LV-(Plus,Pro) batteries by a NOTICE label that specifies inverter compatibility.

Parallel connection 1: One stack of battery packs

- Insert an RJ45 plug into the **LINK OUT** port on **Battery 1** and the **LINK IN** port on **Battery 3**.
- Insert dust caps into the lower **B+** and **B-** ports on **Battery 1**.


Inverter
BAT+ BMS BAT-
Battery 3
RJ45 plug
Locking bracket
Battery 2
Locking bracket
Battery 1
Locking bracket
Dust cap
RJ45 plug
Dust cap

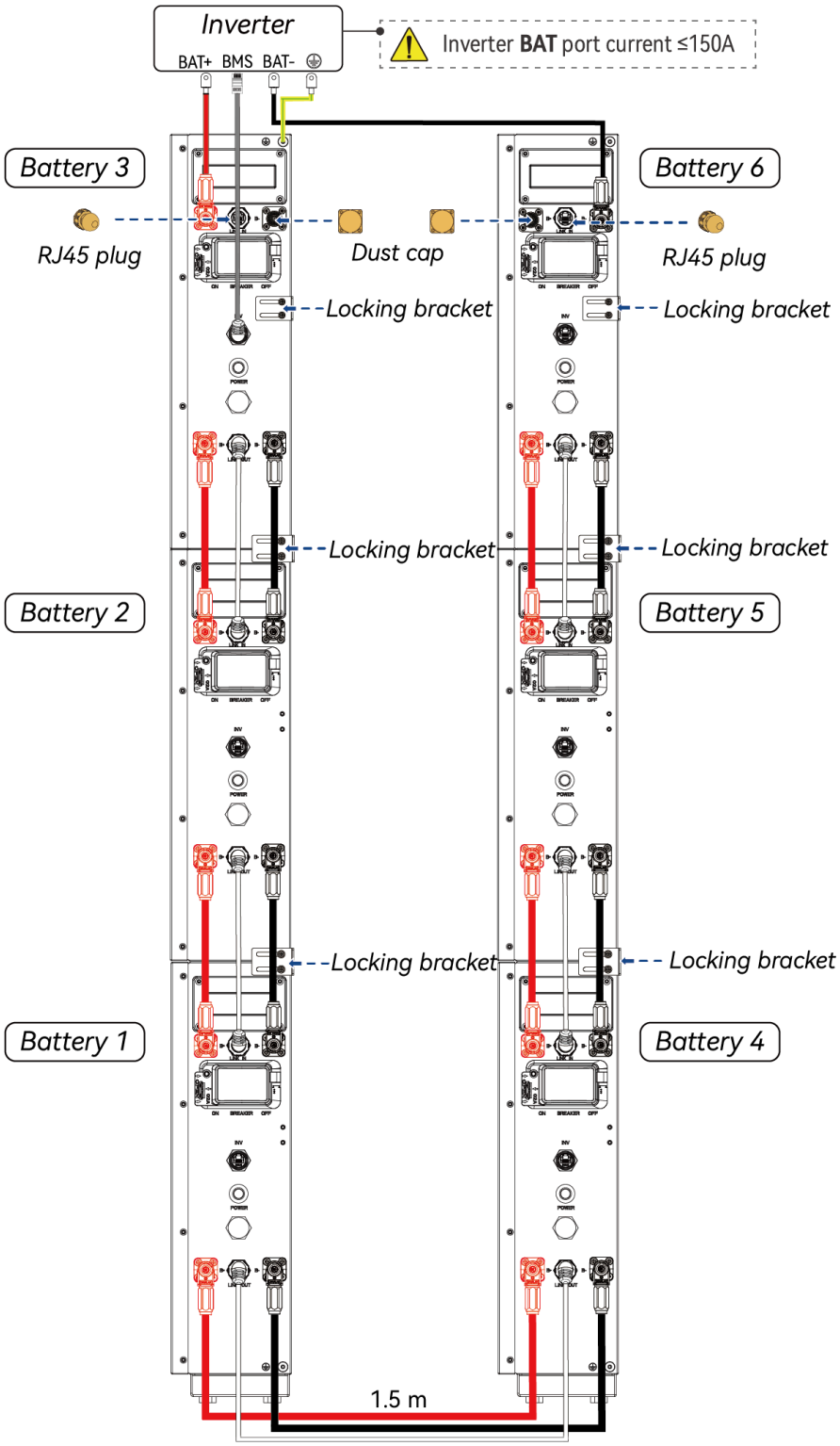
Parallel connection 2: Two stacks of battery packs in daisy-chain connection

⚠ CAUTION

Risk of severe battery damage

- For a daisy-chain connection, keep the inverter's DC battery input current below 150 A. Exceeding this limit can result in blown fuses, melted wiring, and battery fire hazards. If the current at the inverter's **BAT** port exceeds 150 A, use a busbar *(on page 36)* to connect the batteries to the inverter.
- The installer is responsible for ensuring compliance with this current limit. SAJ shall not be held liable for battery malfunction or damage resulting from mismatched inverter specifications.

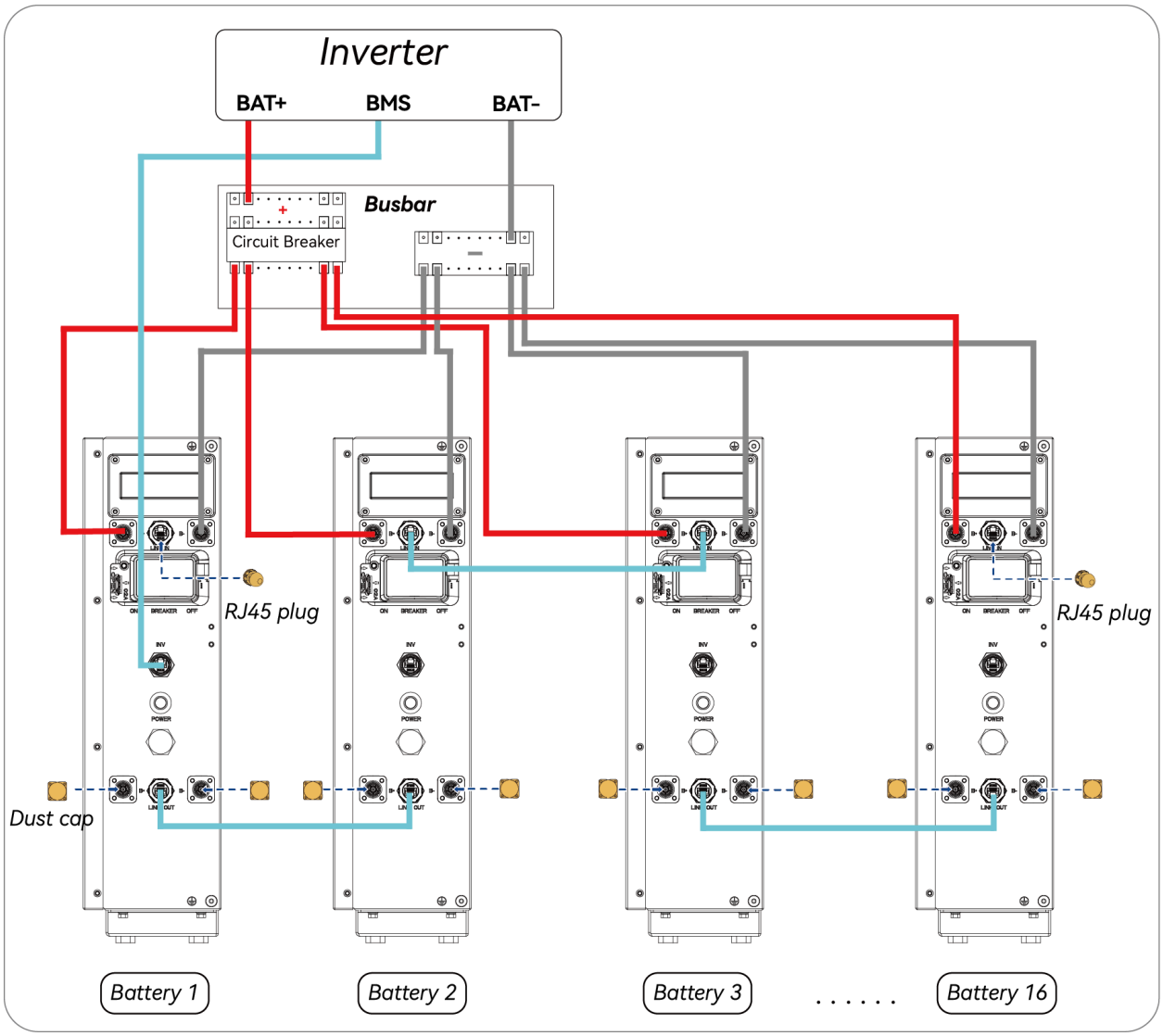
- For connection between adjacent stacks, use 1.5 m power and communication cables.
- For parallel connection with two stacks, insert dust caps into the upper **B-** port on **Battery 3** and the upper **B+** port on **Battery 6**. Insert an RJ45 plug into the **LINK IN** port on **Battery 1** and the **LINK IN** port on **Battery 6**.
- For parallel connection with more than two stacks, install dust caps and RJ45 plugs in the same configuration as specified above.


Inverter
BAT+ BMS BAT-
Inverter BAT port current ≤150A
Battery 3
Battery 6
RJ45 plug
Dust cap
RJ45 plug
Locking bracket
Locking bracket
Locking bracket
Locking bracket
Battery 2
Battery 5
Locking bracket
Locking bracket
Battery 1
Battery 4
1.5 m

Parallel connection 3: Busbar

For parallel connection of multiple battery packs, a busbar can be used to connect the batteries to the inverter.

- Insert a dust cap into the lower **B+** and **B-** ports on each battery pack.
- Insert an RJ45 plug into the **LINK IN** port on the first and last battery packs.



6. Startup and shutdown

6.1. Startup

⚠ WARNING

Risk of electric shock, fire, explosion and irreversible equipment damage

Improper installation or wiring can cause short circuits, overheating, fire or explosion.

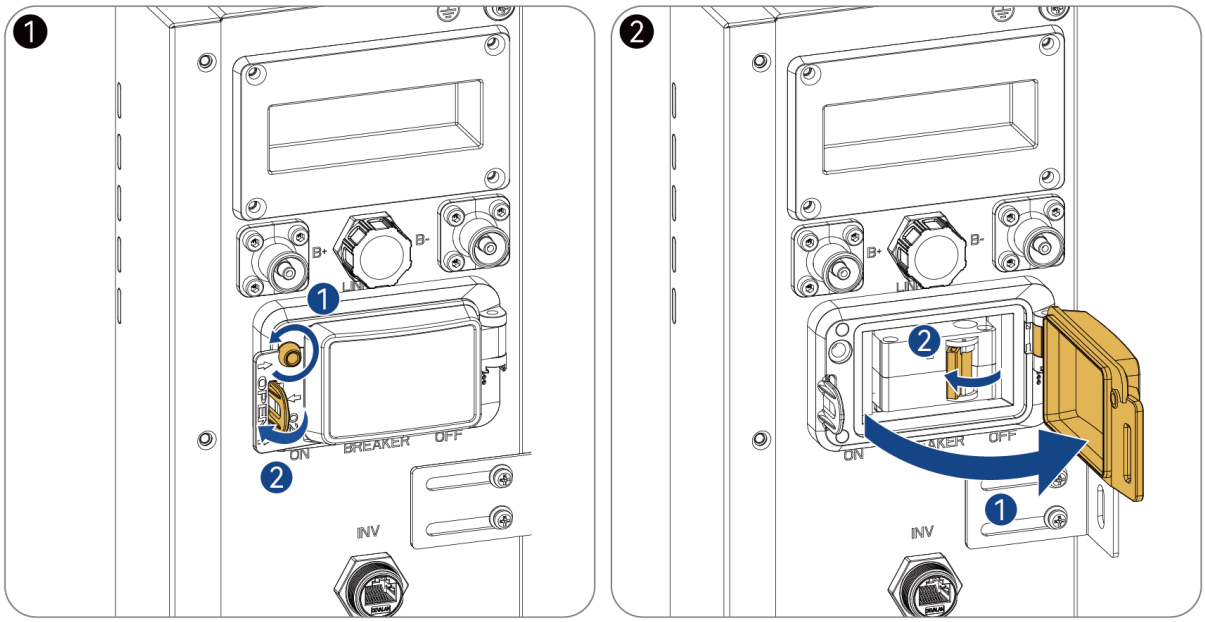
- Before starting up the system, ensure all installation operations are performed in accordance with the procedures in the manual.
- Ensure all connections are clean, tight, and torque to the specification.
- Double-check positive (+) and negative (-) terminals to ensure correct connections. Reverse polarity can permanently damage equipment.
- Ensure proper grounding connection and cable specification.

Procedure

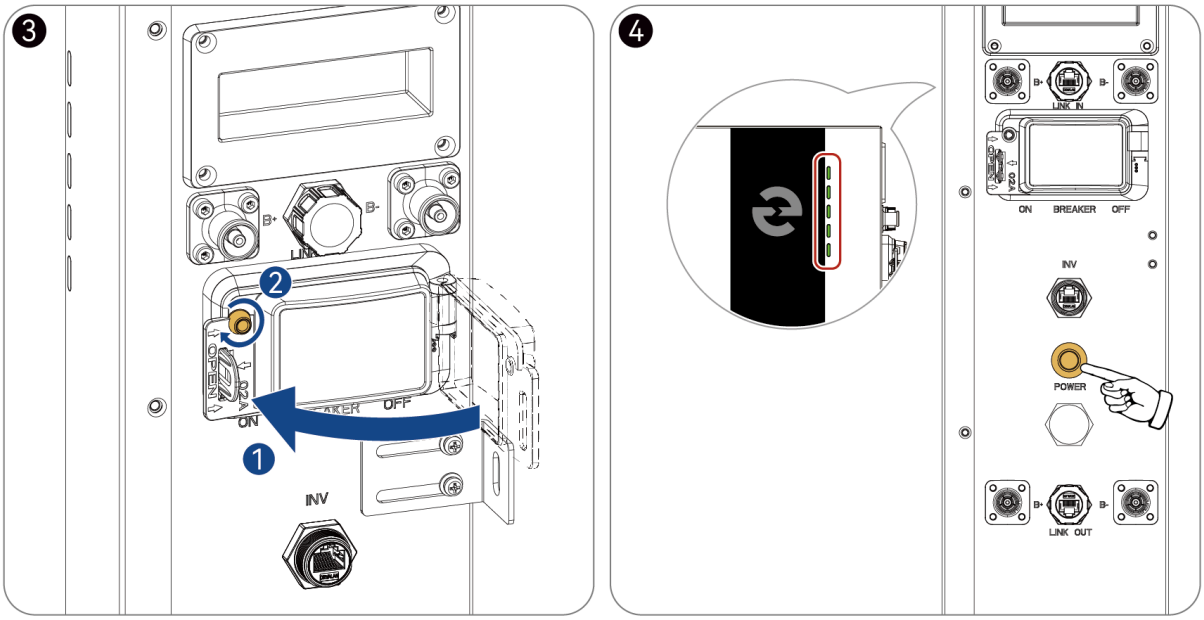
1. Loosen the screws on the **BREAKER** cover and press the latch to unlock the cover.
2. Open the cover and flip the switch a full 90 degrees from **OFF** to **ON** to turn on the circuit breaker.

⚠ CAUTION

- Always turn on the circuit breaker before pressing the power button. If power button is pressed before turning on the circuit breaker, the battery's output protection may be triggered, preventing the connected inverter from operating normally.



3. Close the cover and tighten the screw.
4. Press the **POWER** button and hold for 5 seconds, until the LED indicator is on.



6.2. Shutdown

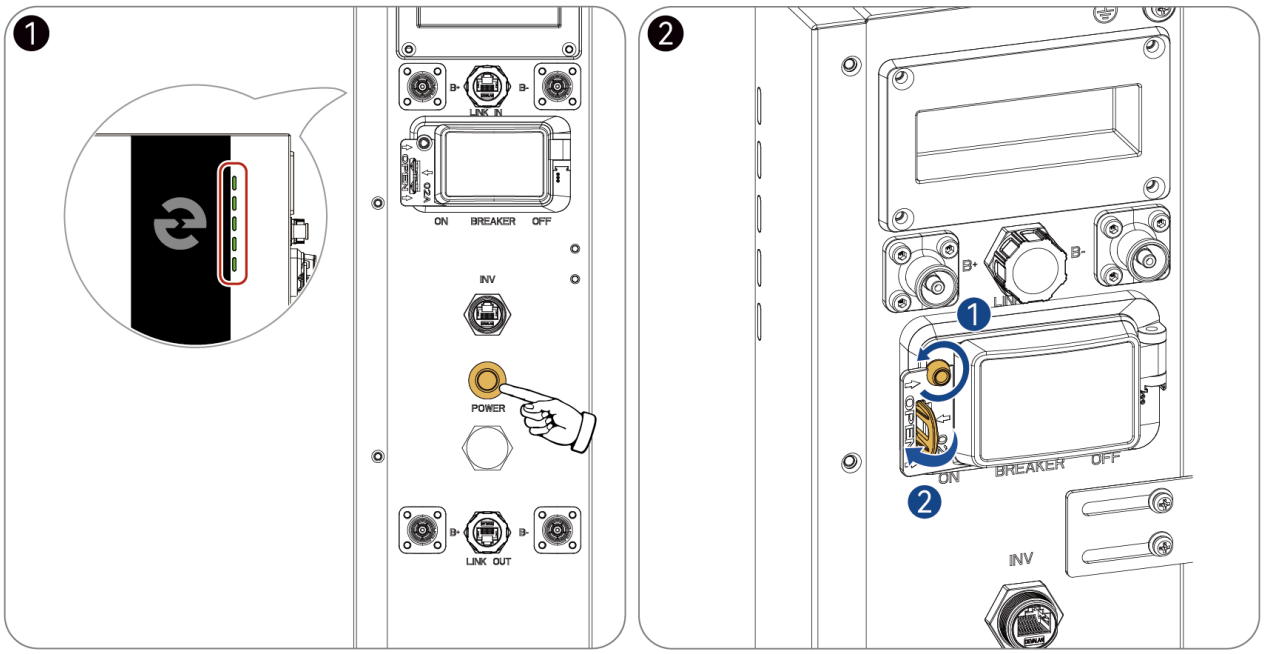
WARNING

Risk of electric shock

Before conducting any maintenance work, wait for at least 15 minutes after shutdown.

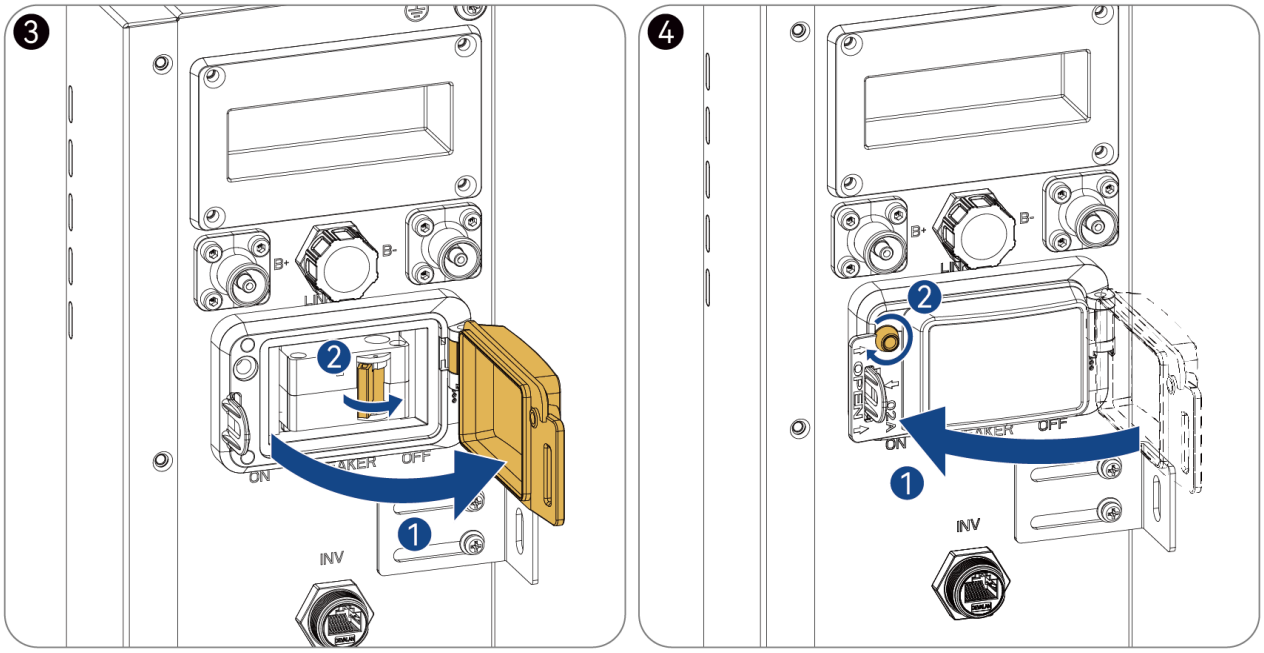
Procedure

1. Press the **POWER** button and hold for five seconds, until the LED indicator is off.
2. Loosen the screws on the **BREAKER** cover and press the latch to unlock the cover.



3. Open the cover and turn off the circuit breaker.

4. Close the cover and tighten the screws.



7. Commissioning on the App

7.1. About elekeeper

The SAJ elekeeper Application Version 5.0 is an easy-to-use, AI-powered energy management platform designed for homeowners and businesses with full ecosystem autonomous AI control. It gives the Owner full control over their energy - from generation and storage to consumption and selling - through a single App that works on phones, tablets, and computers. The platform provides the following AI-powered modules:

- **AI Care**: provides six-dimensional system diagnosis and 24/7 system protection.
- **AI Saving**: provides AI-powered working strategy adaptation for various scenarios to maximize user revenue.
- **AI Keeper**: provides intelligent functions including full voice autonomous control, user intent recognition, , electricity data analysis, and autonomous task planning.

7.2. Download the elekeeper App

Search for "elekeeper" in the App store and download the App.

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

7.3. Sign up at the elekeeper App

The end user, installer, or distributor can follow this procedure to sign up at the elekeeper App. The installer can also follow this procedure to create an account for the end user.

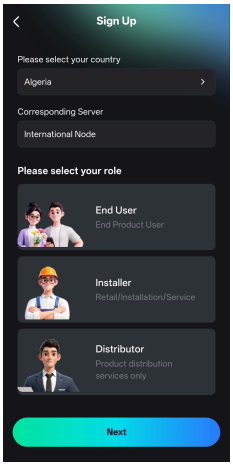
Note: Recommend activating the Location Services on the phone for optimum utilization of the functions.

Procedure

1. Open the App and tap **Sign Up** on the login page.



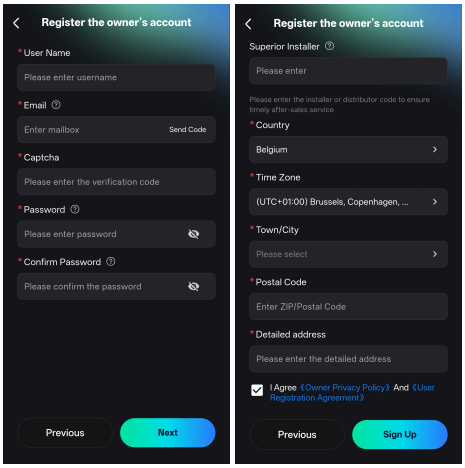
2. Select the country of the installation site and the user role.



Parameter	Description
Corresponding Server	The server is set automatically depending on the selected country.
Please select your role	• **End User**: The owner of the power plant. Select this option when the installer is signing up for the end user. • **Installer**: The installation and retail service providers. • **Distributor**: The distribution service provider.

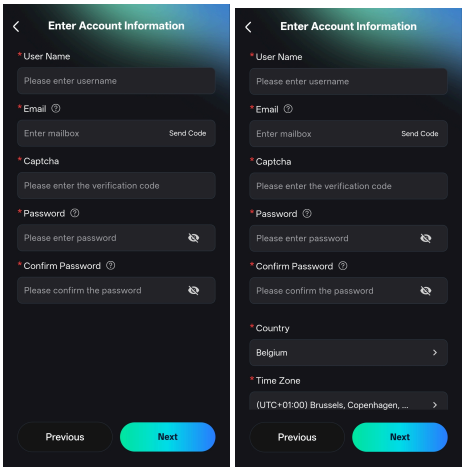
Table 7.1. Signup parameters

3. For the **End User** role, fill in the user information accordingly.

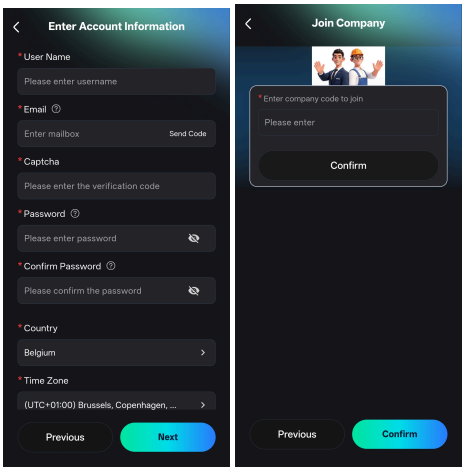


4. For the **Installer** role, either create a company or join an existing company to provide the information accordingly.

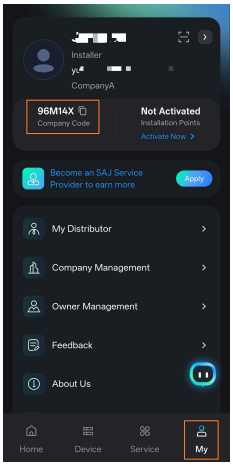
   To create a company:



To join a company:



To check an existing user's company code, open page **My**:

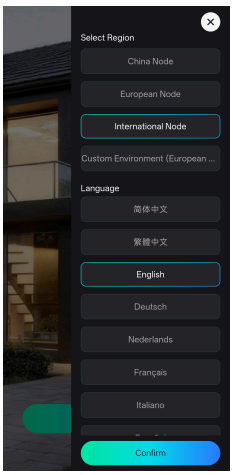


5. For the **Distributor** role, provide similar information as the **Installer** role.

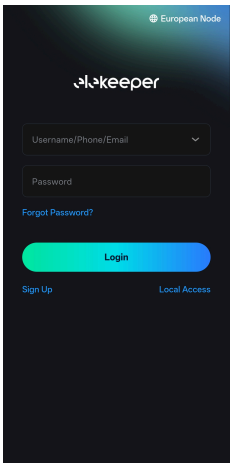
7.4. Log in to the elekeeper App

Procedure

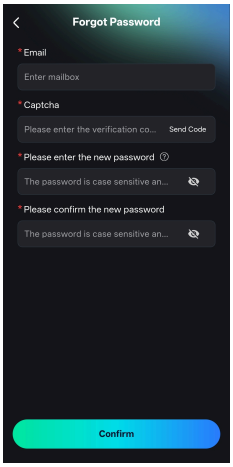
1. Open the App and tap the globe icon on the top right corner.
2. Select the **Region** and **Language** depending on the installation site of the system.



3. Log in with the username, phone number, or email.



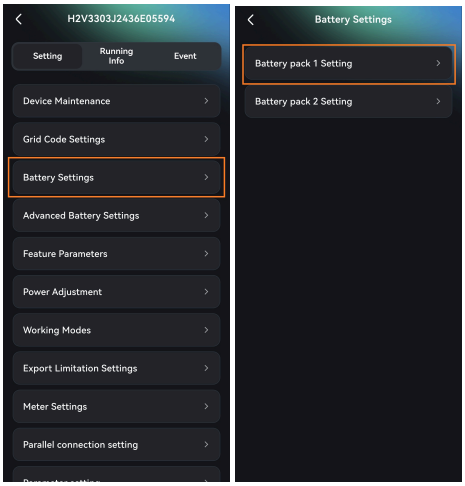
4. (Optional) If you forgot your password, reset your password with email verification.



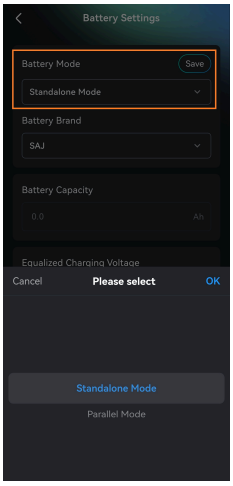
7.5. Battery settings

Note: The detailed operations on the App might vary, depending on the app version and inverter model you are using.

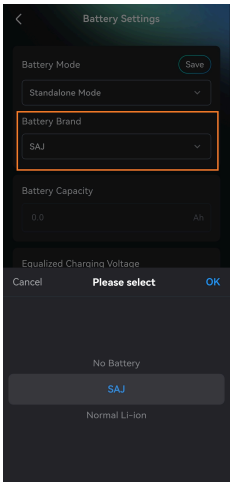
1. On the homepage, tap **Battery Settings** > **Battery Pack 1/2 Setting** to set the parameters for each battery pack.



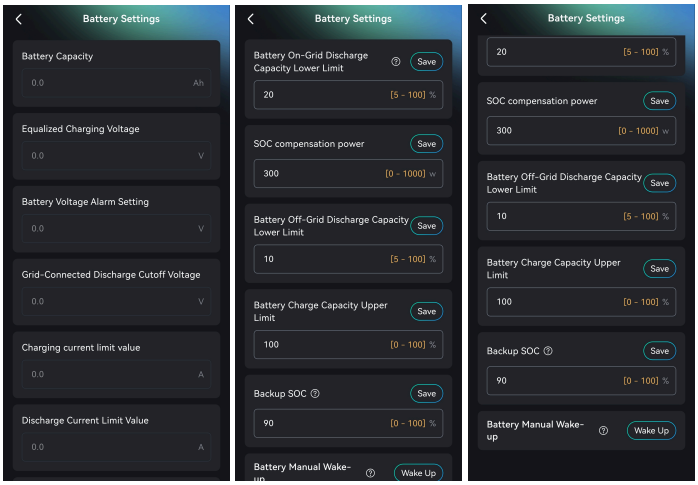
2. Select the battery connection mode.



3. Select the battery brand.



4. Set the following parameters as needed.



8. System maintenance

8.1. Routine maintenance

To ensure the system lifespan, perform the suggested routine maintenance operations. To purchase the routine maintenance service, contact the installer, distributor, or after-sales.

⚠ WARNING

Danger of electric shock

Turn off the system before cleaning, inspecting cables or maintaining components. Do not open any covers for 5 minutes after disconnecting all power sources.

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.	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	• Check whether the equipment is damaged or deformed. • Check whether the equipment generates abnormal sound during operation. • Check whether all equipment parameters are correctly set during operation.	Once every 6 months
Electrical connection	• Check whether cables are disconnected or loose. • Check whether cables are damaged, especially whether the cable sheath that contacts a metal surface is damaged.	6 months after the first commissioning and once every 6 to 12 months after first maintenance
Grounding reliability	Check whether the PE cable is securely connected.	6 months after the first commissioning and once every 6 to 12 months after first maintenance
Sealing	Check whether all terminals and ports are properly sealed.	Once a year

8.2. Troubleshooting

For any errors reported below, try the suggested solutions or contact the after-sales for support.

⚠ WARNING

The troubleshooting operations must be performed by authorized technicians only.

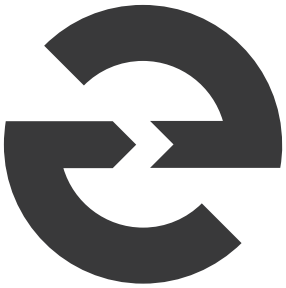
Error code	Error message	Possible cause	Suggested solution
97	BMS internal communication error	1. Communication error between battery control unit and battery module. 2. Did not install RJ45 plug, therefore battery control unit counted the number of battery modules connected mistakenly.	1. Check if communication cable is connected properly. 2. Check if RJ45 plug is installed.
98	Battery module sequence error	1. Cable connection is wrong. 2. Did not install RJ45 plug. 3. Communication cable connection is wrong.	1. Connect the cable correctly. 2. Check if the RJ45 plug is installed. 3. Check if the communication cable is working.
99	Discharge overcurrent protection	Discharging current exceeds the set limit.	Wait until the error is clear or restart.
100	Charge overcurrent protection	Charging current exceeds the set limit.	Wait until the error is clear or restart.
101	Total voltage low protection	Total voltage is lower than the set limit.	Force charging the battery.
102	Total voltage high protection	Total voltage is higher than the set limit.	Wait until the error is clear or restart.
103	Single battery module voltage low protection	Single battery module voltage is lower than the set limit.	Force charging the battery.
104	Single battery module voltage high protection	Single battery module voltage is higher than the set limit.	Wait until the error is clear or restart.
105	BMS hardware error	1. Single battery module voltage sensor error. 2. Temperature sensor error. 3. Current sensor error.	1. Check if battery temperature and voltage sensor cable is in poor contact. 2. Check if current sensor cable is in poor contact. 3. Replace BMS.
106	Charging temperature low protection	The battery temperature is lower than the minimum battery protection temperature.	Wait until battery temperature increases and the error is clear.

Error code	Error message	Possible cause	Suggested solution
107	Charging temperature high protection	The battery temperature is higher than the maximum battery protection temperature.	Wait until battery temperature decreases and the error is clear.
108	Discharging temperature low protection	The battery temperature is lower than the minimum battery protection temperature, causing relay disconnection and then charging termination.	Wait until battery temperature increases and the error is clear.
109	Discharging temperature high protection	The battery temperature is higher than the maximum battery protection temperature.	Wait until battery temperature decreases and the error is clear.
110	Relay error	1. Cathode or anode relay is adhesive. 2. Cathode or anode relay is unable to close.	Replace relay.
111	Pre-charge error	1. Pre-charge relay damaged. 2. Pre-charge resistor open circuit. 3. BMS damaged.	1. Replace pre-charge relay. 2. Replace pre-charge resistor. 3. Replace BMS.
112	Insulation error	Battery module has electricity leakage.	Contact battery supplier.
113	BMS supplier incompatibility	BMS of battery module and battery control unit are incompatible.	Check if the model of battery module and battery control unit are compatible.
114	Battery cell supplier incompatibility	Supplier of battery module and battery cell are incompatible.	Check if the model of battery module is correct.
115	Battery cell incompatibility	Battery cells are incompatible.	Check if the model of battery module is correct.
116	Battery pack models or grades are inconsistent	Battery pack models or grades are inconsistent.	Check if the model or grade of battery modules are consistent.
117	Circuit breaker is open	1. Circuit breaker is open. 2. Circuit breaker auxiliary contact error.	Replace circuit breaker.
118	Temperature difference is too wide	1. Temperature sensor error. 2. Battery life span.	Check if temperature sensor cable is in poor contact.
119	Voltage difference is too wide (Class II)	1. Sensor cable is loose. 2. Battery life span.	1. Check if voltage sensor cable is in poor contact. 2. Replace BMS.
120	Voltage difference is too wide (Class I)	Sensor cable is loose.	1. Check if voltage sensor cable is in poor contact. 2. Replace BMS.

Error code	Error message	Possible cause	Suggested solution
121	BMS over temperature protect	1. Ambient temperature is high. 2. Overload.	1. Check if ambient temperature is high. 2. Check if overloaded.
122	Short circuit protect	P+ and P- short circuit.	Check if the cable connected correctly.
123	Total Voltage match failed	Connection is wrong.	Contact technical support to locate the fault.
124	The system is locked	System is faulty.	Contact technical support to locate the fault.
125	FUSE error protection	Fuse is damaged.	Contact technical support to locate the fault.
126	Voltage on charging port is high protection	Inverter output voltage is high.	Contact technical support to locate the fault.
129	Heating-film detect fault	No heating film is detected by the BMS.	Contact technical support to locate the fault.
130	DCDC-BMS comm lost	The communication between the battery module DCDC and the BMS is abnormal.	Contact technical support to locate the fault.
131	Auxiliary supply voltage abnormal fault	The circuit of the auxiliary supply is not functioning properly.	Contact technical support to locate the fault.
132	Heat sink high temperature fault	The temperature of the heat sink in the DCDC exceeds the upper threshold.	Contact technical support to locate the fault.
133	PCB high temperature fault	The temperature of the PCB in the DCDC exceeds the upper threshold.	Contact technical support to locate the fault.
134	SOH low fault	The battery has poor state of health (SOH).	Contact technical support to locate the fault.
135	Heating-film short-circuit fault	The battery module's heating film short-circuited.	Contact technical support to locate the fault.
136	Heating-film open-circuit fault	The circuit of the battery module's heating film is open.	Contact technical support to locate the fault.
137	Heating-film over-current fault	The resistance of the battery module's heating film is abnormal.	Contact technical support to locate the fault.
138	Aerosol abnormal fault	The aerosol density of the battery module's heating film is abnormal.	Contact technical support to locate the fault.
139	Button stuck fault	The button sends abnormal signals or the button is stuck.	Contact technical support to locate the fault.
140	Fan fault	The fan of the DCDC is not functioning properly.	Contact technical support to locate the fault.
141	Inverter-BMS comm lost	The communication between the BMS and the inverter is abnormal.	Contact technical support to locate the fault.

9. Product specification

Model	EK60 B3-5.0-LV	EK60 B3-5.0-LV-Plus	EK60 B3-5.0-LV-Pro
Performance Specification			
Battery Type	LiFePO4		
Cell Capacity (Ah)	100		
Rated energy (kWh)	5		
Usable energy (kWh)	4.5		
Cycle Life [1]	≥6000		
Depth of Discharge	90%		
Rated Voltage (V)	51.2		
Voltage Range (V)	44.8—57.6		
Rated Charging Current (A)	50		
Max. Charging Current (A)	50		
Rated Discharging Current (A)	100		
Max. Discharging Current (A)	100		
Peak Discharging Current (A)	150 (10 s)		
Max. Charging Power (kW)	2.5		
Max. Discharging Power (kW)	5		
General Data			
Weight (kg)	43		
Dimensions (H/W/D) (mm)	511 / 468 / 141.2		
Charging Temperature Range	0°C to +55°C		-20°C to +55°C
Discharging Temperature Range	-20°C to +55°C		
Relative Humidity Range	0%-95%		
Max. Operating Altitude (m)	< 2000		
Cooling Method	Natural convection		
Ingress Protection Rating	IP65		
Protective Class	I		
Installation Environment	Indoor & Outdoor		
Installation Method	Floor-standing / Wall-mounting		
Max. Parallel Quantity	16 units (80 kWh)		
Compatible Inverter	SAJ H2 & H3 series		
Communication	CAN		
Warranty (years)	10		
Protection			
Over-voltage and Under-voltage Protection	Integrated		
Over-current Protection	Integrated		
Over-temperature and Under-temperature Protection	Integrated		
DC Breaker	Integrated		
Standard Compliance			
Standard	IEC 62619, IEC 62040, IEC 61000, UN38.3		



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