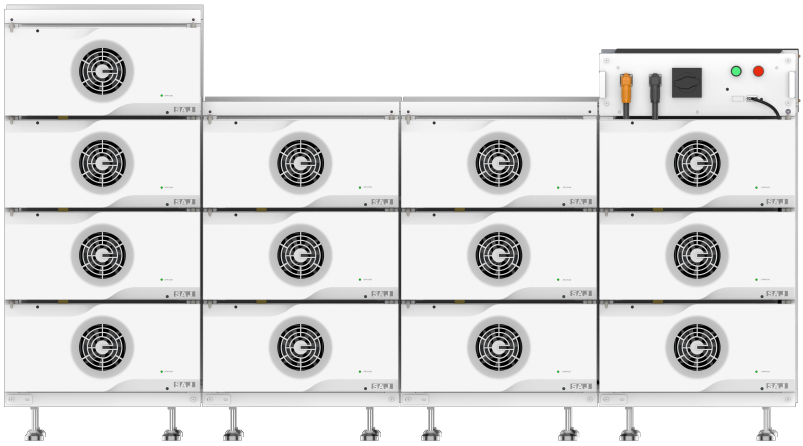
CB3 series

C&I Battery

CB3-(M60-M260)

User Manual



Version 0.0

Copyright Statement

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

Contact us

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

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

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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 product introductions and instructions of operating, maintaining, and troubleshooting the SAJ product.

You can find the latest version of this document as eManual at https://www.saj-electric.com/.

Note:

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

Validity

This manual is valid for the following product:

- CB3-(M20-M260)

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
V0.0	2026-04-08	First version.

Contents

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 series system is a high-voltage battery system provided for C&I photovoltaic storage solutions. The CB3 battery system supports flexible configuration options of battery units ranging from 3 to 13.

The CH2 series hybrid inverters can integrate with CB3 with 3-12 battery units. The CH3 series hybrid inverters can integrate with CB3 with 13 battery units. A single cluster supports flexible capacity requirements, ranging from 60 kWh to 260 kWh.

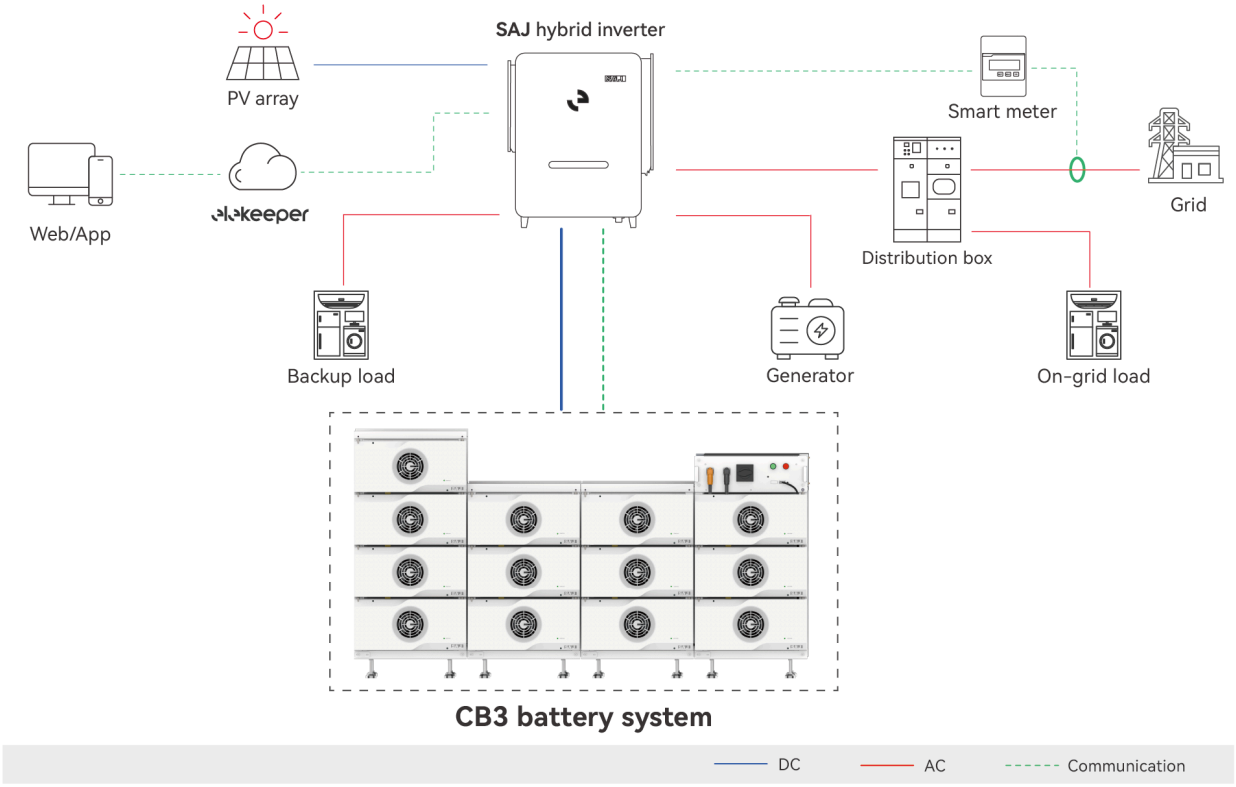


Figure 2.1. System application

2.1. Model description

Take CB3-M60 as an example:

CB3-M60

① ②

① The product name.

② The nominal energy of the battery storage system in kWh. The value includes 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, and 260.

2.2. Product description

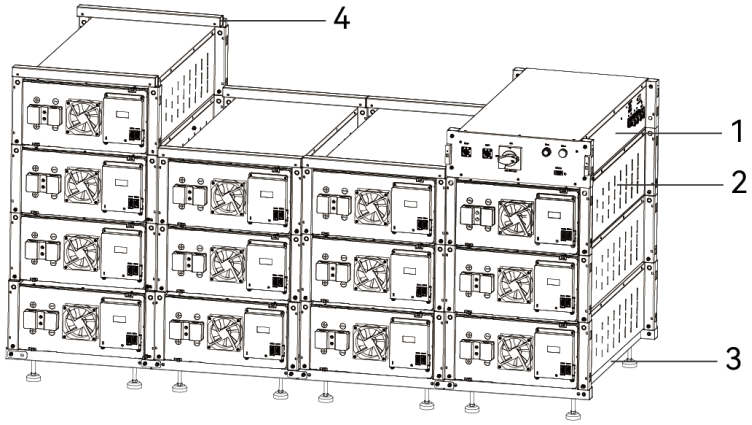


Figure 2.2. CB3 system components

Callout	Component
1	Battery control unit (BCU)
2	Battery unit
3	Base frame
4	Top beam

2.2.1. Dimensions

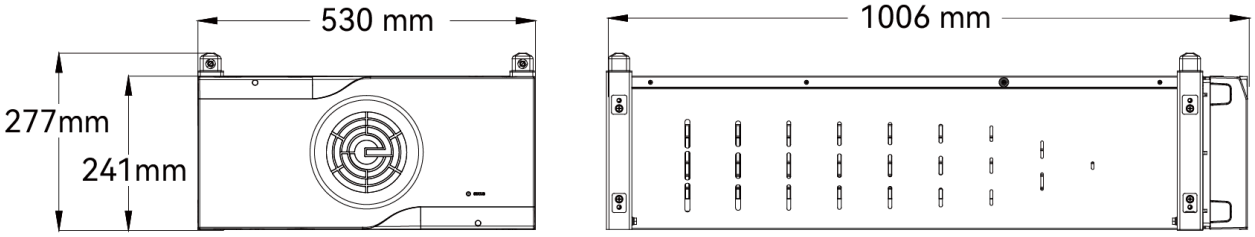


Figure 2.3. Dimension of battery unit

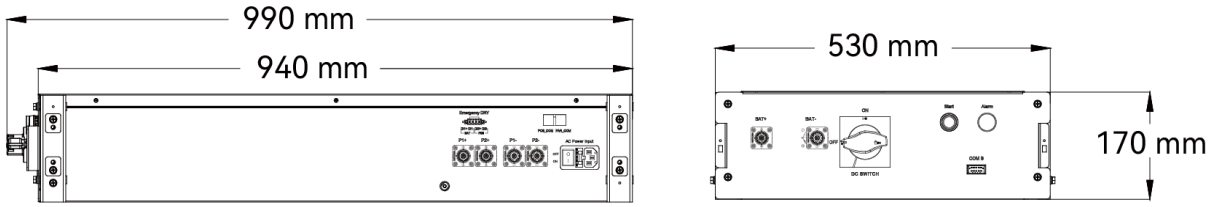


Figure 2.4. Dimension of battery control unit

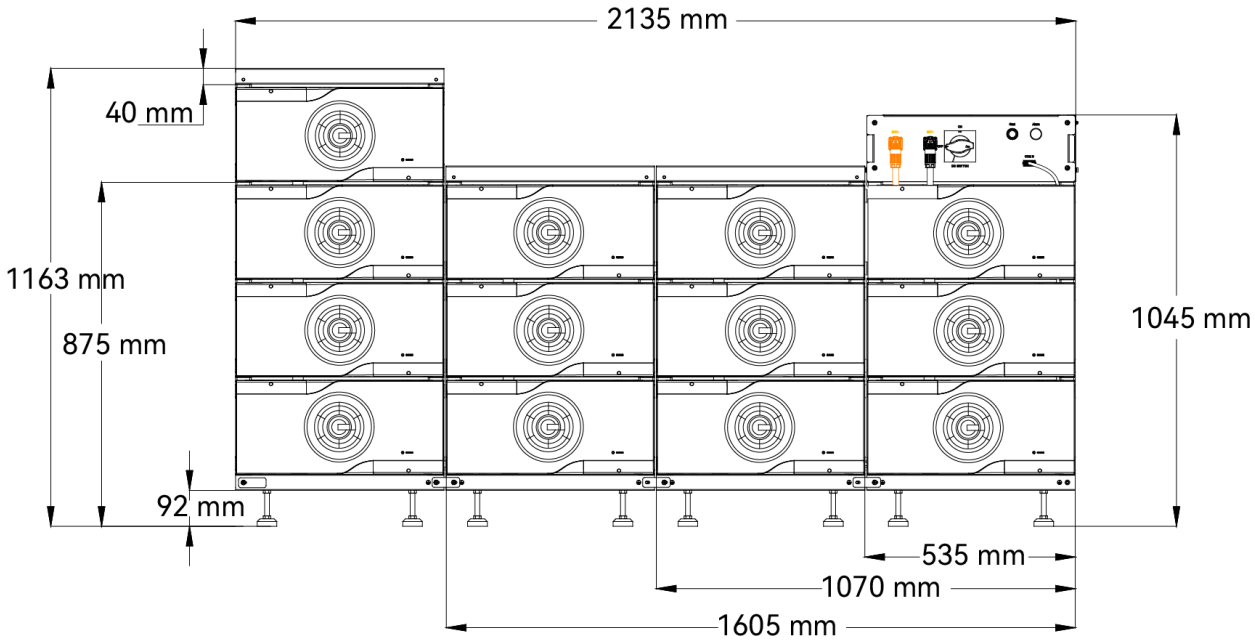


Figure 2.5. Dimension of CB3 battery system

2.2.2. Electrical terminals and indicators

Battery control unit (BCU)

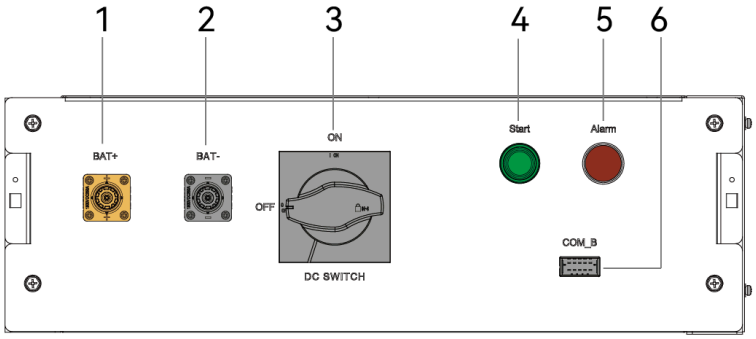


Figure 2.6. Battery control unit - front view

Callout	Silkscreen	Description
1	**BAT+**	The positive battery connection port.
2	**BAT-**	The negative battery connection port.
3	**DC SWITCH**	The DC switch controlling the connection to the battery units.
4	**Start**	The startup button of the whole CB3 battery system. • Flashing, 0.2s: the system is upgrading. • Flashing, 2s: the system is at standby status. • Solid on: the system is up and running. • Solid off: the system is off.

Callout	Silkscreen	Description
5	**Alarm**	The alarm status indicator. • Flashing, 0.5s: fatal system error. • Solid red: device error. • Solid off: the system is normal.
6	**COM_B**	The BMU communication cable connection port.

Table 2.1. Electrical terminals on BCU front

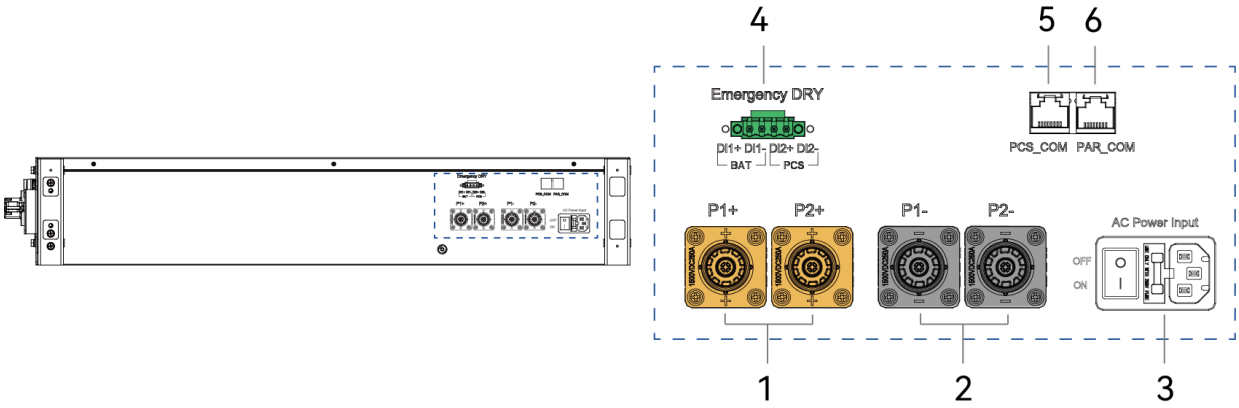


Figure 2.7. Battery control unit - right-side view

Callout	Silkscreen	Description
1	**P1+**, **P2+**	The positive battery cable connection ports to the inverters.
2	**P1-**, **P2-**	The negative battery cable connection ports to the inverters.
3	**AC Power Input**	The 220/230V AC power supply for the CB3 battery system.
4	**Emergency Dry**	The dry contact input connection ports to external emergency shutdown devices.
5	**PCS_COM**	The communication port connecting to the inverter **BMS** communication port.
6	**PAR_COM**	The communication port for battery multi-cluster connections.

Table 2.2. Electrical terminals on BCU front

Battery unit (BU)

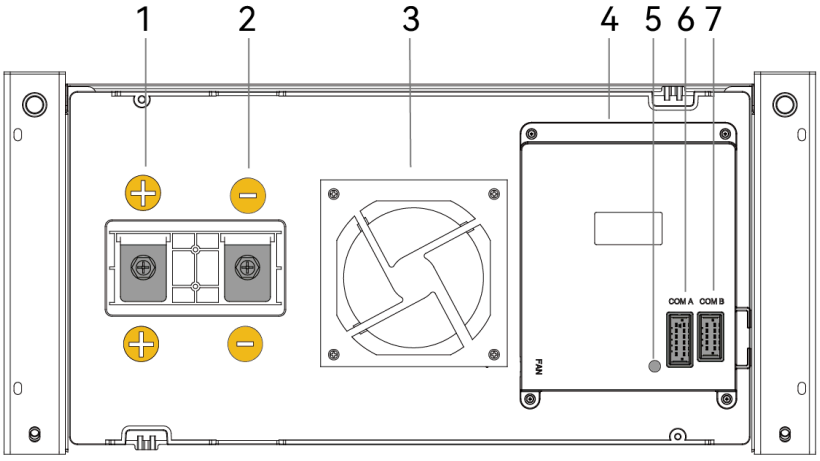


Figure 2.8. Battery unit front-view

Callout	Silkscreen	Description
1	**+**	The positive battery cable connection port.
2	**-**	The negative battery cable connection port.
3	/	The fan for battery cooling.
4	/	The battery management unit (BMU).
5	/	The BU status indicator. • Solid red: BU hardware error. • Flashing yellow, 0.2s: the BU is upgrading. • Solid green: the BU is running. • Solid off: the BU is disconnected.
6	**COM A**	The BMU communication port A.
7	**COM B**	The BMU communication port B.

Table 2.3. Battery unit components

3. Transportation and storage

3.1. Transportation

⚠ 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 **4** cartons of batteries in one stack.
- Load or unload batteries with caution. Otherwise, the batteries may short circuit or become damaged like leakage or cracking, catch fire or explode.

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 before installation

NOTICE

- The battery remains 40% power when it is sent from the factory.
- The longer the battery is stored, the lower the SOC. If the battery remaining voltage fails to reach the startup voltage requirement, the battery may be damaged.

The battery should be installed within 6 months since delivered from the factory and used with compatible inverters. Store the battery packs in a dry and ventilated environment. Keep them at least 600 mm away from heat sources.

Environment requirements for storage within one month:

- Temperature range: -20 ℃ to +45 ℃
- Relative humidity: 5% to 95% RH

Environment requirements for storage within one year:

- Temperature range: 0℃ to +35 ℃
- Relative humidity: < 85% RH

For long term storage without installation, contact **SAJ** technical support to charge the battery to 45%-55% SOC every three months.

4. Installation instructions

4.1. 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 the harmonized installation environment may jeopardize the life span of the product.
- The installation site must be well ventilated.

4.2. Installation Preparation

Read the following sections to determine the installation site.

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

4.2.1. Installation location requirement

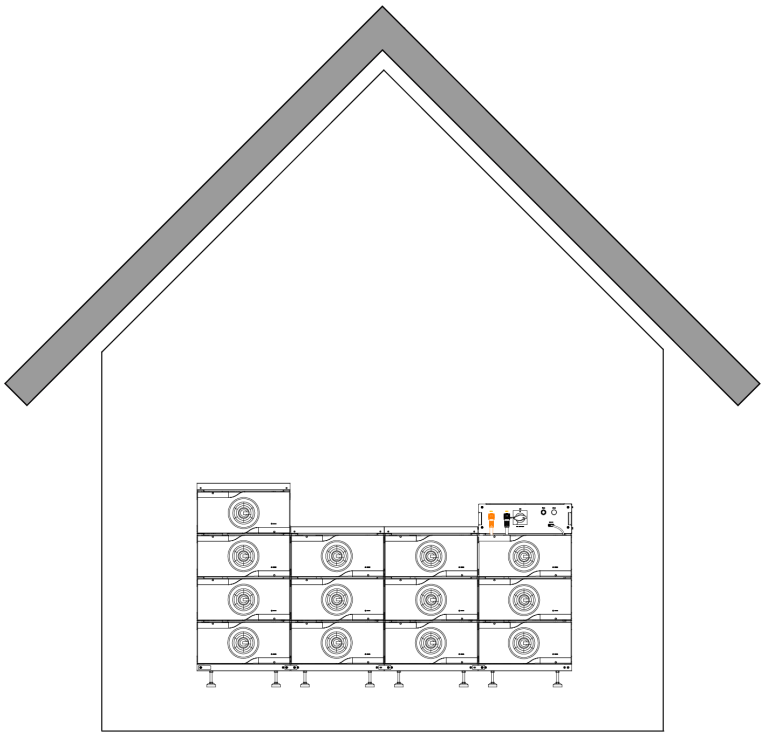


Figure 4.1. Indoor installation only

- The equipment can only be installed indoors.
- Mount vertically. Never install the battery tilted forwards, sideways, horizontally or upside down.
- The ground should be flat and no inclination.

⚠ CAUTION

Make sure that the load-bear capacity of the ground is sufficient for the full system installation.

4.2.2. Installation space requirement

Poor air ventilation will affect the working performance of internal electronic components and shorten the service life of the system. Reserve at least the following clearance around the whole battery rack to ensure a good air circulation at the installation area:

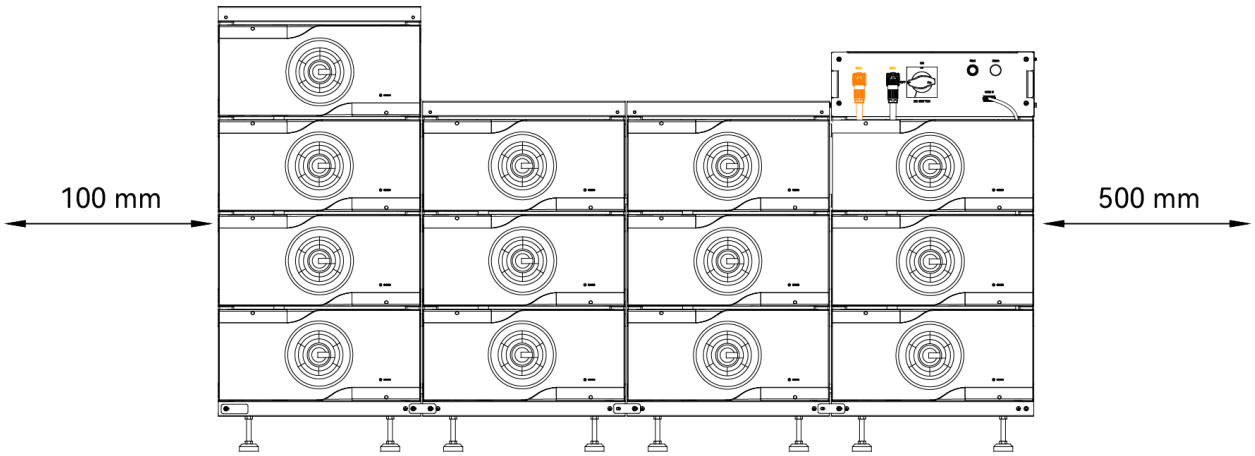


Figure 4.2. Front view

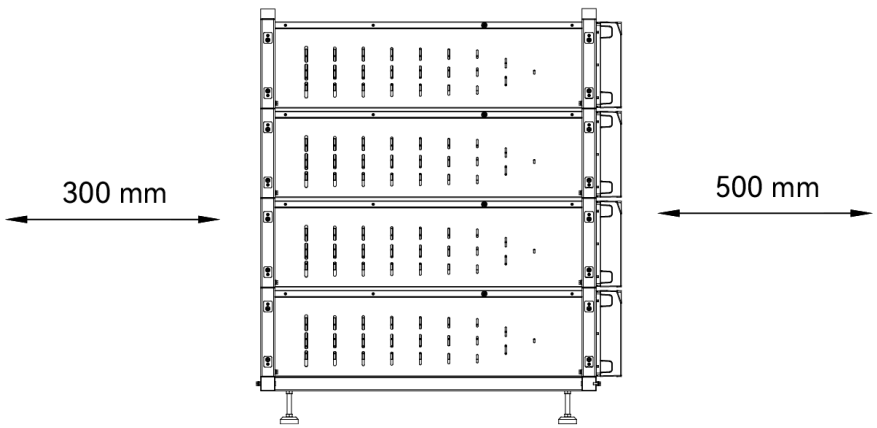


Figure 4.3. Side view

The required installation space requirement is similar for all battery unit configurations.

4.2.3. Transportation equipment

The installers need to prepare proper equipment for transporting and lifting the product components. For example, a crane.

Crane

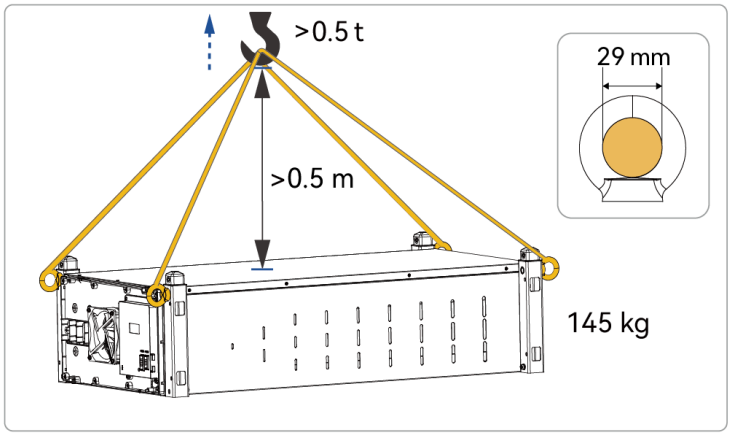


Figure 4.4. Move with crane

- Select flexible lifting straps or tie-down straps with a minimum individual breaking strength of no less than 0.5 tons.
- The straps should be threaded through the lifting rings on top of the battery units and securely fastened to prevent any slippage during lifting.
- Lift and move the cabinet by raising the straps.

NOTICE

- The distance between the lifting hook and the top of the battery unit must be at least 0.5 meters to ensure sufficient clearance to prevent any accidental contact or damage during lifting operations.
- The tilt angle of the battery unit should be less than 10°.

4.2.4. Installation personnel

CAUTION

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

  At least four operators or installation engineers are needed to move and install the battery units during the whole installation procedure.

4.2.5. Installation tools

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

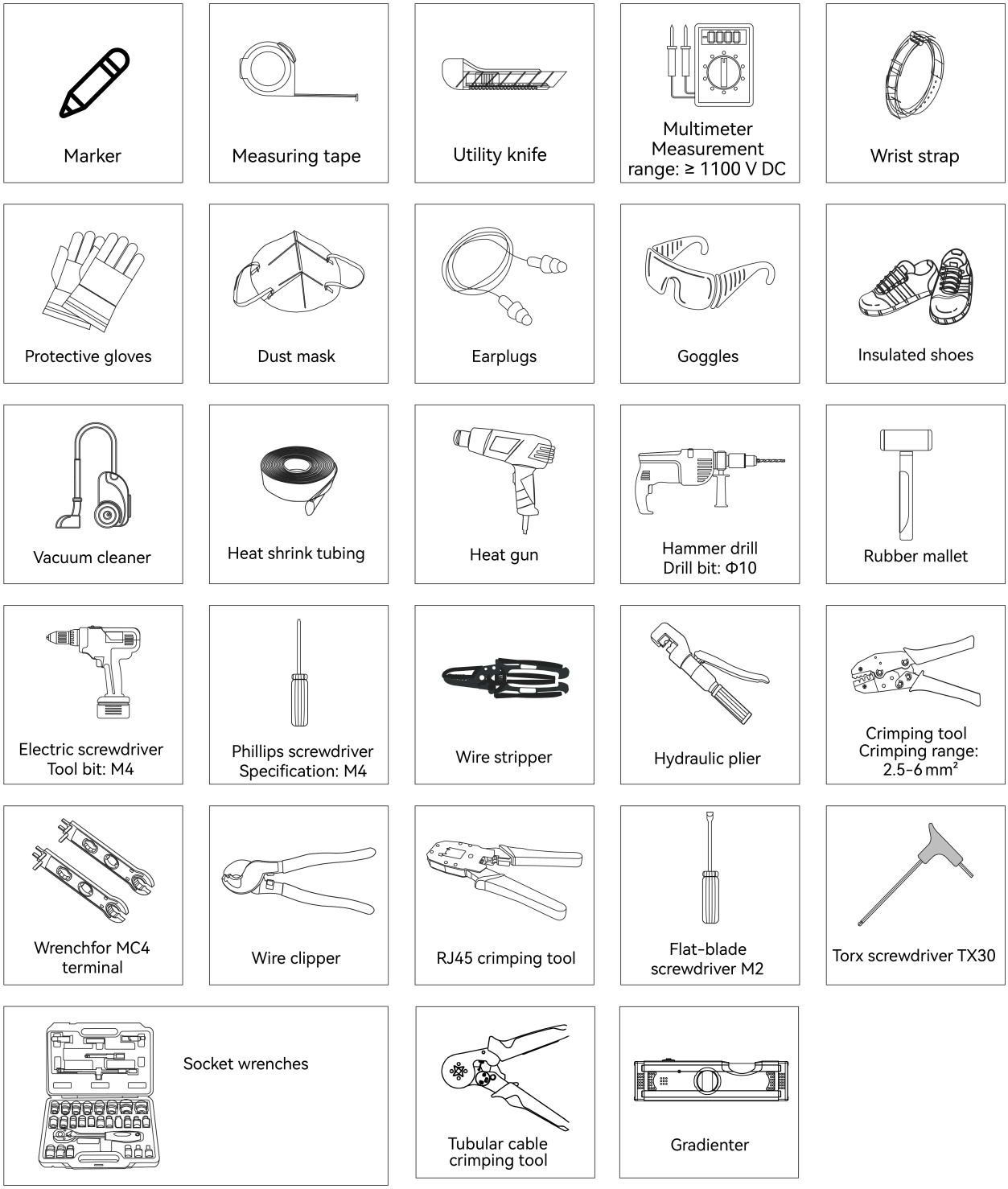
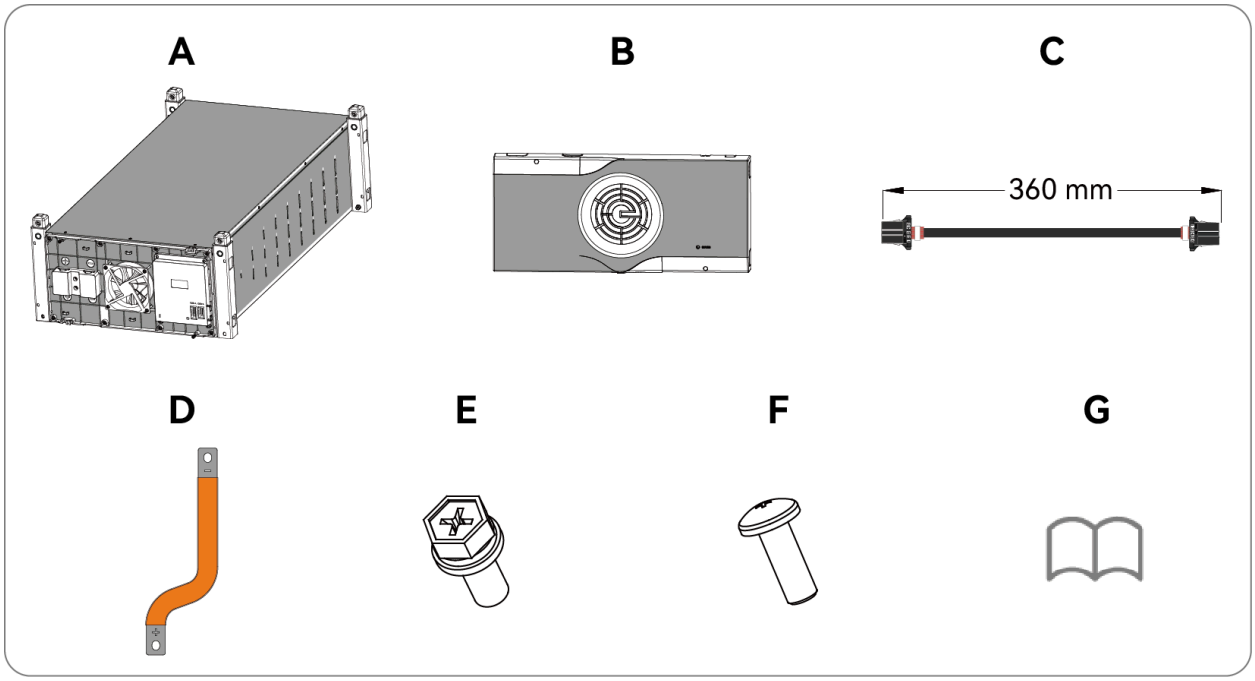


Figure 4.5. Suggested installation tools

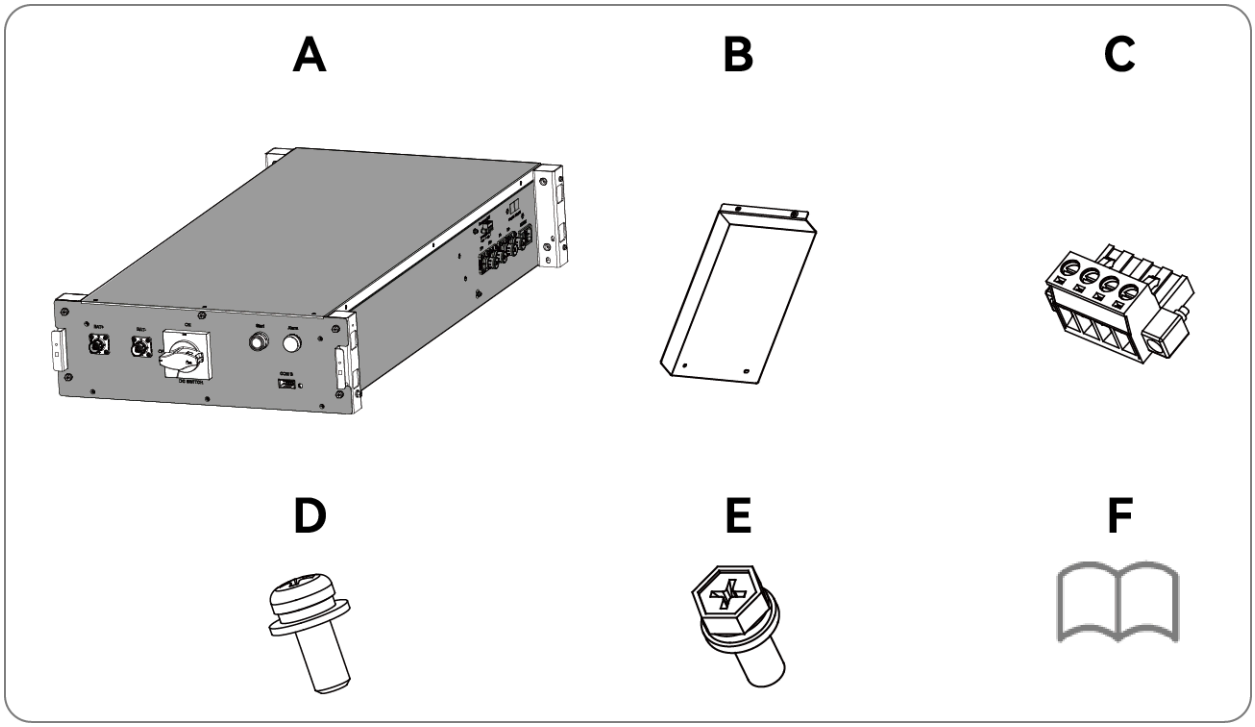
4.3. Packing list

CB3-M20 battery unit



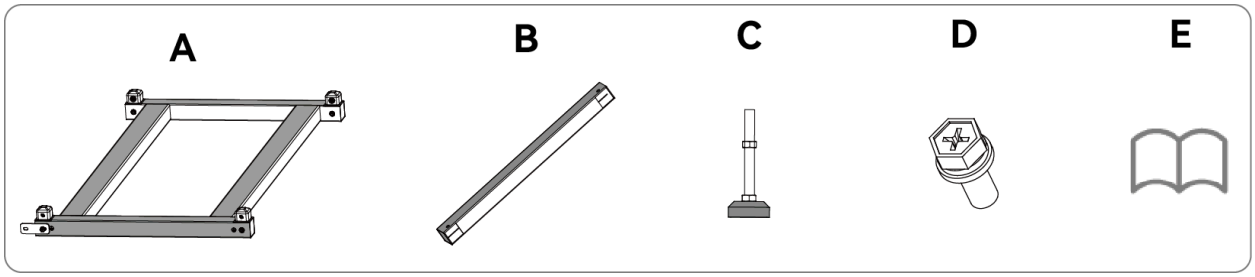
Number	Quantity	Designation
A	1	CB3-M20 battery unit
B	1	Front cover
C	1	BMU communication cable
D	1	Battery unit busbar
E	4	M6*16 screw
F	2	ST3.5*9.5 screw
G	1	Documents

CB3-HVC battery control unit



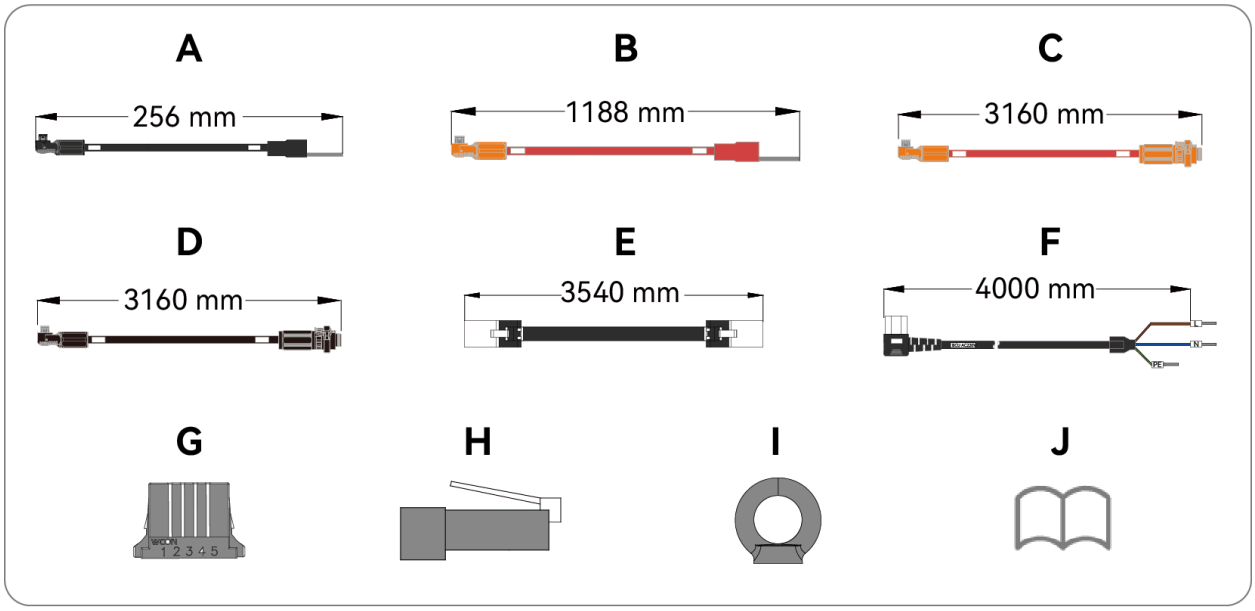
Number	Quantity	Designation
A	1	CB3-HVC battery control unit
B	1	Cable cover
C	1	4-pin connector
D	4	M4*10 screw
E	4	M6*16 screw
F	1	Documents

Accessory package CB3-ACK-BASE: frames and brackets



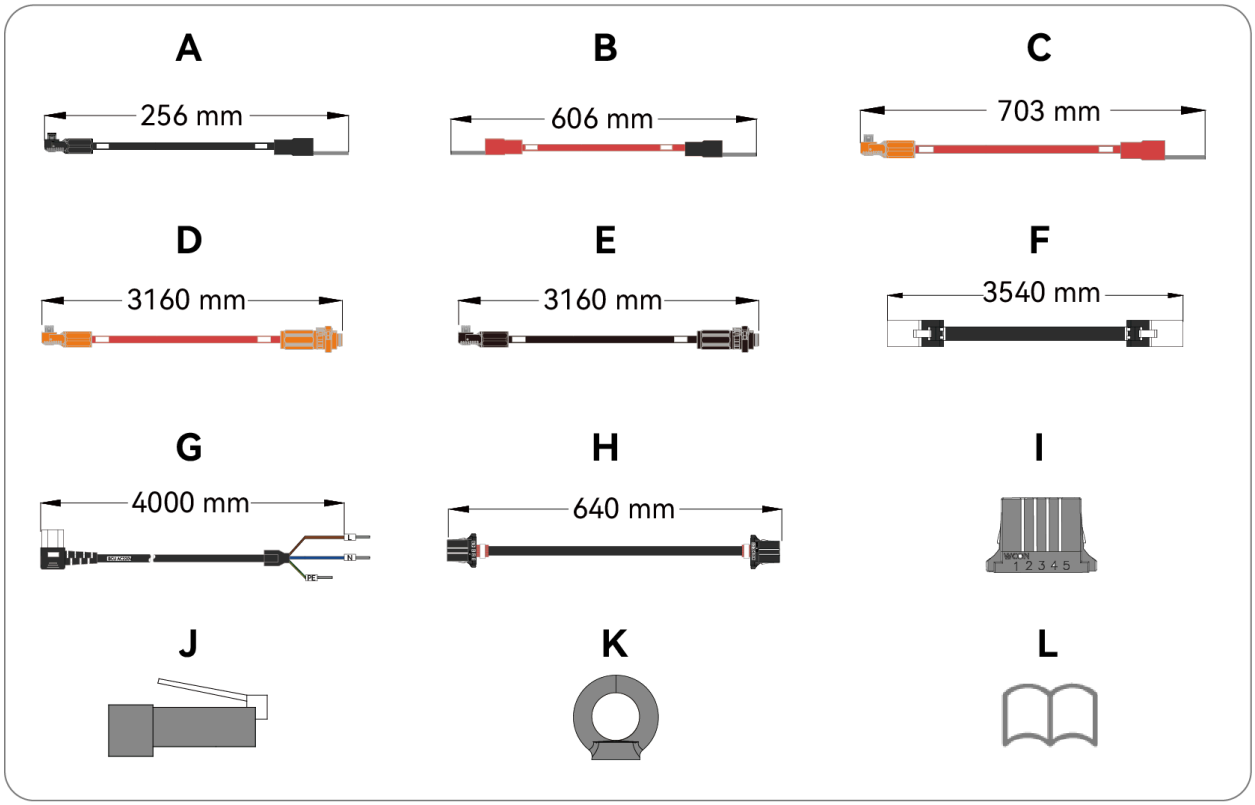
Number	Quantity	Designation
A	1	Base frame
B	2	Top beam
C	4	Leveling foot
D	4	M6*16 screw
E	1	Documents

Accessory package CB3-ACK-04P: cables for 3-4 CB3-M20 battery units



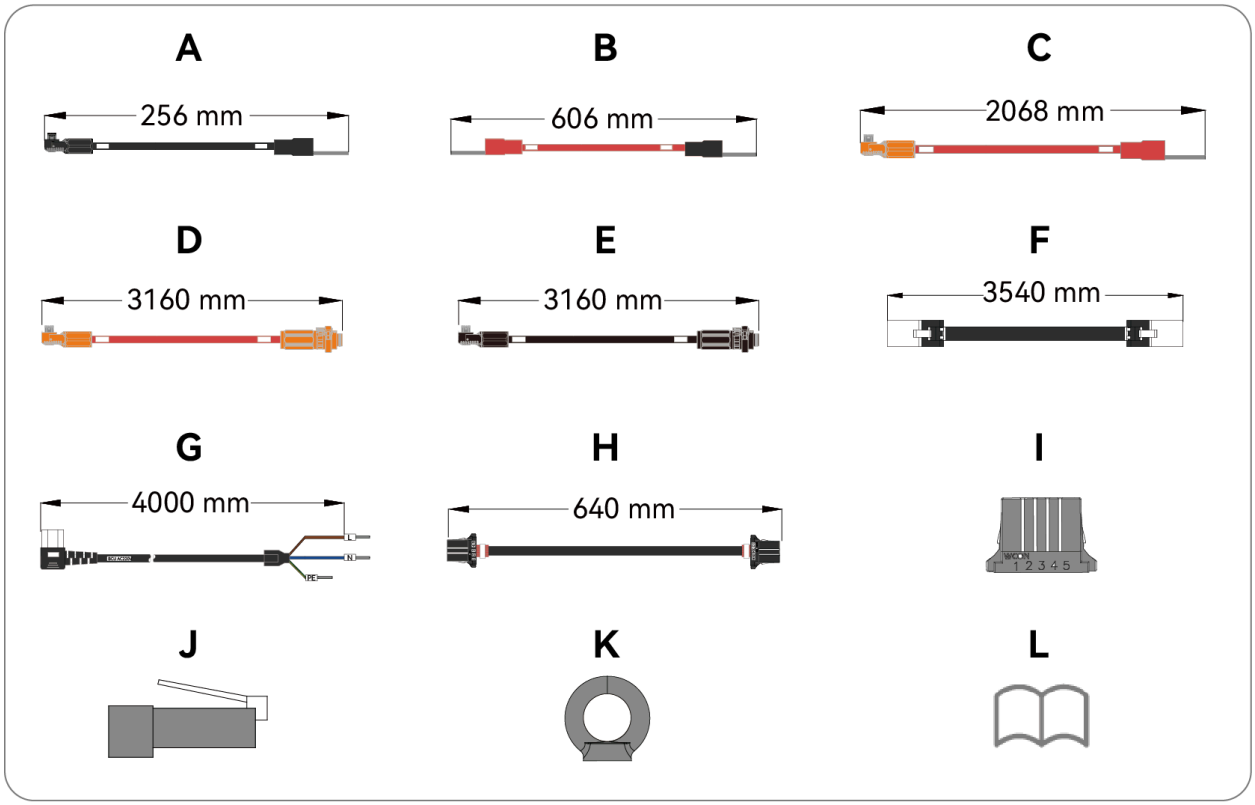
Number	Quantity	Designation
A	1	BCU-BU negative power cable
B	1	BCU-BU positive power cable
C	1	BCU-inverter positive power cable
D	1	BCU-inverter negative power cable
E	1	BCU-inverter standard network cable
F	1	220V AC power supply cable
G	1	BMU end plug
H	1	BCU RJ45 resistor
I	4	Eye bolt
J	1	Documents

Accessory package CB3-ACK-08P: cables for 5-8 CB3-M20 battery units



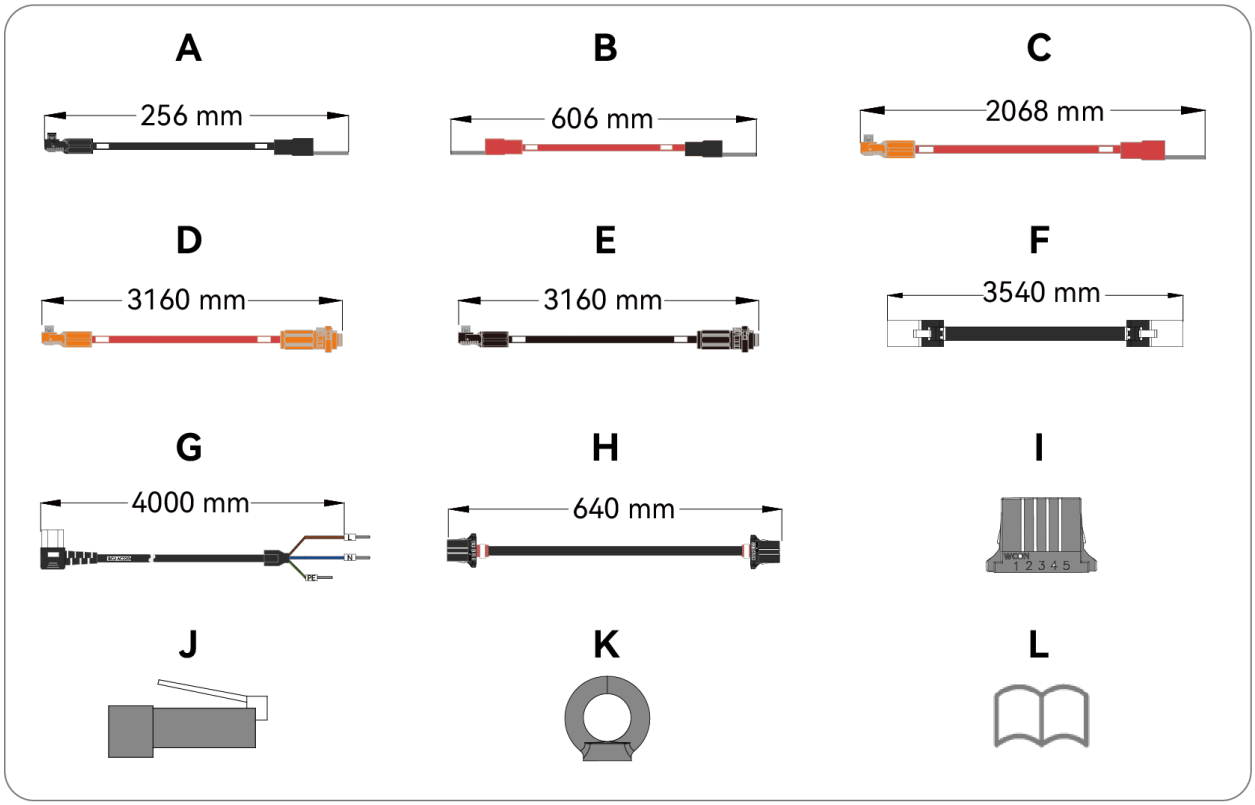
Number	Quantity	Designation
A	1	BCU-BU negative power cable
B	1	Between-stack power cable
C	1	BCU-BU positive power cable
D	1	BCU-inverter positive power cable
E	1	BCU-inverter negative power cable
F	1	BCU-inverter standard network cable
G	1	220V AC power supply cable
H	1	BMU communication cable
I	1	BMU end plug
J	1	BCU RJ45 resistor
K	4	Eye bolt
L	1	Documents

Accessory package CB3-ACK-12P: cables for 9-12 CB3-M20 battery units



Number	Quantity	Designation
A	1	BCU-BU negative power cable
B	2	Between-stack power cable
C	1	BCU-BU positive power cable
D	1	BCU-inverter positive power cable
E	1	BCU-inverter negative power cable
F	1	BCU-inverter standard network cable
G	1	220V AC power supply cable
H	2	BMU communication cable
I	1	BMU end plug
J	1	BCU RJ45 resistor
K	4	Eye bolt
L	1	Documents

Accessory package CB3-ACK-13P: cables for 13 CB3-M20 battery units

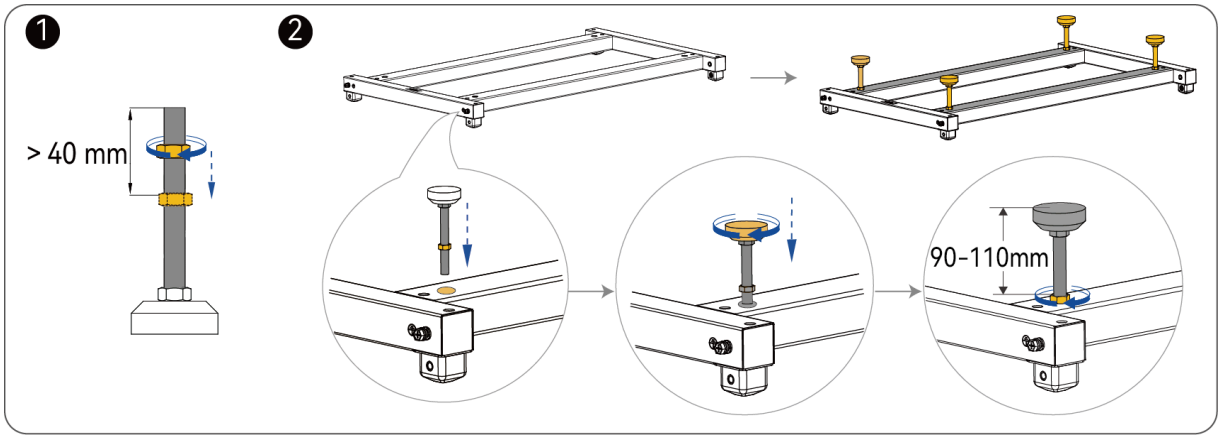


Number	Quantity	Designation
A	1	BCU-BU negative power cable
B	3	Between-stack power cable
C	1	BCU-BU positive power cable
D	1	BCU-inverter positive power cable
E	1	BCU-inverter negative power cable
F	1	BCU-inverter standard network cable
G	1	220V AC power supply cable
H	3	BMU communication cable
I	1	BMU end plug
J	1	BCU RJ45 resistor
K	4	Eye bolt
L	1	Documents

4.4. Install the base frame

Procedure

1. Adjust the height of the leveling foot and install four feet for each base frame.

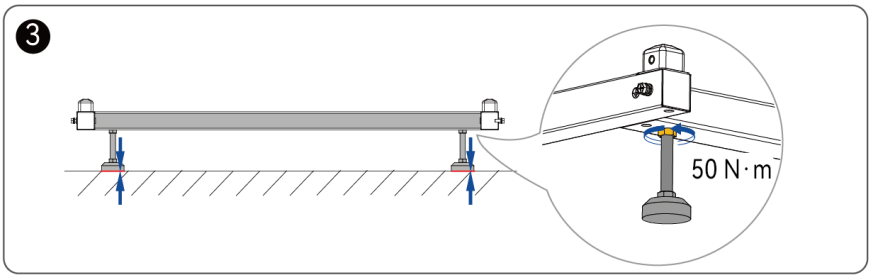


CAUTION

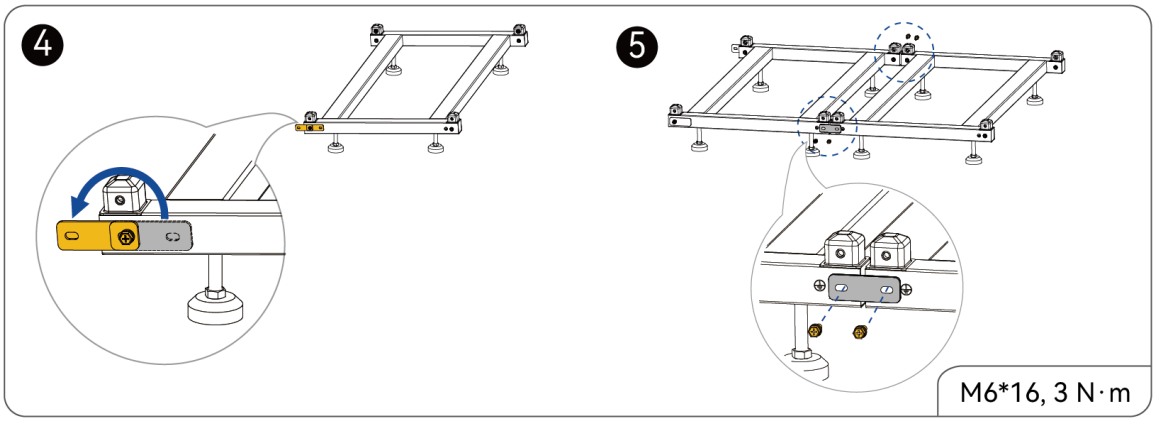
Risk of unstable frame installation

To ensure firm installation, insert the leveling foot into the base frame deep enough, leaving out no longer than 110mm length.

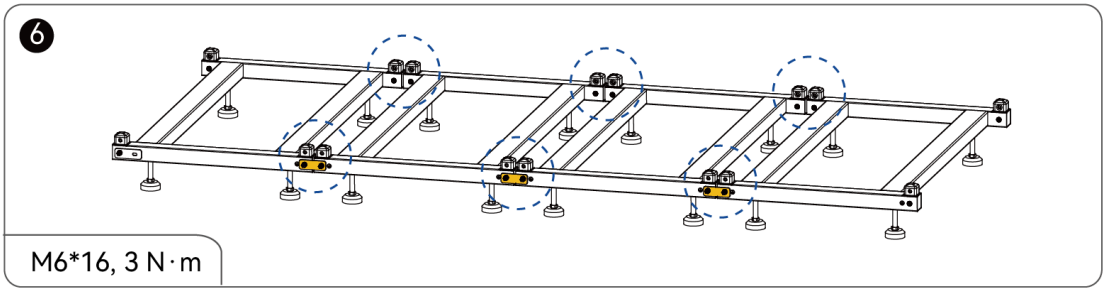
2. Ensure that all the leveling feet are firmly placed on the ground. Adjust the height of the feet as needed. Tighten the screw firmly.



3. Secure the front and back grounding plates between every two base frames.



4. Assemble all the base frames according to the actual system configuration.

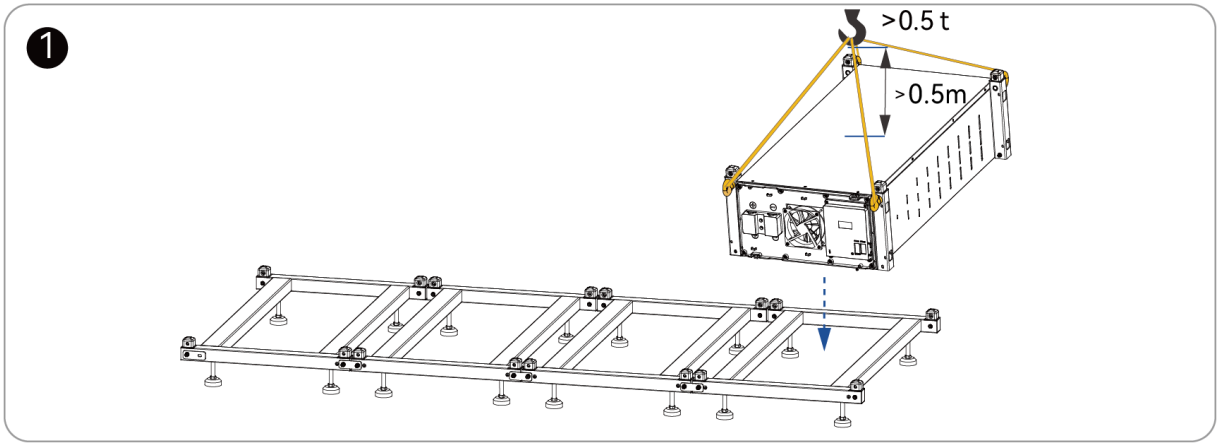


4.5. Install the battery units

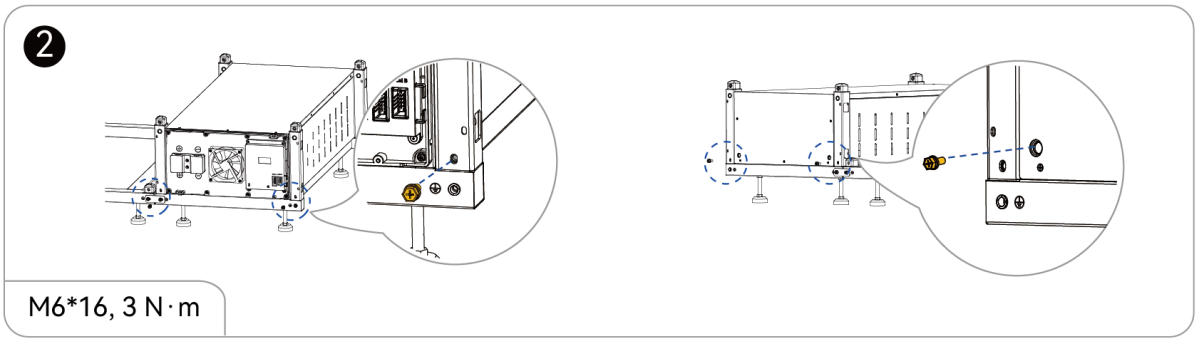
Install the number of battery units according to the actual requirement. In this installation procedure, the full battery system with 13 battery units are used for illustration.

Procedure

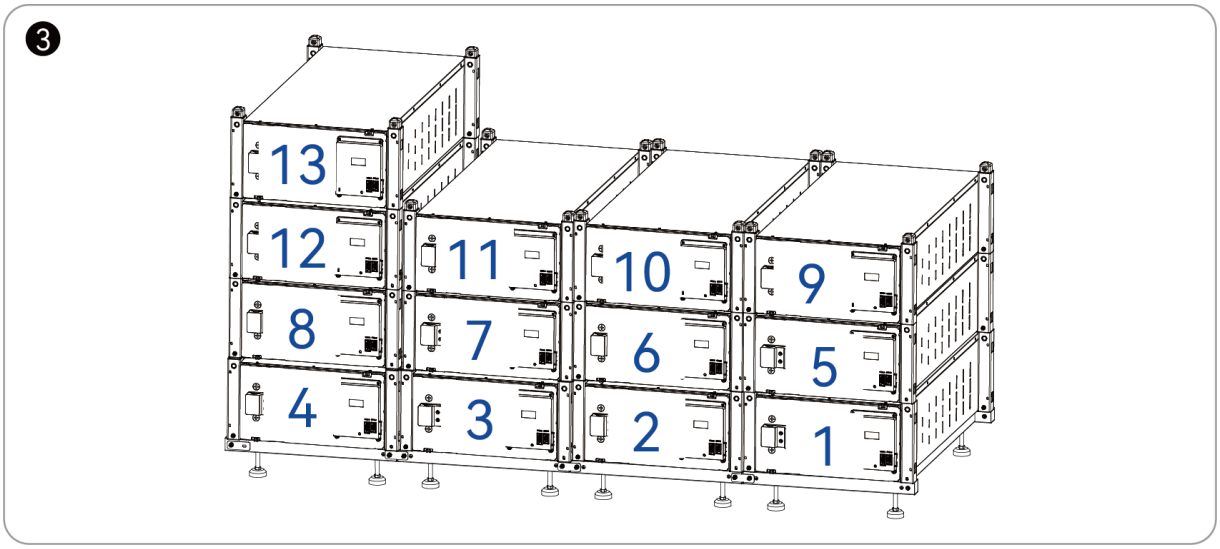
1. Move the first battery unit onto the furthest right frame with a crane.



2. Fasten the battery unit to the frame with four screws.



3. Install the other battery units according to the marked sequence.



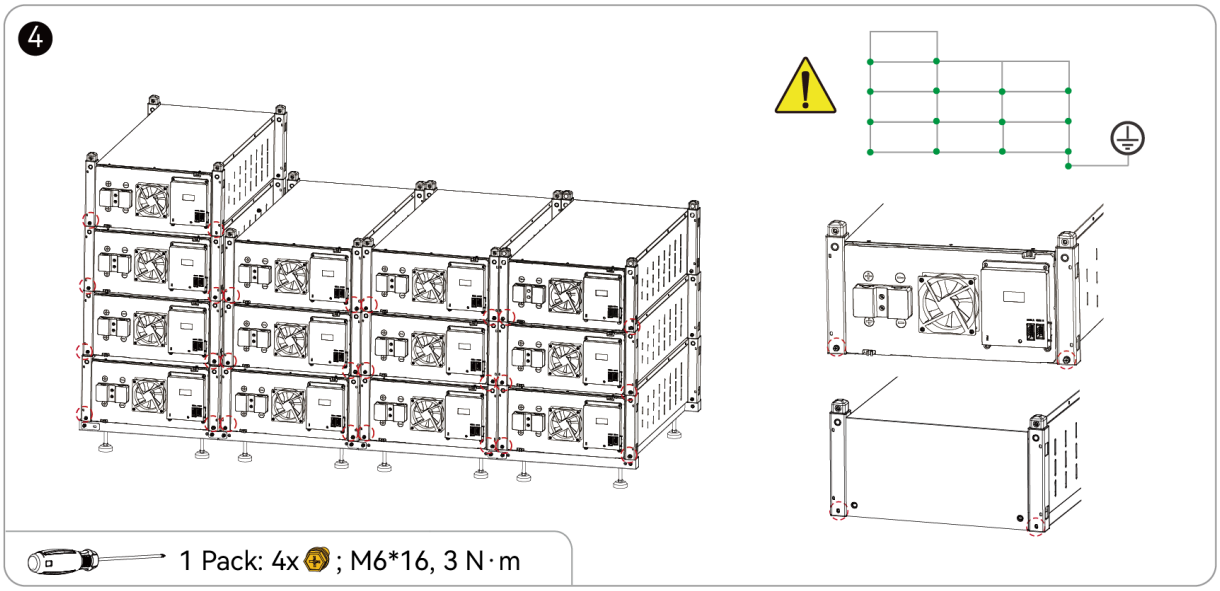
4. Check that the four screws for each battery unit are tightened properly before taking any further steps.

WARNING

Risk of electrical shock or system failure.

Ensure all assembly bolts are fully installed and tightened to the specified torque.

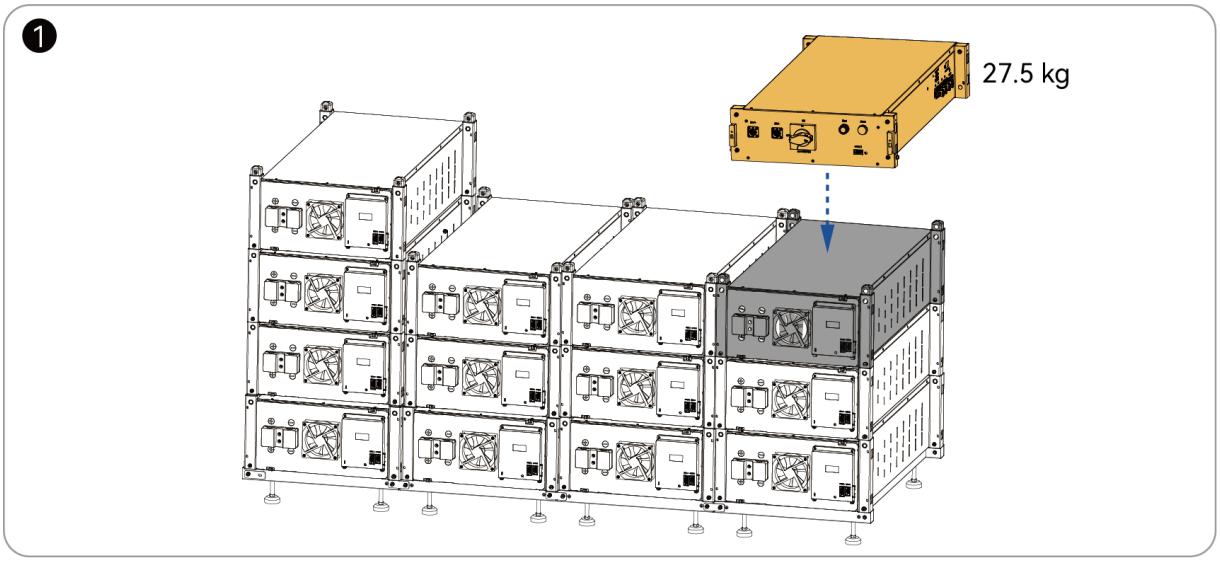
These bolts are essential for establishing electrical continuity between the battery units. Proper installation is required to create a valid grounding path.



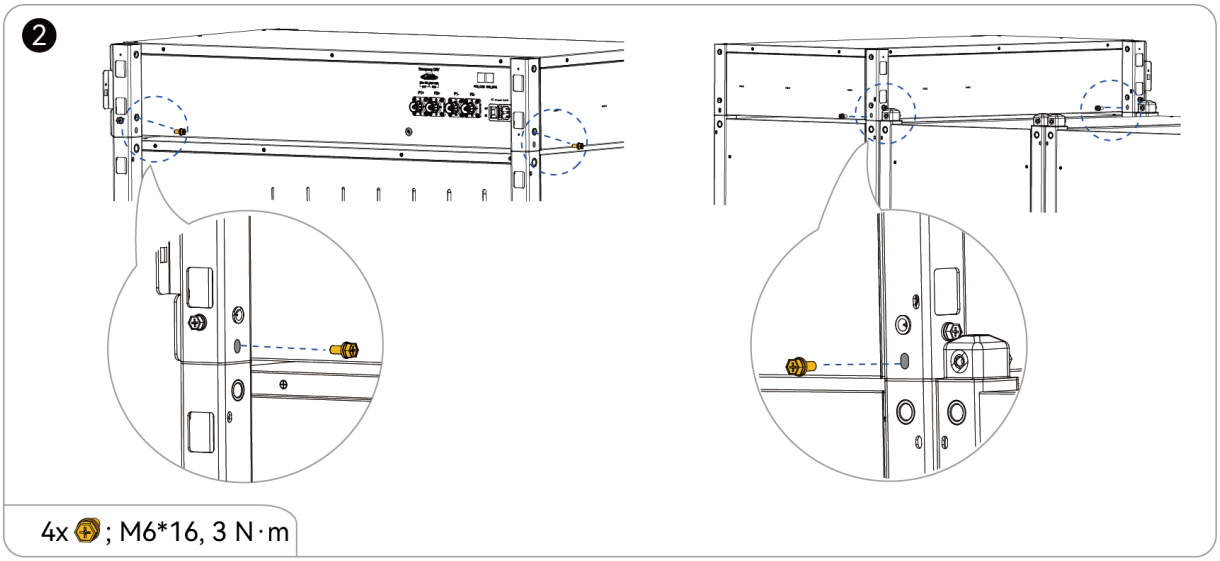
4.6. Install the battery control unit

Procedure

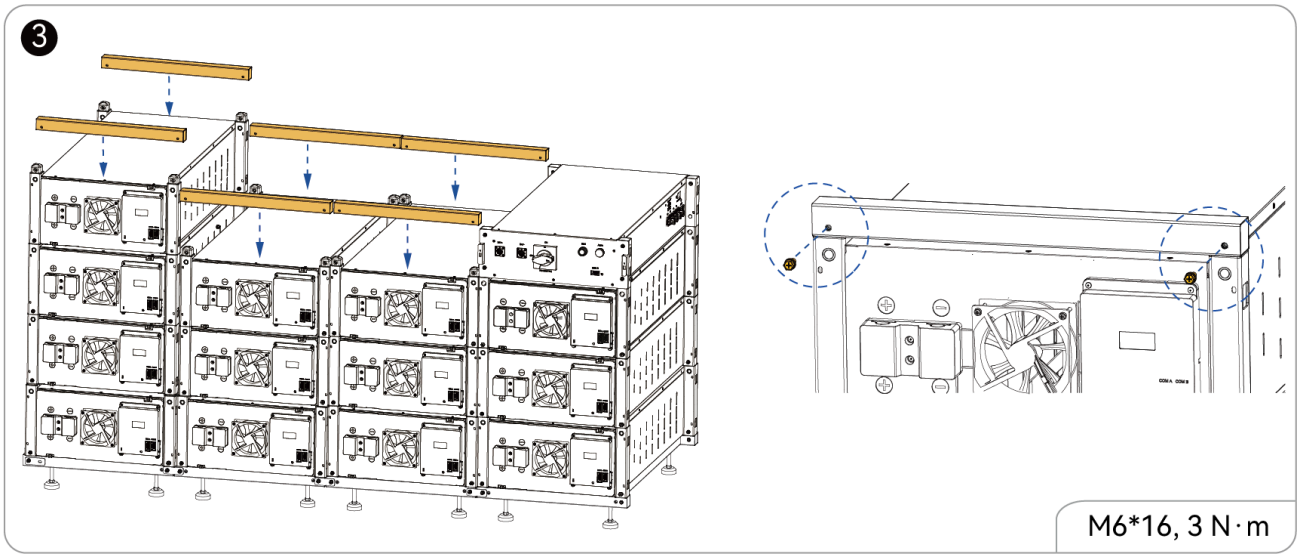
1. Move the battery control unit (BCU) onto the top battery unit on the first stack.



2. Fasten the four screws to secure the BCU to the battery unit.



3. Install two top beams for each top battery unit. Secure each top beam with two screws.



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 grounding cable

Before you begin

Prepare a grounding cable according to the following specification:

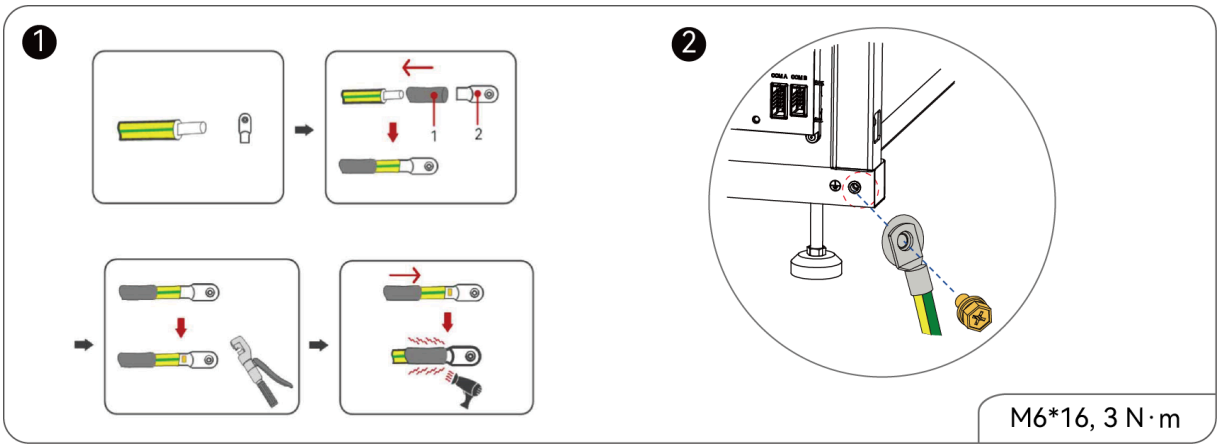
Cable cross-sectional area (mm^2)	Connecting terminal
25-50	RNBS38-8 OT/DT

Procedure

Prepare and connect the grounding cable to the base frame. Connect the other cable end to the external earthing bar.

WARNING

Connect the grounding cable before other electrical connections.



5.3. Connect battery cables

Before starting the cable connections, read this procedure about which cable connections are needed. In this procedure, the battery system with 8 battery units are used for illustration.

DANGER

Risk of electrical shock

Before connecting the battery cables, make sure that the **DC SWITCH** on the battery control unit is **OFF**.

NOTICE

All the battery units are connected in series, not in parallel. Follow the cable connection instructions to ensure correct connection.

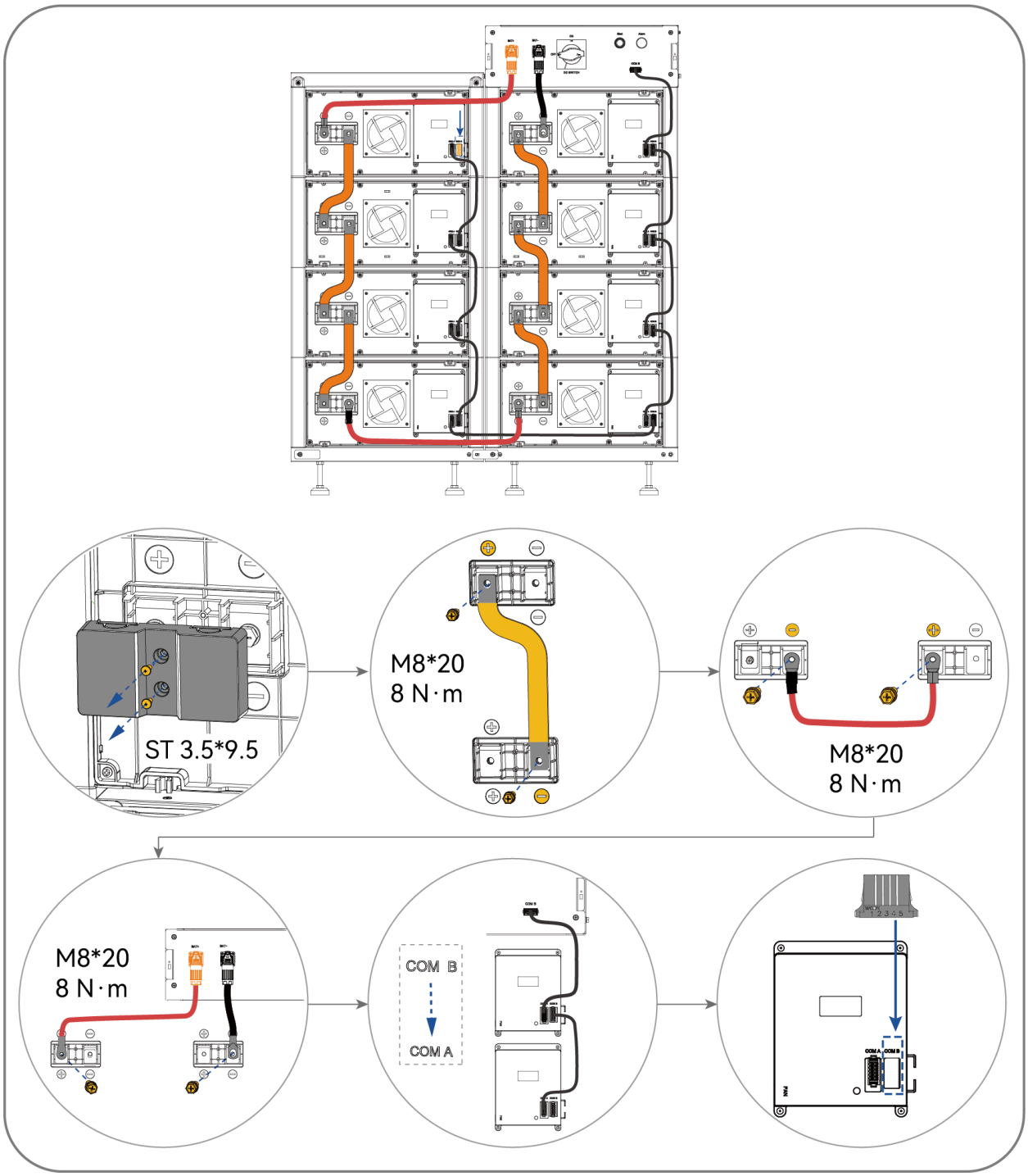


Figure 5.1. Battery cable connections

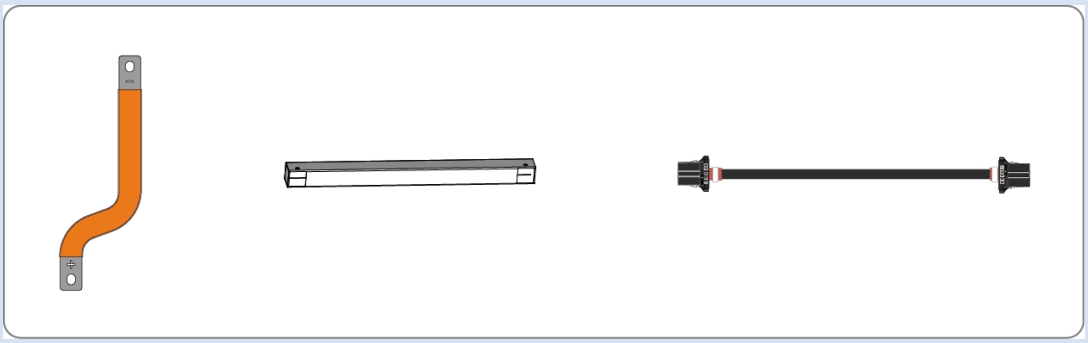
Procedure

1. Remove the cable cover from the battery front panel.
2. Install and secure the battery busbar between the battery units with two M8*20 screws.
3. Connect and secure the battery cable between the battery units with two M8*20 screws.
4. Connect and secure the battery cable between the battery unit and the battery control unit.
5. Connect the BMU communication cables from **COM B** to **COM A**.
6. Insert the RJ45 resistor the **COM B** port of the corresponding battery unit.

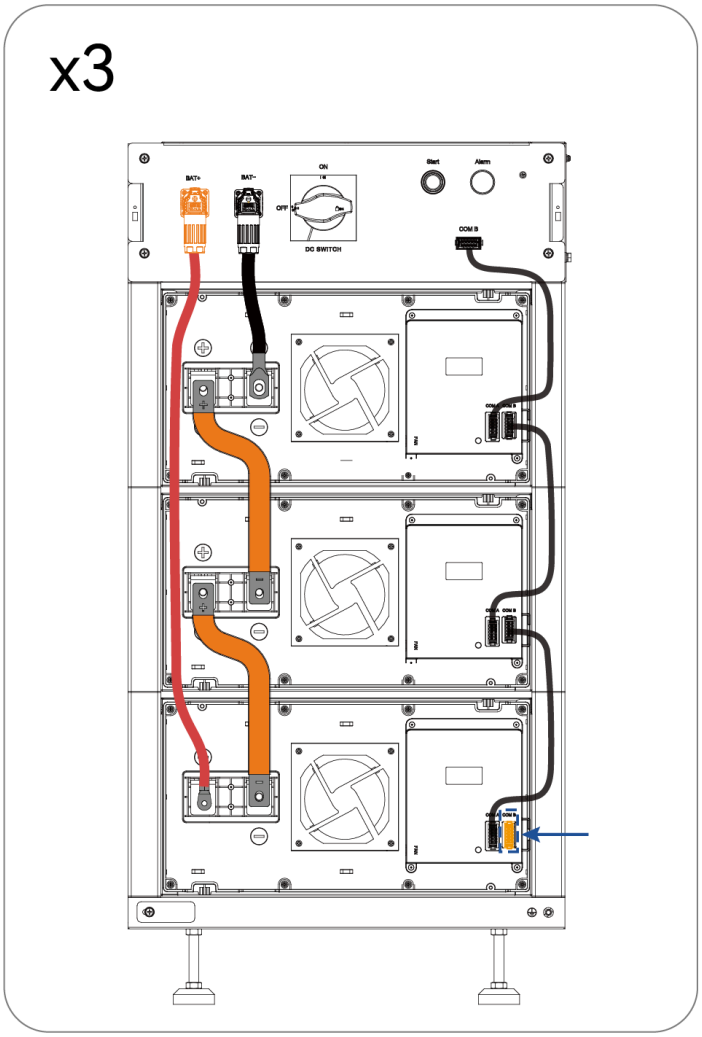
What to do next

For cable connection diagrams of each system configuration with 3-13 battery units, see sections 5.3.1. 3 battery units *(on page 31)* to 5.3.11. 13 battery units *(on page 41)*.

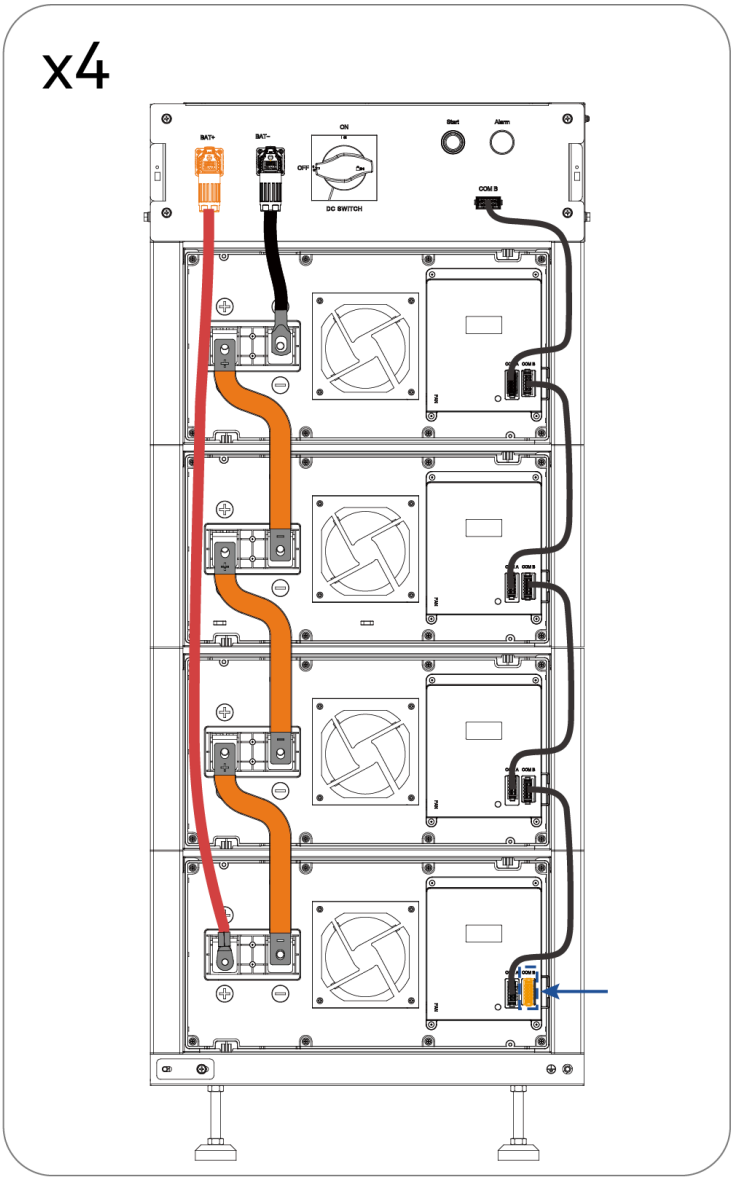
Note: After the system installation is completed, some of the following parts can be unused. These parts are delivered in a shared package for different battery unit configurations.



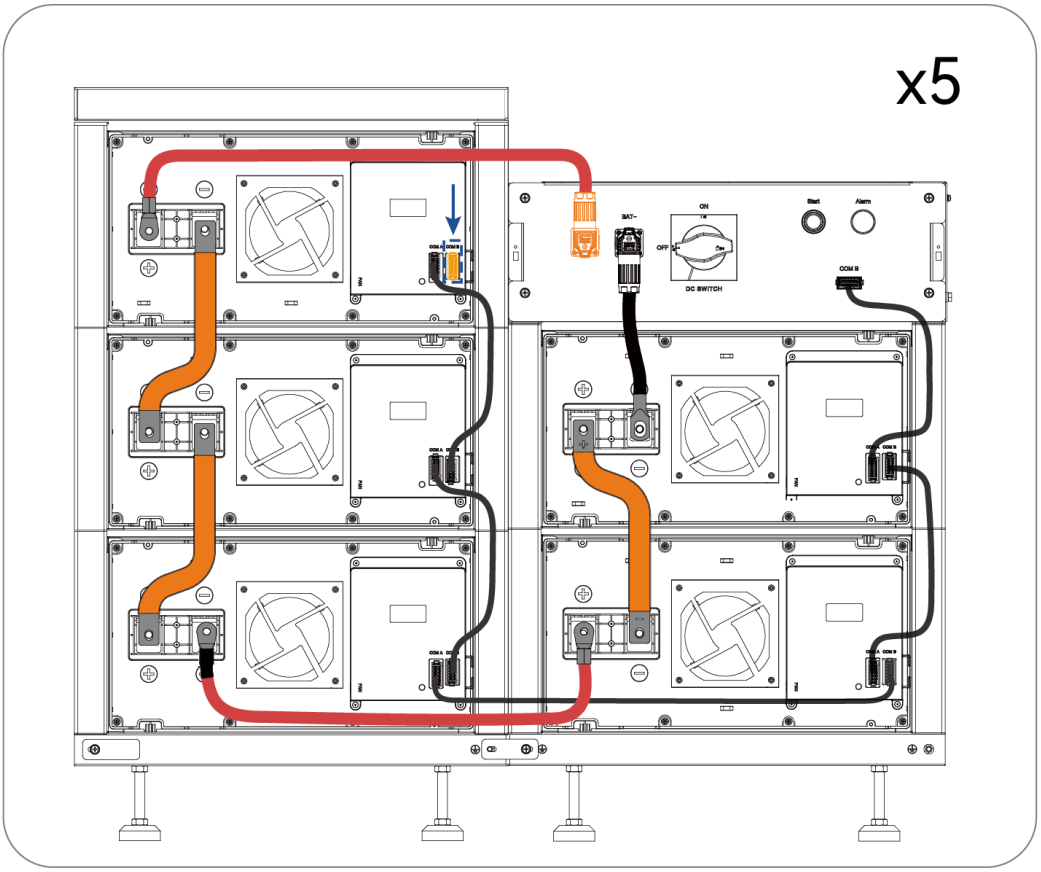
5.3.1. 3 battery units



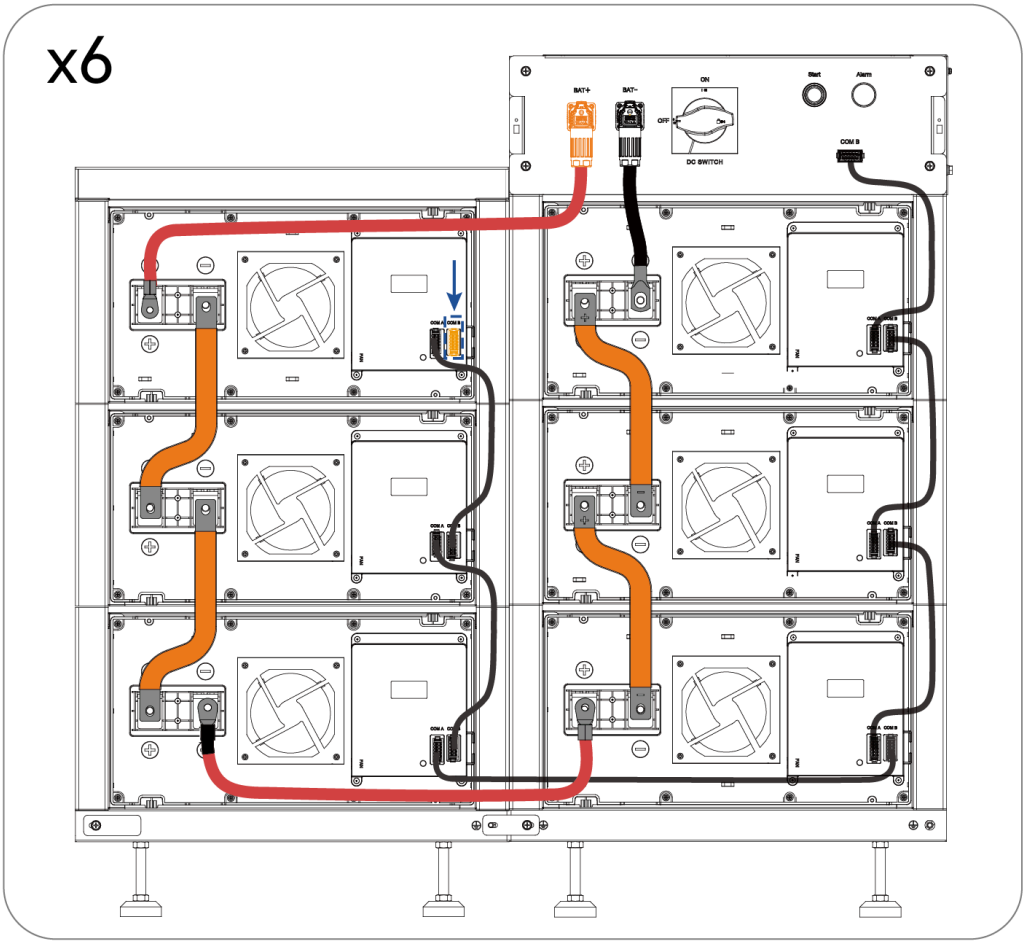
5.3.2. 4 battery units



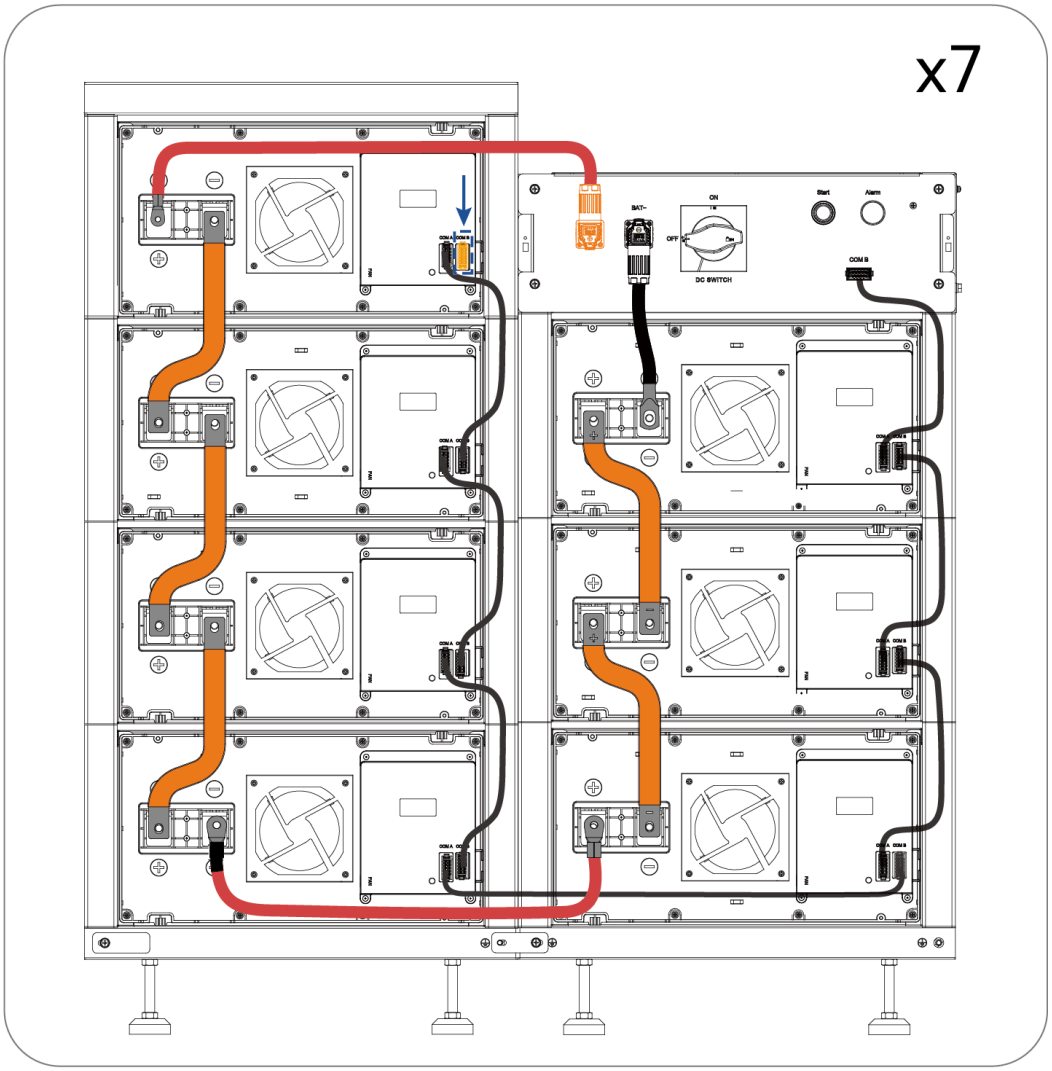
5.3.3. 5 battery units



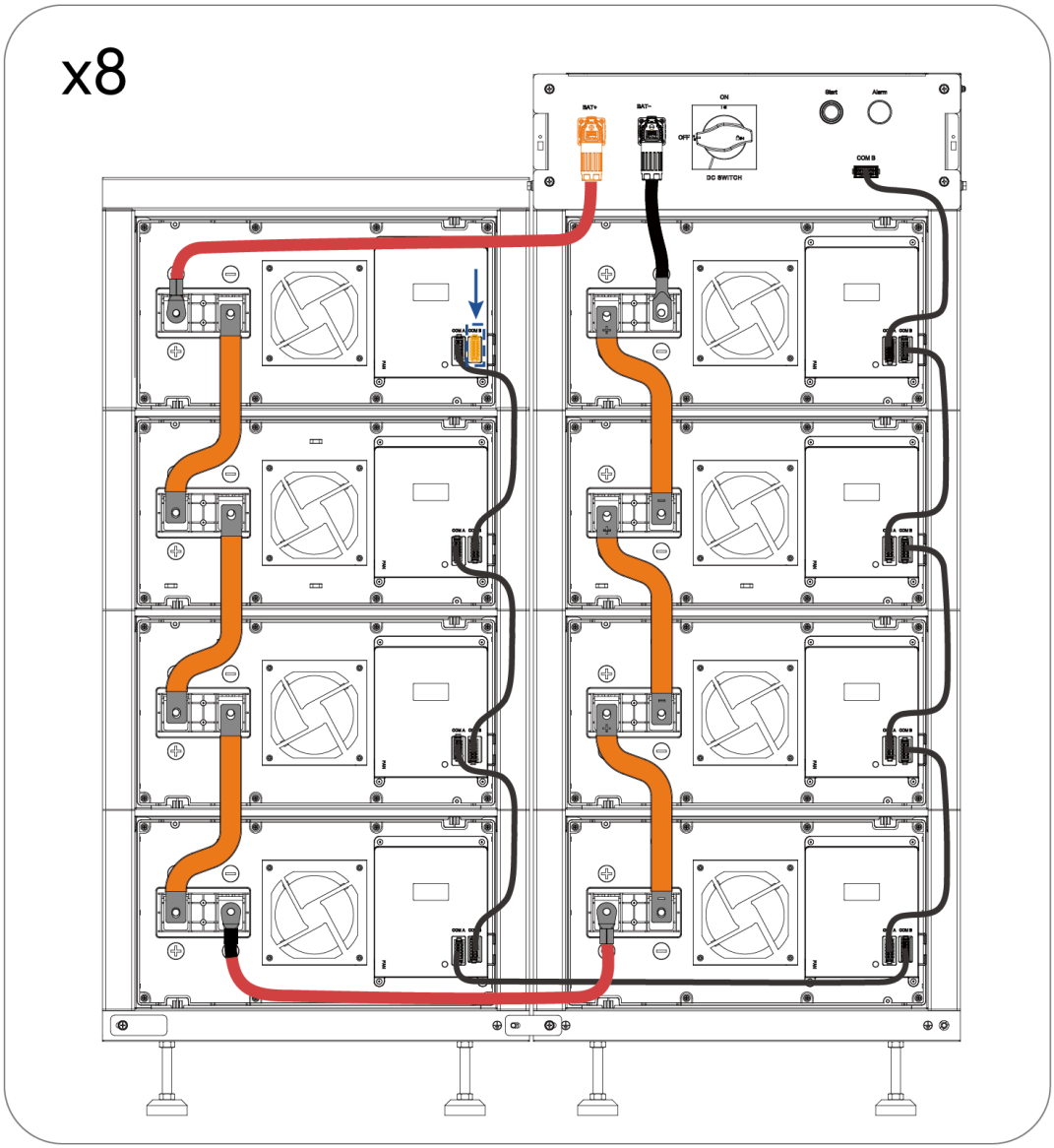
5.3.4. 6 battery units



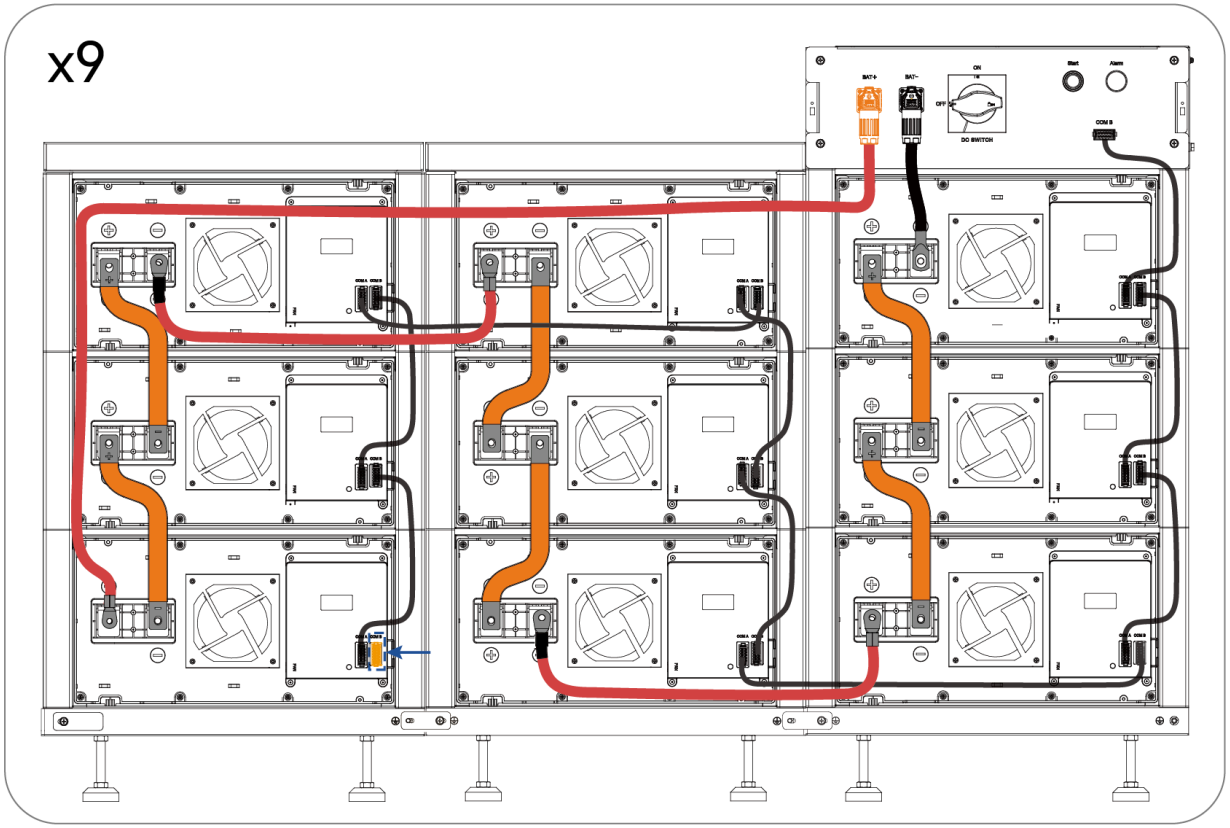
5.3.5. 7 battery units



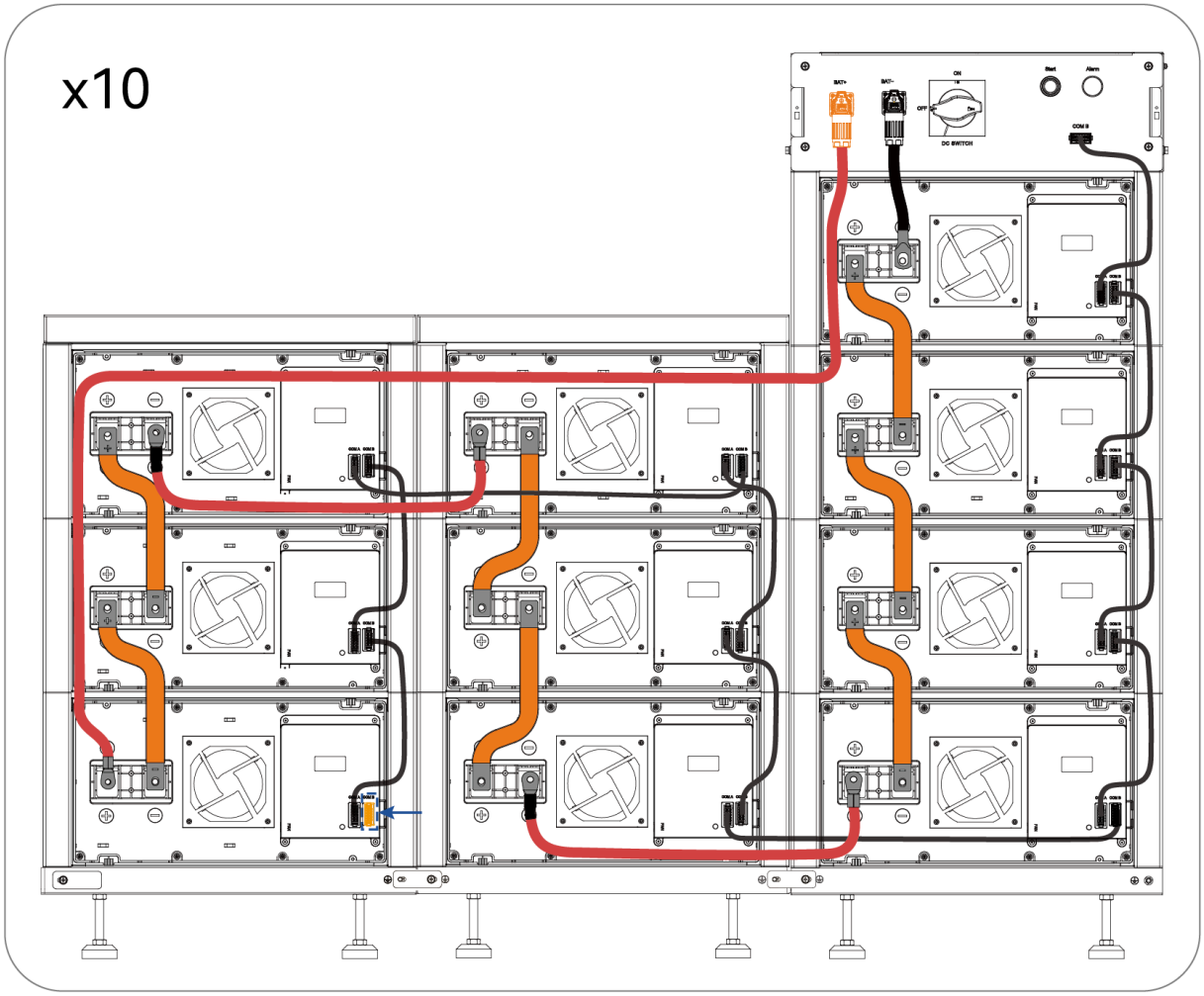
5.3.6. 8 battery units



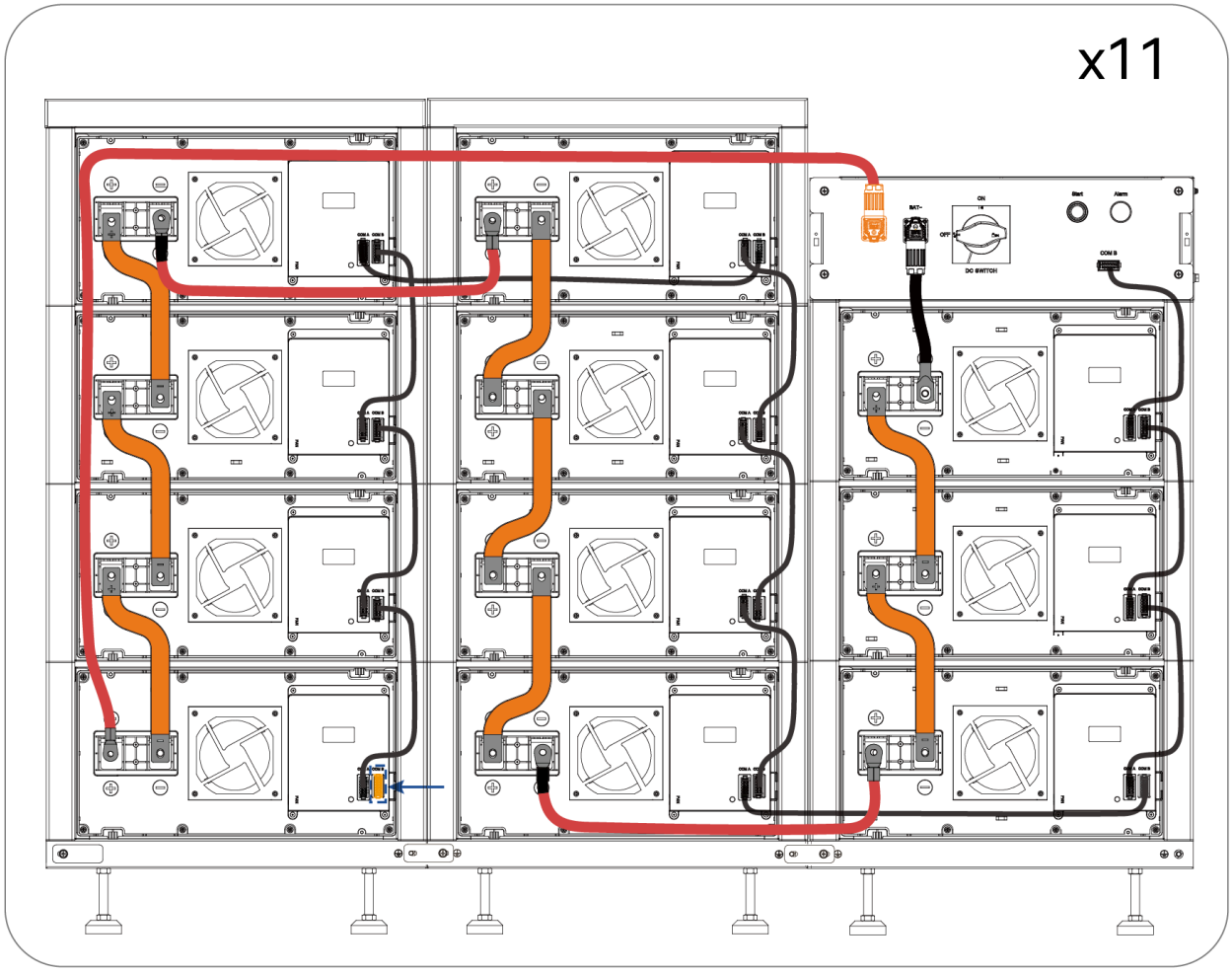
5.3.7. 9 battery units



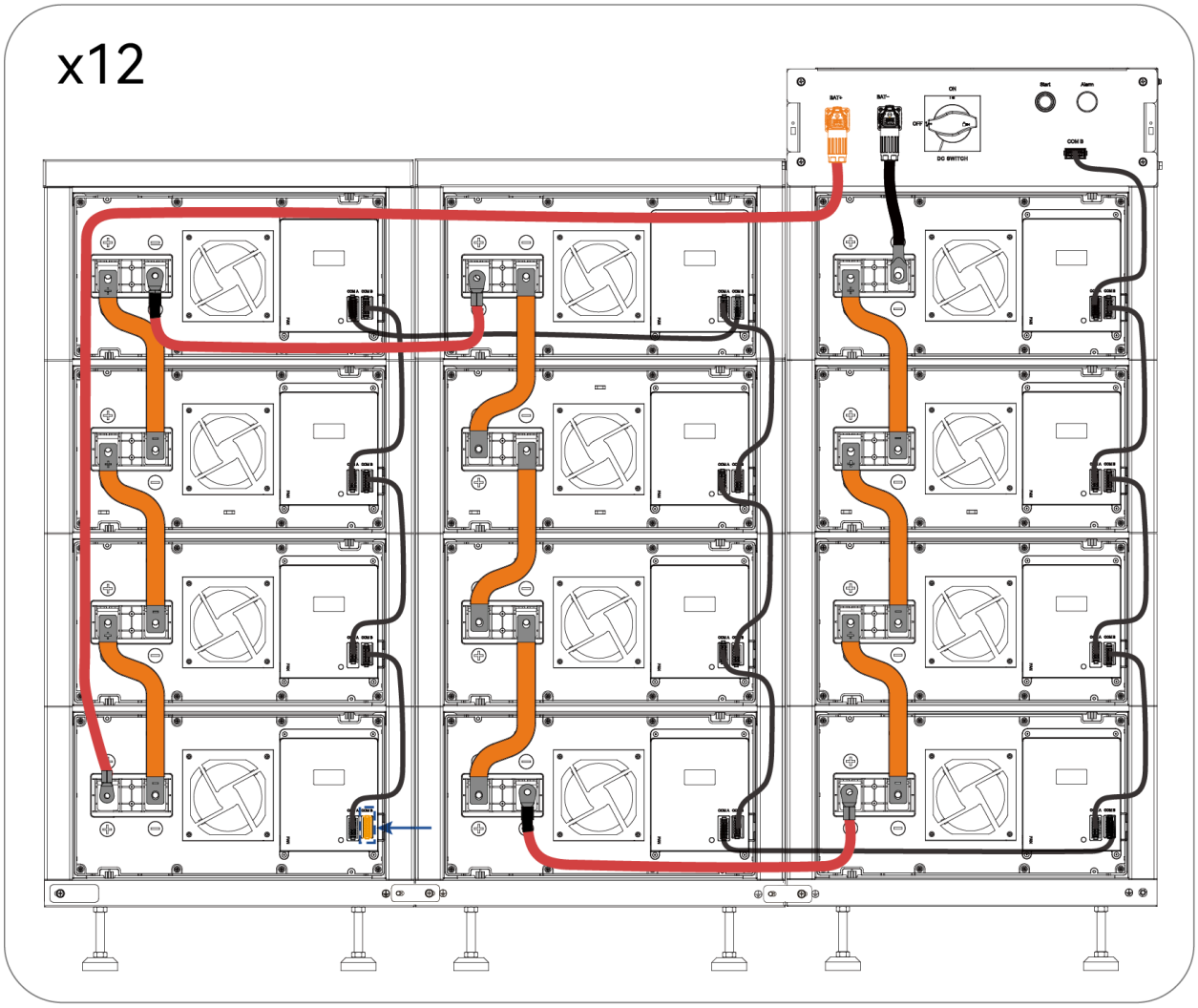
5.3.8. 10 battery units



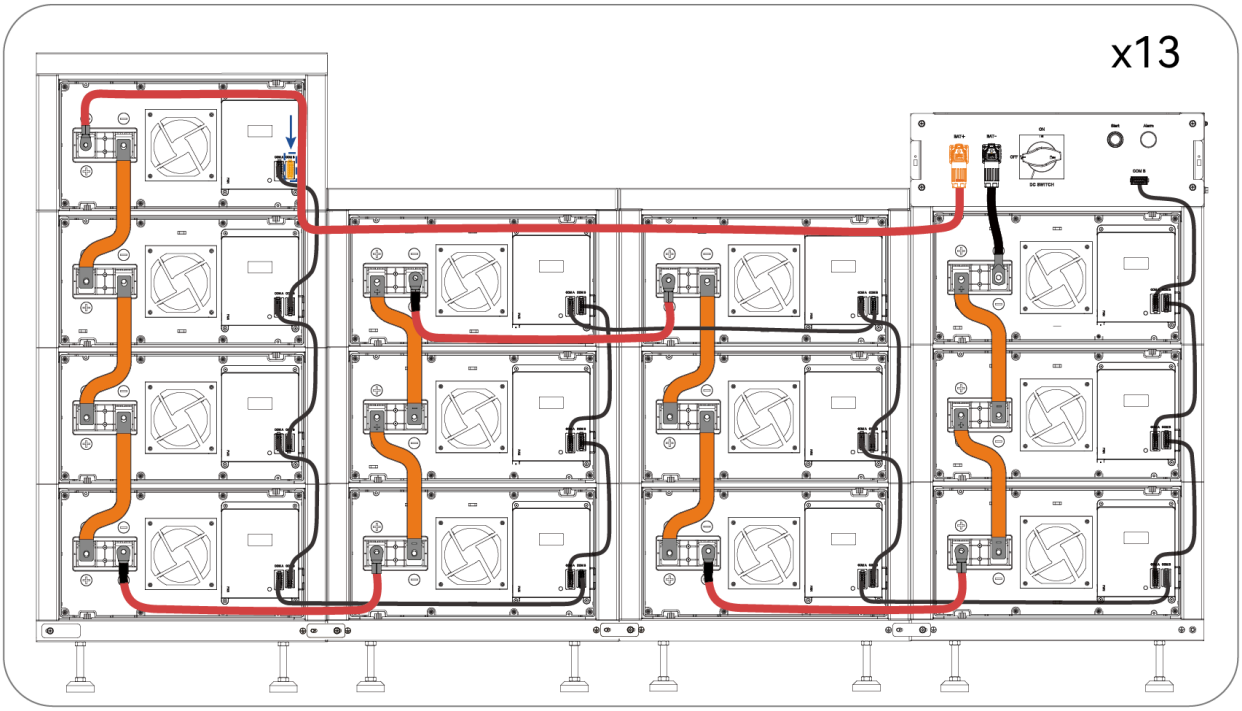
5.3.9. 11 battery units



5.3.10. 12 battery units



5.3.11. 13 battery units

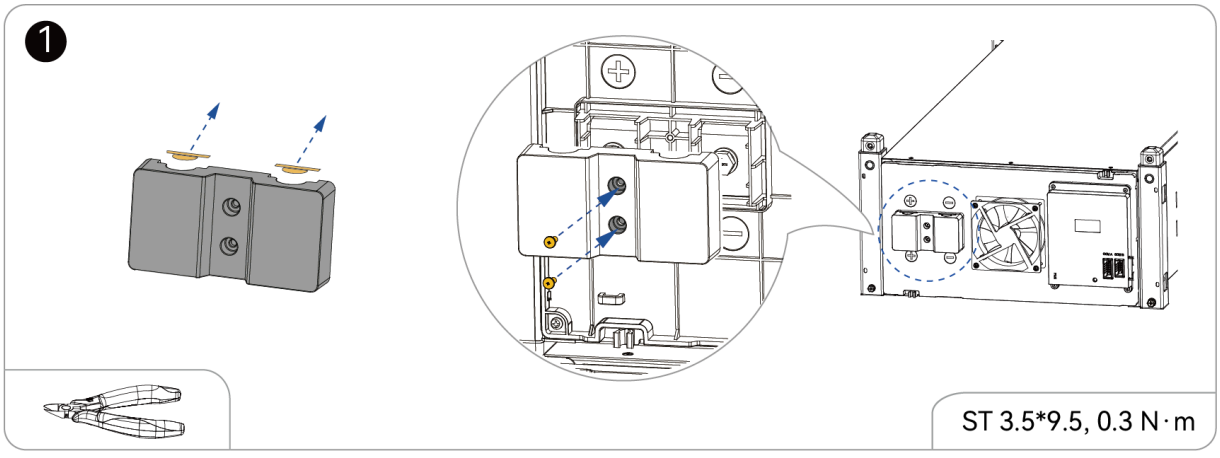


5.4. Install the covers

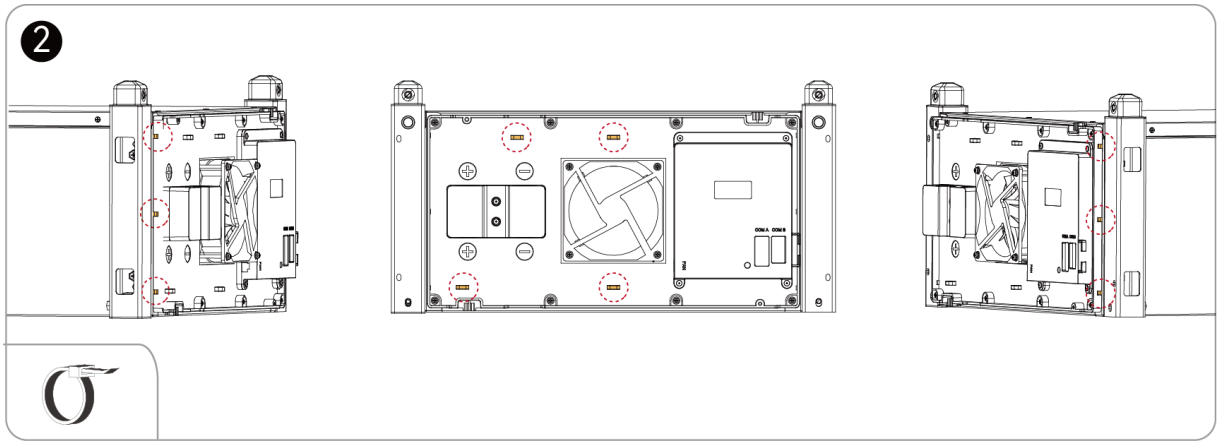
After all the battery cables are connected, install the protective covers on the battery units.

Procedure

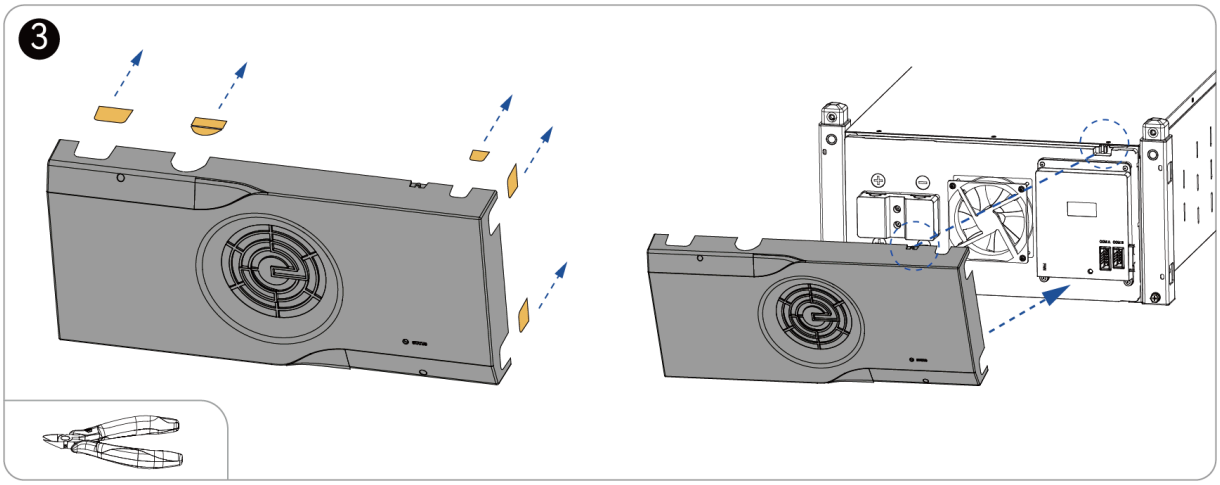
1. Remove the cable entry holder from the cover based on the cable route. Install and secure the cable cover with the two ST3.5*9.5 screws.



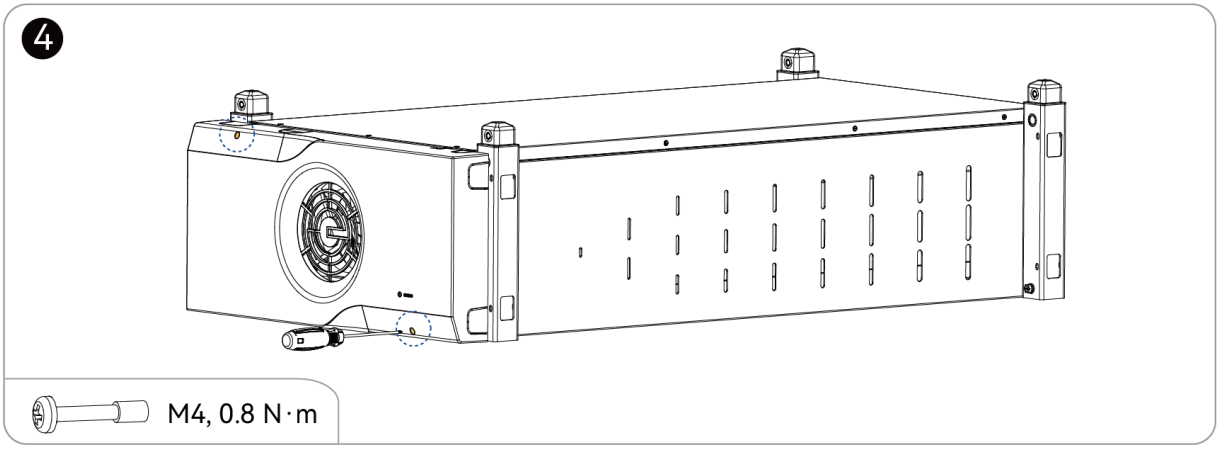
2. Organize and tighten the cables with cable ties. Secure the cable ties to the front panel slots.



3. Remove the cable entry holder from the cover based on the cable route. Install the cover on to the front panel according to the locking slot.



4. Secure the cover with the two M4 screws inside the cover.



5. Check that all the covers are installed properly.

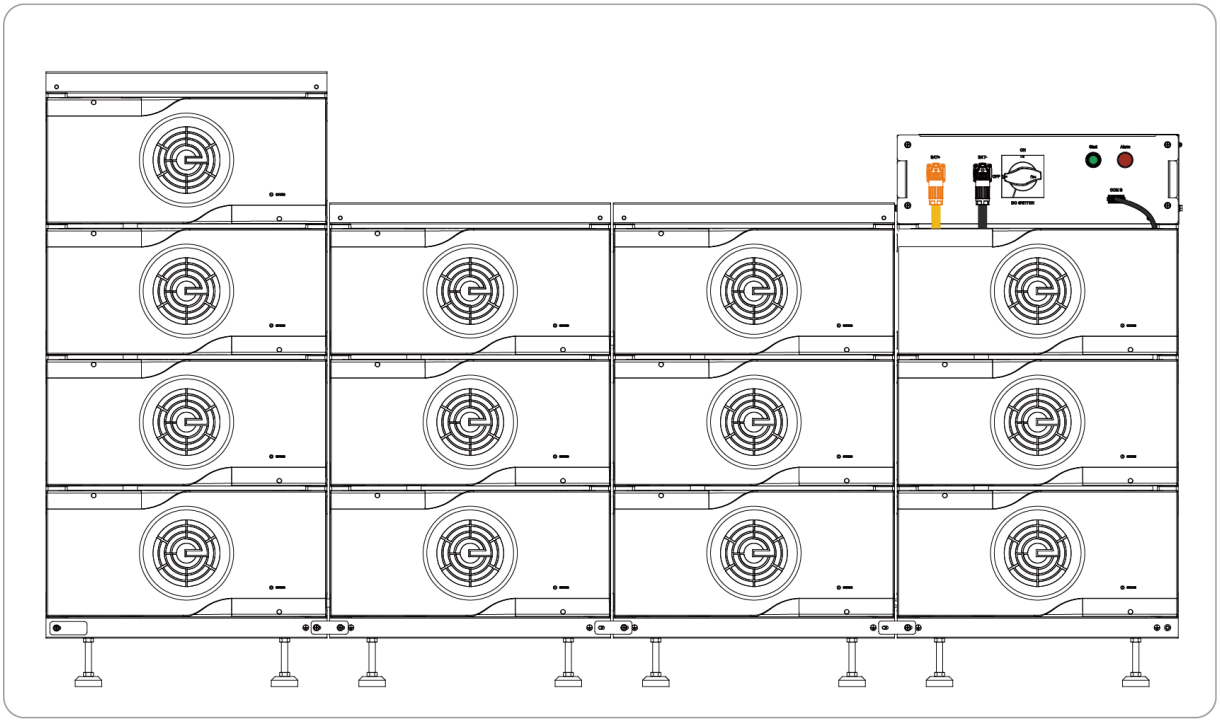


Figure 5.2. Completion view

5.5. Connect to the CH2 series inverter

Follow this procedure to connect the CB3 battery system to the CH2 series inverter.

Note: Integrate CH2 series inverter with CB3 system consisting of 3-12 battery units.

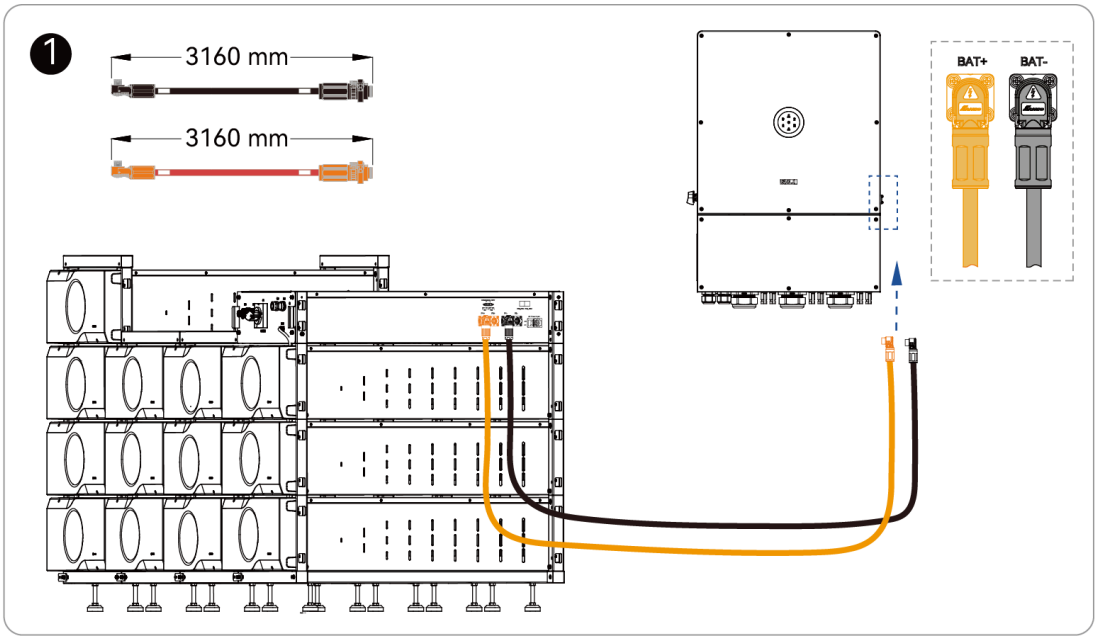
DANGER

Risk of electrical shock

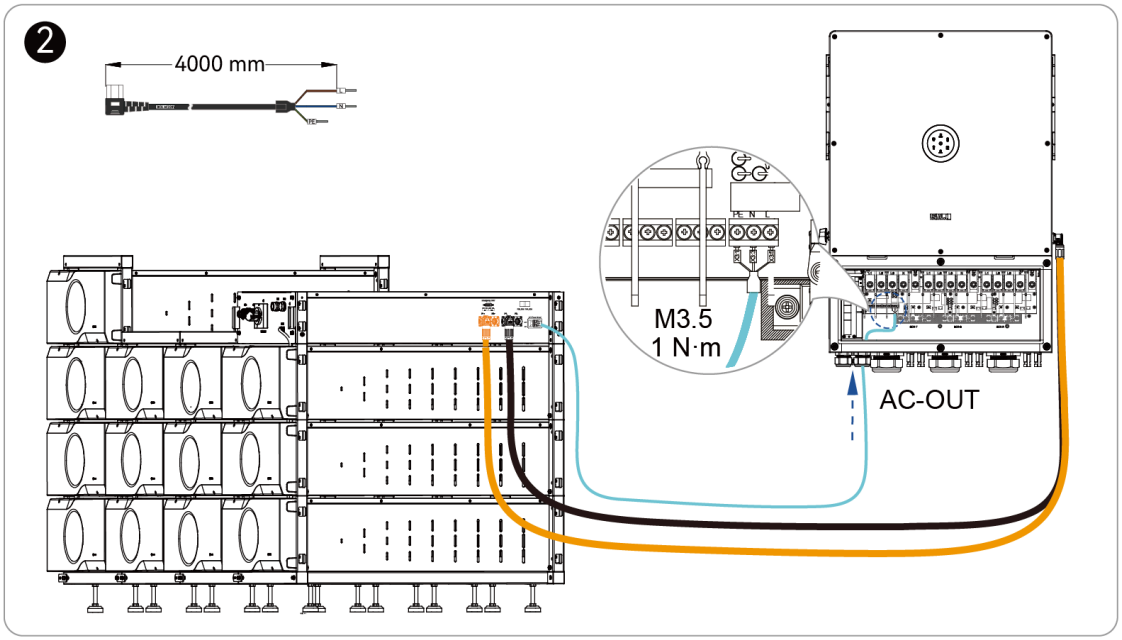
Before connecting the battery power cables, make sure that the inverter is powered off.

Procedure

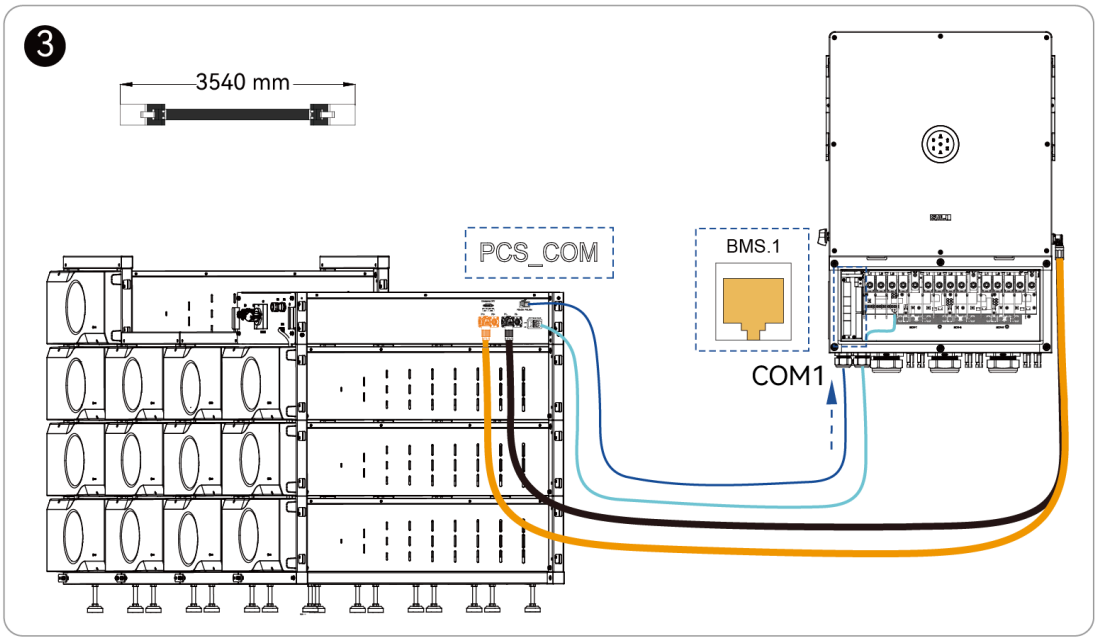
1. Connect the positive battery power cables to the **BAT+** port on the inverter, and connect the negative cable to **BAT-** port on the inverter.



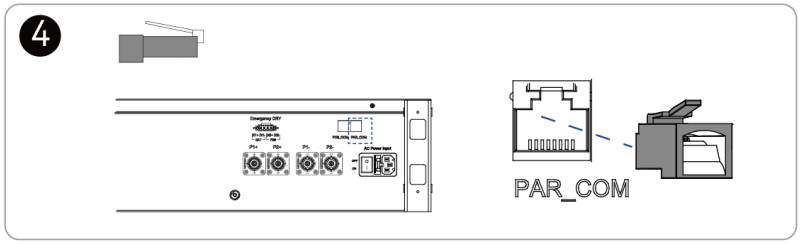
2. Pass the AC power supply cable through the **AC-OUT** cable gland of the inverter and connect to the AC terminals.



3. Connect the network cable from the **PCS_COM** port to the **BMS.1** RJ45 port on the inverter.



4. Check that the RJ45 resistor is installed into the BCU **PAR_COM** port.



5.6. Connect to the CH3 series inverter

Follow this procedure to connect the CB3 battery system to the CH3 series inverter.

Note: Integrate CH3 series inverter with CB3 system consisting of 13 battery units.

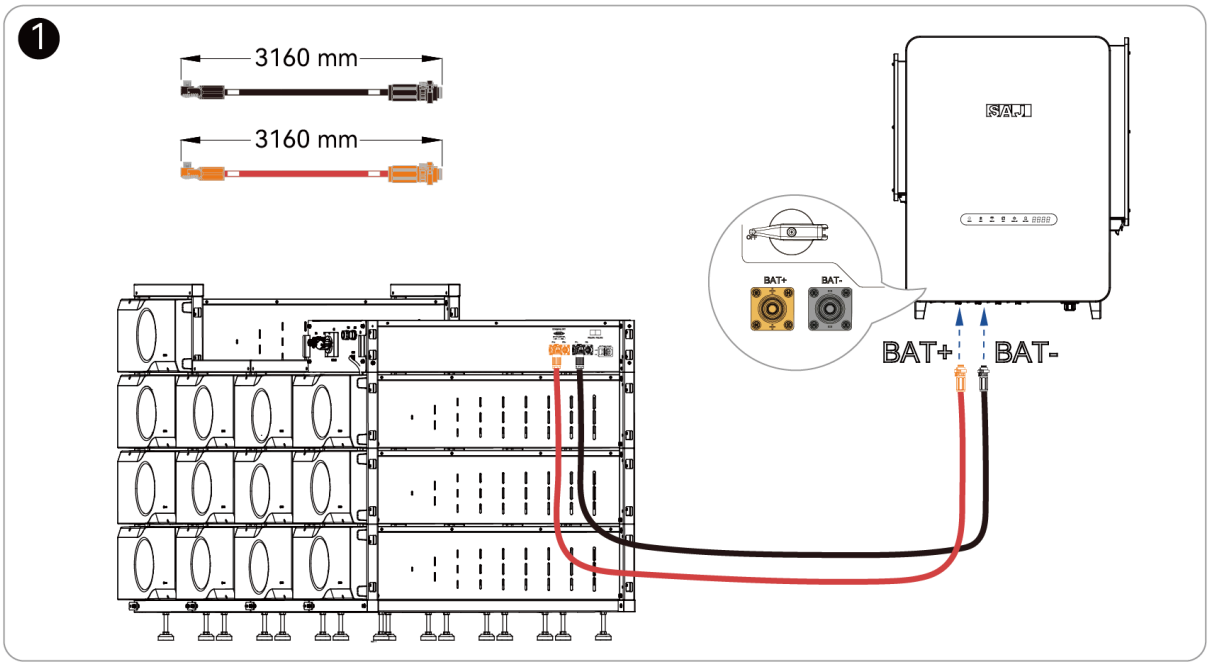
DANGER

Risk of electrical shock

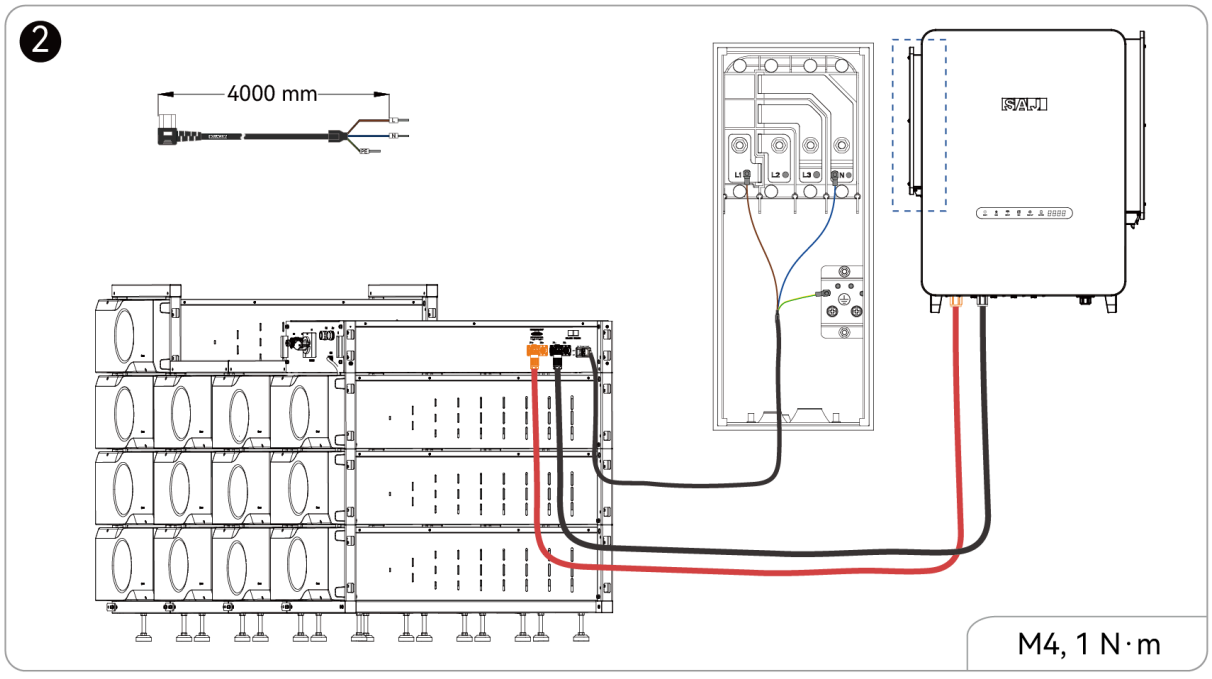
Before connecting the battery power cables, make sure that the inverter is powered off.

Procedure

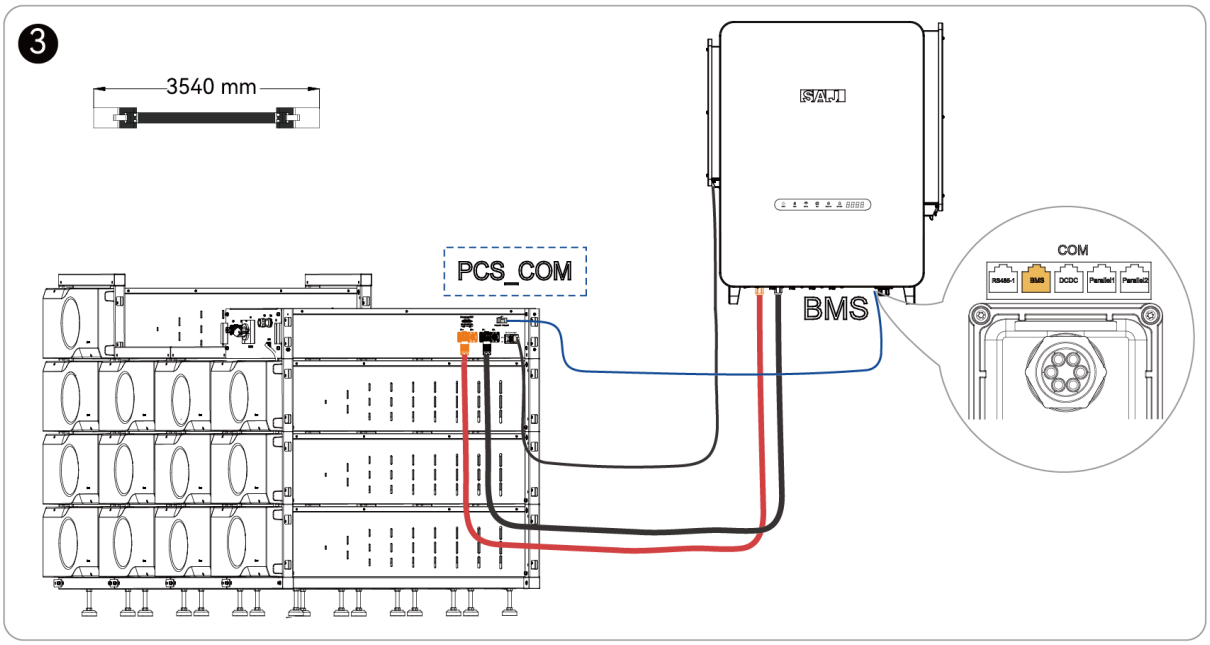
1. Connect the positive battery power cables to the **BAT+** port on the inverter, and connect the negative cable to **BAT-** port on the inverter.



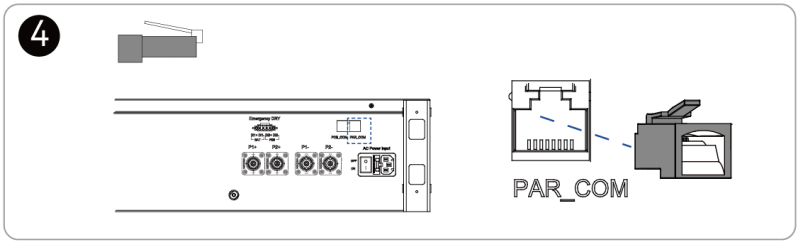
2. Connect the AC power supply cable to the **BACKUP** AC output terminals on the inverter.



3. Connect the network cable from the **PCS_COM** port to the **BMS** RJ45 port on the inverter.



4. Check that the RJ45 resistor is inserted into the BCU **PAR_COM** port.



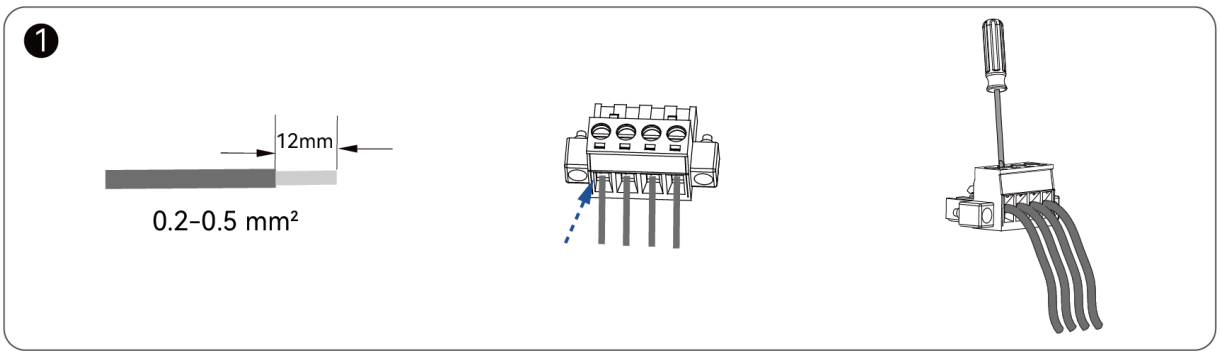
5.7. Connect to the external emergency device

Connect to the external emergency device through the dry input contact connection to stop the CB3 battery system in urgent situations. Select one of the following options for start/stop control:

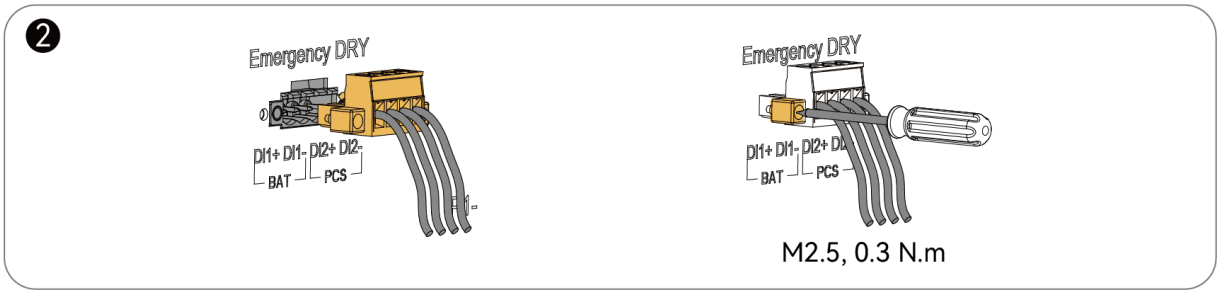
- Connect to **BAT**: Stop the battery system first and signal the inverter to stop through LAN communication.
- Connect to both **BAT** and **PCS**: Stop both the battery system and the inverter immediately.

Procedure

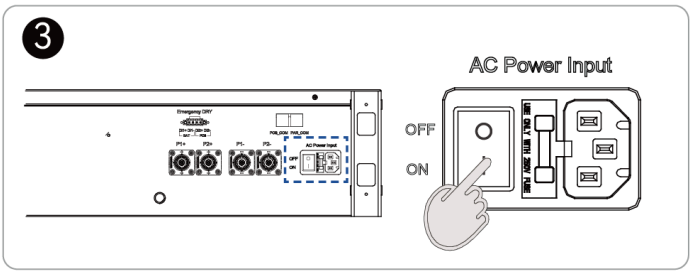
1. Prepare the cables of cross-sectional area 0.2-0.5 mm^2 and assemble the 4-pin connector.



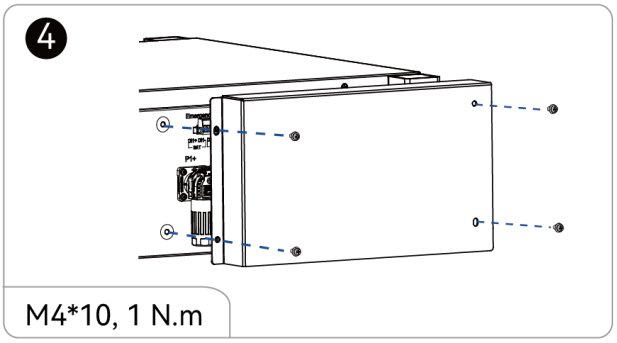
2. Connect and secure the 4-pin connector to the BCU **Emergency DRY** port.



3. Press | to turn on the AC power input switch.



4. Install the cable cover on the BCU.



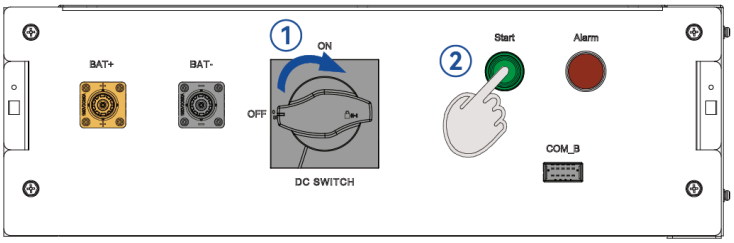
6. Startup and shutdown

6.1. Start up CB3 battery system

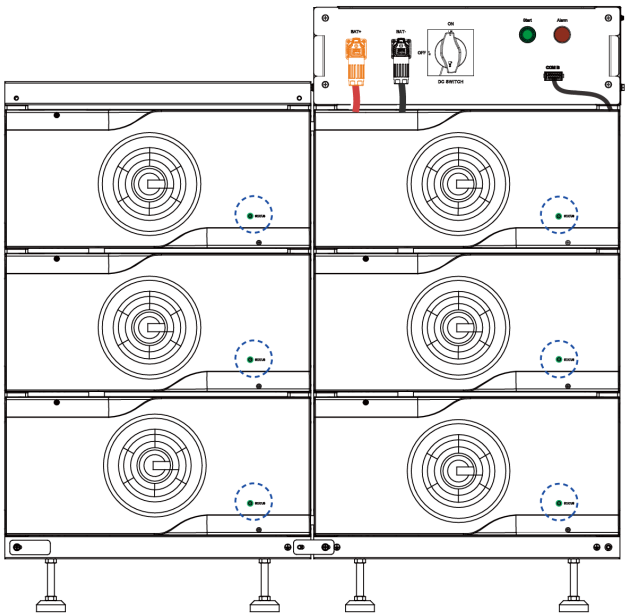
Follow this procedure to start up the CB3 battery system.

Procedure

1. Turn the **DC SWITCH** to **ON**. Press the **Start** button on the BCU for a few seconds until the button shows solid green.



2. Check that all the battery indicators show green.



6.2. Stop CB3 battery system

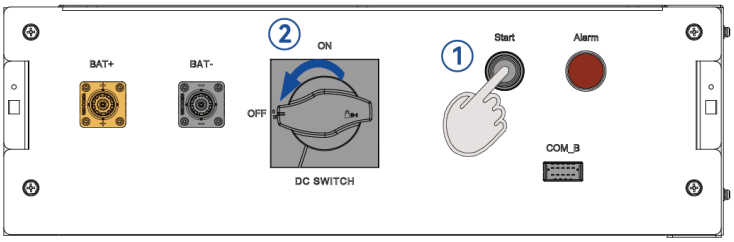
Follow this procedure to stop the running CB3 battery system.

Procedure

1. Disconnect the AC and DC power input at the inverter side.

   For detailed instructions, see the inverter *User Manual*.

2. Press the **Start** button on the BCU for a few seconds until the button is off. Turn the **DC SWITCH** to **OFF**.



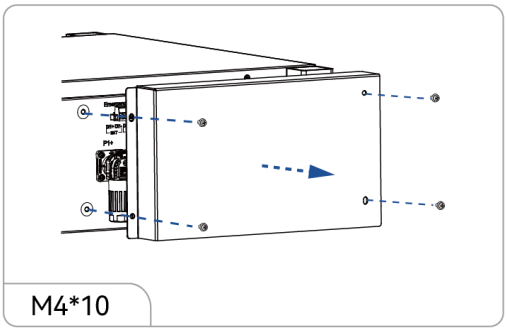
3. Check that all the battery indicators are off.

6.3. Stop CB3 battery system for maintenance

Follow this procedure to shut down the battery system for maintenance purpose.

Procedure

1. Follow the steps in section 6.3. Stop CB3 battery system for maintenance *(on page 50)*.
2. Remove the cable cover on the right side of the BCU.



3. Unplug all the battery power cables to the inverter.
4. Turn off the **AC Power Input** switch on the BCU and unplug the cable.
5. Disconnect the positive and negative battery power cables on the BCU front panel.
6. Check that all the battery indicators are off.

7. Commissioning

7.1. About elekeeper

The elekeeper is an easy-to-use, AI-powered energy management platform designed for homeowners and businesses. 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.

Key features:

- Real-time, centralized monitoring: The Owner can view the status and performance of all energy devices anytime, anywhere.
- AI-powered scheduling: The system automatically optimizes when to store, use, or sell energy to maximize efficiency and savings.
- Smart diagnostics: The platform detects potential issues early and sends alerts to the Owner before problems occur.
- Actionable insights: Clear, data-driven reports help the Owner make smarter decisions and potentially increase revenue from their energy system.

7.2. Download the elekeeper App

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

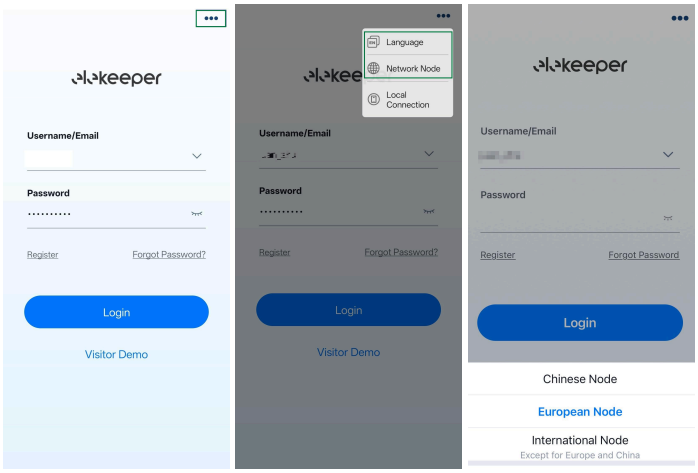
Alternatively, scan the below QR code to download the App.

Note: The detailed operations on the App might vary, depending on the App version in use.

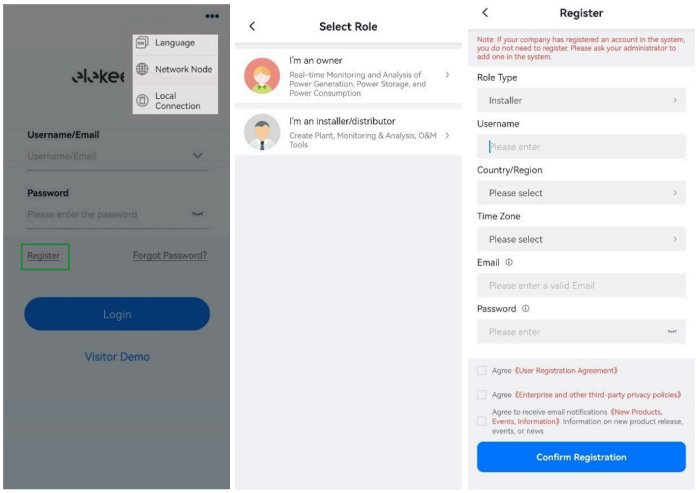
7.3. Log in to the elekeeper App

Procedure

1. Open the App and tap the three-dot icon ••• on the top right corner.
2. Set **Language** to English and **Network Node** to European Node or International Node depending on the installation site of the system.

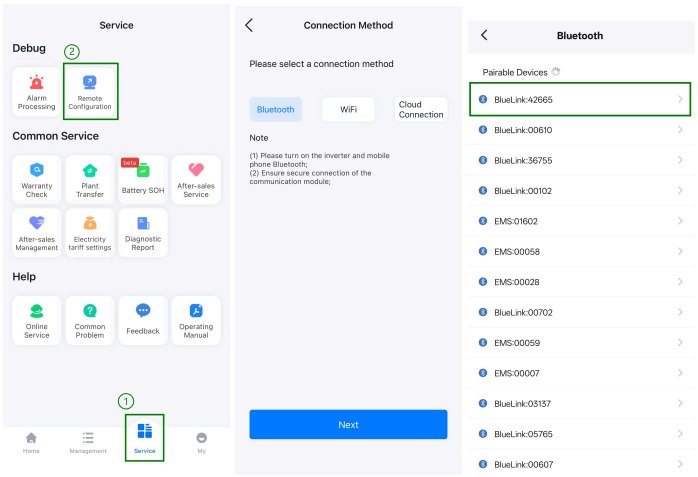


3. If you do not have an account, register first.
   a. Tap **Register**. Choose whether you are an owner, installer, or distributor.
   b. Follow the instructions on the screen to complete the registration.



4. Use the account and password to log in to the App.
5. On the **Service** page, select Remote Configuration.
6. Check that Bluetooth is enabled on your mobile phone. Tap **Bluetooth** and then select the communication module or EMS to be connected.

   For the communication modules, the **BlueLink** is named with the last five numbers of the inverter's SN or the communication module's SN. For example, 42665.

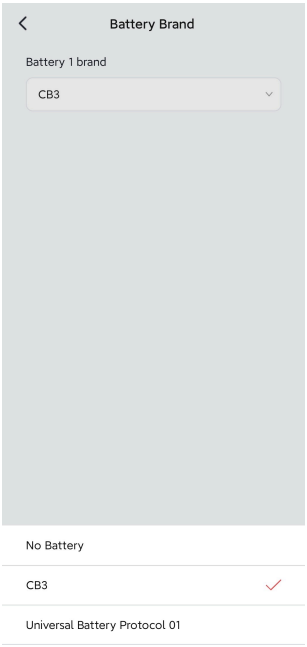


7.4. Initialize the battery system

The installation technicians can configure the **Battery Settings** during the initialization of the inverter on the elekeeper App.

For example, the following battery settings are available on the elekeeper App:

- **Battery Brand**: select CB3.
- **Battery Parameters**: set the parameters as needed.
- **Cell Voltage**: view the cell voltage of each battery module as needed.



After the inverter is initialized, the battery group information can be displayed on the **Device Info** page of the inverter on the elekeeper App. For example:

For detailed commissioning instructions of the inverter, refer to the corresponding inverter *User Manual*.

8. Maintenance instructions

Product parts	Operation	Standard	Interval	Power OFF
Battery unit	Visual inspection: • Check the appearance • Rust • Screws • Fan • Front panel vents	• No obvious damage. • No obvious paint fading or rusting. • The screws are not loose or falling off. • The fan rotates normally without abnormal noises. • The surface of the front panel vents is clean and not clogged.	Quarterly	Yes
EMS	Viewing the indicator status.	The indicator is steady green.	Quarterly	No
Distributor Box	Visual inspection: • Check the appearance. • Rust • Anything unusual in the cabinet	• No obvious coating peeling, scratches. • No obvious paint fading or rusting. • The cabinet is clean and free of unexpected objects.	Quarterly	No
Labels	Visual inspection.	Clearly visible and free from defacement.	Quarterly	No
Battery Pack	Charge the battery.	If the system is not in use for a long period of time, charge the battery to no less than 50% SOC.	Every 6 months	Yes
Grounding and Equipotential Junction Point	Ground wire Internal equipotential	The grounding resistance must not be greater than 4Ω. Equipotential connections between the battery units are correct.	Yearly	Yes
Security Function	Emergency button	Check that the emergency stop button is working.	Yearly	Yes

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.

NOTICE

The troubleshooting operations must be performed by authorized technicians.

Error Code	Error Message	Possible Cause	Solution
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.

Error Code	Error Message	Possible Cause	Solution
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.
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.

Error Code	Error Message	Possible Cause	Solution
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.
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**.

10. Product specification

Battery unit

Model	CB3-M20
Nominal Capacity [A]	314
Nominal Energy [kWh]	20
Rated DC Voltage [V]	64
Rated Charging/Discharging Current [A]	157
Max Charging/Discharging Current [A]	200
DoD [%]	0.95
Operating Temperature Range	Charging: 0 to +55℃ Discharging: -10℃ to +55℃
Ambient Humidity	5%-85%
Altitude [m]	3000
Ingress Protection Rating	IP20
Dimensions [W*D*H] [mm]	530*1006*277
Weight [kg]	145

Battery control module (BCU)

Model	CB3-HVC
Voltage Range [V]	150-1000
Rated Charging/Discharging Current [A]	157
Max. Charging/Discharging Current [A]	200
Operating Temperature Range	-20℃ to +55℃
Ingress Protection Rating	IP20
Dimensions [W*D*H] [mm]	530*990*170
Weight [kg]	27.5
Communication Protocol	CAN
Ambient Humidity	5%-85%
Altitude [m]	3000

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