

# EK70 series

All-in-One Energy Storage System

EK70 HS5-(8K-20K)-T3-X

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## User Manual



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## Warranty

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

## About this document

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

- EK70 HS5-(8K-20K)-T3-X

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



**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



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



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



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



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

## Revision history

| Version | Date       | Changes                                         |
|---------|------------|-------------------------------------------------|
| V0.3    | 2026-09-20 | Optimized the product image on the front cover. |
| V0.2    | 2026-06-23 | <a href="#">11.3. Battery (on page 134)</a>     |
| V0.1    | 2026-06-10 | Editorial changes only.                         |
| V0.0    | 2026-04-28 | First version.                                  |

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# 1. Safety instructions

## 1.1. Safety symbols

| Symbol                                                                              | Description                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <b>Danger:</b> Electrical shock hazard<br>This device is directly connected to public grid and thus all work to the system shall only be carried out by qualified personnel.                                         |
|    | <b>Danger:</b> Hot surface<br>The components inside the battery will release a lot of heat during operation. Do not touch metal plate housing during operating.                                                      |
|    | <b>Danger:</b> Risk of electric shock from energy stored in capacitor.<br>Do not open the cabinet door until 5 minutes after disconnecting all sources of supply.                                                    |
|    | <b>Warning:</b> No open flames<br>Do not place or install near flammable or explosive materials.                                                                                                                     |
|    | <b>Caution</b><br>Keep the product out of reach of children.                                                                                                                                                         |
|   | <b>Caution:</b> Check the user manual before service<br>If an error has occurred, refer to the troubleshooting instructions to remedy the error.                                                                     |
|  | <b>Caution</b><br>This device shall NOT be disposed of in residential waste.                                                                                                                                         |
|  | <b>Caution</b><br>This battery module shall NOT be disposed of in residential waste.                                                                                                                                 |
|  | <b>CE Mark</b><br>Equipment with the CE mark fulfills the requirements of the Low Voltage Directive and Electro Magnetic Compatibility.                                                                              |
|  | <b>RoHS compliant mark</b><br>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. |
|  | <b>RCM compliant mark</b><br>Equipment with the RCM mark is in compliance with AS/NZS 4417.1 & 2 and the EESS.                                                                                                       |
|  | <b>Recyclable</b>                                                                                                                                                                                                    |

## 1.2. Inverter safety instructions

### Personal Safety

#### **DANGER**

##### **Risk of personnel hazard or equipment damage due to improper operations**

Improper operations performed on energized equipment by unqualified personnel may lead to equipment failure or safety hazards.

- Only qualified and trained professionals who are familiar with electrical installation and local codes may install, maintain, or repair the equipment.
- Before any operation, read the safety precautions thoroughly and always follow the standard procedures during operation. Non-standard and improper operations on the energized equipment may cause fire, electric shocks, or explosion.
- Do not reconstruct or alter the equipment, add components, or change the installation sequence without permission. Any unauthorized operation including modification of product functionality of any form may cause lethal hazard to the operator, third parties, the units or their property.
- Before any operation, remove conductive objects such as watches, bracelets, bangles, rings, and necklaces to prevent electric shocks.
- During operation, do not open the housing or touch electrical terminals.

#### **WARNING**

##### **Risk of personal injury due to direct contact with the components or housing**

Direct contact with hazardous moving or hot components during the inverter's operation may lead to personal injury.

- Do not touch a running fan with your hands, components, screws, or any other tools.
- During operation, do not touch heat sink area with bare hands as the inverter surface may become hot.

#### **CAUTION**

##### **Risk of equipment damage and personal injury**

If you detect any unusual odors, hear abnormal noises, or notice smoke during operation, immediately shut down the unit and disconnect all power sources.

#### **NOTICE**

##### **Risk of equipment malfunction and safety hazards**

Failure to follow proper guidance and neglect of regular monitoring prevents the timely identification and prevention of potential issues.

- Read the entire user manual before installation and keep it at hand for future reference.
- Regularly check the status via the monitoring interface to promptly detect any abnormalities.

## Electrical Safety

### DANGER

#### Risk of high voltage and electric shock

Before any operation, disconnect the inverter from all AC and DC power sources and wait at least 5 minutes to allow internal capacitors to discharge.

### WARNING

#### Risk of overheat, fire and equipment damage

Obstructing ventilation or allowing foreign objects to enter the equipment may lead to fire hazards.

- During operation, ensure that the ventilation vents or heat dissipation systems are not obstructed or covered by other objects to prevent fire due to high temperature.
- During operation, prevent foreign matter from entering the equipment. Otherwise, equipment short-circuits or damage, load power derating, power failure, or personal injury may occur.
- Do not place any foreign objects or liquid containers on the inverter.

## Environment Requirements

### DANGER

#### Risk of severe electrical shock

- A lightning strike can induce a sudden and massive power surge, which poses severe hazard to both personnel and equipment.
- Installation, operation, and maintenance is prohibited during thunderstorms.

## Mechanical Safety

### NOTICE

#### Risk of equipment failure or physical injury

Installing or operating an inverter with pre-existing physical damage compromises safety and functionality.

- Before unpacking the inverter, check the outer packing materials for damage, such as holes and cracks, and check the inverter model. If any damage is found or the inverter model is not what you requested, do not unpack the package and contact your supplier as soon as possible.
- Before installation, inspect the equipment for any visible damage or signs of transportation damage. If damage is found, do not install or use the equipment.

### 1.3. Battery safety instructions

#### DANGER

##### **Risk of electric shock, short circuit, or equipment damage**

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

- Do not use the battery or the battery control unit if it is defective, broken or damaged.
- Do not subject the battery to any strong force.
- Keep the power off prior to any operations.
- Make sure that the battery is grounded prior to use.
- Do not pull out any cables or open the battery enclosure when the battery is powered on.
- Maintenance and installation at the battery cell assembly level are not required, and on-site repair or replacement of cell-level components is strictly prohibited. Any such operations shall be carried out by returning the battery module to SAJ or the service provider.

#### DANGER

##### **Risk of reduced life cycle, fire, or explosion**

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

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

#### DANGER

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

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

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

#### WARNING

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

Improper handling by unqualified individuals can lead to electrical hazards.

- Only qualified personnel with a thorough understanding of local safety regulations and battery standards may install, maintain, remove, or dispose of this product.
- **SAJ** shall not be held liable for any loss or warranty claims resulting from unauthorized product modifications that could lead to fatal injury, harm to third parties, or impaired equipment performance.
- The battery cannot be disposed of as household refuse. When the service life of the battery reaches its limit, it is not required to return it to the dealer or **SAJ**, but it must be recycled to the special waste lithium battery recycling station in the area.

 **WARNING****Risk of fire, explosion, severe burns, equipment destruction**

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

- To ensure personal and property safety, never short-circuit the positive (+) and negative (-) terminals.
- Connect the batteries in parallel. Do not connect them in series.
- The battery can start only when connected to the inverter. Once disconnected from the inverter, there is no voltage output at the positive and negative terminals. Do not forcibly activate the battery to output voltage by other means.

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

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

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

 **NOTICE**

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

## 1.4. Recycling and disposal

 **NOTICE**

This product should not be disposed as a residential waste.

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

## 2. Product information

### 2.1. Product introduction

#### 2.1.1. EK70 product models

##### Model description

Take EK70-HS5-12K-T3-X-IE as an example.

EK70
HS5
12K
T3
X
- IE

①
②
③
④
⑤

- ① The product series.
- ② It means the rated power of the system is 12 kW.
- ③ It means three phase with 3 MPPT.
- ④ It means the rated capacity in kWh of battery packs.
- ⑤ It can be blank or IE. IE means the Ireland model.

##### Product models

|                              |                               |
|------------------------------|-------------------------------|
| <b>System</b>                | EK70 HS5-8K-T3-X <sup>1</sup> |
|                              | EK70 HS5-10K-T3-X             |
|                              | EK70 HS5-12K-T3-X             |
|                              | EK70 HS5-12K-T3-X-IE          |
|                              | EK70 HS5-15K-T3-X             |
|                              | EK70 HS5-20K-T3-X             |
| <b>Inverter</b>              | EK70 HS5-8K-T3                |
|                              | EK70 HS5-10K-T3               |
|                              | EK70 HS5-12K-T3               |
|                              | EK70 HS5-12K-T3-IE            |
|                              | EK70 HS5-15K-T3               |
|                              | EK70 HS5-20K-T3               |
| <b>Battery</b>               | EK70 BU5-6.0-TV               |
|                              | EK70 BU5-7.0-TV               |
|                              | EK70 BU5-9.0-TV               |
| <b>Battery base</b>          | BE5-TV                        |
| <b>Wall-mounting bracket</b> | BT5-TV                        |

1. The value of x includes 6, 7, 9, 12, 14, 15, 16, 18, 21, 24, 25, 27, 28, 30, 35, 36, 40, 42, 45, 50, and 54.

### 2.1.2. Dimension

Use one stack with six battery modules as an example:

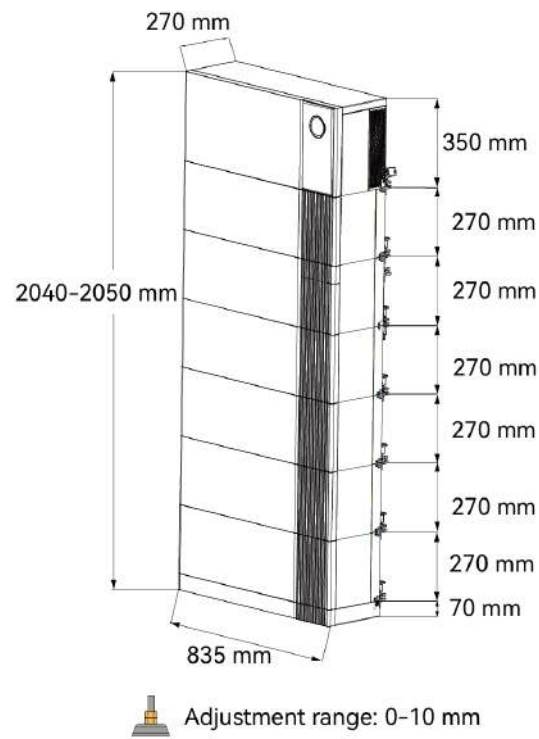
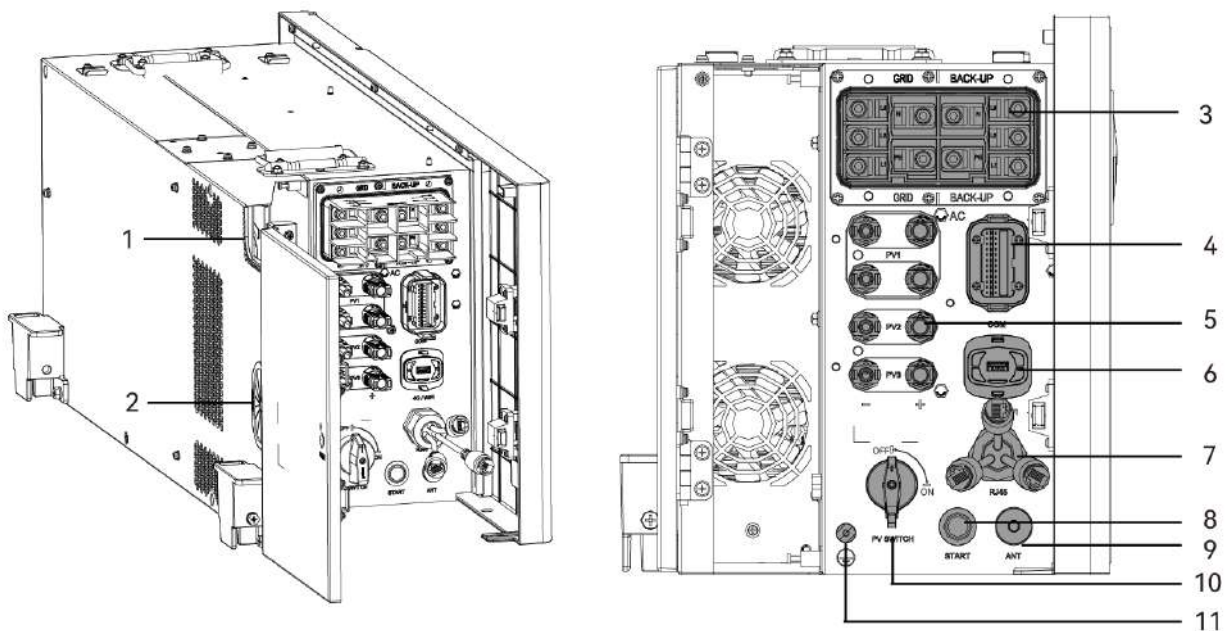


Figure 2.1. Dimensions

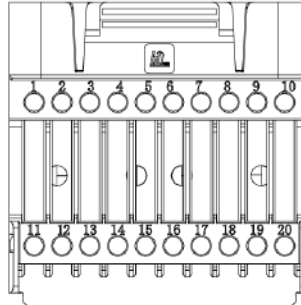
### 2.1.3. Inverter ports and switches



| Callout | Silkscreen                                                                                          | Description                                                                                                                                                                                                      |
|---------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | /                                                                                                   | The cable entry hole 1 for routing AC power cables.                                                                                                                                                              |
| 2       | /                                                                                                   | The cable entry hole 2 for routing the following cables: <ul style="list-style-type: none"> <li>• The grounding cable</li> <li>• The DC power cables</li> <li>• The communication cables</li> </ul>              |
| 3       | <b>AC</b> <ul style="list-style-type: none"> <li>• <b>GRID</b></li> <li>• <b>BACK-UP</b></li> </ul> | The connection ports for AC power cables. <ul style="list-style-type: none"> <li>• <b>GRID</b>: for connecting to the public grid.</li> <li>• <b>BACK-UP</b>: for connecting to the home backup load.</li> </ul> |
| 4       | <b>COM</b>                                                                                          | The connection port for communication cables from external devices like DI/DO devices.                                                                                                                           |
| 5       | <b>PV1, PV2, PV3</b>                                                                                | The negative and positive PV input connection ports.                                                                                                                                                             |
| 6       | <b>4G/WIFI</b>                                                                                      | The connection port of the eSolar AIO3 Pro and 4G Pro communication modules.                                                                                                                                     |
| 7       | <b>RJ45</b>                                                                                         | The RJ45 connection ports for <b>LAN1</b> , <b>LAN2</b> , and <b>DRMs</b> connections as labelled on the ports.<br><b>LAN1</b> and <b>LAN2</b> ports are reserved for future use.                                |
| 8       | <b>START</b>                                                                                        | For starting up the energy storage system.                                                                                                                                                                       |
| 9       | <b>ANT</b>                                                                                          | The LoRa antenna connection port.                                                                                                                                                                                |
| 10      | <b>PV SWITCH</b>                                                                                    | The PV switch that controls the connection to the PV array.                                                                                                                                                      |

| Callout | Silkscreen                                                                        | Description                          |
|---------|-----------------------------------------------------------------------------------|--------------------------------------|
| 11      |  | The grounding cable connection port. |

Table 2.1. Inverter electrical ports



| Number | Silkscreen        | Description                                                                                                          |
|--------|-------------------|----------------------------------------------------------------------------------------------------------------------|
| 1-6    | /                 | Reserved for future use.                                                                                             |
| 7      | <b>DO1+</b>       | Output connection for dry contact device 1.                                                                          |
| 8      | <b>DO1-</b>       | Output connection for dry contact device 1.                                                                          |
| 9      | <b>DO2+</b>       | Output connection for dry contact device 2.                                                                          |
| 10     | <b>DO2-</b>       | Output connection for dry contact device 2.                                                                          |
| 11     | <b>PC 485A</b>    | Reserved RS485 connection ports.                                                                                     |
| 12     | <b>PC 485B</b>    | The RS485 communication can be adjusted with the provided 120 $\Omega$ resistor controlled by <b>SW2</b> DIP switch. |
| 13     | <b>Meter 485A</b> | For RS485 connections with the meter.                                                                                |
| 14     | <b>Meter 485B</b> | The RS485 communication can be adjusted with the provided 120 $\Omega$ resistor controlled by <b>SW3</b> DIP switch. |
| 15     | <b>DI1+</b>       | Input connection for dry contact device 1.                                                                           |
| 16     | <b>DI1-</b>       | Input connection for dry contact device 1.                                                                           |
| 17     | <b>DI2+</b>       | Input connection for dry contact device 2.                                                                           |
| 18     | <b>DI2-</b>       | Input connection for dry contact device 2.                                                                           |
| 19     | <b>12V</b>        | Port for providing 12V DC power supply to the external device.                                                       |
| 20     | <b>GND</b>        | Port for grounding connection.                                                                                       |

Table 2.2. 20-pin definition for COM port

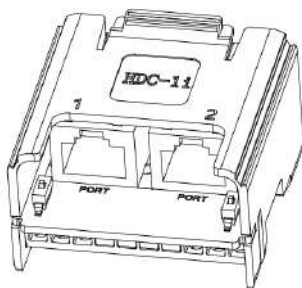


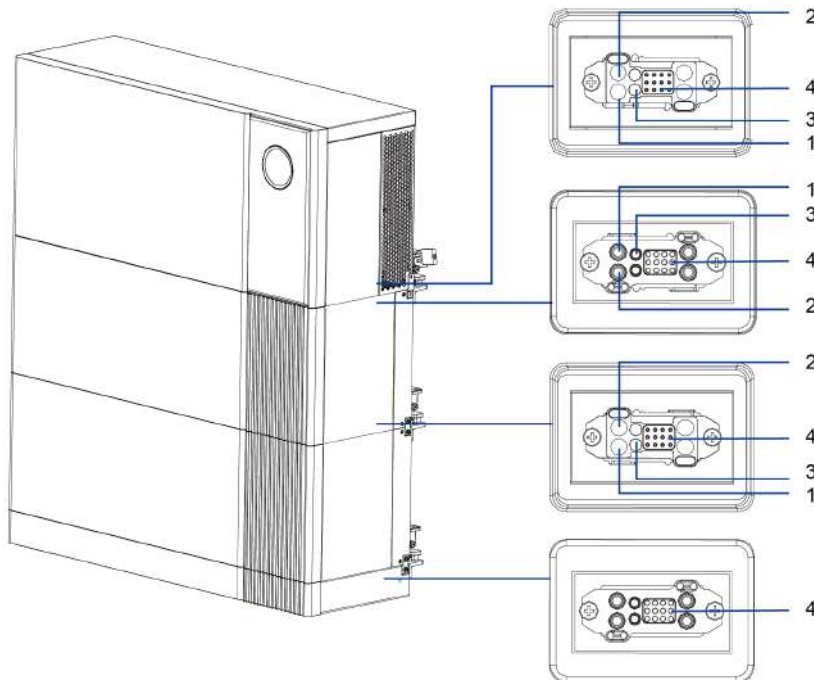
Figure 2.2. RJ45 ports for communication connector

| Number | Silkscreen      | Description    |
|--------|-----------------|----------------|
| 1      | <b>PORT CAN</b> | Reserved port. |

| Number | Silkscreen | Description    |
|--------|------------|----------------|
| 2      | DSP CAN    | Reserved port. |

### 2.1.4. Blind-mate connectors

The EK70 system is equipped with blind-mate connectors on the inverter, batteries, and battery base, ensuring quick electrical connection and communication among these components. The following figure shows the positions and ports of the connectors.



| Number            | Designation                                                 |
|-------------------|-------------------------------------------------------------|
| 1                 | The positive pole port of the blind-mate connector.         |
| 2                 | The negative pole port of the blind-mate connector.         |
| 3                 | The protective earth (PE) port of the blind-mate connector. |
| 4                 | The communication ports of the blind-mate connector.        |
| Non-labeled ports | Reserved for future use.                                    |

## 2.1.5. LED on the inverter



Figure 2.3. Inverter LED panel

| Display                                                                           | Color  | Status                    | Description                                               |
|-----------------------------------------------------------------------------------|--------|---------------------------|-----------------------------------------------------------|
|  | Green  | Solid on                  | The inverter is working properly with grid connection.    |
|                                                                                   |        | Breath, on 1.5s, off 1.5s | The inverter is in initialization or standby state.       |
|                                                                                   |        | Breath, on 3s, off 3s     | The inverter is working properly off-grid.                |
|                                                                                   |        | Breath, on 0.5s, off 0.5s | The inverter is working off-grid with SOC lower than 20%. |
|                                                                                   | Red    | Solid on                  | The inverter is faulty.                                   |
|                                                                                   | Yellow | Breath, on 3.5s, off 3.5s | The inverter is upgrading.                                |
|                                                                                   | Gray   | Off                       | The inverter is powered off.                              |

Table 2.3. LED light

| Display                                                                             | Color | Status                | Description                                                |
|-------------------------------------------------------------------------------------|-------|-----------------------|------------------------------------------------------------|
|  | White | Integer (example, 50) | Battery state of charge (SOC). For example, 50%.           |
|                                                                                     |       | --                    | The battery communication is lost.                         |
|  | White | Solid on              | The PV array is working.                                   |
|                                                                                     |       | Off                   | The PV array is not connected.                             |
|  | Red   | Solid on              | The PV array is faulty.                                    |
|                                                                                     |       | Solid on              | The battery is charging.                                   |
|                                                                                     |       | Breath, on 1s, off 1s | The battery is discharging.                                |
|                                                                                     | Off   | Off                   | The battery is disconnected or inactive.                   |
|  | White | Solid on              | The battery is faulty.                                     |
|                                                                                     |       | Solid on              | The inverter is working with grid connection.              |
|                                                                                     |       | Breath, on 3s, off 3s | The inverter is working off-grid.                          |
|                                                                                     | Off   | Off                   | No grid is detected.                                       |
|  | Red   | Solid on              | AC connection point is faulty.                             |
|                                                                                     |       | Solid on              | In good communication with the meter, BMS, and cloud.      |
|                                                                                     | Red   | Breath, on 1s, off 1s | Lost communication with the meter, BMS, or cloud.          |
|                                                                                     |       | Solid on              | Lost communication with all the meter, the BMS, and cloud. |

Table 2.4. LED indicators

## 2.2. Work mode

The EK70 system supports the following working modes:

### AI Mode

The working mode with AI Saving enabled. The system leverages AI-powered intelligent scheduling based on forecasts of PV generation, load demand, and electricity pricing to optimally allocate energy sources and usage, minimizing electricity bills and maximizing grid-export revenue.

### Self-consumption Mode

The self-consumption mode maximizes the use of electricity generated by PV and minimizes the electricity purchased from the grid to reduce costs.

| Period                   | Working logic                                                                                                                                                                                                                                   |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PV power is sufficient   | <b>[PV → Loads &gt; Battery &gt; Grid]</b><br>Any PV power will first supply the loads, with any surplus being used to charge the battery. Any excess power can then be exported to the grid.                                                   |
| PV power is insufficient | <b>[Battery + Grid → Loads]</b><br>Both the battery and the grid power the loads.<br>The battery discharges power to the loads first. Once the battery reaches its minimum SOC, it stops discharging, and the grid supplies power to the loads. |

### Time-of-use Mode

The time-of-use mode allows the users to set the battery charging and discharging time according to the local peak and valley electricity prices.

| Period                                             | Working logic                                                                                                                                 |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Charging period (with lower electricity price)     | <b>[Grid → Battery]</b><br>The battery charges from the grid at a preset charging power until reaching the preset stop-charging SOC (%).      |
| Discharging period (with higher electricity price) | <b>[Battery → Loads]</b><br>The battery discharges to loads at a preset discharging power until reaching the preset stop-discharging SOC (%). |
| Other period                                       | The working logic is the same as self-consumption mode.                                                                                       |

### Back-up Mode

The back-up mode is suitable for areas with frequent power outages. In this mode, the battery capacity is maintained at a relatively high level to ensure that loads work normally when the grid is off. The battery will not be discharged until a grid outage occurs.

| Period             | Working logic                                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Grid outage occurs | <b>[PV → Loads &gt; Battery]</b><br>The PV power will first supply the loads, with any surplus being used to charge the battery. |

| Period         | Working logic                                                                                                                                                                             |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No grid outage | <b>[PV → Loads &gt; Battery &gt; Grid]</b><br>The PV power will supply the loads first and any surplus will be used to charge the battery. Excess power can then be exported to the grid. |

Table 2.5. With sufficient PV power

| Period                        | Working logic                                                                                                                                                                                             |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Battery SOC > preset capacity | <b>[Battery → Loads]</b><br>Grid outage occurs<br>The battery discharges power to the loads until the battery reaches its minimum SOC.                                                                    |
|                               | <b>[Grid → Loads]</b><br>No grid outage<br>The grid powers the loads.                                                                                                                                     |
| Battery SOC ≤ preset capacity | <b>[Insufficient PV → Loads]</b><br>Grid outage occurs<br>Only the insufficient PV supplies power to the loads. The battery will not be discharged until its SOC becomes higher than the preset capacity. |
|                               | <b>[Grid → Loads]</b><br>No grid outage<br>Only the grid powers the loads.                                                                                                                                |

Table 2.6. With insufficient PV power

## 2.3. System overview

This section shows the typical integration solutions of system.

### Whole home backup solution

In the whole home backup solution, the system supports integrating with a manual transfer switch that allows the whole home load to connect to and switch between the inverter AC backup output and the public grid. If the grid goes off, the whole home load can be manually switched to the system immediately, and vice versa.

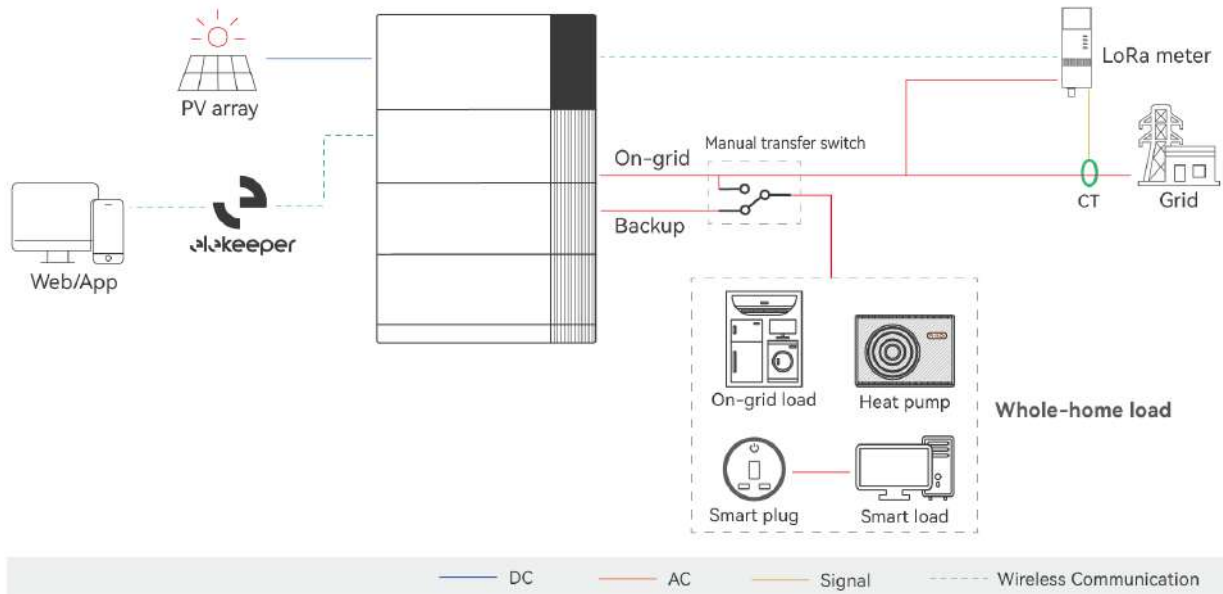


Figure 2.4. Whole home backup solution

| Brand  | Specification                                                                                                 |
|--------|---------------------------------------------------------------------------------------------------------------|
| Lazzen | <ul style="list-style-type: none"> <li>Single-phase: NDQ2S-63/1P</li> <li>Three-phase: NDQ2S-63/3P</li> </ul> |

Table 2.7. Manual transfer switch specification

### Partial backup solution

In the partial backup solution, the on-grid load can be connected to the grid AC output of the system, and the off-grid load can be connected to the AC backup output of the system.

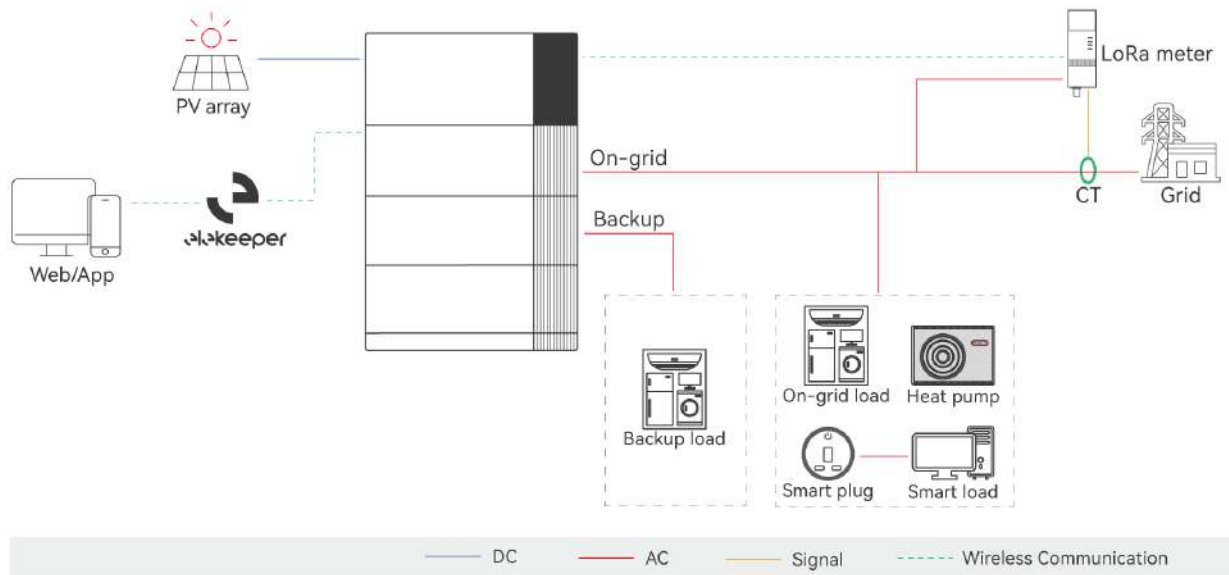


Figure 2.5. Partial Backup Solution

In both solutions, the system provides a dual-channel wireless meter. The meter supports wireless communication with the system at an optimal distance of 150 meters when penetrating walls.

The system also support integrating with wired meter connections through RS485 communication.

### 3. Transportation and storage

#### 3.1. Battery transportation and storage

##### 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 **6** 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.

##### Storage



##### NOTICE

- The battery remains 50% 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.

Environment requirements for storage within one month:

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

Environment requirements for storage within one year:

- Temperature range: 0°C to 35 °C
- Relative humidity: < 85% RH

### 3.2. Inverter transportation and storage

#### DANGER

- Observe all safety symbols displayed on the packaging prior to transportation.
- Maintain stable driving conditions throughout transportation to prevent the inverter from colliding or dropping, as internal power components may be damaged, potentially causing short circuits or explosions upon subsequent power-up.
- Ensure that transport vehicles are not overloaded and that weight is distributed evenly.
- Do not drill holes into the product or its housing for any transportation-related purpose. Such modifications can damage the structural integrity and functionality of the device.
- Do not store or transport the equipment in damp, flammable, or explosive environments.

#### WARNING

- When moving the equipment, use the original packaging or dedicated handling tools to avoid muscle strain from lifting heavy objects alone.
- Wear suitable protective gloves when manually handling equipment.
- When lifting the inverter, grip it firmly at the designated handles and support the base. Keep the unit level to avoid dropping.
- Do not unpack the inverter packaging if it is not used immediately.
- Do not store the inverter in areas exposed to direct sunlight, rain, strong electric fields, or high humidity. Such conditions can cause overheating, electrical failure, or corrosion.
- Do not store inverters near chemically corrosive substances or in locations prone to pests or rodents. These can cause irreversible damage to housing and internal components.
- Do not stack heavy objects on top of the inverter enclosure during storage.
- Do not tilt or invert the packaging. Maintain the upright orientation as indicated on the carton to prevent internal displacement or component stress.

#### CAUTION

- Store inverters in a clean, dry, and well-ventilated area to avoid moisture buildup and overheating.
- Promptly replace any packaging materials that have been damaged by insects or rodents.

#### NOTICE

- It is recommended to retain the original packaging for future relocation or return for repair.
- Before long-term storage (exceeding 6 months), ensure the storage environment meets requirements and periodically inspect the packaging integrity. Check for environmental damage, pest intrusion, or packaging degradation.

Storage environment requirements:

- Temperature range: -40 °C to +60 °C
- Relative humidity: 5% to 95% RH
- Corrosion protection level: C4

## 4. Installation

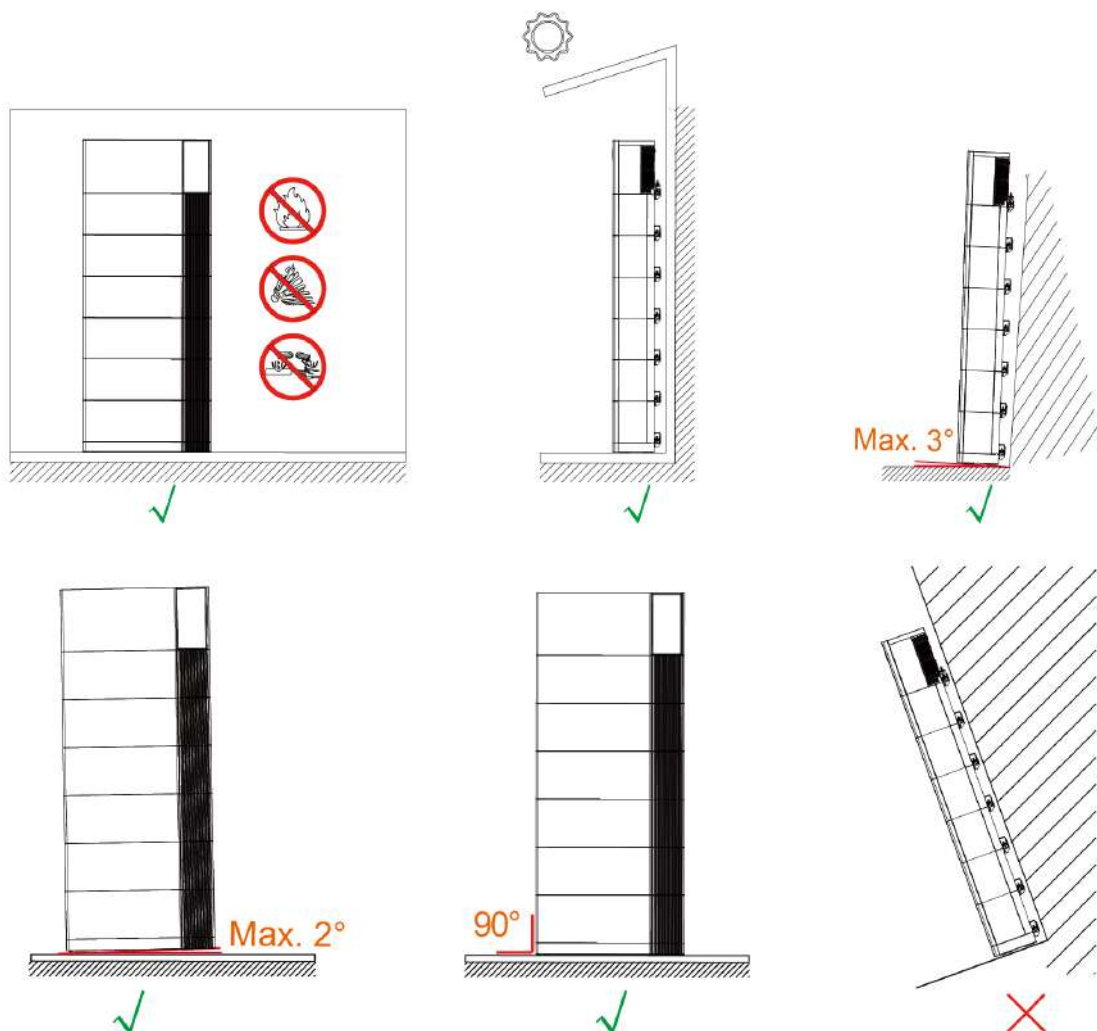
### 4.1. Installation environment requirements

- Do not expose the device to direct solar irradiation as this could cause power derating due to overheating.
- The installation environment must be free of inflammable or explosive materials.
- The device must be installed in a place at least 900mm away from any heat source.
- Do not install the device at a place where the temperature changes extremely. The ambient temperature of the installation site must not exceed 50°C.
- Keep the device away from children.
- Do not install the device in the bedroom, toilet, or bathroom. The installation site must be at least 1.2 meters away from the emergency exit.
- When installing the device at the garage, keep it away from the driveway.
- Keep the device from water sources such as taps, sewer pipes and sprinklers to prevent water seepage.
- For outdoor installation, keep the device away from direct sunlight, rain and snow.
- For outdoor installation in salt-laden environments, check with the equipment manufacturer to verify site suitability. Salt-corrosive areas are generally within 1,000 metres of the coastline. Salt exposure level varies by site conditions such as onshore wind, rainfall and local topography.
- Ensure the inverter is installed in a well-observed area where the LED display panel can be easily read for real-time status checks.

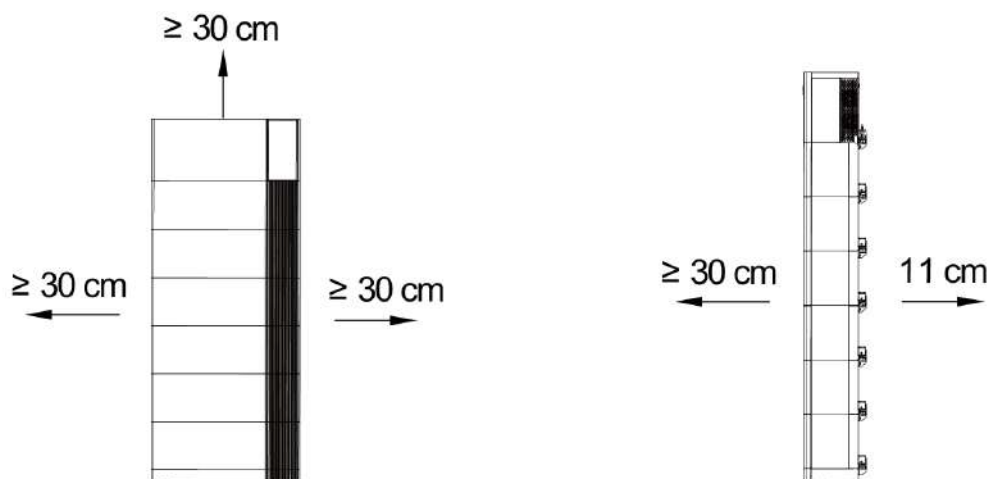


## 4.2. Plan the installation site

Install the product vertically.



Keep enough clearance around the product to ensure proper ventilation.



### 4.3. Installation tools

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

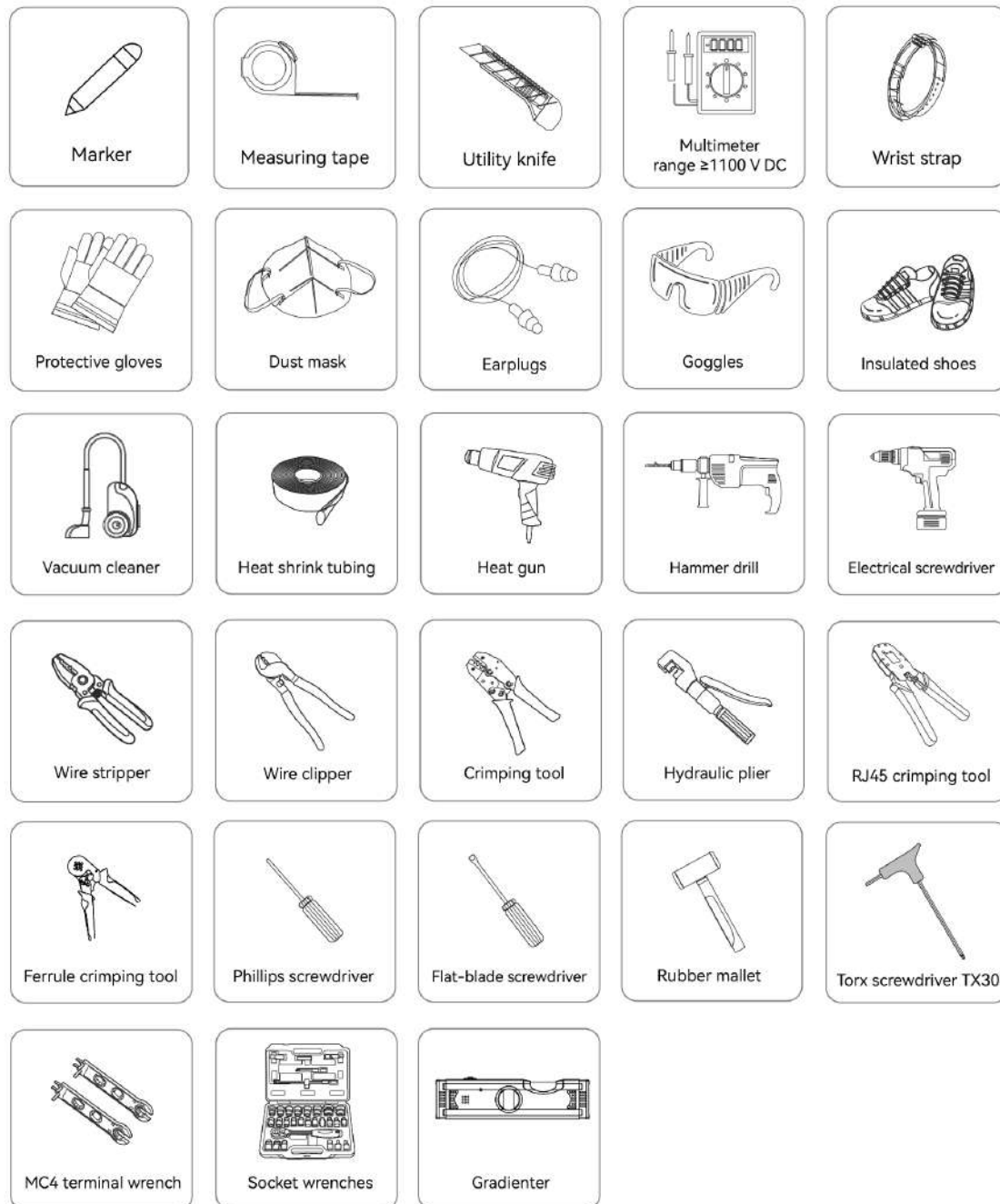


Figure 4.1. Suggested installation tools

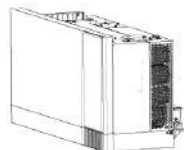
## 4.4. Packing list

### Inverter

A1\*



A2\*



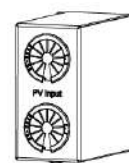
B



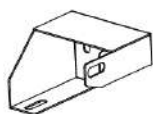
C



D



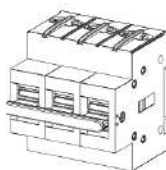
E



F



G



Z



Accessory package



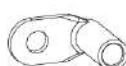
H



I



J



K



L



M



N



O\*



P\*



Q

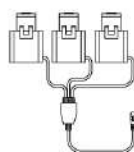


Meter package

R



S



T

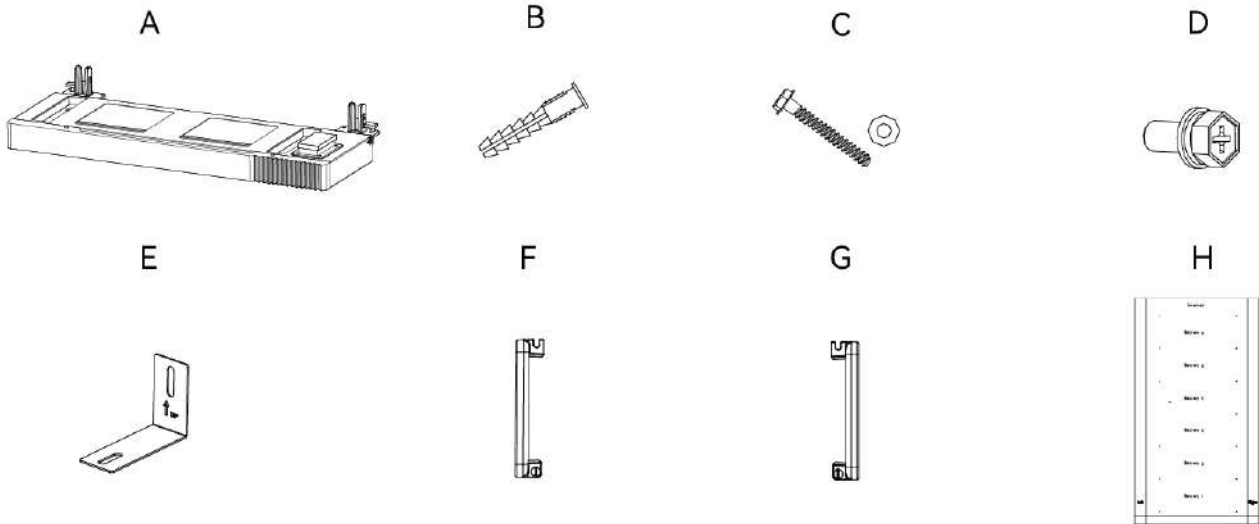


| Number  | Quantity                         | Designation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A1*/A2* | 1                                | Depending on different shipments, either A1 or A2 is included in this package. Refer to the actual product you received. <ul style="list-style-type: none"> <li>A1: Inverter without battery base. The battery base and its related accessories are delivered in a separate package.</li> <li>A2: Inverter with battery base. The inverter is pre-secured beneath the inverter with the screws. Before installation, remove the screws to detach the battery base from the inverter.</li> </ul> |
| B       | 1                                | Protective cover of inverter                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| C       | 1                                | AC protective cover                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| D       | 1                                | PV protective cover                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| E       | 1                                | Anti-theft bracket                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| F       | 1                                | Communication module                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| G       | 1                                | Manual transfer switch                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| H       | 1                                | Bolts and gaskets for anti-theft bracket                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| I       | 1                                | Hand-tighten screw                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| J       | SC10-5-90: 5<br>SC10-16-5-90: 10 | AC cable terminals: <ul style="list-style-type: none"> <li>SC10-5-90: For 6-8 mm<sup>2</sup> cables</li> <li>SC16-5-90: For 10-16 mm<sup>2</sup> cables</li> </ul>                                                                                                                                                                                                                                                                                                                              |
| K       | 3 or 4                           | PV connector. The quantity varies depending on different machine models.                                                                                                                                                                                                                                                                                                                                                                                                                        |
| L       | 1                                | 20-pin communication connector. <p><b>Note:</b> For some units, the communication connector is pre-installed on the <b>COM</b> port.</p>                                                                                                                                                                                                                                                                                                                                                        |
| M       | 3                                | M6*16 screw                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| N       | 6 or 4                           | M4*10 screw. <ul style="list-style-type: none"> <li>With grounding plate: 6</li> <li>Without grounding plate: 4</li> </ul>                                                                                                                                                                                                                                                                                                                                                                      |
| O*      | 1                                | Grounding plate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| P*      | 1                                | Wrench for securing the AC cover                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Q       | 1                                | Antenna to be connected to the inverter.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| R       | 1                                | Meter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| S       | 3                                | Current transformer (CT)                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| T       | 1                                | Antenna to be connected to the meter.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Z       | 1                                | Documentation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

**Note:** Depending on different shipments, the components marked with \* may not be included in this package. Refer to the actual product you received.

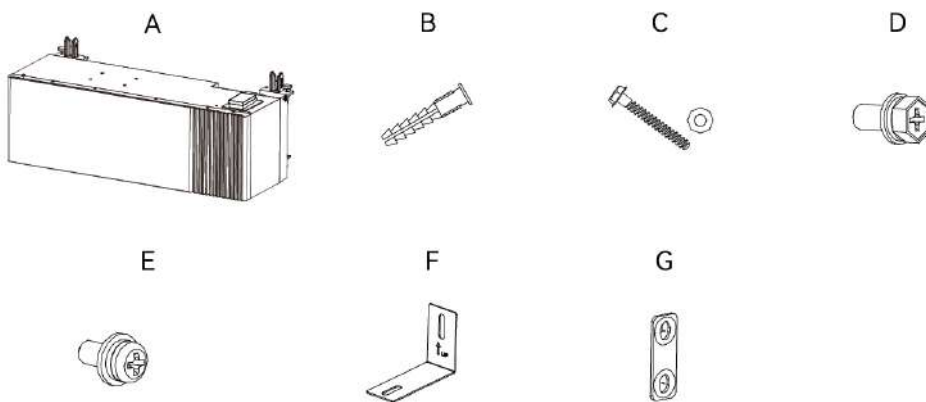
The following figure and table show the components for installing the battery base.

Depending on different shipments, these components are either included in the inverter's package or delivered in a separate package. Refer to the actual product you received.



| Number | Quantity | Designation                                                                                                               |
|--------|----------|---------------------------------------------------------------------------------------------------------------------------|
| A      | 1        | Battery base. Depending on different shipments, the battery base can be pre-secured beneath the inverter with the screws. |
| B      | 2        | M6*80 expansion bolt                                                                                                      |
| C      | 2        | ST6*50 screw and gasket set                                                                                               |
| D      | 2        | M6*16 screw                                                                                                               |
| E      | 2        | Locking bracket                                                                                                           |
| F      | 1        | Left handle                                                                                                               |
| G      | 1        | Right handle                                                                                                              |
| H      | 1        | Positioning cardboard                                                                                                     |

### Battery pack

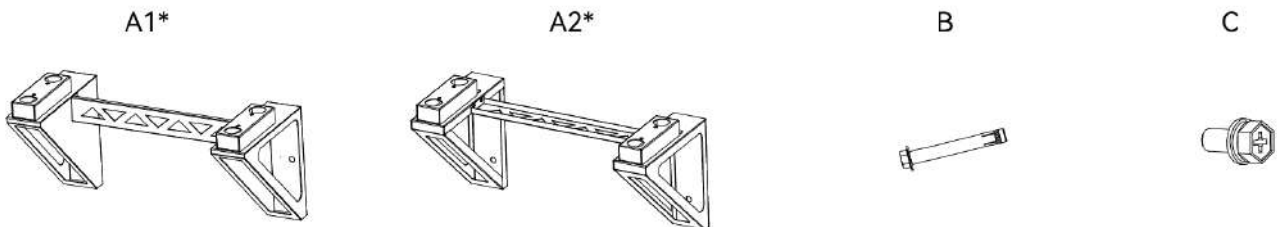


| Number | Quantity | Designation                 |
|--------|----------|-----------------------------|
| A      | 1        | Battery pack                |
| B      | 2        | M6*80 expansion bolt        |
| C      | 2        | ST6*50 screw and gasket set |
| D      | 4        | M6*16 screw                 |
| E*     | 2        | M4*10 screw                 |
| F      | 2        | Locking bracket             |

| Number | Quantity | Designation     |
|--------|----------|-----------------|
| G*     | 1        | Grounding plate |

**Note:** Depending on different shipments, the components marked with \* may be not included in the package. Refer to the actual product you received.

### Wall bracket



| Number | Quantity | Designation                                                                                                                                                                                                                                                                         |
|--------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A1/A2  | 1        | Wall bracket. Depending on different shipments, either A1 or A2 is included in this package. Refer to the actual product you received. <ul style="list-style-type: none"> <li>. A1: 3 installation holes are equipped.</li> <li>. A2: 2 installation holes are equipped.</li> </ul> |
| B      | 4 or 6   | M12*100 expansion bolt. <ul style="list-style-type: none"> <li>. For the wall bracket with 3 installation holes, 6 bolts are provided.</li> <li>. For the wall bracket with 2 installation holes, 4 bolts are provided.</li> </ul>                                                  |
| C      | 2        | M6*16 screw                                                                                                                                                                                                                                                                         |

## 4.5. Dimension

Use one stack with six battery modules as an example:

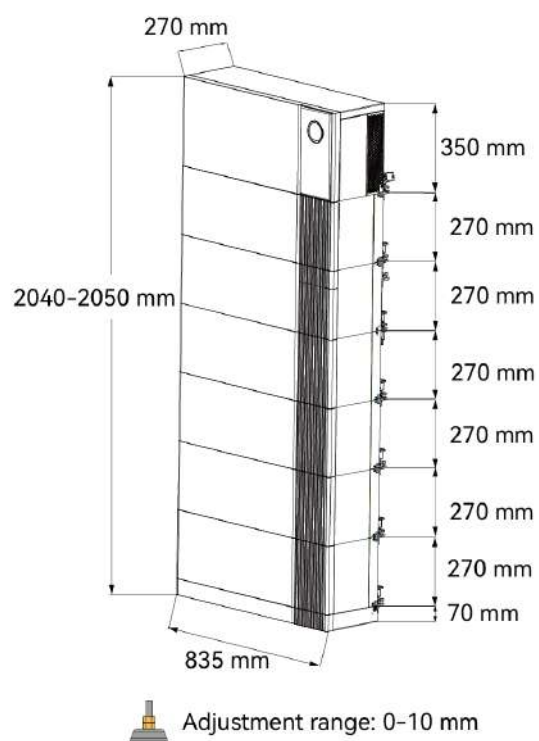


Figure 4.2. Dimensions

## 4.6. Ground mounting

### Note:

- For ground mounting, a maximum of 6 batteries is supported.
- Depending on the shipments, some packages do not include the grounding plates and its screws. In this case, skip the related steps for installing them in this procedure.

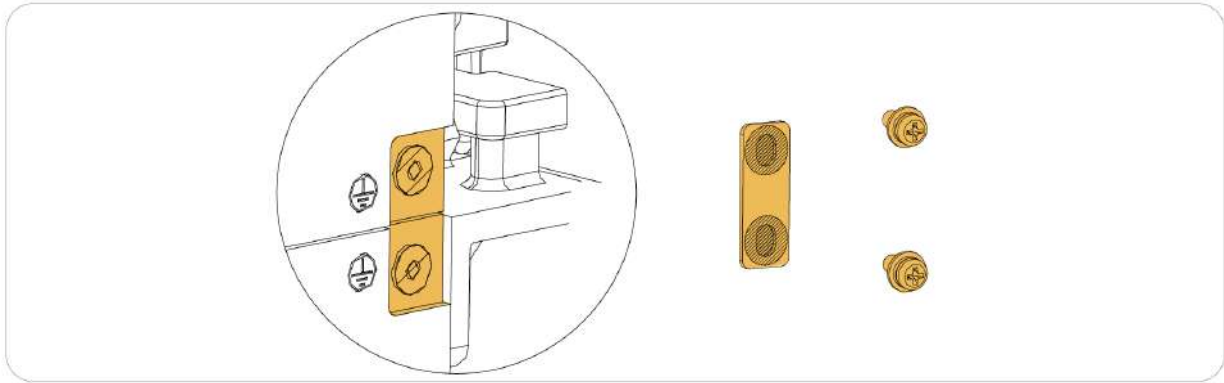
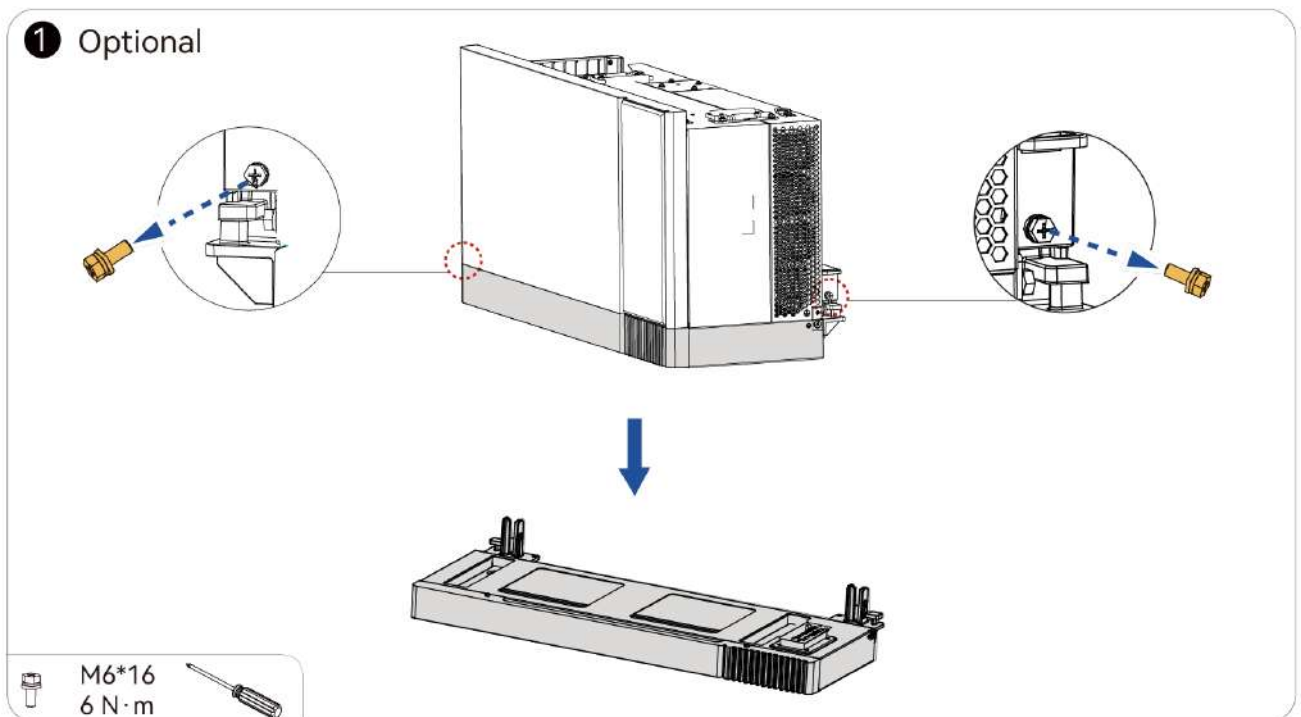
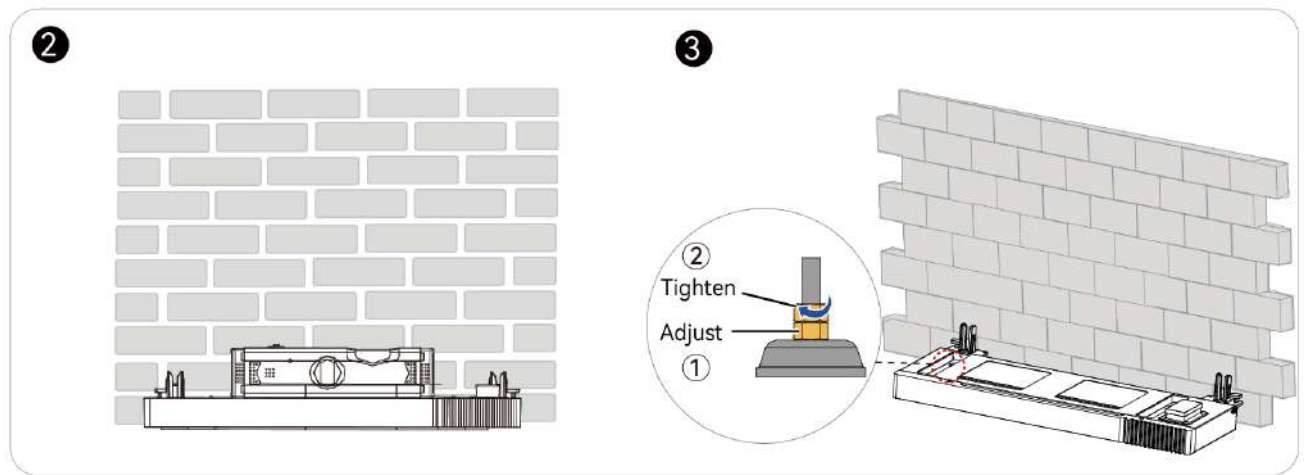
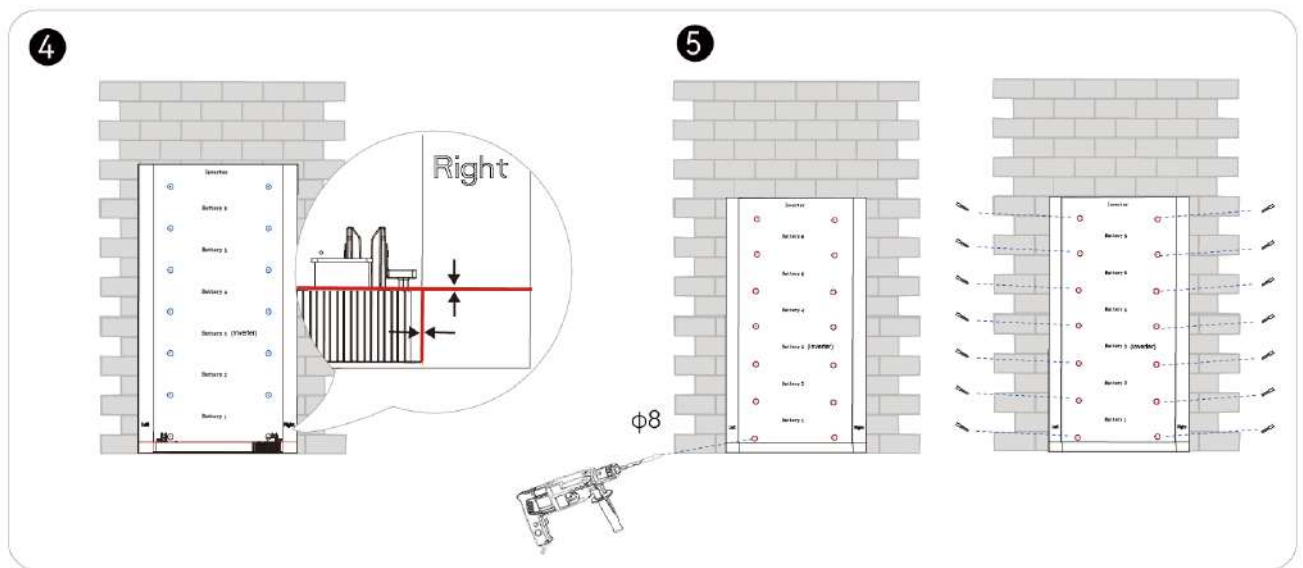


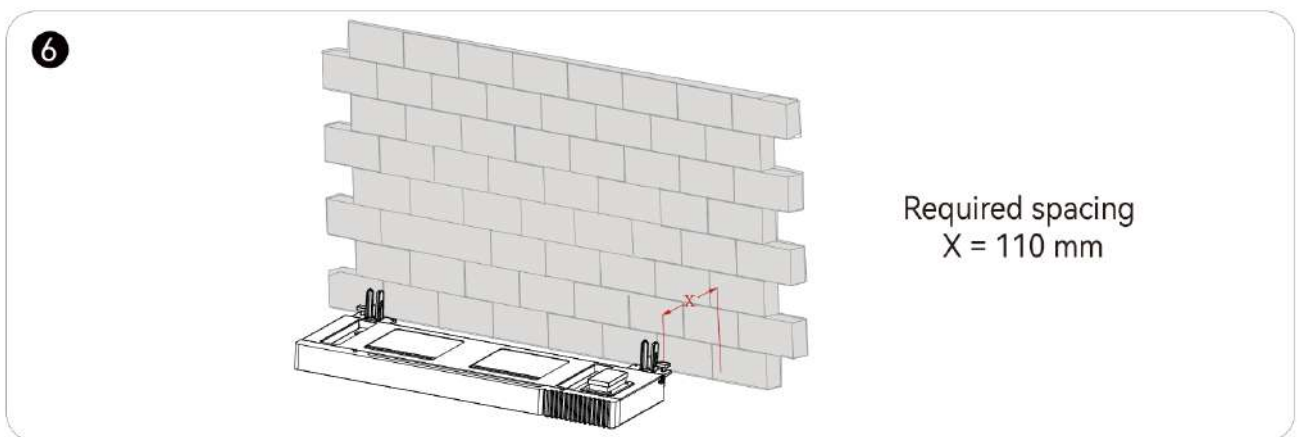
Figure 4.3. Grounding plate and its screws (optional)

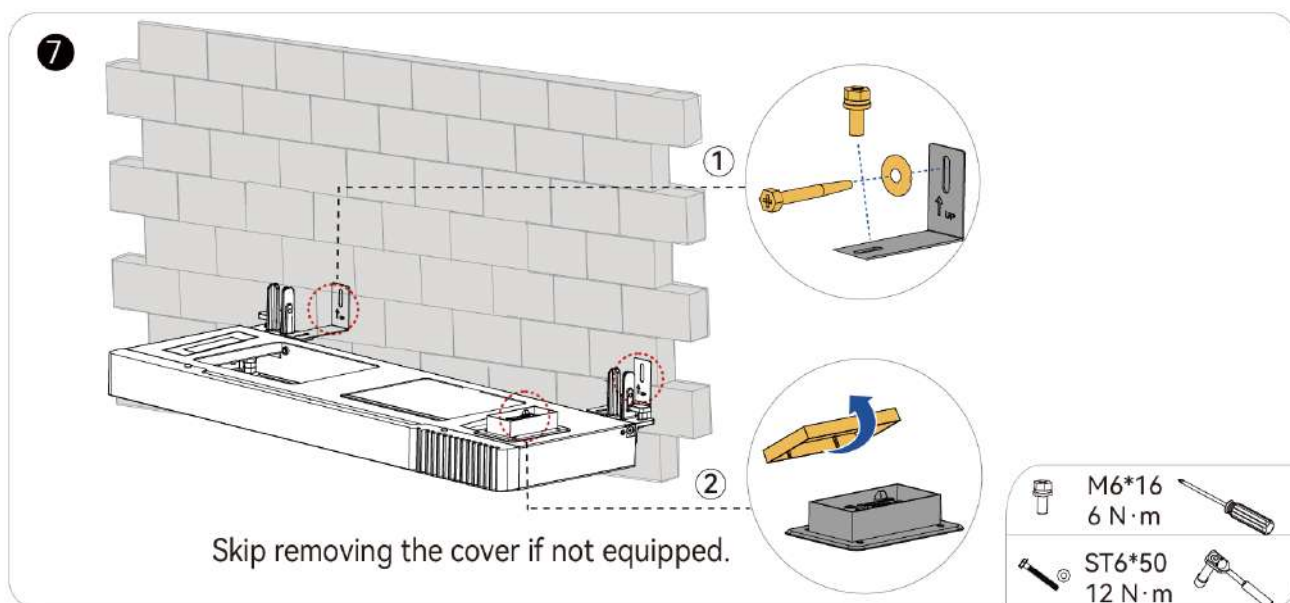
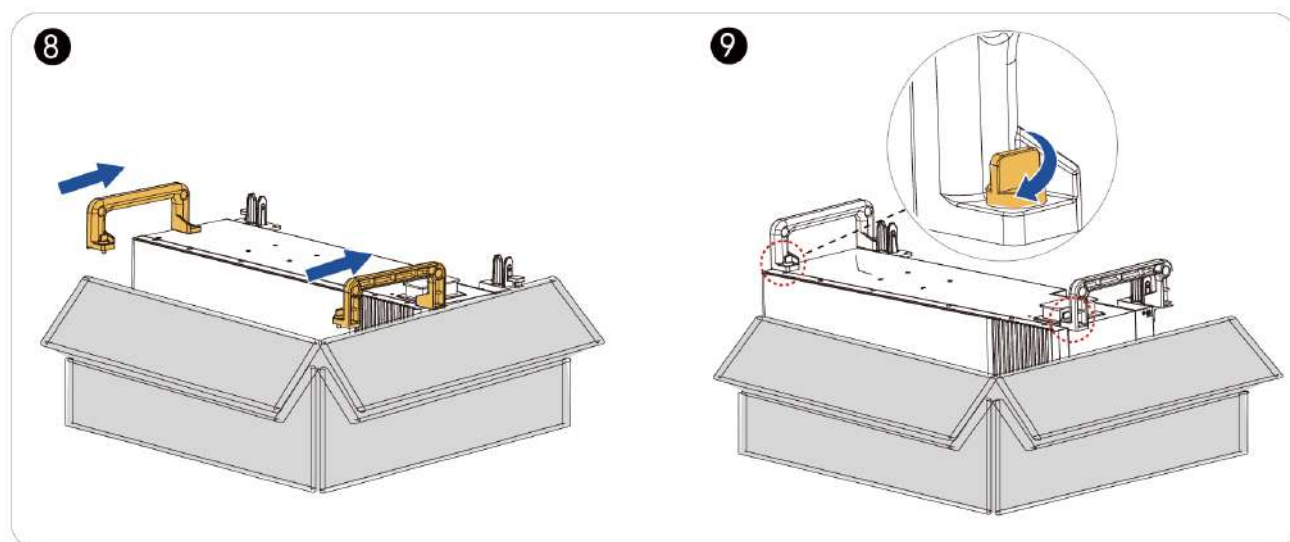
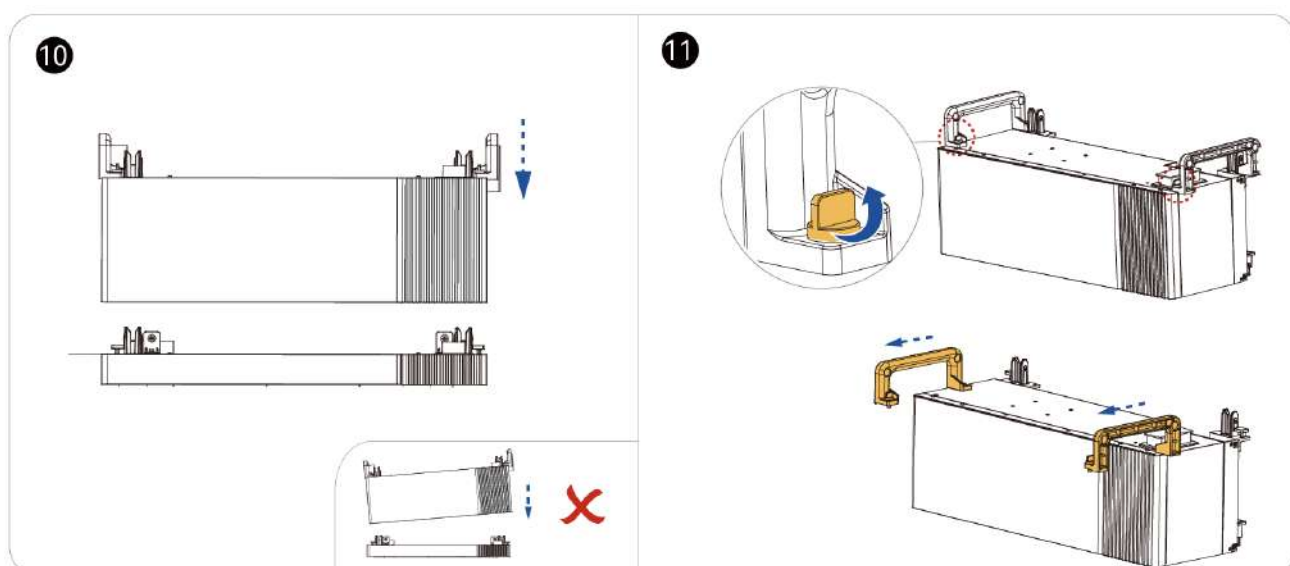
(Optional) Step 1: Detach the battery base from the inverter. If the battery base you received is not included in the inverter package and is instead included in a separate package, skip step 1.

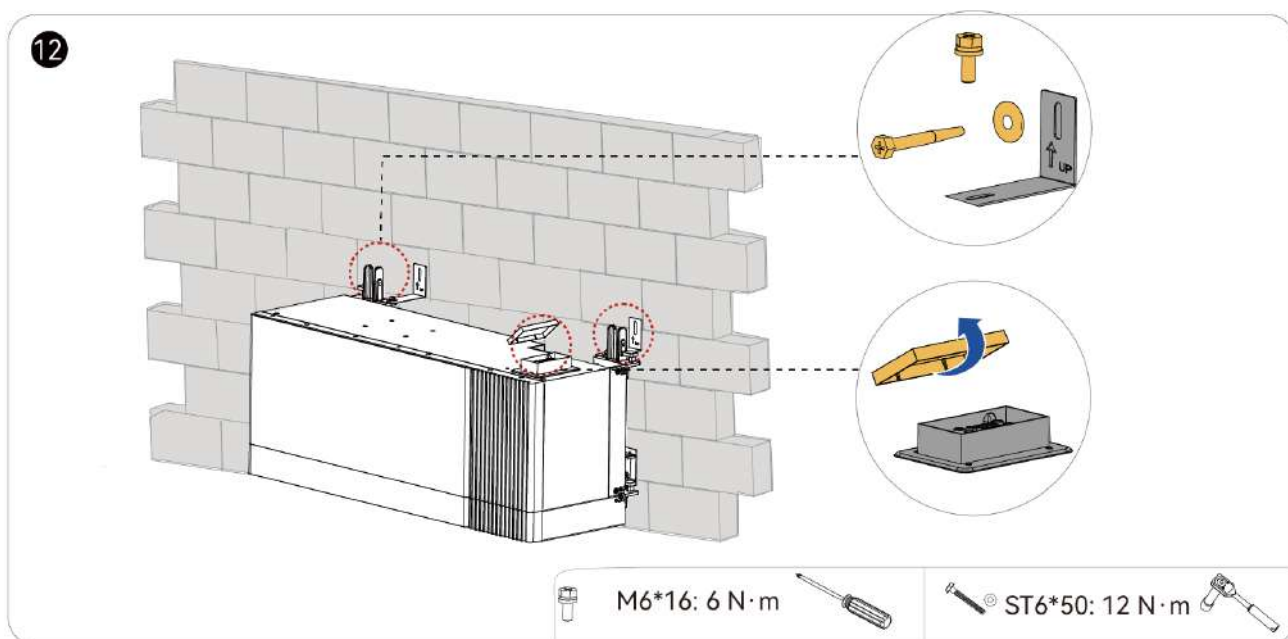
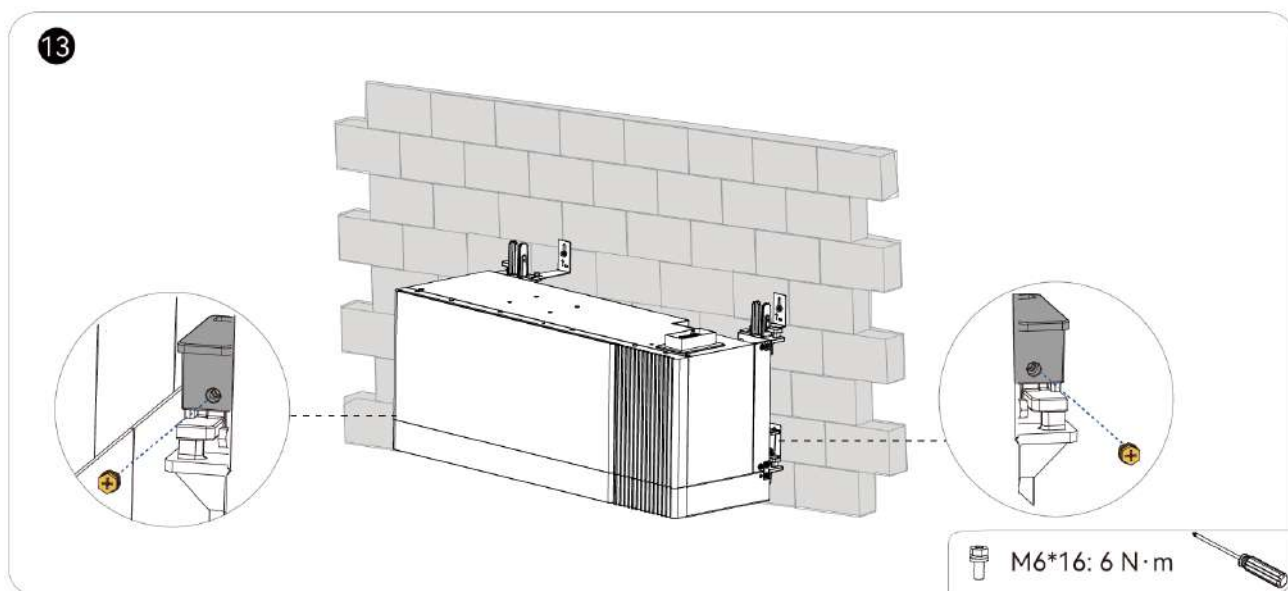
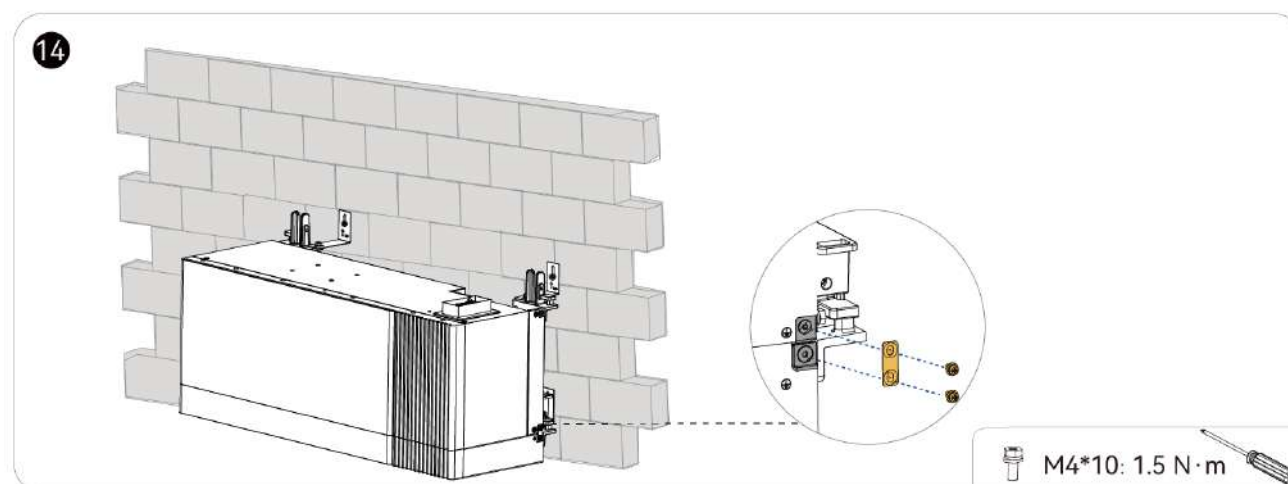




**Note:** Before drilling, put the battery base aside to keep the blind-mate ports dust-free.

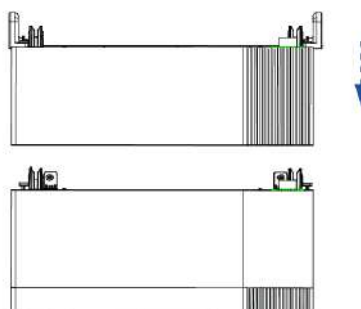






**Note:** If the product package you received does not include the grounding plate and corresponding screws, skip the above step.

15

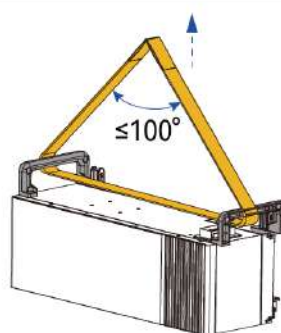


16

Install more batteries by taking the same steps as the first one.

17

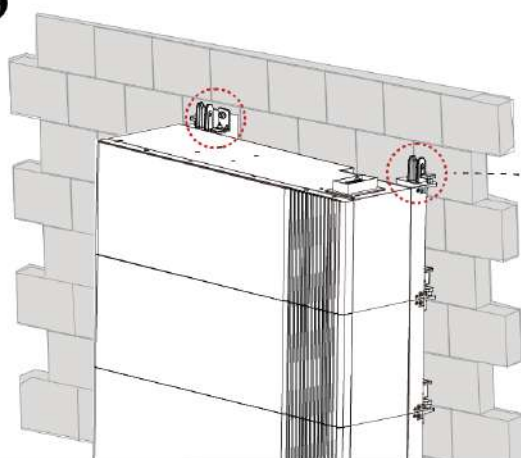
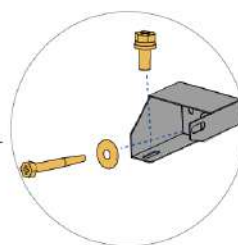
≥4 batteries: recommend  
using a lifting device.



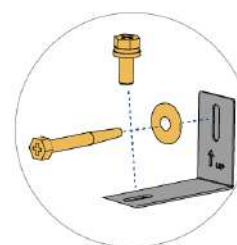
### NOTICE

The apex angle of the lifting slings should not exceed 100° to ensure safe lifting and transport.

18



With lock



Without lock

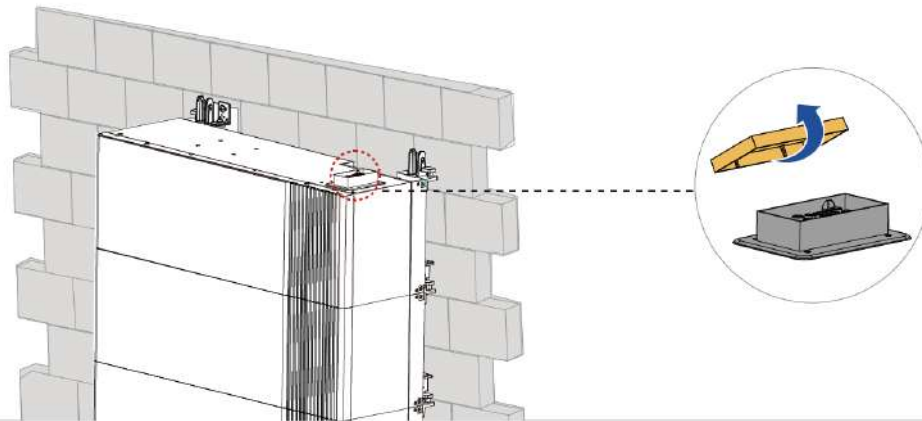


M6\*16: 6 N·m



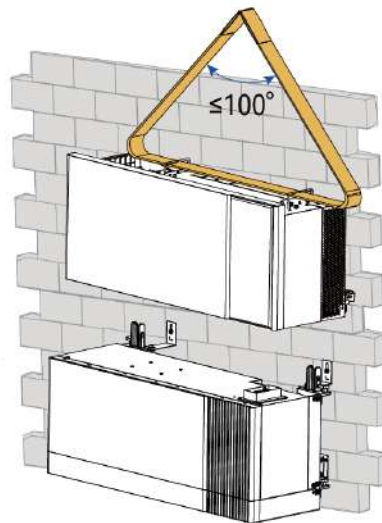
ST6\*50: 12 N·m

19



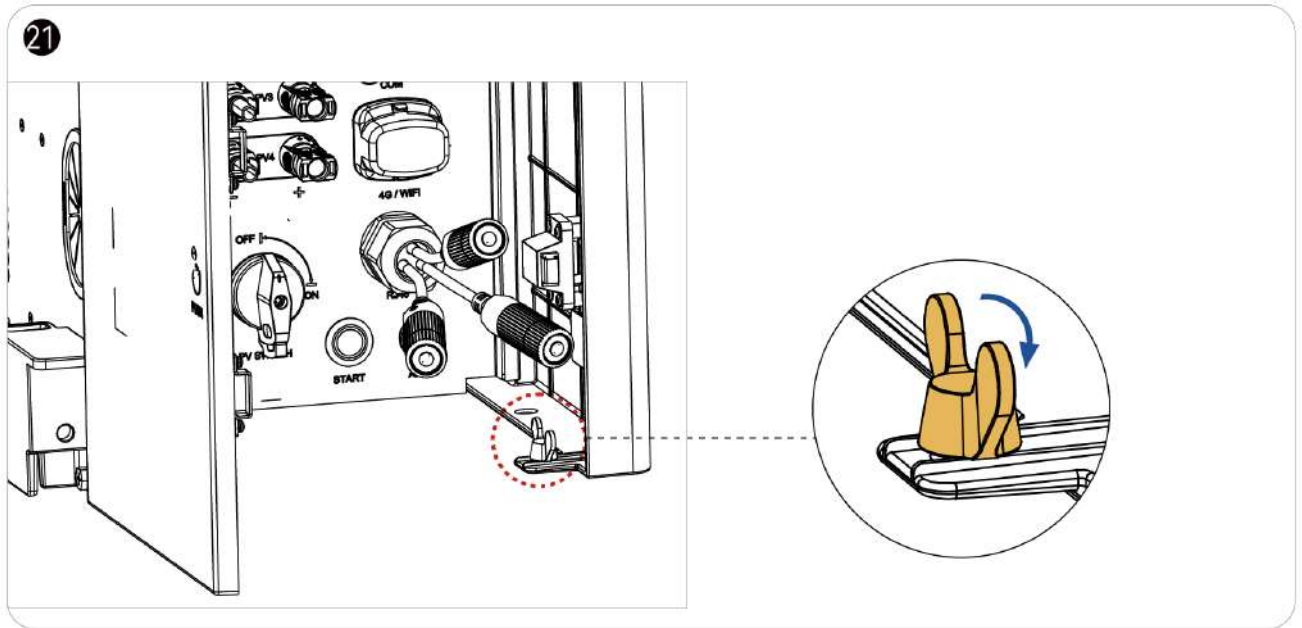
20

≥4 batteries: recommend using a lifting device.

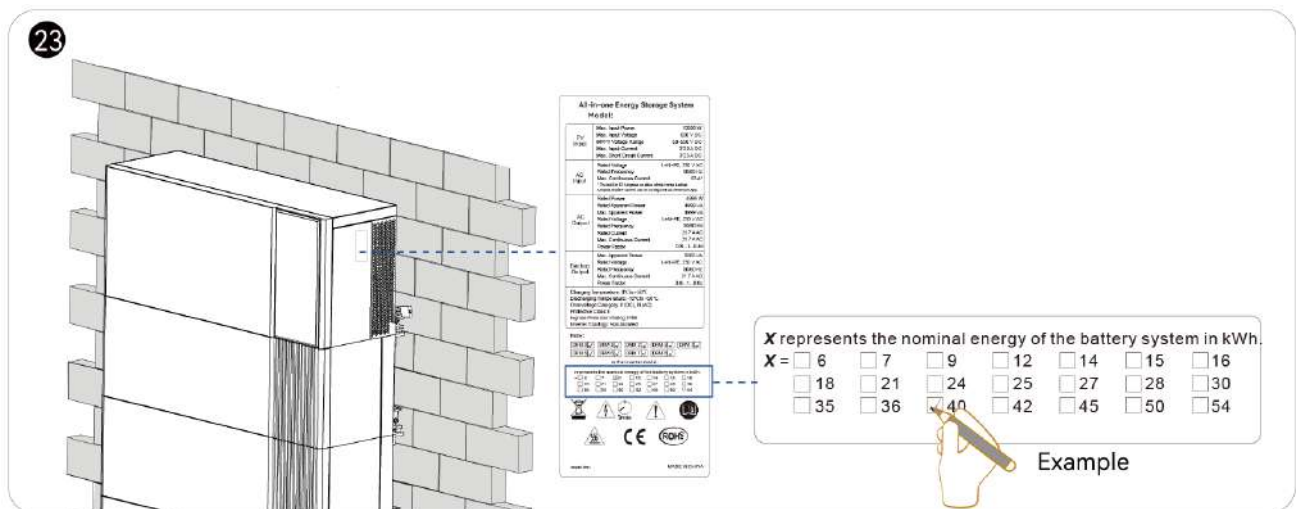


**i NOTICE**

The apex angle of the lifting slings should not exceed 100° to ensure safe lifting and transport.



**Note:** If the product package you received does not include the grounding plate and corresponding screws, skip installing them.



## 4.7. Wall mounting

### Note:

- For wall mounting, a maximum of 2 batteries is supported.
- Depending on the shipments, some packages do not include the grounding plates and its screws. In this case, skip the related steps for installing them in this procedure.

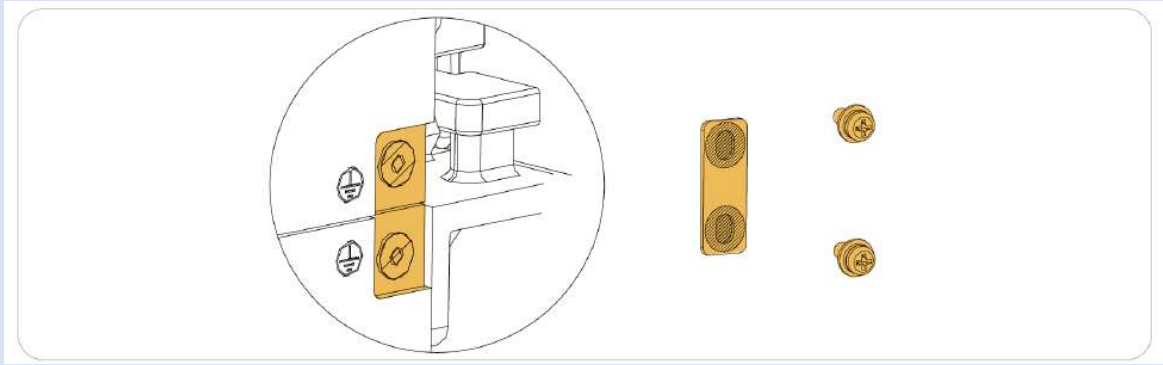
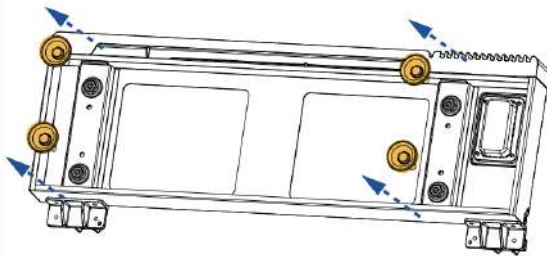
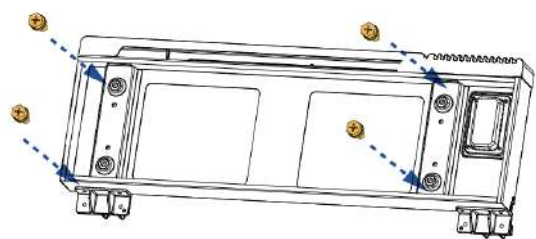


Figure 4.4. Grounding plate and its screws (optional)

**1** Remove the bumper feet.



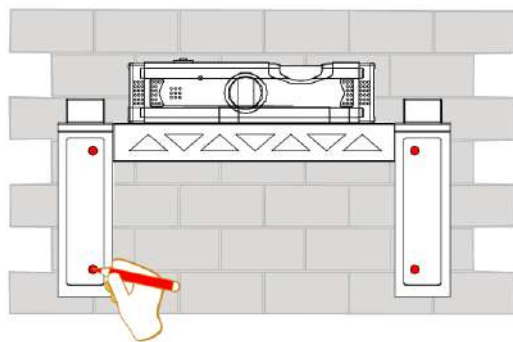
**2**



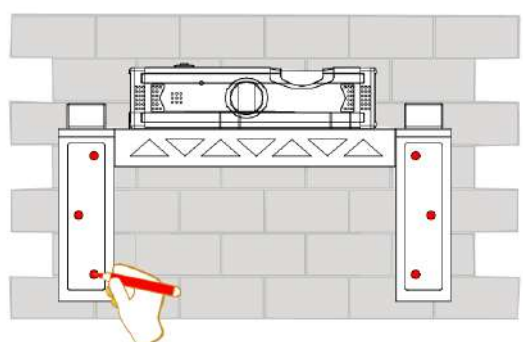
M6\*16 6 N·m



**3** For wall bracket with 2 installation holes

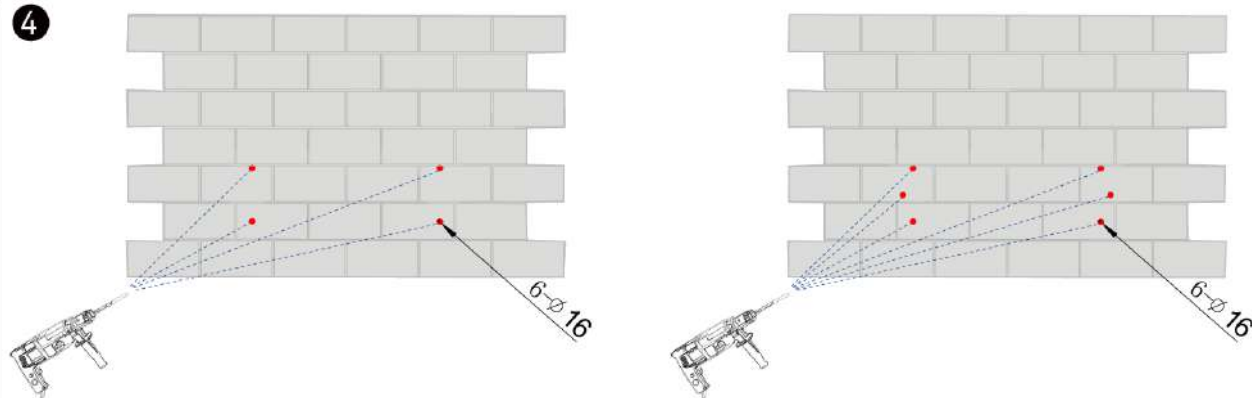


For wall bracket with 3 installation holes



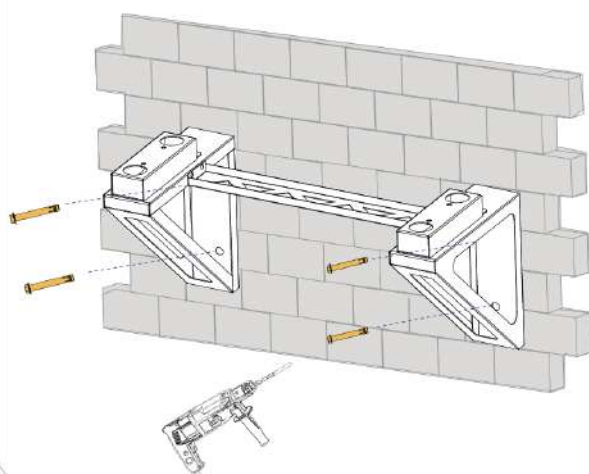
**Note:** The installation height of the wall bracket can be decided according to the actual condition and local regulations of the installation site.

4

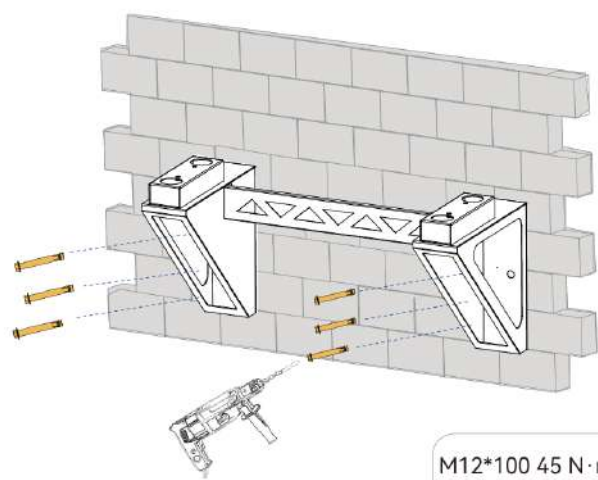


5

For wall bracket with 2 installation holes

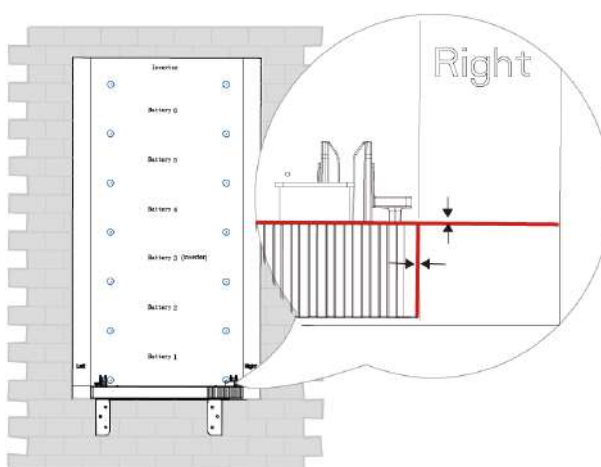


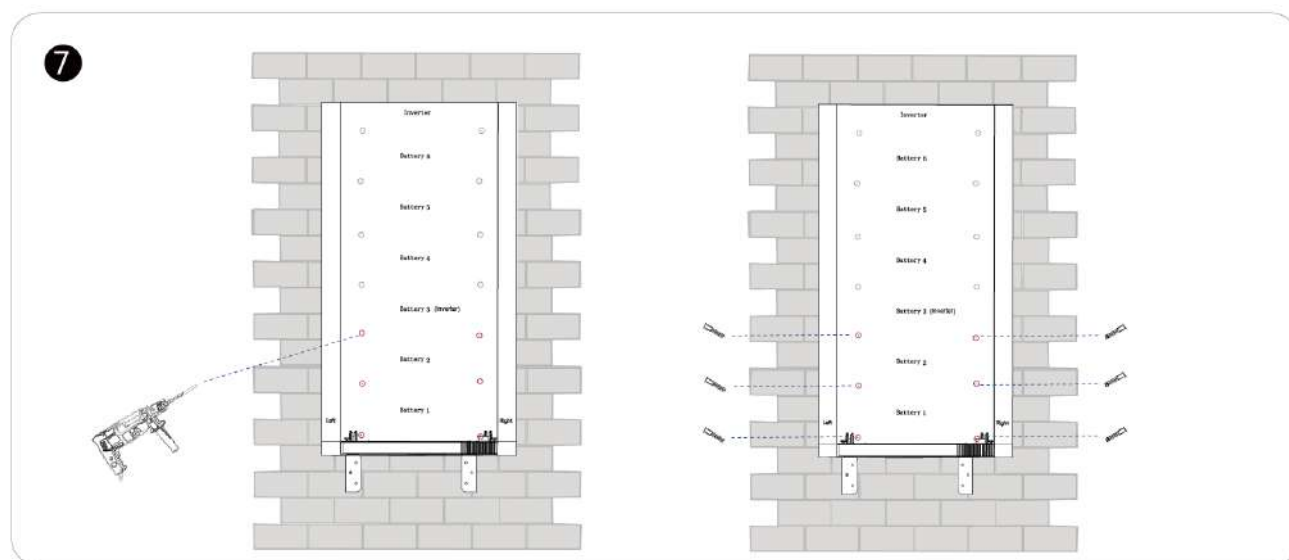
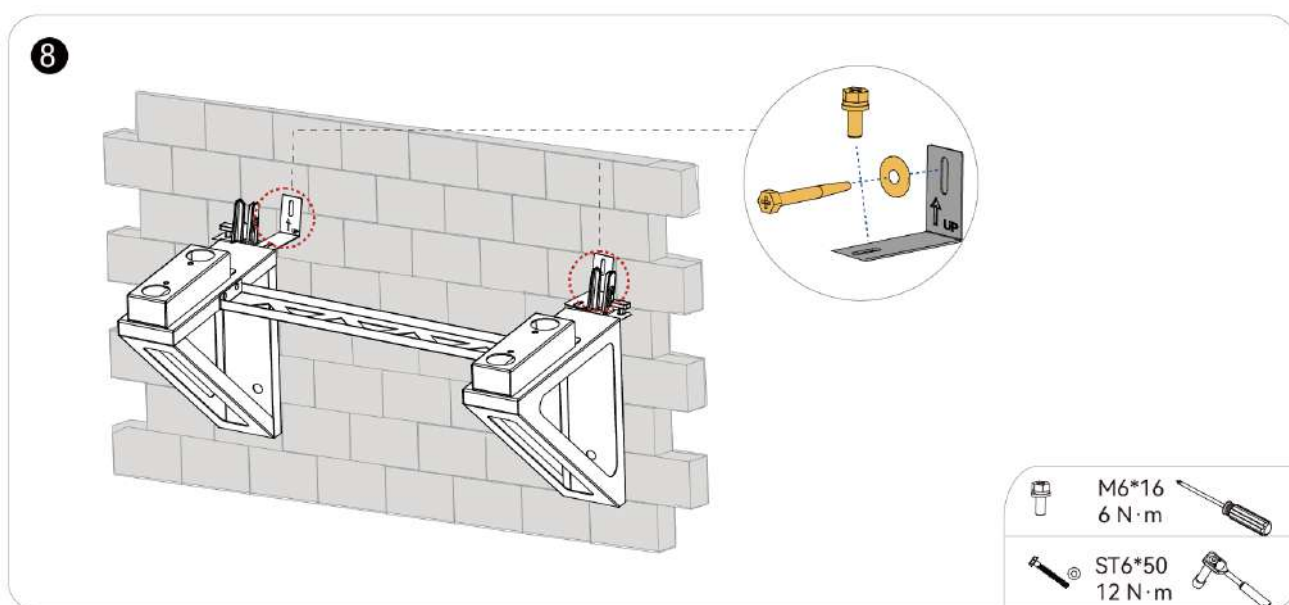
For wall bracket with 3 installation holes



M12\*100 45 N·m

6

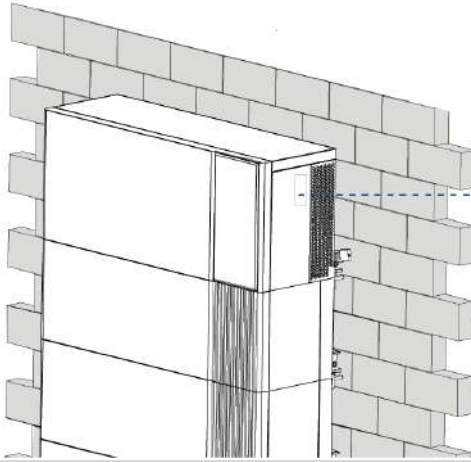




9

Install the batteries and inverter by taking the same steps as the ground mounting.

10



| All-in-one Energy Storage System |                      |        |
|----------------------------------|----------------------|--------|
| Model                            |                      |        |
| J1<br>E19                        | Max. Recharge Power  | 1200 W |
|                                  | Max. Discharge Power | 1200 W |
|                                  | Max. Inverter Output | 1200 W |
| A1<br>E19                        | Max. Recharge Power  | 1400 W |
|                                  | Max. Discharge Power | 1400 W |
|                                  | Max. Inverter Output | 1400 W |
| E1<br>E19                        | Max. Recharge Power  | 1600 W |
|                                  | Max. Discharge Power | 1600 W |
|                                  | Max. Inverter Output | 1600 W |
| E2<br>E19                        | Max. Recharge Power  | 1800 W |
|                                  | Max. Discharge Power | 1800 W |
|                                  | Max. Inverter Output | 1800 W |
| E3<br>E19                        | Max. Recharge Power  | 2000 W |
|                                  | Max. Discharge Power | 2000 W |
|                                  | Max. Inverter Output | 2000 W |
| E4<br>E19                        | Max. Recharge Power  | 2200 W |
|                                  | Max. Discharge Power | 2200 W |
|                                  | Max. Inverter Output | 2200 W |
| E5<br>E19                        | Max. Recharge Power  | 2400 W |
|                                  | Max. Discharge Power | 2400 W |
|                                  | Max. Inverter Output | 2400 W |
| E6<br>E19                        | Max. Recharge Power  | 2600 W |
|                                  | Max. Discharge Power | 2600 W |
|                                  | Max. Inverter Output | 2600 W |
| E7<br>E19                        | Max. Recharge Power  | 2800 W |
|                                  | Max. Discharge Power | 2800 W |
|                                  | Max. Inverter Output | 2800 W |
| E8<br>E19                        | Max. Recharge Power  | 3000 W |
|                                  | Max. Discharge Power | 3000 W |
|                                  | Max. Inverter Output | 3000 W |
| E9<br>E19                        | Max. Recharge Power  | 3200 W |
|                                  | Max. Discharge Power | 3200 W |
|                                  | Max. Inverter Output | 3200 W |
| E10<br>E19                       | Max. Recharge Power  | 3400 W |
|                                  | Max. Discharge Power | 3400 W |
|                                  | Max. Inverter Output | 3400 W |
| E11<br>E19                       | Max. Recharge Power  | 3600 W |
|                                  | Max. Discharge Power | 3600 W |
|                                  | Max. Inverter Output | 3600 W |
| E12<br>E19                       | Max. Recharge Power  | 3800 W |
|                                  | Max. Discharge Power | 3800 W |
|                                  | Max. Inverter Output | 3800 W |
| E13<br>E19                       | Max. Recharge Power  | 4000 W |
|                                  | Max. Discharge Power | 4000 W |
|                                  | Max. Inverter Output | 4000 W |
| E14<br>E19                       | Max. Recharge Power  | 4200 W |
|                                  | Max. Discharge Power | 4200 W |
|                                  | Max. Inverter Output | 4200 W |
| E15<br>E19                       | Max. Recharge Power  | 4400 W |
|                                  | Max. Discharge Power | 4400 W |
|                                  | Max. Inverter Output | 4400 W |
| E16<br>E19                       | Max. Recharge Power  | 4600 W |
|                                  | Max. Discharge Power | 4600 W |
|                                  | Max. Inverter Output | 4600 W |
| E17<br>E19                       | Max. Recharge Power  | 4800 W |
|                                  | Max. Discharge Power | 4800 W |
|                                  | Max. Inverter Output | 4800 W |
| E18<br>E19                       | Max. Recharge Power  | 5000 W |
|                                  | Max. Discharge Power | 5000 W |
|                                  | Max. Inverter Output | 5000 W |
| E19<br>E19                       | Max. Recharge Power  | 5200 W |
|                                  | Max. Discharge Power | 5200 W |
|                                  | Max. Inverter Output | 5200 W |
| E20<br>E19                       | Max. Recharge Power  | 5400 W |
|                                  | Max. Discharge Power | 5400 W |
|                                  | Max. Inverter Output | 5400 W |
| E21<br>E19                       | Max. Recharge Power  | 5600 W |
|                                  | Max. Discharge Power | 5600 W |
|                                  | Max. Inverter Output | 5600 W |
| E22<br>E19                       | Max. Recharge Power  | 5800 W |
|                                  | Max. Discharge Power | 5800 W |
|                                  | Max. Inverter Output | 5800 W |
| E23<br>E19                       | Max. Recharge Power  | 6000 W |
|                                  | Max. Discharge Power | 6000 W |
|                                  | Max. Inverter Output | 6000 W |
| E24<br>E19                       | Max. Recharge Power  | 6200 W |
|                                  | Max. Discharge Power | 6200 W |
|                                  | Max. Inverter Output | 6200 W |
| E25<br>E19                       | Max. Recharge Power  | 6400 W |
|                                  | Max. Discharge Power | 6400 W |
|                                  | Max. Inverter Output | 6400 W |
| E26<br>E19                       | Max. Recharge Power  | 6600 W |
|                                  | Max. Discharge Power | 6600 W |
|                                  | Max. Inverter Output | 6600 W |
| E27<br>E19                       | Max. Recharge Power  | 6800 W |
|                                  | Max. Discharge Power | 6800 W |
|                                  | Max. Inverter Output | 6800 W |
| E28<br>E19                       | Max. Recharge Power  | 7000 W |
|                                  | Max. Discharge Power | 7000 W |
|                                  | Max. Inverter Output | 7000 W |
| E29<br>E19                       | Max. Recharge Power  | 7200 W |
|                                  | Max. Discharge Power | 7200 W |
|                                  | Max. Inverter Output | 7200 W |
| E30<br>E19                       | Max. Recharge Power  | 7400 W |
|                                  | Max. Discharge Power | 7400 W |
|                                  | Max. Inverter Output | 7400 W |
| E31<br>E19                       | Max. Recharge Power  | 7600 W |
|                                  | Max. Discharge Power | 7600 W |
|                                  | Max. Inverter Output | 7600 W |
| E32<br>E19                       | Max. Recharge Power  | 7800 W |
|                                  | Max. Discharge Power | 7800 W |
|                                  | Max. Inverter Output | 7800 W |
| E33<br>E19                       | Max. Recharge Power  | 8000 W |
|                                  | Max. Discharge Power | 8000 W |
|                                  | Max. Inverter Output | 8000 W |
| E34<br>E19                       | Max. Recharge Power  | 8200 W |
|                                  | Max. Discharge Power | 8200 W |
|                                  | Max. Inverter Output | 8200 W |
| E35<br>E19                       | Max. Recharge Power  | 8400 W |
|                                  | Max. Discharge Power | 8400 W |
|                                  | Max. Inverter Output | 8400 W |
| E36<br>E19                       | Max. Recharge Power  | 8600 W |
|                                  | Max. Discharge Power | 8600 W |
|                                  | Max. Inverter Output | 8600 W |
| E37<br>E19                       | Max. Recharge Power  | 8800 W |
|                                  | Max. Discharge Power | 8800 W |
|                                  | Max. Inverter Output | 8800 W |

**X** represents the nominal energy of the battery system in kWh.

|     |    |    |    |    |    |    |    |
|-----|----|----|----|----|----|----|----|
| X = | 6  | 7  | 9  | 12 | 14 | 15 | 16 |
|     | 18 | 21 | 24 | 25 | 27 | 28 | 30 |
|     | 35 | 36 | 40 | 42 | 45 | 50 | 54 |



### Example

## 5. Electrical connection safety

Electrical connection must only be operated by professional technicians. Before the operation, the technicians must wear necessary personal protective equipment (PPE) including insulating gloves, insulating shoes, and a safety helmet.



### DANGER

**Danger to life due to potential fire or electricity shock.**

- Do not install the cabinet near any inflammable or explosive items.
- When it is powered on, the equipment should comply with national rules and regulations.



### WARNING

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

### 5.1. Wiring guidelines

- The selection, installation, and routing of cables must comply with local laws, regulations, and standards.
- During the placement of power cables, avoid coiling or twisting. If a power cable is found to be too short, replace it entirely; do not create splices or weld joints within the cable.
- Ensure that all cables are firmly connected, have good insulation, and are appropriately sized for their application.
- Cable trays and pass-through holes should not have sharp edges. Use protective measures at conduit entrances or pass-through holes to prevent damage to cables from sharp edges or burrs.
- Group similar types of cables together and secure them neatly, ensuring they lie flat and straight without damage to the outer jacket. Different types of cables should be laid separately to avoid entanglement or crossing.
- For buried cables, use cable supports and clamps to securely fix them in place. Ensure that backfilled soil around underground cables is compacted to prevent deformation or damage during the backfilling process.
- When external conditions like installation methods or ambient temperatures change, verify the cable selection according to local regulations to ensure parameters like current-carrying capacity.
- To prevent insulation aging or damage due to high temperatures, maintain a minimum distance of 30 mm between cables and heat-generating components or heat source peripheries.

### 5.2. Ground protection

- Follow the grounding guidelines below for the equipment which is critical to ensure electrical safety and compliance with local standards:
- The impedance of the equipment's grounding system must meet the requirements specified by local electrical standards.
- The equipment must be permanently connected to a protective ground. Before operating the equipment, always check the electrical connections to ensure that the equipment is reliably grounded.
- It is strictly prohibited to operate the equipment if the grounding conductor has not been installed.
- Do not damage or tamper with the grounding conductor in any way.

### 5.3. AC- and DC-side handling

- Before installing or removing power cables, turn off all switches on both the AC and DC sides to ensure that no electrical flows through the system during the operation.
- Prior to connecting the AC side cables, verify that the phase sequence of the three-phase cables matches the silk-screen markings on the cable connectors.
- If the equipment has multiple input and output paths, disconnect all inputs and outputs before proceeding. After ensuring all power sources are disconnected, wait for at least 5 minutes to allow any residual charge in capacitors or other components to dissipate. Only then should you perform any operations on the equipment.

### 5.4. Electrostatic Discharge (ESD) Protection



#### CAUTION

Contact with or improper handling of printed circuit boards or other electrostatic discharge sensitive components can lead to device damage.

- Avoid unnecessary contact with circuit boards.
- Adhere to ESD protection standards, such as wearing an anti-static wrist strap.

### 5.5. Earth fault alarm monitoring

This inverter is of transformer-less design and therefore does not provide galvanic isolation between the DC and AC sides. To comply with safety requirements, it incorporates earth fault alarm monitoring function in accordance with IEC 62109-2, *clause 13.9*. This function continuously checks the insulation resistance of the PV array to earth.

If an earth fault is detected due to damaged cables, moisture ingress or similar reasons, the inverter responds as follows:

- The LED light illuminates **red**.
- An error code **<31>** is displayed in the elekeeper App.

When error code **<31>** is reported, the technical support engineer can take the following actions:

1. Disconnect all the AC and DC power sources.
2. Check whether the grounding cable and all the AC power cables are connected securely.
3. Check whether all the AC and DC power cables are broken or soaked in water.
4. Check whether the battery packs are soaked in water.
5. When all the above items are normal, restart the system.
6. If the error is still active, contact SAJ for further support.



#### NOTICE

This inverter **must not be connected to functionally earthed PV arrays**, where either the positive or negative pole is permanently connected to earth. Such installations would be interpreted as a permanent earth fault, causing continuous false alarms and potentially damaging the inverter's internal circuitry.

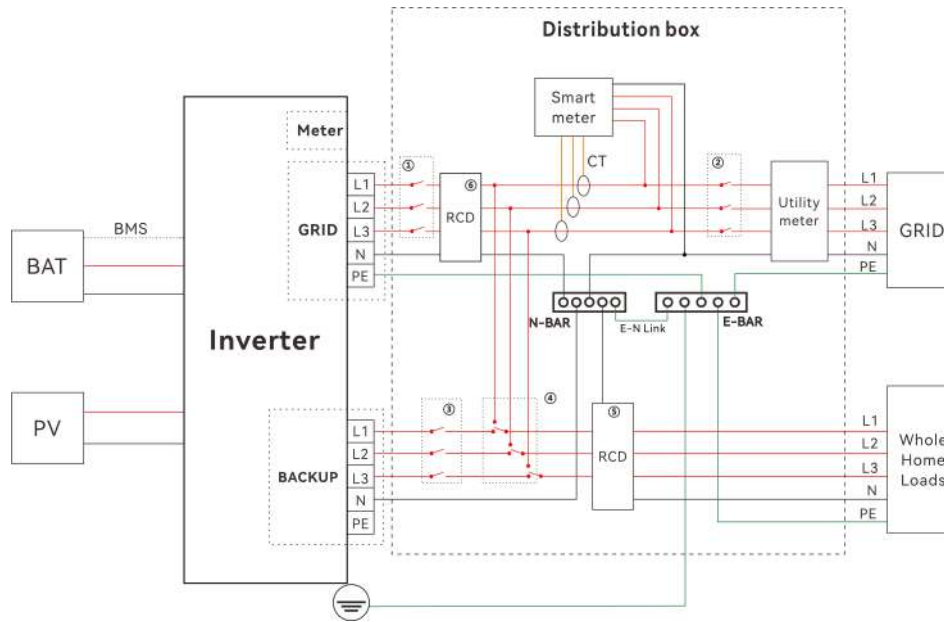
## 6. Electrical connection

### 6.1. Australia and New Zealand

This section shows the system connection diagrams applicable to Australia and New Zealand.

- To comply with AS/NZS3000, the neutral (N) cables of the grid and backup-load sides (where applicable) must be connected together.
- Do not connect the PE terminal of the **BACKUP** port.
- The E-BAR and the N-BAR must be connected as illustrated.

#### Whole home backup solution



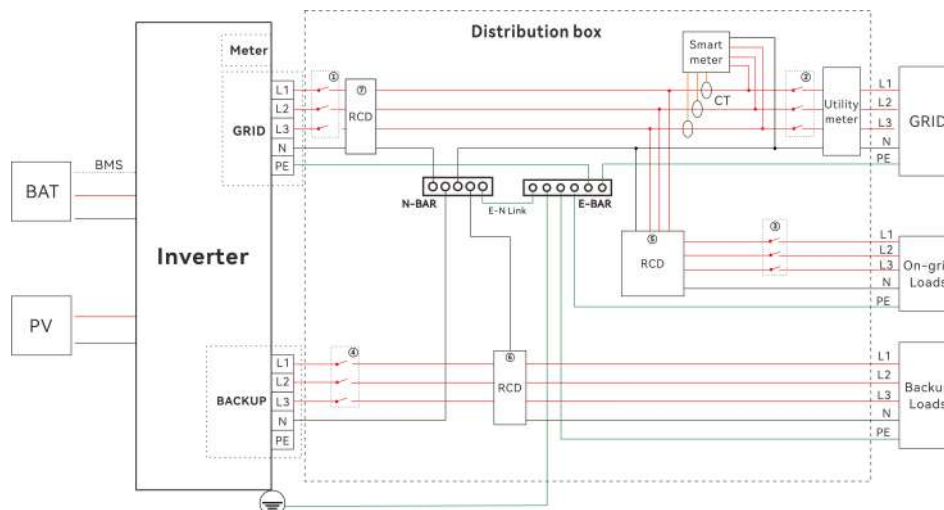
| Product model           | ① AC breaker (grid) | ③ AC breaker (backup loads) | ② AC breaker (utility meter) | ④ Manual transfer switch | ⑤⑥ RCD (on-grid/backup loads) <sup>1</sup> |
|-------------------------|---------------------|-----------------------------|------------------------------|--------------------------|--------------------------------------------|
| EK70 HS5-8K-T3-X        | 63A/400 V           | 63A/400 V                   | Main breaker                 | 63A/230 V                | 30 mA                                      |
| EK70 HS5-10K-T3-X       | 63A/400 V           | 63A/400 V                   | Main breaker                 | 63A/230 V                | 30 mA                                      |
| EK70 HS5-12K-T3-X (-IE) | 63A/400 V           | 63A/400 V                   | Main breaker                 | 63A/230 V                | 30 mA                                      |
| EK70 HS5-15K-T3-X       | 63A/400 V           | 63A/400 V                   | Main breaker                 | 63A/230 V                | 30 mA                                      |
| EK70 HS5-20K-T3-X       | 63A/400 V           | 63A/400 V                   | Main breaker                 | 63A/230 V                | 30 mA                                      |

Table 6.1. Recommended AC breaker and RCD specifications

1. The on-grid RCD is optional since the inverter is integrated with a residential current monitoring unit (RCMU). However, if the external RCD must be installed according to the local regulations, install a type A RCD of action current 30 mA or higher.

**Note:** The values in the above table are recommendations only and can be set to other values based on the actual conditions.

## Partial backup solution



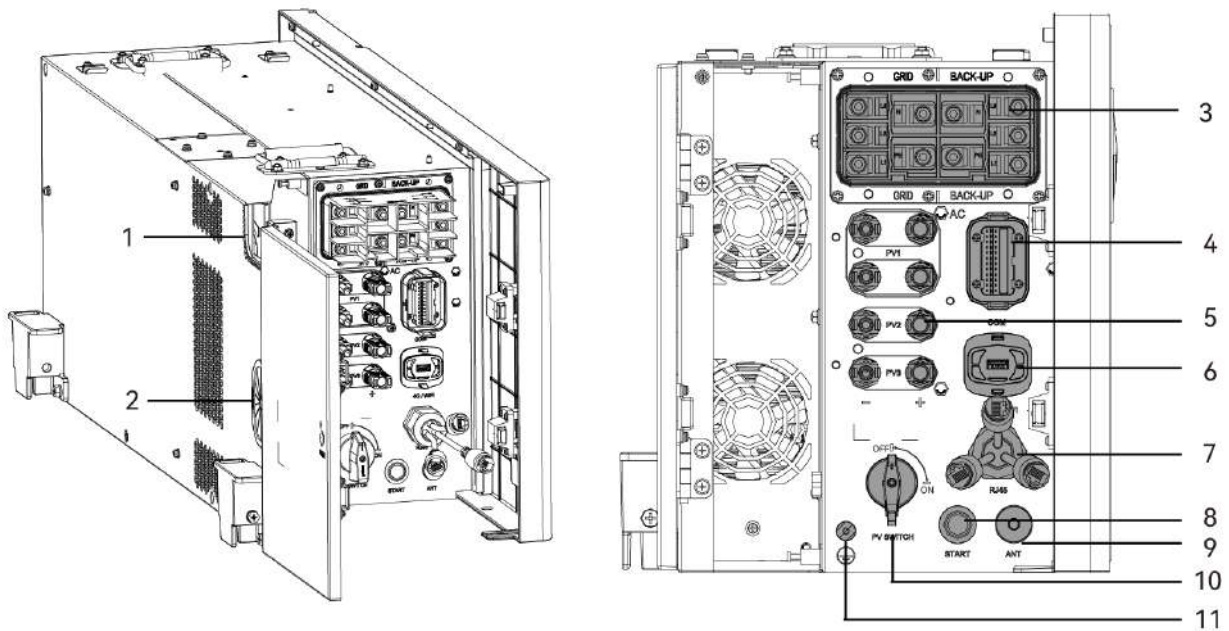
| Product model           | ① AC breaker (grid) | ④ AC breaker (backup loads) | ② AC breaker (utility meter) | ③ AC breaker (on-grid loads) | ⑤⑥ RCD (on-grid/backup loads) <sup>1</sup> |
|-------------------------|---------------------|-----------------------------|------------------------------|------------------------------|--------------------------------------------|
| EK70 HS5-8K-T3-X        | 32 A/400 V          | Depend on loads             | Main breaker                 | Depend on loads              | 30 mA                                      |
| EK70 HS5-10K-T3-X       | 40 A/400 V          | Depend on loads             | Main breaker                 | Depend on loads              | 30 mA                                      |
| EK70 HS5-12K-T3-X (-IE) | 50 A/400 V          | Depend on loads             | Main breaker                 | Depend on loads              | 30 mA                                      |
| EK70 HS5-15K-T3-X       | 63 A/400 V          | Depend on loads             | Main breaker                 | Depend on loads              | 30 mA                                      |
| EK70 HS5-20K-T3-X       | 63 A/400 V          | Depend on loads             | Main breaker                 | Depend on loads              | 30 mA                                      |

Table 6.2. Recommended AC breaker and RCD specifications

1. The on-grid RCD is optional since the inverter is integrated with a residential current monitoring unit (RCMU). However, if the external RCD must be installed according to the local regulations, install a type A RCD of action current 30 mA or higher.

**Note:** The values in the above table are recommendations only and can be set to other values based on the actual conditions.

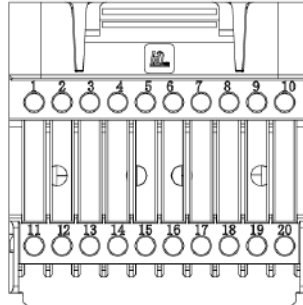
## 6.2. Inverter ports and switches



| Callout | Silkscreen                                                                                          | Description                                                                                                                                                                                                      |
|---------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | /                                                                                                   | The cable entry hole 1 for routing AC power cables.                                                                                                                                                              |
| 2       | /                                                                                                   | The cable entry hole 2 for routing the following cables: <ul style="list-style-type: none"> <li>• The grounding cable</li> <li>• The DC power cables</li> <li>• The communication cables</li> </ul>              |
| 3       | <b>AC</b> <ul style="list-style-type: none"> <li>• <b>GRID</b></li> <li>• <b>BACK-UP</b></li> </ul> | The connection ports for AC power cables. <ul style="list-style-type: none"> <li>• <b>GRID</b>: for connecting to the public grid.</li> <li>• <b>BACK-UP</b>: for connecting to the home backup load.</li> </ul> |
| 4       | <b>COM</b>                                                                                          | The connection port for communication cables from external devices like DI/DO devices.                                                                                                                           |
| 5       | <b>PV1, PV2, PV3</b>                                                                                | The negative and positive PV input connection ports.                                                                                                                                                             |
| 6       | <b>4G/WIFI</b>                                                                                      | The connection port of the eSolar AIO3 Pro and 4G Pro communication modules.                                                                                                                                     |
| 7       | <b>RJ45</b>                                                                                         | The RJ45 connection ports for <b>LAN1</b> , <b>LAN2</b> , and <b>DRMs</b> connections as labelled on the ports.<br><b>LAN1</b> and <b>LAN2</b> ports are reserved for future use.                                |
| 8       | <b>START</b>                                                                                        | For starting up the energy storage system.                                                                                                                                                                       |
| 9       | <b>ANT</b>                                                                                          | The LoRa antenna connection port.                                                                                                                                                                                |
| 10      | <b>PV SWITCH</b>                                                                                    | The PV switch that controls the connection to the PV array.                                                                                                                                                      |

| Callout | Silkscreen                                                                        | Description                          |
|---------|-----------------------------------------------------------------------------------|--------------------------------------|
| 11      |  | The grounding cable connection port. |

Table 6.3. Inverter electrical ports



| Number | Silkscreen        | Description                                                                                                          |
|--------|-------------------|----------------------------------------------------------------------------------------------------------------------|
| 1-6    | /                 | Reserved for future use.                                                                                             |
| 7      | <b>DO1+</b>       | Output connection for dry contact device 1.                                                                          |
| 8      | <b>DO1-</b>       | Output connection for dry contact device 1.                                                                          |
| 9      | <b>DO2+</b>       | Output connection for dry contact device 2.                                                                          |
| 10     | <b>DO2-</b>       | Output connection for dry contact device 2.                                                                          |
| 11     | <b>PC 485A</b>    | Reserved RS485 connection ports.                                                                                     |
| 12     | <b>PC 485B</b>    | The RS485 communication can be adjusted with the provided 120 $\Omega$ resistor controlled by <b>SW2</b> DIP switch. |
| 13     | <b>Meter 485A</b> | For RS485 connections with the meter.                                                                                |
| 14     | <b>Meter 485B</b> | The RS485 communication can be adjusted with the provided 120 $\Omega$ resistor controlled by <b>SW3</b> DIP switch. |
| 15     | <b>DI1+</b>       | Input connection for dry contact device 1.                                                                           |
| 16     | <b>DI1-</b>       | Input connection for dry contact device 1.                                                                           |
| 17     | <b>DI2+</b>       | Input connection for dry contact device 2.                                                                           |
| 18     | <b>DI2-</b>       | Input connection for dry contact device 2.                                                                           |
| 19     | <b>12V</b>        | Port for providing 12V DC power supply to the external device.                                                       |
| 20     | <b>GND</b>        | Port for grounding connection.                                                                                       |

Table 6.4. 20-pin definition for COM port

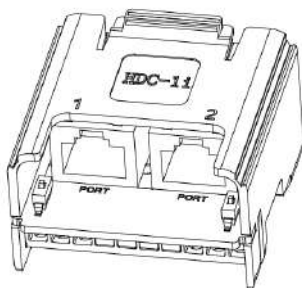


Figure 6.1. RJ45 ports for communication connector

| Number | Silkscreen      | Description    |
|--------|-----------------|----------------|
| 1      | <b>PORT CAN</b> | Reserved port. |

| Number | Silkscreen | Description    |
|--------|------------|----------------|
| 2      | DSP CAN    | Reserved port. |

### 6.3. Prepare the cables

#### Grounding cable specification

| Cable type      | Recommended cross-sectional area range (mm <sup>2</sup> ) |
|-----------------|-----------------------------------------------------------|
| Grounding cable | 6                                                         |

#### AC grid and backup cable specification

Prepare the following outdoor high-temperature ( $\geq 105^{\circ}\text{C}$ ) cables for AC grid and backup load connections:

| Solution          | AC grid cable type    | Recommended cross-sectional area (mm <sup>2</sup> ) | Recommended conductor material |
|-------------------|-----------------------|-----------------------------------------------------|--------------------------------|
| Whole home backup | One five-wire cable   | 16                                                  | Copper                         |
| Partial backup    | Five separated cables | 16                                                  | Copper                         |

Table 6.5. AC grid cable specification

| Solution          | AC backup cable type  | Cross-sectional area (mm <sup>2</sup> ) |                   | Recommended conductor material |
|-------------------|-----------------------|-----------------------------------------|-------------------|--------------------------------|
|                   |                       | Range                                   | Recommended value |                                |
| Whole home backup | One five-wire cable   | 10-16                                   | 16                | Copper                         |
|                   | Five separated cables | /                                       | 16                | Copper                         |

Table 6.6. AC backup cable specification for whole home backup

| Solution       | Model           | AC backup cable type  | Cross-sectional area range (mm <sup>2</sup> ) |                   | Recommended conductor material |
|----------------|-----------------|-----------------------|-----------------------------------------------|-------------------|--------------------------------|
|                |                 |                       | Range                                         | Recommended value |                                |
| Partial backup | HS5-8K-T3-X     | One five-wire cable   | 4-6                                           | 6                 | Copper                         |
|                | HS5-10K-T3-X    | Five separated cables | /                                             | 6                 | Copper                         |
|                | HS5-12K-T3-X    |                       |                                               |                   |                                |
|                | HS5-12K-T3-X-IE |                       |                                               |                   |                                |
|                | HS5-15K-T3-X    | One five-wire cable   | 6-8                                           | 6                 | Copper                         |
|                | HS5-20K-T3-X    | Five separated cables | /                                             | 6                 | Copper                         |

Table 6.7. AC backup cable specification for partial backup

#### PV cable specification

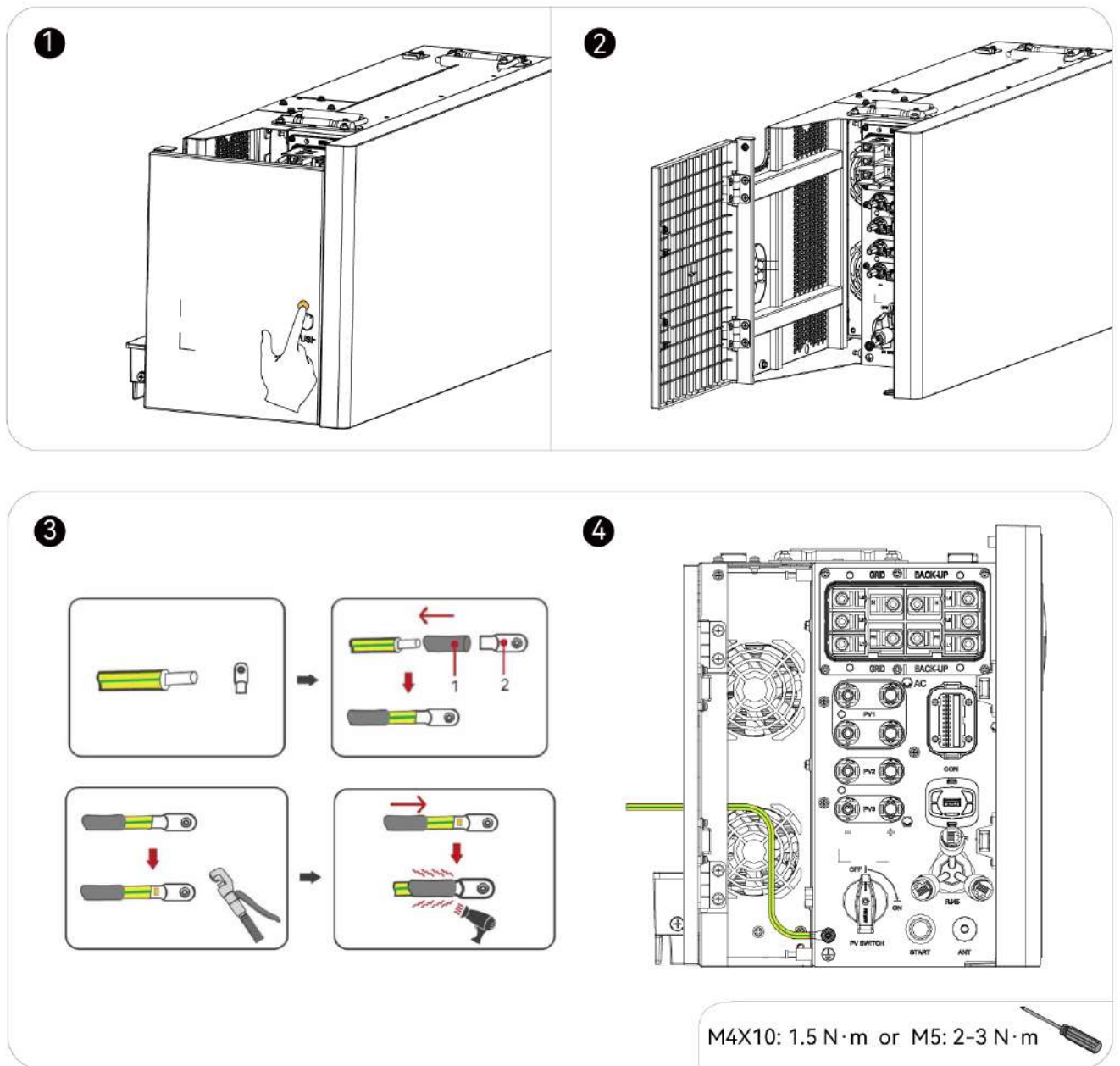
| Cross-sectional area range (mm <sup>2</sup> ) |                   | Recommended conductor material                      |
|-----------------------------------------------|-------------------|-----------------------------------------------------|
| Range                                         | Recommended value |                                                     |
| 5.0-6.0                                       | 6.0               | Outdoor copper wire cable, complying with 1000 V DC |

#### Communication cable specification

| Terminals | Cable cross-sectional area (mm <sup>2</sup> ) | Cable outer diameter (mm) | Insulation off (mm)       |                 |
|-----------|-----------------------------------------------|---------------------------|---------------------------|-----------------|
|           |                                               |                           | External protective layer | Wire insulation |
| 1 - 10    | 0.5 - 0.75                                    | 4.5 - 6.5                 | 55                        | 7.5             |

| Terminals | Cable cross-sectional area(mm <sup>2</sup> ) | Cable outer diameter (mm) | Insulation off (mm)       |                 |
|-----------|----------------------------------------------|---------------------------|---------------------------|-----------------|
|           |                                              |                           | External protective layer | Wire insulation |
| 11 - 20   | 0.2 - 0.5                                    |                           | 33                        | 7.5             |

## 6.4. Connect the grounding cable

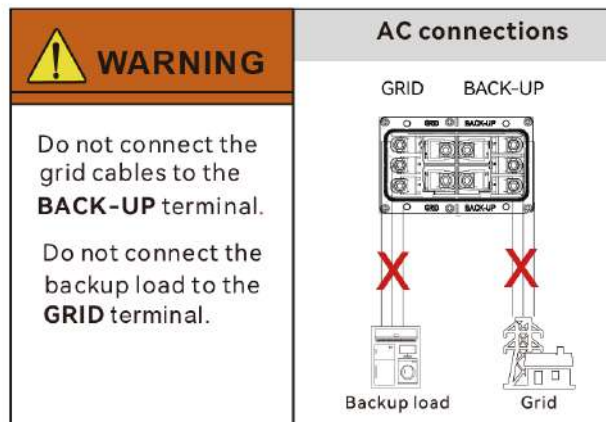
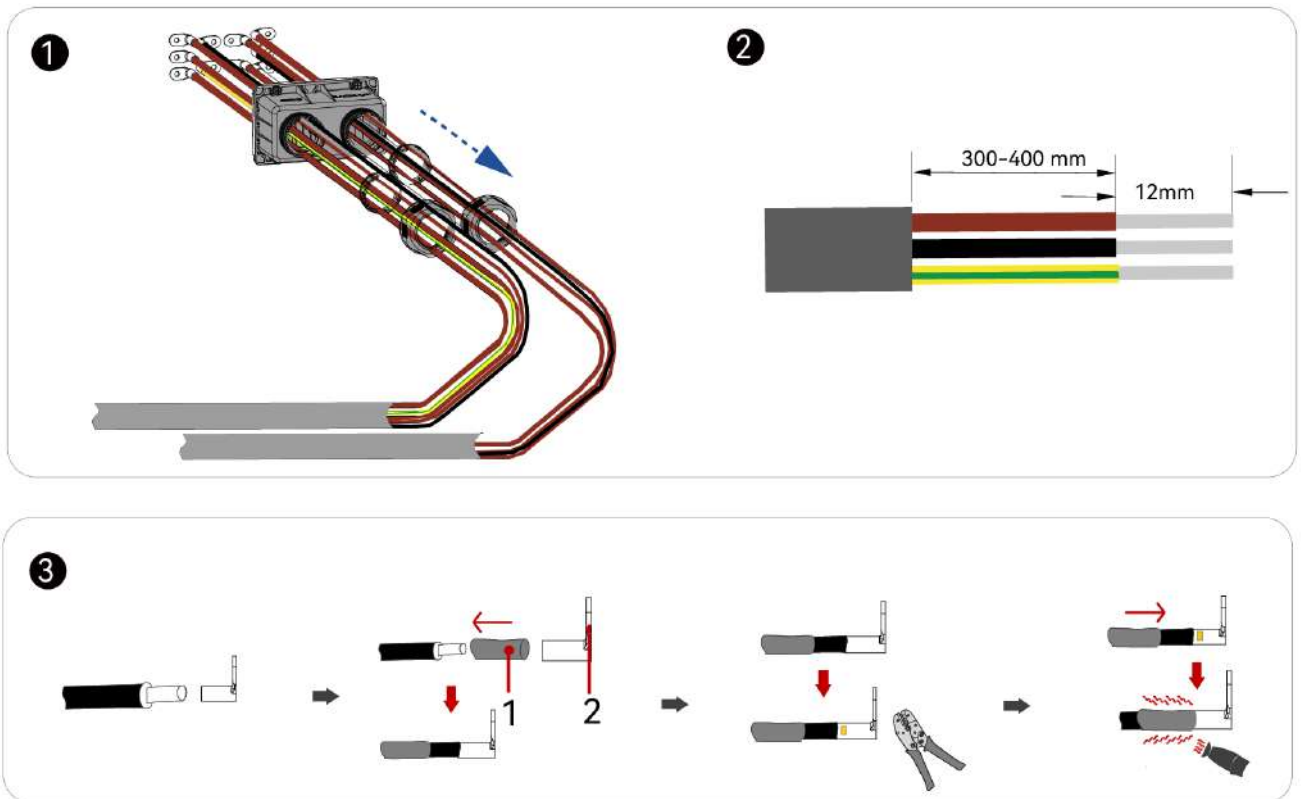


**Note:** The screw can be M4 or M5 depending on shipments. Confirm the screw specification before installation and tighten it to the corresponding torque.

## 6.5. Connect the AC power cables

### NOTICE

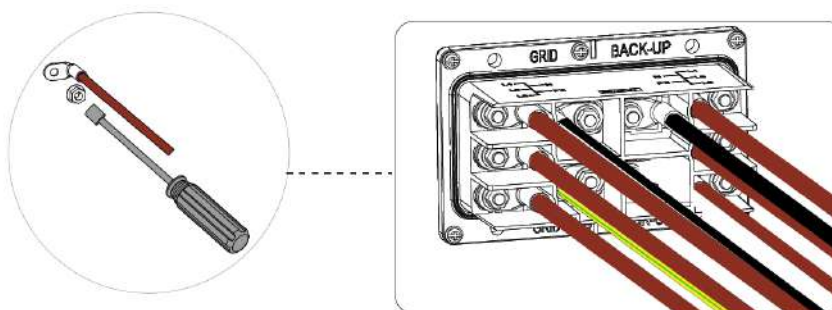
- Secure the corrugated pipe on the wall after finishing all wiring connections.
- When fixing the corrugated pipe at the upper left of the machine on the wall, leave an extra cable length of 300 to 400 mm. If it is fixed in other directions, reserve a longer length as needed.
- Products are subject to continuous updates. The printed guide may not reflect the latest changes. If there is any inconsistency between the received product and the printed guide, see the latest electronic Quick Guide or User Manual.



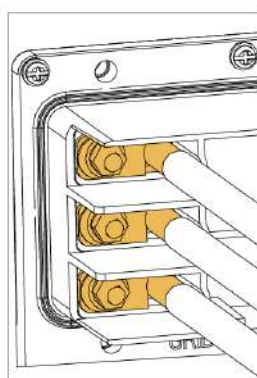
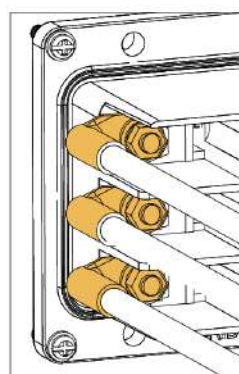
#### Note:

Use cold-pressed terminal crimping plier to crimp the AC cables.

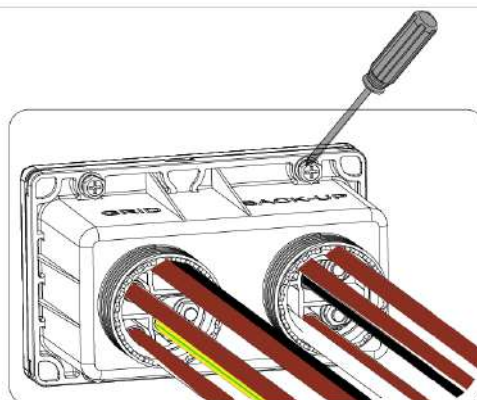
4



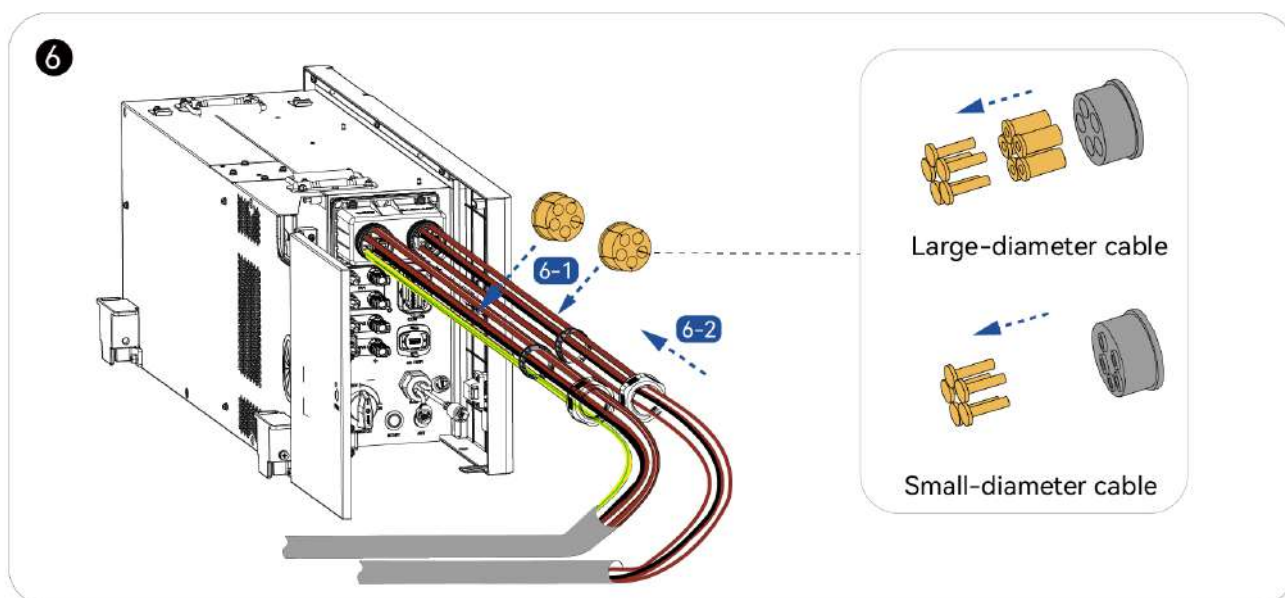
M5: 2-3 N·m



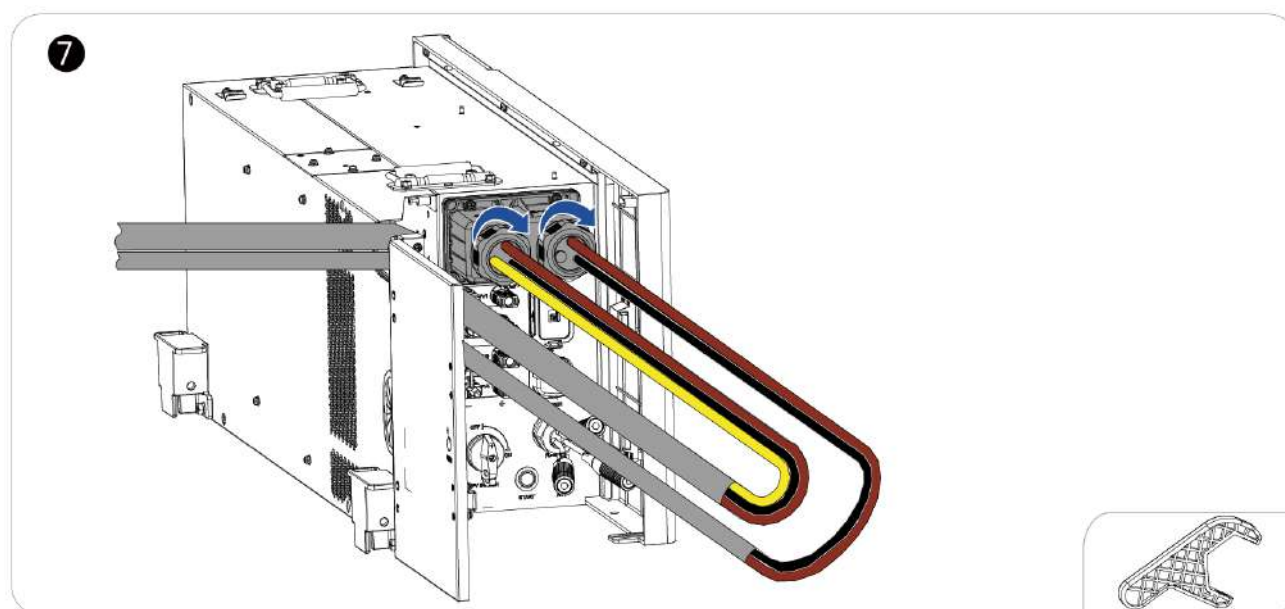
5



M5: 2-3 N·m



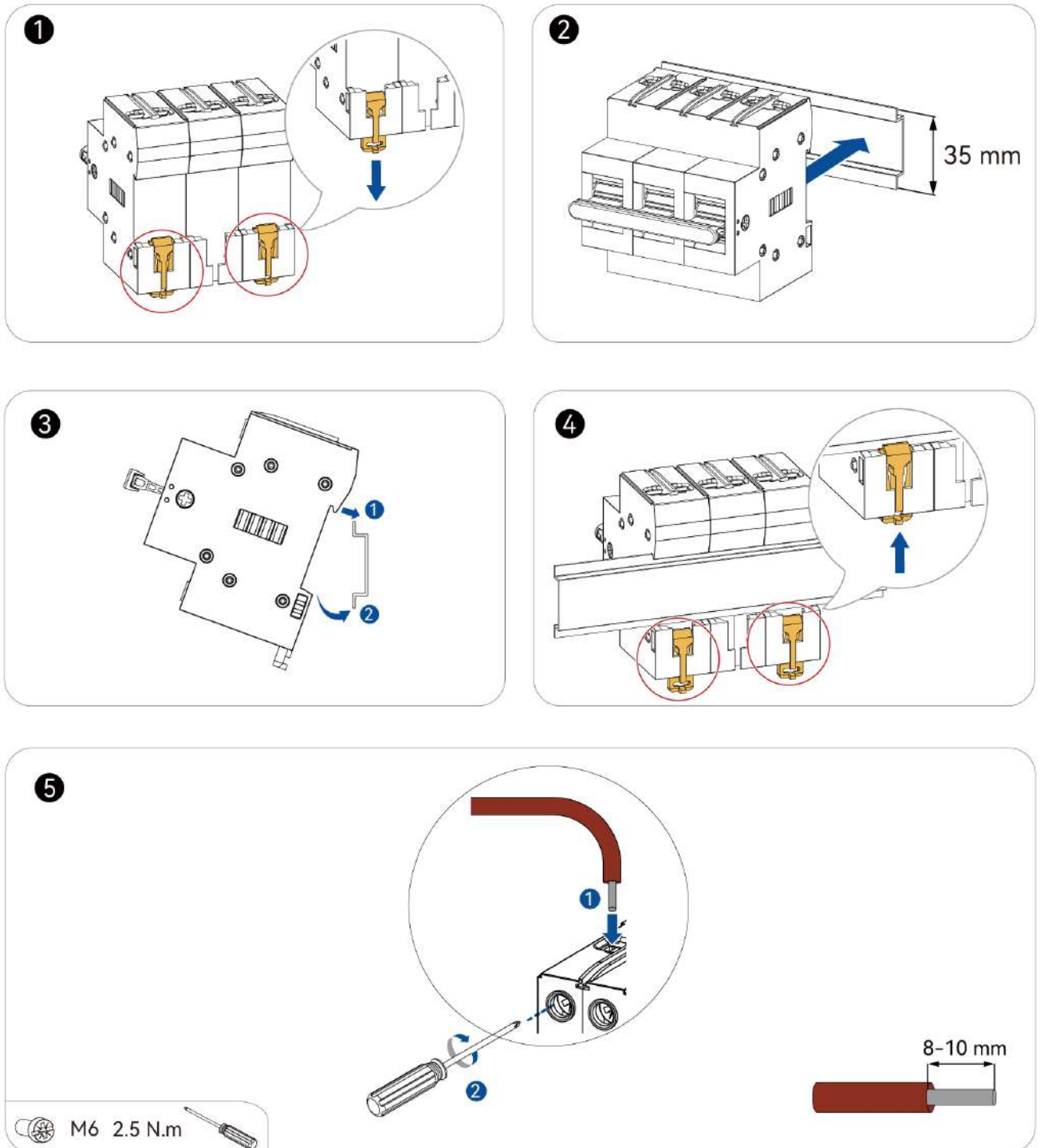
| Rubber type           | Cross-sectional area range of cable (mm <sup>2</sup> ) |
|-----------------------|--------------------------------------------------------|
| Large-diameter rubber | 10-16                                                  |
| Small-diameter rubber | 4-6                                                    |

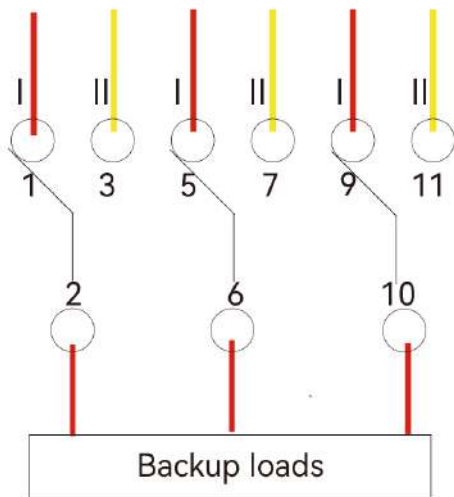


## 6.6. Connect the manual transfer switch (option A)

### NOTICE

- The illustrations are provided for reference only. The component appearance is subject to the actual product you have received.
- The manual transfer switch may vary depending on the shipments. If the product received differs from the one in the printed document, see the latest electronic User Manual or Quick Guide.



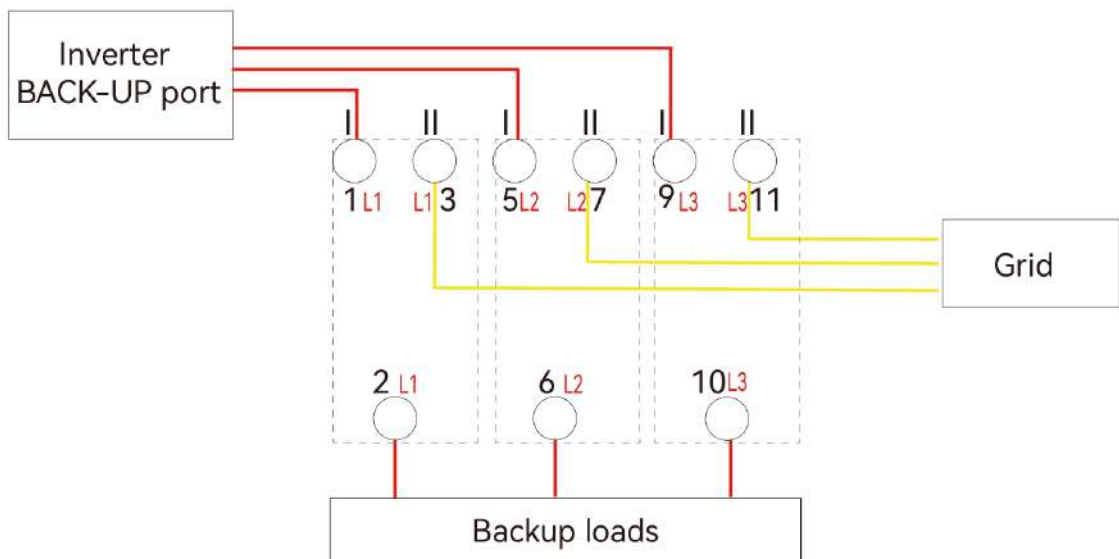


Input I (1,5,9) to inverter BACK-UP port  
Input II (3,7,11) to grid

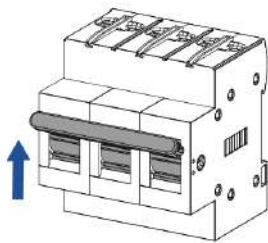
Or

Input I (1,5,9) to grid  
Input II (3,7,11) to inverter BACK-UP port

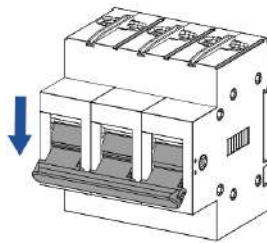
### Example



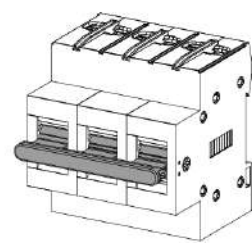
6



ON: Input I connected



ON: Input II connected

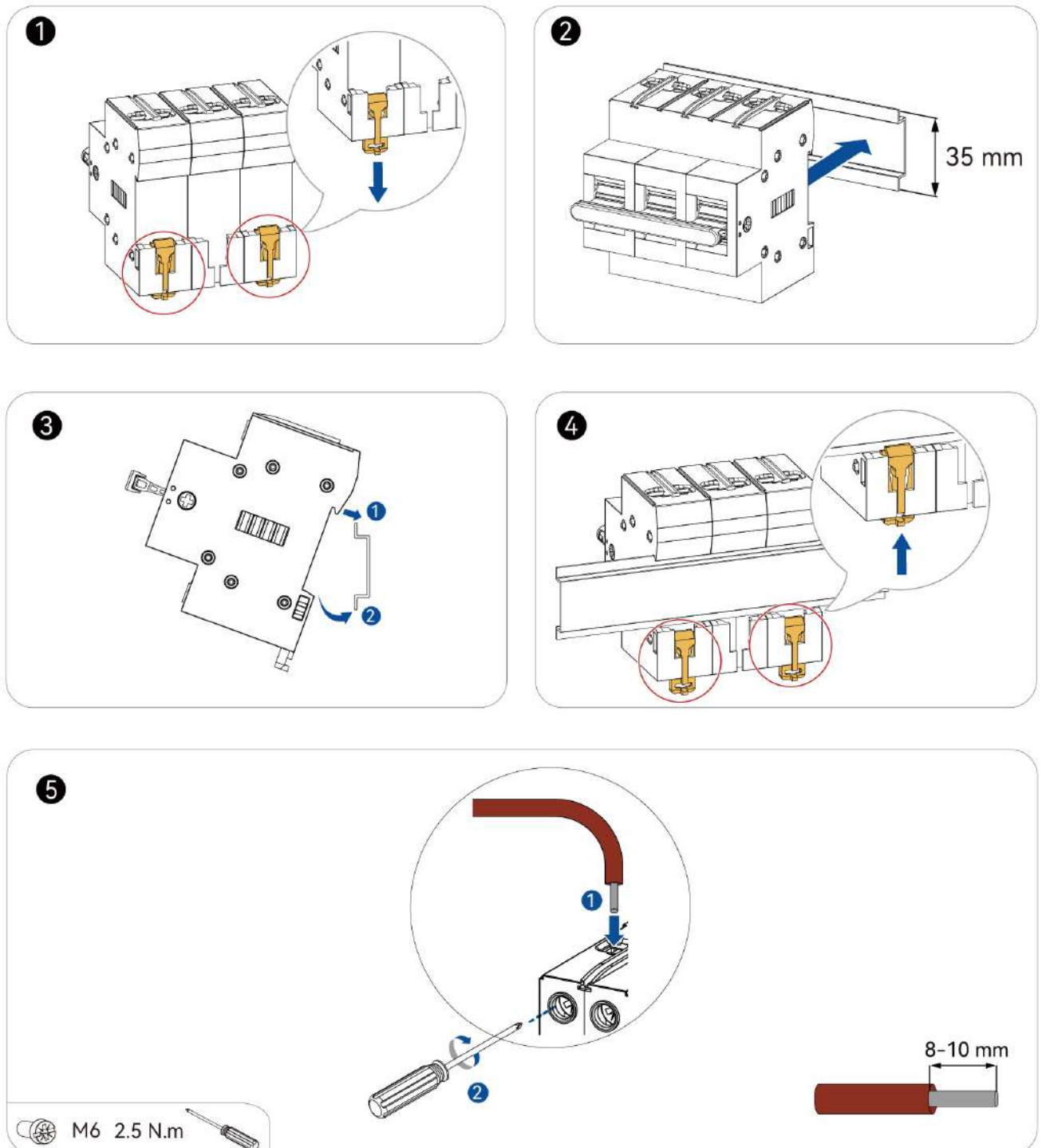


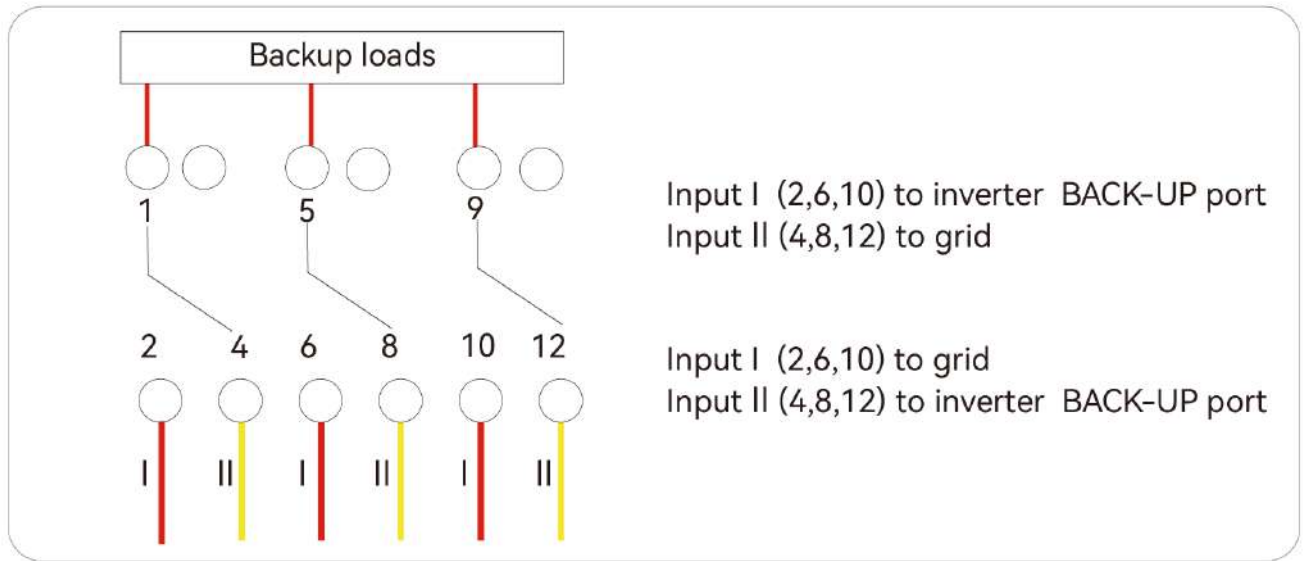
OFF: BACK-UP port and  
Grid disconnected

## 6.7. Connect the manual transfer switch (option B)

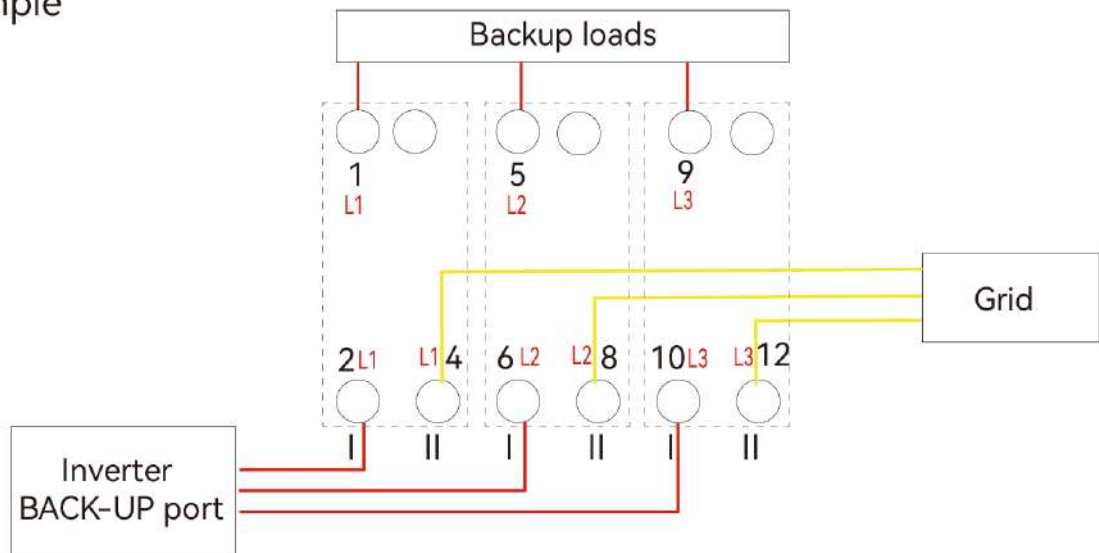
### NOTICE

- The illustrations are provided for reference only. The component appearance is subject to the actual product you have received.
- The manual transfer switch may vary depending on the shipments. If the product received differs from the one in the printed document, see the latest electronic User Manual or Quick Guide.

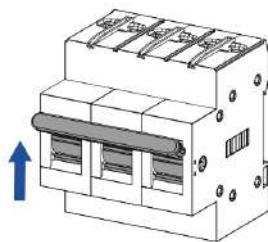




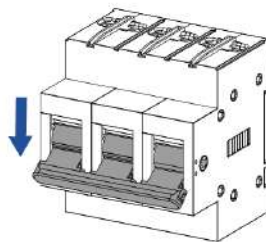
### Example



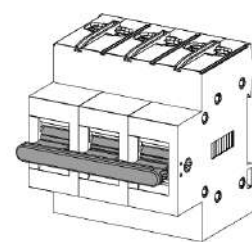
6



ON: Input II connected



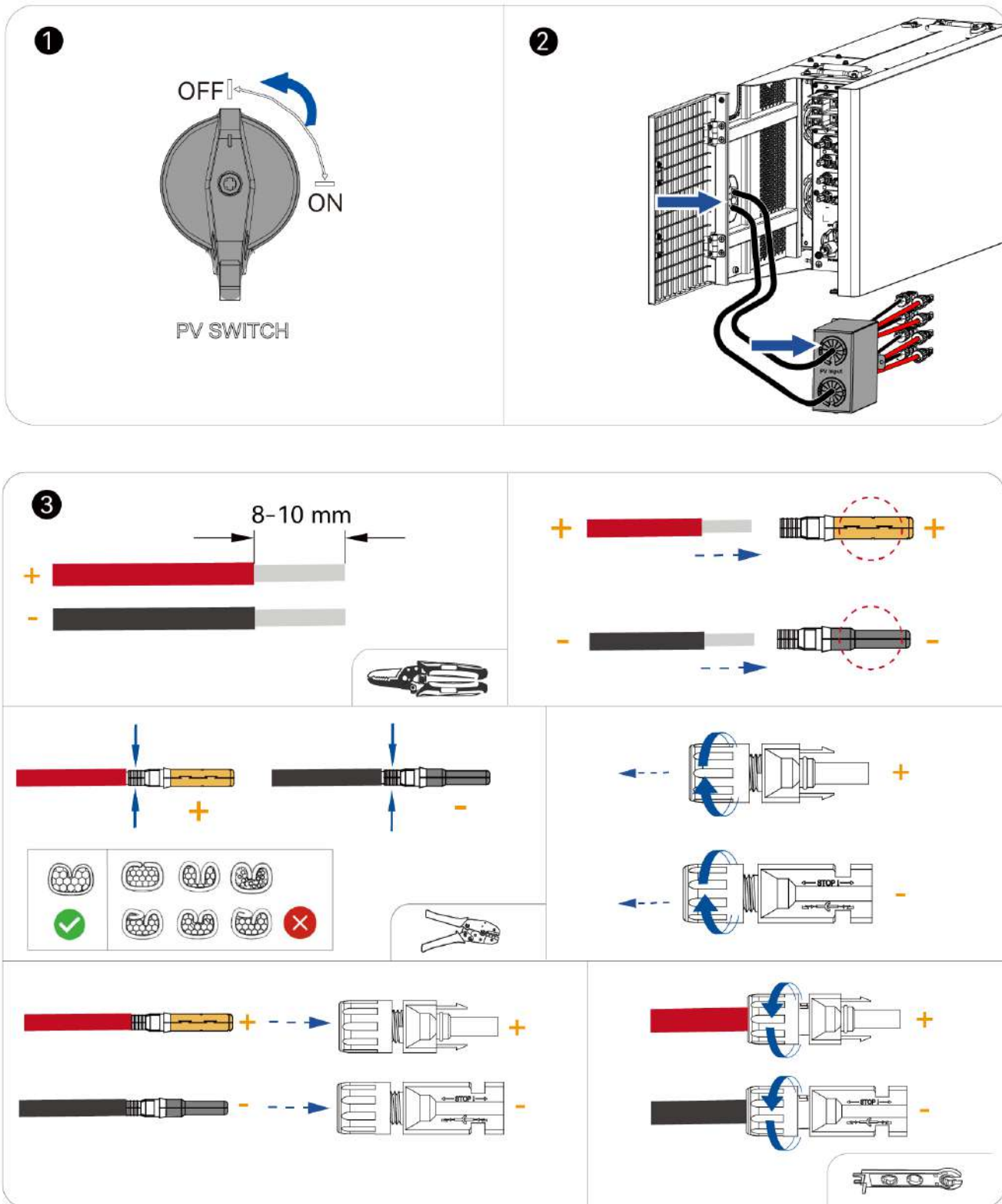
ON: Input I connected

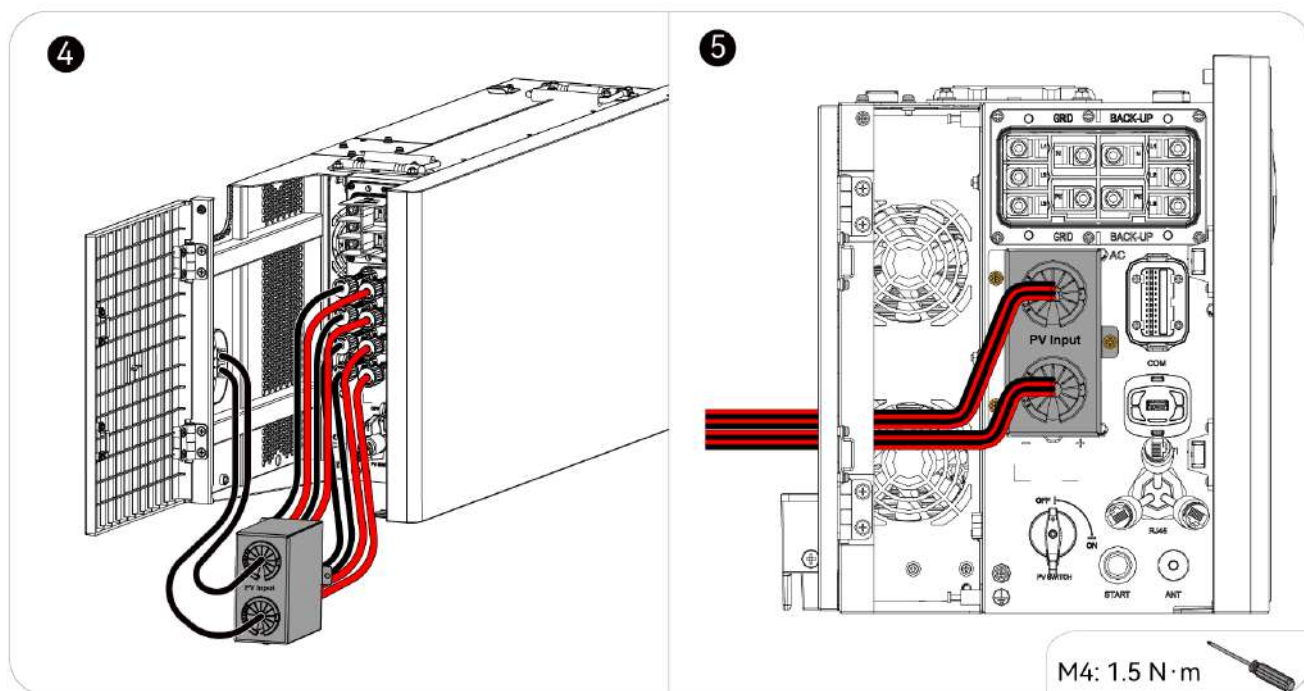


OFF: BACK-UP port and Grid disconnected

## 6.8. Connect the DC power cables

**Note:** Depending on different models, some ports may be disabled with plugs. Only connect the cables to the available ports.



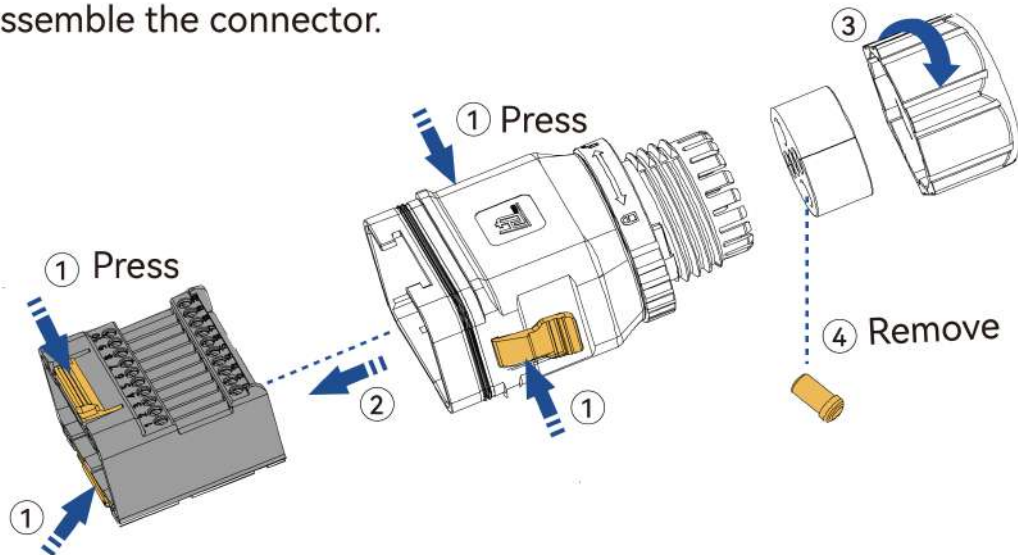


## 6.9. Connect the communication cables to COM port

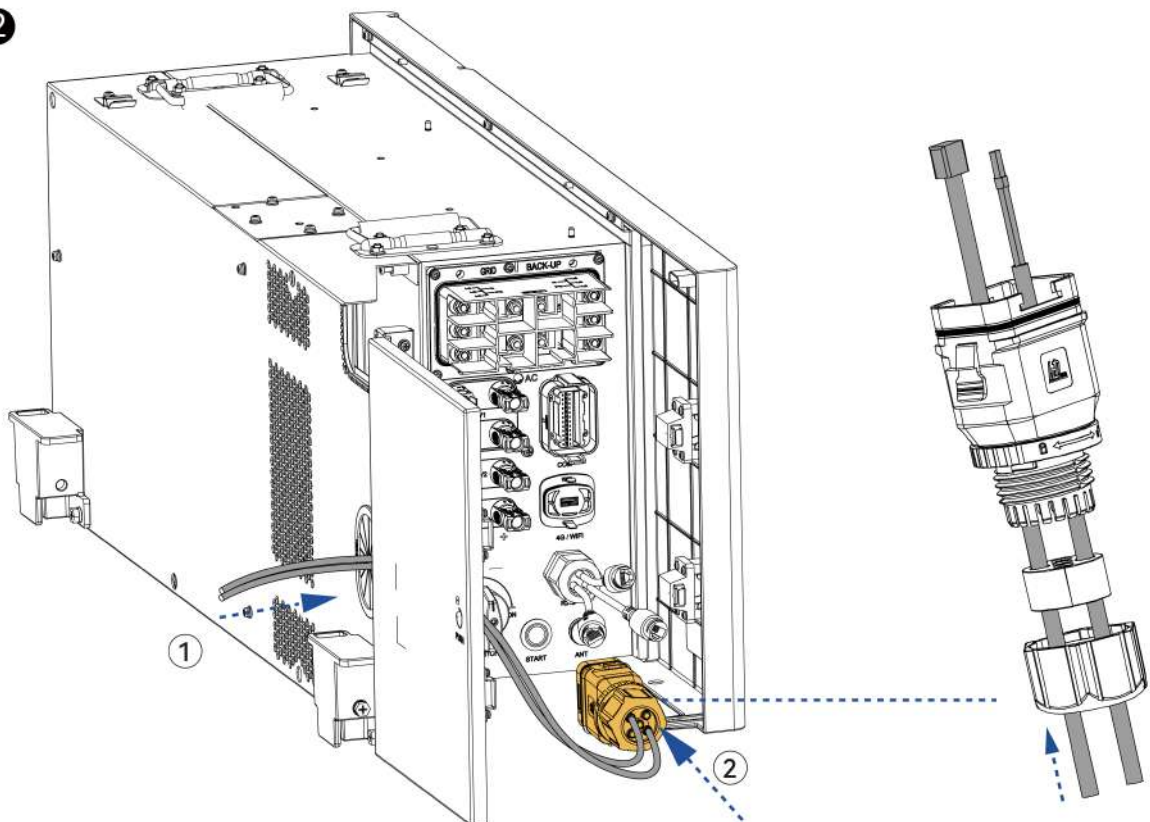
### NOTICE

Even if no cables are connected, the communication connector must be installed onto the **COM** port. Otherwise, an internal communication loss alarm will be triggered.

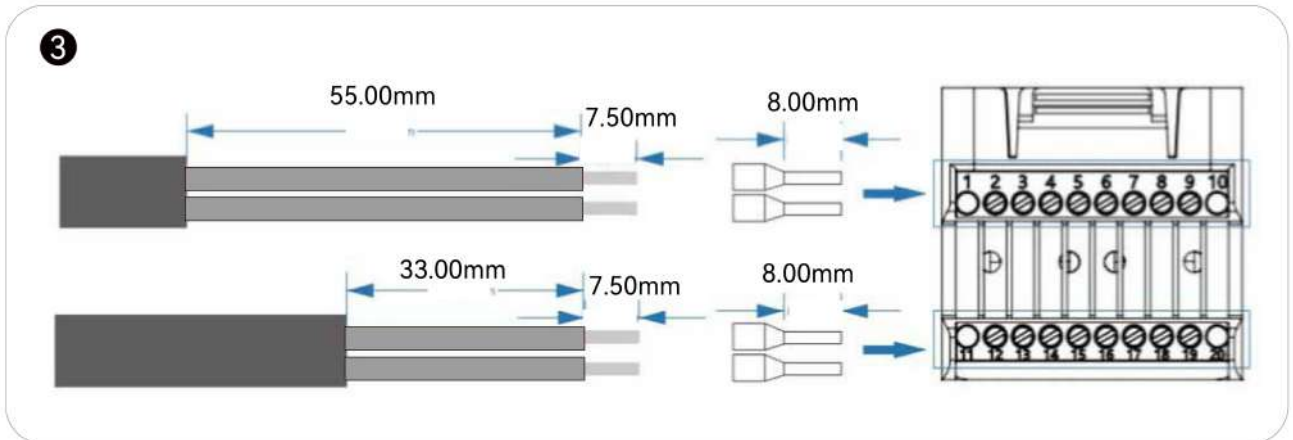
#### ① Disassemble the connector.



#### ②



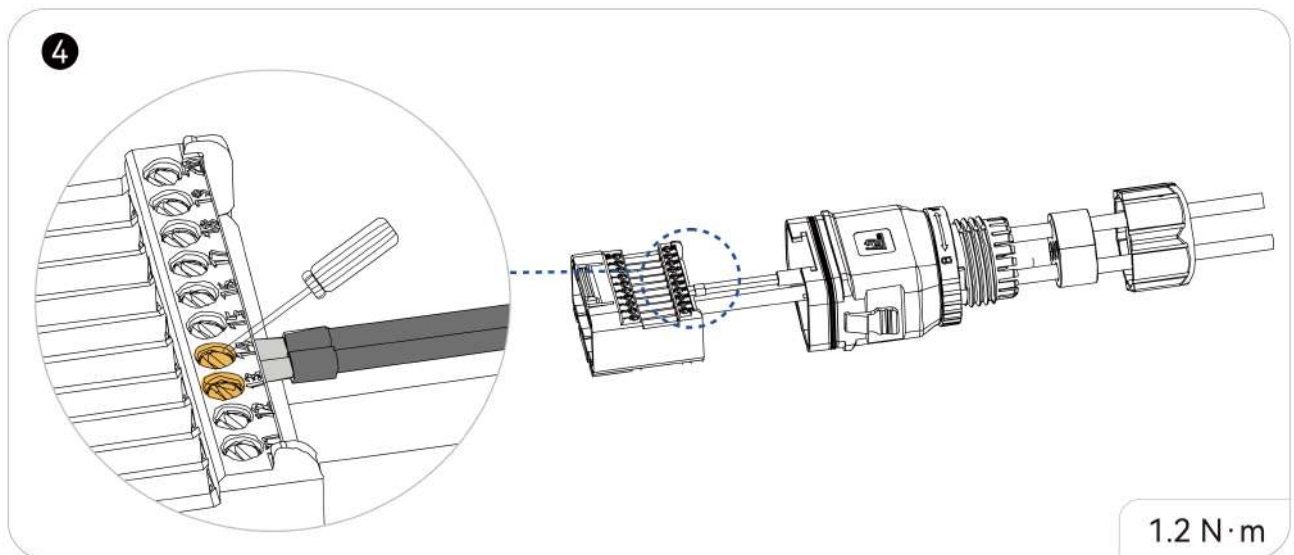
Step 3: Connect and secure the cables to the corresponding terminals based on your needs.



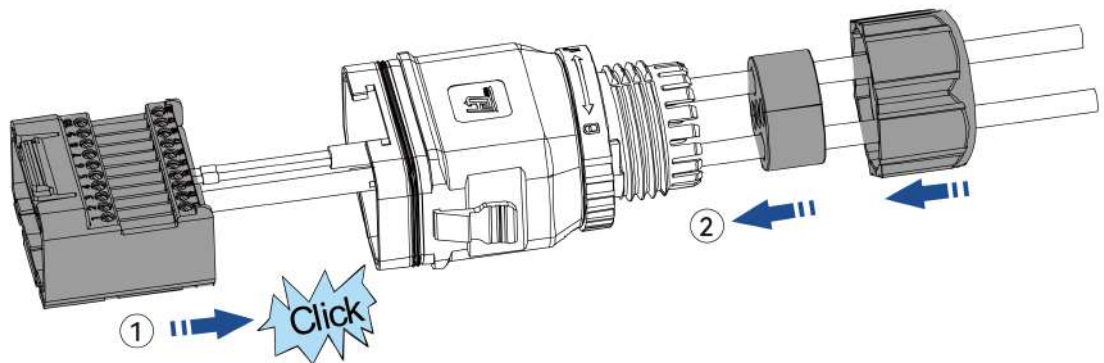
(Optional) Step 4: This step is only required for wired communication between inverter and meter. Connect the cables to terminals **13** (RS485 A) and **14** (RS485 B).

**Note:**

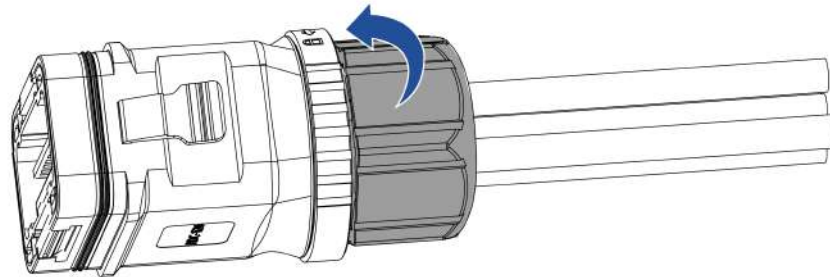
- The inverter is wirelessly pre-paired with the meter at the factory. For wireless communication, no wiring is required at the communication connector. Skip this step and install the antennas instead.
- For any terminal equipped with a 120  $\Omega$  resistor, such as METER-A, switch the resistor to **ON** if the cable exceeds 20 meters.



5

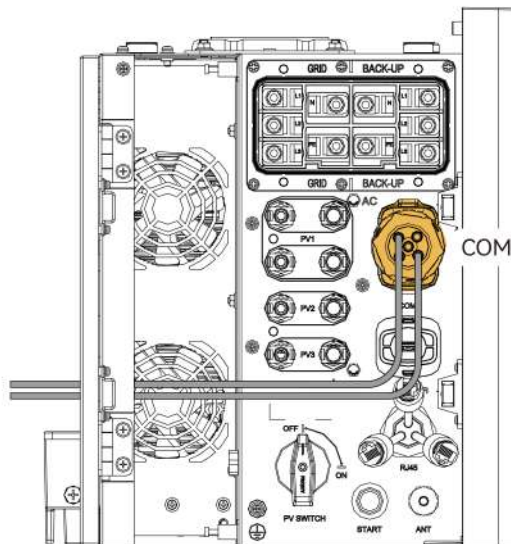


6



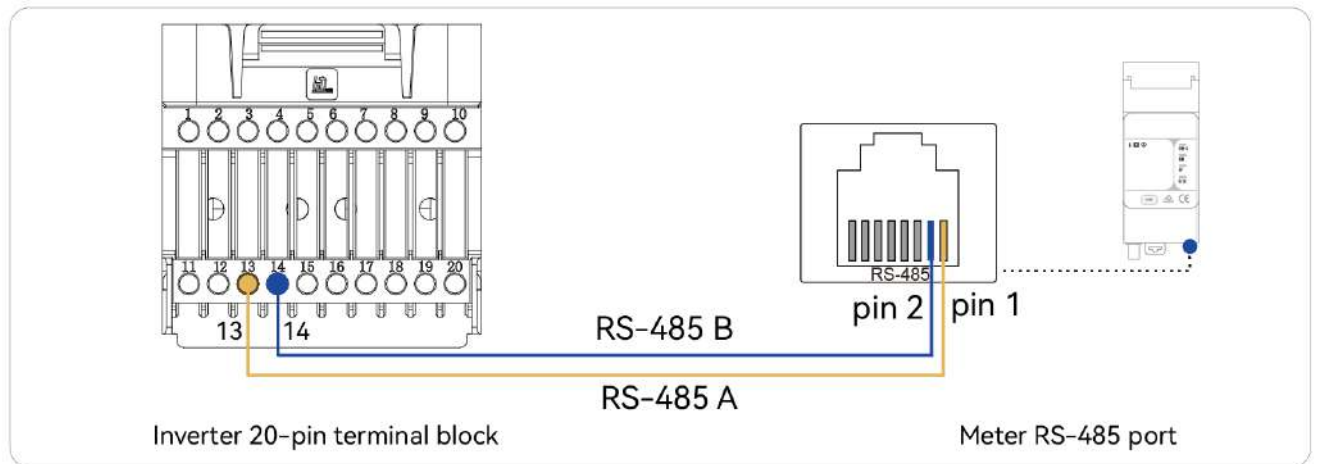
2.5 N·m

7



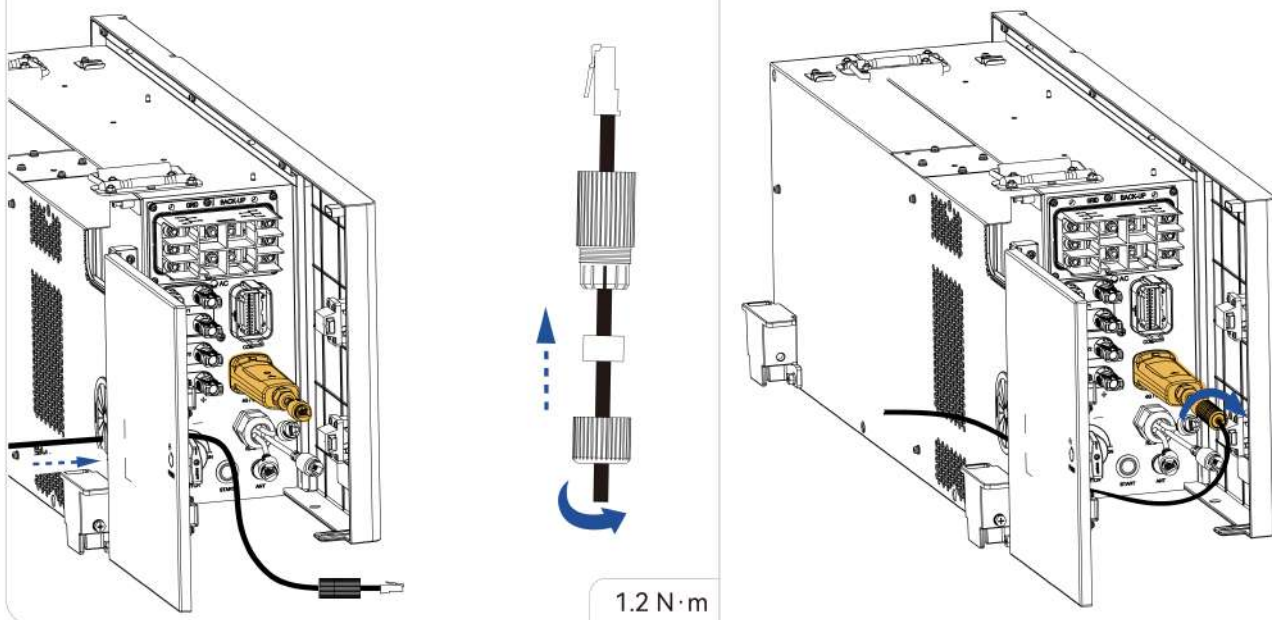
Step 8: Connect the other end of the cables to external devices, such as the meter.

**Note:** The inverter is wirelessly pre-paired with the meter at the factory. For wireless communication, no wiring is required at the communication connector. Skip this step and install the antennas instead.

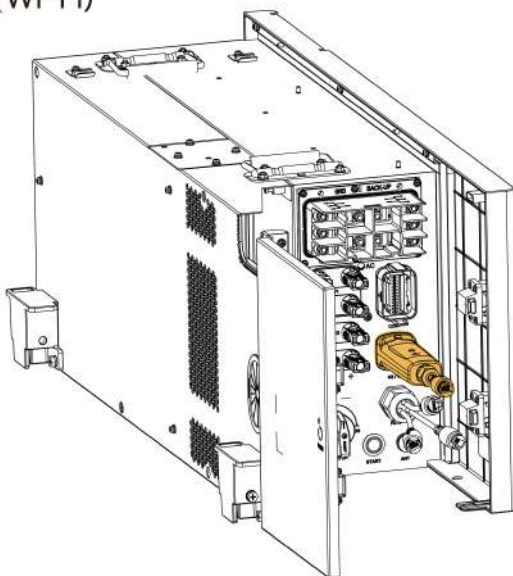


## 6.10. Connect the communication module

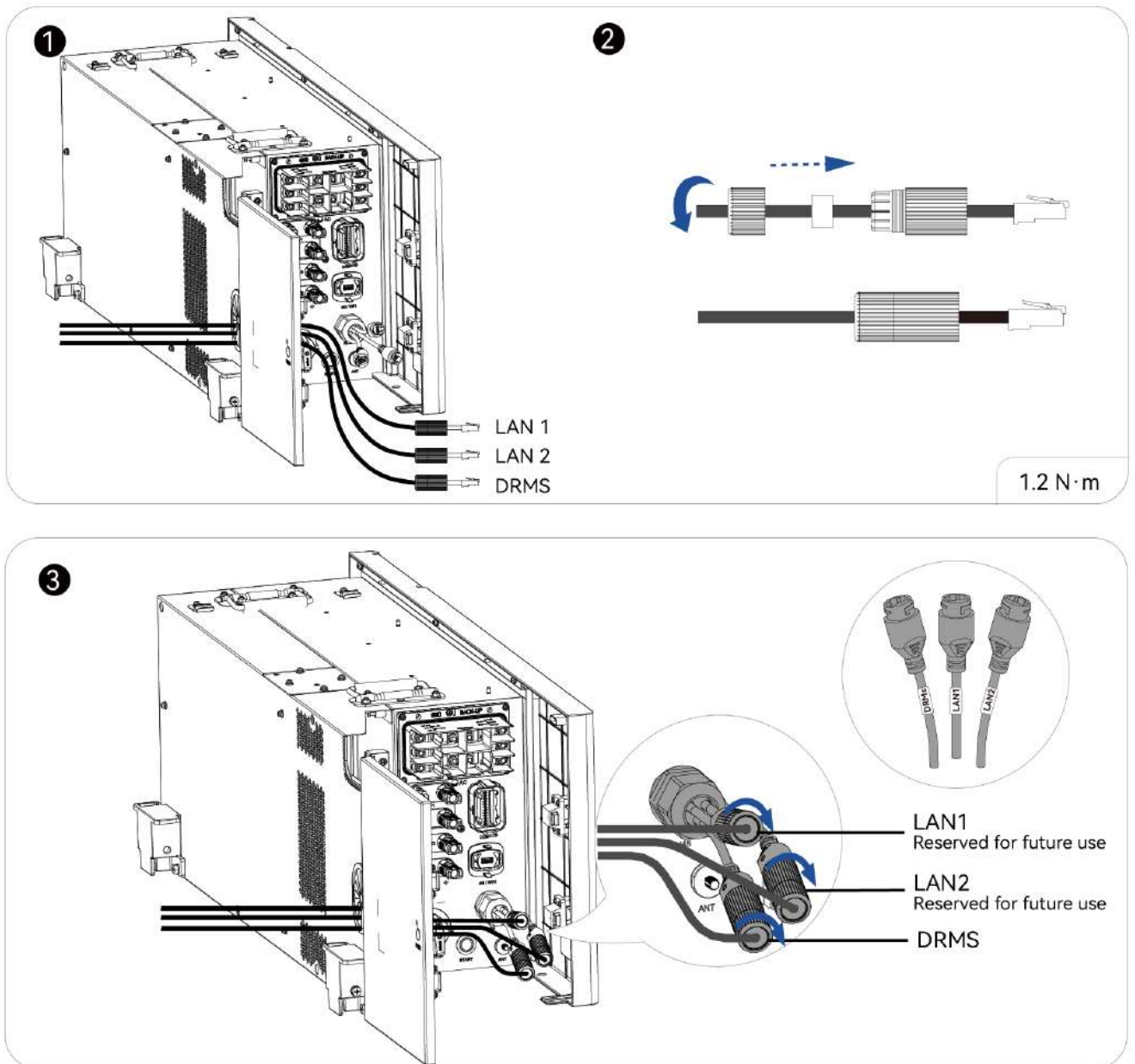
eSolar AIO3 Pro module (Ethernet)



eSolar AIO3 Pro module (Wi-Fi)



## 6.11. Connect the LAN and DRMS cables



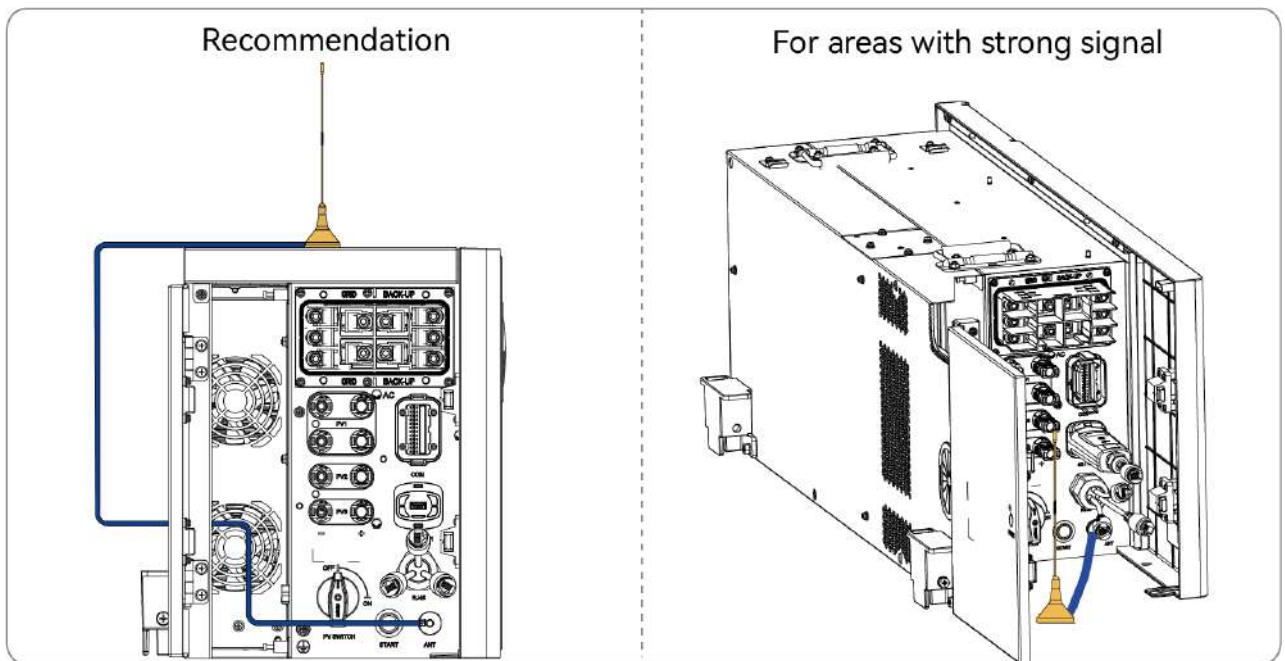
## 6.12. Connect the antenna

This procedure provides the instructions for installing the antennas used to establish wireless communication between the inverter and the meter.

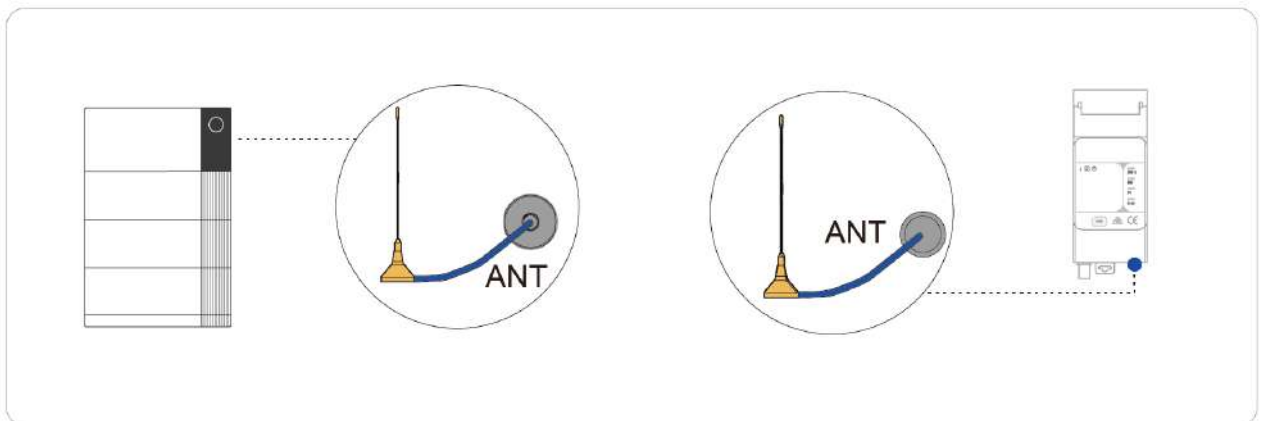
### NOTICE

- If the RS-485 wired communication is used, skip this step.
- For better signal reception, install the antennas vertically on top of the inverter and the distribution box where the meter is installed. Otherwise, signal loss may occur.
- With the antennas installed, the inverter is pre-paired wireless with the meter included in delivery. If you want to replace or add a meter, pair the meter and inverter through elekeeper app as instructed in the digital User Manual.

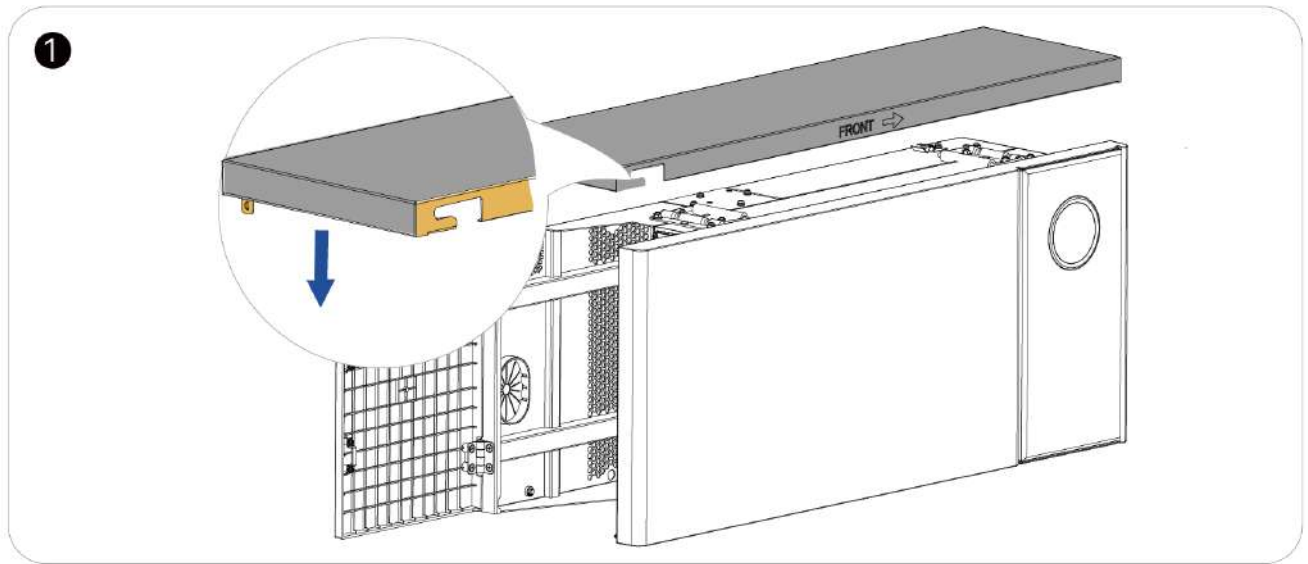
1. Connect the antenna on the inverter.



2. Connect the antenna on the meter.

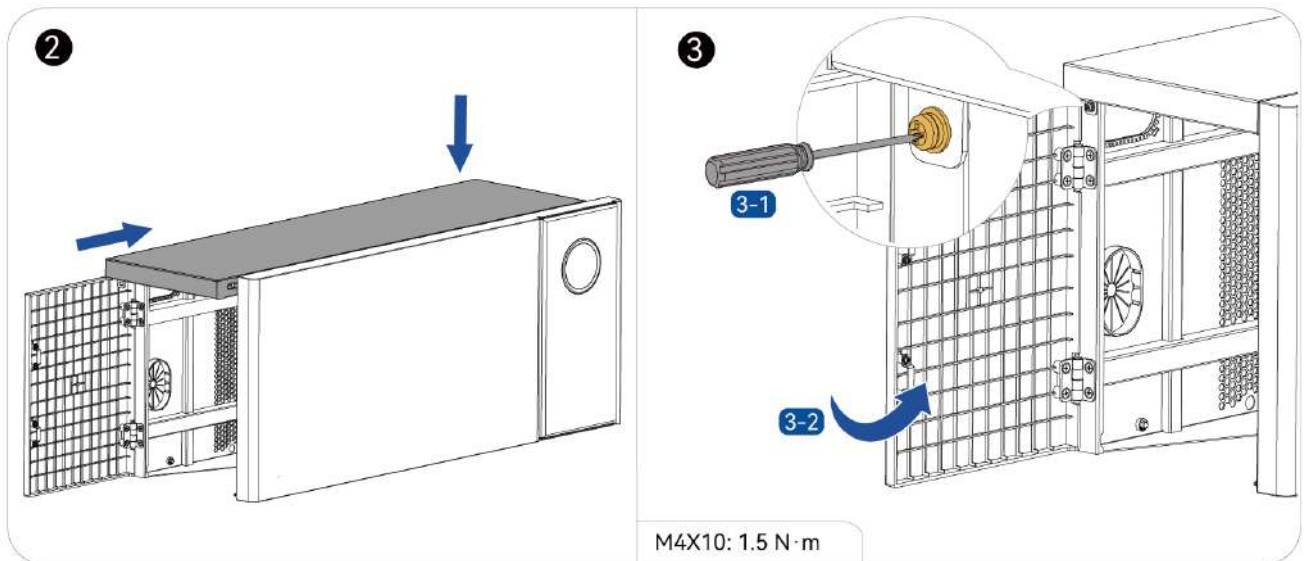


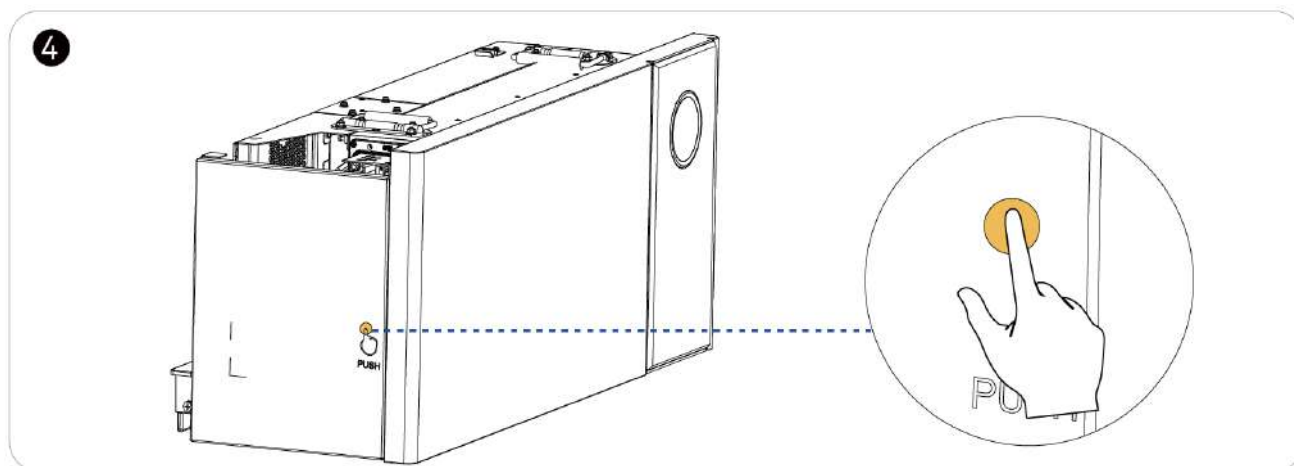
### 6.13. Install the inverter cover



**Note:**

Ensure that the removable top cover is securely fixed to prevent internal damage. Protective bonding continuity is verified at the fully assembled system level; the cover must be fitted as part of the system during this test.





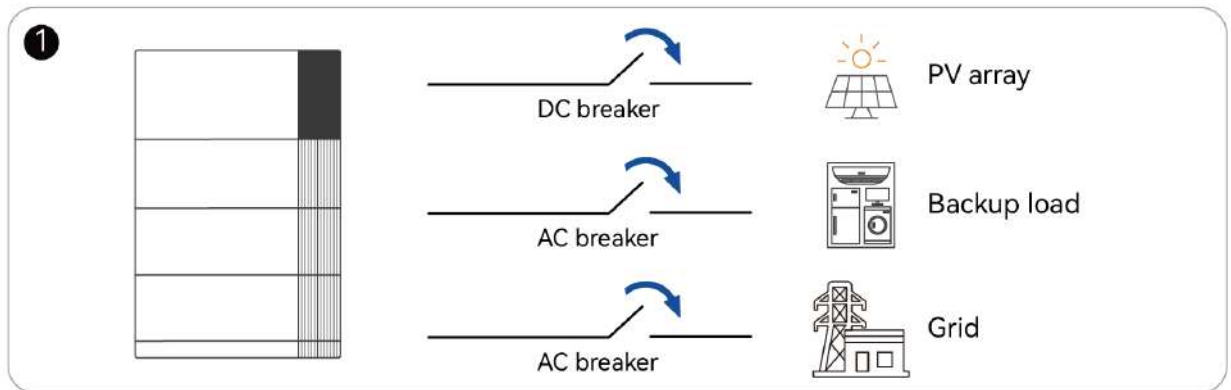
## 7. Start up the system

### Before you begin

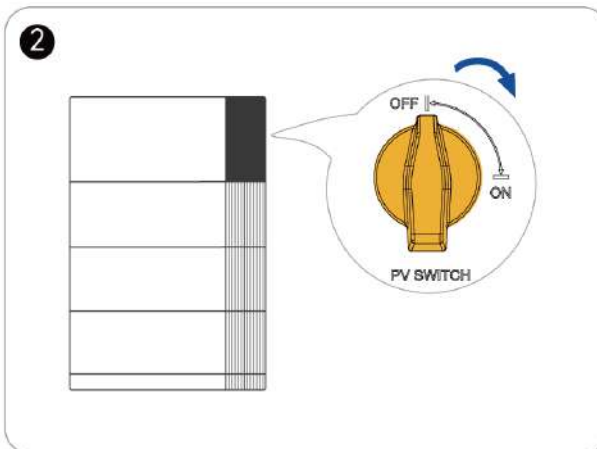
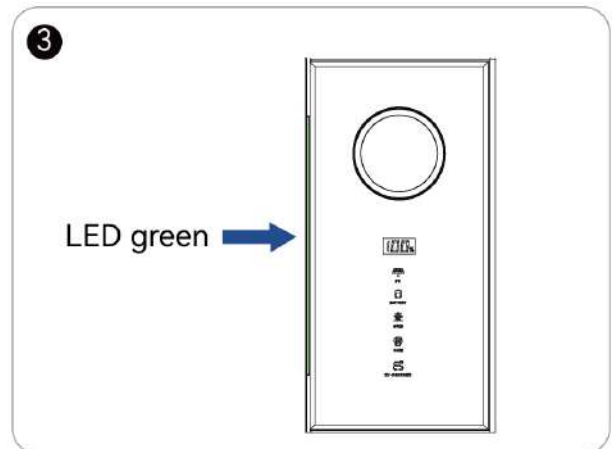
Verify that all the electrical connections are properly wired and secured before starting up the system.

#### • Method 1 for starting up the system

1. Open the AC distribution box, turn on the following circuit breakers in sequence.
  - a. The backup loads
  - b. The grid



2. On the inverter, turn on the **PV SWITCH** to enable the connection to the PV arrays.
3. Check the LED indicator status on the inverter panel to ensure that the inverter is running properly.

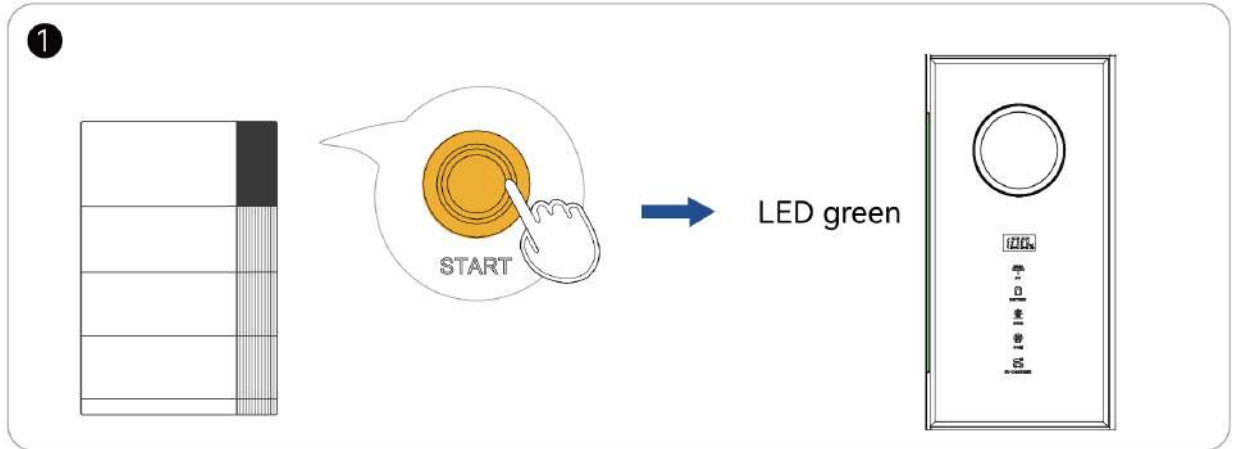


4. Download the elekeeper App and perform the system commissioning.

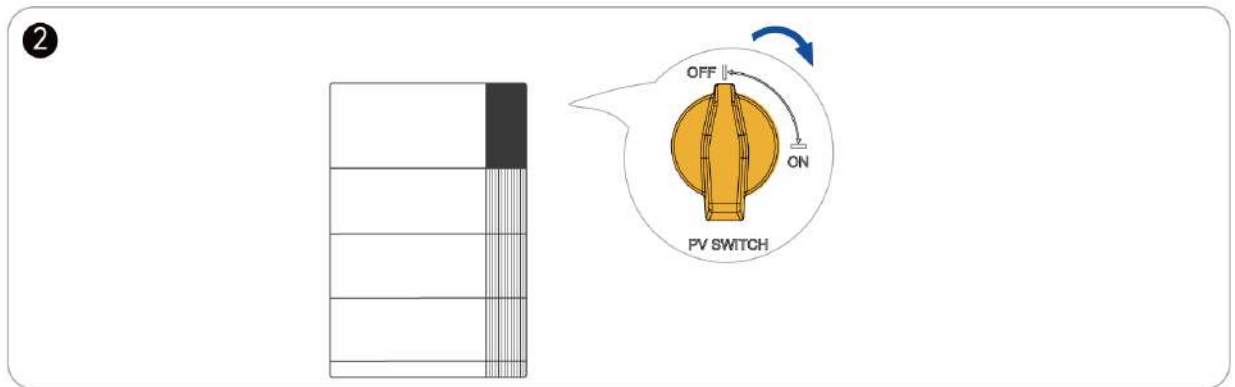


#### • Method 2 for starting up the system

1. On the left side of the inverter, press and hold the **START** button for 5 seconds until the LED indicator on the front panel is on.

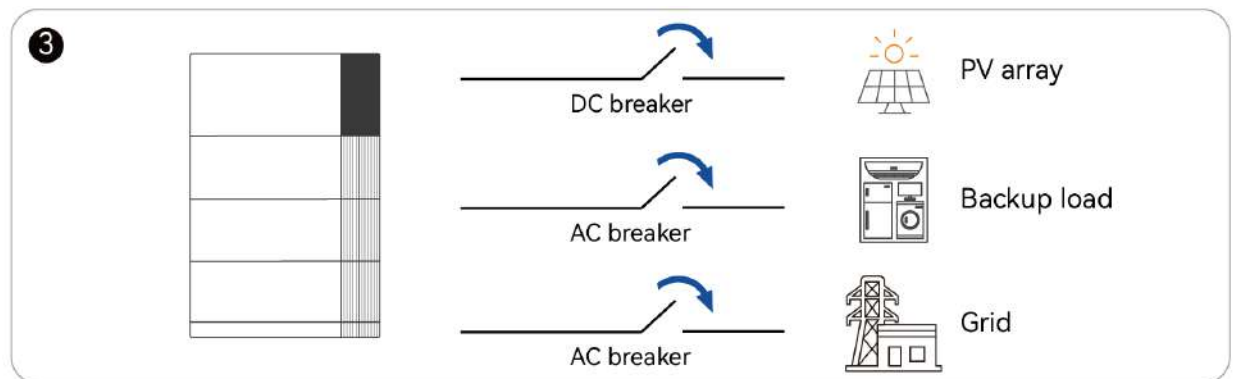


2. On the inverter, turn on the **PV SWITCH** to enable the connection to the PV arrays.



3. Open the AC distribution box, turn on the following circuit breakers in sequence.

- a. The backup loads
- b. The grid

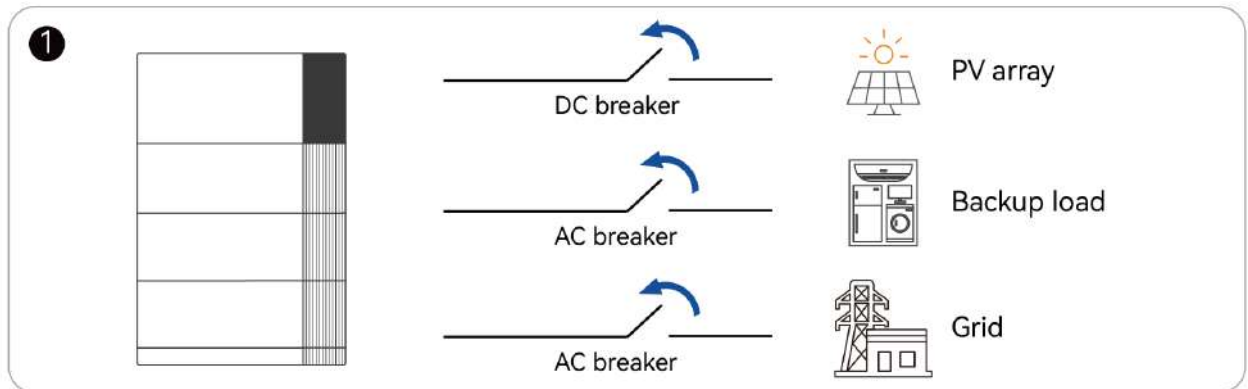


4. Download and elekeeper App and perform the system commissioning.

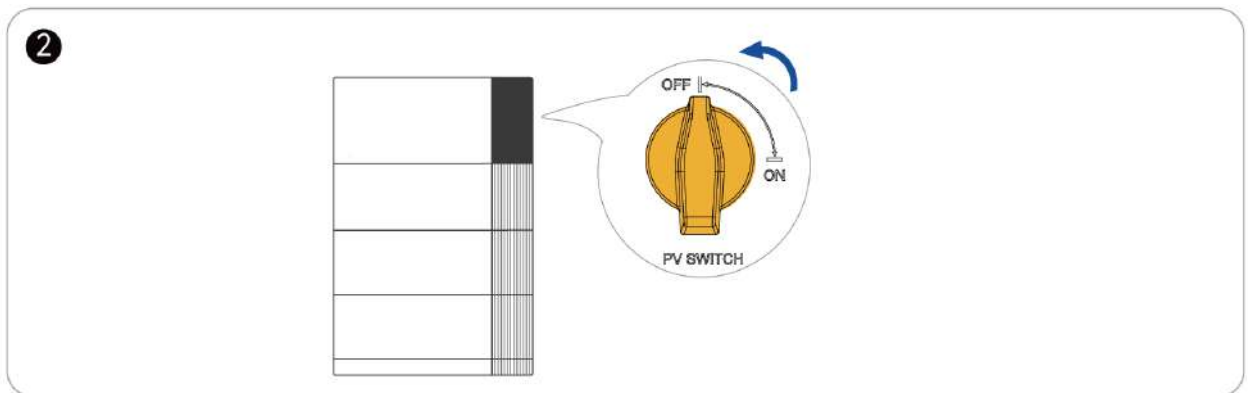


## 8. Shut down the system

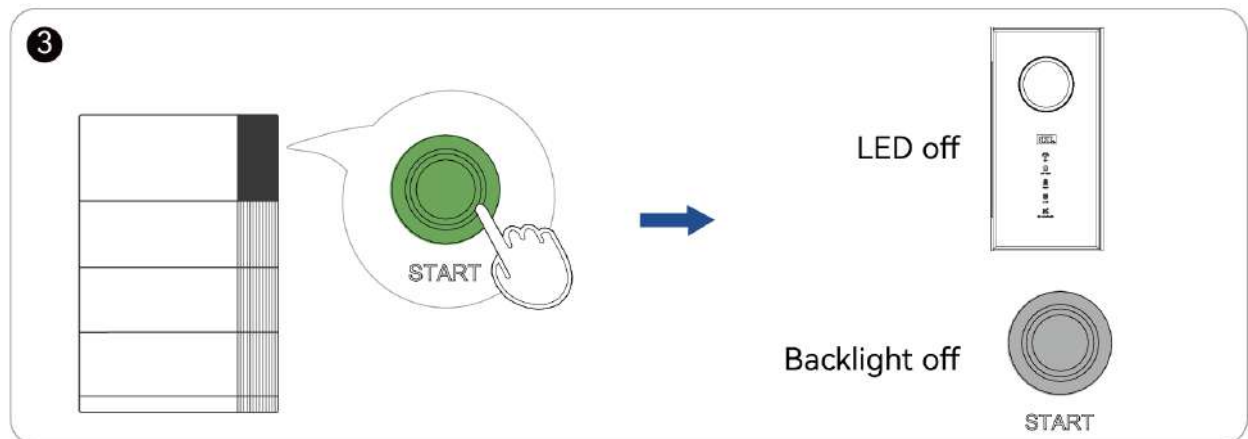
1. Open the AC distribution box, turn off the following circuit breakers:
  - a. The backup loads
  - b. The grid



2. On the left side of the inverter, turn off the **PV SWITCH** to disconnect from the PV arrays.



3. On the inverter, press and hold the **START** button for 5 seconds, and then release the button. Wait until both the button backlight and the LED indicator turn off.



**Note:** Once the system is shut down, there is no voltage output at the positive and negative terminals. Do not forcibly activate the system to output voltage by other means.

**Note:**

Battery module disconnection: Electronic switch. To disconnect the output, press and hold the **START** button for 5 seconds. This causes the battery module to shut down automatically and the main positive contactor to open.

## 9. Commissioning on App

### 9.1. Download and log in to the elekeeper App

#### 9.1.1. 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.

#### 9.1.2. 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.



#### 9.1.3. 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.

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



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

The 'Sign Up' screen displays a 'Please select your country' dropdown menu with 'Algeria' selected. Below it, the 'Corresponding Server' is set to 'International Node'. The 'Please select your role' section offers three options: 'End User' (End Product User), 'Installer' (Retail/Installation/Service), and 'Distributor' (Product & End-User services only). A 'Next' button is at the bottom.

| Parameter                      | Description                                                                                                                                                                                                                                                                                                            |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Corresponding Server</b>    | The server is set automatically depending on the selected country.                                                                                                                                                                                                                                                     |
| <b>Please select your role</b> | <ul style="list-style-type: none"> <li>• <b>End User:</b> The owner of the power plant. Select this option when the installer is signing up for the end user.</li> <li>• <b>Installer:</b> The installation and retail service providers.</li> <li>• <b>Distributor:</b> The distribution service provider.</li> </ul> |

Table 9.1. Signup parameters

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

The 'Register the owner's account' screen is shown in two states. The left state is the initial registration form with fields for 'User Name', 'Email', 'Captcha', 'Password', and 'Confirm Password'. The right state is the 'Supervisor Installer' form, which includes fields for 'Country' (set to Belgium), 'Time Zone' (set to UTC+01:00), 'Town/City', 'Postal Code', and 'Detailed address'. It also features a checkbox for 'I Agree (Owner Privacy Policy & And User Registration Agreement)' and a 'Sign Up' button.

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

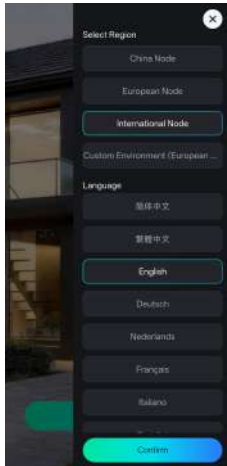
To join a company:

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

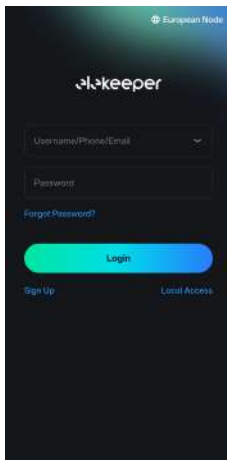
- For the **Distributor** role, provide similar information as the **Installer** role.

### 9.1.4. Log in to the elekeeper App

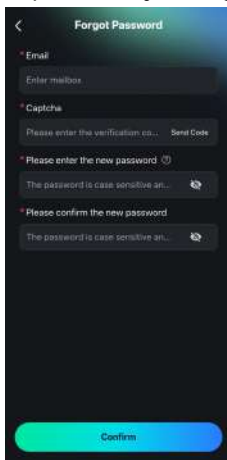
1. Open the App and tap the globe icon  on the top right corner.
2. Select the **Region** and **Language** depending on the installation site of the system.



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



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



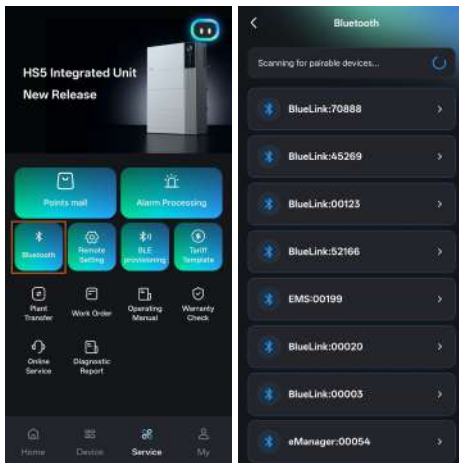
## 9.2. Initialization and installation diagnosis

### 9.2.1. Perform one-click initialization

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.



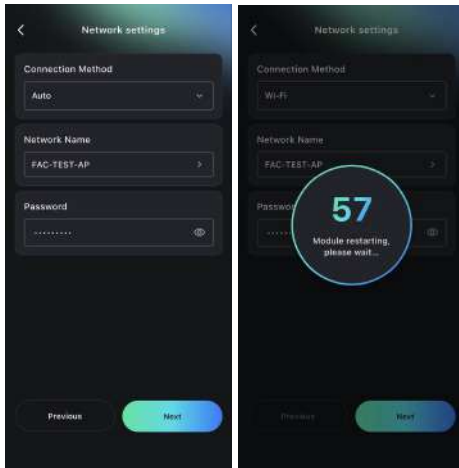
2. Tap **One-Click Initialize** to start initialization.

**Example:**



3. Configure the network parameters.

**Example:**



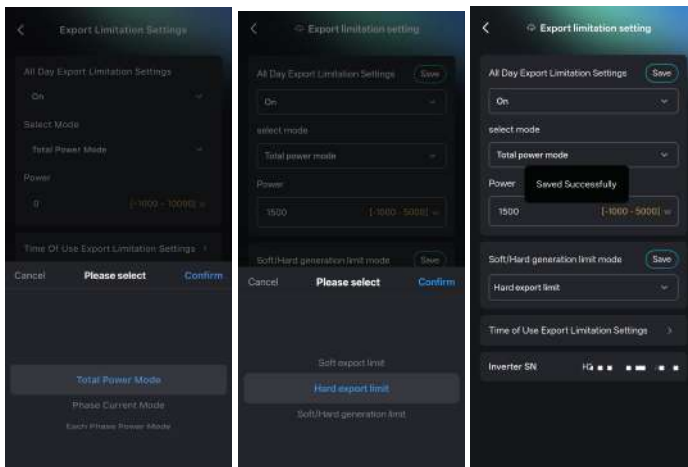
Example:

| Parameter                | Description                                                                                                                                                                                                 |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Connection Method</b> | The network connection type. <ul style="list-style-type: none"> <li>• <b>Auto</b></li> <li>• <b>Wi-Fi</b></li> <li>• <b>Ethernet:</b> ensure that the Ethernet cable is connected to the router.</li> </ul> |
| <b>Network Name</b>      | The Wi-Fi network to connect to.                                                                                                                                                                            |
| <b>Password</b>          | The password for the selected Wi-Fi network.                                                                                                                                                                |

4. Configure the export limitation function.

The export limitation function controls the maximum power that the inverter exports to the grid.

Example:

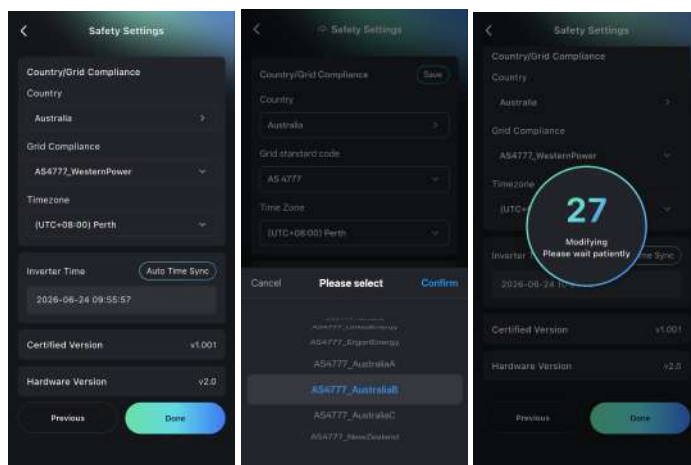


| Parameter                                 | Description                                                                                              |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>All Day Export Limitation Settings</b> | Enable or disable the export power limitation function that runs continuously throughout the entire day. |

| Parameter                                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Select Mode</b>                            | <p>The modes for the export power limitation function.</p> <ul style="list-style-type: none"> <li>• <b>Total Power Mode</b></li> <li>• <b>Phase Current Mode</b></li> <li>• <b>Each Phase Power Mode</b></li> </ul> <p><b>Phase Current Mode</b> and <b>Each Phase Power Mode</b> are only applicable for three-phase inverters.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Power</b>                                  | The export power limit value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Soft/Hard generation limit mode</b>        | <ul style="list-style-type: none"> <li>• <b>Soft export limit:</b> enable software limit control only, and the export limit is the user-defined power limit value. <ul style="list-style-type: none"> <li>– In case of communication loss, the inverter exports power within the AC grid output power limit.</li> <li>– In 60 seconds after communication recovery, the export limit is controlled by the user-defined power limit value again.</li> </ul> </li> <li>• <b>Hard export limit:</b> enable both software and hardware limit controls. <ul style="list-style-type: none"> <li>– When the export power exceeds the user-defined limit for 5 seconds, the inverter enters standby mode. The inverter restarts automatically in 60 seconds, gradually ramping up its output power.</li> <li>– In case of communication loss for 5 seconds, the inverter stops working.</li> </ul> </li> <li>• <b>Soft/Hard generation limit:</b> the control mode is similar to <b>Hard export limit</b>. Only that the inverter enters standby mode when the export power exceeds the user-defined limit for 15-20 seconds.</li> </ul> <p><b>Note:</b> This parameter is only applicable for specific grid code according to local regulations.</p> |
| <b>Time Of Use Export Limitation Settings</b> | <p>The time-specific settings that take priority over the <b>All Day Export Limitation Settings</b>. The settings can be executed once on specific time and date or repeatedly as a loop.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

##### 5. Configure the safety parameters.

###### Example:



| Parameter      | Description                          |
|----------------|--------------------------------------|
| <b>Country</b> | The equipment installation location. |

| Parameter              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Grid Compliance</b> | <p>Select the grid compliance according to your installation location.</p> <p>Taking Australia as an example, select the specific type of compliance according to the owner's grid configuration.</p> <ul style="list-style-type: none"> <li>. <b>AS4777_AustraliaA</b>: For large interconnected power system.</li> <li>. <b>AS4777_AustraliaB</b>: For small interconnected power systems. For example, Western Power.</li> <li>. <b>AS4777_AustraliaC</b>: For isolated or remote power systems. For example, Horizon Power and TasNetworks.</li> </ul> |
| <b>Inverter Time</b>   | Tap <b>Auto Time Sync</b> to sync the inverter time to the time of the device running the App.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## 9.2.2. Perform installation diagnosis

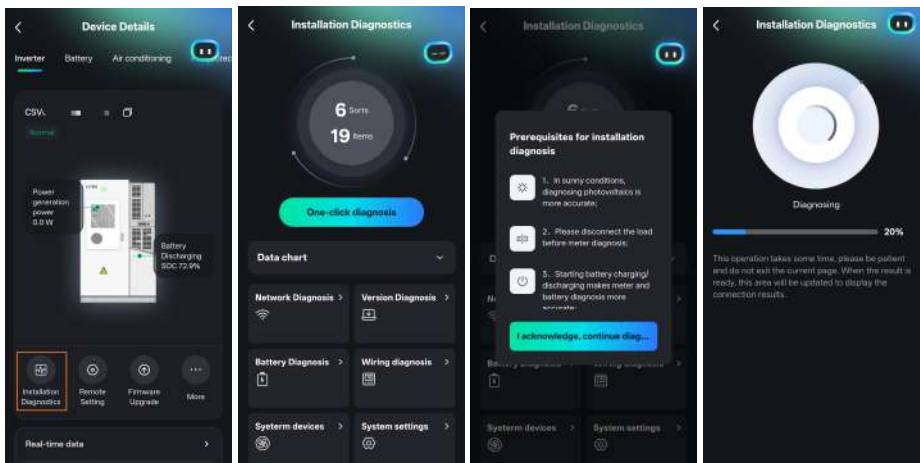
After the inverter initialization is completed, perform one-click installation diagnosis to verify the installation status of the system, including the network connection, battery settings, wiring status, and so on.

1. On the **Home** page, tap the device name to open the **Device Details** page.

**Example:**



2. Tap **Installation Diagnostics** to start one-click diagnosis.



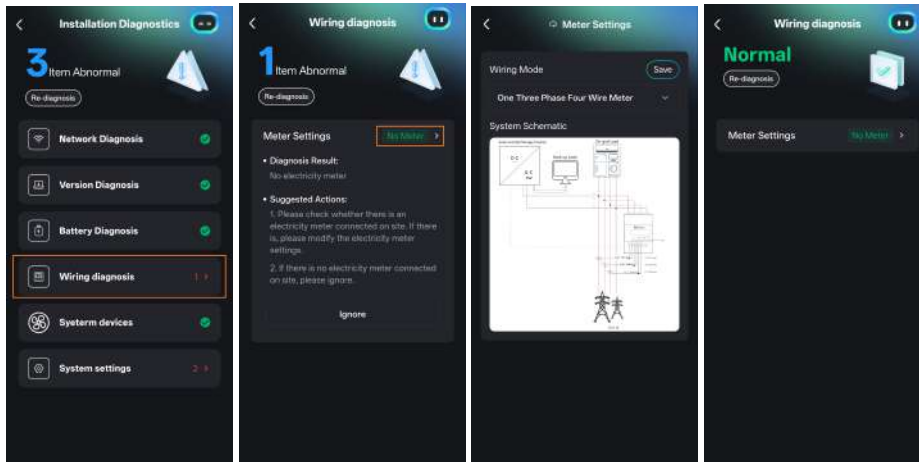
**Note:** If the software versions of the product are too low, follow the prompt-up to upgrade the system version first.

3. Check the faulty diagnostics results and take the suggested actions.

**Example:**

- a. Tap **Wiring diagnosis** to check the detailed issue and suggested actions.
- b. Tap **No Meter** to change the meter settings where applicable or ignore this issue.

- c. Tap **Re-diagnosis** to run the check again.
- d. Take necessary actions until the issue is resolved.



### 9.3. Plant management

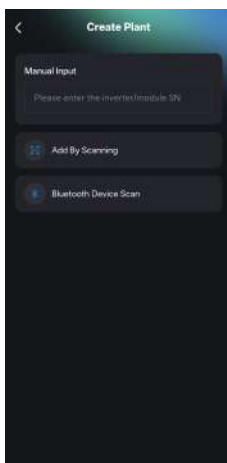
### 9.3.1. Create a power plant

Follow this procedure to create a power plant.

1. On the **Home** page, tap **Create Plant**.



2. Provide the product serial number (SN) to add the devices in the plant.
  - **Manual Input:** Enter the SN of the inverter or the communication module.
  - **Add By Scanning:** Scan the SN.
  - **Bluetooth Device Scan:** Connect to the inverter or communication module through Bluetooth connection.



3. Configure the plant details based on the owner's actual information.

**Create Plant**

1 Add Device 2 Station Information 3 LPR Installer

\* Plant Name  
CH62 plant

\* Country  
Belgium

\* Time Zone  
(UTC+01:00) Brussels, Copenhagen, Madrid, Paris

\* City  
Woluwe-Saint-Lambert

\* Detailed address  
[Address field]

\* Post Code  
[Post Code field]

Previous Next

Is photovoltaic installed ☒

\* Plant capacity  
50 kWp

Number of PV Panels  
12

PV Panel Azimuth  
45

PV Panel Inclination  
45

Previous Next

4. Provide the end user and installer information for future maintenance and support purposes.

The installer company code is created when the installed signs up at the App. For example, 19067G.

**Create Plant**

1 Add Device 2 Station Information 3 Customer

Please enter both owner and installer info for plant maintenance and support!

End User  Select Owner

Username / Phone Number

Search

Installer

Username / Phone Number / Company

Search

Ignore

Previous Save

5. After the plant is created successfully, check the plant status as needed.

**Plant**

0°C

Grid 0 W Photovoltaic 0 W Load 0 W

14.8 W 90.1% Discharge

Normal CH62 plant

Revenue

0 Yesterday 0 Month 0 Total

AI driving AI Saving 3.0

Home Service My

**Device**

90.1%

Associated Devices

EMS Module(199) Grid Meter(199)

OK Online Offline

Energy Storage PV Meter(199)

Offline Offline

Diesel(199)

Home Service My

**Device Details**

Inverter Battery Air conditioning

CSVA

Power generation power 0.0 W

Battery Discharging SOC 73.9%

Installation Diagnostic Remote Setting Firmware Upgrade More

Real-time data

### 9.3.2. View the power plant details

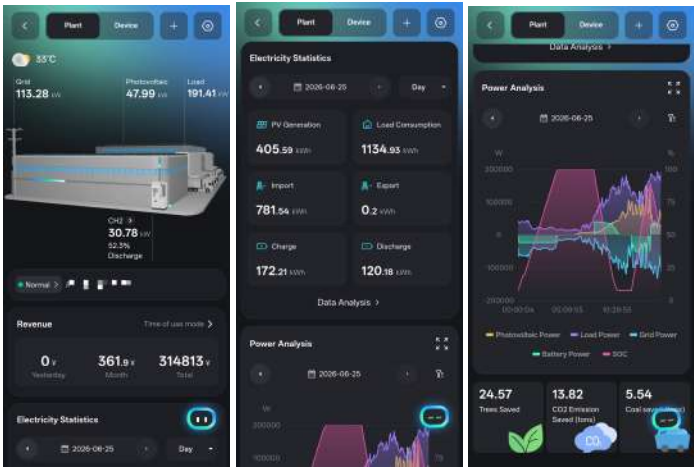
Follow this procedure to check detailed power plant information.

- On the **Home** page, select and tap the target power plant.

**Example:**



- Check the following plant information.



| Information             | Description                                                                                                                                                                                                                                                                                                                                        |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Live energy information | <ul style="list-style-type: none"> <li><b>Grid:</b> The power that the device is importing from or exporting to the grid.</li> <li><b>Photovoltaic:</b> The current power generated by the PV array.</li> <li><b>Load:</b> The overall power consumption by the load.</li> <li><b>Discharge:</b> The current SOC of the battery system.</li> </ul> |
| Revenue                 | The daily, monthly, and total revenue of the power plant.                                                                                                                                                                                                                                                                                          |
| Electricity Statistics  | The energy statistics of the power plant. Daily, weekly, monthly, yearly, and total statistics are available for detailed data analysis.                                                                                                                                                                                                           |
| Power Analysis          | The power statistics of the power plant.                                                                                                                                                                                                                                                                                                           |

Table 9.2. Power plant information

- Tap each highlighted area for further information or operation.



| Number | Description                                                                                                |
|--------|------------------------------------------------------------------------------------------------------------|
| ①      | Tap to check the weather forecast.                                                                         |
| ②      | Tap to open the <b>Device Details</b> page for detailed device status and operations like remote settings. |
| ③      | Tap to open the alarm messages list.                                                                       |
| ④      | Tap to check or modify the working strategy of the device.                                                 |

## 9.4. View product information

### 9.4.1. Check alarm messages

On the elekeeper App, monitor the system and check the real-time alarm messages.

1. Open the alarm message list with one of the options:

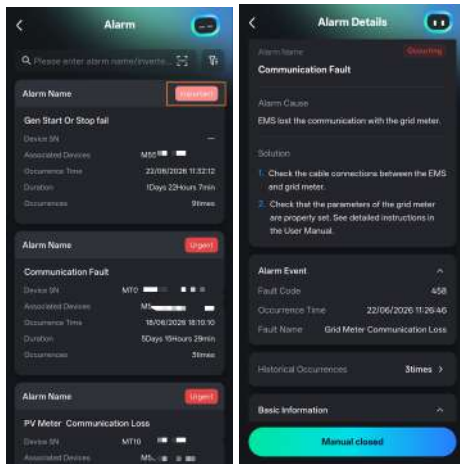
- On the **Home** page, tap the plant status icon in the middle. For example:



- On the **Service** page, tap **Alarm Processing**.



2. On the **Alarm** page, tap the alarm severity to open the alarm details.



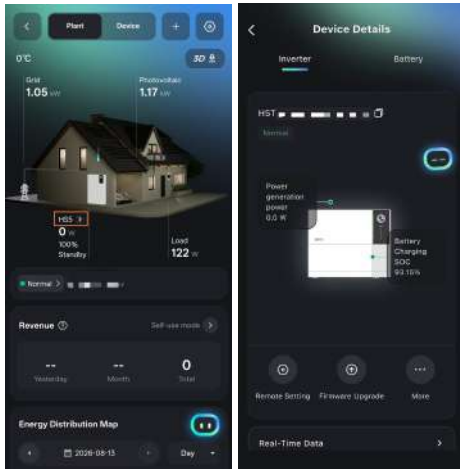
3. Take the suggested troubleshooting actions. Or close the alarm manually if applicable.

## 9.4.2. Check battery status

The installation engineer or the owner can follow this procedure to check the battery status on the elekeeper App.

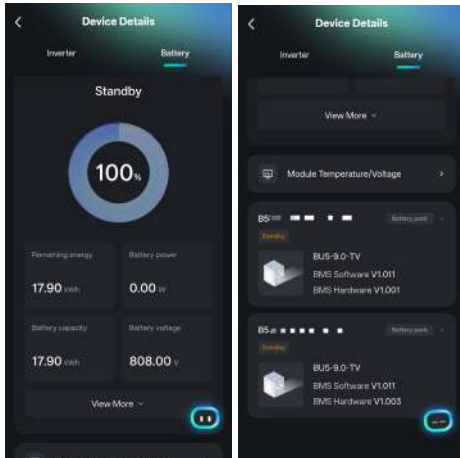
1. On the **Home** page, tap the plant to open the plant details page. Then tap the product name to open page **Device Details**.

**Example:**

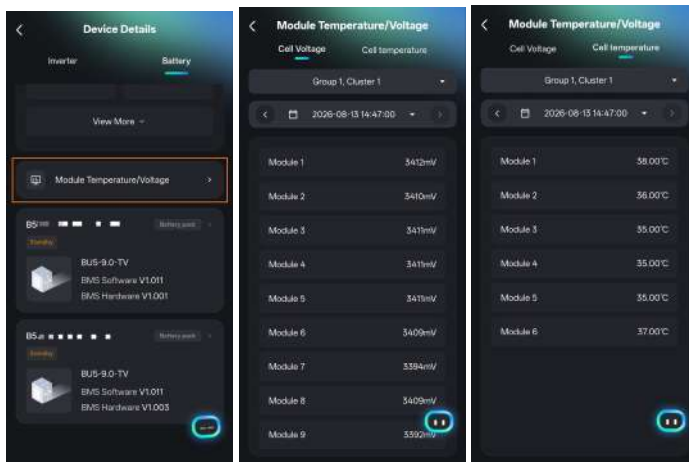


2. Tap page **Battery** to open the battery details page.

**Example:** View the SoC and remaining energy of the battery system:



3. Check the battery module temperature and voltage as needed.

**Example:**

### 9.4.3. View the inverter firmware version

(For Installer role only) Follow this procedure to view the following inverter firmware versions:

- **Display Board Version:** advanced RISC machine (ARM) version
- **Control Board Version:** digital signal processor (DSP) version

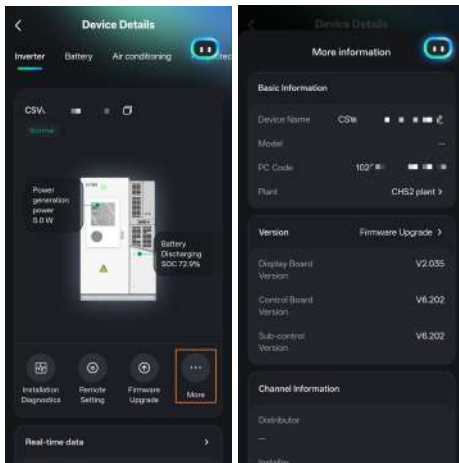
1. On the **Home** page, tap the device name to open the **Device Details** page.

**Example:**



2. Tap **More**.

**Example:**



3. On the **Device Details** page, tap **Firmware Upgrade** to upgrade the software versions as needed.



#### 9.4.4. View the V-Watt and V-Var settings

This inverter complies with AS/NZS 4777.2: 2020 for power quality response modes. It meets DNSPs' grid connection rules and requirements for the volt-watt and volt-var settings in different regions.

**Note:**

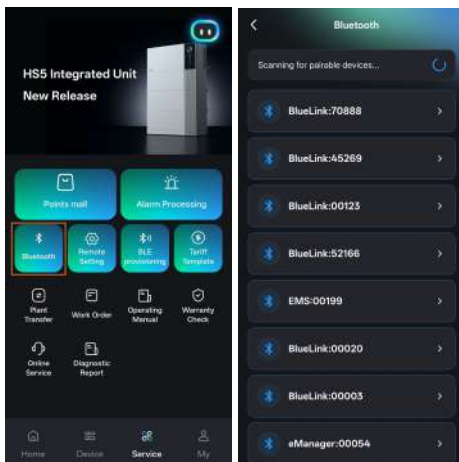
With regard to the power rate limit mode, SAJ product sets the product WGr to 16.67% Pn by default in the following cases according to the requirements of 3.3.5.2 as 4777.2: 2020.

- Soft ramp up after connection.
- Reconnect or soft ramp up/down following a response to frequency disturbance.

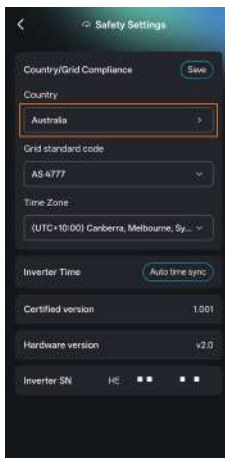
1. On page **Service**, tap **Bluetooth**. Select the communication module, inverter or EMS according to the last five digits of the serial number (SN).

**Example:**

- **BlueLink: 45269** for a communication module or inverter.
- **EMS: 00199** for EMS units.



2. On the **Remote Setting** page, tap **Safety Settings** and check whether the grid compliance is set to **Australia** grid codes. Change the settings if needed.



- On the **Remote Setting** page, select **V-Watt/V-Var** to view the parameter values.

For **V-Watt** response mode:

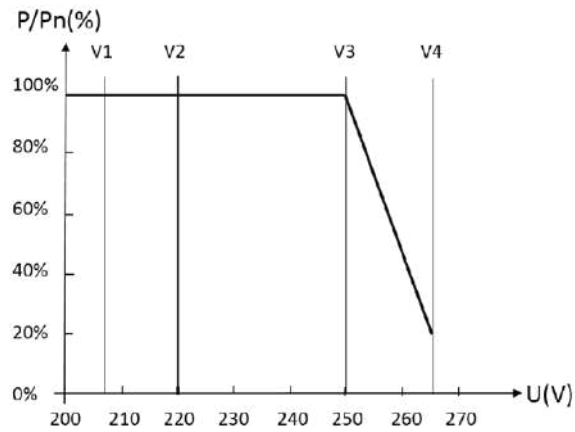


Figure 9.1. Curve for a Volt-Watt response mode (AS4777 Series)

| V-Watt/V-Var |          |
|--------------|----------|
| V-Watt       | Enabled  |
| V1           | 207.0V   |
| V2           | 220.0V   |
| V3           | 255.0V   |
| V4           | 260.0V   |
| %P1          | 100.0%   |
| %P2          | 100.0%   |
| %P3          | 100.0%   |
| %P4          | 20.0%    |
| V-Var        | Disabled |
| V1           | 207.0V   |
| V2           | 220.0V   |

Parameters:

For **Volt-Var** control mode:

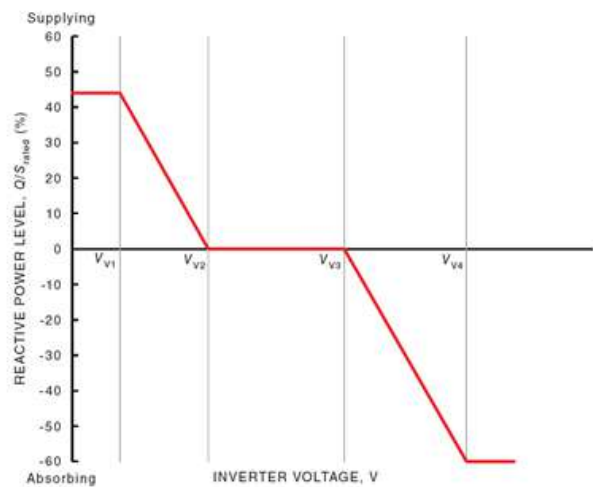


Figure 9.2. Curve for a Volt-Var control mode (AS4777 Series)

|              |         |
|--------------|---------|
| V-Watt/V-Var |         |
| %P2          | 100.0%  |
| %P3          | 100.0%  |
| %P4          | 20.0%   |
| V-Var        | Enabled |
| V1           | 307.0V  |
| V2           | 220.0V  |
| V3           | 240.0V  |
| V4           | 258.0V  |
| %VAR1        | 44.0%   |
| %VAR2        | 0%      |
| %VAR3        | 0%      |
| %VAR4        | -60.0%  |

Parameters:

## 9.5. System function configurations

### 9.5.1. Configure working strategy

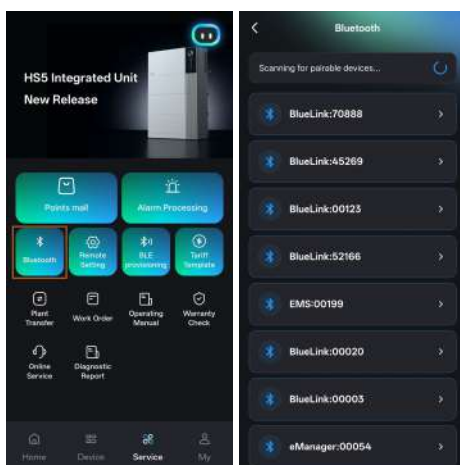
Follow this procedure to configure the device working strategy.

**Note:** The working strategy options and parameters may vary for different devices. Configure the parameters based on the actual App.

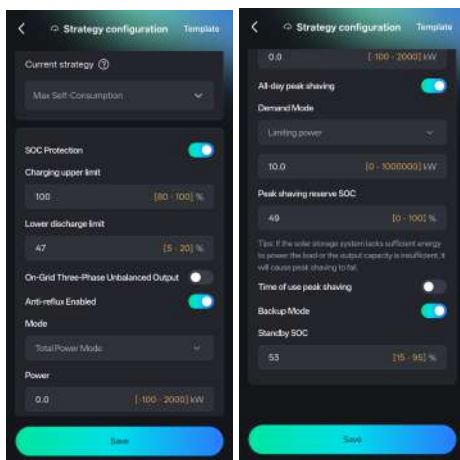
- On page **Service**, tap **Bluetooth**. Select the communication module, inverter or EMS according to the last five digits of the serial number (SN).

**Example:**

- BlueLink: 45269** for a communication module or inverter.
- EMS: 00199** for EMS units.



- Select **Strategy Configuration** or **Working Modes** (depending on the device) to configure the parameters as needed.
- For mode **Max Self-Consumption**, configure the following parameters:

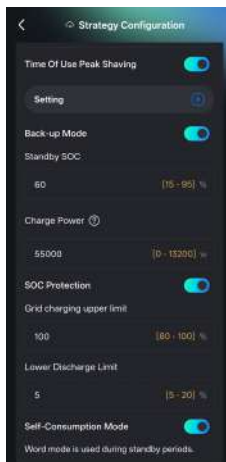


| Parameter                   | Description                                                                                                   |
|-----------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Current strategy</b>     | The active working strategy for the device.                                                                   |
| <b>SOC Protection</b>       | Whether to enable battery state of charge (SOC) protection to help prevent excessive charging or discharging. |
| <b>Charging upper limit</b> | The maximum battery SOC allowed during charging. Once reached, the battery stops charging.                    |

| Parameter                                    | Description                                                                                                                                           |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Lower discharge limit</b>                 | The minimum battery SOC allowed during discharging to protect the battery from over-discharge. Once reached, the battery stops discharging.           |
| <b>On-Grid Three-Phase Unbalanced Output</b> | Whether to enable three-phase unbalanced output when the system is operating on-grid.<br>This parameter is applicable for three-phase inverters only. |
| <b>Anti-reflux Enabled</b>                   | Enables or disables export limit control function to prevent power from feeding back to the grid.                                                     |
| <b>Mode</b>                                  | Selects the export limit control mode used by the system.                                                                                             |
| <b>Power</b>                                 | The power limit value used in the selected control mode.                                                                                              |
| <b>All-day peak shaving</b>                  | Enables or disables peak shaving throughout the entire day.                                                                                           |
| <b>Demand Mode</b>                           | Selects the demand control method used for peak shaving.                                                                                              |
| <b>Demand Mode power</b>                     | Sets the target power limit used when the selected demand mode requires a power threshold.                                                            |
| <b>Peak shaving reserve SOC</b>              | Sets the battery SOC reserved for peak shaving operation.                                                                                             |
| <b>Time of use peak shaving</b>              | Enables or disables peak shaving based on configured time periods.                                                                                    |
| <b>Backup Mode</b>                           | Enables or disables backup power operation so the battery can reserve energy for backup loads.                                                        |
| <b>Standby SOC</b>                           | Sets the battery SOC to be maintained in standby for backup or reserve purposes.                                                                      |

Table 9.3. Max Self-Consumption parameters

4. For **Time of Use Peaking Shaving** mode, configure the following parameters:

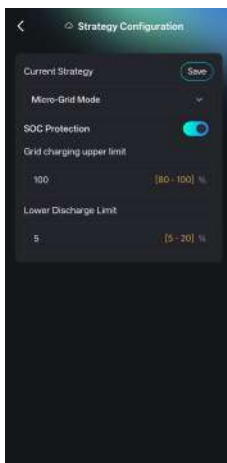


| Parameter                       | Description                                                                                                                             |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Time Of Use Peak Shaving</b> | Enables or disables peak shaving based on configured time-of-use periods.                                                               |
| <b>Setting</b>                  | The time-of-use setting area where you can add and configure the charging and discharging schedules at configured charging power limit. |
| <b>Back-up Mode</b>             | Whether to enable the backup power operation so the battery can reserve energy for backup loads.                                        |
| <b>Standby SOC</b>              | The battery SOC to be maintained in standby for backup or reserve purposes.                                                             |
| <b>Charge Power</b>             | The charging power used when backup mode charging is active.                                                                            |

| Parameter                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SOC Protection</b>            | Whether to enable battery state of charge (SOC) protection to help prevent excessive charging or discharging.                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Grid charging upper limit</b> | The maximum battery SOC allowed when charging from the grid.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Lower Discharge Limit</b>     | The minimum battery SOC allowed during discharging to protect the battery from over-discharge.                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Self-Consumption Mode</b>     | Whether to enable self-consumption mode during standby periods. <ul style="list-style-type: none"> <li>For CHS2 series, enable this option of <b>Self-Consumption Mode</b> for the non-charging or non-discharging periods so that the system can work in self-consumption mode when the system is not charging or discharging. If this option is disabled during these periods, the system will be at the bypass status and provides no power to the backup loads.</li> </ul> |

Table 9.4. TOU mode parameters

5. For **Micro-Grid Mode**, configure the following parameters:



| Parameter                        | Description                                                                                                      |
|----------------------------------|------------------------------------------------------------------------------------------------------------------|
| <b>Current Strategy</b>          | The active working strategy for the device.                                                                      |
| <b>SOC Protection</b>            | Enables or disables battery SOC protection to help prevent excessive charging or discharging in micro-grid mode. |
| <b>Grid charging upper limit</b> | The maximum battery SOC allowed when charging from the grid.                                                     |
| <b>Lower Discharge Limit</b>     | Sets the minimum battery SOC allowed during discharging to protect the battery from over-discharge.              |

Table 9.5. Micro-Grid mode parameters

6. For **VPP Mode**, configure the following parameters:



| Parameter                 | Description                                                                                               |
|---------------------------|-----------------------------------------------------------------------------------------------------------|
| VPP Enable                | Enables or disables VPP mode for the device.                                                              |
| SOC Protection            | Enables or disables battery SOC protection to help prevent excessive charging or discharging in VPP mode. |
| Grid charging upper limit | The maximum battery SOC allowed when charging from the grid.                                              |
| Lower Discharge Limit     | Sets the minimum battery SOC allowed during discharging to protect the battery from over-discharge.       |

Table 9.6. VPP mode parameters

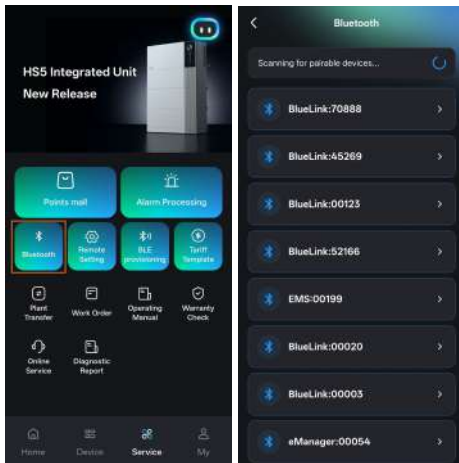
## 9.5.2. Set the battery parameters

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.

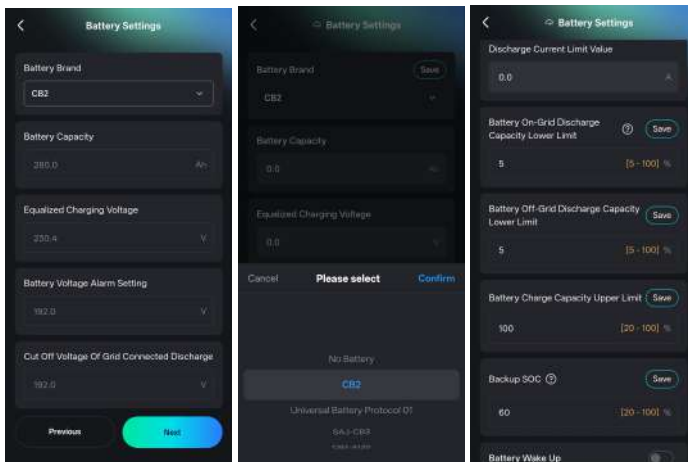
1. On page **Service**, tap **Bluetooth**. Select the communication module, inverter or EMS according to the last five digits of the serial number (SN).

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

| Parameter                                              | Description                                                                                                                                                                                                  |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cut Off Voltage Of Grid Connected Discharge</b>     | The voltage at which the battery hard-stops discharging during grid-tied operation and switches to grid power, serving as the final physical protection.                                                     |
| <b>Charge Current Limit Value</b>                      | 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.                                                    |
| <b>Discharge Current Limit Value</b>                   | The maximum discharging current (A) allowed. The load power is limited beyond this current to avoid overcurrent damage to the battery.                                                                       |
| <b>Battery On-Grid Discharge Capacity Lower Limit</b>  | The SOC percentage at which discharging stops during grid-tied operation, switching to grid power to reserve energy for unexpected outages.                                                                  |
| <b>Battery Off-Grid Discharge Capacity Lower Limit</b> | The lower SOC percentage (typically lower than the grid-tied value) allowed during off-grid/power outage situations to extend emergency backup duration.                                                     |
| <b>Battery Charge Capacity Upper Limit</b>             | The SOC percentage at which charging stops. Reducing this value can prolong battery life.                                                                                                                    |
| <b>Backup SOC</b>                                      | 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.      |
| <b>Battery Wake Up</b>                                 | 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. |

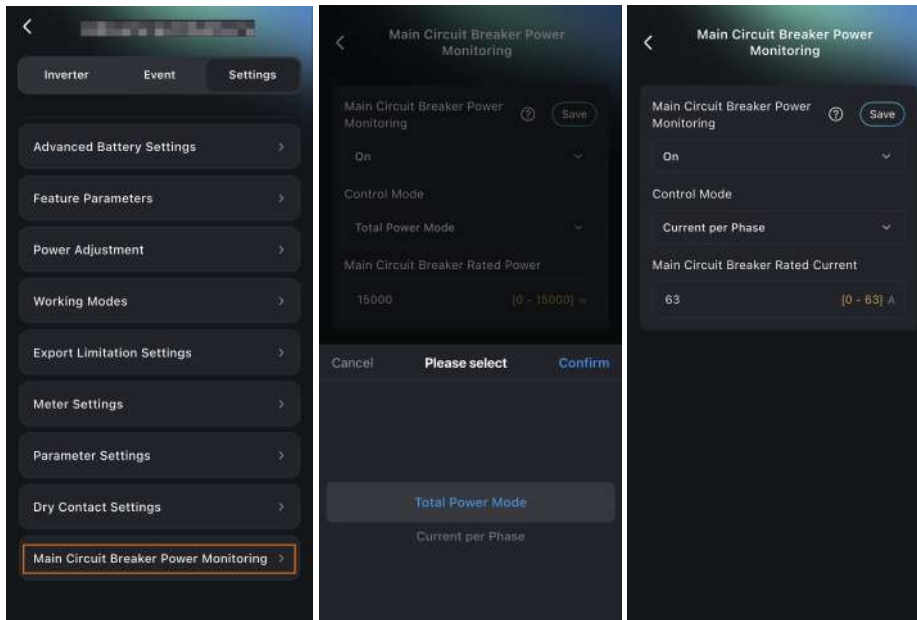
Table 9.7. Battery parameters

### 9.5.3. Configure main circuit breaker power monitoring

The main circuit breaker power monitoring function dynamically restricts power drawn from and fed to the grid, avoiding over-current tripping of your main circuit breaker.

1. Under the **Settings** tab on the device page, tap **Main Circuit Breaker Power Monitoring**.
2. From the drop down list of **Main Circuit Breaker Power Monitoring**, select **On** to enable this function.
3. Select the power monitoring mode and configure the corresponding parameters.

**Example:**



| Mode                   | Mode description                                                                                                                                                                                                                        | Steps                                                                                                                                                                                 |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Total Power Mode       | The inverter monitors the total import and export power in real time. When it exceeds the configured rated power of the main circuit breaker, the inverter restricts the import and export power to prevent overload tripping.          | <ol style="list-style-type: none"> <li>For <b>Control Mode</b>, select <b>Total Power Mode</b>.</li> <li>Configure a value for <b>Main Circuit Breaker Rated Power</b>.</li> </ol>    |
| Current per Phase Mode | The inverter monitors the current of each individual phase in real time. When it exceeds the configured rated current of main circuit breaker, the inverter dynamically restricts import and export power to prevent overload tripping. | <ol style="list-style-type: none"> <li>For <b>Control Mode</b>, select <b>Current per Phase</b>.</li> <li>Configure a value for <b>Main Circuit Breaker Rated Current</b>.</li> </ol> |

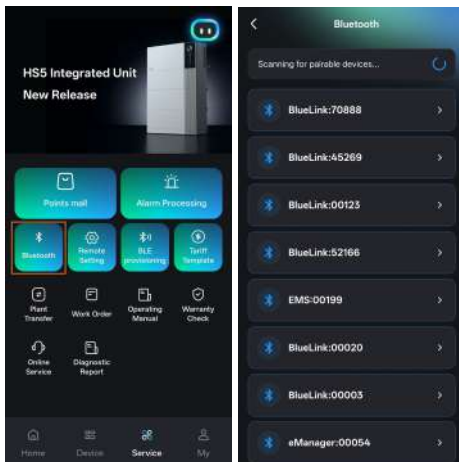
## 9.5.4. Configure power adjustment function

The power adjustment function allows the inverter to regulate and optimize the output power according to grid requirements and operational conditions. This function enables the inverter to adjust active and reactive power dynamically to improve grid stability, comply with local regulations, and enhance energy efficiency.

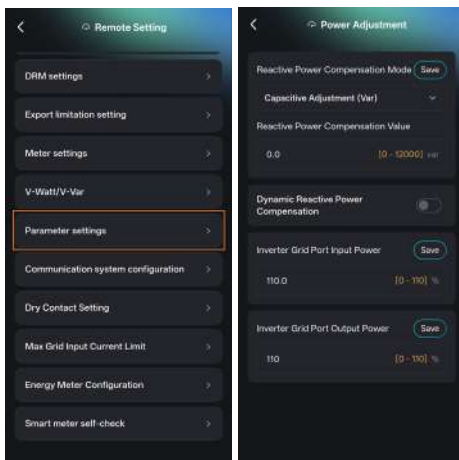
1. On page **Service**, tap **Bluetooth**. Select the communication module, inverter or EMS according to the last five digits of the serial number (SN).

**Example:**

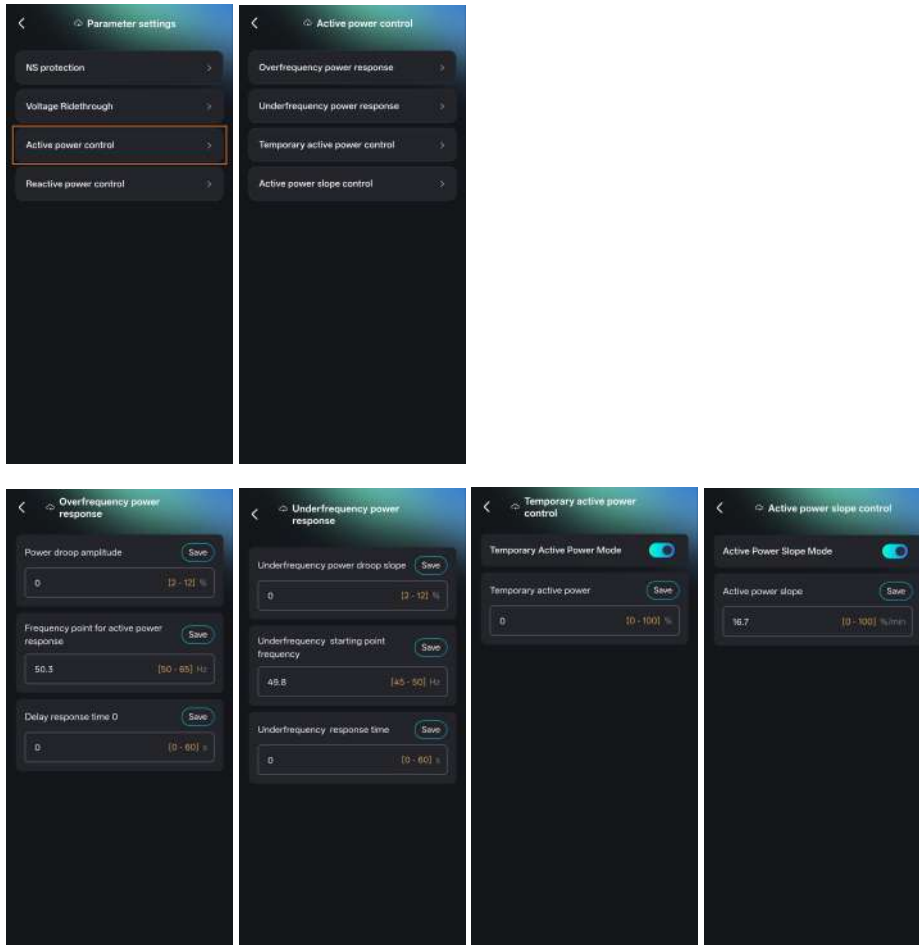
- **BlueLink: 45269** for a communication module or inverter.
- **EMS: 00199** for EMS units.



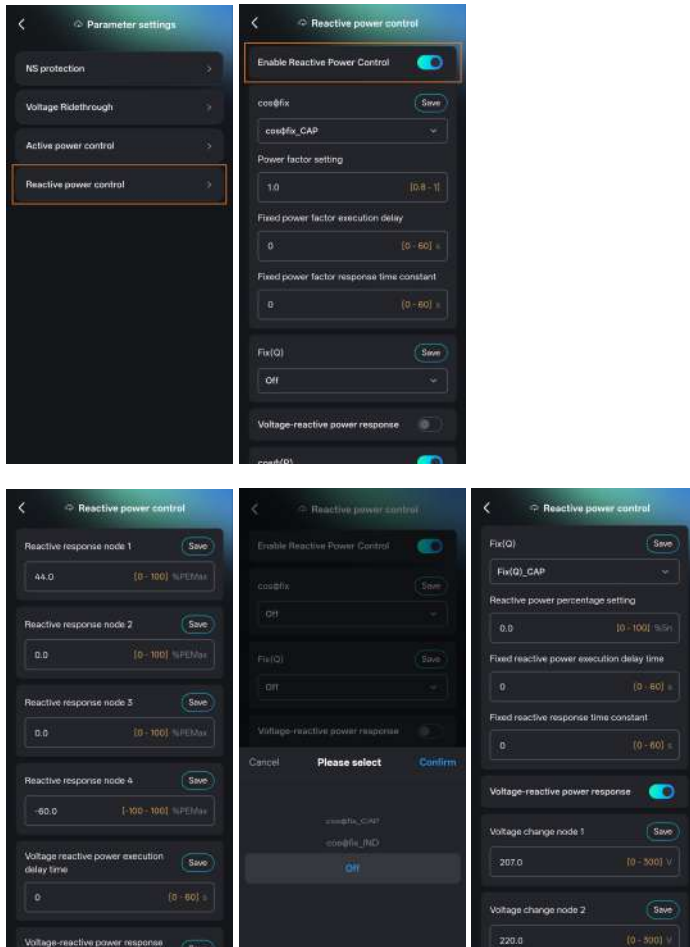
2. Select **Parameter settings**, and configure the power adjustment parameters as needed.



3. For **Active power control**, select the corresponding parameter groups and configure the corresponding parameters as needed:



- For **Reactive power control**, enable the control function first and then configure the corresponding parameters as needed:



### 9.5.5. Configure the DRM settings

When the **Country** is set to Australia on page **Safety Settings**, set the demand response mode (DRM) according to local regulations as needed.

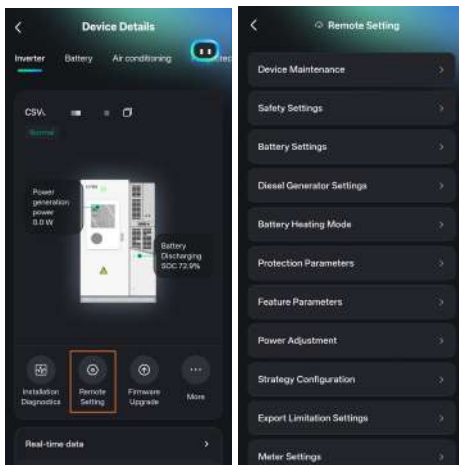
1. On the **Home** page, tap the device name to open the **Device Details** page.

**Example:**



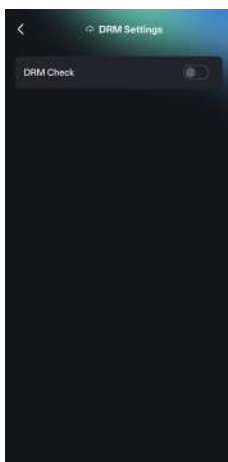
2. On page **Device Details**, tap **Remote Setting** to open the device settings.

**Example:**



**Note:** The settings menu and parameter list may vary for different devices and user roles.

3. Select **DRM Settings**, and enable the **DRM Check** function.



## 10. System maintenance

### 10.1. Routine maintenance

To ensure that the system lifespan, perform the suggested routine maintenance operations.



#### Danger of electric shock

Before operating on the system for cleaning, cable inspection, component maintaining, power off the whole system. Do not open any product cover until 5 minutes after disconnecting all sources of supply.

#### Note:

To purchase the routine maintenance service, contact the installer, distributor, or **SAJ** product support.

#### System routine maintenance

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

**Battery-specific routine maintenance**

| Check item                                            | Check method                                                                                                                                                                                                                                                                                                                                                      | Maintenance interval                                                            |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| <b>Battery routine maintenance (tool requirement)</b> | <ol style="list-style-type: none"> <li>1. Use only manufacturer-provided professional tools to inspect, test, or service the battery pack.</li> <li>2. Do not disassemble, modify, or perform maintenance on the battery pack without proper training and approved tools.</li> </ol>                                                                              | Applicable to all battery maintenance activities                                |
| <b>Battery module appearance</b>                      | <ol style="list-style-type: none"> <li>1. Check the battery modules for swelling, deformation, cracks, liquid leakage, corrosion, or abnormal odor.</li> <li>2. Check the battery enclosure for damage, deformation, or signs of overheating.</li> </ol>                                                                                                          | Once every 6 to 12 months                                                       |
| <b>Battery terminal and connection check</b>          | <ol style="list-style-type: none"> <li>1. Power off the entire system before performing any checks.</li> <li>2. Inspect all battery terminals and connectors for looseness, oxidation, or signs of overheating.</li> <li>3. Verify that all cable connections are tight and properly torqued to the specified value using manufacturer-approved tools.</li> </ol> | 6 months after the first commissioning and once every 6 to 12 months after that |
| <b>Battery operating status &amp; parameters</b>      | <ol style="list-style-type: none"> <li>1. Check the battery pack status such as SOC, voltage, current, and temperature.</li> <li>2. Ensure no cell voltage imbalance, over-temperature, or other alarms are reported.</li> <li>3. Verify the battery communicates normally with the inverter/BMS.</li> </ol>                                                      | Once every 6 months                                                             |
| <b>Battery ventilation and environment</b>            | <ol style="list-style-type: none"> <li>1. Check that the battery compartment and ventilation openings are free of dust, debris, or blockages.</li> <li>2. Ensure the battery is installed in a well-ventilated, cool, and dry environment away from heat sources or direct sunlight.</li> </ol>                                                                   | Once every 6 to 12 months (or once every 3 to 6 months in dusty environments)   |

## 10.2. Troubleshooting

For the errors reported as below, contact the service support for further assistance.

The troubleshooting operations must be performed by authorized technicians only.

| Error code | Error message                 | Possible cause                                                                                                                                                                              | Solution                                                                                                                                                                                                                                                                                                                          |
|------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1          | Master Relay Error            | <ol style="list-style-type: none"> <li>1. Live cable grounding occurred on the grid side.</li> <li>2. The grid voltage is too low.</li> <li>3. Inverter relay circuit is faulty.</li> </ol> | <ol style="list-style-type: none"> <li>1. Measure if the voltage between the ground cable and the neutral cable is greater than 10V.</li> <li>2. Measure if the grid voltage is too low.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                                                             |
| 2          | Master EEPROM Error           | The internal memory of the inverter is faulty.                                                                                                                                              | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. Check if any firmware upgrade is available and the selected firmware version is correct.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                       |
| 3          | Master Temperature High Error | Inverter over-temperature                                                                                                                                                                   | <ol style="list-style-type: none"> <li>1. Check if the inverter's cooling duct is blocked.</li> <li>2. Check if the inverter is installed in a direct sunlight location.</li> <li>3. Check if the installation environment has adequate ventilation.</li> <li>4. If the fault persists, please contact your installer.</li> </ol> |
| 4          | Master Temperature Low Error  | Inverter under-temperature                                                                                                                                                                  | Check if the ambient temperature at the inverter installation location is too low. If not, please contact your installer.                                                                                                                                                                                                         |
| 5          | Lost Communication M<->S      | The internal communication of the inverter is lost.                                                                                                                                         | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                            |
| 6          | GFCI Device Error             | The residual current detection device of the inverter is faulty.                                                                                                                            | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                            |
| 7          | DCI Device Error              | The DC component detection device of the inverter is faulty.                                                                                                                                | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                            |

| Error code | Error message              | Possible cause                                                                 | Solution                                                                                                                                                                                                                                                                                                                                                       |
|------------|----------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8          | Current Sensor Error       | The current detection device of the inverter is faulty.                        | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. Check if positive and negative terminals of the string MC4 connector are reversely connected.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                                               |
| 9          | Master Phase1 Voltage High | The grid voltage exceeds the limit permitted by the inverter grid compliance.  | <ol style="list-style-type: none"> <li>1. Check if the grid voltage is too high.</li> <li>2. Check if the inverter AC output cables are securely connected and if the grid connection cables are too thin.</li> <li>3. Check if the selected inverter grid compliance is correct.</li> <li>4. If the fault persists, please contact your installer.</li> </ol> |
| 10         | Master Phase1 Voltage Low  | The grid voltage is below the limit permitted by the inverter grid compliance. | <ol style="list-style-type: none"> <li>1. Check if the grid voltage is too low.</li> <li>2. Check if the inverter AC output cables are securely connected.</li> <li>3. Check if the selected inverter grid compliance is correct.</li> <li>4. If the fault persists, please contact your installer.</li> </ol>                                                 |
| 11         | Master Phase2 Voltage High | The grid voltage exceeds the limit permitted by the inverter grid compliance.  | <ol style="list-style-type: none"> <li>1. Check if the grid voltage is too high.</li> <li>2. Check if the inverter AC output cables are securely connected and if the grid connection cables are too thin.</li> <li>3. Check if the selected inverter grid compliance is correct.</li> <li>4. If the fault persists, please contact your installer.</li> </ol> |
| 12         | Master Phase2 Voltage Low  | The grid voltage is below the limit permitted by the inverter grid compliance. | <ol style="list-style-type: none"> <li>1. Check if the grid voltage is too low.</li> <li>2. Check if the inverter AC output cables are securely connected.</li> <li>3. Check if the selected inverter grid compliance is correct.</li> <li>4. If the fault persists, please contact your installer.</li> </ol>                                                 |

| Error code | Error message                | Possible cause                                                                                                                                                      | Solution                                                                                                                                                                                                                                                                                                                                                       |
|------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13         | Master Phase3 Voltage High   | The grid voltage exceeds the limit permitted by the inverter grid compliance.                                                                                       | <ol style="list-style-type: none"> <li>1. Check if the grid voltage is too high.</li> <li>2. Check if the inverter AC output cables are securely connected and if the grid connection cables are too thin.</li> <li>3. Check if the selected inverter grid compliance is correct.</li> <li>4. If the fault persists, please contact your installer.</li> </ol> |
| 14         | Master Phase3 Voltage Low    | The grid voltage is below the limit permitted by the inverter grid compliance.                                                                                      | <ol style="list-style-type: none"> <li>1. Check if the grid voltage is too low.</li> <li>2. Check if the AC output cables are securely connected.</li> <li>3. Check if the selected inverter grid compliance is correct.</li> <li>4. If the fault persists, please contact your installer.</li> </ol>                                                          |
| 15         | Grid Voltage 10Min High      | The grid voltage exceeds the limit permitted by the inverter grid compliance.                                                                                       | <ol style="list-style-type: none"> <li>1. Check if the grid voltage is too high.</li> <li>2. Check if the inverter AC output cables are securely connected and if the grid connection cables are too thin.</li> <li>3. Check if the selected inverter grid compliance is correct.</li> <li>4. If the fault persists, please contact your installer.</li> </ol> |
| 16         | OffGrid Output Voltage Low   | The battery derates its output power due to excessive load power at the off-grid port, low battery state of charge, or excessively high or low battery temperature. | <ol style="list-style-type: none"> <li>1. Reduce the load connected to the off-grid port.</li> <li>2. Check if the battery state of charge is too low.</li> <li>3. Check if the ambient temperature of the battery is too high or too low.</li> <li>4. If the fault persists, please contact your installer.</li> </ol>                                        |
| 17         | OffGrid Output Short Circuit | The external wiring of the back-up port is short-circuited.                                                                                                         | Correct the external wiring at the back-up port.                                                                                                                                                                                                                                                                                                               |
| 18         | Master Grid Frequency High   | The grid frequency exceeds the upper limit specified by the local grid code.                                                                                        | <ol style="list-style-type: none"> <li>1. Check if the selected inverter grid compliance is correct.</li> <li>2. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                                                                                  |

| Error code | Error message                  | Possible cause                                                                | Solution                                                                                                                                                                                                                                                                                                                                          |
|------------|--------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 19         | Master Grid Frequency Low      | The grid frequency is below the lower limit specified by the local grid code. | <ol style="list-style-type: none"> <li>1. Check if the selected inverter grid compliance is correct.</li> <li>2. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                                                                     |
| 20         | BATInputMode Error             | The battery is connected in a non-parallel configuration.                     | <ol style="list-style-type: none"> <li>1. Check if the battery input configuration is correct.</li> <li>2. If the battery input is in parallel mode, check if all battery connections are secure.</li> </ol>                                                                                                                                      |
| 21         | Phase1 DCV High                | The DCI of the AC output exceeds the limit.                                   | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                            |
| 22         | Phase2 DCV High                | The DCI of the AC output exceeds the limit.                                   | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                            |
| 23         | Phase3 DCV High                | The DCI of the AC output exceeds the limit.                                   | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                            |
| 24         | Master No Grid Error           | The inverter fails to detect the grid voltage.                                | <ol style="list-style-type: none"> <li>1. Check if the grid is available, the switch of the grid-connection box has tripped, or the inverter AC cables are securely connected.</li> <li>2. If no problems are found, close the AC switch and reconnect to the grid.</li> <li>3. If this fault persists, please contact your installer.</li> </ol> |
| 25         | DC ReverseConnect Error        | Reverse polarity exists at the PV or battery port.                            | Check the DC port wirings.                                                                                                                                                                                                                                                                                                                        |
| 26         | Parallel machine CAN Com Error | Parallel CAN communication fails.                                             | Check the parallel CAN communication wirings.                                                                                                                                                                                                                                                                                                     |

| Error code | Error message         | Possible cause                                                                 | Solution                                                                                                                                                                                                                                                                                                                                                                                        |
|------------|-----------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 27         | GFCI Error            | A ground residual current fault is detected at the plant.                      | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches. Then Check if the AC output ground cable is secure and the AC wirings are correct.</li> <li>2. Check the AC/DC cables and PV panels for damages and water ingress.</li> <li>3. If no problems are found, restart the inverter. If this fault persists, please contact your installer.</li> </ol>                     |
| 28         | Phase1 DCI High       | The DCI of the AC output exceeds the limit.                                    | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                                                                          |
| 29         | Phase2 DCI High       | The DCI of the AC output exceeds the limit.                                    | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                                                                          |
| 30         | Phase3 DCI High       | The DCI of the AC output exceeds the limit.                                    | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                                                                          |
| 31         | ISO Error             | The insulation resistance of PV strings to ground is lower than the set value. | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, check if the AC output ground wire is secure and the AC wirings are correct.</li> <li>2. Check the AC/DC cables and PV panels for damages and water ingress.</li> <li>3. If no problems are found, close the AC switch, then restart the inverter. If this fault persists, please contact your installer.</li> </ol> |
| 32         | Bus Voltage Imbalance | The bus voltage is unbalanced.                                                 | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                                                                          |

| Error code | Error message           | Possible cause                                                               | Solution                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------|-------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 33         | Master Bus Voltage High | The DC input voltage exceeds the allowable input limit of the inverter.      | <ol style="list-style-type: none"> <li>1. Check the PV panel quantities in each string and calculate the open circuit voltage in each string to make sure they are lower than the maximum input voltage of the inverter.</li> <li>2. If no problems are found, close the AC switch and restart the inverter.</li> <li>3. If the fault persists, please contact your installer or the manufacturer's service center.</li> </ol> |
| 34         | Master Bus Voltage Low  | The inverter bus voltage is too low.                                         | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                                                                                                         |
| 35         | Master Grid Phase Error | The rotation direction of three-phase grid sequence (L1/L2/L3) is incorrect. | <ol style="list-style-type: none"> <li>1. Verify and adjust the grid-side L1/L2/L3 phase sequence (normally clockwise L1-L2-L3), and adjust the phase sequence on the meter side accordingly.</li> <li>2. If the measured voltage is normal and this fault persists, please contact your installer.</li> </ol>                                                                                                                 |
| 36         | Master PV Voltage High  | The inverter DC input voltage is too high.                                   | <ol style="list-style-type: none"> <li>1. Check the PV panel quantities in each string and calculate the open circuit voltage in each string to make sure they are lower than the maximum input voltage of the inverter.</li> <li>2. If no problems are found, close the AC switch and restart the inverter.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                                      |
| 37         | Master Islanding Error  | Islanding effect occurs due to grid loss.                                    | <ol style="list-style-type: none"> <li>1. Check if the grid is available, the switch of the grid-connection box has tripped, or the inverter AC cables are securely connected.</li> <li>2. If no problems are found, close the AC switch and reconnect to the grid.</li> <li>3. If this fault persists, please contact your installer.</li> </ol>                                                                              |

| Error code | Error message                | Possible cause                                                                                                                                                 | Solution                                                                                                                                                                                                                                                                                                                                                                         |
|------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 38         | Master HW Bus Voltage High   | The DC input voltage exceeds the allowable input limit of the inverter.                                                                                        | <ol style="list-style-type: none"> <li>1. Check the PV panel quantities in each string and calculate the open circuit voltage in each string to make sure they are lower than the maximum input voltage of the inverter.</li> <li>2. If no problems are found, close the AC switch and restart the inverter. 3. If the fault persists, please contact your installer.</li> </ol> |
| 39         | Master HW PV Current High    | <ol style="list-style-type: none"> <li>1. The positive and negative poles of the string are reversed.</li> <li>2. The inverter has internal damage.</li> </ol> | <ol style="list-style-type: none"> <li>1. Check if the positive and negative terminals of the string are reversed.</li> <li>2. If no problems are found, close the AC switch and restart the inverter.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                                                                                              |
| 40         | Master Self-Test Failed      | The power-on self-test of the inverter is abnormal.                                                                                                            | Please contact your installer.                                                                                                                                                                                                                                                                                                                                                   |
| 41         | HW Inv Current High          | The internal hardware protection circuit of the inverter detects that the current exceeds the safety threshold.                                                | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches and check if the AC cables are firmly connected.</li> <li>2. If no problems are found, close the AC switch and restart the inverter.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                                                                                      |
| 42         | Master AC SPD Error          | The AC lightning protection circuit is abnormal.                                                                                                               | Please contact your installer.                                                                                                                                                                                                                                                                                                                                                   |
| 43         | Master DC SPD Error          | The DC lightning protection circuit is abnormal.                                                                                                               | Please contact your installer.                                                                                                                                                                                                                                                                                                                                                   |
| 44         | Master Grid NE Voltage Error | The L/N wires are reversed or the ground wire connection is abnormal.                                                                                          | <ol style="list-style-type: none"> <li>1. Measure if the voltage between the ground cable and the neutral cable is greater than 10V. If greater than 10V, it indicates the live cable is grounded.</li> <li>2. If the above check is normal, please contact your installer.</li> </ol>                                                                                           |
| 45         | Master Fan1 Error            | The fan blade is stuck or damaged.                                                                                                                             | <ol style="list-style-type: none"> <li>1. Check if the external fan (if any) is working properly.</li> <li>2. If the fan is working properly but this fault still persists, turn off the AC and DC switches for 5 minutes, then restart the inverter.</li> <li>3. If this fault persists, please contact your installer.</li> </ol>                                              |

| Error code | Error message                               | Possible cause                                                    | Solution                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------|---------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 46         | Master Fan2 Error                           | The fan blade is stuck or damaged.                                | <ol style="list-style-type: none"> <li>1. Check if the external fan (if any) is working properly.</li> <li>2. If the fan is working properly but this fault still persists, turn off the AC and DC switches for 5 minutes, then restart the inverter.</li> <li>3. If this fault persists, please contact your installer.</li> </ol>                                                                               |
| 47         | Master Fan3 Error                           | The fan blade is stuck or damaged.                                | <ol style="list-style-type: none"> <li>1. Check if the external fan (if any) is working properly.</li> <li>2. If the fan is working properly but this fault still persists, turn off the AC and DC switches for 5 minutes, then restart the inverter.</li> <li>3. If this fault persists, please contact your installer.</li> </ol>                                                                               |
| 48         | Master Fan4 Error                           | The fan blade is stuck or damaged.                                | <ol style="list-style-type: none"> <li>1. Check if the external fan (if any) is working properly.</li> <li>2. If the fan is working properly but this fault still persists, turn off the AC and DC switches for 5 minutes, then restart the inverter.</li> <li>3. If this fault persists, please contact your installer.</li> </ol>                                                                               |
| 49         | Lost Communication between Master and Meter | The communication between the inverter and the meter is abnormal. | <ol style="list-style-type: none"> <li>1. Check if the meter is working properly.</li> <li>2. Check if the communication cable between the inverter and meter is securely connected.</li> <li>3. Check if the parameters for inverter-meter communication are correctly set, including communication address, baud rate, and so on.</li> <li>4. If this fault persists, please contact your installer.</li> </ol> |
| 50         | Lost Communication between M<->S            | The internal communication of the inverter is lost.               | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                                                                                            |

| Error code | Error message                                      | Possible cause                                                         | Solution                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------|----------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 51         | Lost Communication between inverter and Grid Meter | The communication between the inverter and the grid meter is abnormal. | <ol style="list-style-type: none"> <li>1. Check if the meter is working properly.</li> <li>2. Check if the communication cable between the inverter and meter is securely connected.</li> <li>3. Check if the parameters for inverter-meter communication are correctly set, including communication address, baud rate, and so on.</li> <li>4. If this fault persists, please contact your installer.</li> </ol> |
| 52         | HMI EEPROM Error                                   | The internal memory of the inverter is faulty.                         | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. Check if any firmware upgrade is available and the selected firmware version is correct</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                                                                                                        |
| 53         | HMI RTC Error                                      | RTC fault.                                                             | Please contact your installer.                                                                                                                                                                                                                                                                                                                                                                                    |
| 54         | BMS Device Error                                   | The battery is faulty.                                                 | Please contact your installer.                                                                                                                                                                                                                                                                                                                                                                                    |
| 55         | BMS Lost.Conn                                      | The BMS fails to start properly.                                       | <ol style="list-style-type: none"> <li>1. Check if the BMS button is enabled.</li> <li>2. Check if the BMS button is lighted.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                                                                                        |
| 56         | CT Device Err                                      | The CT device is faulty.                                               | Please contact your installer.                                                                                                                                                                                                                                                                                                                                                                                    |
| 57         | AFCI Lost Com.Err                                  | The communication of the AFCI board is interrupted.                    | Please contact your installer.                                                                                                                                                                                                                                                                                                                                                                                    |
| 58         | Lost Com.H<->S Err                                 | The internal communication of the inverter is lost.                    | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                                                                                            |
| 59         | Lost Communication between inverter and PV Meter   | The communication between the inverter and the PV meter is lost.       | <ol style="list-style-type: none"> <li>1. Check if the meter is working properly.</li> <li>2. Check if the communication cable between the inverter and meter is securely connected.</li> <li>3. Check if the parameters for inverter-meter communication are correctly set, including communication address, baud rate, and so on.</li> <li>4. If this fault persists, please contact your installer.</li> </ol> |
| 60         | EV_Lost.Conn Warn                                  | The communication between the charger and the inverter is lost.        | Please contact your installer.                                                                                                                                                                                                                                                                                                                                                                                    |

| Error code | Error message             | Possible cause                                                                 | Solution                                                                                                                                                                                                                                                                                                                                                       |
|------------|---------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 61         | Slave Phase1 Voltage High | The grid voltage exceeds the limit permitted by the inverter grid compliance.  | <ol style="list-style-type: none"> <li>1. Check if the grid voltage is too high.</li> <li>2. Check if the AC output cables are securely connected and if the grid connection cables are too thin.</li> <li>3. Check if the selected inverter grid compliance is correct.</li> <li>4. If the fault persists, please contact your installer.</li> </ol>          |
| 62         | Slave Phase1 Voltage Low  | The grid voltage is below the limit permitted by the inverter grid compliance. | <ol style="list-style-type: none"> <li>1. Check if the grid voltage is too low.</li> <li>2. Check if the inverter AC output cables are securely connected.</li> <li>3. Check if the selected inverter grid compliance is correct.</li> <li>4. If the fault persists, please contact your installer.</li> </ol>                                                 |
| 63         | Slave Phase2 Voltage High | The grid voltage exceeds the limit permitted by the inverter grid compliance.  | <ol style="list-style-type: none"> <li>1. Check if the grid voltage is too high.</li> <li>2. Check if the inverter AC output cables are securely connected and if the grid connection cables are too thin.</li> <li>3. Check if the selected inverter grid compliance is correct.</li> <li>4. If the fault persists, please contact your installer.</li> </ol> |
| 64         | Slave Phase2 Voltage Low  | The grid voltage is below the limit permitted by the inverter grid compliance. | <ol style="list-style-type: none"> <li>1. Check if the grid voltage is too low.</li> <li>2. Check if the AC output cables are securely connected.</li> <li>3. Check if the selected inverter grid compliance is correct.</li> <li>4. If the fault persists, please contact your installer.</li> </ol>                                                          |
| 65         | Slave Phase3 Voltage High | The grid voltage exceeds the limit permitted by the inverter grid compliance.  | <ol style="list-style-type: none"> <li>1. Check if the grid voltage is too high.</li> <li>2. Check if the inverter AC output cables are securely connected and if the grid connection cables are too thin.</li> <li>3. Check if the selected inverter grid compliance is correct.</li> <li>4. If the fault persists, please contact your installer.</li> </ol> |

| Error code | Error message            | Possible cause                                                                                                         | Solution                                                                                                                                                                                                                                                                                              |
|------------|--------------------------|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 66         | Slave Phase3 Voltage Low | The grid voltage is below the limit permitted by the inverter grid compliance.                                         | <ol style="list-style-type: none"> <li>1. Check if the grid voltage is too low.</li> <li>2. Check if the AC output cables are securely connected.</li> <li>3. Check if the selected inverter grid compliance is correct.</li> <li>4. If the fault persists, please contact your installer.</li> </ol> |
| 67         | Slave Frequency High     | The grid frequency exceeds the upper limit specified by the local grid.                                                | <ol style="list-style-type: none"> <li>1. Check if the selected inverter grid compliance is correct.</li> <li>2. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                         |
| 68         | Slave Frequency Low      | The grid frequency is lower than the lower limit specified by the local grid.                                          | <ol style="list-style-type: none"> <li>1. Check if the selected inverter grid compliance is correct.</li> <li>2. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                         |
| 69         | DCDC_Lost.Conn Warn      | The communication between the DCDC device and the inverter is lost.                                                    | Please contact your installer.                                                                                                                                                                                                                                                                        |
| 70         | DCDC_Device Error        | The DCDC device is faulty.                                                                                             | Please contact your installer.                                                                                                                                                                                                                                                                        |
| 71         | Parall CAN Lost Com. Err | The number of online parallel units read by the parallel master is inconsistent with the configured parallel quantity. | <ol style="list-style-type: none"> <li>1. Check if the configured ID of the secondary unit is correct.</li> <li>2. Check if the CAN communication cable for parallel connection is properly plugged in.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                  |
| 72         | LCD Lost comm.Err        | The inverter fails to receive communication data from the LCD.                                                         | <ol style="list-style-type: none"> <li>1. Check if the communication cable between the LCD and the inverter is securely connected.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                       |

| Error code | Error message                   | Possible cause                                                                                                                                                                | Solution                                                                                                                                                                                                                                                                                                                                                                                  |
|------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 73         | Slave No Grid Error             | The inverter cannot detect the grid voltage.                                                                                                                                  | <ol style="list-style-type: none"> <li>1. Check if the grid is available, the switch of the grid-connection box has tripped, or the inverter AC cables are securely connected.</li> <li>2. If no problems are found, close the AC switch and reconnect to the grid.</li> <li>3. If this fault persists, please contact your installer.</li> </ol>                                         |
| 74         | Slave PV Input Mode Error       | The PV mode selection is incorrect.                                                                                                                                           | <ol style="list-style-type: none"> <li>1. Check if the inverter's string mode is set correctly.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                                                                                              |
| 75         | Slave HW PV Curr High           | <ol style="list-style-type: none"> <li>1. The positive and negative terminals of the string are connected inversely.</li> <li>2. The inverter has internal damage.</li> </ol> | <ol style="list-style-type: none"> <li>1. Check if the positive and negative terminals of the string are reversed.</li> <li>2. If no problems are found, close the AC switch and restart the inverter.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                                                                                                       |
| 76         | Slave PV Voltage High           | The DC input voltage of the inverter is too high.                                                                                                                             | <ol style="list-style-type: none"> <li>1. Check the PV panel quantities in each string and calculate the open circuit voltage in each string to make sure they are lower than the maximum input voltage of the inverter.</li> <li>2. If no problems are found, close the AC switch and restart the inverter.</li> <li>3. If the fault persists, please contact your installer.</li> </ol> |
| 77         | Slave HW Bus Volt High          | The DC input voltage exceeds the allowable input limit of the inverter.                                                                                                       | <ol style="list-style-type: none"> <li>1. Check the PV panel quantities in each string and calculate the open circuit voltage in each string to make sure they are lower than the maximum input voltage of the inverter.</li> <li>2. If no problems are found, close the AC switch and restart the inverter.</li> <li>3. If the fault persists, please contact your installer.</li> </ol> |
| 78         | Grid Power Emergency Disconnect | The grid AC relay disconnects according to the command from the external device.                                                                                              | Please contact your installer.                                                                                                                                                                                                                                                                                                                                                            |
| 80         | Software version mismatch       | The software versions of parallel devices are inconsistent.                                                                                                                   | Perform unified upgrade via the cloud platform or manually upgrade to the same version.                                                                                                                                                                                                                                                                                                   |

| Error code | Error message               | Possible cause                                                                                                     | Solution                                                                                                                                                                                                                                                                                                              |
|------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 81         | Lost Communication D<->C    | The internal communication of the inverter is lost.                                                                | <ol style="list-style-type: none"> <li>1. Turn off the AC and DC switches, wait for 5 minutes, then restart the inverter.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                |
| 83         | Master Arc Device Error     | The arc fault device is faulty.                                                                                    | Please contact your installer.                                                                                                                                                                                                                                                                                        |
| 84         | Master PV Mode Error        | Incorrect PV mode is selected.                                                                                     | <ol style="list-style-type: none"> <li>1. Check if the inverter's string mode is set correctly.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                          |
| 85         | Authority expires           | The authorization has expired.                                                                                     | Please contact your installer.                                                                                                                                                                                                                                                                                        |
| 86         | DRMO Error                  | The DRMO is faulty.                                                                                                | Please contact your installer.                                                                                                                                                                                                                                                                                        |
| 87         | Master Arc Error            | DC arcing is caused by DC short circuit or poor terminal contact.                                                  | <ol style="list-style-type: none"> <li>1. Check if the terminals are in good contact and if the PV positive/negative to ground insulation is normal.</li> <li>2. If no problems are found, close the AC switch and restart the inverter.</li> <li>3. If the fault persists, please contact your installer.</li> </ol> |
| 88         | Master SW PV Current High   | 1. The positive and negative terminals of the string are connected inversely. 2. The inverter has internal damage. | <ol style="list-style-type: none"> <li>1. Check if the positive and negative terminals of the string are reversed.</li> <li>2. If no problems are found, close the AC switch and restart the inverter.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                                   |
| 89         | Battery Voltage High        | The battery voltage is too high.                                                                                   | <ol style="list-style-type: none"> <li>1. The battery voltage is higher than the maximum voltage of the inverter.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                        |
| 90         | Battery Current High        | The battery cannot output power due to low battery SOC or excessive load.                                          | <ol style="list-style-type: none"> <li>1. Reduce the back-up load.</li> <li>2. Charge the battery or stop using the battery.</li> <li>3. If the remaining battery capacity and load are normal, but the fault persists, contact your installer.</li> </ol>                                                            |
| 91         | Battery Charge Voltage High | The battery voltage is too high during charging.                                                                   | <ol style="list-style-type: none"> <li>1. Do not power off the battery during charging.</li> <li>2. Restart the battery and the inverter.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                                                                                                |

| Error code | Error message                    | Possible cause                                                                                                                                                                                                                                                                                      | Solution                                                                                                                                                                                                                                                                                         |
|------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 92         | Battery OverLoad                 | The battery cannot output power due to low battery SOC or excessive load.                                                                                                                                                                                                                           | <ol style="list-style-type: none"> <li>1. Reduce the back-up load.</li> <li>2. Charge the battery or stop using the battery.</li> <li>3. If the remaining battery capacity and load are normal, but the fault persists, please contact your installer.</li> </ol>                                |
| 93         | Battery SoftConnet TimeOut       | The battery failed to pre-charge the bus.                                                                                                                                                                                                                                                           | Please contact your installer.                                                                                                                                                                                                                                                                   |
| 94         | Output OverLoad                  | The connected load exceeds the maximum output power of H2.                                                                                                                                                                                                                                          | <ol style="list-style-type: none"> <li>1. Reduce the connected load.</li> <li>2. If this fault persists, please contact your installer.</li> </ol>                                                                                                                                               |
| 95         | Battery Open Circuit             | The inverter cannot detect the battery voltage.                                                                                                                                                                                                                                                     | <ol style="list-style-type: none"> <li>1. Check if the battery breaker is turned on.</li> <li>2. Check if the battery power cable is securely connected.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                                                            |
| 96         | Battery Discharge Voltage Low    | Low voltage is detected during battery discharge overload.                                                                                                                                                                                                                                          | <ol style="list-style-type: none"> <li>1. Do not turn off the battery during discharging.</li> <li>2. The battery voltage is too low, which leads to system protection.</li> </ol>                                                                                                               |
| 97         | BMS Internal Communication Error | <ol style="list-style-type: none"> <li>1. The communication between the battery high-voltage box and the battery pack is abnormal.</li> <li>2. The last battery pack is not equipped with a resistor plug, causing the high-voltage box to identify an abnormal number of battery packs.</li> </ol> | <ol style="list-style-type: none"> <li>1. Check if the communication cable is correctly connected.</li> <li>2. Check if the last battery pack has a plug.</li> <li>3. If the fault persists, please contact your installer.</li> </ol>                                                           |
| 97         | BMS Internal Communication Error | Internal BMS communication is lost.                                                                                                                                                                                                                                                                 | <ol style="list-style-type: none"> <li>1. Check if the communication cable is correctly connected.</li> <li>2. Check if the last battery pack has a plug.</li> <li>3. Check if the communication cable is abnormal.</li> <li>4. If the fault persists, please contact your installer.</li> </ol> |

| Error code | Error message                        | Possible cause                                                                                                                                                                                                | Solution                                                                                                                                                                                                                                                                                         |
|------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 98         | Bat Sequence Error                   | Battery pack communication is abnormal.                                                                                                                                                                       | <ol style="list-style-type: none"> <li>1. Check if the communication cable is correctly connected.</li> <li>2. Check if the last battery pack has a plug.</li> <li>3. Check if the communication cable is abnormal.</li> <li>4. If the fault persists, please contact your installer.</li> </ol> |
| 99         | Discharge Over Current Protection    | The discharge current exceeds the set threshold.                                                                                                                                                              | <ol style="list-style-type: none"> <li>1. Wait for the fault to clear or restart the system.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                        |
| 100        | Charge Over Current Protection       | The charge current exceeds the set threshold.                                                                                                                                                                 | <ol style="list-style-type: none"> <li>1. Wait for the fault to clear or restart the system</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                         |
| 101        | Module Under Voltage Protection      | The total voltage is lower than the set threshold.                                                                                                                                                            | <ol style="list-style-type: none"> <li>1. Force-charge the battery.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                                 |
| 102        | Module Over Voltage Protection       | The total voltage is higher than the set threshold.                                                                                                                                                           | <ol style="list-style-type: none"> <li>1. Wait for the fault to clear or restart the system.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                        |
| 103        | Single Cell Under Voltage Protection | The cell voltage is lower than the set minimum value.                                                                                                                                                         | <ol style="list-style-type: none"> <li>1. Force-charge the battery.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                                 |
| 104        | Single Cell Over Voltage Protection  | The cell voltage is higher than the set threshold.                                                                                                                                                            | <ol style="list-style-type: none"> <li>1. Wait for the fault to clear or restart the system.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                        |
| 105        | BMS Hardware Error                   | <ol style="list-style-type: none"> <li>1. The cell voltage detection module is faulty.</li> <li>2. The temperature detection module is faulty.</li> <li>3. The current detection module is faulty.</li> </ol> | <ol style="list-style-type: none"> <li>1. Restart the system.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                                       |
| 106        | Charging temperature low protection  | The battery is charged below 0°C.                                                                                                                                                                             | <ol style="list-style-type: none"> <li>1. Wait for the battery to warm up until the fault clears.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                   |

| Error code | Error message                                  | Possible cause                                                                                                     | Solution                                                                                                                                                                         |
|------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 107        | Charging temperature high protection           | The battery temperature is too high.                                                                               | <ol style="list-style-type: none"> <li>1. Wait for the battery to cool down until the fault clears.</li> <li>2. If the fault persists, please contact your installer.</li> </ol> |
| 108        | Discharging temperature low protection         | The relay is opened to stop discharge as the battery temperature is too low.                                       | <ol style="list-style-type: none"> <li>1. Wait for the battery to warm up until the fault clears.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>   |
| 109        | Discharging temperature high protection        | The battery temperature is too high.                                                                               | <ol style="list-style-type: none"> <li>1. Wait for the battery to cool down until the fault clears.</li> <li>2. If the fault persists, please contact your installer.</li> </ol> |
| 110        | BMS Relay Error                                | 1. The negative or positive relay is welded. 2. The negative or positive relay fails to close.                     | <ol style="list-style-type: none"> <li>1. Restart the system.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                       |
| 111        | Pre-charge Error                               | 1. The precharge relay is damaged. 2. The precharge resistor is open-circuited. 3. The BMS is damaged.             | <ol style="list-style-type: none"> <li>1. Restart the system.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                       |
| 112        | BMS Insulation Error                           | The battery pack may have leakage.                                                                                 | <ol style="list-style-type: none"> <li>1. Restart the system.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                       |
| 113        | BMS supplier Incompatibility                   | The BMS used by the battery pack is incompatible with that of the high-voltage box.                                | Please contact your installer.                                                                                                                                                   |
| 114        | Battery cell supplier incompatibility          | The cell manufacturers of battery packs are inconsistent.                                                          | Please contact your installer.                                                                                                                                                   |
| 115        | Battery cell incompatibility                   | The cell grades of battery packs are inconsistent.                                                                 | Please contact your installer.                                                                                                                                                   |
| 116        | Battery pack models or grades are inconsistent | The model or grade of the battery pack is mismatched.                                                              | Please contact your installer.                                                                                                                                                   |
| 117        | Circuit Breaker Is Open                        | 1. The battery circuit breaker is not closed. 2. The auxiliary contact of the battery circuit breaker is abnormal. | <ol style="list-style-type: none"> <li>1. Close the battery circuit breaker.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                        |
| 118        | Temperature Difference Is Too Wide             | The temperature detection module is faulty.                                                                        | <ol style="list-style-type: none"> <li>1. Restart the system.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                       |
| 119        | Voltage Difference Is Too Wide (Class II)      | The sampling wire is loose.                                                                                        | <ol style="list-style-type: none"> <li>1. Restart the system.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                       |

| Error code | Error message                               | Possible cause                                                             | Solution                                                                                                                                                                                                                                                                         |
|------------|---------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 120        | Voltage Difference Is Too Wide (Class I)    | The sampling wire is loose.                                                | <ol style="list-style-type: none"> <li>1. Restart the system.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                                       |
| 121        | BMS Over Temperature Protect                | 1. The ambient temperature is too high. 2. The battery is overloaded.      | <ol style="list-style-type: none"> <li>1. Check if the ambient temperature of the battery is too high.</li> <li>2. If the temperature is normal, leave the battery for 30 minutes, then restart it.</li> <li>3. If the fault persists, please contact your installer.</li> </ol> |
| 122        | Short Circuit Protect                       | The positive and negative terminals of the battery are short-circuited.    | <ol style="list-style-type: none"> <li>1. Check if the battery's wiring is correct.</li> <li>2. If the fault persists, please contact your installer.</li> </ol>                                                                                                                 |
| 123        | Total voltage match failed                  | Contact technical support for troubleshooting.                             | Please contact your installer.                                                                                                                                                                                                                                                   |
| 124        | The system is locked                        | Contact technical support for troubleshooting.                             | Please contact your installer.                                                                                                                                                                                                                                                   |
| 125        | FUSE error protection                       | Contact technical support for troubleshooting.                             | Please contact your installer.                                                                                                                                                                                                                                                   |
| 126        | Voltage on charging port is high protection | Contact technical support for troubleshooting.                             | Please contact your installer.                                                                                                                                                                                                                                                   |
| 127        | Heating film overtemperature protection     | Contact technical support for troubleshooting.                             | Please contact your installer.                                                                                                                                                                                                                                                   |
| 128        | Abnormal temperature increases              | Contact technical support for troubleshooting.                             | Please contact your installer.                                                                                                                                                                                                                                                   |
| 129        | Heating-Film Detect Fault                   | No heating film is detected by the BMS.                                    | Please contact your installer.                                                                                                                                                                                                                                                   |
| 130        | DCDC-BMS Comm Lost                          | The communication between the battery module DCDC and the BMS is abnormal. | Please contact your installer.                                                                                                                                                                                                                                                   |
| 131        | Auxiliary Supply Voltage Abnormal Fault     | The circuit of the auxiliary supply is not functioning properly.           | Please contact your installer.                                                                                                                                                                                                                                                   |
| 132        | Heatsink High Temperature Fault             | The temperature of the heat sink in the DCDC exceeds the upper threshold.  | Please contact your installer.                                                                                                                                                                                                                                                   |
| 133        | PCB High Temperature Fault                  | The temperature of the PCB in the DCDC exceeds the upper threshold.        | Please contact your installer.                                                                                                                                                                                                                                                   |
| 134        | SOH Low Fault                               | The battery has poor state of health (SOH).                                | Please contact your installer.                                                                                                                                                                                                                                                   |
| 135        | Heating-Film Short-Circuit Fault            | The battery module's heating film short-circuited.                         | Please contact your installer.                                                                                                                                                                                                                                                   |

| Error code | Error message                                 | Possible cause                                                                             | Solution                       |
|------------|-----------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------|
| 136        | Heating-Film Open-Circuit Fault               | The circuit of the battery module's heating film is open.                                  | Please contact your installer. |
| 137        | Heating-Film Over-Current Fault               | The resistance of the battery module's heating film is abnormal.                           | Please contact your installer. |
| 138        | Aerosol Abnormal Fault                        | The aerosol density of the battery module's heating film is abnormal.                      | Please contact your installer. |
| 139        | Button Stuck Fault                            | The button sends abnormal signals or the button is stuck.                                  | Please contact your installer. |
| 140        | Fan Fault                                     | The fan of the DCDC is not functioning properly.                                           | Please contact your installer. |
| 141        | Inverter-BMS Comm Lost                        | The communication between the BMS and the inverter is abnormal.                            | Please contact your installer. |
| 162        | Gen Start or Stop Error                       | Check the connection cable between the diesel generator and the inverter.                  | Please contact your installer. |
| 225        | Battery Software Overvoltage Fault            | The voltage is too high during battery charging.                                           | Please contact your installer. |
| 226        | Battery Software Undervoltage Fault           | Low voltage is detected during battery discharge overload.                                 | Please contact your installer. |
| 227        | Battery Discharge Software Overcurrent Fault  | The battery cannot output power due to excessive load.                                     | Please contact your installer. |
| 228        | Battery Charge Software Overcurrent Fault     | The battery cannot output power due to excessive charge current.                           | Please contact your installer. |
| 229        | Battery Discharge Overpower Fault             | The battery cannot output power due to excessive discharge power.                          | Please contact your installer. |
| 230        | Battery Charge Overpower Fault                | The battery cannot output power due to excessive charge power.                             | Please contact your installer. |
| 233        | Battery Hardware Overvoltage Fault            | Protection is triggered because the battery voltage exceeds the hardware protection point. | Please contact your installer. |
| 234        | Battery Hardware Overcurrent Fault            | Protection is triggered because the battery current exceeds the hardware protection point. | Please contact your installer. |
| 237        | Battery Voltage Exceeds BMS Upper Limit Fault | The battery voltage exceeds the BMS over-voltage protection limit.                         | Please contact your installer. |
| 238        | Battery Voltage Exceeds BMS Lower Limit Fault | The battery voltage is below the BMS under-voltage protection limit.                       | Please contact your installer. |
| 239        | Battery Side Precharge Fault                  | The DCDC precharge MOS precharge times out.                                                | Please contact your installer. |

| Error code | Error message                               | Possible cause                                                                                                                                   | Solution                       |
|------------|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| 241        | Bus Voltage Overvoltage Fault               | The output voltage on the high-voltage side of the battery pack DCDC exceeds the software overvoltage limit.                                     | Please contact your installer. |
| 242        | Bus Voltage Undervoltage Fault              | The output voltage on the high-voltage side of the battery pack DCDC is below the software undervoltage limit.                                   | Please contact your installer. |
| 243        | Bus Discharge Overcurrent Fault             | The discharge current on the high-voltage side of the battery pack DCDC exceeds the software current limit.                                      | Please contact your installer. |
| 244        | Bus Charge Overcurrent Fault                | The charge current on the high-voltage side of the battery pack DCDC exceeds the software current limit.                                         | Please contact your installer. |
| 245        | Bus Discharge Overpower Fault               | The discharge power on the high-voltage side of the battery pack DCDC exceeds the software power limit.                                          | Please contact your installer. |
| 246        | Bus Charge Overpower Fault                  | The charge power on the high-voltage side of the battery pack DCDC exceeds the software power limit.                                             | Please contact your installer. |
| 247        | Bus Hardware Overvoltage Fault              | The output voltage on the high-voltage side of the battery pack DCDC exceeds the hardware overvoltage limit.                                     | Please contact your installer. |
| 248        | Bus Hardware Overcurrent Fault              | The charge and discharge current on the high-voltage side of the battery pack DCDC exceeds the hardware overcurrent limit.                       | Please contact your installer. |
| 249        | Hardware Resonant Chamber Overcurrent Fault | The resonant tank current on the high-voltage side of the battery pack DCDC exceeds the hardware overcurrent limit.                              | Please contact your installer. |
| 250        | Auxiliary Power Source Fault                | The internal auxiliary power supply of the battery pack is abnormal.                                                                             | Please contact your installer. |
| 251        | Hardware Protection Signal Fault            | A hardware protection fault is triggered by any of the following: battery overcurrent, battery overvoltage, bus overvoltage, or bus overcurrent. | Please contact your installer. |
| 252        | Bus Voltage Differential Fault              | A fault occurs when the deviation of detected bus voltage among battery packs exceeds the limit.                                                 | Please contact your installer. |
| 253        | BMS Protection Signal Fault                 | BMS asserts the DCDC protection pin.                                                                                                             | Please contact your installer. |

| Error code | Error message                               | Possible cause                                                                     | Solution                       |
|------------|---------------------------------------------|------------------------------------------------------------------------------------|--------------------------------|
| 254        | Software Resonant Chamber Overcurrent Fault | Overcurrent occurs in the resonant tank on the high-voltage side of DCDC.          | Please contact your installer. |
| 255        | Soft Start Abnormal Fault                   | Soft-start timeout of the DCDC bus voltage.                                        | Please contact your installer. |
| 257        | Heatsink High Temperature Fault             | The temperature of the internal DCDC heat sink exceeds the high-temperature limit. | Please contact your installer. |
| 258        | Heatsink Low Temperature Fault              | The temperature of the internal DCDC heat sink is below the low-temperature limit. | Please contact your installer. |
| 259        | PCB High Temperature Fault                  | The temperature of the internal DCDC PCB exceeds the high-temperature limit.       | Please contact your installer. |
| 260        | PCB Low Temperature Fault                   | The temperature of the internal DCDC PCB is below the low-temperature limit.       | Please contact your installer. |
| 261        | Fan Fault                                   | The internal DCDC fan fails to operate properly.                                   | Please contact your installer. |
| 262        | Heating Film Fault                          | The heating film switch on the DCDC side cannot be turned off.                     | Please contact your installer. |
| 263        | Heatsink Temperature Sensor Line Faulty     | The temperature sensing wire of the internal DCDC heat sink is open-circuited.     | Please contact your installer. |
| 264        | PCB Temperature Sensor Line Faulty          | The temperature sensing wire of the internal DCDC PCB is open-circuited.           | Please contact your installer. |

## 11. Product specification

### 11.1. EK70 HS5-(8K-20K)-T3-X

| Model                                   |                           | EK70<br>HS5-8K-<br>T3-X <sup>1</sup> | EK70<br>HS5-10K-<br>T3-X | EK70<br>HS5-12K-<br>T3-X | EK70<br>HS5-12K-<br>T3-X-IE | EK70<br>HS5-15K-<br>T3-X | EK70<br>HS5-20K-<br>T3-X |
|-----------------------------------------|---------------------------|--------------------------------------|--------------------------|--------------------------|-----------------------------|--------------------------|--------------------------|
| PV DC Input                             |                           |                                      |                          |                          |                             |                          |                          |
| Recommended max. PV power               |                           | 16000                                | 20000                    | 24000                    | 24000                       | 30000                    | 40000                    |
| Max. Input Voltage (V)                  |                           | 1000                                 |                          |                          |                             |                          |                          |
| MPPT Voltage Range (V)                  |                           | 150-900                              |                          |                          |                             |                          |                          |
| Start-up Voltage (V)                    |                           | 160                                  |                          |                          |                             |                          |                          |
| Nominal DC Input Voltage (V)            |                           | 600                                  |                          |                          |                             |                          |                          |
| Max. Input Current per MPPT (A)         |                           | 20/20/20                             |                          |                          |                             | 40/20/20                 |                          |
| Max. Short-circuit Current per MPPT (A) |                           | 25/25/25                             |                          |                          |                             | 50/25/25                 |                          |
| Number of MPP Trackers                  |                           | 3                                    |                          |                          |                             |                          |                          |
| No. of Strings per MPP Tracker          |                           | 1+1+1                                |                          |                          |                             | 2+1+1                    |                          |
| Battery DC Input                        |                           |                                      |                          |                          |                             |                          |                          |
| Battery Type                            |                           | LiFePO4                              |                          |                          |                             |                          |                          |
| Battery Voltage Range [V]               |                           | 600-900                              |                          |                          |                             |                          |                          |
| BAT Communication Interface             |                           | CAN                                  |                          |                          |                             |                          |                          |
| Max. Battery Quantity per System        |                           | 6                                    |                          |                          |                             |                          |                          |
| AC Output/Input (On-Grid)               |                           |                                      |                          |                          |                             |                          |                          |
| AC Output (On-Grid)                     | Rated Output Power (W)    | 8000                                 | 9999                     | 12000                    | 11000                       | 15000                    | 20000                    |
|                                         | Rated Apparent Power (VA) | 8000                                 | 9999                     | 12000                    | 11000                       | 15000                    | 20000                    |
|                                         | Max. Apparent Power (VA)  | 8800                                 | 9999                     | 13200                    | 11000                       | 16500                    | 22000                    |
|                                         | Rated Output Voltage (V)  | 3L+N+PE, 230/400                     |                          |                          |                             |                          |                          |
|                                         | Rated Output Current (A)  | 11.6                                 | 14.5                     | 17.4                     | 15.9                        | 21.7                     | 29.0                     |
|                                         | Max. Output Current (A)   | 12.8                                 | 14.5                     | 19.1                     | 15.9                        | 23.9                     | 31.9                     |
|                                         | Adjustable Power Factor   | 0.8 leading-0.8 lagging              |                          |                          |                             |                          |                          |
| AC Input (On-Grid)                      | Rated Input Voltage (V)   | 3L+N+PE, 230/400                     |                          |                          |                             |                          |                          |
|                                         | Max. Input Current (A)    | 63 <sup>2</sup>                      |                          |                          |                             |                          |                          |

| Model                                          | EK70<br>HS5-8K-<br>T3-X <sup>1</sup>                                                                 | EK70<br>HS5-10K-<br>T3-X | EK70<br>HS5-12K-<br>T3-X | EK70<br>HS5-12K-<br>T3-X-IE | EK70<br>HS5-15K-<br>T3-X | EK70<br>HS5-20K-<br>T3-X |
|------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|-----------------------------|--------------------------|--------------------------|
| Rated AC Grid Frequency (Hz)                   | 50/60                                                                                                |                          |                          |                             |                          |                          |
| Total Current Harmonic Distortion              | < 3%                                                                                                 |                          |                          |                             |                          |                          |
| AC Output (Backup)                             |                                                                                                      |                          |                          |                             |                          |                          |
| Max. Output Apparent Power (VA)                | 8000                                                                                                 | 10000                    | 12000                    | 12000                       | 15000                    | 20000                    |
| Peak Output Apparent Power (VA 10s)            | 16000                                                                                                | 20000                    | 24000                    | 24000                       | 30000                    | 40000                    |
| Rated Output Voltage (V)                       | 3L+N+PE, 230/400                                                                                     |                          |                          |                             |                          |                          |
| Max. Output Current (A)                        | 11.6                                                                                                 | 14.5                     | 17.4                     | 17.4                        | 21.7                     | 29.0                     |
| Rated AC Grid Frequency (Hz)                   | 50/60                                                                                                |                          |                          |                             |                          |                          |
| Adjustable Power Factor                        | 0.8 leading-0.8 lagging                                                                              |                          |                          |                             |                          |                          |
| Total Current Harmonic Distortion              | < 3%                                                                                                 |                          |                          |                             |                          |                          |
| Switch Time (ms)                               | ≤10                                                                                                  |                          |                          |                             |                          |                          |
| Efficiency                                     |                                                                                                      |                          |                          |                             |                          |                          |
| Euro Efficiency                                | 97.6%                                                                                                |                          |                          |                             |                          |                          |
| Max. Efficiency                                | 98.2%                                                                                                |                          |                          |                             |                          |                          |
| Protection                                     |                                                                                                      |                          |                          |                             |                          |                          |
| Insulation Monitoring                          | Integrated                                                                                           |                          |                          |                             |                          |                          |
| Residual Current Monitoring                    | Integrated                                                                                           |                          |                          |                             |                          |                          |
| DC Reverse Polarity Protection                 | Integrated                                                                                           |                          |                          |                             |                          |                          |
| Anti-islanding Protection                      | AFD                                                                                                  |                          |                          |                             |                          |                          |
| AC Short-circuit Protection                    | Integrated                                                                                           |                          |                          |                             |                          |                          |
| AC Overcurrent/Overvoltage Protection          | Integrated                                                                                           |                          |                          |                             |                          |                          |
| AC Overvoltage Category                        | III                                                                                                  |                          |                          |                             |                          |                          |
| DC Overvoltage Category                        | II                                                                                                   |                          |                          |                             |                          |                          |
| DVC Class                                      | DVC-A for communication terminals;<br>DVC-C for PV terminals, Battery terminals and all AC terminals |                          |                          |                             |                          |                          |
| I <sub>cw</sub> [kA]                           | ≤10 kA (<10s) for all terminals                                                                      |                          |                          |                             |                          |                          |
| I <sub>cc</sub> [kA]                           | ≤10 kA (<10s) for all terminals                                                                      |                          |                          |                             |                          |                          |
| Current Inrush [A] (Peak value)                | 36 for all AC terminals                                                                              |                          |                          |                             |                          |                          |
| Max. AC Fault Current [A] (Peak value)         | 95 for all AC terminals                                                                              |                          |                          |                             |                          |                          |
| Max. AC Overcurrent Protection [A] (RMS value) | 63 for all AC terminals                                                                              |                          |                          |                             |                          |                          |
| Max. DC Fault Current [A] (Peak value)         | 13.5 for battery terminals                                                                           |                          |                          |                             |                          |                          |

| Model                                          | EK70<br>HS5-8K-<br>T3-X <sup>1</sup>                                                                                                                                                                                                                      | EK70<br>HS5-10K-<br>T3-X | EK70<br>HS5-12K-<br>T3-X | EK70<br>HS5-12K-<br>T3-X-IE | EK70<br>HS5-15K-<br>T3-X | EK70<br>HS5-20K-<br>T3-X |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|-----------------------------|--------------------------|--------------------------|
| Max. DC Overcurrent Protection [A] (RMS value) | 12 for battery terminals                                                                                                                                                                                                                                  |                          |                          |                             |                          |                          |
| Feedback Current [A]                           | 0                                                                                                                                                                                                                                                         |                          |                          |                             |                          |                          |
| DC Switch                                      | Integrated                                                                                                                                                                                                                                                |                          |                          |                             |                          |                          |
| DC Surge Protection                            | Type II                                                                                                                                                                                                                                                   |                          |                          |                             |                          |                          |
| AC Surge Protection                            | Type II                                                                                                                                                                                                                                                   |                          |                          |                             |                          |                          |
| AFCI                                           | Integrated                                                                                                                                                                                                                                                |                          |                          |                             |                          |                          |
| Inverter Topology                              | Non-isolation                                                                                                                                                                                                                                             |                          |                          |                             |                          |                          |
| Protective Class                               | I                                                                                                                                                                                                                                                         |                          |                          |                             |                          |                          |
| Pollution Degree                               | II                                                                                                                                                                                                                                                        |                          |                          |                             |                          |                          |
| General Data                                   |                                                                                                                                                                                                                                                           |                          |                          |                             |                          |                          |
| Dimensions (W / H / D) (mm)                    | 835 / 690 - 2050 / 270 <ul style="list-style-type: none"><li>• Inverter: 835 / 350 / 270</li><li>• Battery pack: 835 / 270 / 270</li><li>• Battery base: 835 / 70 - 80 / 270</li></ul>                                                                    |                          |                          |                             |                          |                          |
| Weight (kg)                                    | <ul style="list-style-type: none"><li>• Inverter: 44.5</li><li>• Battery pack:<ul style="list-style-type: none"><li>- EK70 BU5-6.0-TV: 60.4</li><li>- EK70 BU5-7.0-TV: 71.7</li><li>- EK70 BU5-9.0-TV: 79.2</li></ul></li><li>• Battery base: 8</li></ul> |                          |                          |                             |                          |                          |
| Charging Temperature Range                     | 0°C to +50 °C                                                                                                                                                                                                                                             |                          |                          |                             |                          |                          |
| Discharging Temperature Range                  | -10°C to +50 °C                                                                                                                                                                                                                                           |                          |                          |                             |                          |                          |
| Relative humidity range                        | 5%-95% Non-condensing                                                                                                                                                                                                                                     |                          |                          |                             |                          |                          |
| Corrosion resistance grade                     | C4                                                                                                                                                                                                                                                        |                          |                          |                             |                          |                          |
| Max. Operating Altitude (m)                    | 3000                                                                                                                                                                                                                                                      |                          |                          |                             |                          |                          |
| Cooling                                        | Smart air cooling                                                                                                                                                                                                                                         |                          |                          |                             |                          |                          |
| Heating                                        | Heating function for low-temperature operation.                                                                                                                                                                                                           |                          |                          |                             |                          |                          |
| Ingress Protection Rating                      | IP66                                                                                                                                                                                                                                                      |                          |                          |                             |                          |                          |
| Communication                                  | WLAN / Fast Ethernet / RS485                                                                                                                                                                                                                              |                          |                          |                             |                          |                          |
| Communication Module                           | eSolar AIO3 Pro / eSolar 4G Pro                                                                                                                                                                                                                           |                          |                          |                             |                          |                          |
| Warranty                                       | Refer to the warranty policy                                                                                                                                                                                                                              |                          |                          |                             |                          |                          |

1. X stands for the battery system configuration. The value of x can be 6, 7, 9, 12, 14, 15, 16, 18, 21, 24, 25, 27, 28, 30, 35, 36, 40, 42, 45, 50, and 54. Each number presents the energy storage capacity for different models. For battery combinations and ratings, refer to the battery combination datasheet.

2. The built-in 63A bypass function enables the whole-house backup power, and the current can be configured on the elekeeper App.

## 11.2. EK70 battery and battery system designations

This section provides the battery and battery system designations by SAJ battery code. The SAJ battery code indicates the manufacturer of the battery cell, which is determined by the 6th character of the serial number (SN) code. The SN is located on the power label attached to the battery. For example, in SN code B5UB4M0Y2552E00002, the 6th character **M** indicates the manufacturer.

The following table lists the battery and battery system designations.

| SAJ battery code | Battery designation                                                                                            | Battery system designation                                                                                                                                        |
|------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| M                | IFpP74/176/209/[(1P6S)]M/-10+50/95<br>IFpP74/176/209/[(1P7S)]M/-10+50/95<br>IFpP74/176/209/[(1P9S)]M/-10+50/95 | IFpP74/176/209/[(1P6S)YP]M/-10+50/95(Y=1,2,3,4,5,6)<br>IFpP74/176/209/[(1P7S)YP]M/-10+50/95(Y=1,2,3,4,5,6)<br>IFpP74/176/209/[(1P9S)YP]M/-10+50/95(Y=1,2,3,4,5,6) |
| N                | IFpP73/175/208/[(1P6S)]M/-10+50/95<br>IFpP73/175/208/[(1P7S)]M/-10+50/95<br>IFpP73/175/208/[(1P9S)]M/-10+50/95 | IFpP73/175/208/[(1P6S)YP]M/-10+50/95(Y=1,2,3,4,5,6)<br>IFpP73/175/208/[(1P7S)YP]M/-10+50/95(Y=1,2,3,4,5,6)<br>IFpP73/175/208/[(1P9S)YP]M/-10+50/95(Y=1,2,3,4,5,6) |
| O                | IFpP73/176/208/[(1P6S)]M/-10+50/95<br>IFpP73/176/208/[(1P7S)]M/-10+50/95<br>IFpP73/176/208/[(1P9S)]M/-10+50/95 | IFpP73/176/208/[(1P6S)YP]M/-10+50/95(Y=1,2,3,4,5,6)<br>IFpP73/176/208/[(1P7S)YP]M/-10+50/95(Y=1,2,3,4,5,6)<br>IFpP73/176/208/[(1P9S)YP]M/-10+50/95(Y=1,2,3,4,5,6) |
| I                | IFpP74/176/209/[(1P6S)]M/-10+50/95<br>IFpP74/176/209/[(1P7S)]M/-10+50/95<br>IFpP74/176/209/[(1P9S)]M/-10+50/95 | IFpP74/176/209/[(1P6S)YP]M/-10+50/95(Y=1,2,3,4,5,6)<br>IFpP74/176/209/[(1P7S)YP]M/-10+50/95(Y=1,2,3,4,5,6)<br>IFpP74/176/209/[(1P9S)YP]M/-10+50/95(Y=1,2,3,4,5,6) |
| K                | IFpP74/176/209/[(1P6S)]M/-10+50/95<br>IFpP74/176/209/[(1P7S)]M/-10+50/95<br>IFpP74/176/209/[(1P9S)]M/-10+50/95 | IFpP74/176/209/[(1P6S)YP]M/-10+50/95(Y=1,2,3,4,5,6)<br>IFpP74/176/209/[(1P7S)YP]M/-10+50/95(Y=1,2,3,4,5,6)<br>IFpP74/176/209/[(1P9S)YP]M/-10+50/95(Y=1,2,3,4,5,6) |
| J                | IFpP73/175/209/[(1P6S)]M/-10+50/95<br>IFpP73/175/209/[(1P7S)]M/-10+50/95<br>IFpP73/175/209/[(1P9S)]M/-10+50/95 | IFpP73/175/209/[(1P6S)YP]M/-10+50/95(Y=1,2,3,4,5,6)<br>IFpP73/175/209/[(1P7S)YP]M/-10+50/95(Y=1,2,3,4,5,6)<br>IFpP73/175/209/[(1P9S)YP]M/-10+50/95(Y=1,2,3,4,5,6) |

## 11.3. Battery

| Model                                     | EK70 BU5-6.0-TV                                                                   | EK70 BU5-7.0-TV                                                                  | EK70 BU5-9.0-TV                                                                  |
|-------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| <b>Performance Specification</b>          |                                                                                   |                                                                                  |                                                                                  |
| Battery Type                              | LiFePO4                                                                           |                                                                                  |                                                                                  |
| Cell Capacity (Ah)                        | 314                                                                               |                                                                                  |                                                                                  |
| Cycle Life <sup>1</sup>                   | 10000                                                                             |                                                                                  |                                                                                  |
| Total Energy Capacity (kWh)               | 6                                                                                 | 7                                                                                | 9                                                                                |
| Usable Energy Capacity <sup>2</sup> (kWh) | 6                                                                                 | 7                                                                                | 9                                                                                |
| Depth of Discharge                        | 100%                                                                              |                                                                                  |                                                                                  |
| Max. Charging / Discharging Power (W)     | 3000                                                                              | 3500                                                                             | 4600                                                                             |
| Rated Voltage (V)                         | 780                                                                               |                                                                                  |                                                                                  |
| Max. Charging / Discharging Current (A)   | 7.7                                                                               | 9.0                                                                              | 11.8                                                                             |
| Recommended Charging Method               | Charge at constant current of 3.85 A until reaching the maximum voltage of 780 V. | Charge at constant current of 4.5 A until reaching the maximum voltage of 780 V. | Charge at constant current of 5.9 A until reaching the maximum voltage of 780 V. |

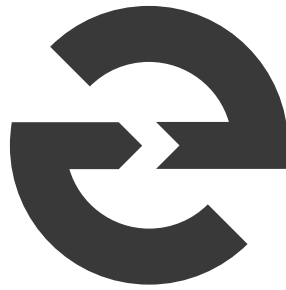
| Model                                  | EK70 BU5-6.0-TV                 | EK70 BU5-7.0-TV | EK70 BU5-9.0-TV |
|----------------------------------------|---------------------------------|-----------------|-----------------|
| <b>General Data</b>                    |                                 |                 |                 |
| Weight (kg)                            | 60.4                            | 71.7            | 79.2            |
| Dimensions (W / H / D) (mm)            | 835 / 270 / 270                 |                 |                 |
| Storage Temperature Range              | -10 °C to +40°C                 |                 |                 |
| Charging Temperature Range             | -30°C to +50°C <sup>3</sup>     |                 |                 |
| Discharging Temperature Range          | -30°C to +50°C <sup>4</sup>     |                 |                 |
| Relative Humidity Range                | 5%-95%                          |                 |                 |
| Max. Operating Altitude (m)            | 3000                            |                 |                 |
| Cooling Methods                        | Natural convection              |                 |                 |
| Ingress Protection Rating              | IP66                            |                 |                 |
| Installation Method                    | Ground mounting / Wall mounting |                 |                 |
| Number of Modules per Controller (PCS) | 1-6                             |                 |                 |
| Compatible Inverters                   | EK70 series                     |                 |                 |

1. Provided by the battery manufacturer. Test conditions: 25±2°C, 0.5C charge and discharge rate, SOH 60%.

2. Provided by the battery manufacturer. Test conditions: 100% depth of discharge, 0.2C charge and discharge rate at 25°C, at the beginning of life.

3. For models without heating function, the charging temperature range is 0°C to +50°C. The 7th character of the battery SN code identifies the heating function: 0 = without heating function; 1 = with heating function. For example, B5UB4M0Y2552E00002 indicates the model does not support the heating function.

4. For models without heating function, the discharging temperature range is -10°C to +50°C.



**SAJ** | **elkeeper**

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