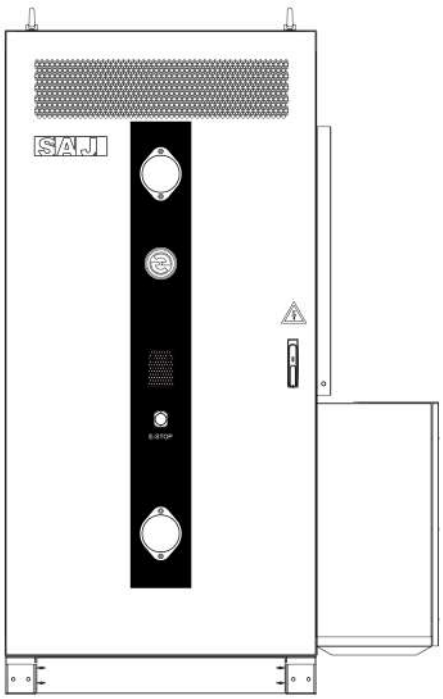
CB3 series

C&I Liquid Cooling Energy Storage System

CB3-L261

User Manual



Version 0.1

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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:

- CB3-L261

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

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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
V0.1	2026-07-09	• 4.1.2. Installation environment requirement *(on page 20)* • 4.1.4. Prepare the installation site *(on page 21)*
V0.0	2026-07-03	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

1.2.1. General guidelines

The lithium-ion battery energy storage systems (BESS) present a higher risk of fire due to several factors inherent to their chemistry and operation. The electrolyte in battery packs is flammable, toxic, and volatile. Thermal runaway in battery packs can produce flammable gases, along with harmful gases such as carbon monoxide (CO) and hydrogen fluoride (HF).

For the safety and integrity of battery packs, it is essential to follow the guidelines below:

- Do not expose battery packs to high-temperature environments or place them near heat-emitting devices such as direct sunlight, fire sources, transformers, or heaters. Overheating of battery packs can lead to fire or explosion.
- It is strictly prohibited to disassemble, modify, or damage battery packs (such as inserting foreign objects, immersing in water or other liquids), as this can cause leakage, overheating, fire, or explosion of the battery pack. Any attempts to modify battery without the permission from SAJ will void the limit warranty for the battery.

1.2.2. Battery pack fault handling

⚠ DANGER

Risk of Injury from Battery Leak

Contact with a faulty or leaking battery pack can cause severe injury.

- Never touch leaked electrolyte or inhale any fumes. If you detect leakage, unusual odors, or signs of damage, do not approach. Immediately contact qualified personnel.
- Qualified personnel must wear full protective gear, including safety goggles, chemical-resistant gloves, a gas mask, and protective clothing, before handling a leaking battery.

The electrolyte is corrosive, and contact can cause skin irritation and chemical burns. If exposed to the electrolyte, take the following measures immediately:

- Inhalation : Evacuate the contaminated area immediately, breathe fresh air; seek medical assistance immediately.
- Eye contact : Immediately rinse the eyes with copious amounts of water for at least 30 minutes without rubbing; seek medical help immediately.
- Skin contact : Wash the affected area thoroughly with plenty of water and soap; seek medical assistance immediately.
- Ingestion : Seek medical help immediately.

1.2.3. Handling of dropped battery packs

When a battery pack has fallen (whether packaged or not), but there is no obvious deformation, damage, unusual odor, smoke, or fire, take the following actions immediately:

- Evacuate the personnel from the area.
- Professional personnel should use mechanical tools to transfer the battery pack to an open and safe location; allow the battery pack to rest for 1 hour while monitoring its temperature to ensure it remains within ±10℃ of room temperature.
- Contact SAJ service engineer.

If the dropped battery pack exhibits any obvious unusual odor, damage, smoke, or fire:

- Immediately evacuate all personnel from the area.
- Contact professional personnel and call emergency services promptly.

- Under safe conditions, professional personnel should use firefighting equipment to extinguish fires.
- Stop using the battery pack immediately after it has fallen, and contact SAJ service engineer for assessment.

2. Product information

The CB3-L261 is a high-voltage liquid-cooling battery system provided for C&I photovoltaic storage solutions. The CB3-L261 battery system is equipped with five battery packs as one stack and supports four stacks at maximum for expansion purposes.

The CB3-L261 battery storage system also supports parallel deployment of four cabinets at maximum.

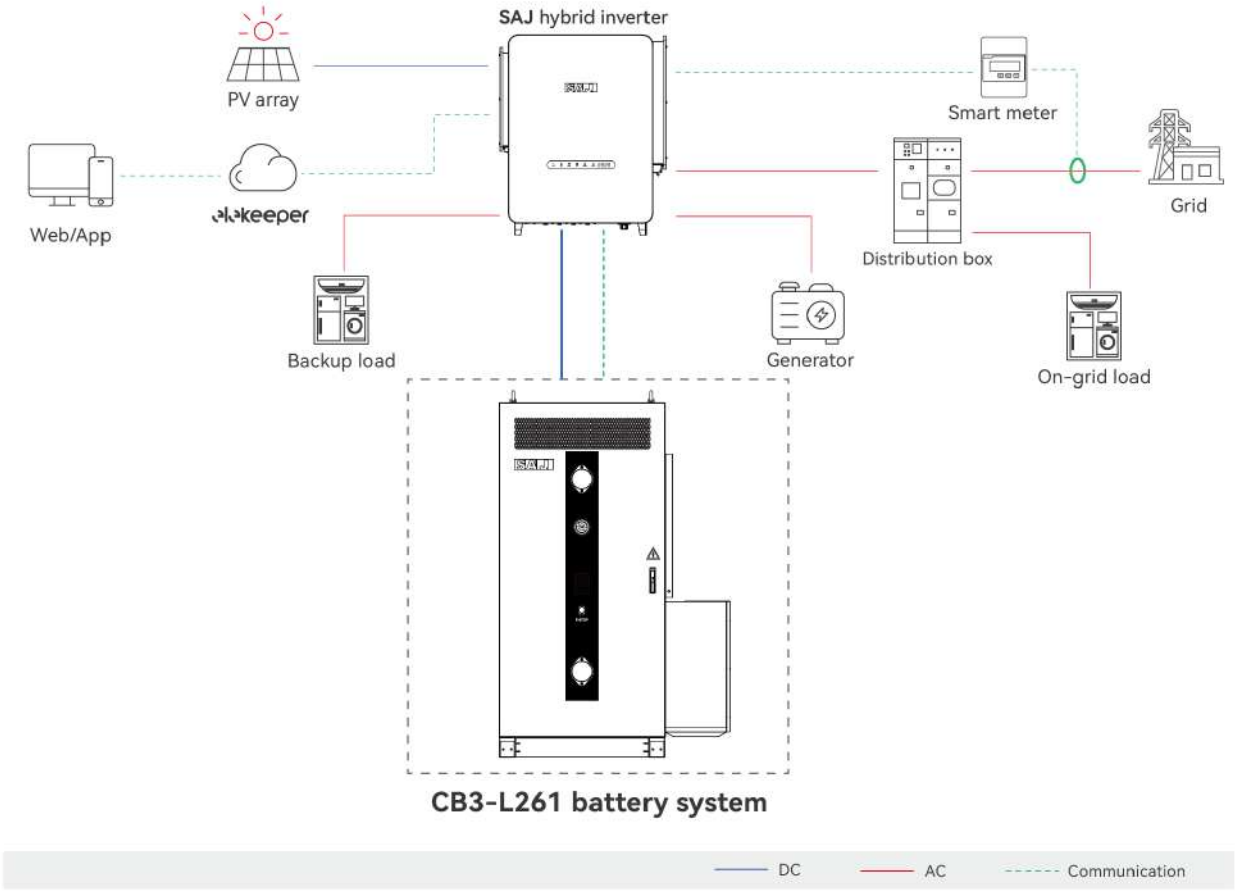


Figure 2.1. System application

2.1. Model description

CB3-L261

① ② ③

①	The product series.
②	The CB3 battery system is equipped with liquid temperature control system.
③	The nominal energy of the energy storage system in kWh.

2.2. Product appearance

2.2.1. Dimensions

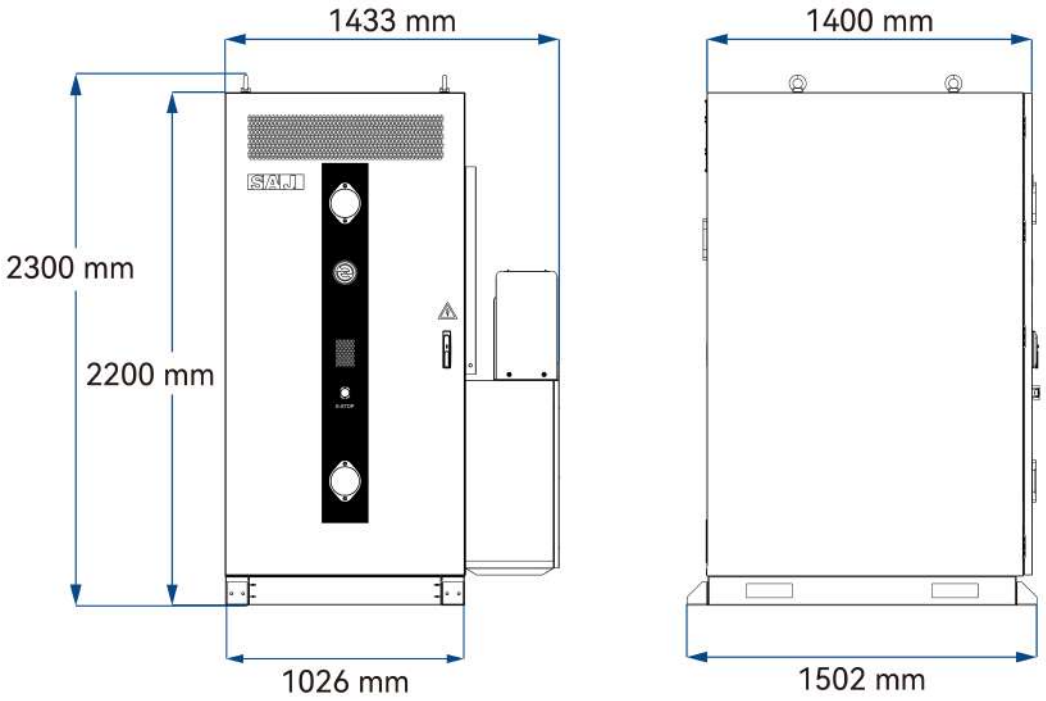


Figure 2.2. Cabinet dimensions

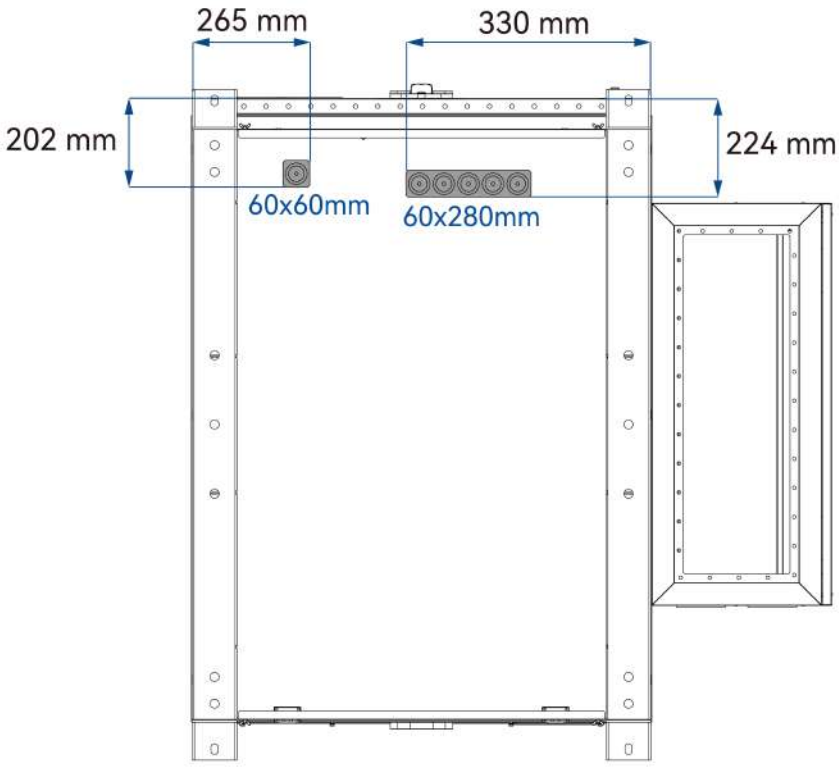
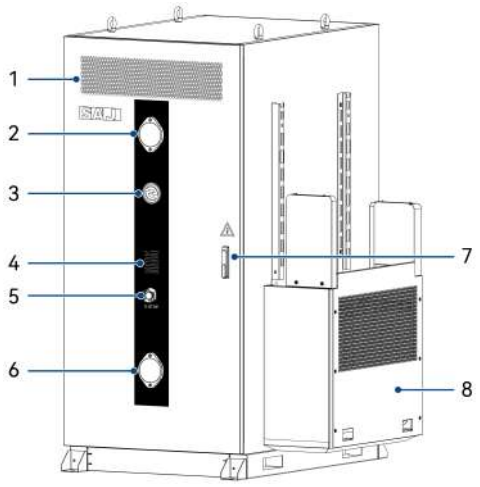


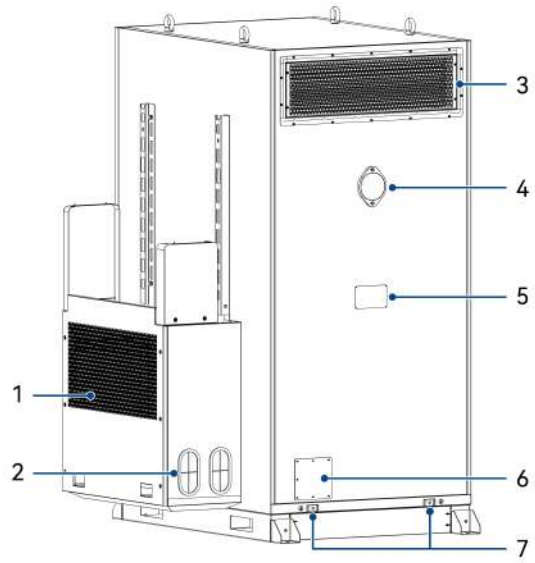
Figure 2.3. Bottom view of cable entries

2.2.2. Cabinet



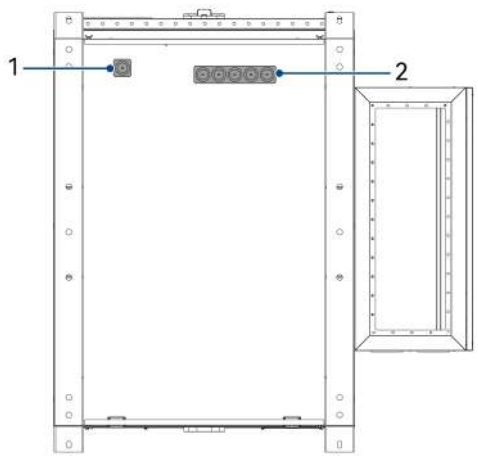
1. Air inlet vent equipped with dust filter
2. Exhaust valve 1
3. LED ring light.
   For LED status descriptions, see 2.2.3. Cabinet LED panel *(on page 10)*.
4. Audio-visual fire alarm
5. Emergency stop switch
6. Exhaust valve 2
7. Cabinet lock
8. Cable cabinet

Table 2.1. Front view



1. Cable cabinet
2. Cable entry hole
3. Air outlet vent
4. Exhaust valve 3
5. Equipment nameplate
6. External fire hose coupling connector
7. Cabinet grounding connection ports

Table 2.2. Rear view



1. Threaded cable gland for communication cables in multi-cabinet deployment
2. Threaded cable gland for battery power cables and DC input power cables in multi-cabinet deployment

Table 2.3. Bottom view

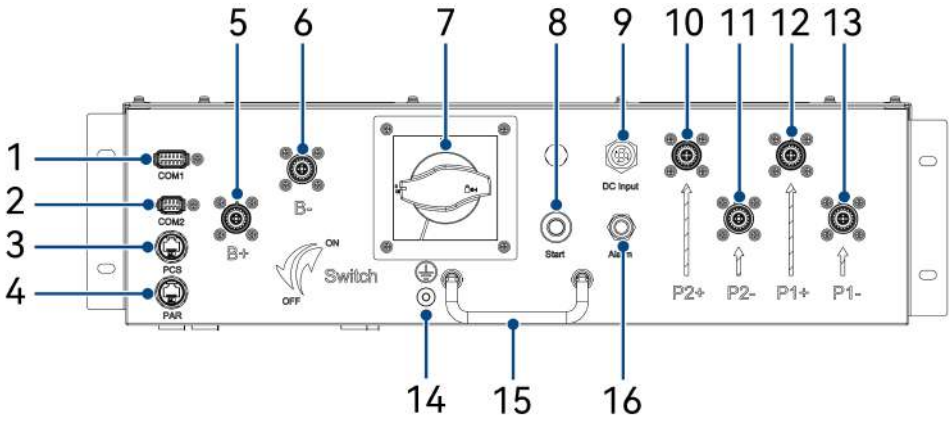
2.2.3. Cabinet LED panel

The following table describes the LED ring on the CB3 cabinet door.

Status		Description
	Solid	The battery system is up and running.
	Breathing	The battery system is at standby status.
	Flashing (0.5s)	The cabinet door is open.
	Flashing (0.2s)	The cabinet is upgrading.
	Solid	The system is faulty.
	Flashing (0.5s)	Fire alarm or fatal error.
	Off	The cabinet is powered off.

2.3. Product internal design

2.3.1. BCU electrical interfaces

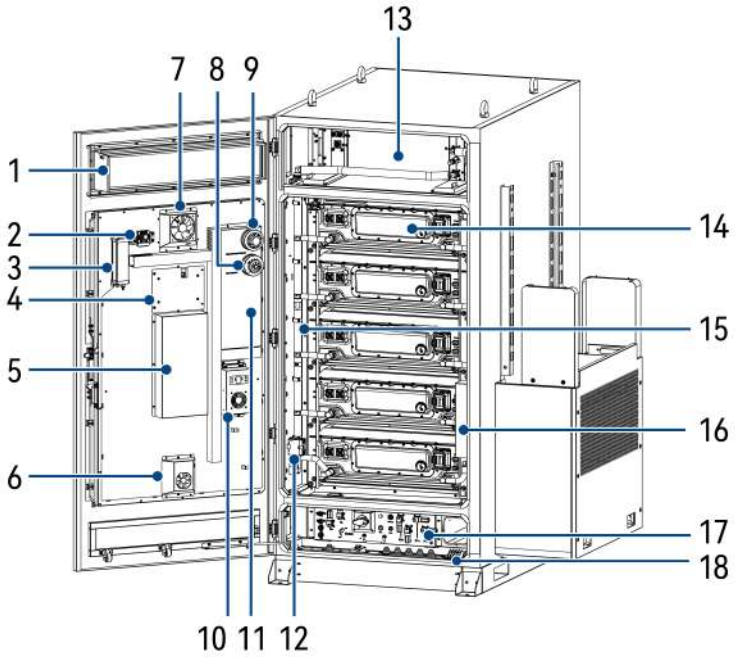


Callout	Silkscreen	Description
1	**COM1**	The BMU communication cable connection port.
2	**COM2**	The BMU communication cable connection port.
3	**PCS**	The communication port connecting to the inverter **BMS** communication port.
4	**PAR**	The communication port for battery multi-cabinet connections.
5	**B+**	The positive battery connection port.
6	**B-**	The negative battery connection port.
7	**Switch**	The DC switch controlling the connection to the battery cluster.
8	**Start**	The startup button of the whole CB3 battery system. • Solid on: the system is up and running. • Solid off: the system is off.
9	**DC Input**	The auxiliary power supply for the BCU.
10, 11	**P2+**, **P2+**	The positive battery cable connection ports to the inverter or to the parallel cabinet.
12, 13	**P1+**, **P1-**	The negative battery cable connection ports to the inverter or to the parallel cabinet.
14	⏚	The grounding connection port.
15	/	The holding handle.

Callout	Silkscreen	Description
16	**Alarm**	The alarm status indicator. • Solid red: device error. • Solid off: the system is normal.

Table 2.4. Electrical terminals on BCU front

2.3.2. Cabinet interior components



1. Air inlet vent equipped with dust filter
2. Compound fire detector
3. Aerosol device
4. LED light panel
5. Audio-visual fire alarm; emergency stop switch
6. Exhaust valve 2
7. Exhaust valve 1
8. Heat detector
9. Optical smoke detector
10. Dehumidifier
11. Fire control board
12. Electrode-type water-immersion sensor
13. Liquid temperature control system
14. Battery pack
15. Liquid cooling pipes
16. Auxiliary (AUX) power supply unit[1]
17. Battery control unit (BCU)
18. Terminal block for AUX power supply cables.

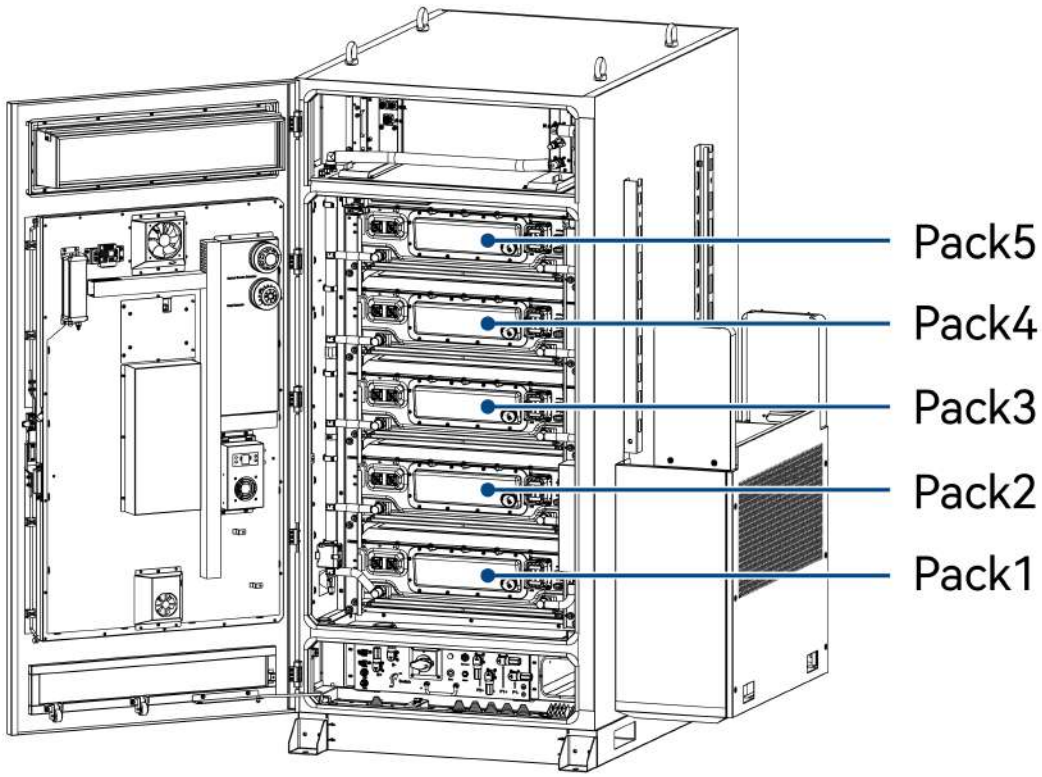
1. The AUX power supply unit controls the power supply to the BCU.

2.3.3. Battery cluster

CB3-L261 employs a lithium-iron phosphate battery system architecture. Each high-voltage battery cluster consists of standardized and modular battery packs connected in series. The battery cluster is connected to a battery control unit (BCU) to manage the storage and release of the electrical energy.

The battery management system (BMS) continuously monitors the status of each battery pack. If an abnormal status or communication failure is detected in any battery pack, the BMS triggers a corresponding alarm and reports the fault information along with the battery pack number to the energy management system (EMS) of the CH3 inverter.

The following figure shows the numbering of the battery packs:



The battery packs are composed of cells connected in series. Each battery pack provides functions such as voltage and temperature collection and balance control for each individual cell.

The battery packs are designed using specialized battery management chips, receive control commands through CAN communication, and report the collected data.

2.3.4. Design of cable entry hole

All the cables between the internal components are connected prior to delivery for installation convenience.

The power and communication cables connecting to the inverter are designed to enter through the interior cable entrance to ensure connection convenience and proper protection.

The cable connections in multi-cabinet deployment are designed to enter through the threaded cable gland on the left and right bottom of the cabinet.

2.4. Liquid temperature control system

The CB3 ESS employs an advanced variable-frequency liquid cooling unit combined with SAJ intelligent temperature control.

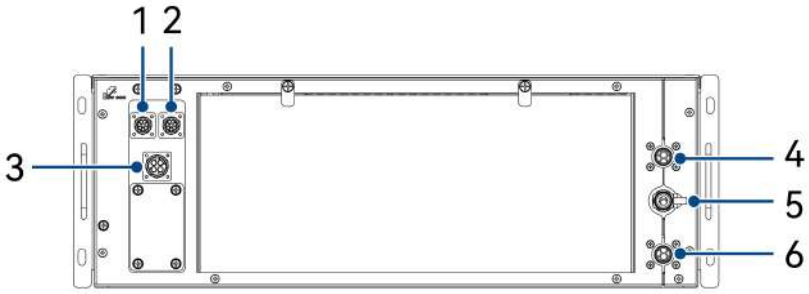


Figure 2.4. Front panel of the liquid temperature control system

Callout	Description
1	The communication port for commissioning.
2	The communication port for battery system communication.
3	The 220V AC power supply.
4	The coolant inlet.
5	The liquid filling port.
6	The coolant outlet.

Variable-Frequency Liquid Cooling Unit

During system operation, if the battery cell temperature reaches a preset threshold, the liquid cooling unit is activated automatically.

Through water circulation and heat exchange, the liquid cooling system effectively removes heat from the cells and expels it outside the cabinet. This design achieves complete isolation between the cells and the external environment, providing a high protection level and safeguarding internal components from external influences.

Multi-Branch Parallel Water Channels

Inside the battery pack, multi-branch parallel water channels ensure uniform cooling for each cell. This design minimizes temperature differences between cells, extending battery life and enhancing overall performance.

Heating Function under Low-Temperature Conditions

When cell temperatures are low, the liquid cooling unit switches to heating mode and activates its heating power. This maintains the cells within a reasonable temperature range, ensuring continuous optimal working condition.

2.5. Fire detection and suppression systems

The fire safety design of the CB3-L261 ESS integrates advanced detection, suppression, and material technologies to ensure rapid response and effective control of potential fire incidents. This comprehensive approach aims to protect personnel, minimize damage, and maintain operational integrity.

Compound Detection System

The compound detection system consists of the temperature, smoke, Carbon Monoxide (CO), Volatile Organic Compounds (VOC), and hydrogen (H_2) sensors. When any of the sensors detects abnormal level inside the cabinet, the system automatically shuts down to prevent further escalation, and issues a fire alarm to alert personnel, awaiting manual inspection and troubleshooting.

- Temperature sensor

The temperature sensor keeps monitoring the temperature inside the cabinet.

- Smoke sensor

The smoke sensor monitors the smoke concentration inside the cabinet.

- Detector of CO, VOC, and H_2

Multi-Layered Fire Suppression System

- Aerosol devices are installed inside each battery pack. Upon detecting thermal runaway, the aerosol activates, filling the entire battery pack with suppressant to extinguish visible flames.
- If a cell enters thermal runaway, the exhaust valve opens, releasing flammable gases into the cabinet. The detector quickly detects these gases, triggering an immediate alarm. Meanwhile, the system activates the exhaust system to vent the flammable gases outside the cabinet, reducing the risk of ignition.
- Additional aerosol devices are installed on the cabinet door. Upon detecting thermal runaway, the aerosol activates, filling the entire cabinet with suppressant to extinguish flames. Meanwhile, the aerosol can also be activated automatically when the compound detection system detects thermal runaway.
- An optional water-based fire suppression system can be configured by connecting external fire hoses, enhancing the system's ability to manage larger fires.

The entire CB3-L261 cabinet is filled with fire-resistant materials capable of withstanding a fire for at least 1 hour. This design provides thermal isolation between faulty and other cabinets, preventing the spread of fire.

3. Transportation and storage

3.1. Transportation

⚠ WARNING

- The transportation equipment must be fully prepared and inspected by professional organizations to ensure qualification.
- Ensure that the transportation equipment is not overloaded.
- Do not drill any holes on the product for transportation purpose. Drilling operations on the equipment housings can lead to several critical issues that may affect the integrity and functionality of the device.

NOTICE

- Strictly package the product before vehicle transportation to ensure its safety. For long-distance transport, we recommend utilizing an enclosed container to provide additional protection against environmental factors and potential damage during transit.
- Do not transport this product together with any equipment or items that may affect its performance or cause damage. Ensure that the product is transported separately to maintain its integrity and functionality during transit.

3.1.1. Transportation with package

Forklift

- Ensure that the forklift operator is qualified and experienced in handling heavy loads.
- Use forklift with 2-ton load capacity to move the CB3 cabinet.
- Recommend sliding the fork blades from the left or right side of the cabinet package to move the package.
- Ensure that the forklift tines are adjusted to a width that can securely and evenly support the load. The width should be as wide as necessary to distribute the weight evenly across both forks.
- Do not use a crane to move the cabinet with package.

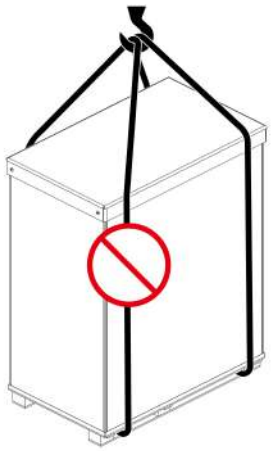


Figure 3.1. No crane

3.1.2. Transportation without package

NOTICE

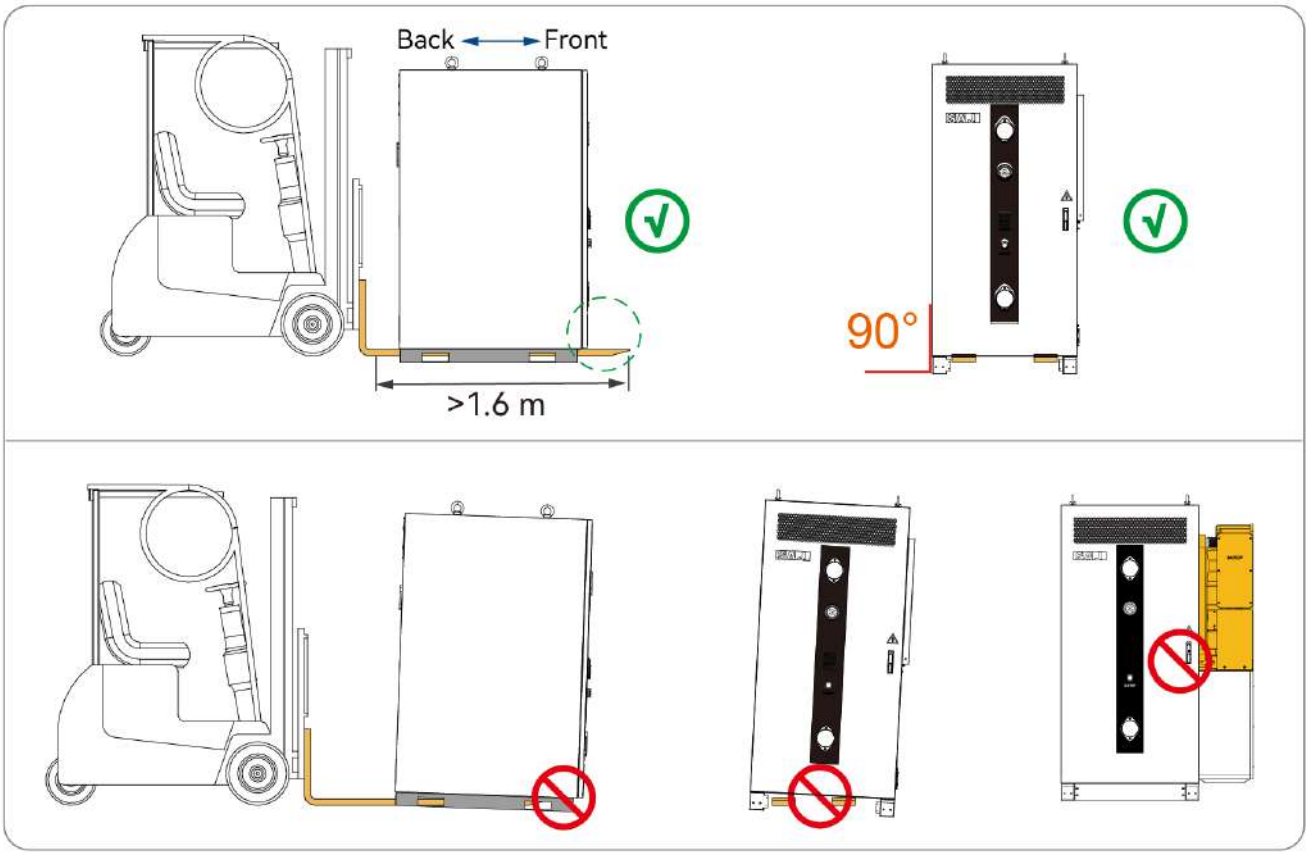
Risk of cabinet drop or cabinet damage during transportation

Improper handling or transportation may cause serious equipment damage.

- Always keep the cabinet strictly horizontal during transport. Never tilt, lay on its side, invert, or position it at an angle.

Forklift

- The load capacity of the forklift must be greater than 3 tons.
- Recommend sliding the fork from the back side of the cabinet.
- Ensure that the forklift tines are adjusted to a width that can securely and evenly support the load.

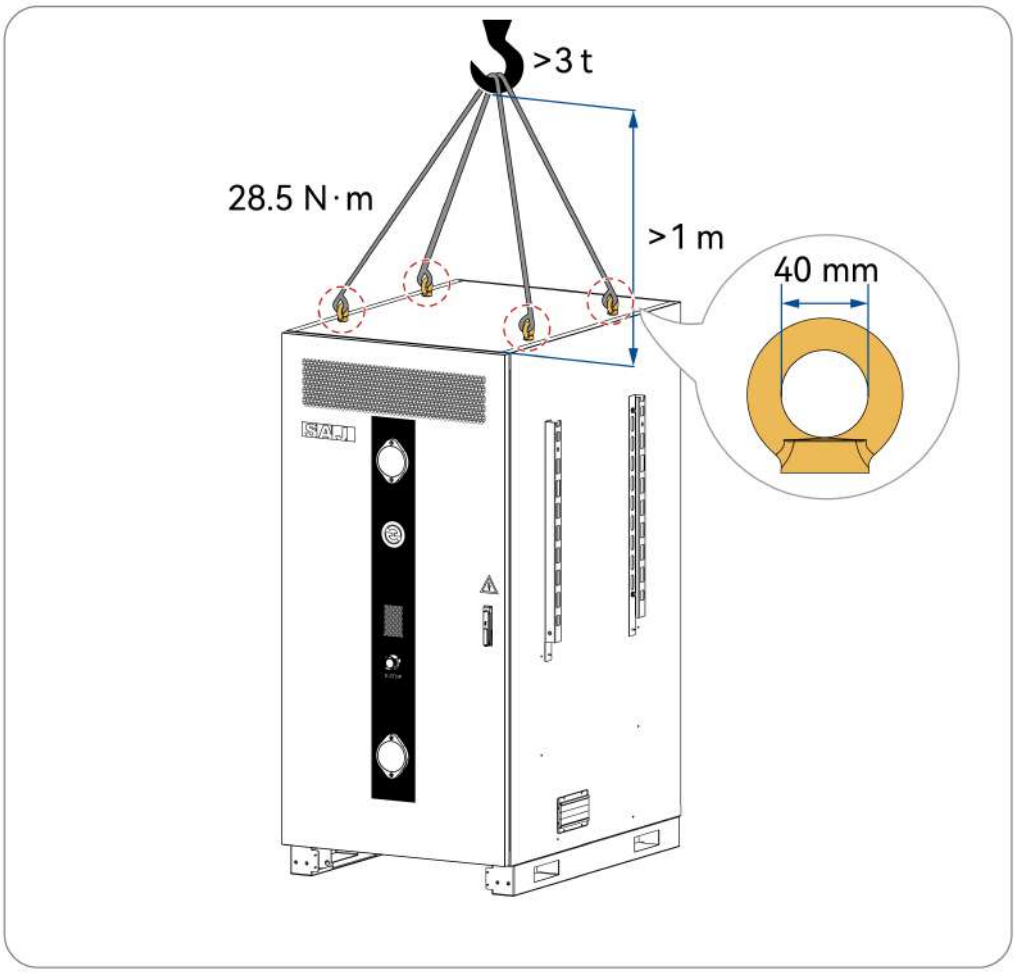


Crane

- Select flexible lifting straps or tie-down straps with a minimum individual breaking strength of no less than 3 tons.
- The straps should be threaded through the lifting rings on top of the cabinet and securely fastened to prevent any slippage during lifting.
- Lift and move the cabinet by raising the straps.
- During crane operations, ensure that the lifting equipment does not touch or rub against the cabinet surface to prevent damage.

NOTICE

- The distance between the lifting hook and the top of the cabinet must be at least 1 meter to ensure sufficient clearance to prevent any accidental contact or damage during lifting operations.
- The tilt angle of the cabinet should be less than 10°.



3.2. Storage

Store the cabinet after unpacking according to the following guidelines if the installation will be performed after certain period:

- Store the cabinet indoors, such as in a large warehouse or workshop, to prevent condensation inside the cabinet or water immersion at the base during rainy seasons.
- If outdoor storage is unavoidable due to site conditions, raise the base of the cabinet to an appropriate height based on local geological and meteorological conditions to avoid water immersion. Provide heating for internal components if the ambient temperature falls too low.
- The required storage temperature range is -25°C to +60°C; the relative humidity 0% to 95% with no condensation. The recommended storage temperature range is 0°C to +30°C; the battery lifespan can be affected when the storage temperature is higher than 40°C.
- Place the cabinet on a dry, level, solid surface with sufficient load-bearing capacity and free from vegetation. The ground must be flat without standing water, depressions, or uneven surfaces.
- Ensure that the cabinet doors are securely locked during storage.
- Take effective measures to prevent rainwater, sand, dust, and other contaminants from entering the interior of the cabinet.
- Conduct inspections at least once every two weeks to check that packaging remains intact and undamaged.
- If the storage period exceeds six months, recharge the battery to approximately 40% state of charge (SOC) regularly.

4. Installation instructions

4.1. Installation preparation

Read the following sections to determine the installation site.

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

4.1.1. Precautions

For safety, be sure to read all the safety instructions carefully prior to any work and observe the appropriate rules and regulations of the country or region where you install the product.

DANGER

Danger to life due to potential fire or electric shock.

Do not install the product near any inflammable or explosive items.

NOTICE

This equipment meets the pollution degree.

- Inappropriate or unharmonised installation environment may jeopardize the life span of the product.
- The installation site must be well ventilated.

4.1.2. Installation environment requirement

It is strongly suggested to install the product in an outdoor location, that is more than 2000 meters from the coast. When selecting the installation location, follow the guidelines below:

- Consult the dealer or SAJ technical support when the distance from the installation location to the coast is between 500 and 2000 meters. Do not install the product within 500 meters from the coast.
- Do not install the product in areas affected by salt damage or pollution which can lead to corrosion of the equipment.
- Do not install the product in areas with moderate or heavy dust pollution, metallic dust pollution, saline-alkali land, corrosive gas pollution, or corrosive rainwater pollution.
- Keep the air inlet and outlet at the installation site clear. If natural airflow is insufficient, add extra ventilation and consult SAJ for assistance.
- The installation environment must be free of inflammable or explosive materials.
- The product must be installed in a place away from any heat source.
- Do not install the product at a place where the temperature changes extremely.
- The height of the product from the ground should be considered to prevent the equipment from soaking in water. The specific height is determined by the site environment.

4.1.3. Installation foundation requirement

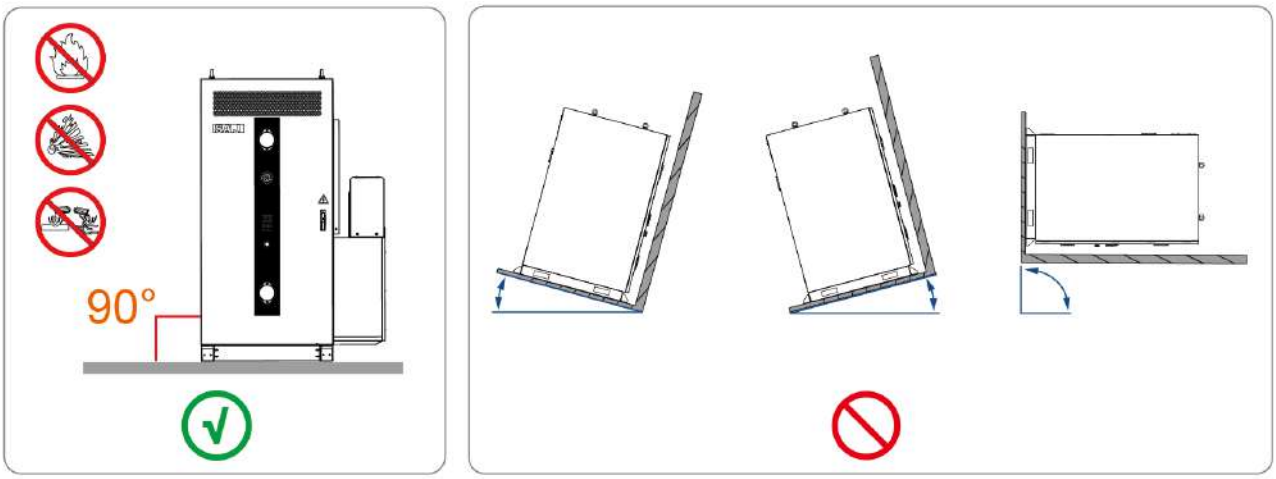
Follow the guidelines below to construct the foundation for installing the CB3 cabinets:

- Install the cabinet on a concrete or non-flammable surface. Ensure that the installation surface is level, solid, flat, and has sufficient load-bearing capacity, with no depressions or inclinations.
- Ensure that the bottom of the equipment is higher than the highest historical water level of the area and at least 300 mm higher than the horizon.
- The foundation design must accommodate an equipment weight of at least 2.8 tons.
- If the foundation's load-bearing capacity is insufficient, it must be verified and strengthened.
- On-site earthwork must be properly compacted to support the equipment adequately.
- After the foundation is excavated, do not perform any soaking and agitating process on the foundation. If the process is applied on the foundation, it is necessary to carry out further excavation and backfilling to consolidate the foundation.
- The horizontal error at the contact surface between the equipment foundation and the cabinet should be less than 3 mm.

4.1.4. Prepare the installation site

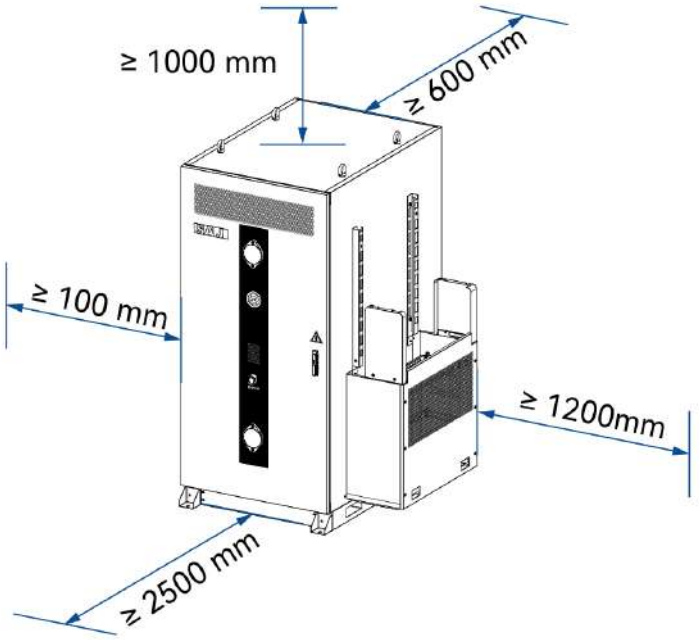
1. Install the cabinet vertically. Do not install it backward-tilted, forward-tilted, or horizontally.

   Recommend installing a canopy at the installation site to ensure optimum performance. For the canopy height, follow product installation space requirements and local regulations.

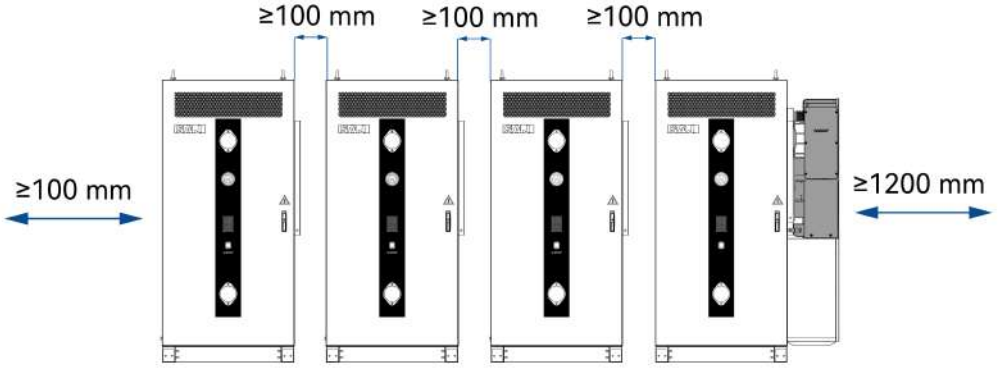


2. Reserve enough space around the CB3 cabinet to ensure proper ventilation.

- A single cabinet:

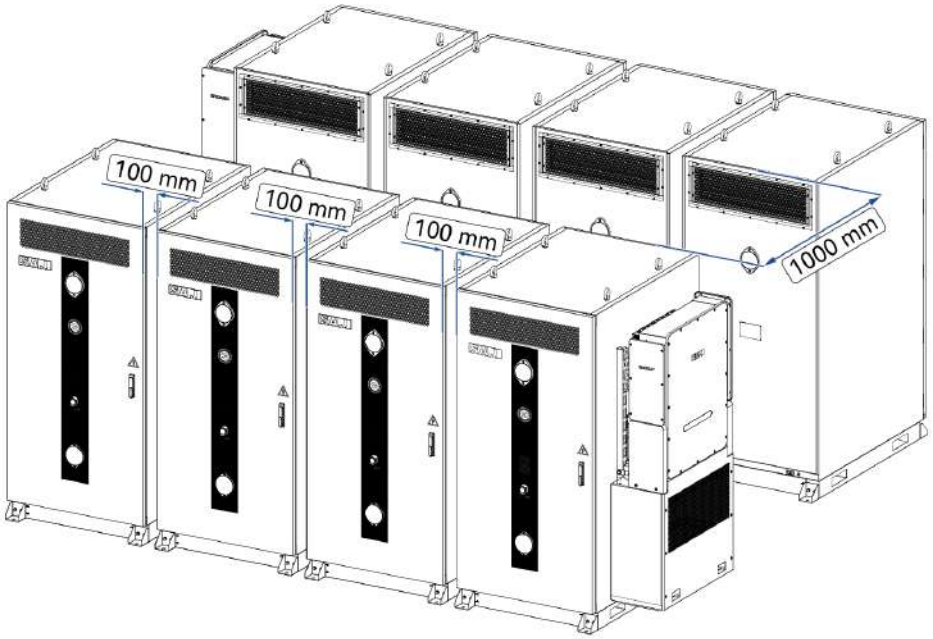


- For battery expansion, install a maximum of four cabinets side-by-side in a row:



- For system expansion, reserve the following space:

- For two systems installed back to back, reserve the following space:



4.1.5. EOS Installation and Safety Requirements - Netherlands

When the CB3 energy storage system (herein referred to as "EOS") is installed in the Netherlands, follow the specific safety guidelines below. The requirements in this section take precedence over the general instructions in section 4.1.4. Prepare the installation site *(on page 21)*.

Positioning and Site Selection

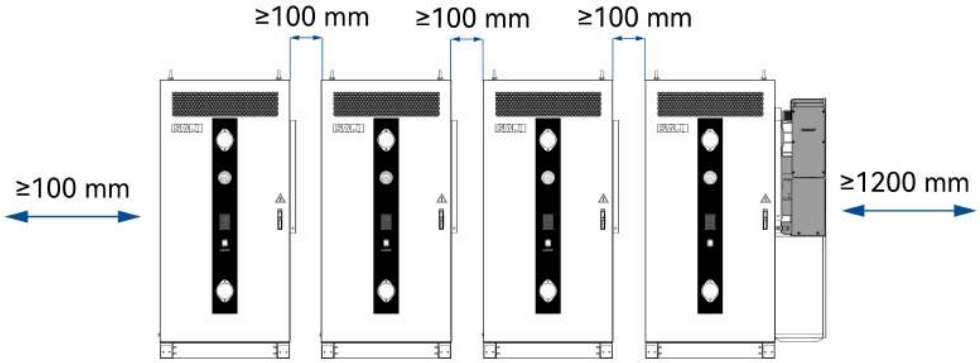
- **Positioning and Site Selection**

1. Environmental Protection
   - **General Placement**: A new EOS must be positioned to ensure it is protected from external environmental influences, based on specific local conditions.
   - **Water Hazards**: Protective measures must account for external influences such as rising damp and inflowing water.
   - **Foundation Stability**: The EOS must be installed on a stable surface. The foundation design must account for the maximum total weight, including potential water filling in the event of calamities.
2. Specialized Site Requirements
   - **Industrial Sites**: When installed on an industrial site, the EOS must be placed outside the reach of mobile cranes and other lifting equipment. If this is not possible, a physical guard against falling objects is mandatory.
   - **Wind Turbine Proximity**: Any EOS located within the 10^{-6} per year site-specific risk contour of a wind turbine must be sufficiently resistant to ice fall and ice erosion.
   - **Collision Protection**: Outdoor units must be positioned to eliminate the risk of collision, considering local traffic intensity and permitted speeds.
   - **Protective Structures**: If a zero-risk location is unavailable, an adequate protective structure (such as an effective guide rail construction) must be installed.

Spatial Arrangement and Distances

1. Stacking Restrictions
   - **Cold Stacking**: Direct stacking of EOS containers is strictly prohibited within an EOS park.
2. Safety Clearances
   - **Inter-Park Spacing**: The shortest distance between separate EOS parks shall be at least 5 meters.

Install no more than 6 EOS cabinets in one park. Reserve enough space between the cabinets:



Security and Access Control

1. Unauthorized Access
   - **Shielding**: The EOS must be adequately shielded from unauthorized access using physical barriers, permanent camera surveillance, or both.
   - **Barrier Specifications**: Physical protection may include walls, fences, or high-security locks.
   - **Fencing Standards**: For multi-unit arrangements, a fixed fence made of non-combustible material (minimum 1.8 meters high) with at least two opposing entrance doors is required.
   - **Multiple EOS Arrangements**: Where more than two units are installed in close proximity, physical separation around the entire energy park is mandatory, potentially supplemented by camera surveillance.
   - **Qualified Personnel**: The periodic check should be carried out by a person with knowledge of the relevant EOS.
2. Emergency Shutdown
   - **Manual Emergency Stop**: The system shall feature an emergency stop device for manual shutdown. This device must provide the same functionality as the automatic shutdown system.
3. **Access Control**: The emergency stop device must be secured so that it is not accessible to unauthorized persons.

Safety Signage and Labeling

Safety signs must be affixed to the exterior of the EOS in highly visible locations. The following ISO 7010 pictograms are mandatory:

 P003	No open flame; Fire, open ignition source and smoking prohibited
 W012	Warning; Electricity
 W026	Warning; Battery charging

4.1.6. Installation tools

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

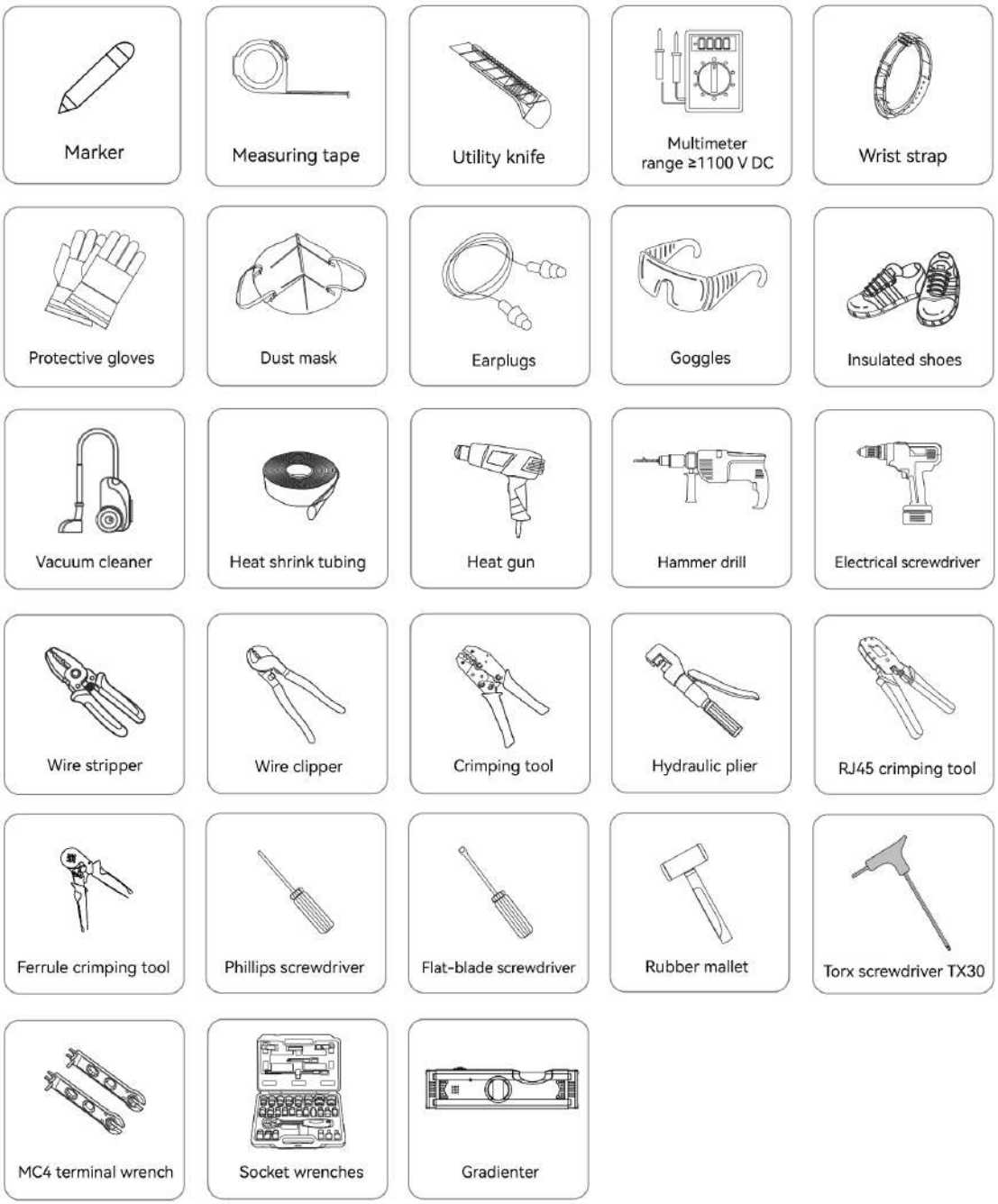


Figure 4.1. Suggested installation tools

4.1.7. Installation personnel

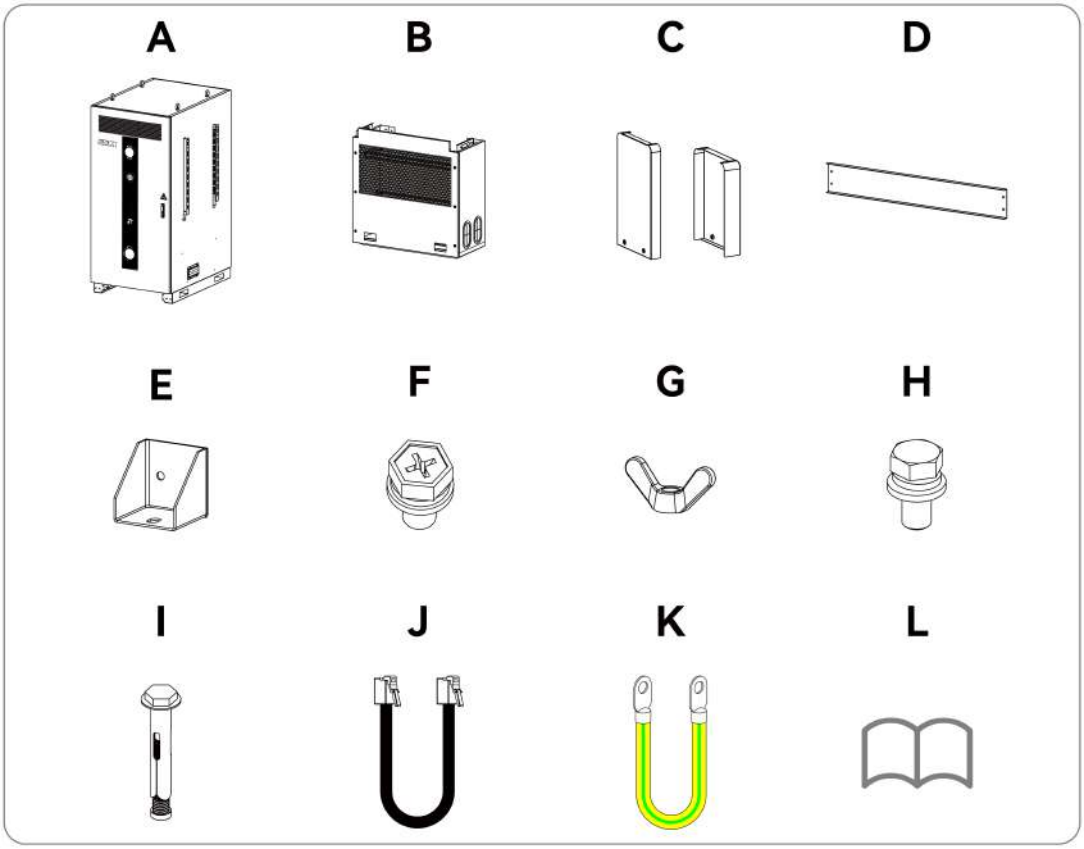
⚠ CAUTION

- The crane operators must have valid operation license or certification and follow the operation safety rules.

  At least two operators or installation engineers are needed to move and install the cabinet during the whole installation procedure.

4.2. Packing list

CB3 cabinet

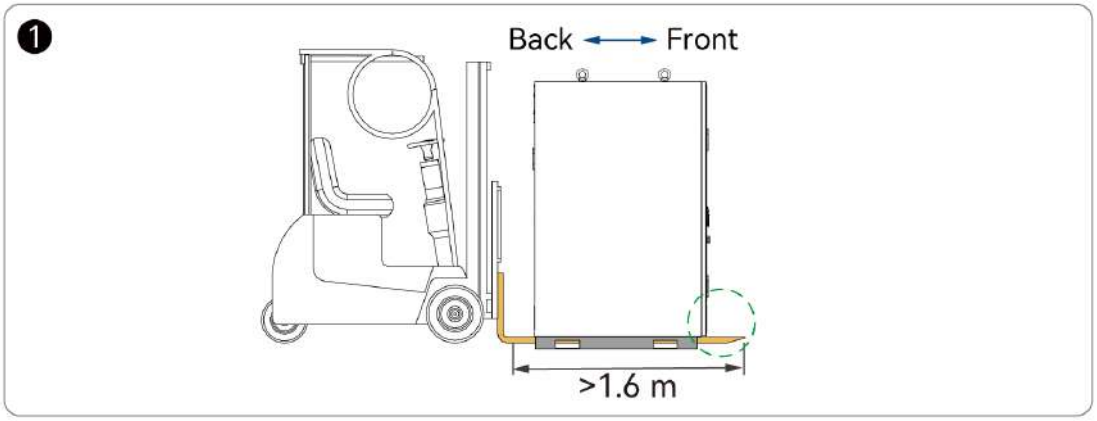


Number	Quantity	Designation
A	1	CB3 cabinet
B	1	Cable cabinet
C	2	Cable cabinet side cover
D	2	Front and back protective covers
E	4	Mounting bracket
F	16	M5x12 screws
G	8	Wing nut
H	8	M10x20 screw
I	4	M12x80 expansion bolt
J	1	BMS communication cable
K	1	Grounding cable between CB3 cabinet and CH3 inverter
L	1	Documents

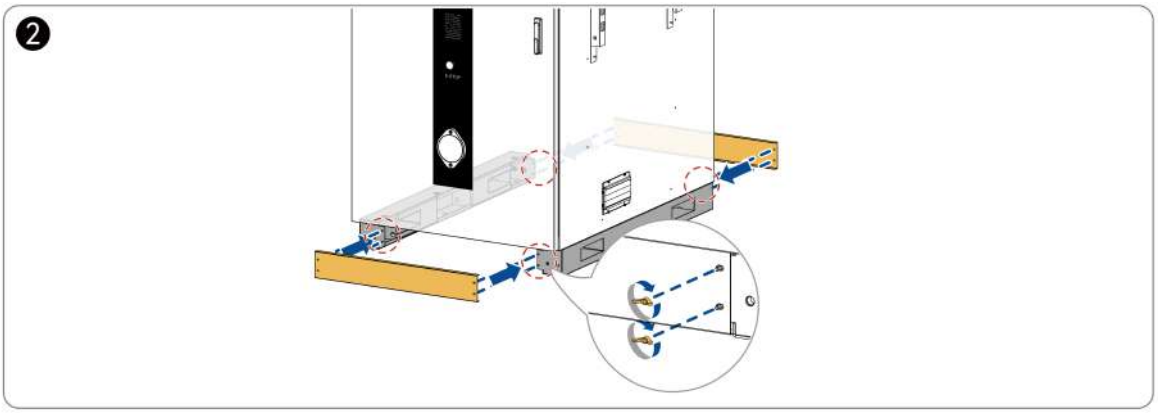
4.3. Mount the cabinet

Procedure

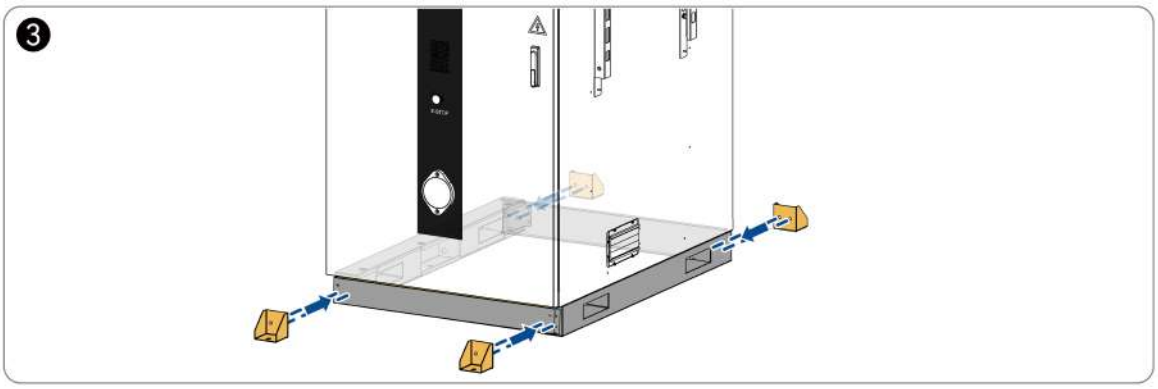
1. Use a forklift to move the cabinet to the installation position.



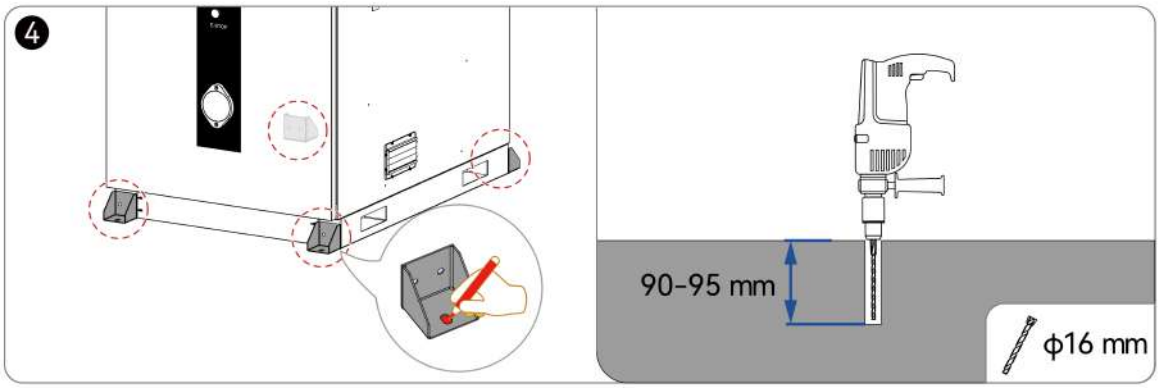
2. Install the front and back protective cover panels and secure each panel with four wing nuts.



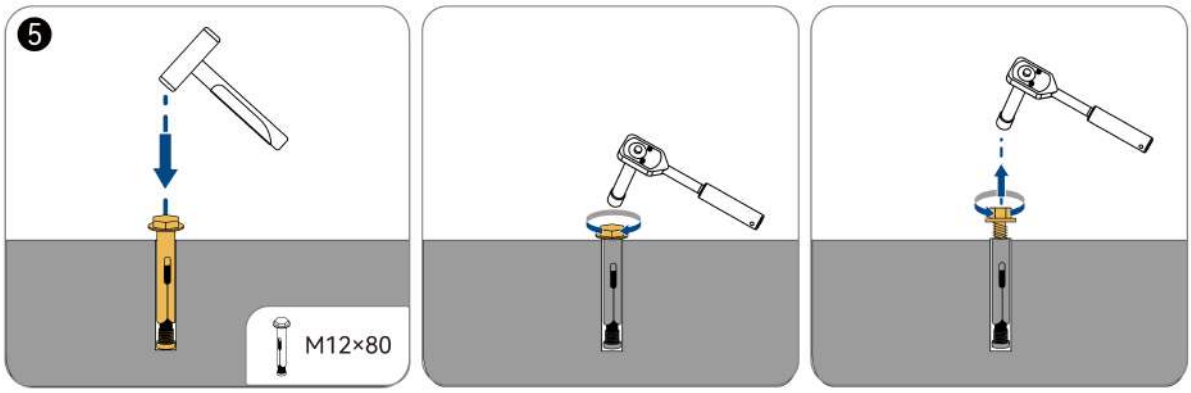
3. Place the mounting brackets on the four corners of the cabinet.



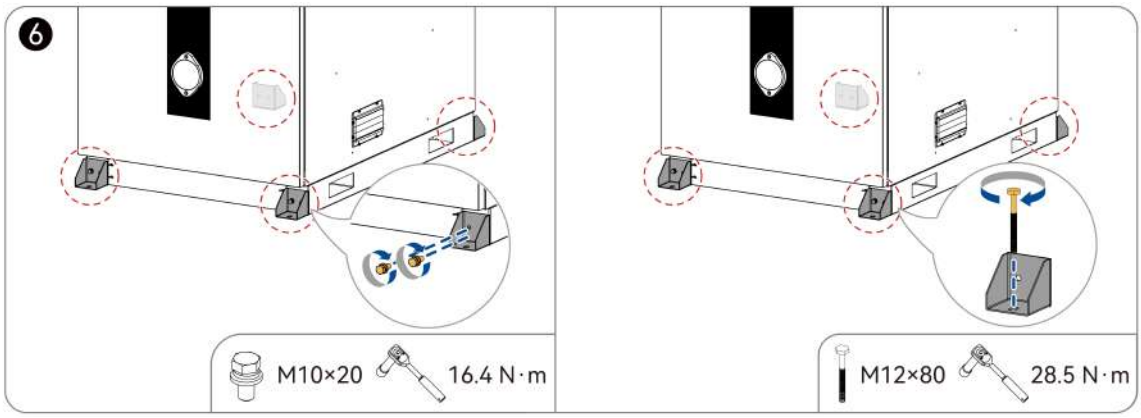
4. Mark four drilling holes on the ground with the mounting bracket and drill the four holes.



5. Insert the M12×80 expansion bolt into the drilled hole, screw in the expansion bolt with a socket wrench, and remove the screw with the socket wrench.



6. Secure each mounting bracket to the cabinet with two M10x20 screws. Secure the mounting bracket to the ground with the M12x80 screw.



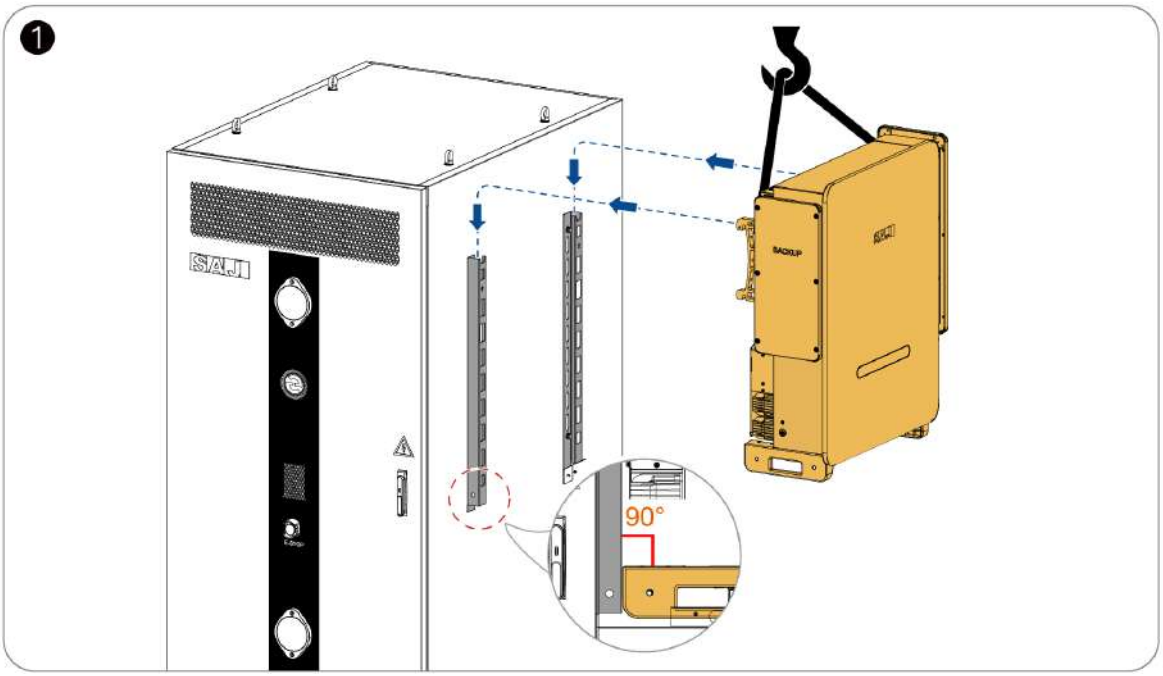
4.4. Install the inverter

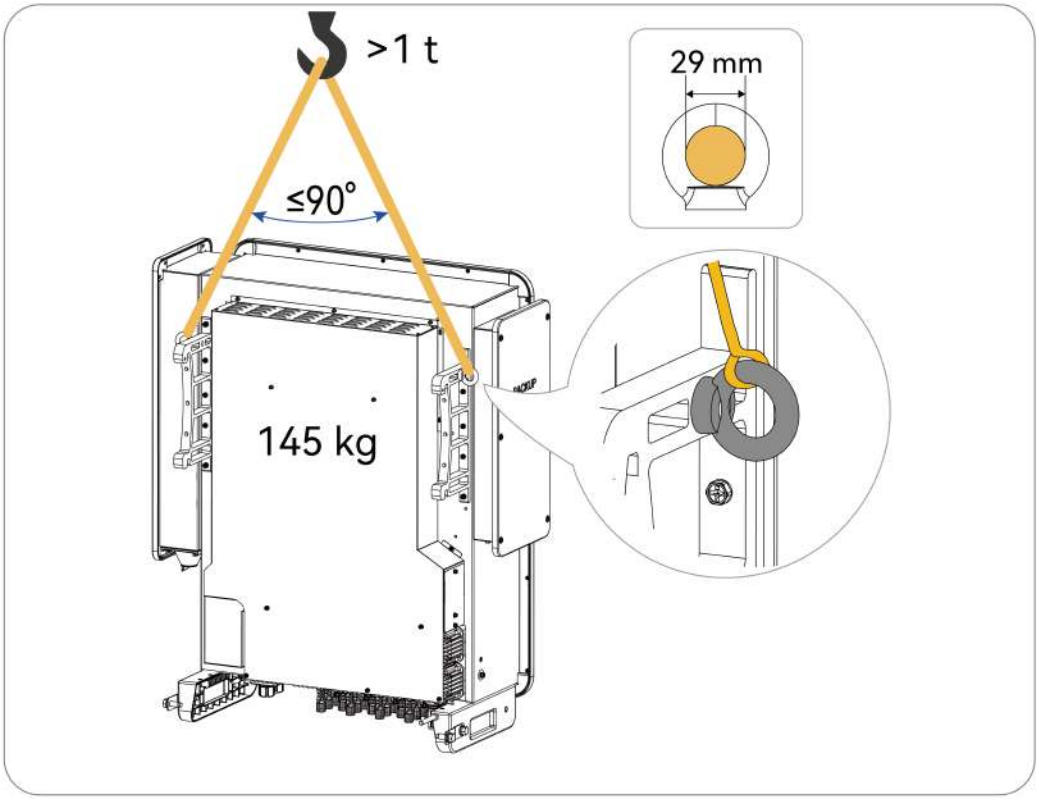
Before you begin

Prepare a crane to lift the CH3 inverter.

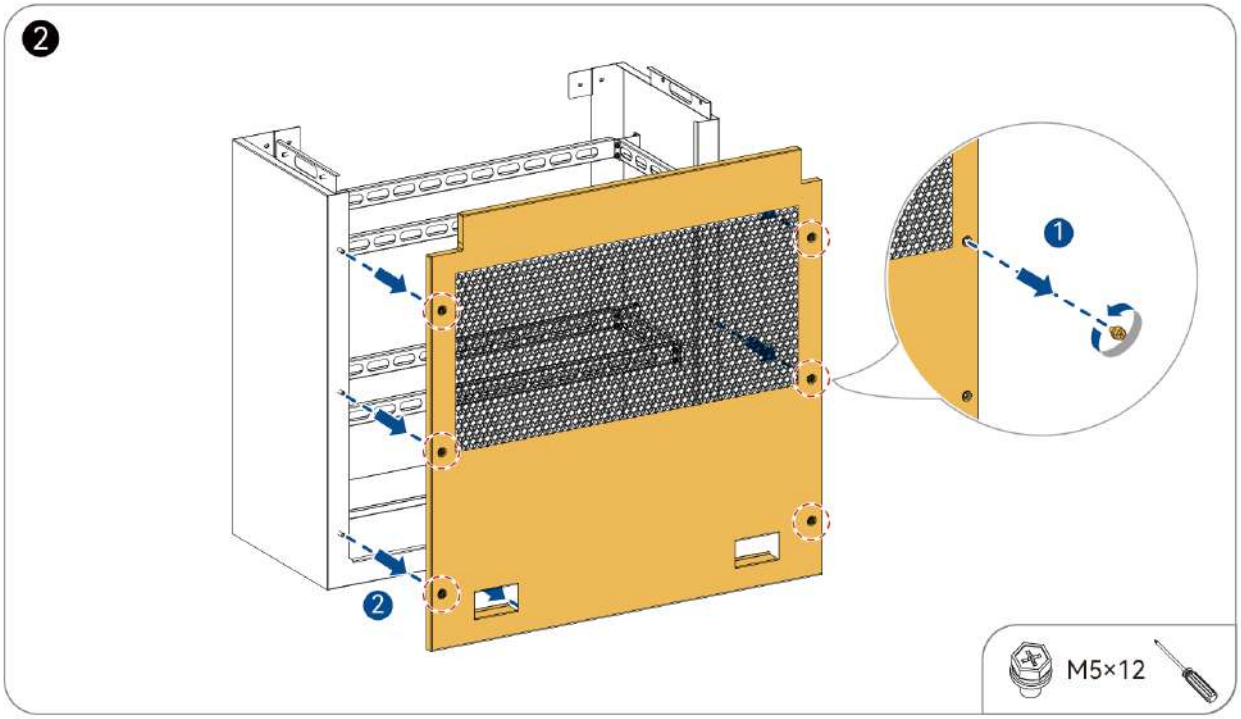
Procedure

1. Mount the inverter onto the mounting bracket on the right side of the cabinet. Make sure that the inverter is firmly placed against the mounting bracket.

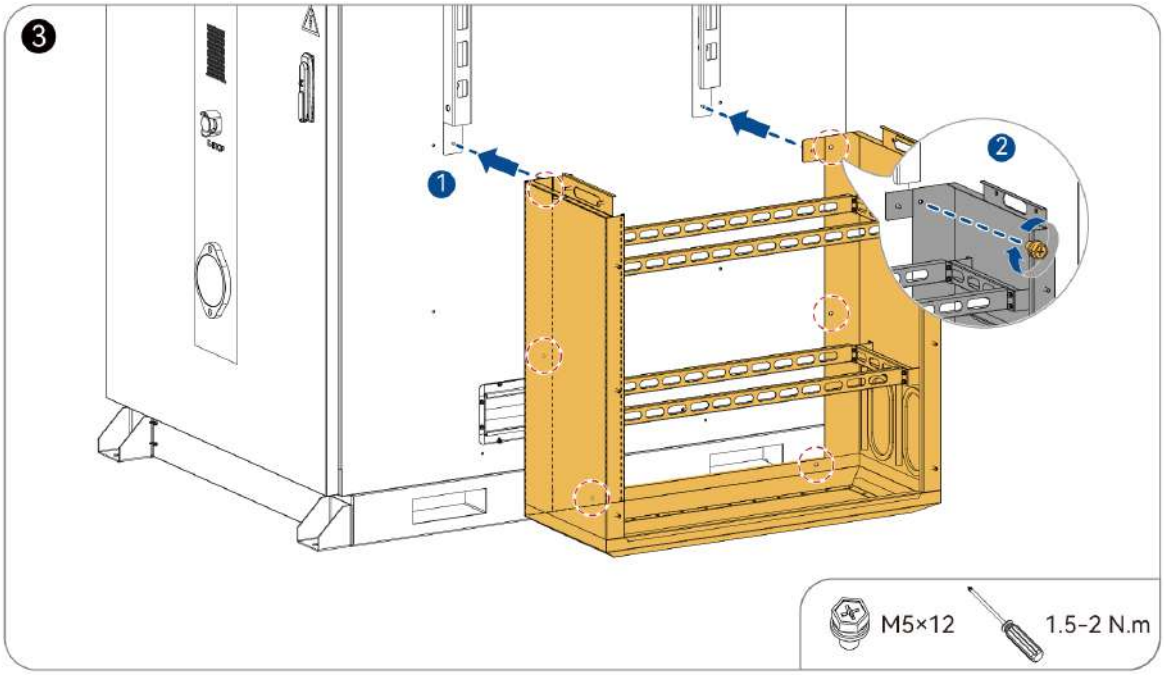




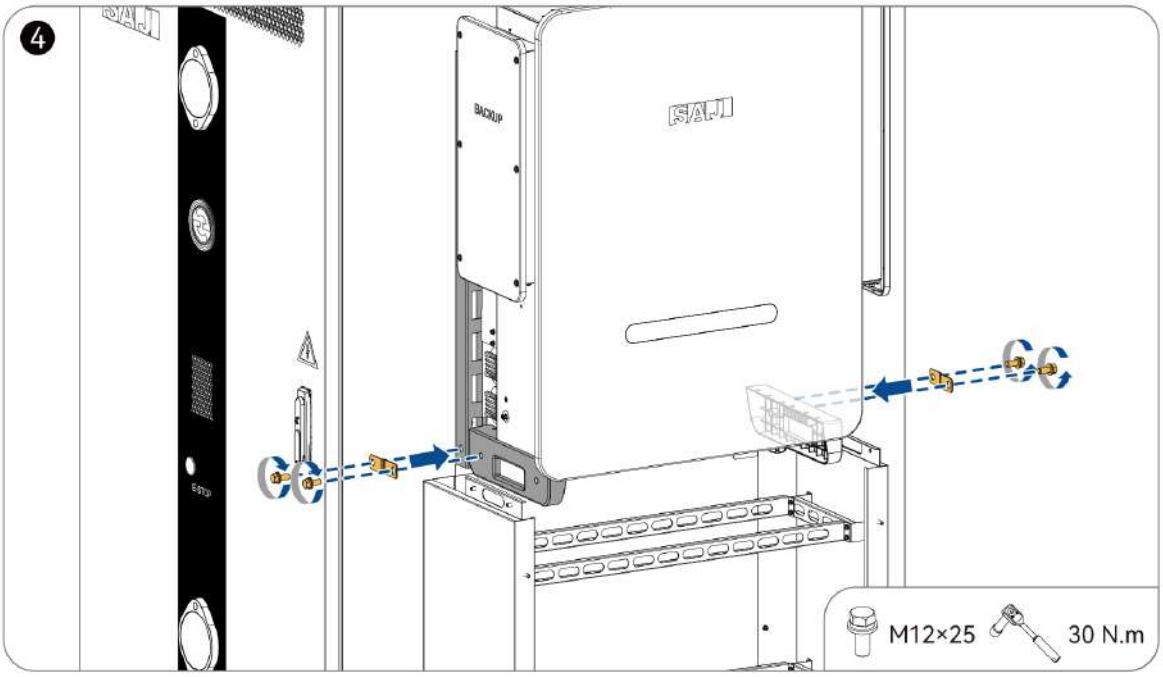
2. Remove the front cover of the cable cabinet.



3. Install the cable cabinet on the right side of the cabinet.



4. Secure the inverter to the mounting bracket with a metal plate on each side.



5. Electrical connection

5.1. 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.

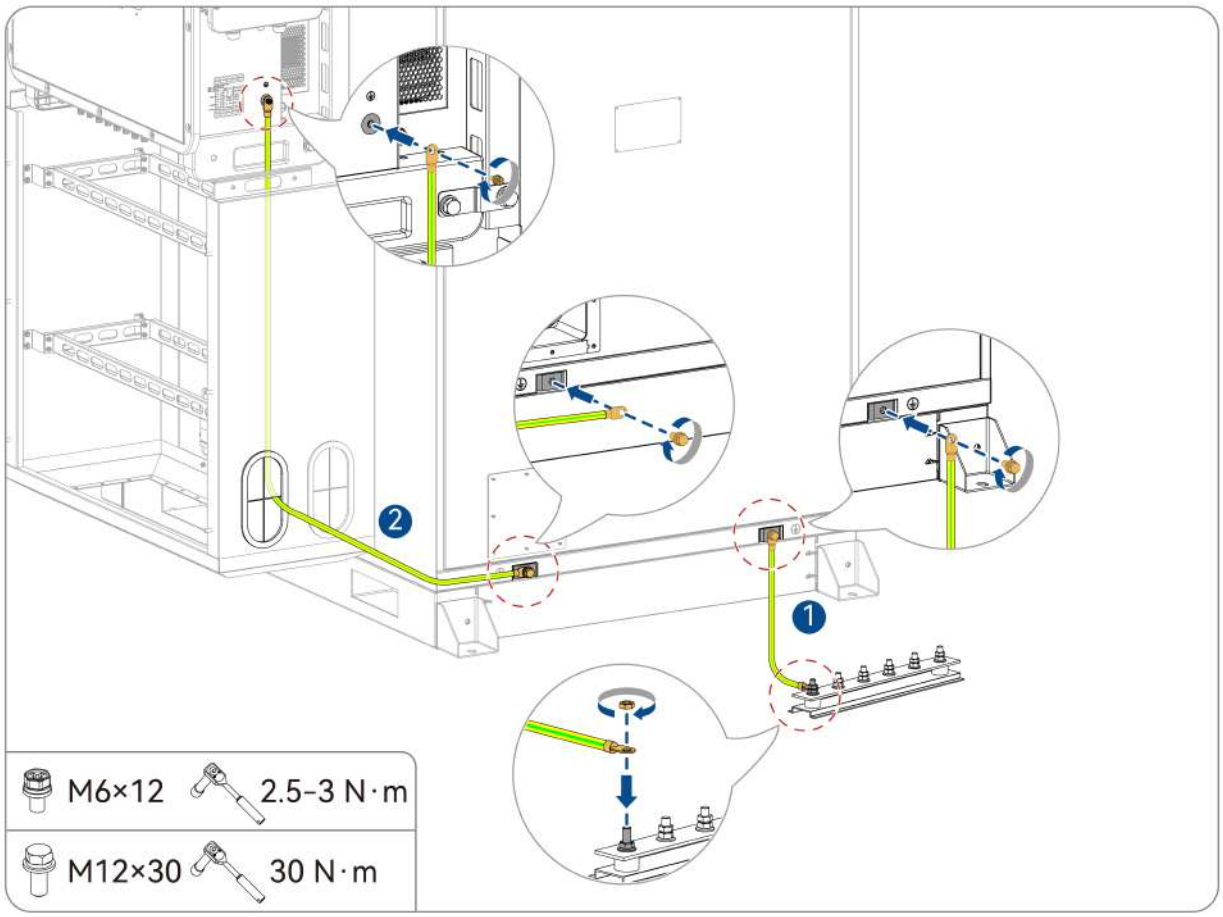
5.2. Connect the grounding cable

Before you begin

> **⚠ WARNING**
>
> **Connect the grounding cable before other electrical connections.**

Prepare an external grounding cable from the CB3 cabinet to the external earthing bar.

Cable cross-sectional area (mm^2)	Connecting terminal
25	SC25-12 OT/DT



Procedure

1. Connect the external grounding cable from the battery cabinet to the external earthing bar.
2. Connect the grounding cable in the delivery package from the CH3 inverter to the cabinet.

5.3. Connect the battery power cables

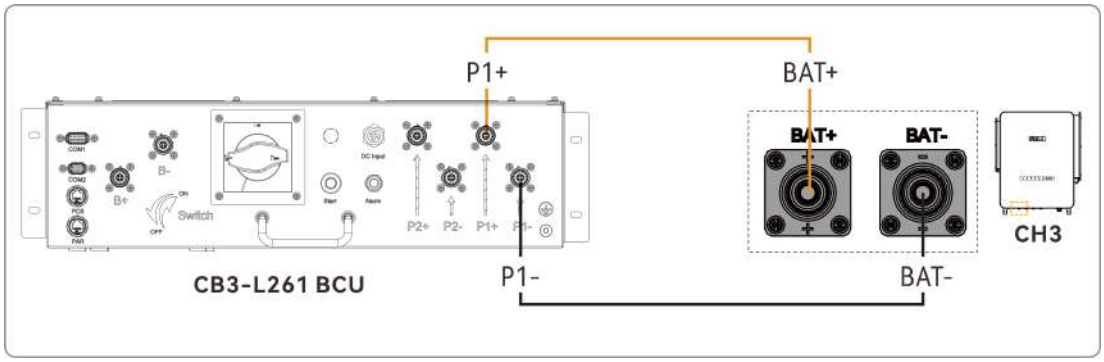
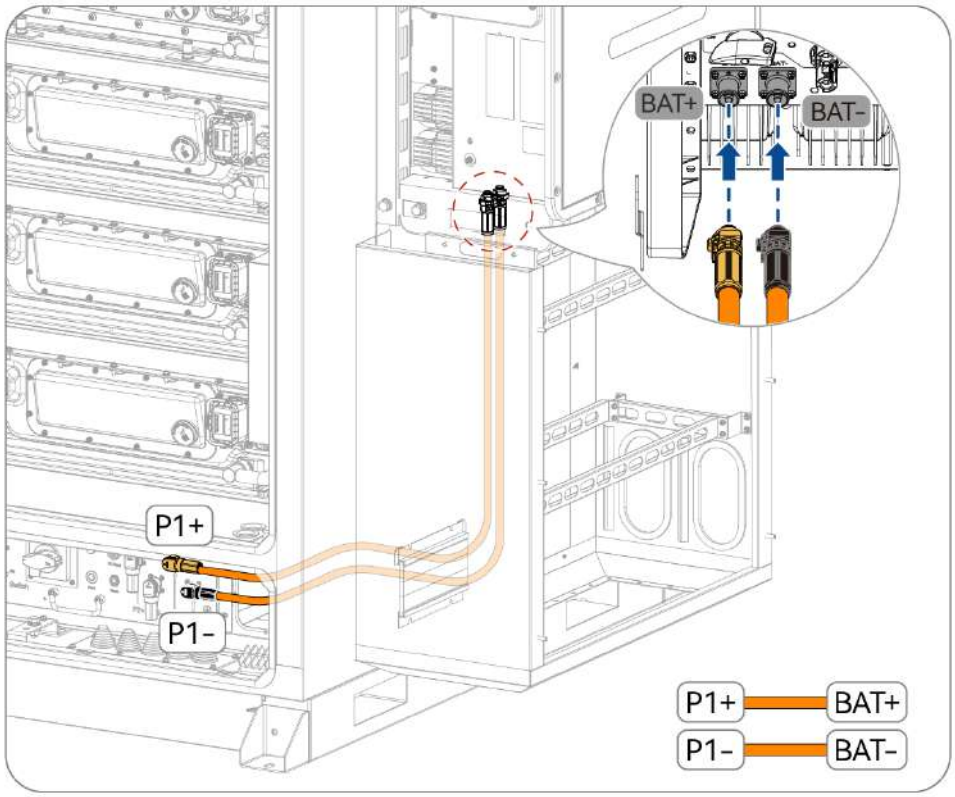


Figure 5.1. Battery power cable connections

Procedure

Plug in the battery power cables from the BCU to the CH3 inverter.



5.4. Connect the battery communication cable

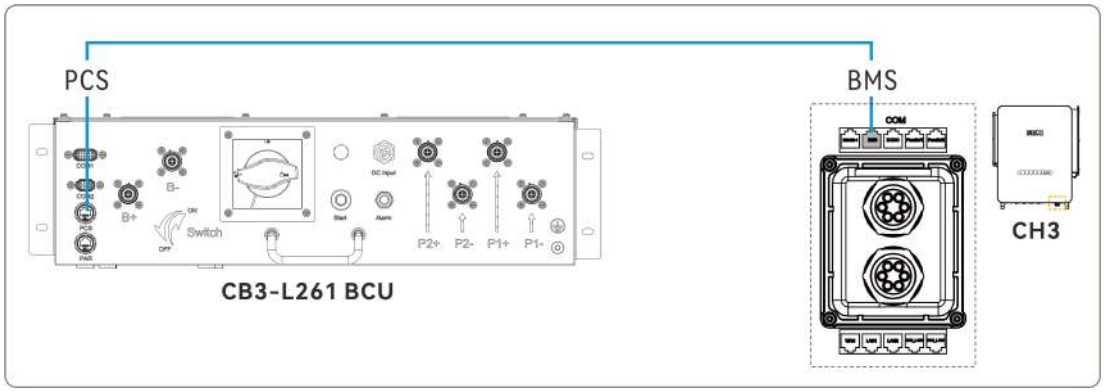
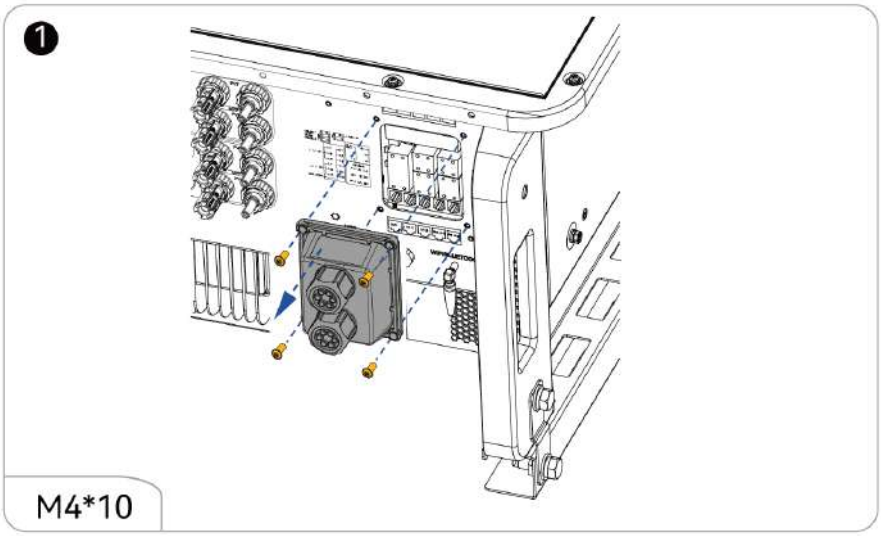


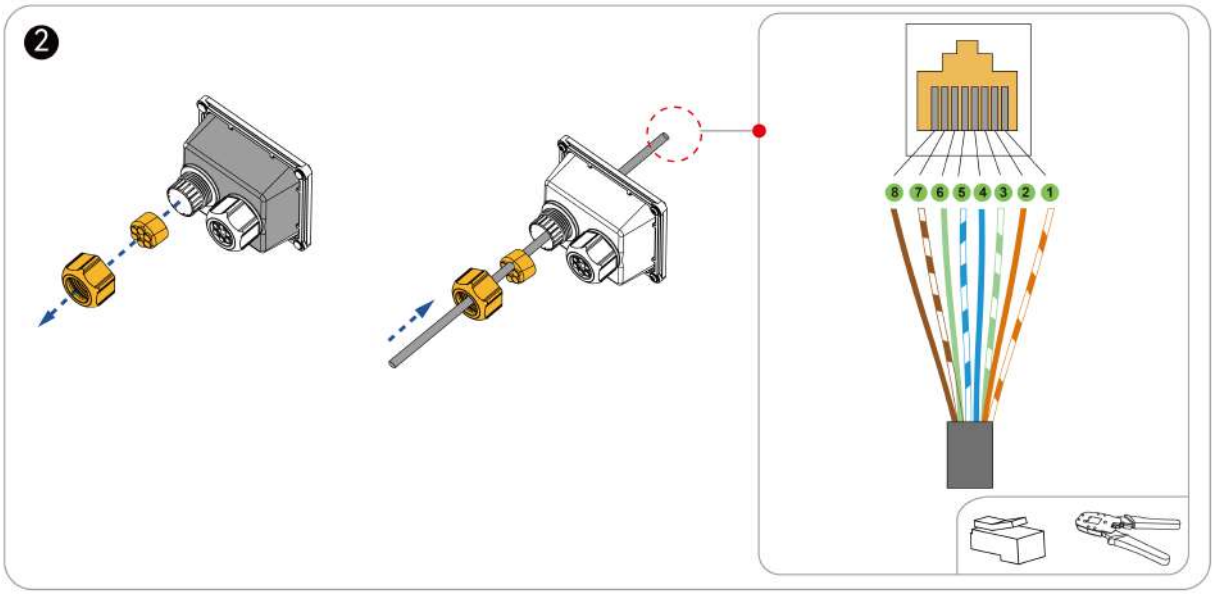
Figure 5.2. Battery communication cable connection

Procedure

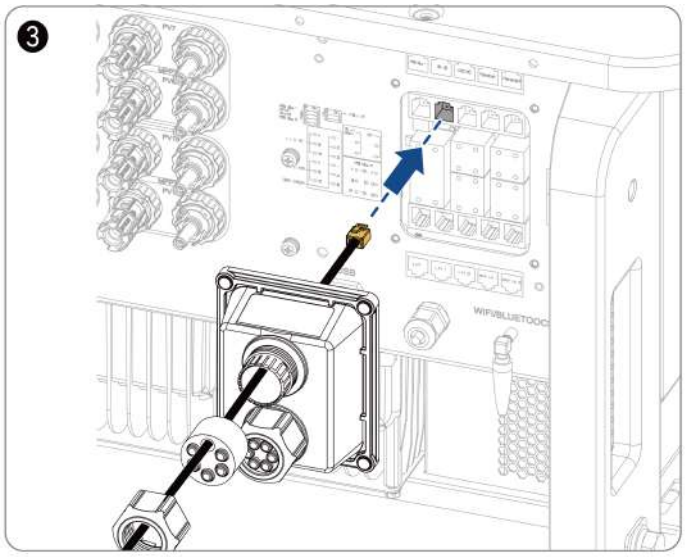
1. Remove the cable cover at the bottom of the inverter.



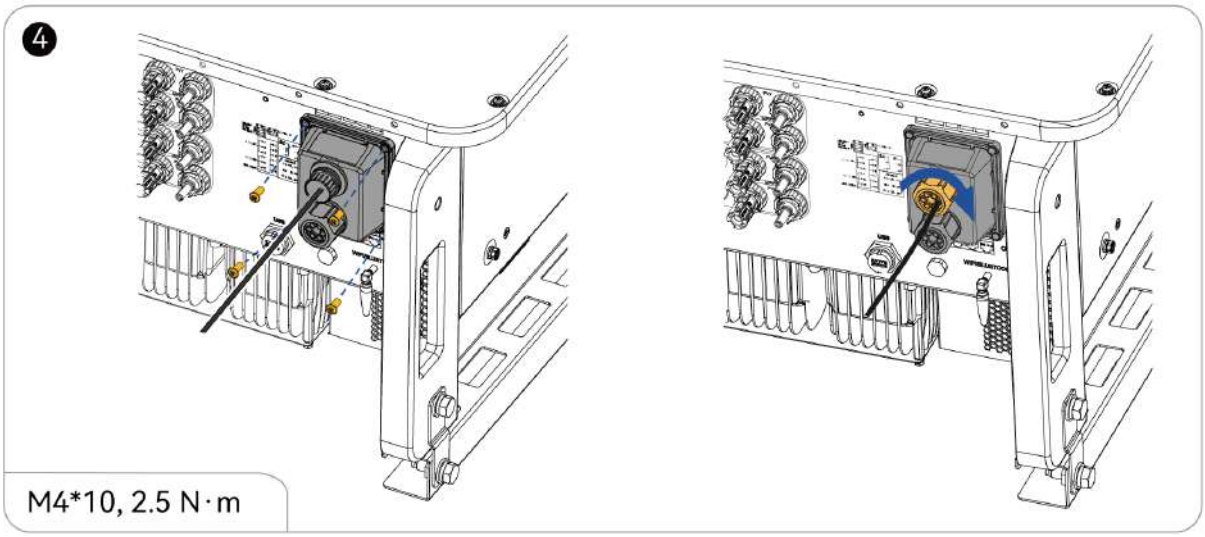
2. Assemble the RJ45 connector. Pass the cables through the cable gland and the sealing plug on the cover.



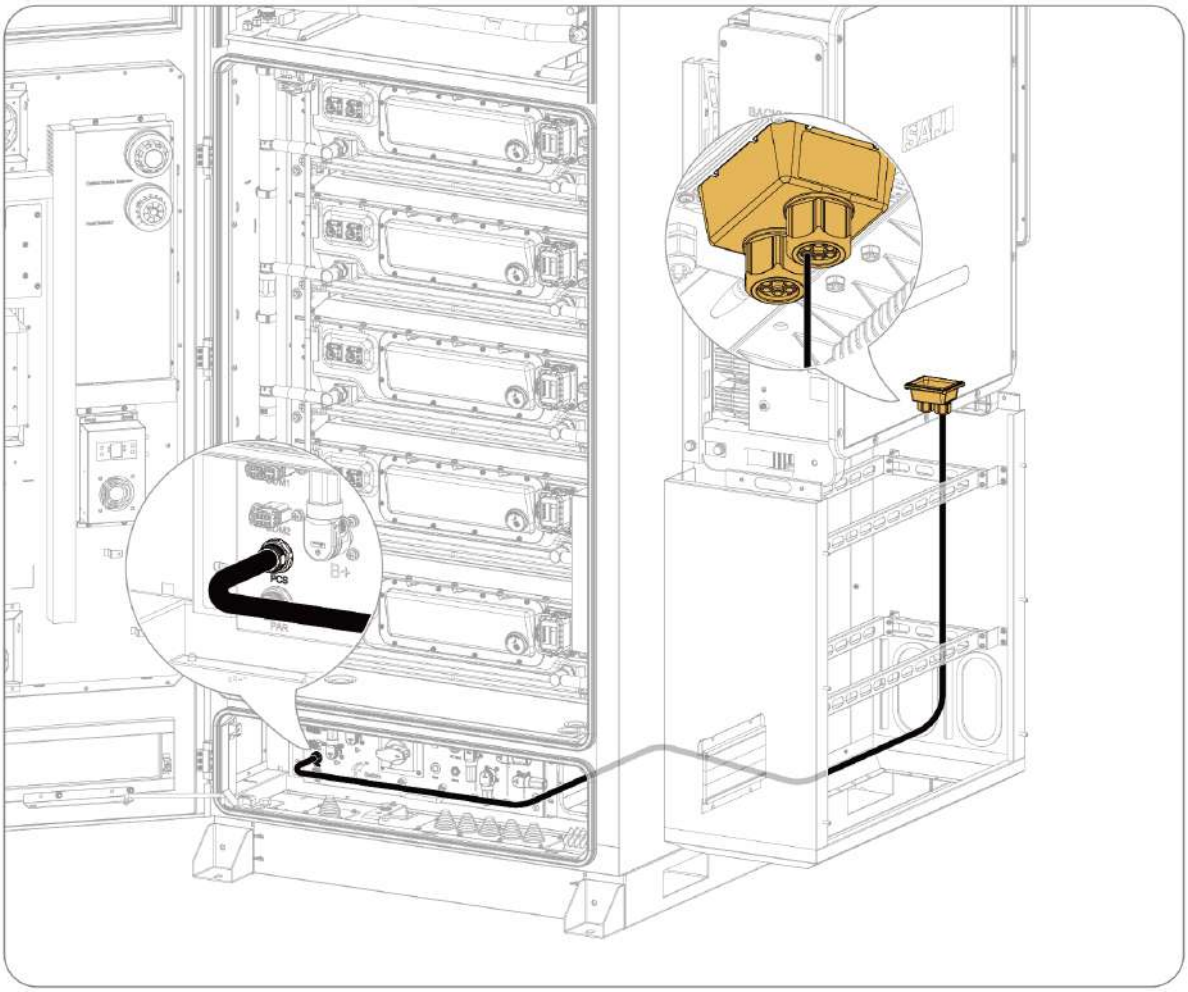
3. Connect the communication cable to the **BMS** port.



4. Install the cable cover to the inverter and tighten the cable gland.



5. Connect the other cable end to the **PCS** port on the CB3 BCU.

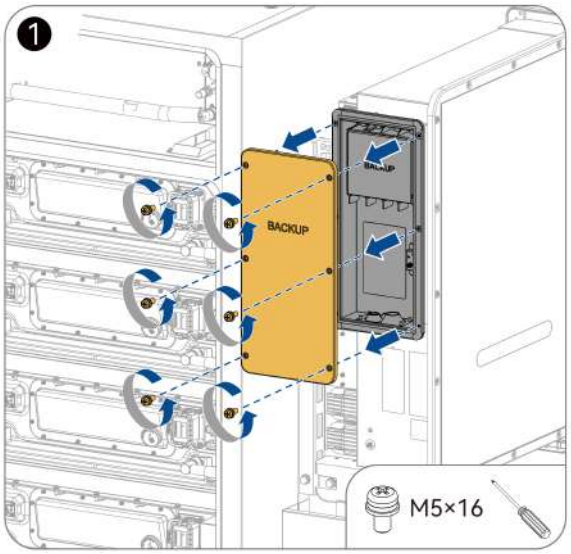


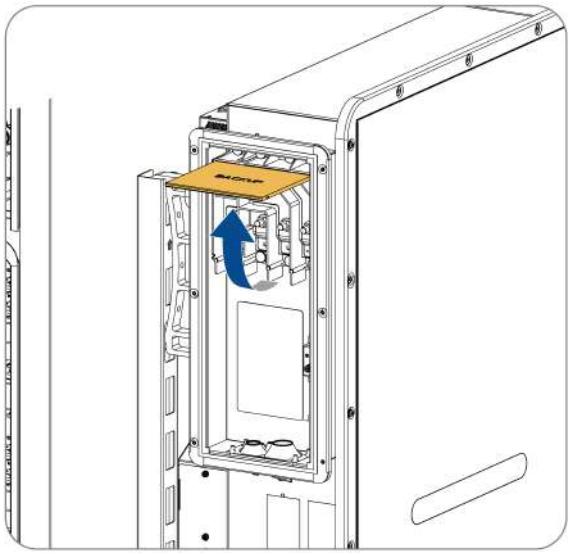
5.5. Connect auxiliary power supply cables

Follow this procedure to connect the auxiliary (AUX) power supply from the CH3 inverter **BACKUP** side to the cable terminal block at the bottom of the CB3 cabinet. This connection provides AUX power supply for the BCU. The cable between the AUX power supply unit and the BCU is connected before delivery.

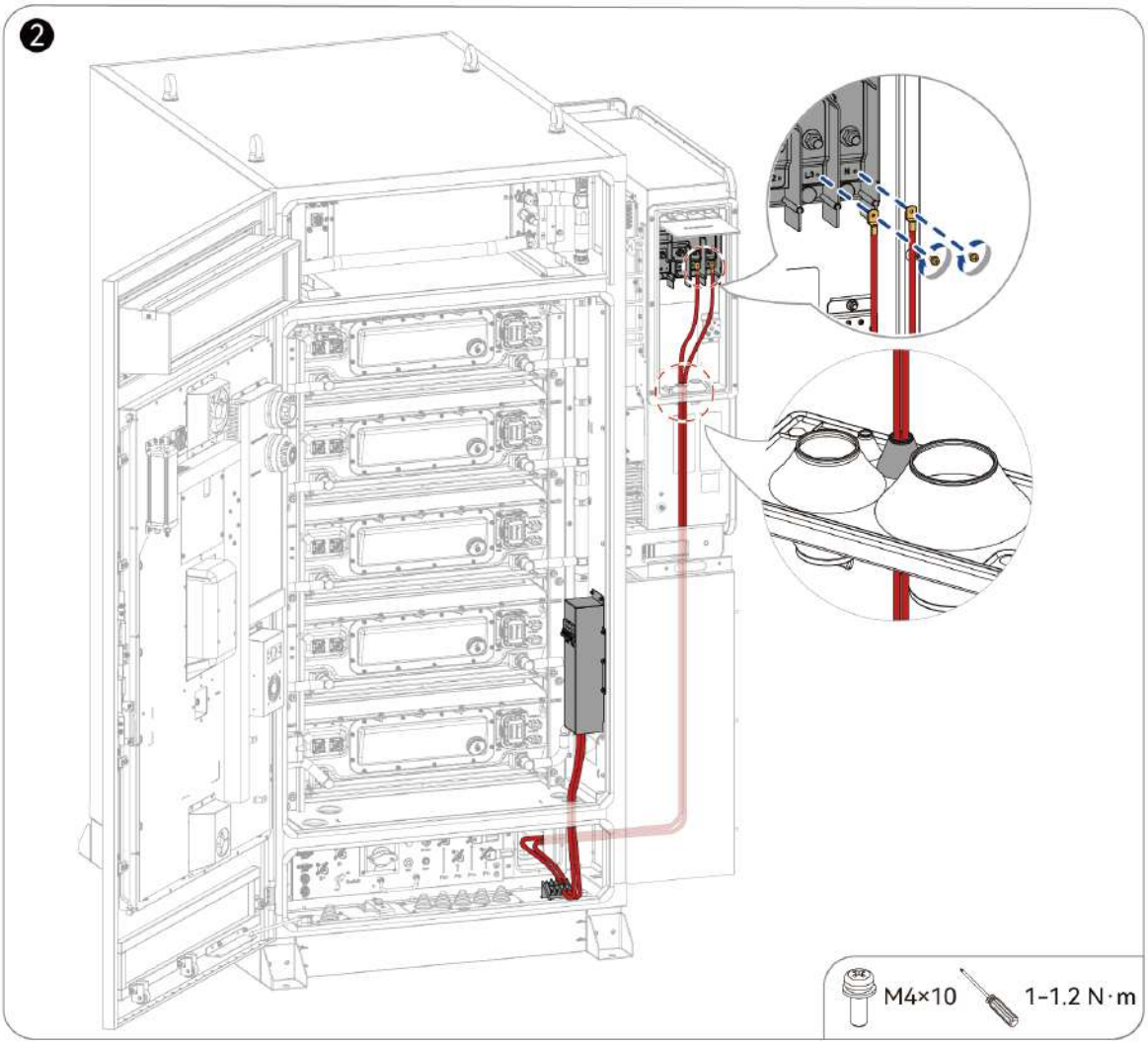
Procedure

1. Remove the outer cover from the **BACKUP** side of the inverter. Lift up the protective cover.

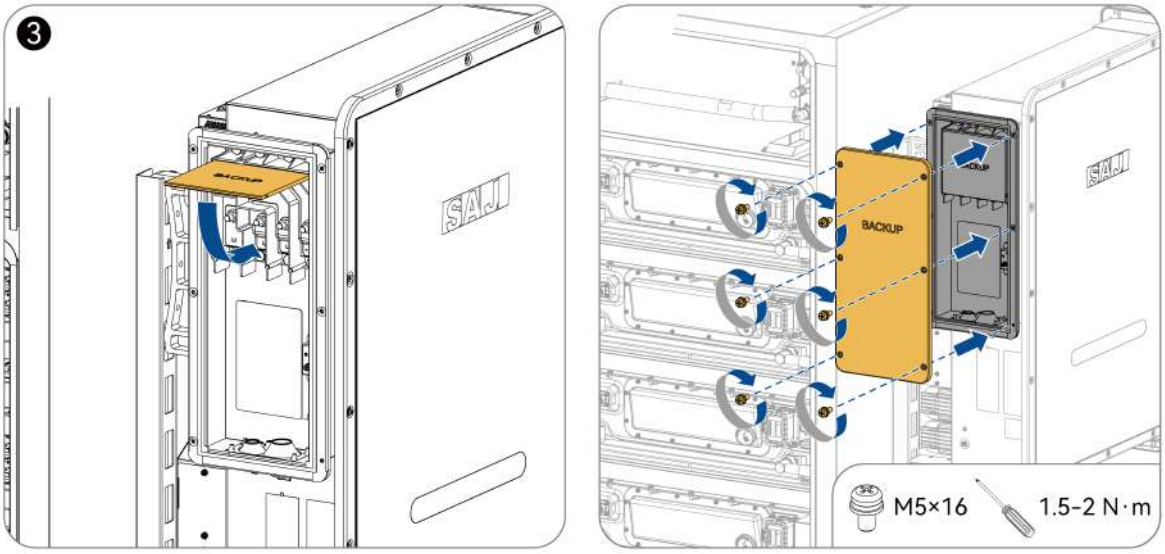




2. Connect the AC input power cable from the cable terminal block to the **L3** and **N** terminals of the inverter **BACKUP** connection.



3. Close the protective cover and install back the outer cover.



5.6. Connect electrical cables in parallel deployment

Follow the diagram below to connect the electrical cables in cabinet parallel deployment.

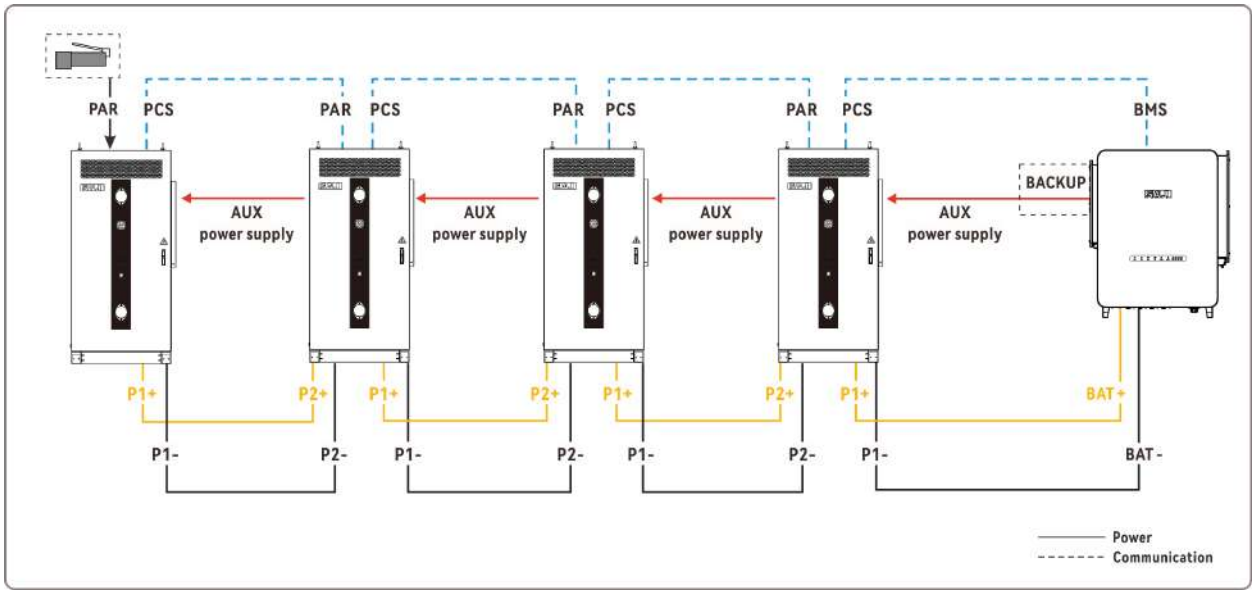
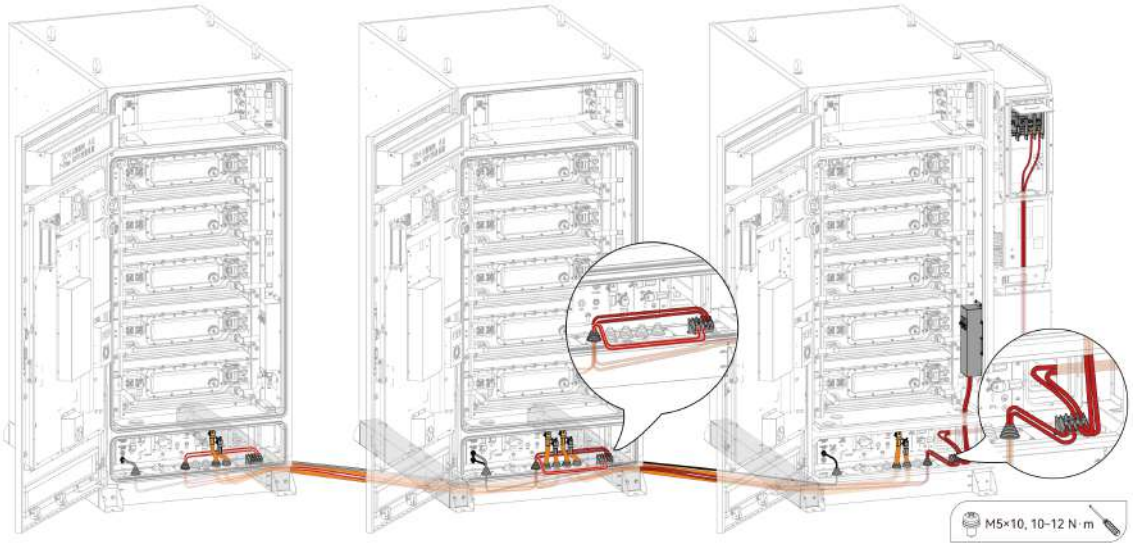


Figure 5.3. Cable connections in parallel deployment



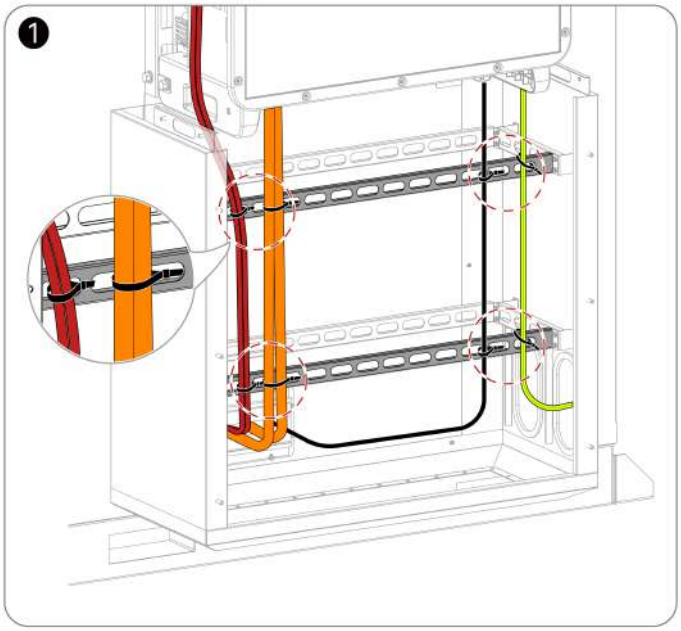
Procedure

1. Connect the negative and positive battery power cables.
2. Connect the standard network communication cables. Insert the RJ45 resistor to the **PAR** port of the furthest CB3 cabinet.
3. Connect the AUX power supply cables.

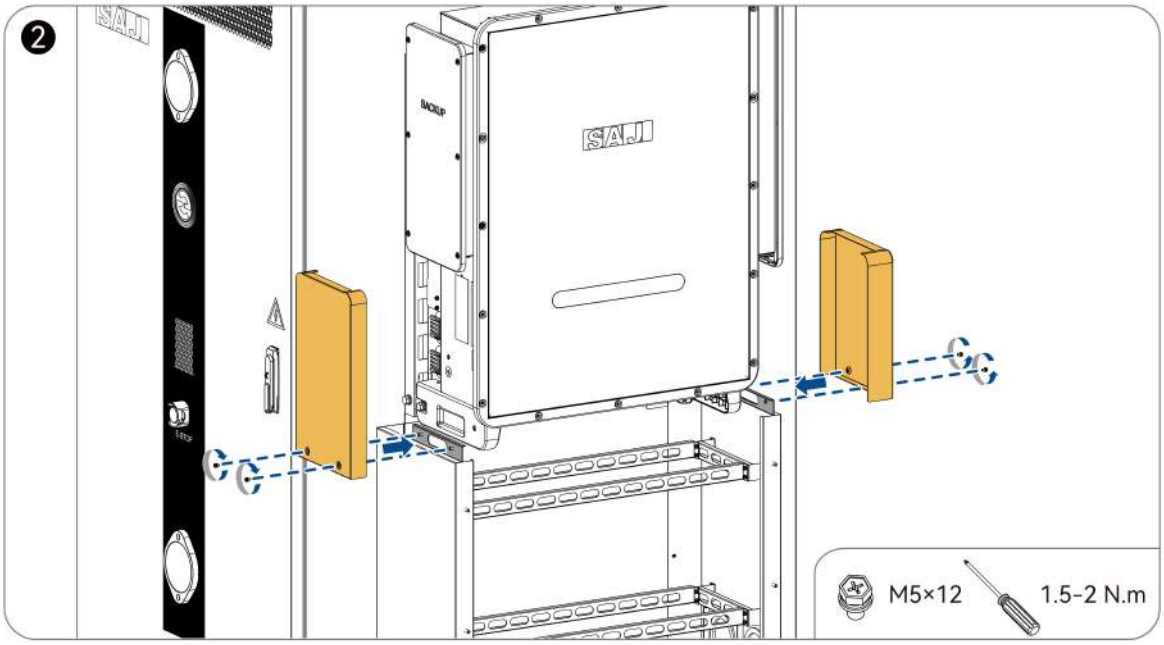
5.7. Finalize the installation

Procedure

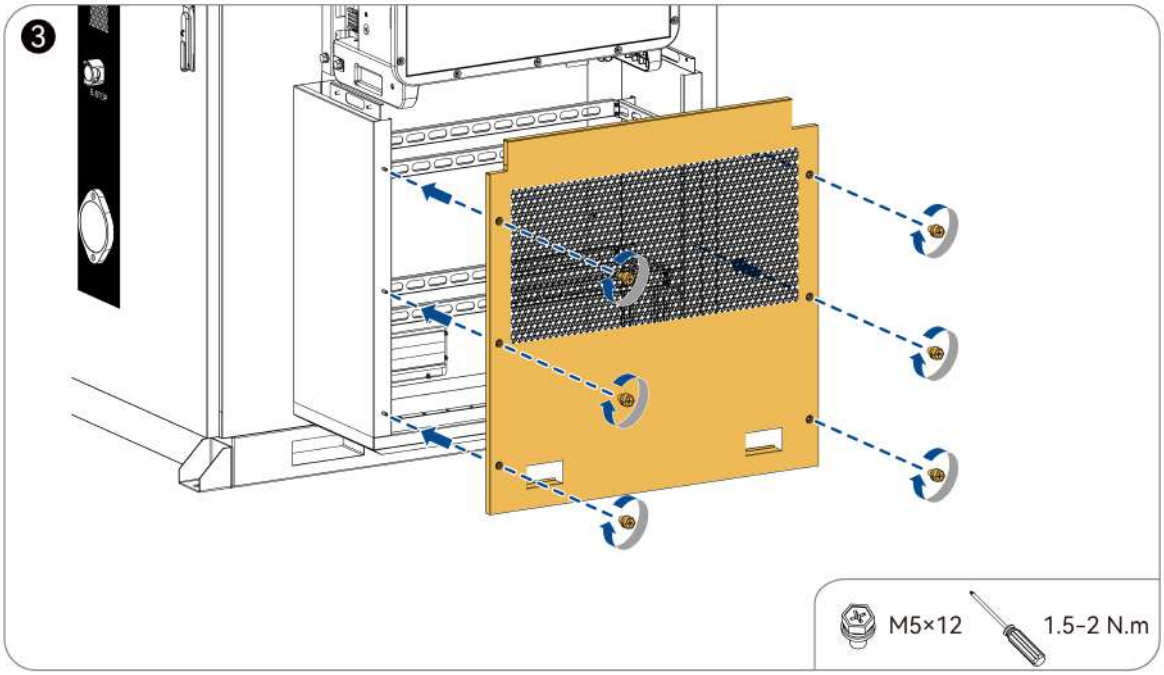
1. Fasten the cables to the beams of the cable cabinet to avoid loose connections.



2. Install the protective cover on each side of the inverter.



3. Install the front cover of the cable cabinet.

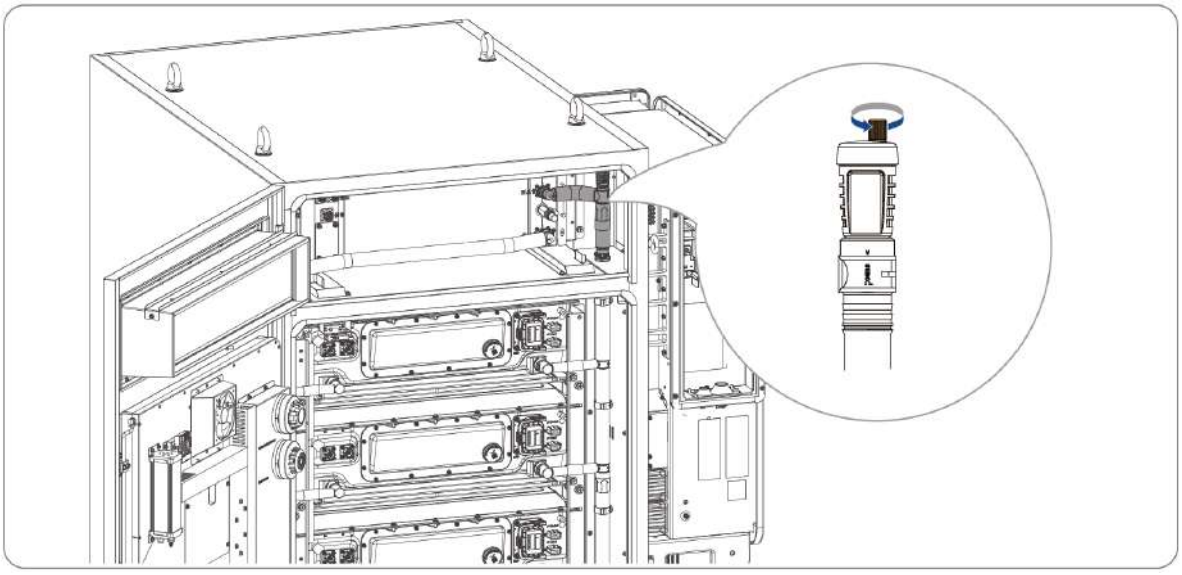


6. Startup and shutdown

6.1. System check before startup

Before starting up the CB3 cabinet, check that the following items meet the corresponding acceptance criteria:

No.	Item	Acceptance Criteria
1	Equipment appearance	• The equipment appearance is intact with no damage, rust, or paint peeling. Any areas of paint peeling should be repainted. • Equipment labels are clear and visible; any damaged labels should be replaced promptly.
2	Cable appearance	• The cable sheath is intact without obvious damage. • The conduit for cabling is undamaged.
3	Cable connection	• Cable connections match the design specifications. • Terminal fabrication complies with relevant standards, ensuring secure and reliable connections. • Labels at both ends of each cable are clear and consistent in orientation. • Cables are not overly taut, allowing for appropriate slack to prevent stress concentration.
4	Cable routing	• Wiring adheres to the principle of separating strong and weak electrical circuits to avoid electromagnetic interference. • Cables are neatly arranged and aesthetically pleasing. • Cable ties are trimmed evenly, with no sharp edges exposed. • Cable bend radii are within reasonable limits; extra length should be left at bends to prevent tension. • Wiring is straight and smooth, with no crossing cables inside the cabinet.
5	Switch	• The switch for the upstream AC equipment is in the **OFF** position. • The switch for the high-voltage box is in the **OFF** position.
6	Liquid cooling system	• Open the switch box of the liquid cooling system and make sure that the switch is pushed upwards and shows **ON**. • Loosen the breather valve by rotating the valve anti-clockwise for 5 full turns. See figure below for the location of the breather valve.

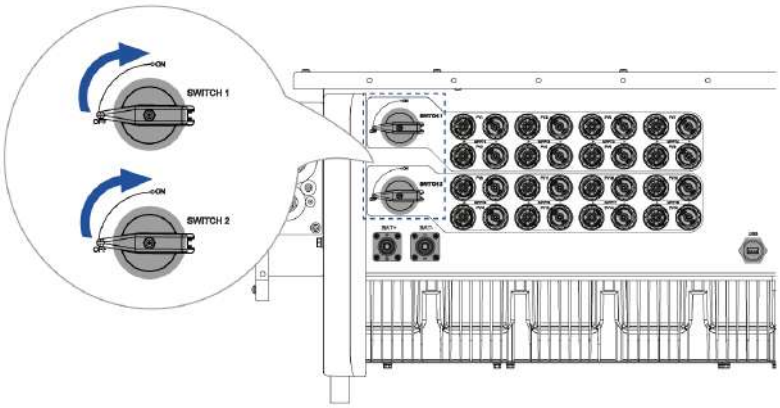


6.2. Start the system

Follow this procedure to start up the CH3 inverter first, and then the CB3 battery system.

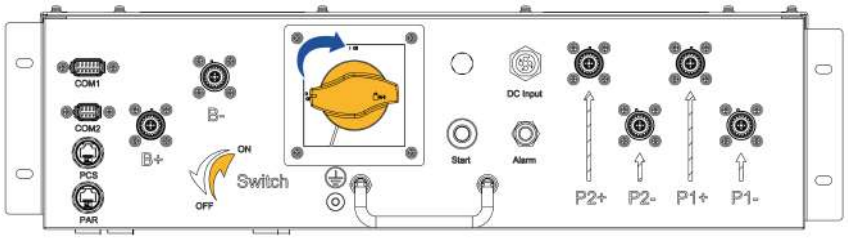
Procedure

1. Connect the external AC circuit breaker to turn on the AC power sources.
2. Turn on the two DC switches at the bottom of the inverter to start up the inverter.



When the STATE indicator shows solid green, it indicates that the inverter is up and running.

3. Turn the DC **Switch** on the BCU to **ON**.



Check that the **Start** button on the BCU shows solid green.

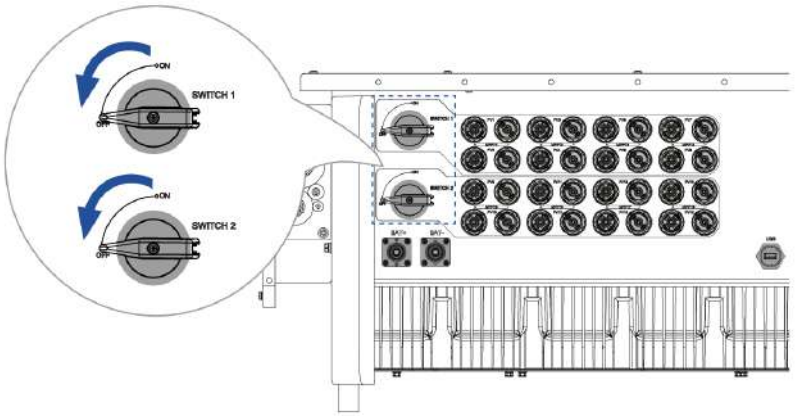
4. Check that the LED indicator on the cabinet door shows green.
5. Continue with the commissioning procedure on the elekeeper App or web platform.
6. After the system is powered on for 30 minutes, test the temperature of the following terminals with a thermal detector to ensure that the temperature is within proper range:
   - Inverter AC terminals
   - BCU DC terminals
   - Battery pack DC terminals
7. Lock the cabinet door and keep the key at a proper place.

6.3. Stop the system

Follow this procedure to stop the running CB3 system.

Procedure

1. Disconnect the external AC circuit breaker to turn off the AC power sources.
2. Turn off the two DC switches at the bottom of the inverter.



When the STATE indicator is off, it indicates that the inverter is powered off.

3. Turn the DC **Switch** on the BCU to **OFF**.
4. Check that the LED indicator on the cabinet door is off.
5. When multiple cabinets are installed, repeat step 3 and 4 on each cabinet.

6.4. Stop the system for maintenance

Take this procedure to shut down the system for maintenance purpose.

Procedure

1. Follow the steps in 6.3. Stop the system *(on page 46)* to stop the system.
2. Unplug the positive and negative power cables on the BCU.

   Check that the LED light on the cabinet door is off.
3. Start the necessary maintenance operations.

7. Commissioning on elekeeper App Version 5.0

7.1. Download and log in to the elekeeper App

7.1.1. 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.

7.1.2. 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.

7.1.3. 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.

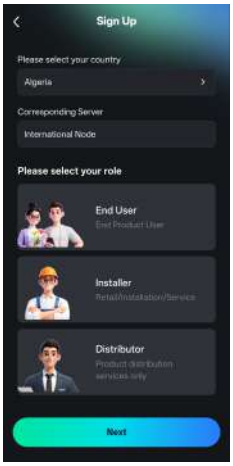
Note: Recommend activating the Location Services on the phone for optimum utilization of the functions.

Procedure

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



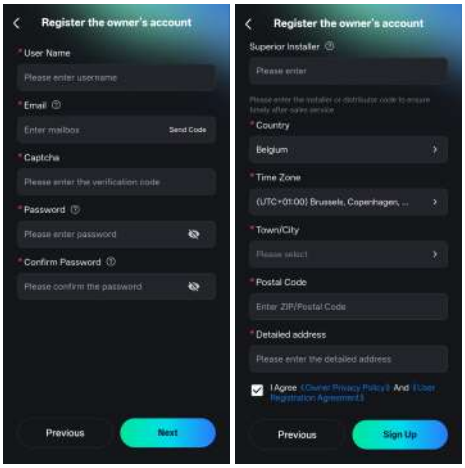
2. Select the country of the installation site and the user role.



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.

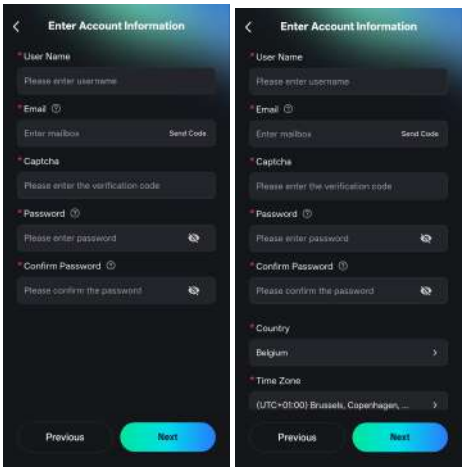
Table 7.1. Signup parameters

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

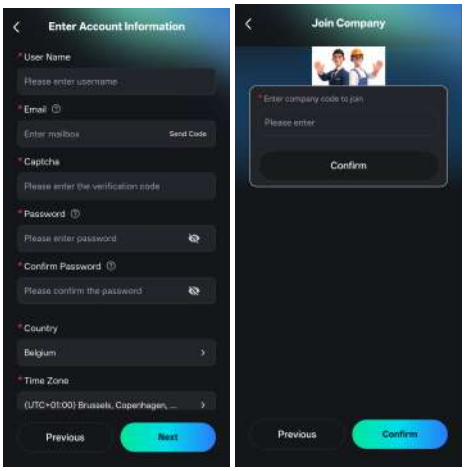


4. For the **Installer** role, either create a company or join an existing company to provide the information accordingly.

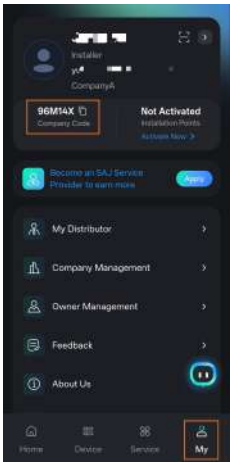
   To create a company:



To join a company:



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

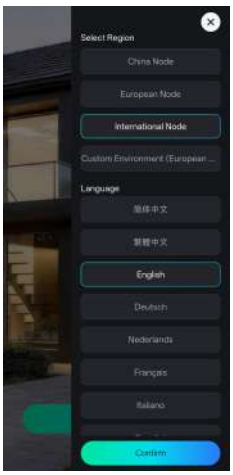


5. For the **Distributor** role, provide similar information as the **Installer** role.

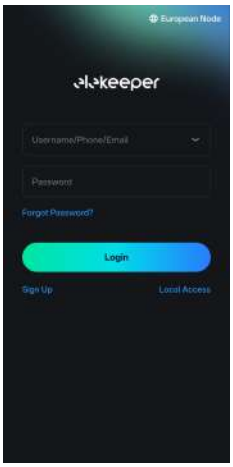
7.1.4. Log in to the elekeeper App

Procedure

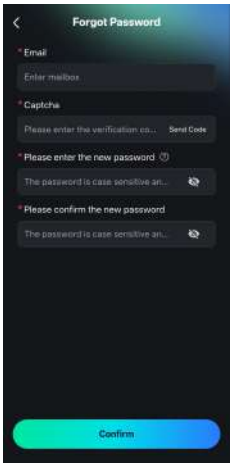
1. Open the App and tap the globe icon on the top right corner.
2. Select the **Region** and **Language** depending on the installation site of the system.



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



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

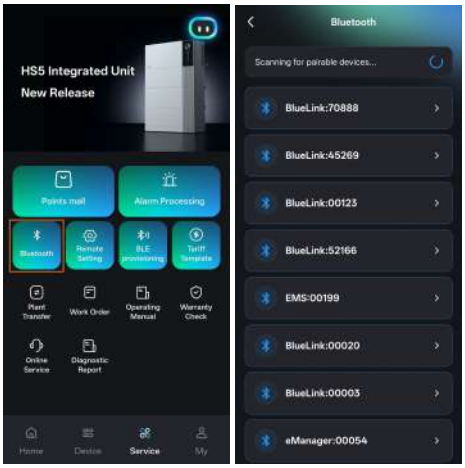


7.2. Set the battery parameters

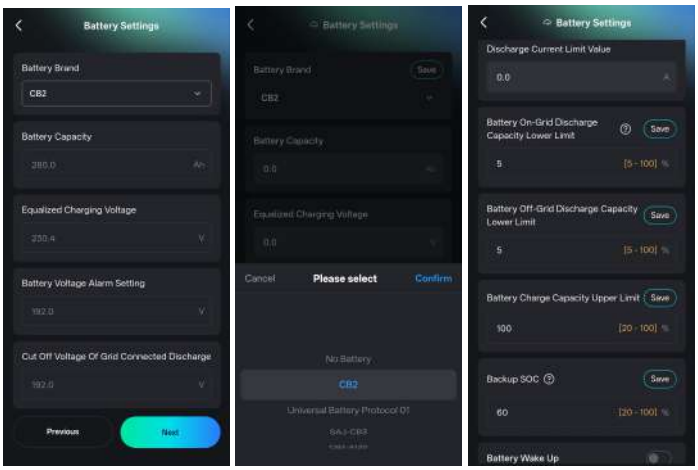
The installation technicians can configure the **Battery Settings** during the initialization of the inverter on the elekeeper App or set the parameters after installation through remote connection.

Procedure

1. On page **Service**, tap **Bluetooth**. Select the communication module, inverter or EMS according to the last five digits of the serial number (SN).
   Example:
   - **BlueLink: 45269** for a communication module or inverter.
   - **EMS: 00199** for EMS units.



2. Select **Battery Settings** and configure the parameters as needed.



Parameter	Description
Battery Brand	The brand of the battery currently adapted for match the corresponding BMS communication protocol.
Battery Capacity	The rated ampere-hour capacity (Ah) of the battery pack, used by the system to estimate total energy (kWh) and remaining runtime.
Equalized Charging Voltage	The maximum charging voltage limit for the battery. When reached, charging stops or switches to constant voltage to prevent overcharging and cell damage.
Battery Voltage Alarm Setting	The voltage threshold at which a low-voltage alarm is triggered. It reminds the user to monitor battery level.

Parameter	Description
Cut Off Voltage Of Grid Connected Discharge	The voltage at which the battery hard-stops discharging during grid-tied operation and switches to grid power, serving as the final physical protection.
Charge Current Limit Value	The maximum charging current (A) allowed by the battery. The system limits the input power beyond this current to protect cells from high current stress.
Discharge Current Limit Value	The maximum discharging current (A) allowed. The load power is limited beyond this current to avoid overcurrent damage to the battery.
Battery On-Grid Discharge Capacity Lower Limit	The SOC percentage at which discharging stops during grid-tied operation, switching to grid power to reserve energy for unexpected outages.
Battery Off-Grid Discharge Capacity Lower Limit	The lower SOC percentage (typically lower than the grid-tied value) allowed during off-grid/power outage situations to extend emergency backup duration.
Battery Charge Capacity Upper Limit	The SOC percentage at which charging stops. Reducing this value can prolong battery life.
Backup SOC	The target SOC threshold maintained by the system (higher than the grid-tied discharge limit). When SOC falls below this, the system prioritizes PV or grid charging to ensure sufficient backup power.
Battery Wake Up	A function to force a wake-up voltage or restart communication when the battery enters sleep state due to undervoltage, overtemperature, or BMS protection, allowing reconnection without physical rewiring.

Table 7.2. Battery parameters

8. Operation and maintenance

8.1. General safety instructions

⚠ WARNING

Danger of high voltage

- After the system is shut down, wait for at least five minutes to let the energy storage capacitors discharge completely before you open the cabinet door for any maintenance operations.
- Only qualified electrical technicians are allowed to perform the maintenance operations.
- Only perform the maintenance operations in clear and dry weather with no wind or sand. Do not open the cabinet door in weather conditions such as rain, snow, thunderstorms, sandstorms, or heavy fog.
- Do not allow any items (such as fingers, parts, screws, or tools) to contact the fan until it has been powered off and has completely stopped rotating to prevent mechanical injuries.

⚠ CAUTION

- Do not leave any screws, washers, and other metal parts inside the cabinet. It can cause short circuits, arc discharges, or other electrical faults, which can lead to serious incidents such as fires or explosions.
- Sand or impact of moisture could damage the electrical components and affect the operating performance of the system.

To ensure the safety and efficiency of maintenance work on the BESS, it is essential to strictly follow these safety operating procedures:

- There must be at least two people or more on-site during maintenance work to assist and respond in emergencies.
- During maintenance, use insulating materials to cover nearby live components to prevent accidental electric shock.
- Do not power on the equipment before completing fault diagnosis to avoid new faults or safety hazards.
- During live inspections, pay attention to warning signs on the equipment and avoid standing near the cabinet door to prevent injuries from unexpected situations.
- For switches that need to be disconnected for maintenance, place a "Do Not Close" warning sign at the switch location to prevent accidental operation.
- After replacing power components or changing wiring in the system, manually start the wiring detection and topology recognition process to ensure normal system operation and avoid abnormalities.
- After completing all maintenance and replacement operations, promptly lock the cabinet door and properly store the keys to ensure the safety of the equipment.

8.1.1. Battery safety instructions

⚠ DANGER

A short circuit in a battery pack can generate an instantaneous large current and release a significant amount of energy, which poses serious risks including personal injury and property damage.

When performing maintenance operations on the battery packs:

- Use high-quality electrical (insulating) tape to wrap any exposed cable terminals on the battery pack to prevent accidental contact between conductive parts and reduces the risk of short circuits.
- Avoid allowing any conductive objects such as screws, tools, or metal debris near the battery pack. These items can inadvertently cause a short circuit if they contact exposed terminals or internal components.

8.2. Regular maintenance

Conduct regular maintenance of the product to ensure its long-term stable operation.

The maintenance cycles provided in this section are for reference; actual maintenance cycles should be adjusted based on the specific environmental conditions at the project site. Especially in harsh environments such as desert areas, maintenance cycles should be shortened, and cleaning and anti-corrosion measures should be more frequent.

If the system is installed in a desert area, it is recommended to carefully inspect and thoroughly clean both the inside and the outside of the cabinet after each sandstorm.

NOTICE

- The maintenance cycles in this section are provided as references; actual maintenance cycles should be adjusted based on factors like power station size, site location, and its environmental conditions.
- Increase the maintenance frequency in areas with heavy sandstorm or dust.

8.2.1. Maintenance items every three months

Take the following maintenance operations at least once every three months:

Item	Method
Safety functions	• Press the emergency shutdown button to confirm that the system immediately stops all operations and cuts off power. • Check whether all warning signs and labels are clearly visible and not damaged or faded. Replace the signs or labels if necessary.
Cabinet exterior	Any flammable objects on top of the cabinet. Remove them immediately if any.
Cabinet interior	Check for any foreign objects, dust, dirt and frosting inside the cabinet.
Air inlets and outlets	Check for dust accumulation on the battery control module fan. If necessary, clean the fan with a vacuum cleaner and replace the dust filter inside the cabinet. For instructions on cleaning and replacing the dust filter, see 8.4. 11.4 *(on page 58)*.
Metal components	• Check all metal components for oxidation or rust. • Measure the system voltage to ensure it remains stable within specified limits. • Check insulation resistance to ensure good insulation and prevent short circuits or leakage accidents.
Liquid cooling system	• Check the pressure level of the liquid cooling system. If the pressure level is low, refill the coolant. • Check for dust accumulation on the dust filter. Clean the dust filter as needed. For instructions, see 8.5. Clean dust filter of liquid temperature control unit *(on page 60)*.

8.2.2. Maintenance items every six months

Take the following maintenance operations at least once every six months:

Item	Method
Cabinet exterior	Inspect the cabinet for the following situations. If found, take necessary actions or contact the service engineers: • Inspect the welding points between the cabinet and the base plate for stability and rust. • Inspect the cabinet shell for damage, peeling or oxidation. For repainting instructions, see 8.7. Repainting *(on page 61)*. • Check that the cabinet door and locks are working.
Wiring and cable arrangement	WARNING Ensure that all internal equipment in the energy storage cabinet is completely powered off and wait at least 5 minutes for capacitors to fully discharge before starting the inspection work. • Check if all cables are neatly arranged, looking for any short circuits, crossings, or loose connections. Correct any abnormalities immediately and reorganize the cables as needed. • Inspect all entry and exit holes to ensure they are properly sealed to prevent water and dust ingress. • Check the cabinet interior for signs of water leakage, especially at the bottom and near junction boxes. Investigate and take waterproofing measures if leakage is found. • Check power cable connections for looseness and retighten them according to previously specified torque values. • Inspect power and control cables for damage, especially where they contact with the metal surfaces for any cut marks. Replace damaged cables immediately. • Check the insulation wrapping tape on power cable terminals for any detachment or damage. Re-wrap as necessary to ensure proper insulation.
Grounding and equipotential bonding	• Check if the ground connection is correct, ensuring the grounding resistance does not exceed 4 Ω. • Inspect the equipotential bonding inside the cabinet to ensure all metal components are electrically connected correctly.
Switch contactors	Inspect the mechanical operation of auxiliary switches and micro-switches in contactors to ensure smooth operation.
Fan	• Observe if the fans are operating normally, checking for any blockages. • Listening for abnormal noises while the fans are running.
Liquid cooling system	After the system runs for five years, check the pH level of the coolant. Replace the coolant if the pH level is high.
Dust filter	Clean or change the dust filter. For instructions, see 8.4. 11.4 *(on page 58)*.
Screw dropout	Check and clean any dropped screws inside the cabinet. Inspect related areas to see if any additional fixing screws are needed.

8.2.3. Maintenance items once a year

Take the following maintenance operations at least once a year:

Item	Method
Cabinet status	Inspect the cabinet for the following situations. If found, take necessary measures or contact the service engineers: • Damage or informality of the cabinet exterior and interior structure. • Abnormal noise during operation. • Cabinet internal temperature is too high. Check the working status of the cooling system in this case. • The humidity and dust level are too high. Follow the instructions in 8.6. 11.5 *(on page 61)* to clean the cabinet in this case.
Cable shielding grounding	Check the connection between cable shielding and insulating tubes to ensure good contact without looseness or damage. Check the grounding cable connection.
Lightning protection devices and fuses	Inspect the lightning protection devices (such as surge protectors) and fuses for tightness and absence of damage. Replace the devices if necessary.
Corrosion	Inspect the cabinet interior for oxidation or rust, particularly on metal parts and connection points.

8.3. Temporary off-grid or standby

When the CB3 system needs to disconnect from the grid or work in standby mode for more than three months, take the following actions first:

- When the grid connection is still available, charge the battery system to at least 40% SOC.
- When the grid connection is not available, turn the **DC** switch on the BCU to the **OFF** position. It allows the system to stay at the low-power state to avoid battery over-discharge.

8.4. Dust filter maintenance

Clean or change the front dust filter and the back air outlet vent every six months.

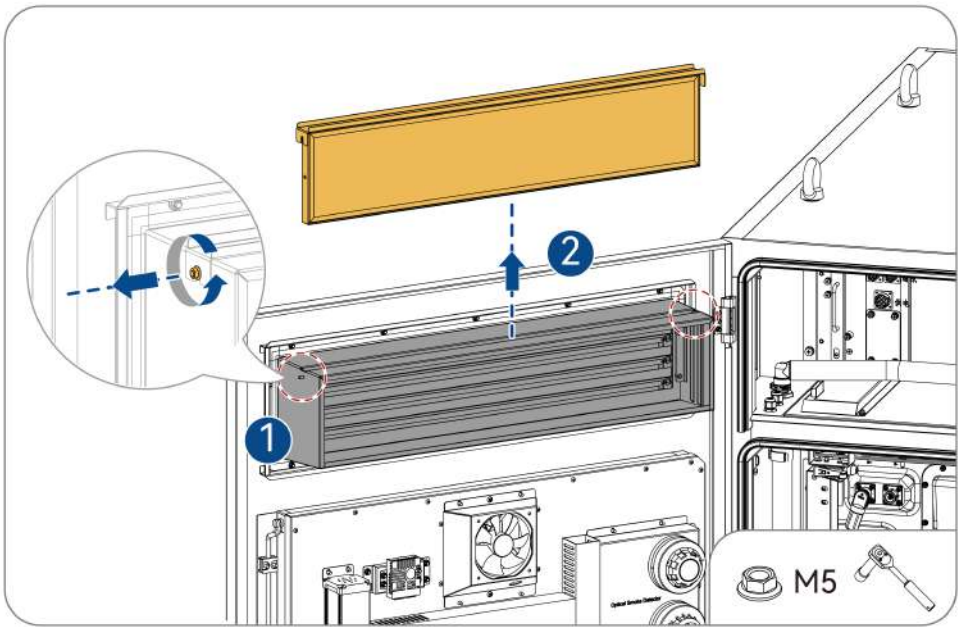
⚠ CAUTION

- Only qualified electrical technicians are allowed to perform the maintenance operations.
- Use insulated tools and wear personal protective equipment and anti-static work clothing.

Procedure

To clean or change the front dust filter on the cabinet door:

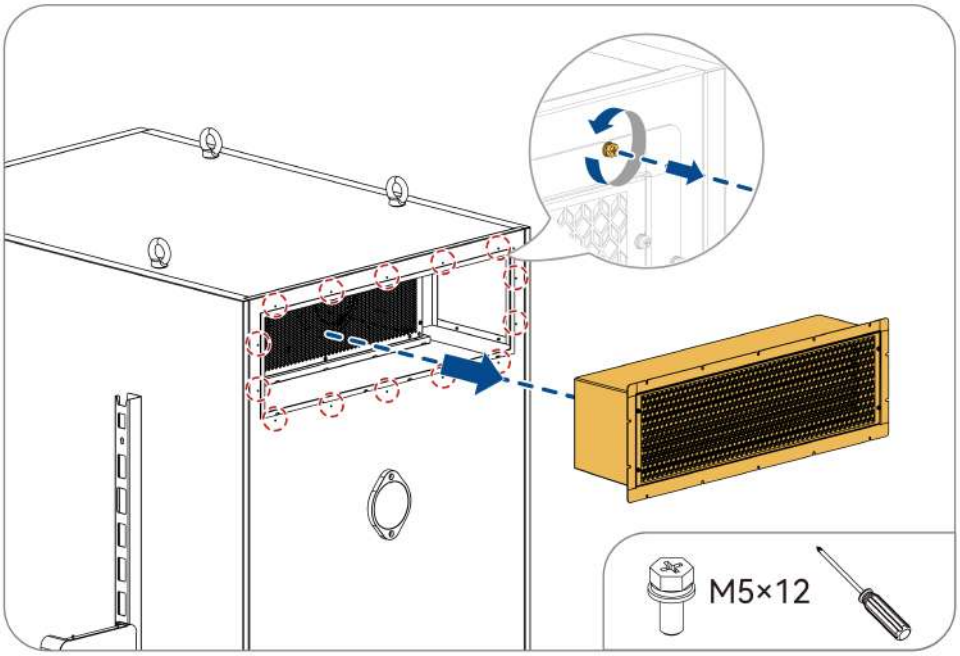
1. Open the cabinet door and locate the dust filter at the top.
2. Loosen the two nuts and lift the filter upwards to remove it from the cabinet door.



3. Clean the filter cover and the filter with air gun. If the filter is damaged, replace with a new one.
4. Install the filter and the cover back to the cabinet door. Secure the two nuts.

To clean or change the air outlet vent on the back of the liquid temperature control system:

5. Locate the air outlet vent at the top of the cabinet back side.
6. Loosen the 12 screws to remove the vent.



7. Clean the vent with air gun. If the vent is damaged, replace with a new one.
8. Install the vent back to the cabinet.

8.5. Clean dust filter of liquid temperature control unit

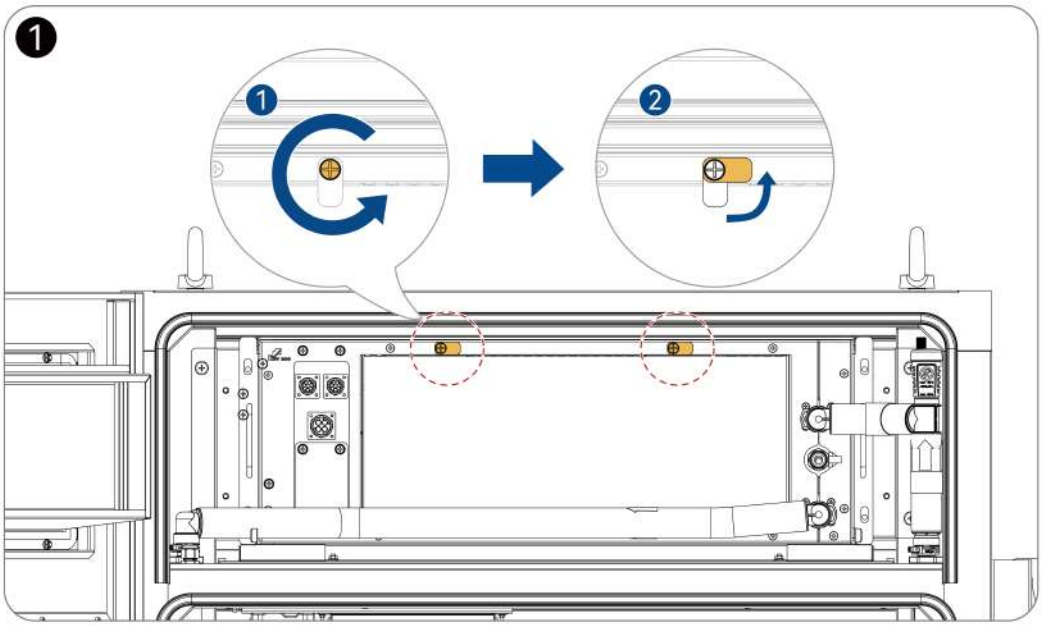
Clean or change the dust filter of the liquid temperature control unit every three months.

⚠ CAUTION

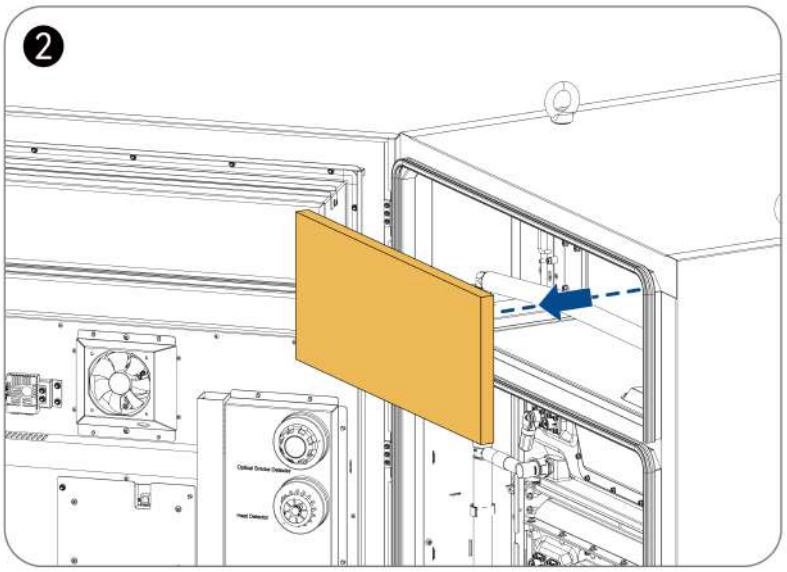
- Only qualified electrical technicians are allowed to perform the maintenance operations.
- Use insulated tools and wear personal protective equipment and anti-static work clothing.

Procedure

1. Open the cabinet door and locate the liquid control unit at the top of the battery stack.
2. Loosen the two screws at the top of the liquid control unit.



3. Remove the front dust filter.



4. Clean the filter with air gun. Install the filter back to the liquid control unit.

8.6. Cabinet cleaning

To ensure the proper operation and extend the lifespan of the cabinet, follow the guidelines below to clean and maintain the energy storage cabinet regularly.

- Adjust the cleaning schedule based on the weather conditions, geographic location, and other environmental factors surrounding the cabinet.

  For cabinets located in harsh environments like desert areas, shorten the cleaning intervals and increase the frequency.
- Do not use brooms to directly sweep dust inside the storage cabinet as this can stir up dust, causing it to reattach to equipment. It is recommended to use a vacuum cleaner to suction dust without causing secondary pollution.
- Check the foundation area of the storage cabinet for dust accumulation. Use a vacuum cleaner to clean the foundation if necessary.
- After the cleaning work is completed, check if the door locks of the cabinet are functioning properly and in good condition. If necessary, apply lubricating oil to the lock holes and other moving parts of the door lock to ensure smooth operation.

8.7. Repainting

NOTICE

Regularly inspect the protective paint on the product for obvious peeling or cracking. Follow the instructions to repaint the cabinet in different conditions.

Condition 1: The surface has water stains and dust that can be cleaned with water.

Illustration	Maintenance Procedure
	Clean the dirty areas on the surface with a cloth or similar cleaning tool dampened with water. If the use of water cannot clean the surface, use ~95% alcohol to wipe the area until the cleanliness is acceptable. You may also use other non-corrosive cleaners that are locally available.

Condition 2: The surface has traces that cannot be cleaned; the painting is damaged.

Illustration	Maintenance Procedure
	Use sandpaper to polish the areas of the surface where the paint is rough or scratched, ensuring the surface becomes smooth.

Illustration	Maintenance Procedure
	Use a wet cloth dampened with water or ~95% alcohol to clean the surface.
	After the surface is dry, use a soft-bristle brush to apply touch-up paint to the scratched areas, ensuring the paint is applied as evenly and consistently as possible.

Condition 3: The primer damage has exposed the substrate of the cabinet.

Illustration	Maintenance Procedure
	Use sandpaper to polish the areas of the surface where the paint is rough or scratched, ensuring the surface becomes smooth.
	Use a wet cloth dampened with water or ~95% alcohol to clean the surface.

Illustration	Maintenance Procedure
	After the surface is dry, spray zinc-rich primer onto areas where the substrate is exposed, ensuring that the spray fully covers all bare substrate areas.
	After the surface is dry, use a soft-bristle brush to apply touch-up paint to the scratched areas, ensuring the paint is applied as evenly and consistently as possible.

9. Troubleshooting

For the errors reported as below, take the suggested troubleshooting actions in the listed order first. If the error is still present after taking the suggested actions or no specific action is suggested, contact the service support for further assistance.

The troubleshooting operations must be performed by authorized technicians.

Error code	Error message	Cause	Troubleshooting actions
69	Latching Fault of Compound Fire Detector	The fire alarm is triggered.	Check whether the cabinet has any fire hazard. If not, clear the alarm manually.
97	BMS internal communication error	1. Communication error between battery control unit and battery module. 2. RJ45 plug is not installed. Therefore, the battery control unit cannot get the correct number of connected battery modules.	1. Check if communication cable is connected properly. 2. Check if RJ45 plug is installed.
98	Battery sequence error	1. Cable connection is wrong. 2. No RJ45 plug is installed. 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 cleared or restart.
100	Charge overcurrent protection	Charging current exceeds the set limit.	Wait until the error is cleared or restart.
101	Battery system undervoltage protection	Total voltage is lower than the set limit.	Force charging the battery.
102	Battery system overvoltage protection	Total voltage is higher than the set limit.	Wait until the error is cleared or restart.
103	Battery module undervoltage protection	Single battery module voltage is lower than the set limit.	Force charging the battery.
104	Battery module overvoltage protection	Single battery module voltage is higher than the set limit.	Wait until the error is cleared or restart.
105	BMS hardware error	1. Single battery module voltage sensor error. 2. Temperature sensor error. 3. Current sensor error.	1. Check if the battery temperature and voltage sensor cable connections are loose. 2. Check if the current sensor cable connection is loose. 3. Replace BMS.
106	Charging overcooling protection	Battery charging at <0℃.	Wait until the battery temperature increases and the error is cleared.
107	Charging overtemperature protection	Battery temperature too high.	Wait until the battery temperature decreases and the error is cleared.
108	Discharging overcooling protection	Battery temperature too low, disconnect relay to stop discharging.	Wait until the battery temperature increases and the error is cleared.

Error code	Error message	Cause	Troubleshooting actions
109	Discharging overtemperature protection	Battery temperature too high.	Wait until the battery temperature decreases and the error is cleared.
110	BMS relay error	1. Cathode or anode relay is adhesive. 2. Cathode or anode relay is unable to close.	Replace the relay.
111	Pre-charge error	1. Pre-charge relay is damaged. 2. Pre-charge resistor is open circuit. 3. BMS is damaged.	1. Replace the pre-charge relay. 2. Replace the pre-charge resistor. 3. Replace the BMS.
112	BMS insulation error	Battery module has electricity leakage.	Contact the battery supplier.
113	BMS model incompatibility	The BMS of battery module and battery control unit is incompatible.	Check if the models of battery module and battery control unit are compatible.
114	Battery supplier incompatibility	Supplier of battery module and battery cell are incompatible.	Check if the model of battery module is correct.
115	Battery model incompatibility	Battery cells are incompatible.	Check if the model of battery module is correct.
116	Battery voltage inconsistency	Battery module voltage are inconsistent.	Check if the model of battery module is correct.
117	Circuit breaker open	1. Circuit breaker is open. 2. Circuit breaker auxiliary contact error.	Replace the circuit breaker.
118	Temperature difference too large	1. Temperature sensor error. 2. Battery life span.	1. Check if the temperature sensor cable connection is loose.
119	Voltage difference too large (Class II)	1. Sensor cable is loose. 2. Battery life span.	1. Check if the voltage sensor cable connection is loose. 2. Replace BMS.
120	Voltage difference too large (Class I)	1. Sensor cable is loose.	1. Check if the voltage sensor cable connection is loose. 2. Replace BMS.
121	BMS overtemperature protection	1. Ambient temperature is high. 2. Overload.	1. Check if the ambient temperature is high. 2. Check if overloaded.
122	Short circuit protection	P+ and P- short circuit.	Check if the cable is connected correctly.
123	Overall voltage mismatch	Connection is wrong.	Contact technical support to locate the fault.
124	System 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	Charging port overvoltage protection	Inverter output voltage is high.	Contact technical support to locate the fault.
130	Limit Switch Triggered	The cabinet door is open.	Close and lock the cabinet door properly.

Error code	Error message	Cause	Troubleshooting actions
131	Temperature sensor triggered	The temperature sensor is triggered.	Check the temperature inside the cabinet.
132	Smoke sensor triggered	The smoke sensor is triggered.	Check the smoke accumulation inside the cabinet.
133	Water immersion sensor triggered	The water-immersion sensor is triggered.	Check whether there is any water immersion inside the cabinet.
134	Aerosol triggered	The aerosol device is triggered.	Check whether the aerosol device is triggered inside the cabinet.
135	Emergency stop	Emergency stop is activated by the external dry contact input device.	1. Deactivate the emergency stop through the external dry contact input device. 2. Reset the **DC** switch on the BCU.
155	CO sensor communication lost	The system lost the communication with the CO sensor.	Check the cable connections of the Co sensor.
350	Outlet Water Temperature High	Internal error of liquid temperature control system.	Contact the installer.
351	Outlet Water Temperature Low	Internal error of liquid temperature control system.	Contact the installer.
352	Outlet Water Temperature Sensor Fault	Internal error of liquid temperature control system.	Contact the installer.
353	Return Water Temperature Sensor Fault	Internal error of liquid temperature control system.	Contact the installer.
354	Compressor Drive Communication Fault	Internal error of liquid temperature control system.	Contact the installer.
355	System High Pressure Lockout	Internal error of liquid temperature control system.	Contact the installer.
356	System Low Pressure Lockout	Internal error of liquid temperature control system.	Contact the installer.
357	Discharge Overtemperature Lockout	Internal error of liquid temperature control system.	Contact the installer.
358	Compressor Drive Overcurrent Lockout	Internal error of liquid temperature control system.	Contact the installer.
359	Compressor Drive Overtemperature Lockout	Internal error of liquid temperature control system.	Contact the installer.
360	Compressor Drive Overvoltage Lockout	Internal error of liquid temperature control system.	Contact the installer.
361	Compressor Drive Undervoltage Lockout	Internal error of liquid temperature control system.	Contact the installer.
362	Compressor Drive Phase Loss Lockout	Internal error of liquid temperature control system.	Contact the installer.
363	Compressor Drive Other Fault Lockout	Internal error of liquid temperature control system.	Contact the installer.
364	Make-up Water Tank Low Level	Internal error of liquid temperature control system.	Contact the installer.

Error code	Error message	Cause	Troubleshooting actions
365	Water Shortage Alarm	Internal error of liquid temperature control system.	Contact the installer.
366	System Pressure High	Internal error of liquid temperature control system.	Contact the installer.
367	Outlet Water Pressure High	Internal error of liquid temperature control system.	Contact the installer.
368	Suction Temperature Sensor Fault	Internal error of liquid temperature control system.	Contact the installer.
369	Low Pressure Sensor Fault	Internal error of liquid temperature control system.	Contact the installer.
370	Power Supply Fault	Internal error of liquid temperature control system.	Contact the installer.
371	Power Supply Phase Loss	Internal error of liquid temperature control system.	Contact the installer.
372	Power Supply Phase Reversal	Internal error of liquid temperature control system.	Contact the installer.
373	Power Supply Overvoltage	Internal error of liquid temperature control system.	Contact the installer.
374	Power Supply Undervoltage	Internal error of liquid temperature control system.	Contact the installer.
375	Compressor Drive Overvoltage Fault	Internal error of liquid temperature control system.	Contact the installer.
376	Compressor Drive Undervoltage Fault	Internal error of liquid temperature control system.	Contact the installer.
377	Compressor Drive Phase Loss Fault	Internal error of liquid temperature control system.	Contact the installer.
378	Pump Drive Communication Fault	Internal error of liquid temperature control system.	Contact the installer.
379	Pump Drive Overvoltage Fault	Internal error of liquid temperature control system.	Contact the installer.
380	Pump Drive Undervoltage Fault	Internal error of liquid temperature control system.	Contact the installer.
381	Pump Drive Phase Loss Fault	Internal error of liquid temperature control system.	Contact the installer.
382	Outlet & Return Water Pressure Sensor Fault	Internal error of liquid temperature control system.	Contact the installer.
383	Outlet & Return Water Temperature Sensor Fault	Internal error of liquid temperature control system.	Contact the installer.
384	Electric Heater Fault Lockout	Internal error of liquid temperature control system.	Contact the installer.
385	Condenser Overtemperature Lockout	Internal error of liquid temperature control system.	Contact the installer.

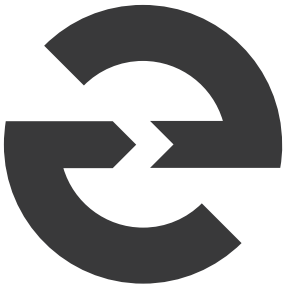
Error code	Error message	Cause	Troubleshooting actions
386	Pump Drive Overvoltage Lockout	Internal error of liquid temperature control system.	Contact the installer.
387	Pump Drive Undervoltage Lockout	Internal error of liquid temperature control system.	Contact the installer.
388	Pump Drive Overtemperature Lockout	Internal error of liquid temperature control system.	Contact the installer.
389	Pump Drive Phase Loss Lockout	Internal error of liquid temperature control system.	Contact the installer.
390	Pump Drive Overcurrent Lockout	Internal error of liquid temperature control system.	Contact the installer.
391	Pump Drive Other Fault Lockout	Internal error of liquid temperature control system.	Contact the installer.
392	Liquid Cooling Unit Fault	Internal error of liquid temperature control system.	Contact the installer.
393	Fire Board Grid Loss	Grid connection is lost.	Contact the installer.
394	CO High Level 1	CO concentration is too high.	Contact the installer.
395	H2 High Level 1	H2 concentration is too high.	Contact the installer.
396	CO High Level 2	CO concentration is too high	Contact the installer.
397	H2 High Level 2	H2 concentration is too high.	Contact the installer.
398	VOC Warning	The multi-sensor fire detector has detected combustible gas.	Contact the installer.
399	H2 Warning	The multi-sensor fire detector detected combustible gas.	Contact the installer.
400	Fire Level Warning	The multi-sensor fire detector detected an aerosol trigger.	Contact the installer.
401	Multi-Sensor Fire Detector Fault	Multi-sensor fire detector fault.	Contact the installer.
402	Fire Protection Level 1	A combustible gas, smoke, or temperature abnormality is detected in the system.	Contact the installer.
403	Fire Protection Level 2	A combustible gas, smoke, or temperature abnormality is detected in the system.	Contact the installer.
404	Fire Lockout	Fire lockout.	Contact the installer.
405	Air Conditioning Fault	Air conditioner fault.	Contact the installer.
406	Intake Valve Fan Fault	Fault of system exhaust self-check.	Contact the installer.
407	Intake Valve Retraction Fault	Fault of system exhaust self-check.	Contact the installer.
408	Intake Valve Extension Fault	Fault of system exhaust self-check.	Contact the installer.

Error code	Error message	Cause	Troubleshooting actions
409	Exhaust Valve Fan Fault	Fault of system exhaust self-check.	Contact the installer.
410	Exhaust Valve Retraction Fault	Fault of system exhaust self-check.	Contact the installer.
411	Exhaust Valve Extension Fault	Fault of system exhaust self-check.	Contact the installer.
412	Fire Protection Board communication lost	Communication between the fire protection board and the main board is lost.	Contact the installer.
413	Liquid Cooling Unit communication lost	Communication with the liquid temperature control system is lost.	Contact the installer.
414	Dehumidifier communication lost	Communication with the dehumidifier is lost.	Contact the installer.
415	Multi-Sensor Fire Detector communication lost	Communication with the multi-sensor fire detector is lost.	Contact the installer.

10. Product specification

System

Model	CB3-L261
Battery Parameters	
Battery Type	LiFePO4
System Configuration	260S1P
Nominal Capacity [A]	314
Nominal Energy [kWh]	261
Nominal Voltage [V]	832
Voltage Range [V]	728-936
Number of Battery Packs	5
Max Charging/Discharging Current [A]	188
Depth of Discharge [%]	0-100
Charge/Discharge Rate [P]	0.5
Battery Pack Protection Level	IP67
Battery Cell Cycles	≥8000 70% EOL
General Parameters	
Ingress Protection Rating	IP55
Corrosion Protection Level	C4-M
Cooling Type	Liquid cooling
Operating Temperature Range	-25℃ to +55℃
Ambient Humidity [%]	0-95% RH, non-condensing
Altitude [m]	2000
Fire Protection	Battery pack-level and cabinet-level aerosols
Dimensions [W*D*H] [mm]	1030*1400*2300
Weight [kg]	2400
Warranty (Year)	Refer to the warranty policy
Standard Compliance	IEC 62619, IEC 62477-1, IEC 61000-6-2, IEC 61000-6-4, UN 38.3



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