



CHIEF-5.0K-7.68kWh

CHIEF-5.0K-11.52kWh

CHIEF-5.0K-15.36kWh

CHIEF-8.0K-7.68kWh

CHIEF-8.0K-11.52kWh

CHIEF-8.0K-15.36kWh

CHIEF-10.0K-7.68kWh

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CHIEF-12.0K-7.68kWh

CHIEF-12.0K-11.52kWh

CHIEF-12.0K-15.36kWh

HARDWARE OPERATION MANUA

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About This Manual

The manual mainly describes the product information, guidelines for installation, operation and maintenance. The manual cannot include complete information about the photovoltaic (PV) system.







How to Use This Manual

Read the manual and other related documents before performing any operation on the machine. Documents must be stored carefully and be available at all times.

Contents may be periodically updated or revised due to product development. The information in this manual is subject to change without notice. The latest manual can be acquired via service @www.ceeg.cn.

1. Safety Introductions

Safety signs

| | | | |
|---|---|---|--|
|  | <p>The DC input terminals of the inverter must not be grounded.</p> |  | <p>Surface high temperature, Please do not touch the machine case.</p> |
|  | <p>The AC and DC circuits must be disconnected separately, and the maintenance personnel must wait for the machine to completely power off for five minutes before operating the machine.</p> |  | <p>Prohibit disassembling machine case, there existing shock hazard, which may cause serious injury or death, please ask qualified person to repair.</p> |
|  | <p>Please read the instructions carefully before use.</p> |  | <p>Do not put it in the waste bin! Recycle it by licensed professional!</p> |

- This chapter contains important safety and operating instructions. Read and keep this manual for future reference.
- Before using the machine, please read the instructions and warning signs of the battery and corresponding sections in the instruction manual.
- Do not disassemble the machine. If you need maintenance or repair, take it to a professional service center.
- Improper reassembly may result in electric shock or fire.
- To reduce risk of electric shock, disconnect all wires before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
- Caution: Only qualified personnel can install this device with battery.
- Never charge a frozen battery.
- For optimum operation of this machine, please follow required specification to select appropriate cable size. It is very important to correctly operate this machine.
- Be very cautious when working with metal tools on or around batteries. Dropping a tool may cause a spark or short circuit in batteries or other electrical parts, even cause an explosion.
- Please strictly follow installation procedure when you want to disconnect AC or DC terminals. Please refer to "Installation" section of this manual for the details.
- Grounding instructions - this machine should be connected to a permanent grounded wiring system. Be sure to

comply with local requirements and regulation to install this machine.

- Never cause AC output and DC input short circuited. Do not connect to the mains when DC input short circuits.

2. Product Introductions

CHIEF series hybrid all-in-one battery energy storage system (BESS) is designed for both indoor and outdoor use.

BESS can store the DC power generated by the PV array into the battery, or convert it into AC power to loads.

This user manual applies to the following products:

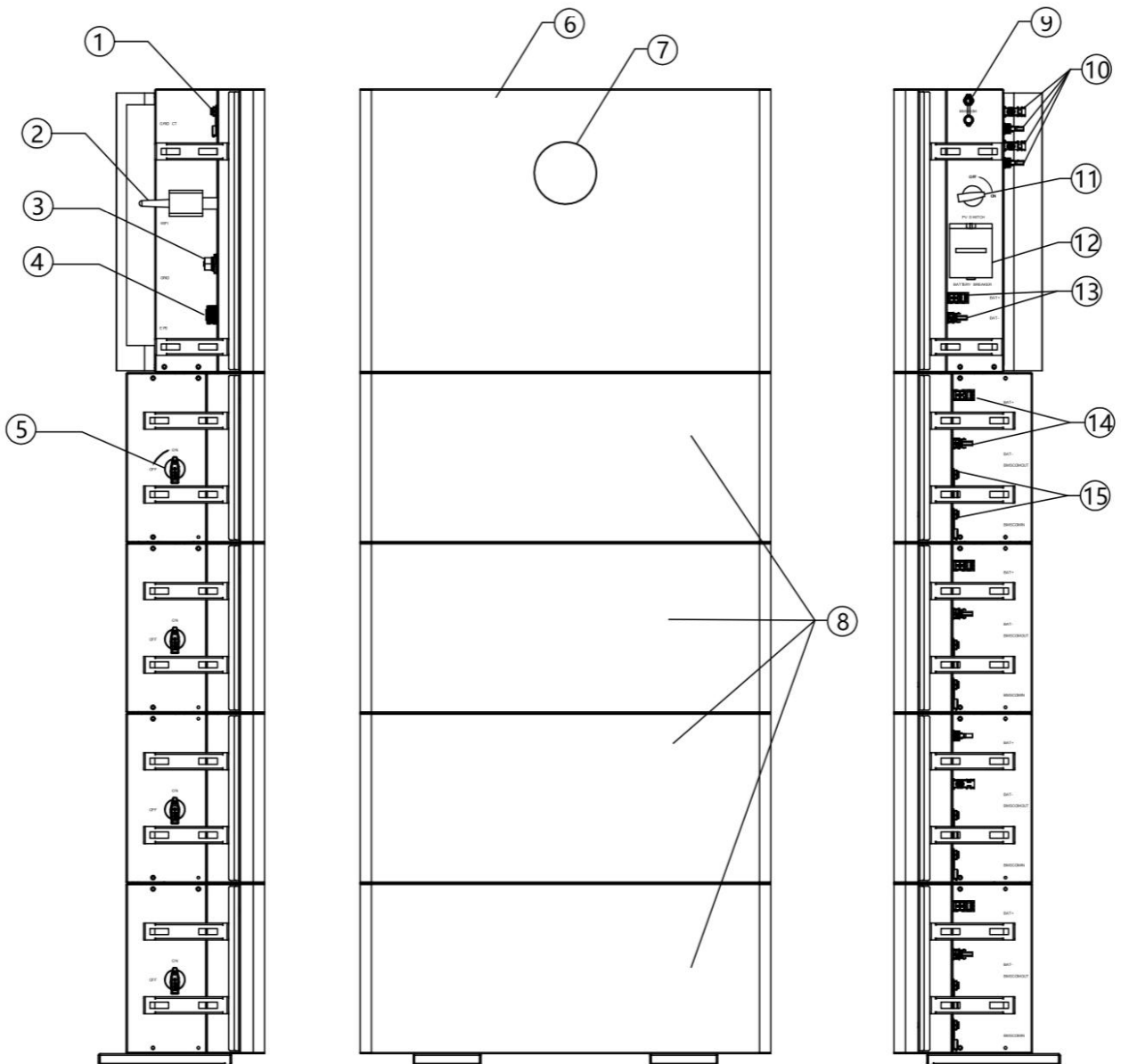
CHIEF-5.0K-7.68kWh; CHIEF-5.0K-11.52kWh; CHIEF-5.0K-15.36kWh;

CHIEF-8.0K-7.68kWh; CHIEF-8.0K-11.52kWh; CHIEF-8.0K-15.36kWh;

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CHIEF-12.0K-7.68kWh; CHIEF-12.0K-11.52kWh; CHIEF-12.0K-15.36kWh

2.1 Product Overview

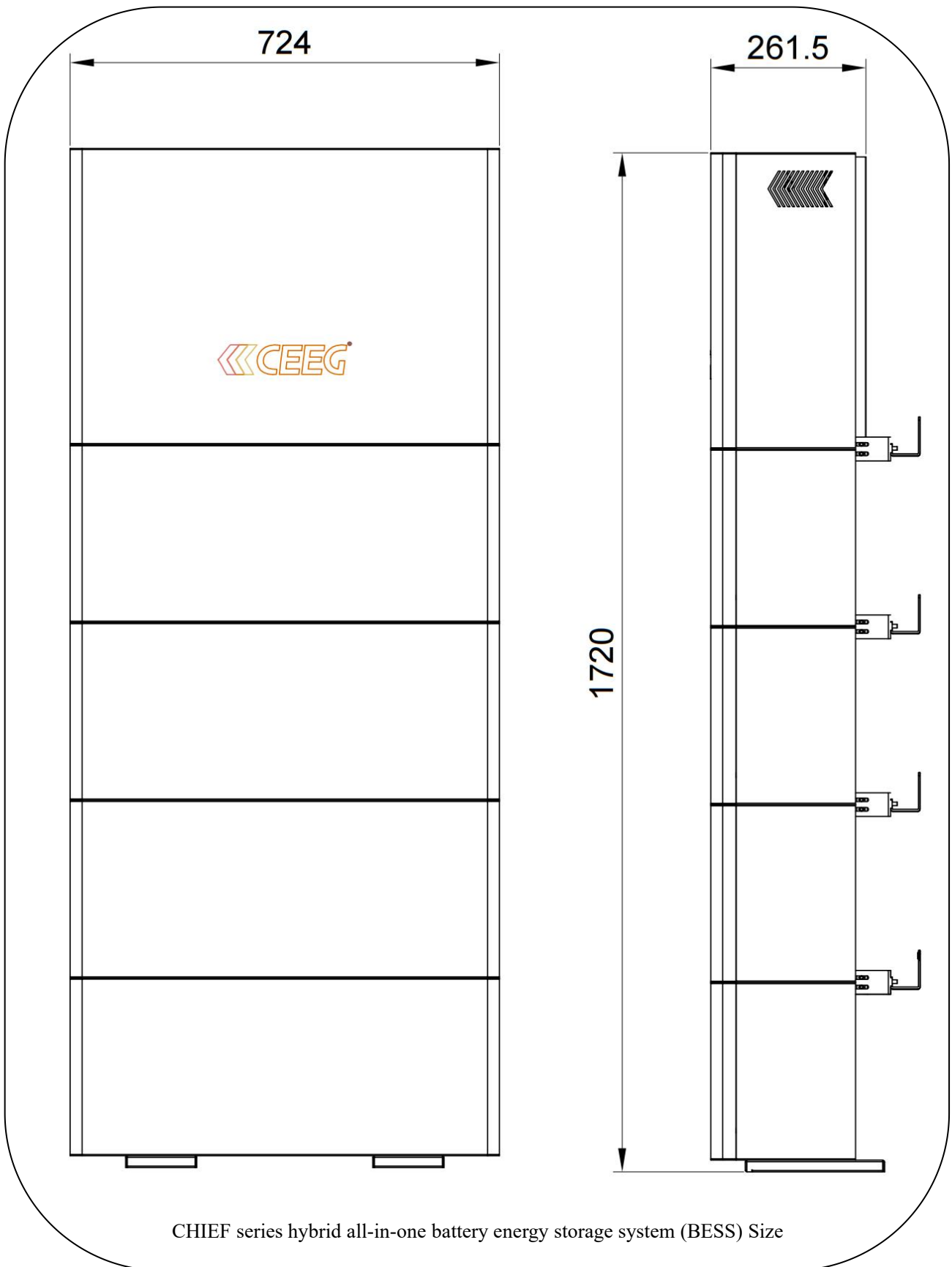


- 1. Grid CT interface
- 2. WIFI interface
- 3. Load
- 4. Grid
- 5. Battery switch

- 6. Hybrid inverter
- 7. SOC display
- 8. PACK
- 9. BMS communication
- 10. PV input

- 11. PV switch
- 12. Battery Breaker
- 13. Battery input
- 14. PACK input
- 15. BMS communication

2.2 Product Size



2.3 Product Features

- 230V/400V Three phase Pure sine wave inverter.
- Self-consumption and feed-in to the grid.
- Auto restart while AC is recovering.
- Programmable supply priority for battery or grid.
- Programmable multiple operation modes: On grid, off grid and UPS.
- Overload/over temperature/short circuit protection.
- Smart battery charger design for optimized battery performance.
- With limit function, prevent excess power overflow to the grid.
- Supporting WIFI monitoring and build-in 1 strings for 1 MPP tracker.

2.4 Basic system Architecture

The following illustration shows basic application of this machine.

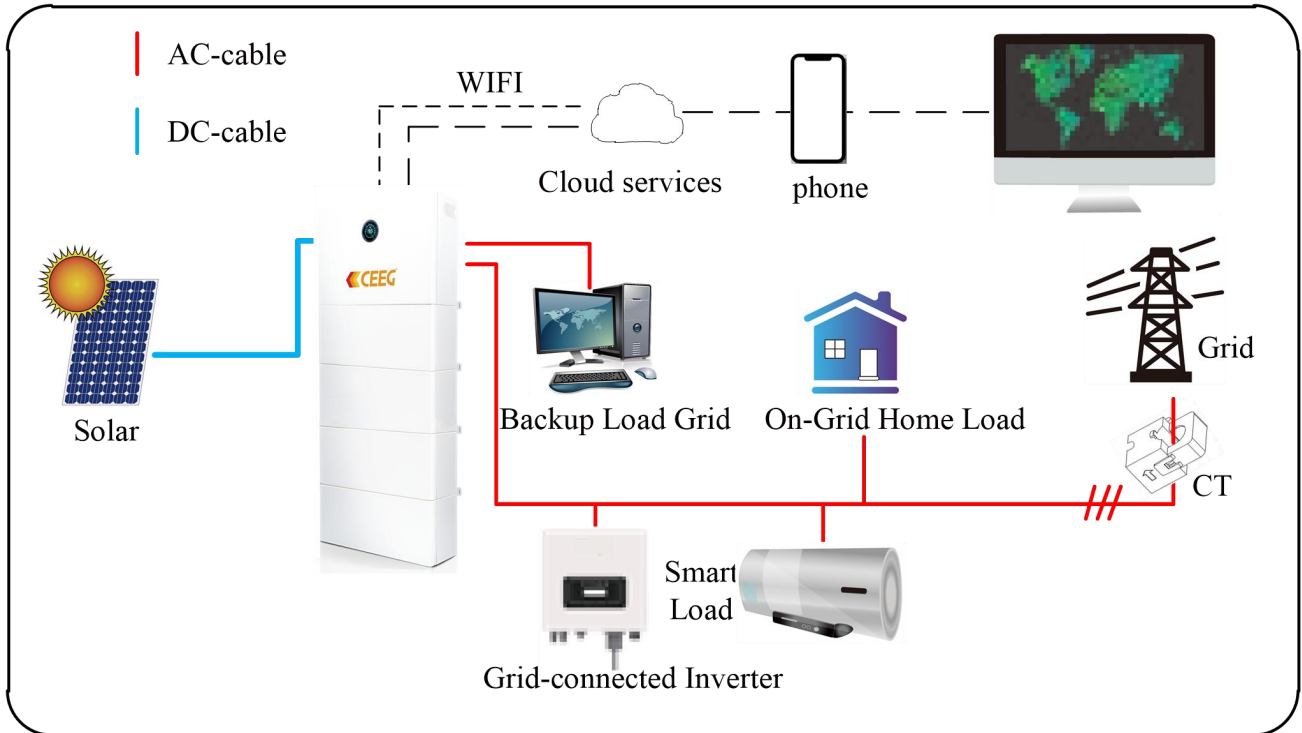
It also includes following devices to have a complete running system.

- PV modules

Consult with your system integrator for other possible system architectures depending on your requirements.

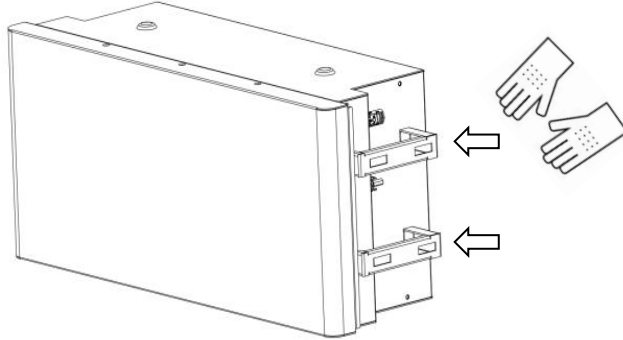
The machine cannot be connected to a generator.

This machine can power all kinds of appliances in home or office environment, including appliances such as refrigerator and air conditioner.

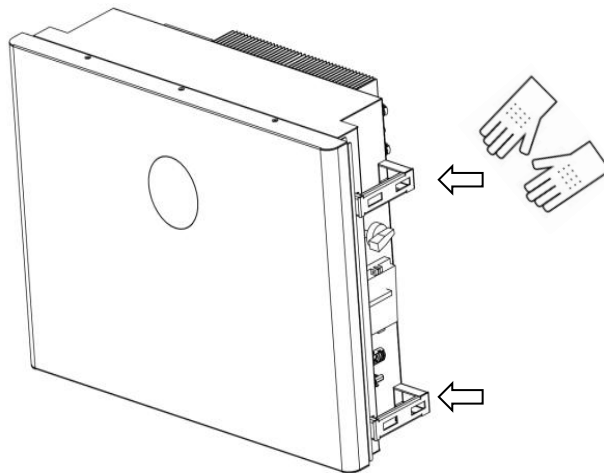


2.5 Product handling requirements

Two people stand on both sides of the machine, holding two handles to lift the machine.
Please wear gloves for operation.



battery box transport

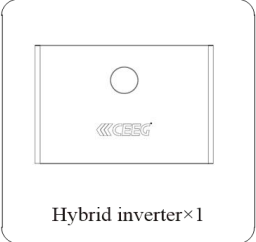
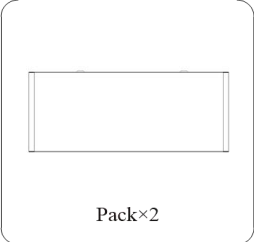
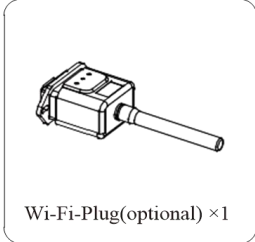

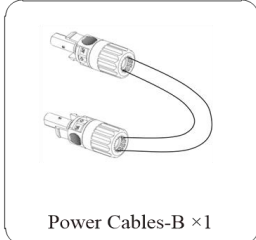

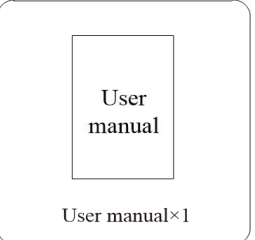
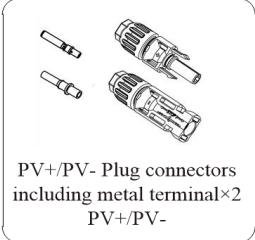


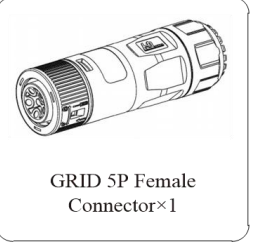
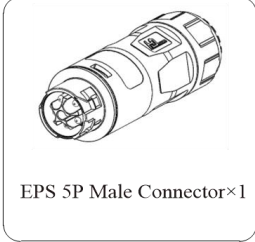
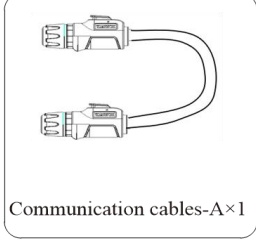
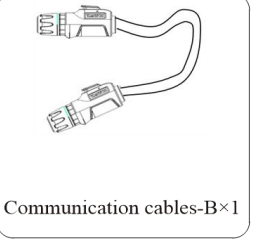
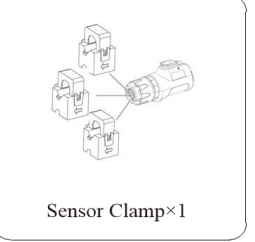
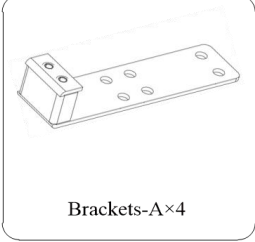
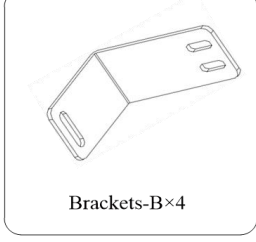
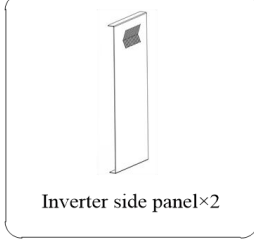
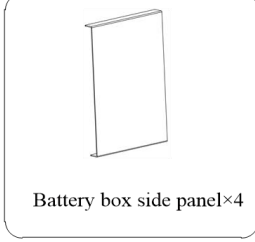


inverter box transport

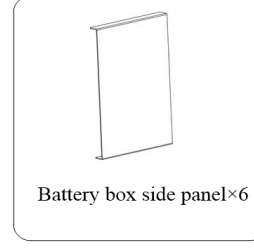
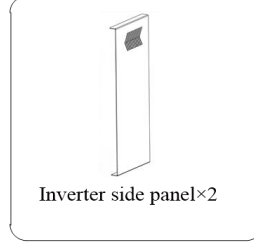
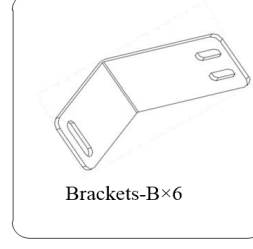
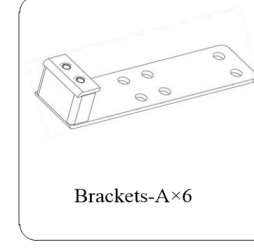
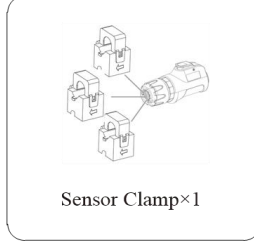
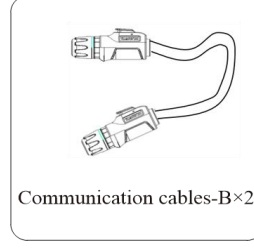
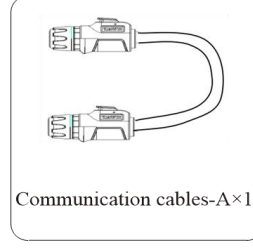
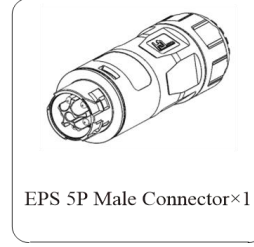
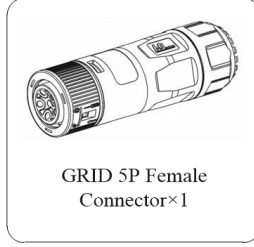
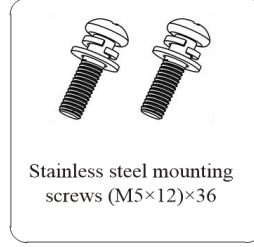
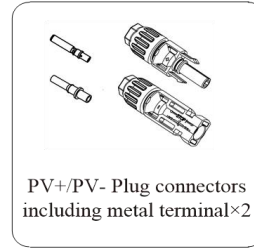
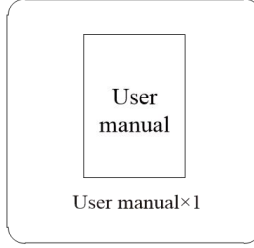
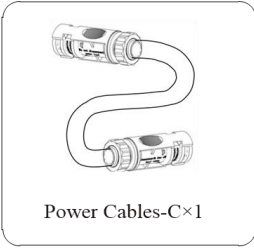
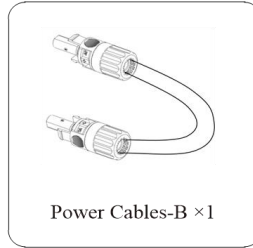
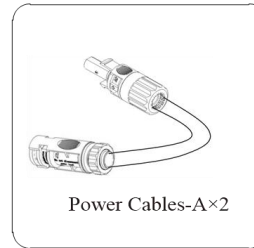
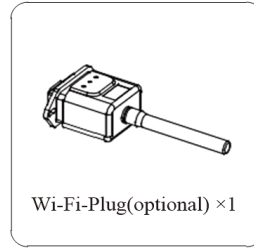
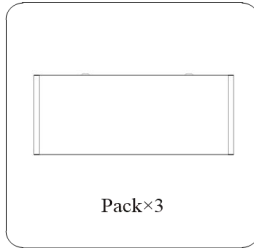
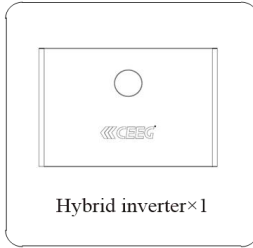
3. Installation

3.1 Parts list



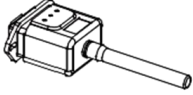
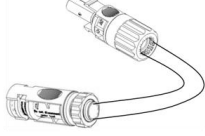



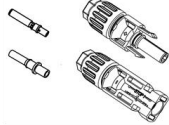


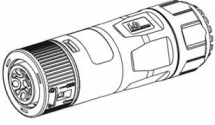
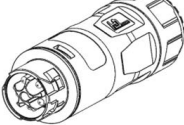
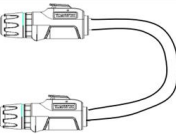
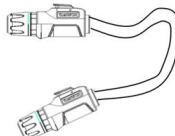
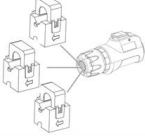
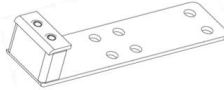
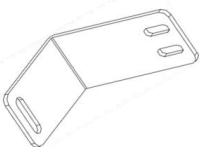

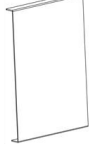
Check the equipment before installation. Please make sure nothing is damaged in the package. You should have received the items in the following package:

| CHIEF-5.0K/8.0K/10.0K/12.0k-7.68kWh | | | |
|--|---|--|---|
|  Hybrid inverter×1 |  Pack×2 |  Wi-Fi-Plug(optional) ×1 |  Power Cables-A×1 |
|  Power Cables-B ×1 |  Power Cables-C×1 |  User manual×1 |  PV+ / PV- Plug connectors including metal terminal×2 PV+ / PV- |
|  Stainless steel anti-collision bolt (M6×60)×8 |  Stainless steel mounting screws (M5×12)×24 |  GRID 5P Female Connector×1 |  EPS 5P Male Connector×1 |
|  Communication cables-A×1 |  Communication cables-B×1 |  Sensor Clamp×1 |  Brackets-A×4 |
|  Brackets-B×4 |  Inverter side panel×2 |  Battery box side panel×4 | |

CHIEF-5.0K/8.0K/10.0K/12.0k-11.52kWh



CHIEF-5.0K/8.0K/10.0K/12.0k-15.36kWh

| | | | |
|---|---|---|---|
|  <p>Hybrid inverter×1</p> |  <p>Pack×4</p> |  <p>Wi-Fi-Plug(optional) ×1</p> |  <p>Power Cables-A×3</p> |
|  <p>Power Cables-B ×1</p> |  <p>Power Cables-C×1</p> |  <p>User manual×1</p> |  <p>PV+/PV- Plug connectors including metal terminal×2</p> |
|  <p>Stainless steel anti-collision bolt (M6×60)×12</p> |  <p>Stainless steel mounting screws (M5×12)×48</p> |  <p>GRID 5P Female Connector×1</p> |  <p>EPS 5P Male Connector×1</p> |
|  <p>Communication cables-A×1</p> |  <p>communication cables-B×3</p> |  <p>Sensor Clamp x1</p> |  <p>Brackets-A×8</p> |
|  <p>Brackets-B×8</p> |  <p>Inverter side panel×2</p> |  <p>Battery box side panel×8</p> | |

3.2 Mounting instructions

Installation Precaution

- Any installation and operation on BESS must be performed by qualified electricians, in compliance with standards, wiring rules or requirements of local grid authorities or companies.
- Before any wiring connection or electrical operation on BESS, all battery and AC power must be disconnected from BESS for at least 5 minutes to make sure BESS is totally isolated to avoid electric shock.
- The temperature of BESS surface might exceed 60°C during working, so please make sure it is cooled down before touching it, and make sure the BESS is untouchable for children.
- Usage and operation of the BESS must follow instructions in this user manual, otherwise the protection design might be useless and warranty for the BESS will be invalid.
- Do not open BESS cover or change any component without CEEG's authorization, otherwise the warranty commitment for the BESS will be invalid.
- Appropriate methods must be adopted to protect BESS from static damage. Any damage caused by static is not warranted by CEEG.
- This BESS includes an integrated residual current device (RCD). If an external residual current device (RCD) is used, a device of type A should be used, with a tripping current of 30 mA or higher.
- This BESS is a multiple mode inverter, it is used for outdoor unconditioned without solar effects. The maximum operating ambient temperature is 55 °C .
- Product should not be used in multiple phase combinations.

Installation Environment

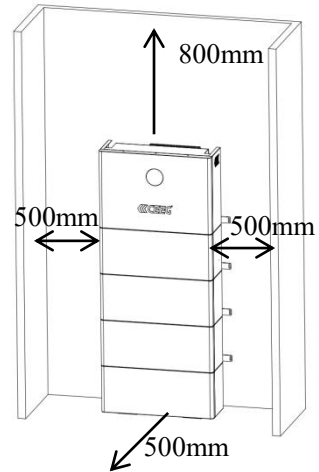
It is required to be installed on a flat ground or platform which can bear at least 300Kg. The back of the battery box requires a wall or bracket that can fix expansion bolts, bearing at least 300Kg. The installation site is required to be free from and has no flammable and explosive items and maintains air circulation. The mounting location must allow free access to the unit for installation and maintenance purposes, and the system panels must not be blocked.

The following locations are not allowed for installation:

- habitable rooms, ceiling cavities or wall cavities, roofs which are not specifically considered suitable;
- seismic areas—additional security measures are required;
- places with an explosive atmosphere;
- locations with direct sunlight or a large change in the ambient temperature;
- sites higher than 3000 meters above sea level;
- BESS installed in any corridor, hallway, lobby or the like and leading to an emergency exit shall ensure sufficient clearance for safe egress of at least 1 meter.
- If the BESS is mounted at a wall or at least distance of 30 mm from the wall or the structure separating it from the habitable space, the distances to other structures or objects must be increased.

The following distances must remain empty:

- (1) 500 mm beside the BESS;
- (2) 800 mm above the BESS;
- (3) 500 mm before the BESS.

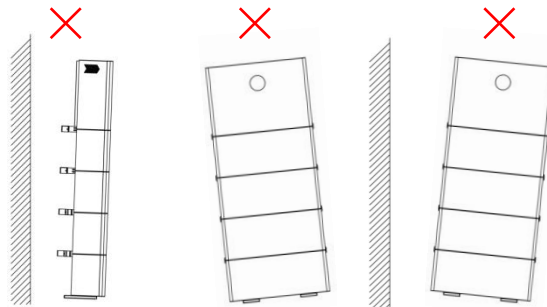


MOUNTING LOCATION SELECTION

For The BESS's protection and convenient maintenance, mounting location for The BESS should be selected carefully based on the following rules:

Rule 1: The BESS should be installed on a solid surface, where is suitable for inverter's dimensions and weight.

Rule 2: The BESS installation should stand vertically or lie on a slop by max 2° as shown in the figure below.



Rule 3: Ambient temperature should be lower than 45°C.

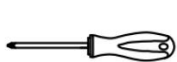
Rule 4: The installation of The BESS should be protected under shelter from direct sunlight or bad weather like snow, rain, lightning etc.

Rule 5: The BESS should be installed at eye level for convenient maintenance.

Rule 6: Product label on The BESS should be clearly visible after installation.

3.2.1 Battery Box Installation

Installation Tools



Cross
screwdriver



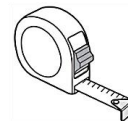
Multimeter



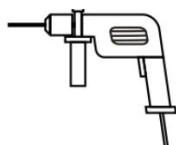
Wire stripper



Claw hammer



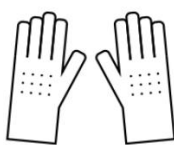
tape measure



Percussion
drill



Diagonal
pliers



Insulating
gloves

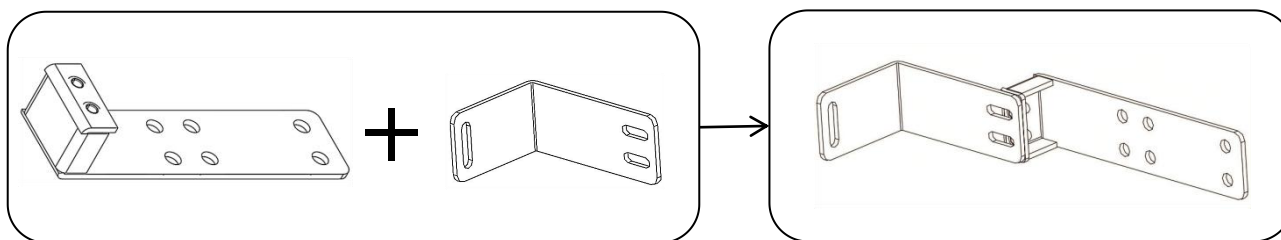


Protective
gloves

For 15kWh BESS:

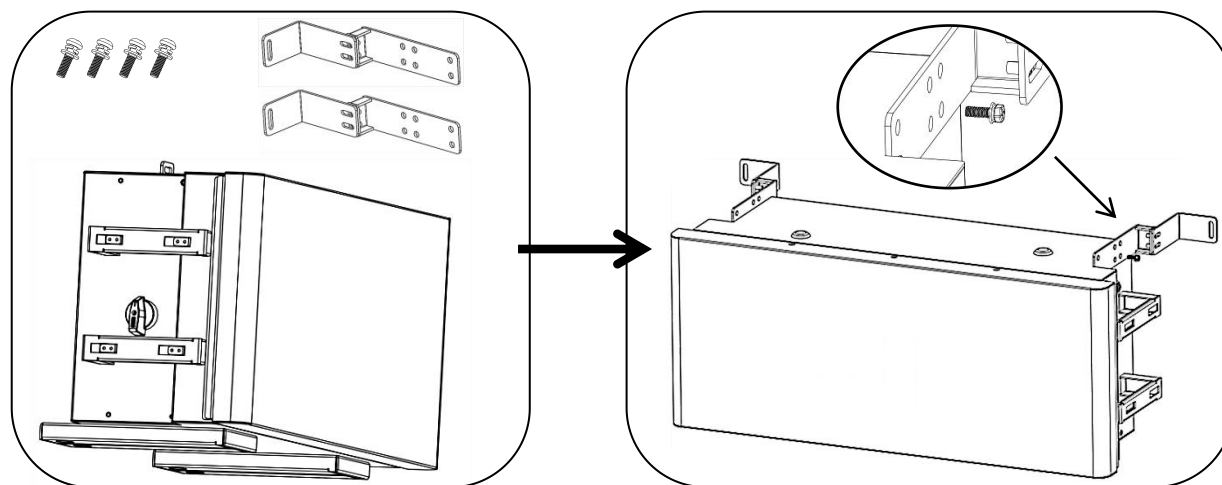
Step 1 : Install the combination brackets

Find 8 Brackets-A, 8 Brackets-B, and 16 M5 screws from the battery box packaging, and use the screws to fix the Brackets-A and Brackets-B together, as shown in the figure:



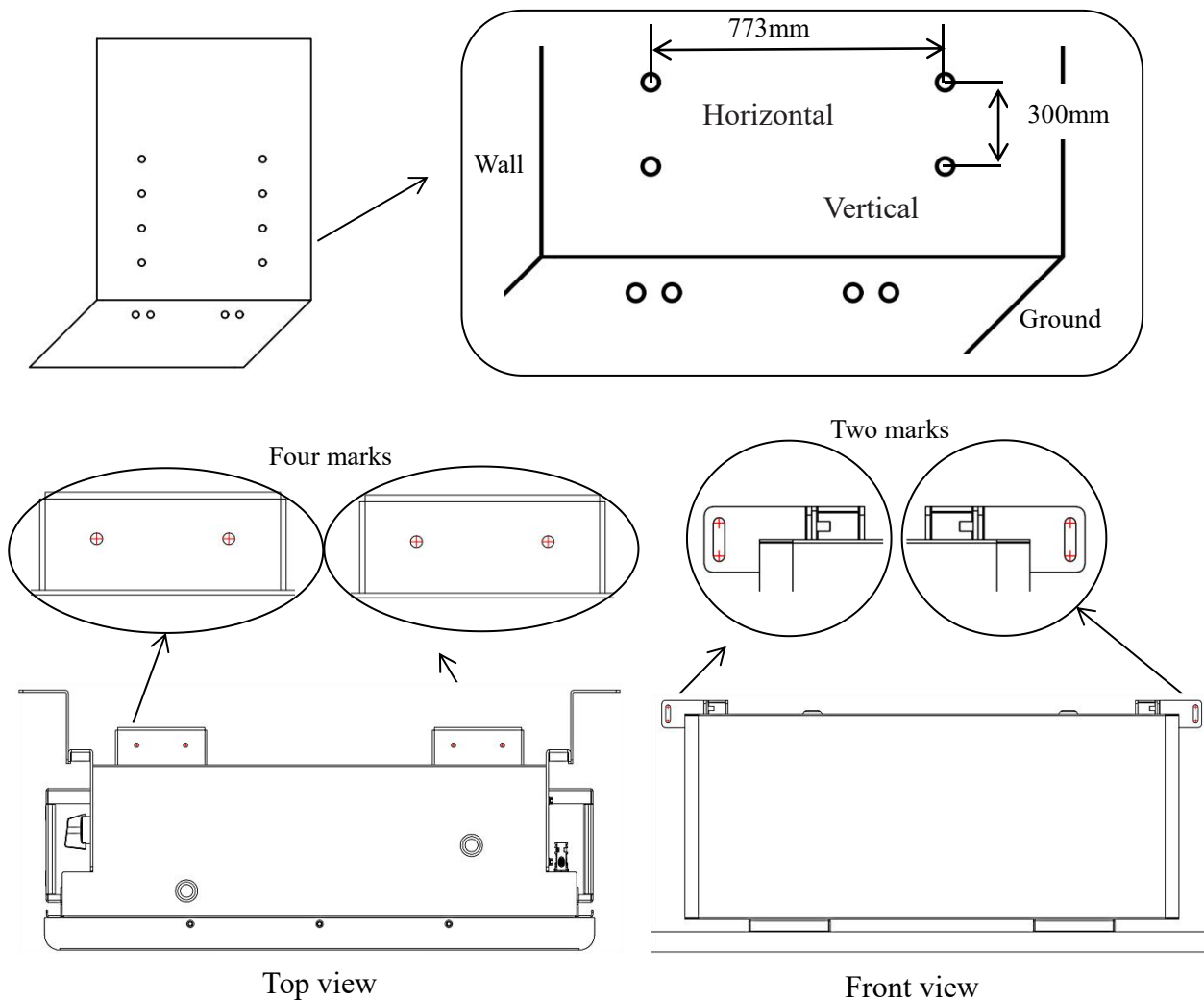
Step 2 : Fix the battery box base

Locate the battery box base, four M5 screws from the battery box. Secure the two assembled brackets to each side of the top of the battery box with the four M5 screws, and then place the battery box base against a fixture (wall or mounting bracket, etc.) in order to mark the fixture.



Step 3 : Drilling hole

After fixing the battery box base, mark the drilling positions on the fixing device according to the holes on the base and mounting bracket (6 holes need to be drilled to install the battery box base), and move the battery box base after marking. In order to facilitate the subsequent installation of the battery box, it is recommended to mark the drilling positions for the remaining battery boxes at this time. In the case of the 15kWh model, for example, in addition to the six holes for installing the battery box base, you will need to drill an additional six holes. Drill the holes according to the marked points.

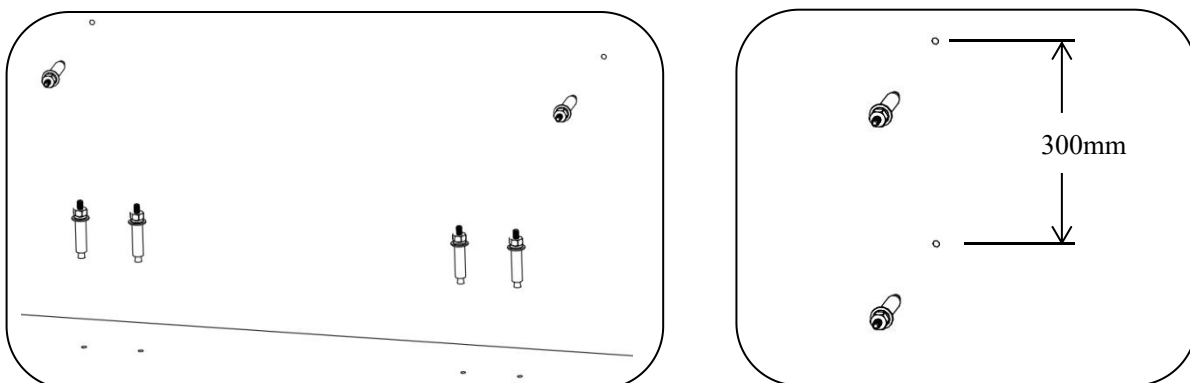


The number of holes you need to pre-drill for different models is as follows:

| Product Model | Number of boreholes |
|--------------------------------------|---------------------|
| CHIEF-5.0K/8.0K/10.0K/12.0k-7.68kWh | 8 |
| CHIEF-5.0K/8.0K/10.0K/12.0k-11.52kWh | 10 |
| CHIEF-5.0K/8.0K/10.0K/12.0k-15.36kWh | 12 |

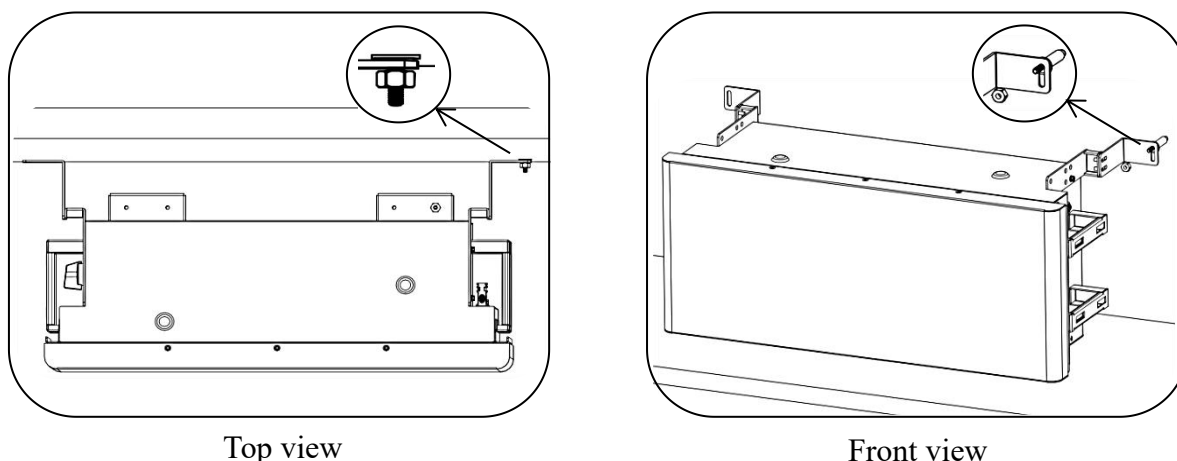
Step 4 : Fix expansion bolt

Locate M6 sleeve expansion bolt from the packing tool and hammer it into the pre-drilled hole so that its surface is flush with the fixture.



Step 5 : Fix battery box and back plate

Move the battery box base so that the holes in the bracket and base overlap and align with the pre-drilled holes in the fixture, (please ensure that the holes are aligned after) and then rotate the expansion bolts with the corresponding nuts until they lock the battery box to the mounting bracket as shown in the figure below:

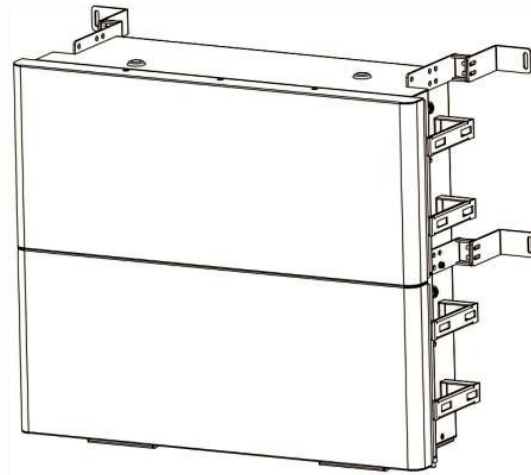


Top view

Front view

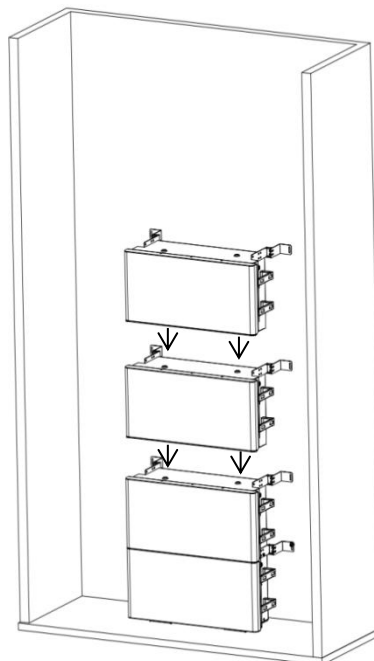
Step 6 : Installation of second battery box side brackets

Place the second battery box smoothly on top of the first battery box, the slotted holes of the two battery boxes should fit perfectly, then use four M5 screws to attach it to the mounting bracket of the first battery box so that the bottom of it fits tightly to the top of the first battery box. Then refer to STEP2, use four M5 screws to attach the two mounting brackets to the top of the second battery box, at this time, the slotted holes on the brackets should match the holes drilled on the fixture before, and finally use the corresponding nuts to rotate the expansion bolts to lock the battery box to the fixture, so that it will be as shown in the figure below:



Step 7 : Install the remaining Battery Box

Reference the STEP 6 steps and install the remaining Battery Box



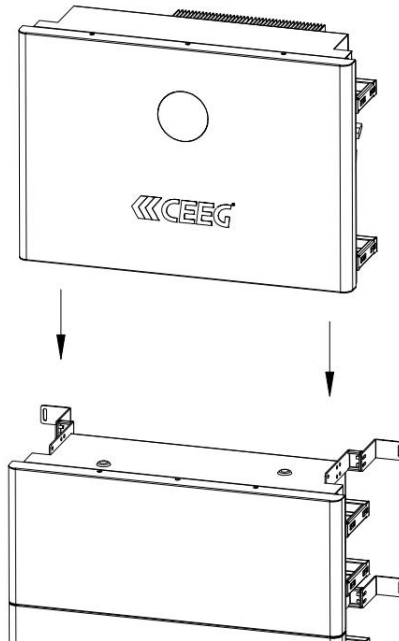
How to fine-tune the battery box:

| Item | Name | Torque | Note |
|------|------------------|--------|---------------------|
| 1 | Expansion screws | 4 N·m | Tune up and down |
| 2 | Tune screws | 3 N·m | Tune left and right |
| 3 | Fix screws | 3 N·m | Tune front and back |

3.2.2 Inverter Box Installation

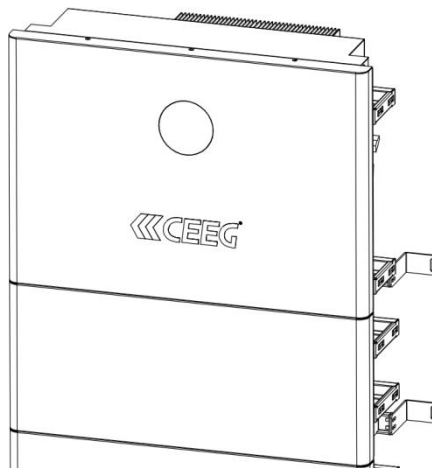
Step 1 : Place the inverter box

Remove the inverter from the box and place it smoothly on the battery box, the upper and lower slots fit perfectly.



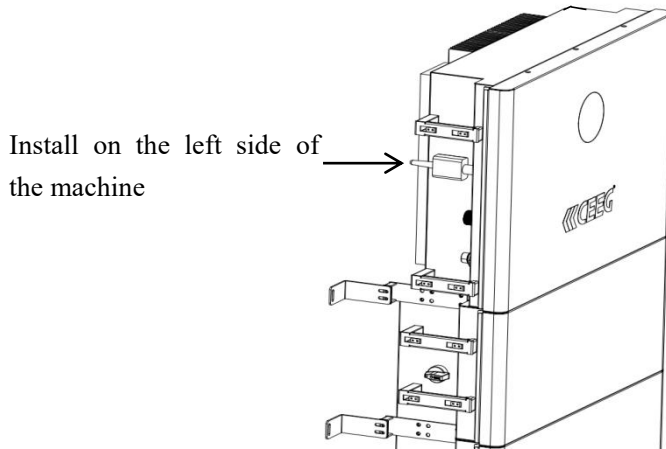
Step 2 : Fix the inverter box

Secure the inverter to the mounting brackets on either side of the top of the battery compartment underneath it using four M5 screws.



Step 3 : Install Wi-Fi module

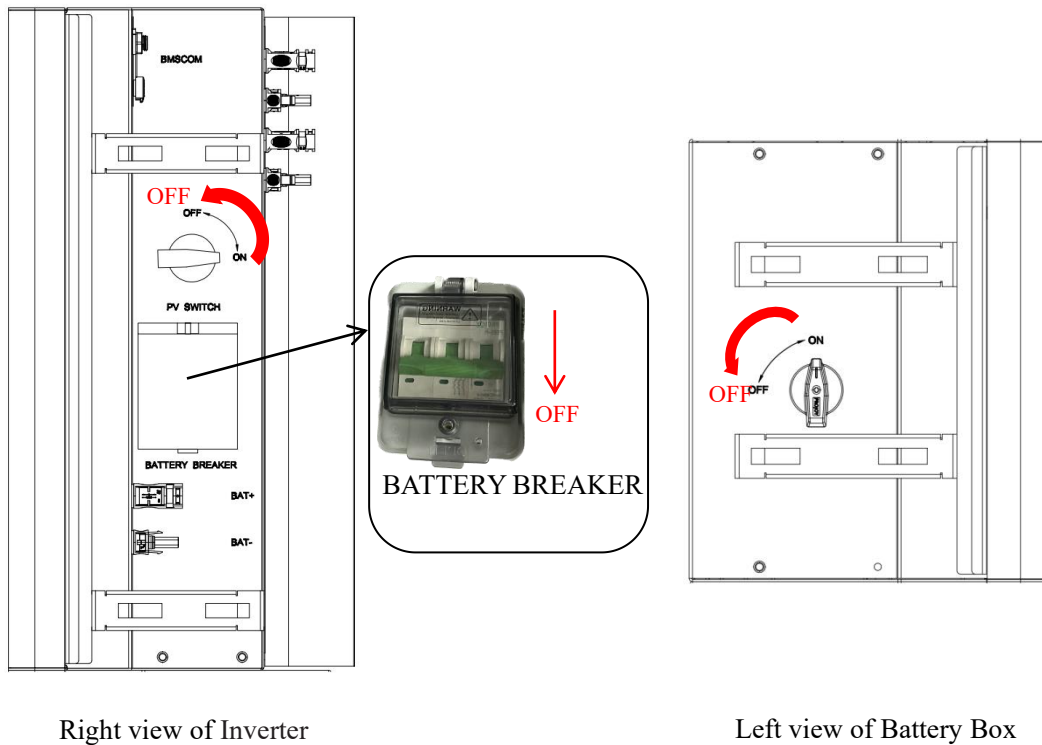
Find the Wi-Fi module in the accessory package and insert it into the base, then tighten the Plastic nut.
Torque: 2.5N.m.



3.3 Cable Connection

3.3.1 General

Ensure that all switches and breakers of BESS are closed (The switch and circuit breaker of the inverter are on the right side of the machine and the switch of the battery box is on the left side of the machine)

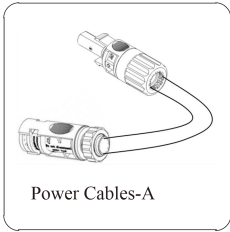
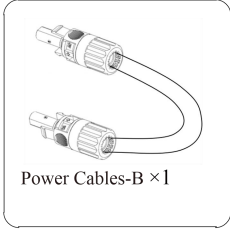
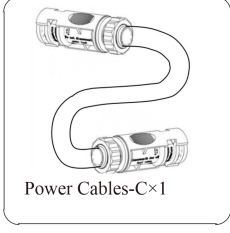


3.3.2 Connect the Inverter Box and Battery Box

For 15kWh

Step 1 : Connect power cables between the battery boxes and the inverter box

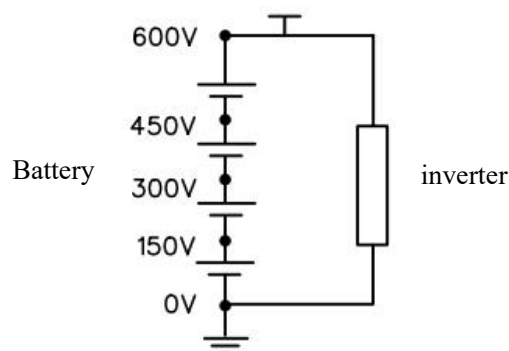
First, take out the power cord from the accessory, there are three kinds of models A, B and C

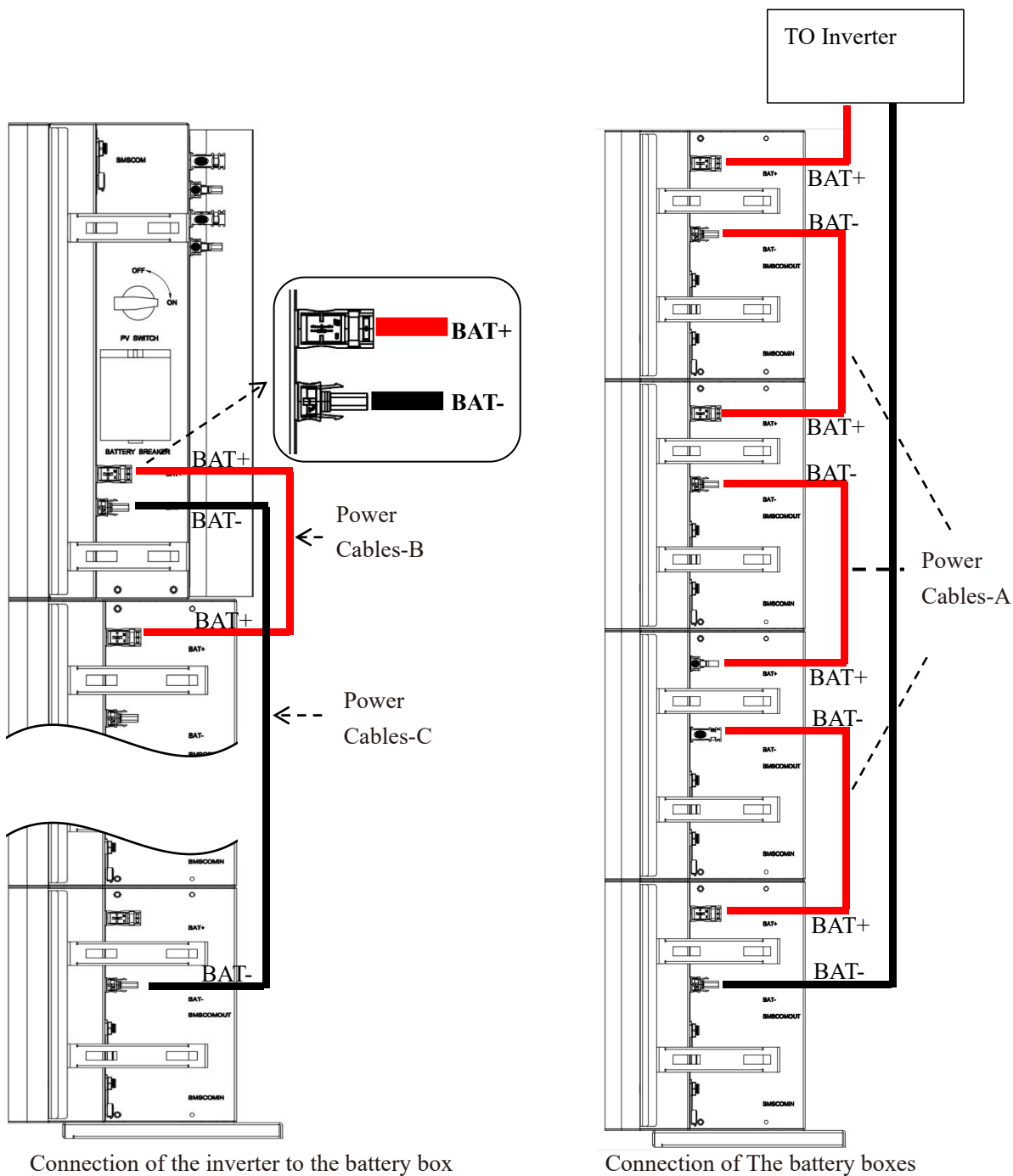
| Type of Cable | Elaborate |
|--|--|
|  <p>Power Cables-A</p> | <p>For the battery case used in series with each other</p> <p>Features: Male Connector -Female Connector; 300mm long; Red</p> |
|  <p>Power Cables-B ×1</p> | <p>To connect the positive electrode of the high voltage side of the battery box to the positive electrode of the inverter</p> <p>Features: Male Connector -Male Connector; 250mm long; Red</p> |
|  <p>Power Cables-C×1</p> | <p>To connect the negative electrode of the low voltage side of the battery case to the negative electrode of the inverter</p> <p>Features: Female Connector -Female Connector; 1300mm long; Black</p> |

For the low voltage side and high voltage side of the battery box:

As we all know, different numbers of battery series can be combined into different power levels of products, flexibly applied in a variety of scenarios.

The circuit model of the battery box connection is roughly as follows. In order to describe, we agree to regard the bottom seat of the battery box as the low voltage side, and the battery closest to the inverter is regarded as the high voltage side. You need to complete the wiring between the battery box and the inverter according to the instructions introduced in the manual.

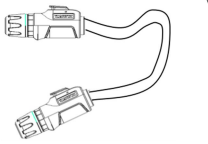


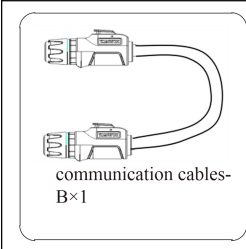


Connection of the inverter to the battery box

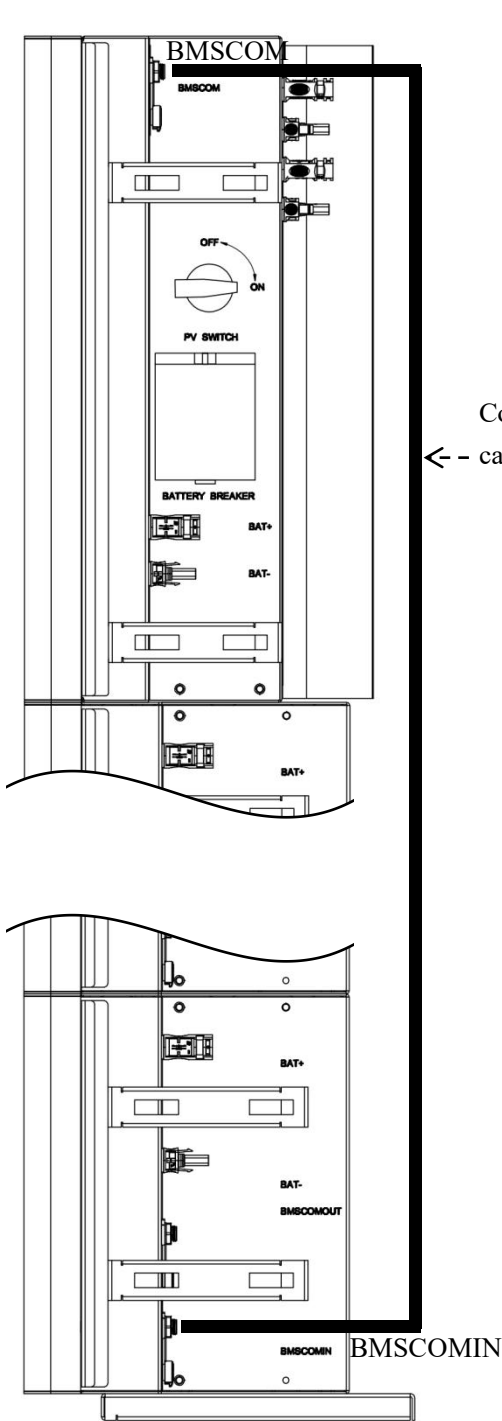
Connection of The battery boxes

Step 2 : Connect communication cables between the battery boxes and the inverter box

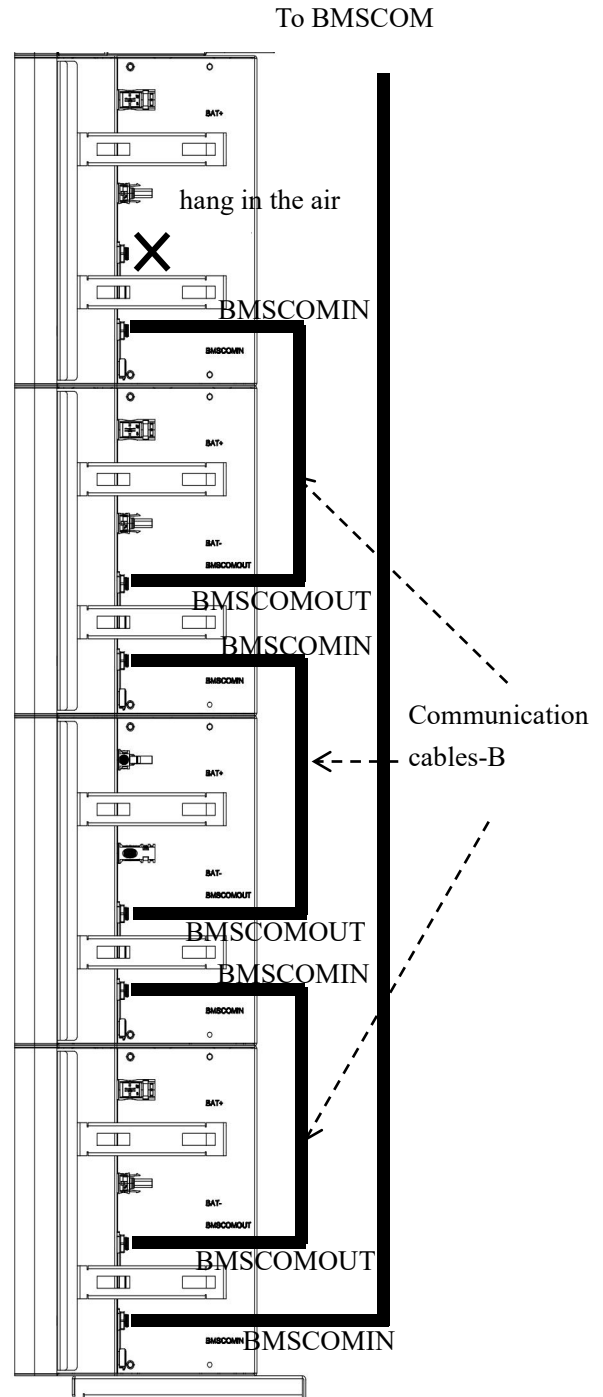
| Type of Cable | Elaborate |
|--|--|
|  <p>communication cables- A×1</p> | <p>Used to connect the BMSCOM port of the inverter to the BMSCOMIN port of the battery box base</p> <p>Features:Male Connector -Male Connector; 1800mm long; Black</p> |



Used to sequentially connect the BMSCOMOUT port of the battery box to the BMSCOMIN port of the subsequent battery box
 Features: Male Connector -Male Connector; 350mm long; Black

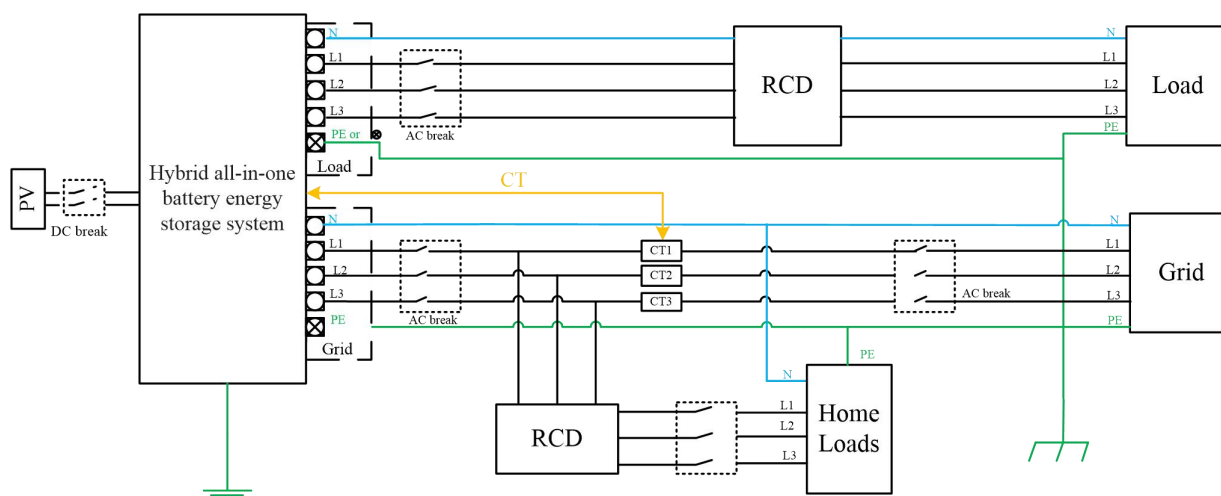


Connection of the inverter to the battery box



Connection of the inverter to the battery box

3.4 System Connection Block Diagram



Before connecting to the grid, a separate AC breaker must be installed between the inverter and the grid, and also between the backup load and the inverter. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current.



All wiring must be performed by a qualified personnel. It is very important for system safety and efficient operation to use appropriate cable for AC input connection. To reduce risk of injury, please use the proper recommended cable as below.

Recommended cables and terminals:

| Cable Type | Cable Specification | Terminal Model | Note |
|-------------------------|--|------------------|------|
| PV+ cable | 10AWG(RED) | Positive DC Plug | |
| PV- cable | 10AWG(BLACK) | Negative DC Plug | |
| Grid cable | 10AWG/PCS | | |
| EPS cable | 10AWG/PCS | | |
| LOAD-AC circuit breaker | Current carrying capacity: $\geq 18A$ | | |
| GRID-AC circuit breaker | Current carrying capacity: $\geq 28A$ | | |
| DC circuit breaker | Current carrying capacity: $\geq 30A$ | | |
| RCD | tripping current : $\geq 30\text{ mA}$ | | |

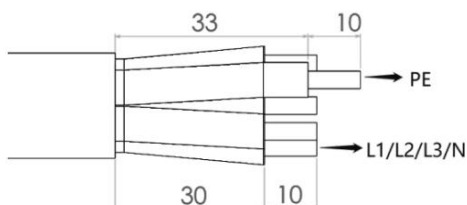
3.5 Connect EPS cables

Warning: Be sure to turn off the AC circuit breaker or isolation switch before starting wiring.

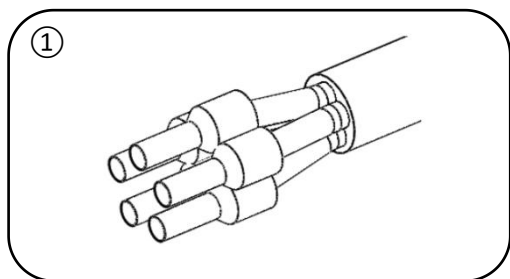
You need to install the 5-core wire (10AWG/PCS) from the load end into the EPS side 5-core male connector provided in the attachment

Step 1: Dimension of stripping

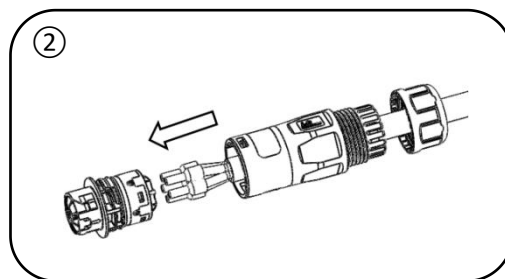
Find the EPS male socket in the attachment, thread the three live wires, one zero wire, and one ground wire at the load end through the EPS male socket, and use a wire stripper to peel off the appropriate length (as shown in the following figure).



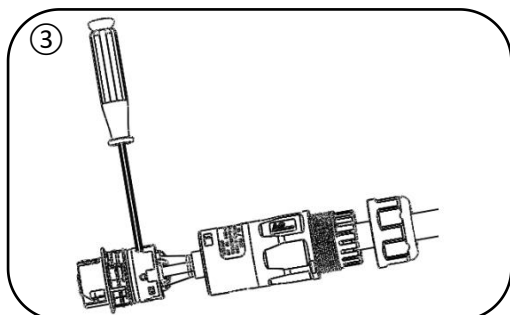
Step 2 : Installation Procedure



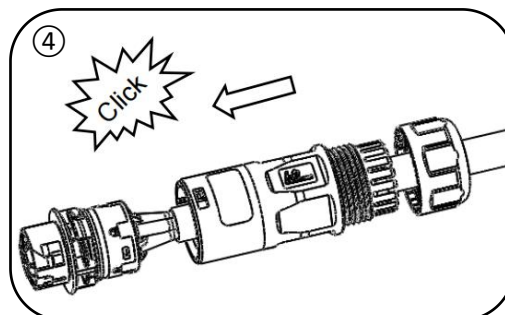
① Crimp the terminals with crimping pliers



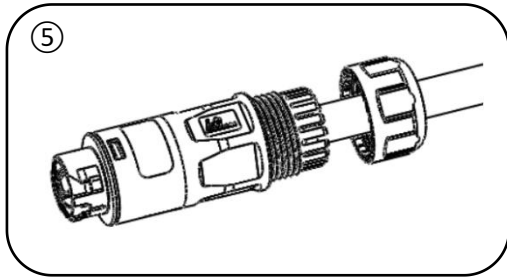
② Set the parts on the cable, insert the terminal holes in sequence



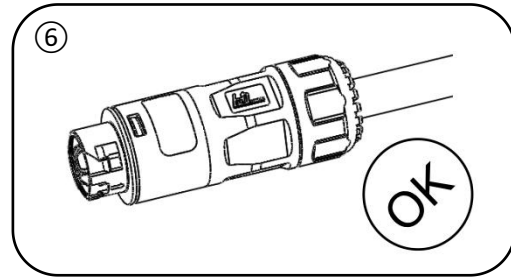
③ Crimp the wire with an inner hexagon screwdriver and screw the torque $1.2 \pm 0.1 \text{ N} \cdot \text{M}$



④ Insert the main body into the rubber core and hear the “click” sound

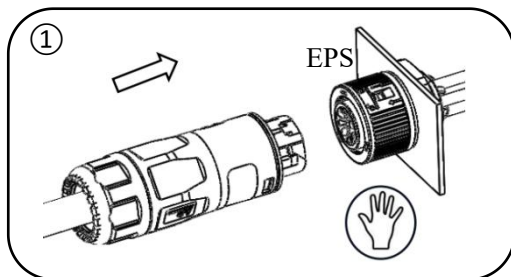


Tighten the nut with an open-ended wrench
(torque $2.5 \pm 0.5\text{N} \cdot \text{M}$)

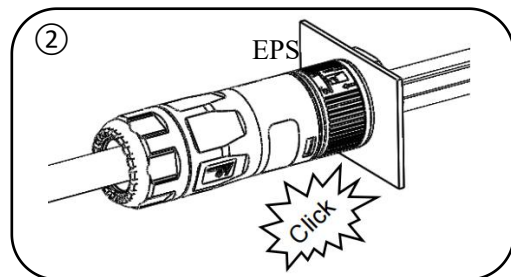


Complete the installation

Step 3: male-female docking



Insert the EPS port on the left side of the inverter
by the installation arrows



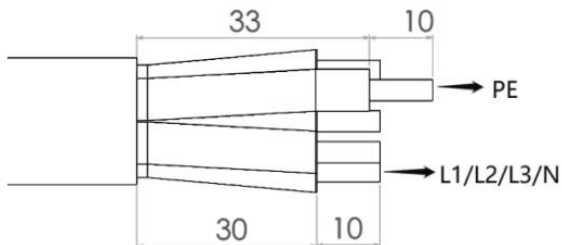
Complete the installation

3.6 Connect GRID cables

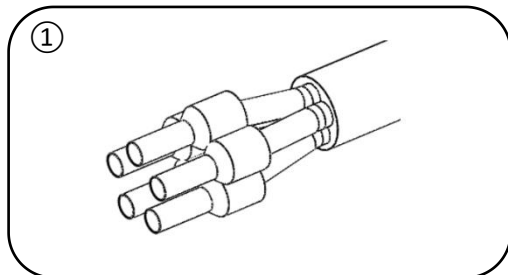
Warning: Be sure that AC power source is disconnected before attempting to wire it to the unit.

Step 1: Dimension of stripping

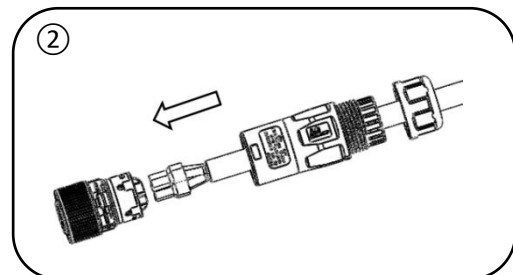
Locate the GRID female receptacle in the accessories and place three fire wires, one zero wire, and one ground wire, through the GRID female receptacle and strip it to the proper length with wire strippers (as shown below).



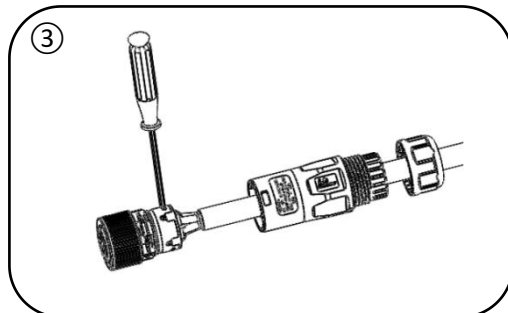
Step 2: Installation Procedure



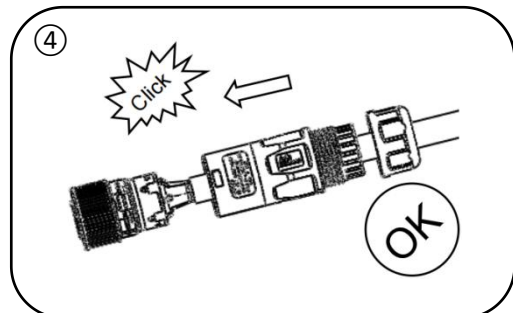
① Crimp the terminals with crimping pliers



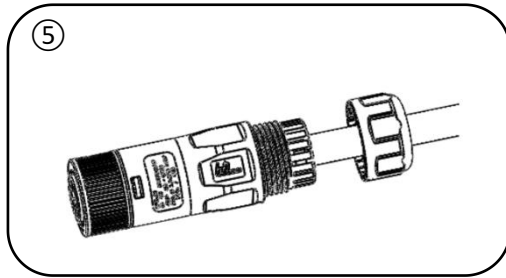
② Set the parts on the cable, insert the terminal holes in sequence



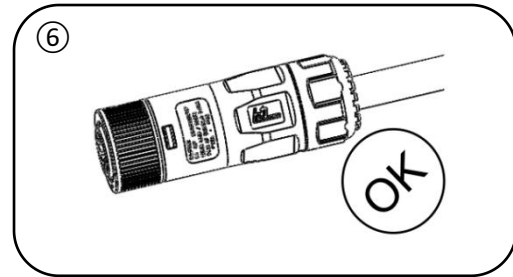
③ Crimp the wire with an inner hexagon screwdriver and screw the torque $1.2 \pm 0.1 \text{ N}\cdot\text{M}$



④ Insert the main body into the rubber core and hear the “click” sound

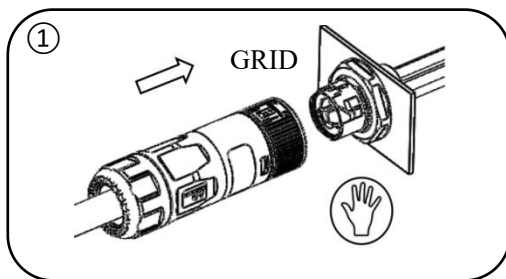


Tighten the nut with an open-ended wrench
(torque $2.5 \pm 0.5\text{N} \cdot \text{M}$)

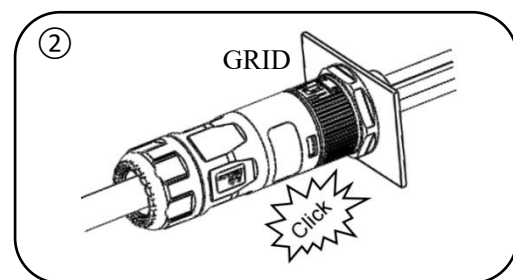


Complete the installation

Step 3: male-female docking



Insert the GRID port on the left side of the
inverter by the installation arrows



Complete the installation

3.7 Connect CT cables

Warning: Be sure that AC power source is disconnected before attempting to wire it to the unit.

Step 1: Stripping on the power grid side

You need to strip the five core wire connected to one side of the power grid to a suitable length in order to:

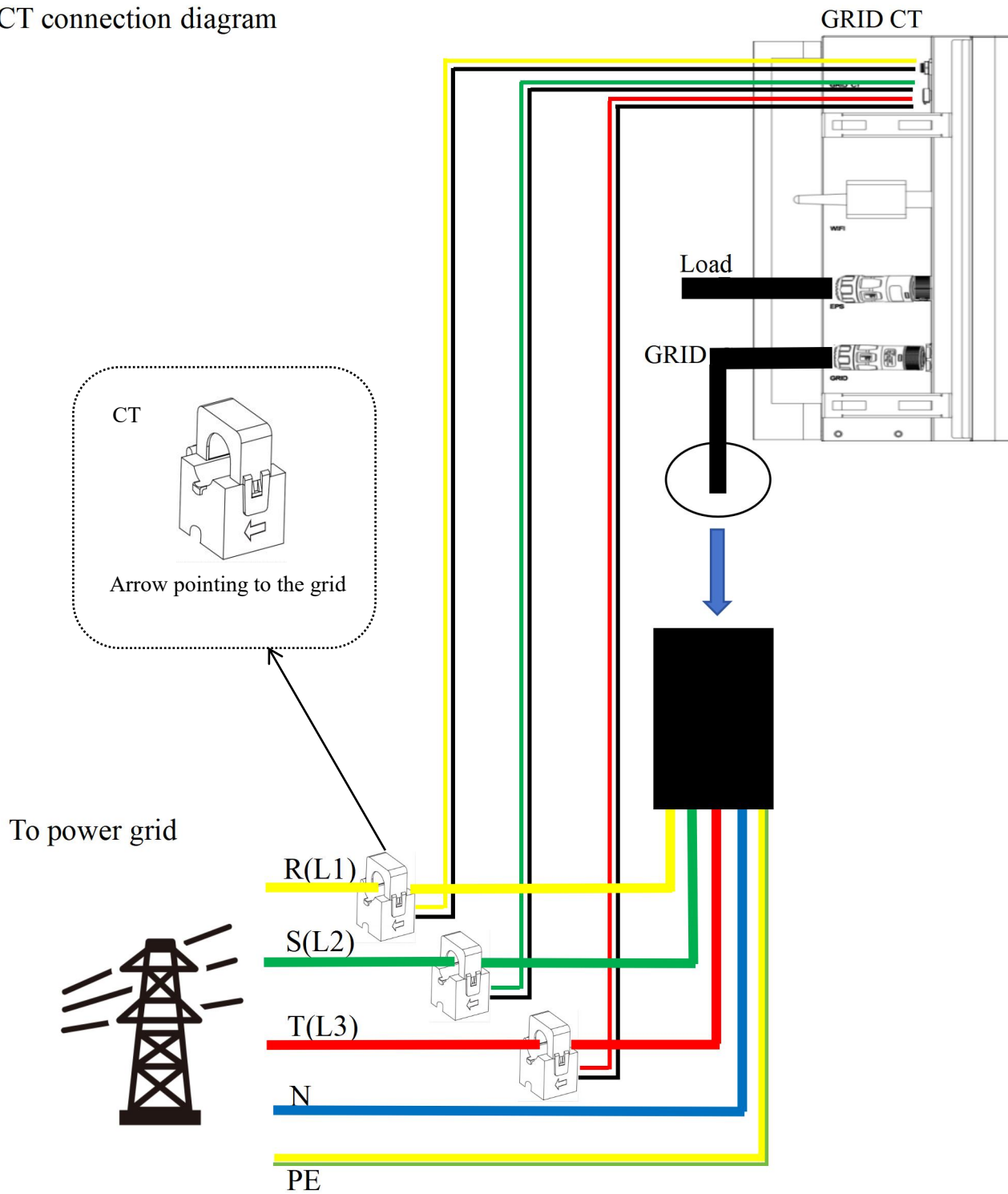
- (1) Place the sensor on the R, S, and T phase cables;
- (2) Connect the cable to the power grid

Step 2: Remove the sensor clamp and place the three sensors on the R, S, and T phase cables respectively

Step 3: Connect the cables R, S, T, N, and PE correctly to the power grid in sequence


Step 4: Connect the terminals of the sensor fixture to the GRID CT port on the left side of BESS

CT connection diagram



3.8 Connect PV cables

Before connecting to PV modules, please install a separately DC circuit breaker between inverter and PV modules. It is very important for system safety and efficient operation to use appropriate cable for PV module connection.

| | |
|--|---|
|  Warning | <p>To avoid any malfunction, do not connect any PV modules with possible leakage current to the inverter. For example, grounded PV modules will cause leakage current to the inverter. When using PV modules, please ensure the PV+ & PV- of solar panel is not connected to the system ground bar.</p> <p>It is requested to use PV junction box with surge protection. Otherwise, it will cause damage on inverter when lightning occurs on PV modules.</p> |
|--|---|


3.8.1 PV Module Selection

When selecting proper PV modules, please be sure to consider below parameters:

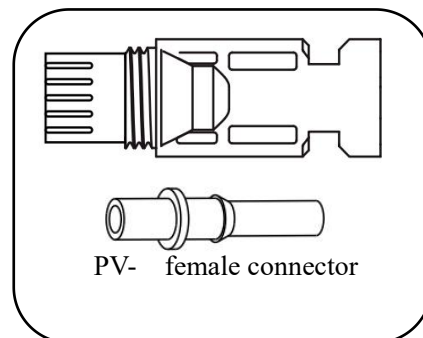
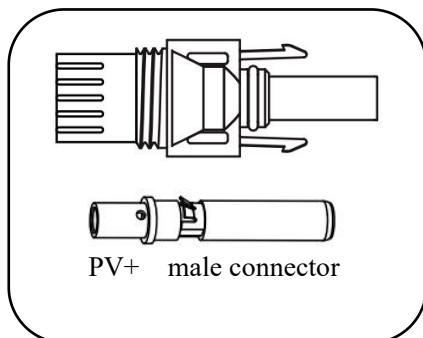
- 1) The open-circuit voltage (Voc) of the PV module must not exceed the maximum value of the open-circuit voltage of the inverter PV array.
- 2) The open circuit voltage (Voc) of the PV module should be higher than the minimum value of the starting voltage.
- 3) The PV modules used to connected to this inverter shall be Class A rating certified according to IEC 61730.

3.8.2 Connect PV cables

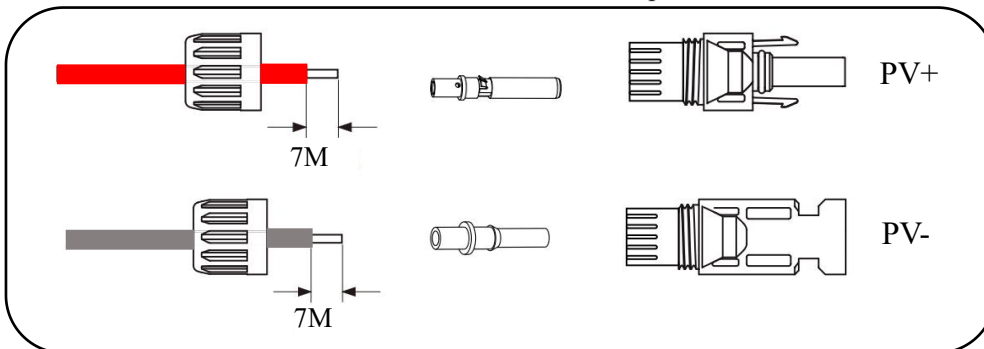
1. Switch the Grid Supply Main Switch(AC)OFF.
2. Switch the DC Isolator OFF.
3. Assemble PV input connector to the inverter.

| | |
|--|--|
|  Warning | <p>Safety Hint When using PV modules, please ensure the PV+ & PV- of solar panel is not connected to the system ground bar.</p> <p>Safety Hint Before connection, please make sure the polarity of PV array matches the “PV+” and “PV-” symbols.</p> <p>Safety Hint Before connecting inverter, please make sure the PV array open circuit voltage is within the 1000V of the inverter.</p> |
|--|--|

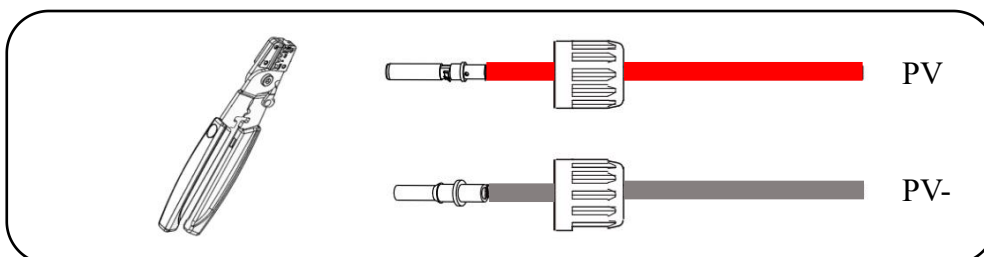
You need to lead four lines (two PV +, two PV-) from the PV module, take the appropriate length and install the PV interface.



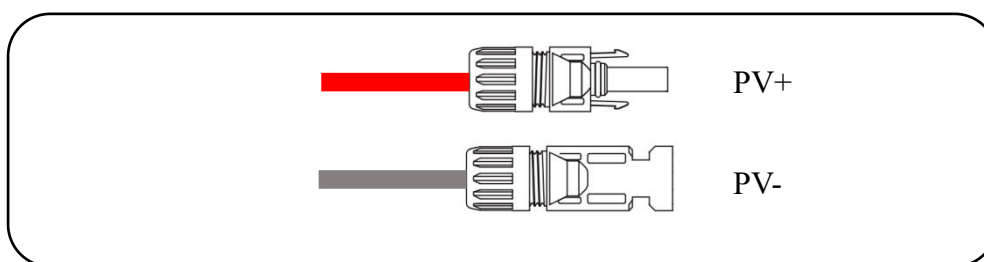
Step 1: Strip off the DC wire about 7mm, disassemble the connector cap nut



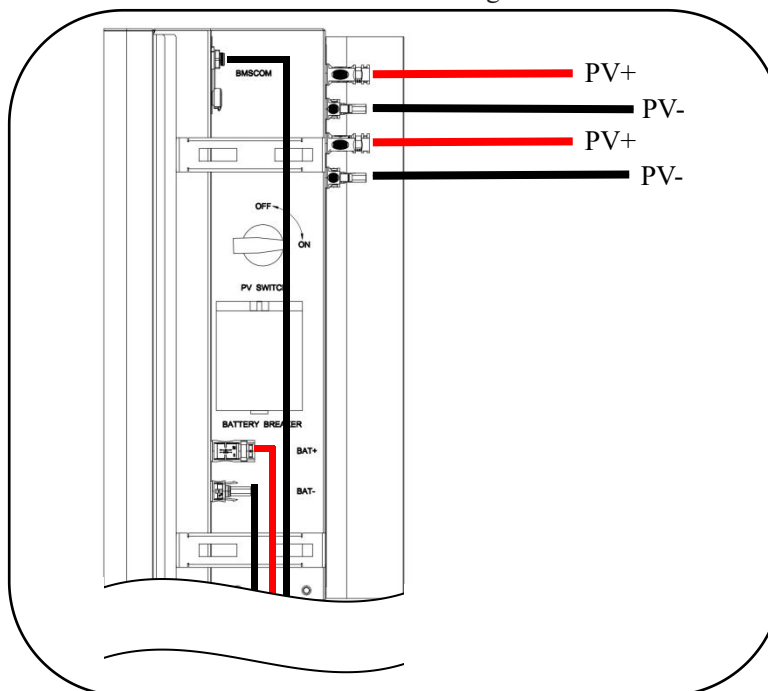
Step 2: Crimping metal terminals with crimping pliers



Step 3: Insert the contact pin to the top part of the connector and screw up the nut to the top part of the connector.



Step 4: Finally, insert the PV terminal into the PV interface on the right side of the inverter





Warning

Warning

Sunlight shines on the panel will generate voltage, high voltage in series may cause danger to life. Therefore, before connecting the DC input line, the solar panel needs to be blocked by the opaque material and the DC switch should be 'OFF', otherwise, the high voltage of the inverter may lead to life-threatening conditions. Please do not switch off DC isolator when the DC current when there is high voltage or current. Technicians need to wait until night to keep safety.

Warning

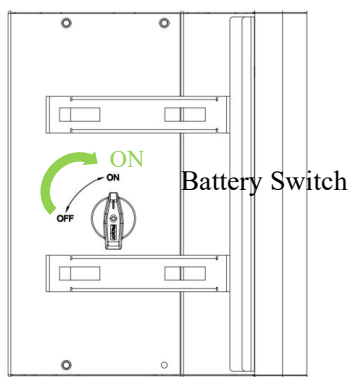
Please use its own DC power connector from the inverter accessories. Do not interconnect the connectors of different manufacturers. Max. DC input current should be 20A. if exceeds, it may damage the inverter and it is not covered by CEEG warranty.

4. System Operation

4.1 Switch on

| | |
|--|--|
|  Warning | Warning: Please check the installation again before turning on the system. |
|--|--|

Step 1: Turn on the battery switch on every battery module

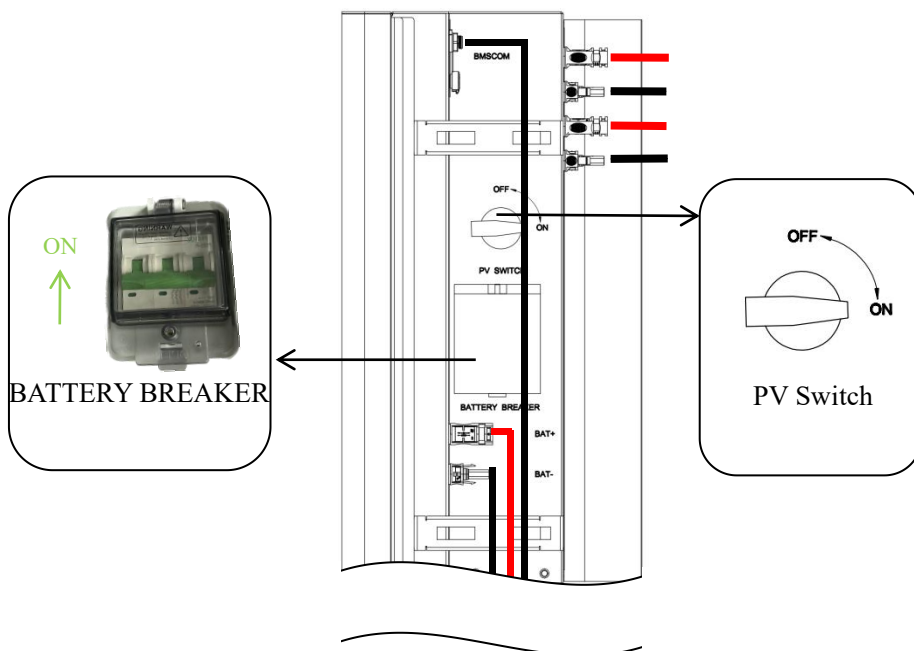


Left view of battery module

Note: The battery switch isolates the internal battery modules which are connected in series, the battery switch should not be used to disconnect the batteries under load. Isolation of battery under load is achieved via battery breaker.

Step 2: Open the battery cover and turn on the battery breaker

Step 3: Turn on the PV Switch



Step 4: Configure the WIFI stick (Only if this is the first time turning on the system).

Please follow the instructions in section 5 to section 6.

4.2 Switch OFF

Step 1: Turn off the Battery breaker.

Step 2: Turn off the PV Switch.

Step 3: Turn off the Battery switch on every battery module.

4.3 Emergency Situations

4.3.1 Emergency Procedure

When the CHIEF battery energy storage system (BESS) appears to be running abnormally, you can turn off the main grid breaker that directly feeding the BESS, and turn off all switches within the BESS. Then please contact CEEG and we will provide detailed instructions.

WARNING: Please do not open the upper cover plate of the BESS by yourself.

4.3.2 First Aid Measures

If battery module leaks electrolyte, avoid contacting with the leaking liquid or gas. If one is exposed to the leaked substance, immediately perform the actions described below:

Skin contact: Remove contaminated clothes and rinse skin with plenty of water or shower for at least 15 minutes. Take a medical treatment immediately.

Eye contact: Immediately flush eyes with plenty of water continuously for at least 15 minutes, occasionally lifting the upper and lower eyelids. Take a medical treatment immediately.

Inhalation: Cover the victim in a blanket, move to the place of fresh air and keep quiet. Take a medical treatment immediately. When dyspnea (breathing difficulty) or asphyxia (breath-hold), give artificial respiration immediately.

Ingestion: Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Take a medical treatment immediately.

4.3.2 Firefighting Measures

Extinguishing media: Dry power, sand, carbon dioxide (CO₂), water spray

Fire precautions and protective measures:

Flammable properties: Lithium ion batteries contain flammable liquid electrolyte that may vent, ignite and produce sparks When subjected to high temperature ($> 150^{\circ}\text{C}$), When damaged or abused (e.g., mechanical damage or electrical overcharge). Burning cells can ignite other batteries in close proximity.

Explosion data: Extreme mechanical abuse will result in rupture of the batteries. Throw into the fire will result in burning.

Special protective equipment for firefighters: In the event of a fire, wear full protective clothing and self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

5. Bluetooth and the Wi-Fi configuration

5.1 Preparation

1. Inverter must be powered up with only PV power.
2. A smart phone managed by Android operating system.
3. Need a router with available internet access to CEEG ESIS application center.

| | |
|--|--|
|  <p>CEEG ESIS</p> | <p>STEP1: Install APP</p> <p>Search and download the CEEG ESIS app on Google Play.</p> |
|  | <p>STEP2: Register an account</p> <ol style="list-style-type: none"> 1. Open CEEG ESIS APP and click the Registration button to register a new account 2. Enter the correct format of the email or phone number, click the send captcha button, and fill in the captcha box with the received captcha. After filling in and confirming the password, press the confirm button to complete the registration |

5.2 Bluetooth and Wi-Fi Configure

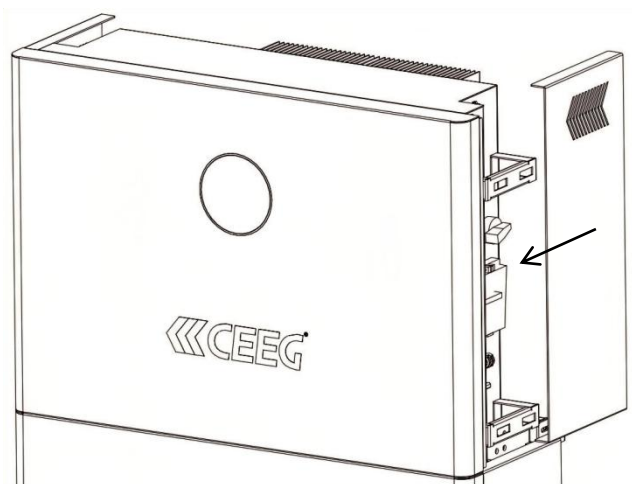
Note: The first connection requires Bluetooth:

- Firstly, turn on your phone's Bluetooth and ensure that your phone is connected to WIFI.
- Open the CEEG ESIS app and click the WIFI configuration button on the login interface to enter the Bluetooth configuration interface.
- Click on the Bluetooth name, enter the interface, and then click the connect button.
- Click on the WIFI configure, find the WIFI name to which your phone is connected, enter the correct password, and click OK to connect to WIFI.
- After the WIFI connection is successful, click " ← " in the upper left corner to return to the login interface.

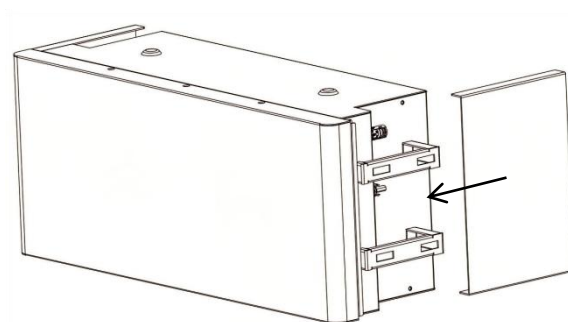
| | | | |
|-----------------------|------------------------------|----------------|-------------------------------|
| | | | |
| Discovering Bluetooth | Bluetooth pairing successful | Configure WIFI | WIFI configuration successful |

5.3 Install the side panels

After the WIFI configuration is successful, you can use the APP to control the machine's Switches,mode transitions,etc.At this point, you need to locate the side panels in the attachment and install them on the left and right sides of the machine.



Installation of Inverter side panel



Installation of battery box side panel

6. Software Instructions

6.1 Software Introduction

6.1.1 General

This product is a mobile phone APP for remote control of the energy storage all-in-one computer sold by our company. Users can check the load, photovoltaic, grid, battery power and electricity consumption in real time through the APP, and query historical data.

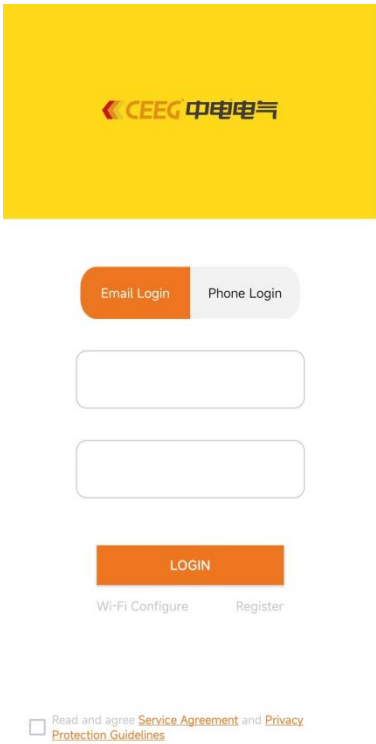
6.1.2 Capability

The software has good usability and reliability, and ensures the security and confidentiality of information.

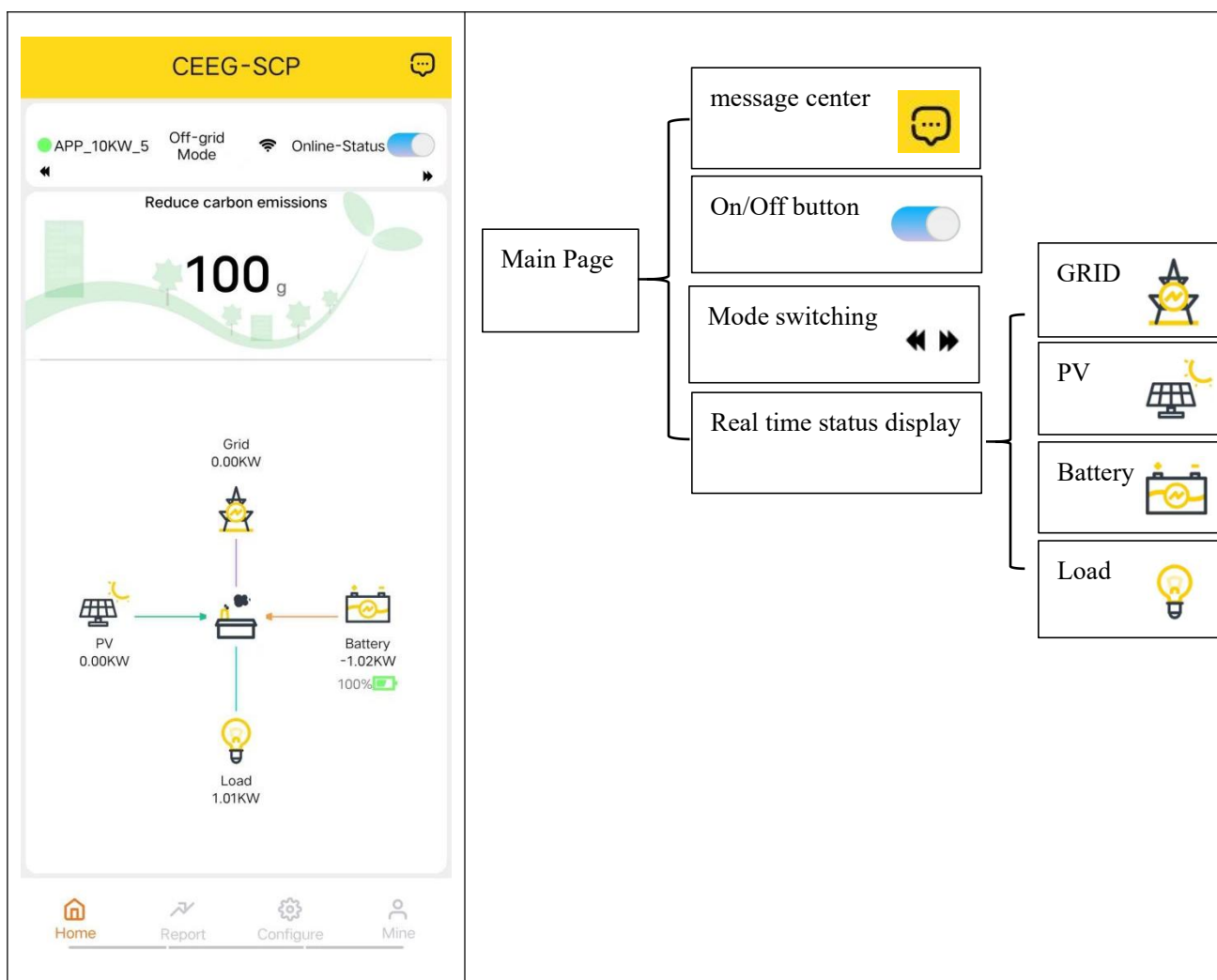
6.2 Operating Environment

This software can be run on Android .

6.3 Login account

| | |
|--|--|
|  | <ol style="list-style-type: none">1. Select email login or phone login2. Enter the correct account and password3. Check "Read and agree service agreement and privacy protection guidelines"4. Press the login button to enter the user interface5. Please ensure that the distribution network is successful and the account registration is completed before proceeding with the login operation |
|--|--|

6.4 Main Page

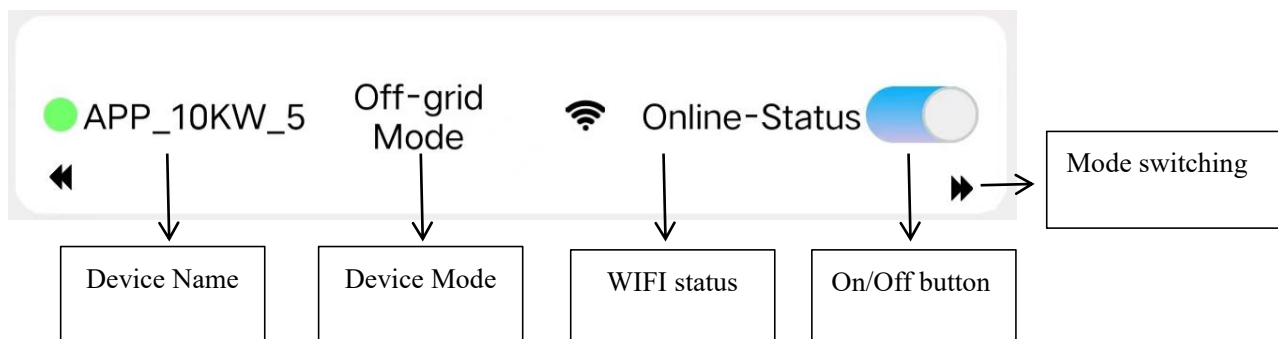


1.Message center

In the message center, you can view device information, fault information, etc. for the day

2.On/Off button and status bar

If you have multiple devices bound, you can swipe the status bar to the left or right to switch and view the device status. The status bar displays the device name, device mode, and device networking status; Click the On/Off button to turn on/off the current device.



3.Real time status display

Click on the icons of power grid, photovoltaic, battery, and load on the homepage to view the data of real-time power grid, real-time photovoltaic, real-time battery, and real-time load.

| | | |
|--|--|--|
| | <div data-bbox="261 197 679 647"> <p>Real-time Grid</p> </div> <div data-bbox="276 685 646 855"> <p>PG-A-Voltage 20.4 V PG-A-Current 2.8 A</p> <p>PG-B-Voltage 50.0 V PG-B-Current 2.6 A</p> <p>PG-C-Voltage 28.4 V PG-C-Current 2.0 A</p> </div> | <p>(1)Real-time Grid</p> <p>The interface can display the voltage and current parameters of grid A, B and C in real time, as well as the power parameters of the grid.</p> |
| | <div data-bbox="261 902 679 1352"> <p>Real-time PV</p> </div> <div data-bbox="276 1391 646 1500"> <p>PV-A-Voltage 25.1 V PV-A-Current 0.0 A</p> <p>PV-B-Voltage 37.2 V PV-B-Current 0.0 A</p> </div> | <p>(2)Real-time PV</p> <p>The interface displays the PV voltage and current parameters as well as the PV power parameters in real time.</p> |

| | <div data-bbox="261 197 679 651"> </div> <div data-bbox="277 689 671 790"> <p>Battery-Voltage 631.8 Battery-Current -1.6 A</p> <p>SOC 100.0 SOH 100.0</p> </div> | <p>(3)Real-time Battery</p> <p>The interface can display the voltage, current and power parameters of the battery in real time, and also observe the SOC and SOH of the battery.</p> | | | | | | | | | | | | |
|---------|--|---|------------|------------|---------|--------------|------------|---------|--------------|------------|---------|--------------|------------|--|
| | <div data-bbox="261 831 679 1128"> <table border="1"> <thead> <tr> <th></th> <th>Voltage(V)</th> <th>Current(A)</th> </tr> </thead> <tbody> <tr> <td>A-Phase</td> <td>231.8</td> <td>2.3</td> </tr> <tr> <td>B-Phase</td> <td>229.1</td> <td>2.3</td> </tr> <tr> <td>C-Phase</td> <td>232.5</td> <td>2.1</td> </tr> </tbody> </table> </div> | | Voltage(V) | Current(A) | A-Phase | 231.8 | 2.3 | B-Phase | 229.1 | 2.3 | C-Phase | 232.5 | 2.1 | <p>(4)Real-time Load</p> <p>This interface displays the voltage and current parameters of the AC line at the load side in real time</p> |
| | Voltage(V) | Current(A) | | | | | | | | | | | | |
| A-Phase | 231.8 | 2.3 | | | | | | | | | | | | |
| B-Phase | 229.1 | 2.3 | | | | | | | | | | | | |
| C-Phase | 232.5 | 2.1 | | | | | | | | | | | | |

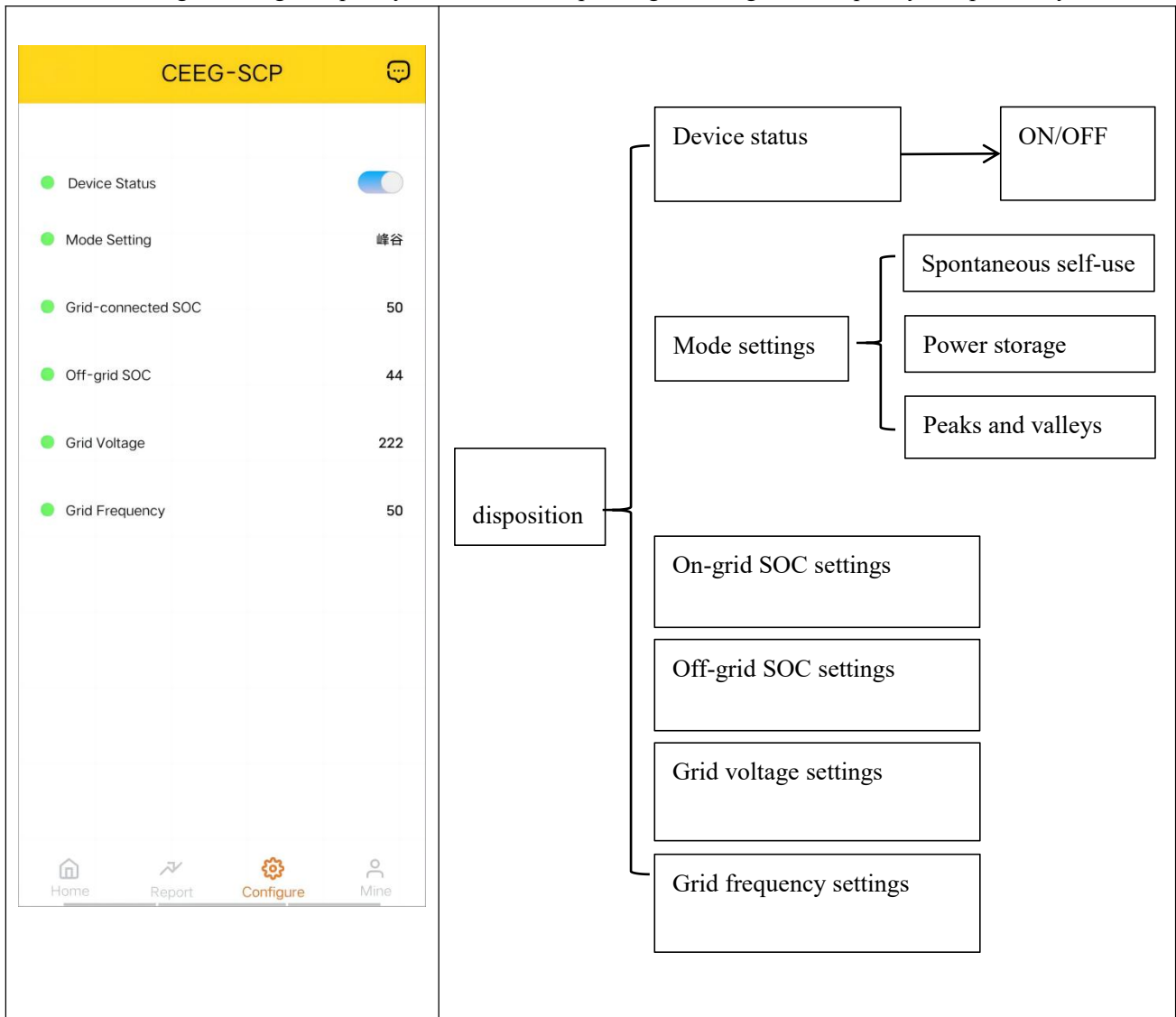
6.5 Report

In the report interface, you can view the historical power and faults of photovoltaic, power grid, and batteries, as well as the cumulative charging/discharging data of batteries and power grid. You can view the data information you want to know by switching dates.

| | |
|--|---|
| | <p>(1)Historical Power</p> <p>This interface allows you to view the historical power information of photovoltaic, power grid, and battery, as well as the cumulative charging, discharging, generation, and discharge information of the battery.</p> <ul style="list-style-type: none"> ①Switch between week, month, and year to view data ②Switching data types [Average], [Maximum],[Minimum], [Summarize] ③Switch date ④Bar chart of PV, GRID, Battery power data ⑤Cumulative charge of the battery,Cumulative discharge of the battery,Cumulative power generation from the grid,Cumulative power generation from the grid,Cumulative discharge of the grid |
| | <p>(2)Historical Failures</p> <p>You can check historical fault information on this interface</p> <ul style="list-style-type: none"> ⑥Switch day, week, and month to view data ⑦Switch date ⑧Fault information data(This page usually displays fault information. When a fault code is displayed, you can go to Chapter 8 for the corresponding fault information.) |

6.6 Configure

- Device status: shows the BESS run/closed state.
- Mode setting: three modes can be choose: Spontaneous self-use, Power storage, Peaks and valleys
- Grid connected SOC/Off grid SOC: The battery SOC values can be set independently in both grid connected and off grid states.
- Power grid voltage/frequency: You can set the power grid voltage and frequency independently.



1.Device status

The buttons here can also be used to control the device's switch on/off

2.Mode settings

(1)Spontaneous self-use

(2)Power storage

(3) Peaks and valleys

Setting method: After switching the mode to peak valley mode, you need to click the time and mode: peak (valley) button based on the actual peak/valley electricity time in the local area to set the mode.

| | | |
|---|---|-------------------------------|
| | | |
| <p>Peak valley mode setting interface</p> | <p>Peak/flat /valley mode selection interface</p> | <p>Time setting interface</p> |

3.ON-grid/Off-grid setting

| | |
|--------------------|---------------------|
| | |
| <p>On-grid SOC</p> | <p>Off-grid SOC</p> |


4.Grid voltage/frequency settings

You need to set the parameters of the machine's grid voltage and frequency based on the local grid voltage and frequency.

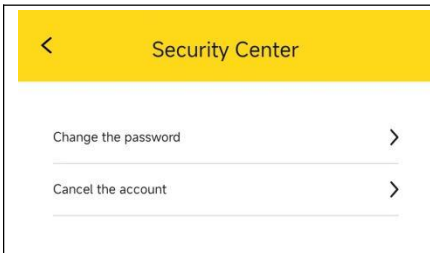
| | |
|---------------------|-----------------------|
| | |
| <p>Grid voltage</p> | <p>Grid frequency</p> |

6.7 Mine

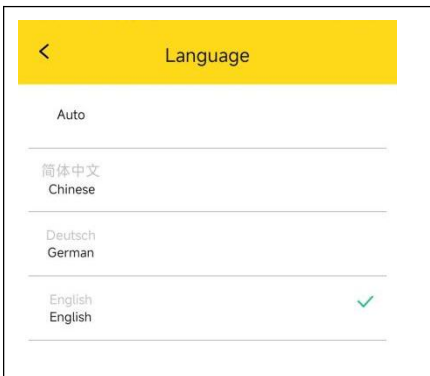
6.7.1 Personal Information Settings

| | |
|--|--|
|  <p>The screenshot shows a yellow header bar with a back arrow, 'Personal Information', and 'CONFIRM'. Below are three rows: 'Nickname: Immanuel Kant', 'E-mail: xxxx@xxx.com', and 'Country region: 中国China/北京'.</p> | <ul style="list-style-type: none"> ● Set avatar: you can custom avatar. ● Set up a nickname: you can set your nickname. ● Set area: you can manually choose region. |
|--|--|

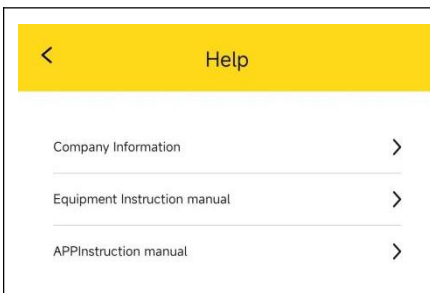
6.7.2 Safety Center

| | |
|--|--|
|  <p>The screenshot shows a yellow header bar with a back arrow, 'Security Center', and 'CONFIRM'. Below are two rows: 'Change the password' and 'Cancel the account', each with a right-pointing arrow.</p> | <ul style="list-style-type: none"> ● Change the password: support changing the password. ● Cancel the account: delete the account all the information. |
|--|--|

6.7.3 Languages

| | |
|--|--|
|  <p>The screenshot shows a yellow header bar with a back arrow, 'Language', and 'CONFIRM'. Below are four rows: 'Auto', '简体中文 Chinese', 'Deutsch German', and 'English English' (with a green checkmark).</p> | <ul style="list-style-type: none"> ● Auto ● Chinese ● English ● German |
|--|--|

6.7.4 Help

| | |
|---|---|
|  <p>The screenshot shows a yellow header bar with a back arrow, 'Help', and 'CONFIRM'. Below are three rows: 'Company Information', 'Equipment Instruction manual', and 'APPInstruction manual', each with a right-pointing arrow.</p> | <ul style="list-style-type: none"> ● Company information ● Equipment instructions ● APP instruction manual |
|---|---|

6.7.5 Current Version

7.Parameter information

| Parameterslist | 12kw/15.36kWh |
|--------------------------------------|---------------------------------|
| Maximum DC power (kW) | 12 |
| DC voltage working range (V) | 614.4 |
| Battery Capacity (kWh) | 15.36 |
| DC voltage ripple coefficient (%) | 2% |
| Rated power (kW) | 12 |
| Maximum output power (kW) | 12 |
| AC access method | 3P4W |
| Rated current (A) | 17.4 |
| Maximum current (A) | 29 |
| Rated frequency (Hz) | 50 |
| Allowable frequency (Hz±%) | 50/60(±0.2%)Hz |
| Current harmonic distortion rate | ±5Hz |
| Power factor | -0.9...+0.9 |
| voltage range | -0.8~+0.8 |
| Rated output voltage (Vac) | AC 380/400V |
| Voltage accuracy | 1% |
| Voltage unbalance | 100% |
| Voltage harmonic distortion rate | 3%@ lineload |
| Rated output frequency (Hz) | 50/60 |
| Overload capacity | ≤110% 10min,≤120% 1min |
| Efficiency | 97% |
| Temperature | -30°C~60°C (Derating above 45°) |
| Humidity | ≤95% |
| Noise (dB) | 65 |
| Dimensions (width*depth*height) (mm) | 1720*724*261.5 |
| Mass (kg) | 220.6 |
| Protection class | IP65 |
| Altitude (m) | 3000 |
| Communication Interface | WIFI |
| Communication protocol | Phone |

8. Fault Code List

| S1 | | |
|--------------|-------------------|--|
| trouble code | error message | |
| 0x0001 | BusVoltLowFault | |
| 0x0002 | BusVoltHighFault | |
| 0x0004 | GridVoltLowFault | |
| 0x0008 | GridVoltHighFault | |
| 0x0010 | GridFreqHFault | |
| 0x0020 | GridFreqLFault | |
| 0x0040 | Reserved4 | |
| 0x0080 | BatCurrHighFault | |
| 0x0100 | Reserved5 | |
| 0x0200 | BatVoltHighFault | |
| 0x0400 | BatVoltLowFault | |
| 0x0800 | GridCurrOverFault | |
| 0x1000 | PolarReverseFault | |
| 0x2000 | LeakToEarth | |
| 0x4000 | HardwareFault | |
| 0x8000 | OutVoltUnbalFault | |

| S2 | | |
|--------------|-------------------|--|
| trouble code | error message | |
| 0x0001 | BatVoltLowFault | |
| 0x0002 | Reserved6 | |
| 0x0004 | DcOverCurrFault | |
| 0x0008 | NeutralUnbalFault | |
| 0x0010 | DCMainSwitchFault | |
| 0x0020 | DCSoftSwitchFault | |
| 0x0040 | ACMainSwitchFault | |
| 0x0080 | IgbtOverTemp | |
| 0x0100 | InductOverTemp | |
| 0x0200 | InvSequenceFault | |

| S3 | | |
|--------------|--------------------|--|
| trouble code | error message | |
| 0x0001 | HardBus VoltFault | |
| 0x0002 | HardBat VoltFault | |
| 0x0004 | HardBat CurrFault | |
| 0x0008 | HardBoostCurrFault | |
| 0x0010 | HardProACCurrFault | |

| | | |
|--------|------------------|--|
| 0x0020 | BatCellOverVoltg | |
| 0x0040 | HardReserved2 | |
| 0x0080 | HardReserved3 | |
| 0x0100 | HardReserved4 | |
| 0x0200 | HardReserved5 | |
| 0x0400 | HardReserved6 | |
| 0x0800 | HardReserved7 | |
| 0x1000 | HardReserved8 | |
| 0x2000 | HardReserved9 | |
| 0x4000 | DampResTcFault | |
| 192 | | |