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User Manual

HYBRID INVERTER

A3600S / A4600S / A5000S
A3600S-E / A4600S-E / A5000S-E

AC-COUPLED INVERTER

AC3600S / AC4600S / AC5000S
AC3600S-E / AC4600S-E / AC5000S-E

Foreword

- The contents of this document are owned by the manufacturer of the system. No portion of this document may be copied or reproduced for commercial purposes. Internal use is permitted.
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- Specifications outlined in this document are subject to change without prior notification. While every effort has been made to ensure that this document is complete, accurate, and up to date, the manufacturer reserves the right to implement changes as necessary without advance notice. The manufacturer will not be held responsible for any damages resulting from this document, including but not limited to omissions, typographical errors, arithmetic mistakes and errors contained herein.

About this Document

The manual mainly describes the product information, guidelines for installation, operation and maintenance.
The manual cannot include complete information about the photovoltaic (PV) system. The reader can get additional information about other devices at <https://www.hinen.com> or on the webpage of the respective component manufacturer.

Validity

This manual is valid for the following inverter models:
Hybrid Inverter: A3600S / A4600S / A5000S / A3600S-E* / A4600S-E* / A5000S-E*
AC-Coupled Inverter: AC3600S / AC4600S / AC5000S / AC3600S-E* / AC4600S-E* / AC5000S-E*
They will be referred to as inverter hereinafter unless otherwise specified.

* Machines with emergency power off switch function.

Target Group

- Qualified personnel who are responsible for the installation and commissioning of the inverter.
- Inverter owners who will have the ability to interact with the inverter.

How to Use This Manual

It is essential to read this manual and any associated documents prior to undertaking any tasks on the inverter.
Ensure that these documents are stored carefully and remain available at all times.
Please note that the contents may be subject to periodic updates or revisions as a result of product development. Changes may occur in the manual with future editions of the inverter.
The latest version of the manual can be obtained by visiting the website at <https://www.hinen.com>

Disclaimer

Inverters must be transported, used, and operated under suitable environmental and electrical conditions. The manufacturer reserves the right to withhold after-sales service or assistance under the following conditions:

- The inverter was damaged during transportation.
- The inverter is out of warranty, or an extended warranty was not purchased.
- The inverter is installed or used under improper environmental or technical conditions without authorization from the manufacturer.
- The inverter is installed or configured in violation of the requirements mentioned in the user manual.
- The inverter is installed and operated in violation of the requirements or warnings mentioned in this user manual.
- The inverter is damaged by any force majeure such as lightning, earthquake, fire, storm, or volcanic eruption.
- The inverter's software or hardware is disassembled, changed, or updated without the manufacturer's authorization.
- The inverter is installed, used, or operated in violation of any international or local policies and regulations.
- Incompatible batteries, loads, or other devices are connected to the inverter system.

Note

- The manufacturer reserves the right to interpret all content in this user manual. To maintain the IP protection level, the inverter must be well-sealed, and unused terminals/ports should not be opened. Ensure no water or dust enters the terminals/ports.
- This product is only suitable for professionals familiar with local regulations, standards, and electrical systems, and who have undergone professional training in relevant product knowledge.
- Handle this product with care and store it in a dry, cool room when not in use.

Safety and Warnings

The inverter adheres rigorously to applicable safety standards in its design and testing processes. It is essential to carefully read and comply with all instructions and safety precautions outlined in the inverter or user manual during installation, operation, or maintenance. Failure to do so may result in personal injury or damage to property.

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01 Safety Introduction

For safety reasons, the installer is responsible for familiarizing himself with this manual and all warnings prior to installation.

Symbol Explanation



Caution!
Failure to observe any warnings contained in this manual may result in injury.



Danger-high voltage and electric shock!



Danger-hot surface!



The components of the product can be recycled.



Lithium ion battery can be recycled.



This side up! This package must always be transported, handled and stored in such a way that the arrows always point upwards.



No more than six (6) identical packages being stacked on each other.



Products shall not be disposed as household waste.



Fragile - The package/product should be handled with care and never be tipped over or slung.



Refer to the operation instructions.



Keep dry! The package/product must be protected from excessive humidity and must be stored under cover.



CE mark.



UK certification.



Explosive gas.



Corrosive electrolyte may leak.



Heavy enough to cause severe injury.



Keep the Pack away from children.



Make sure the battery polarity well connected.



Do not expose to fire.



Personal protective equipment is required during installation, operation and maintenance.



Protective earth wire connection point.



Safety warning

- Any installation or operations on the inverter must be performed by qualified electricians in compliance with standards, wiring rules and the requirements of local grid authorities or companies.
- Before any wiring connection or electrical operation on inverter, all battery and AC power must be disconnected from inverter for at least 5 minutes to make sure inverter is totally isolated to avoid electric shock.
- The temperature of inverter surface might exceed 60°C during operation, so please make sure it has cooled down before touching it, and make sure the inverter is out of reach of children.
- Do not open the inverter or replace any parts without the authorization of the manufacturer, otherwise, the warranty commitment of the inverter will be invalid.
- Usage and operation of the inverter must follow instructions in this user manual, otherwise the protection design might be impaired and warranty commitment for the inverter will be invalid.
- Appropriate methods must be adopted to protect inverter from static damage. Any damage caused by static is not warranted by manufacturer.
- PV negative (PV-) and battery negative (BAT-) on inverter side is not grounded as default design. Connecting PV- to EARTH is strictly forbidden.
- The photovoltaic modules used on the inverter must meet the IEC61730A level, and the total open-circuit voltage of the photovoltaic string/array must be lower than the maximum rated DC input voltage of the inverter. Any damage caused by photovoltaic overvoltage is not covered by the warranty.
- In Australia, the inverter internal switching does not maintain neutral integrity, which must be addressed by external connection arrangements like in the system connection diagram for Australia.
- In Australia, output of back-up side in switchbox should be labeled "Main Switch EPS Supply". The output of normal load side in switch box should be labeled "Main Switch Inverter Supply".

Transportation Requirements

- The inverter is in good electrical and physical condition when it leaves the factory. During transportation, the inverter must be placed in the original packaging or other appropriate packaging. The transport company is responsible for any damage during transportation.
- If you find any packaging problems or any visible damage that could potentially harm the inverter, please notify the responsible transport company immediately. If necessary, you can seek help from the installer manufacturer.
- The battery modules included in this product meet the UN38.3 standards and are classified as Class 9 hazardous materials. Consequently, all loading and unloading activities during transportation must adhere to applicable local laws, regulations, and industry standards. Improper handling during these processes could lead to short circuits or damage to the battery within the container, potentially resulting in leakage, breakage, explosion, or fire.

Electrical Connections

When using the inverter, please comply with all current electrical regulations regarding accident prevention.

- Before electrical connection, please cover the PV modules with opaque materials or disconnect the PV string DC switch. The PV array will generate dangerous voltage when exposed to sunlight. When installing the battery, the positive and negative poles of the battery should be checked and the battery should be turned off.
- Before connecting to the grid, you must obtain permission from the local utility company and have the connection carried out by a certified electrician who has received professional training and has fully read and understood all the information in the operating manual.

Operation Instructions

- Touching the power grid or terminal wires may cause fatal electric shock or fire! Do not touch uninsulated cable ends, DC wires and any live parts. Pay attention to any electrical instructions and documents.
- While in use, the outer casing or inside parts might get hot. Make sure to wear insulating gloves.

Maintenance and Repair Precautions

- Before any maintenance work, please turn off the AC circuit breaker between the product and the power grid, and then turn off the DC switch. After turning off the AC circuit breaker and DC switch, wait at least 5 minutes before any maintenance or repair work.
- The product cannot be operated again until all faults are eliminated. If maintenance is required, please contact the local authorized service center. Do not open the product cover without authorization, and note that hinen does not assume any responsibility for this.

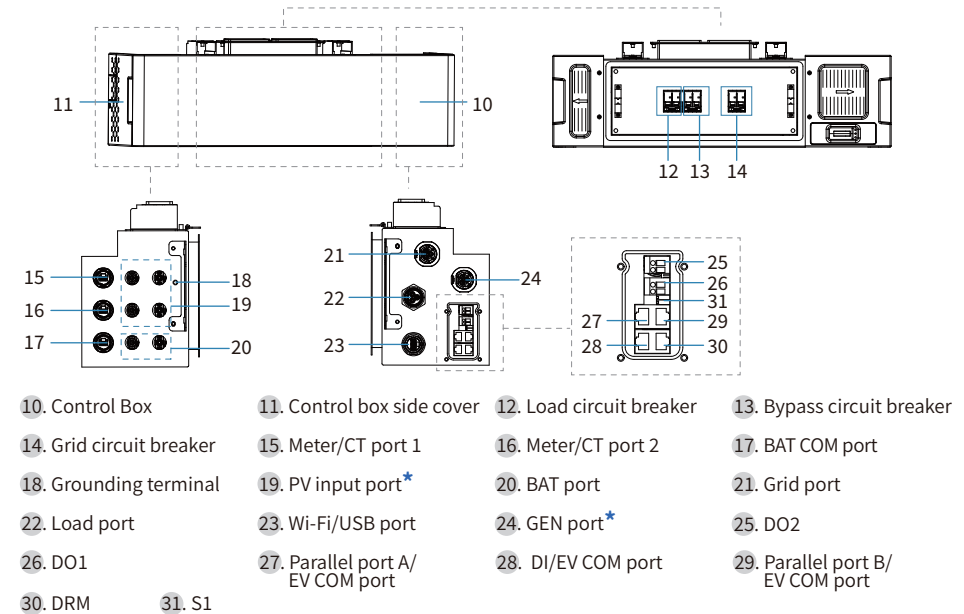
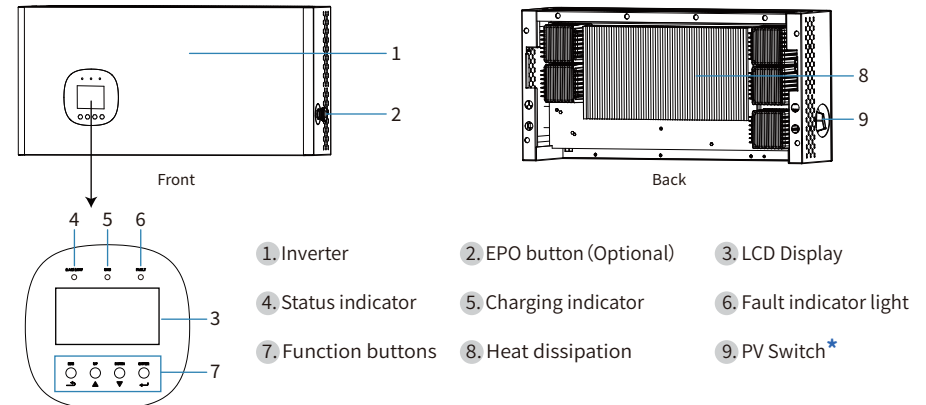
02 Product Introduction

The hybrid inverter combines the functions of an inverter, solar charger, and battery charger into one integrated unit, ensuring uninterrupted power supply for users in all circumstances. It accommodates various power inputs and is equipped with an intelligent energy management system that automatically adjusts power usage according to real-time demand. The comprehensive LCD display provides easy access to user-configurable settings, allowing for simple operation of functions such as battery charging, AC/solar charging, and adjusting input voltage, tailored to different applications.

Additionally, advanced temperature sensors on each battery cell enable users to remotely monitor the battery temperature via CAN communication with the inverter, ensuring optimal performance and safety.

2.1 Product Overview

* : Only for the hybrid inverter.



2.2 Product Size



2.3 Basic System Architecture

The following figure shows the basic application of this inverter.

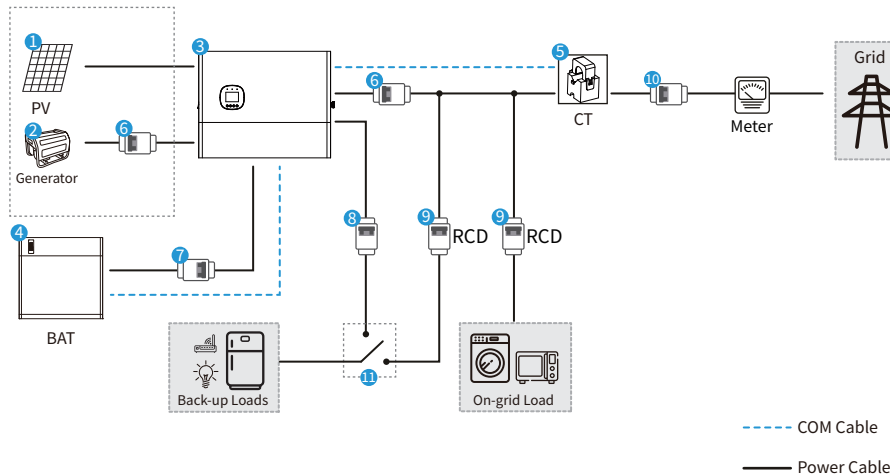
The following equipment is included to form a complete operating system.

- Generator or grid
- PV panels

Please consult your system integrator for other possible system architectures, which depends on your requirements.

This inverter can power a variety of appliances in home or office environment, including motor-type appliances such as refrigerators and air conditioners.

Self-use System (Hybrid Scenario)

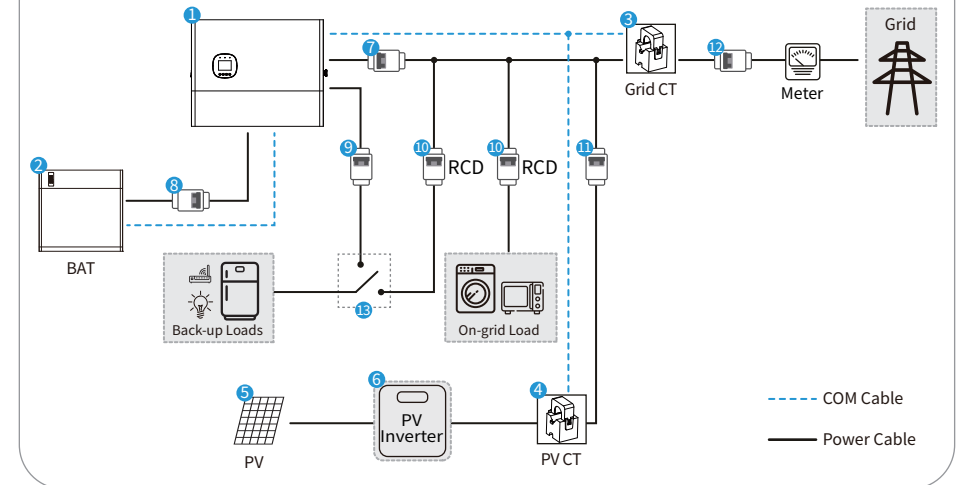


NO.	Parts	Description
1	PV String	Only for hybrid inverter to connect with PV strings.
2	Generator	Only for hybrid inverter.
3	Inverter	Supports hybrid inverter and AC-Coupled inverter.
4	Battery	Select the battery model according to the model of inverter and approved battery list.
5	CT(Current Transformer)	The specifications depend on the actual load.
6	AC Circuit Breaker	Recommended specifications: 50A/230V AC Circuit Breaker.
7	DC Circuit Breaker	Recommended specifications: 50A/≥500V DC Circuit Breaker.
8	RCD (Residual Current Device)	Recommended specifications: 50A/230V, L/N/PE 300mA RCD (Type B).
9	RCD (Residual Current Device)	Recommended specifications: 300mA RCD (Type B), depending on the actual load.
10	Main AC Circuit Breaker	Specifications depend on the actual situation.
11	Changeover Switch	Recommended specifications: 50A/230V.

Note:

- If the battery has integrated a readily accessible internal DC breaker, then no additional ⑦ DC breaker is required.
- The use of ⑧ ⑨ 300mA RCD is recommended but not mandatory, please comply with local regulations for the system installation.
- To ensure that the back-up port load will continue to operate when the inverter is powered down for maintenance, it is recommended that a changeover switch be installed.

Self-use System (AC-Coupled Scenario)



NO.	Parts	Description
1	Inverter	Supports AC-Coupled inverter only.
2	Battery	Select the battery model according to the model of inverter and approved battery list.
3	Grid CT(Current Transformer)	The specifications depend on the actual load.

4	PV CT(Current Transformer)	The specifications depend on the actual load.
5	PV String	PV string is connected to the third-party on-grid inverter.
6	PV Inverter	Supports any third-party on-grid PV inverter.
7	AC Circuit Breaker	Recommended specifications: 50A/230V AC Circuit Breaker.
8	DC Circuit Breaker	Recommended specifications: 50A/ $\geq$ 500V DC Circuit Breaker.
9	RCD (Residual Current Device)	Recommended specifications: 50A/230V, L/N/PE 300mA RCD (Type B).
10	RCD (Residual Current Device)	Recommended specifications: 300mA RCD (Type B), depending on the actual load.
11	AC Circuit Breaker	Specifications of the AC breaker depend on the actual rated output current of the PV inverter.
12	Main AC Circuit Breaker	Specifications depend on the actual situation.
13	Changeover Switch	Recommended specifications: 50A/230V.

Note:

- If the battery has integrated a readily accessible internal DC breaker, then no additional ⑧ DC breaker is required.
- The use of ⑨⑩ 300mA RCD is recommended but not mandatory, please comply with local regulations for the system installation.
- To ensure that the back-up port load will continue to operate when the inverter is powered down for maintenance, it is recommended that a changeover switch be installed.

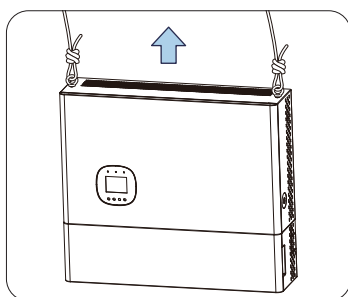
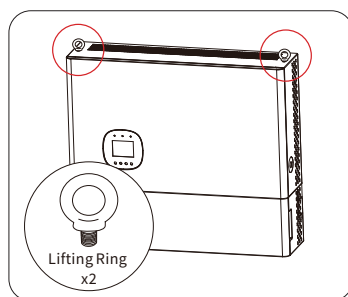
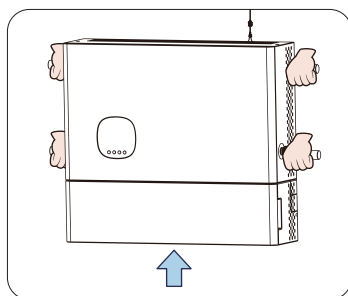
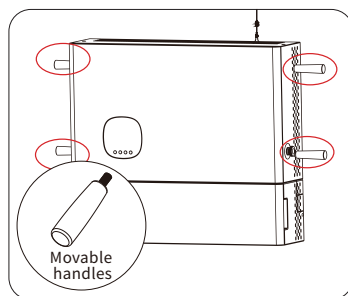
2.4 Product Handling Requirements



Caution

1. Operations such as transportation, turnover, installation and so on must meet the requirements of the laws and regulations of the country or region where it is located.
2. Consider the weight of the equipment before moving it. Assign enough personnel to move the equipment to avoid personal injury and equipment damage.
3. Choose the corresponding handling method according to the weight and pay attention to safety.

It is recommended that at least two people stand on both sides of the machine, using the movable handle tool or the lifting rings in the accessory kit to lift the product.



03 Product Installation

3.1 Pre-Installation Inspection

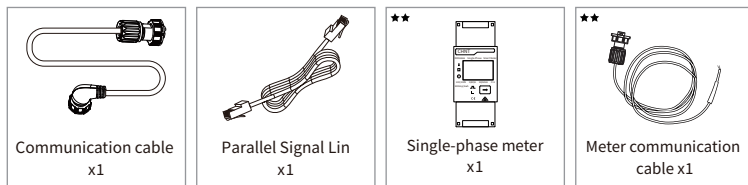
Before signing for the product, please check the following in detail:

1. Inspect the outside of the package for any damage like dents, holes, cracks, or other issues that could harm the device inside. If you find any damage, do not open the package and contact the dealer.
2. Check whether the device model is correct. If there is any discrepancy, do not open the package and contact the dealer.

3.2 Packing List

After receiving the hybrid inverter, please check whether the following parts are missing or damaged. The images shown here are for reference. The actual product and quantity are based on delivery.

Inverter x1	Wall Mount Bracket x1 M5 Nuts with Washers x8	PV Positive Connector* x2	PV Negative Connector* x2	BAT Positive Connector x1
BAT Negative Connector x1	Grid Connector x1 Waterproof Plug x1	Generator Connector x1 Waterproof Plug x1	Load Connector x1 Waterproof Plug x1	Wifi Logger x1
User Manual x1 Quick Installation Guide x1	Handle Spacer x4 Lifting Rings x2	Expansion Screw x7	PV Disassembly Tool x1	Male Dust Cap x3 Female Dust Cap x3
Plug x6	M5 Nuts with Washers x1	M5 Hexagonal Screw Combination x5	Grid CT x1	PV CT** x1
Ground terminal x2	Terminal 1 x8	Terminal 2 x4	Red power cable x1	Black power cable x1



★★ Optional. Types of equipment to be applied vary in different regions. Please consult local customer service for equipment type selection.

*: Only for the hybrid inverter **: Only for the AC-Coupled inverter

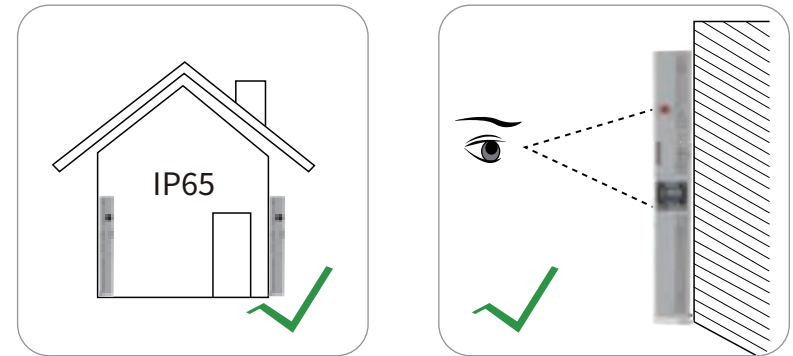
3.3 Installation Tools

Recommended installation tools include but are not limited to the following tools. If necessary, additional auxiliary tools can be used on site.



3.4 Installation Requirements

To protect the equipment and facilitate maintenance, the installation location of the equipment should be carefully selected according to the following rules.



Rule 1. Equipment with IP65 rating can be installed indoors and outdoors.

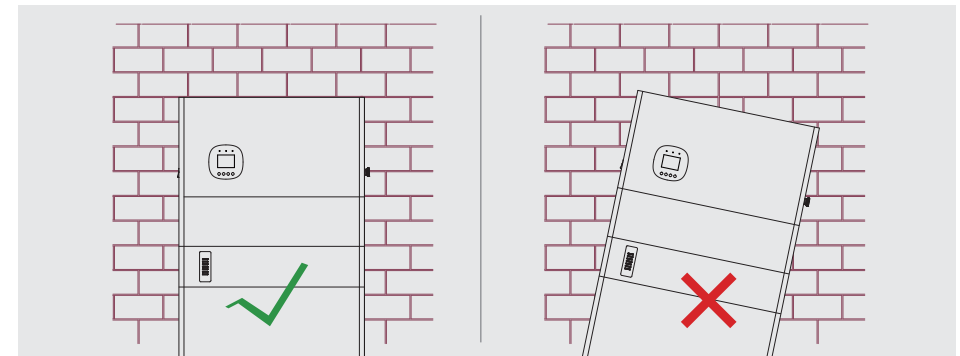


It is recommended that the equipment be installed away from direct sunlight, rain, snow and other adverse influences that may affect its function or deteriorate its life.

Rule 2. Install the equipment in a location that makes electrical connections, operation, and maintenance easy. Ensure that no part of the system blocks switches and circuit breakers to disconnect the equipment from both DC and AC sources.

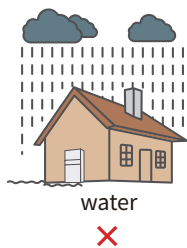
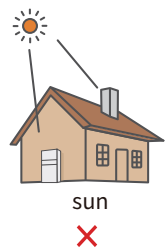
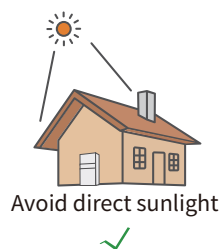
Rule 3. The equipment should be installed at eye level to facilitate maintenance.

Rule 4. After installation, the product label on the device should be clearly visible. Do not damage the label.

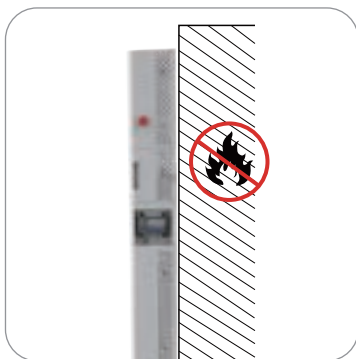


Rule 5. The device should be installed vertically.

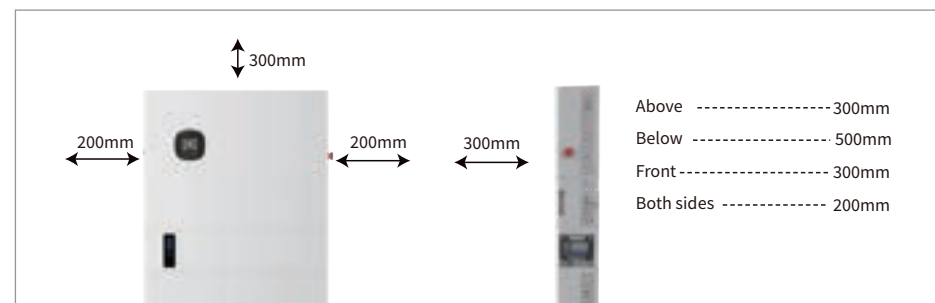
Rule 6. The ambient temperature should be below 45°C (high ambient temperature will reduce the power efficiency of the inverter).



Rule 7. The installation of the equipment must comply with local or national standards and guidelines. Ensure that the mounting surface is strong enough to support four times the weight of the equipment and is appropriate for the size of the equipment (e.g. concrete wall, drywall, etc.).



Rule 8. As shown in the figure below, leave enough space around the equipment to allow natural heat dissipation.



Do not install the inverter in areas with flammable, explosive and corrosive materials or near electromagnetic fields.



Please remember that the equipment is heavy! Use caution when removing it from the packaging. The device is only suitable for mounting on concrete or other non-combustible surfaces.

3.5 Product Installation

3.5.1 Battery Installation

Warning

1. Before the battery is installed, please switch off the Air Breaker of the high Voltage BMS control unit.
2. Make sure the control box is installed above the battery. Do not install the battery above the control box.
3. When installing the battery system, ensure that it is installed horizontally and firmly. When placing the battery base, battery or control box, make sure that the holes on the upper and lower layers are aligned; the anti-tip bracket is vertically close to the ground, wall or battery system surface.
4. When using an impact drill to drill holes, use a cardboard or other protective materials to shield the battery system. This prevents foreign objects from entering the equipment and causing potential damage.
5. Before installing the battery system, remove the cover of the battery module wiring port.

CAUTION:

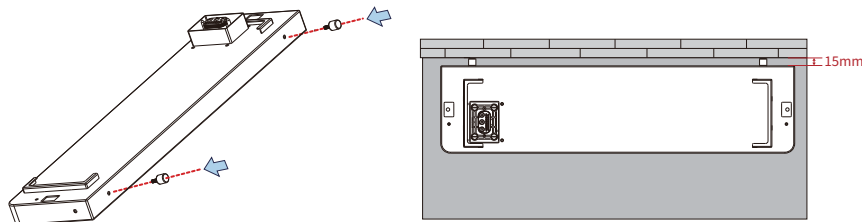
1. This battery is quite heavy! Be cautious when taking it out of the package.
2. The battery module must be installed by at least two people using movable handles.
3. If the battery module is lifted incorrectly or drops during transport or installation, it could lead to injury because of its weight. Handle the battery module with care.
4. Anyone working with the battery system should wear proper personal protective equipment.

Base installation (without foot pad bolts)

Step 1: Install two foot pad screws on the back of the base. (The foot pad screws can control the appropriate distance between the product and the wall.)

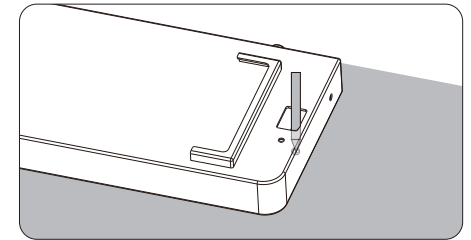
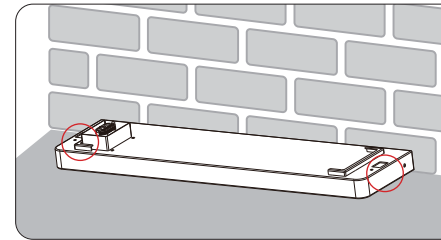
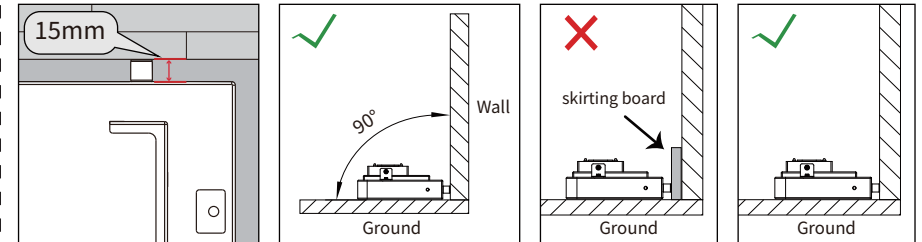
Step 2: Place the base against the wall in a suitable position.

Step 3: Use a marker to mark the drilling holes on the left and right sides and then remove the base. (Note: The base should be 15mm away from the wall, otherwise it will affect the installation of the All-in-one system.)



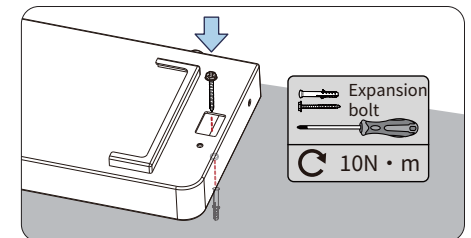
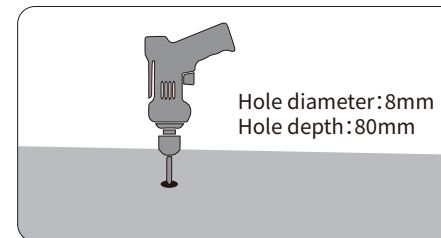
Notice:

- ① The distance between the battery base and the wall needs to be kept at 15mm.
- ② The battery needs to be installed on a hard and flat wall at a 90° angle to the ground.
- ③ The battery needs to be installed on a wall without a baseboard.



Step 4: Use an impact drill to drill the holes.

Step 5: After checking that the battery base is installed in the correct direction, use expansion bolts to fix the base.

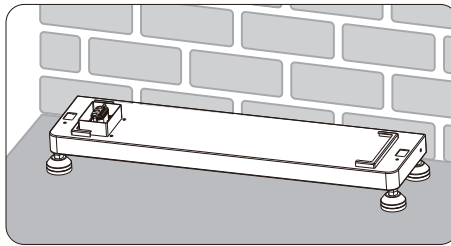
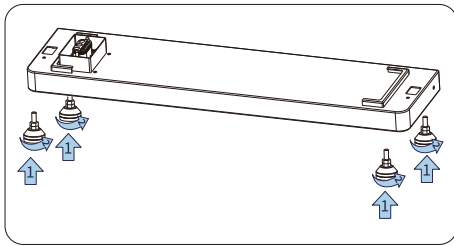
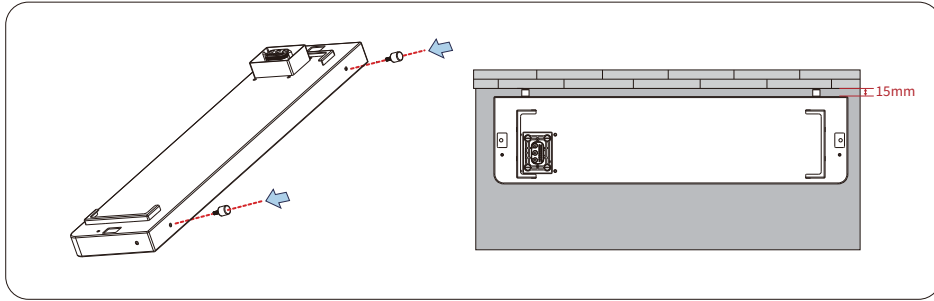


Base installation (with foot pad bolts)

Step 1: Install two foot pad screws on the back of the base. (The foot pad screws can control the appropriate distance between the product and the wall.)

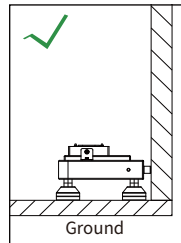
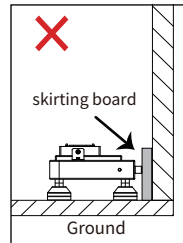
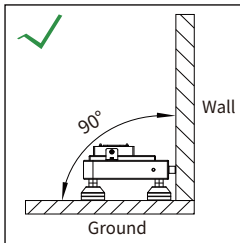
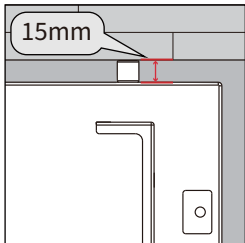
Step 2: Install the adjustable foot pad bolts to the base.

Step 3: Place the base against the wall and place it in a suitable position. (Note: The base should be 15mm away from the wall, otherwise it will affect the installation of the integrated machine.)



Notice:

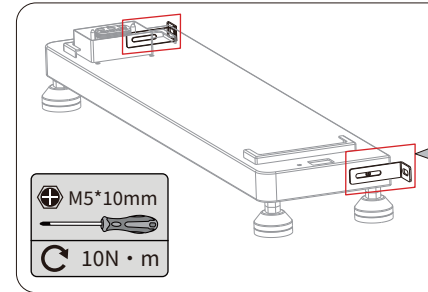
- ① The distance between the battery base and the wall needs to be kept at 15mm.
- ② The battery needs to be installed on a hard and flat wall at a 90° angle to the ground.
- ③ The battery needs to be installed on a wall without a baseboard.



Step 4: Use M5 screws to lock the wall-locking bracket to the base. (Both sides need to be fixed)

Step 5: Use a marker to mark the drilling holes on the left and right sides through the bracket, and remove the base.

Step 6: Use an impact drill to drill holes. Then use 2 expansion screws to lock the wall bracket to the wall. (Ensure both sides are fixed.)

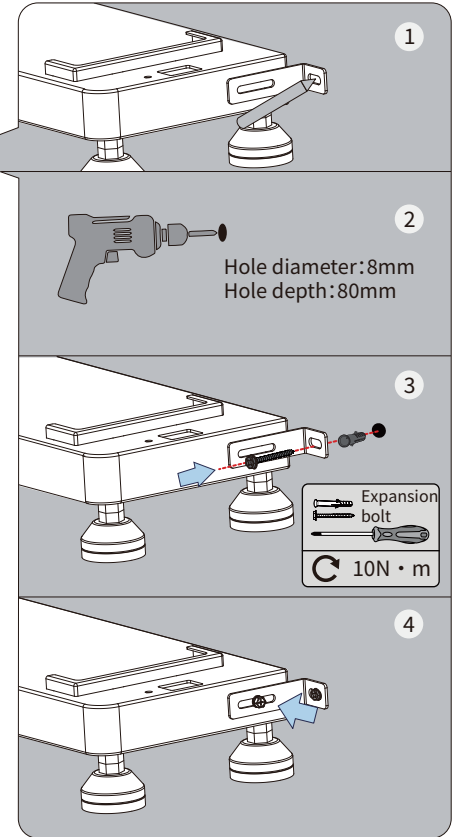


M5*10mm
10N·m



Note

The wall-locking bracket is not required if the foot pad bolts are not needed.



1

2

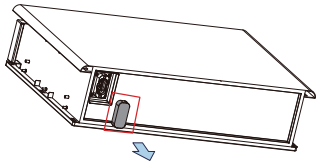
Hole diameter: 8mm
Hole depth: 80mm

3

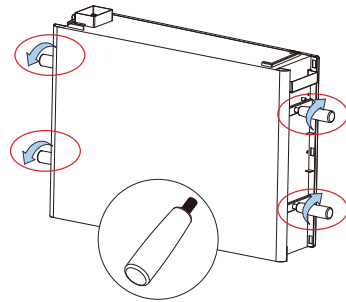
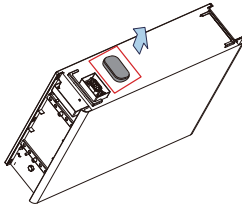
Expansion bolt
10N·m

4

Battery module installation



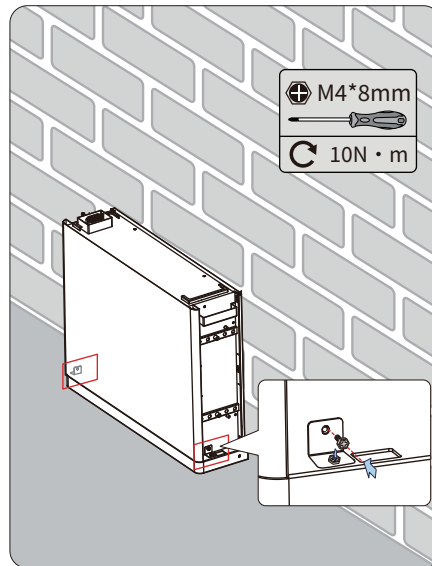
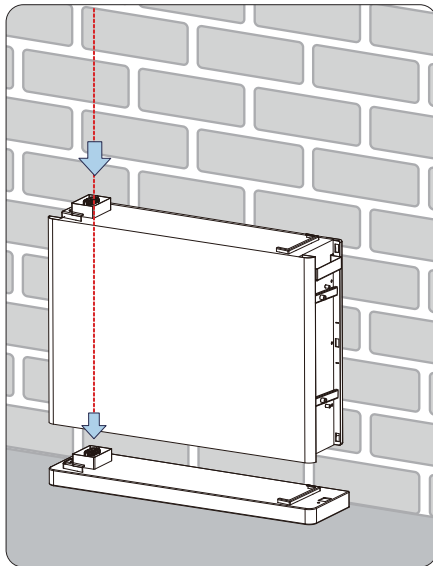
Before stacking, remove the protective cover of the plug on each docked battery module.



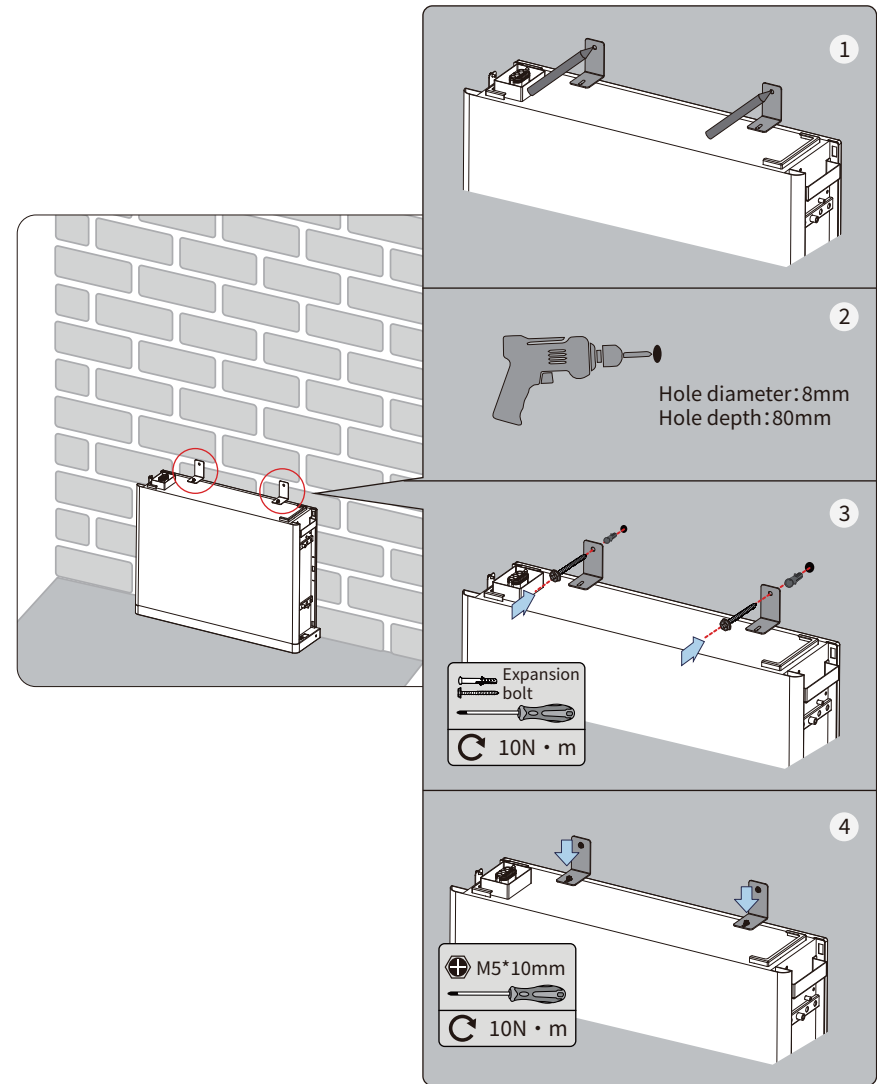
The battery module is heavy, so four handles can be installed to help lift it. Make sure to take off the handles once the battery module is in place.

Step 1: Install the battery module according to the selected battery system type.

Step 2: Use the shell fixing buckle to attach the battery to both the battery and the base. (Make sure both sides are fixed.)



Step 3: Use 2 expansion bolts and 2 M5*10mm screws to secure the battery wall-locking bracket to the wall.



Warning

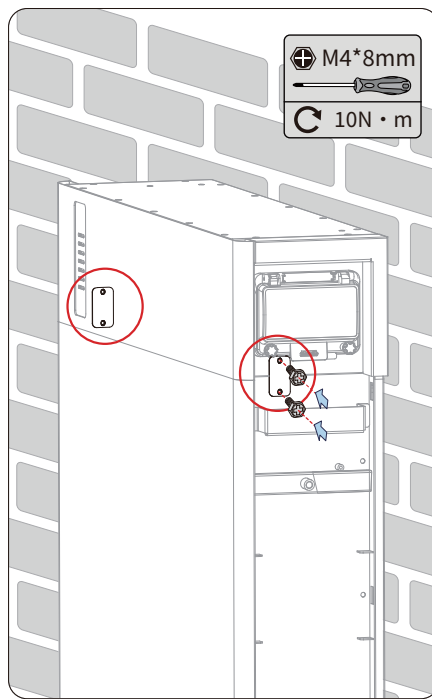
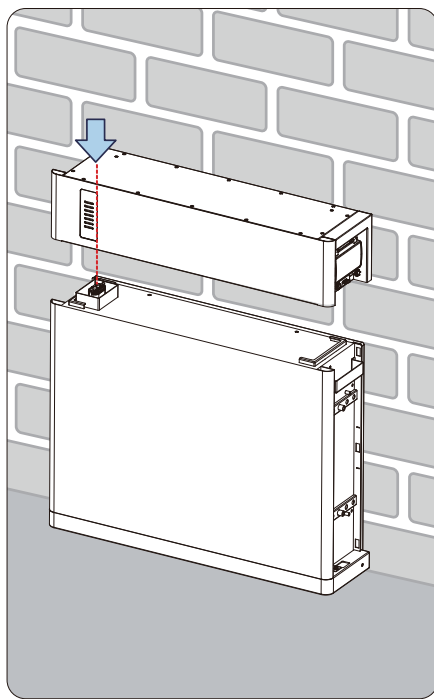
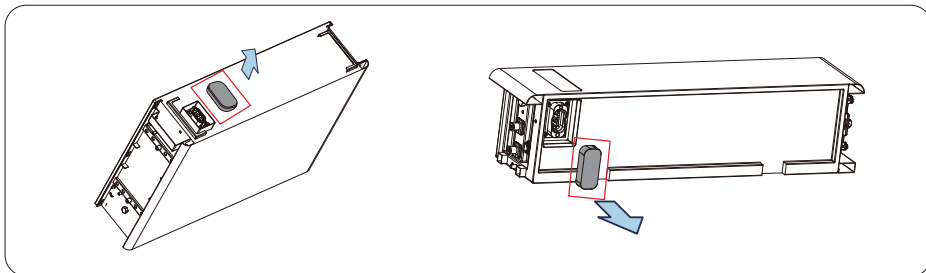
1. After marking the drilling position using a marker, remove the BMS control unit to prevent damage from the impact drill being too near it during drilling.
2. When drilling holes with an impact drill, cover the battery system with cardboard or other materials to prevent debris from entering the device and causing damage to the device.

BMS control unit installation

Step 1: Before connection, you need to remove both protective covers from the battery and the bottom of the BMS control unit.

Step 2: Hold the upper left and right frames of the BMS control unit, then elevate the unit while ensuring that the ports are positioned on the left and the circuit breaker switch is on the right. Carefully align the plug located at the bottom of the BMS control unit with the battery socket, and gently lower it to connect with the top battery.

Step 3: Use the shell fixing buckle to secure the connection between the battery and the BMS control unit. Ensure that both sides are properly fastened.



3.5.2 Inverter Installation

- Operations such as transportation, turnover, installation and so on must meet the requirements of the laws and regulations of the country or region where it is located.
- Move the inverter to the site before installation. Follow the instructions below to avoid personal injury or equipment damage.

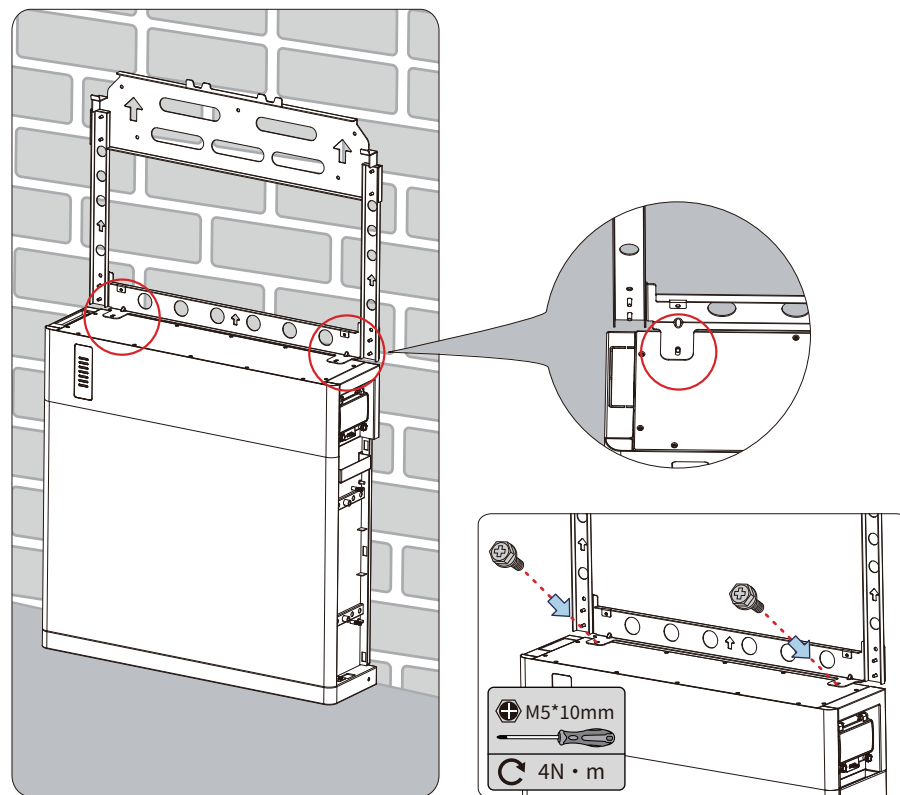


CAUTION

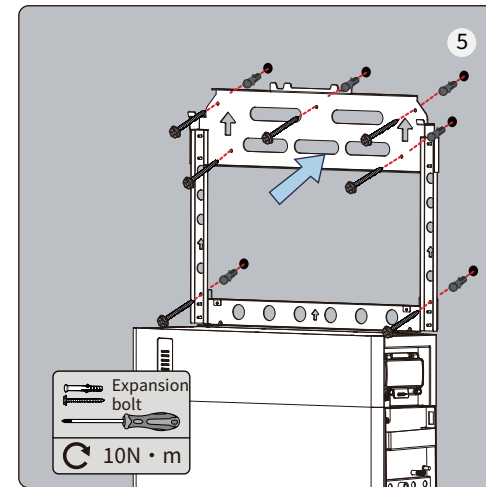
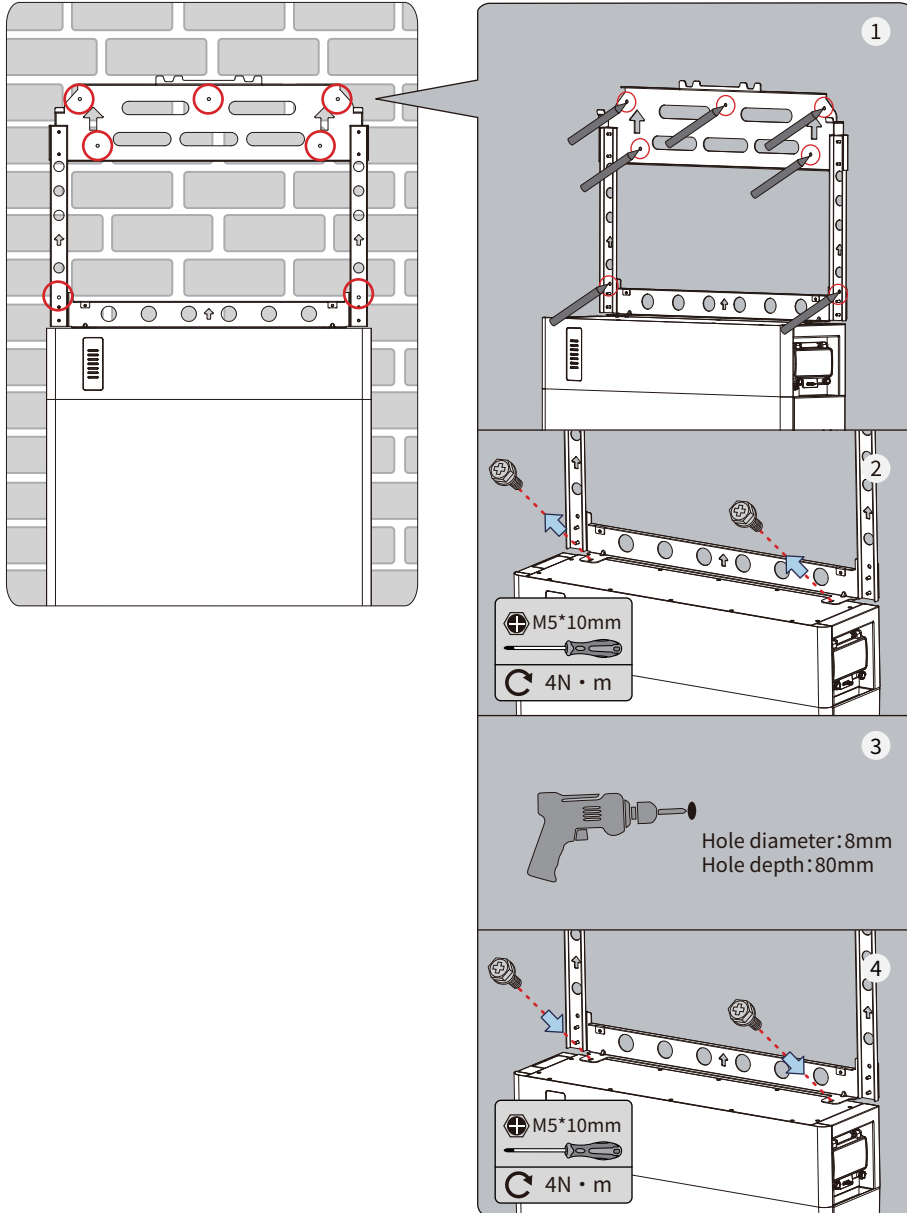
1. Consider the weight of the equipment before moving it. Assign enough personnel to move the equipment to avoid personal injury.
2. Wear safety gloves to avoid personal injury.
3. Keep the equipment in balance during moving to avoid its falling down.
4. Avoid the water pipes and cables buried in the wall when drilling holes.
5. Wear goggles and a dust mask to prevent the dust from being inhaled or contacting eyes when drilling holes.
6. Make sure the inverter is firmly installed in case of falling down.

Wall mount installation

Step 1: Use two M5 bolts to position the wall mount bracket and the battery cover, and tighten the bolts by pressing the wall mount bracket against the wall.

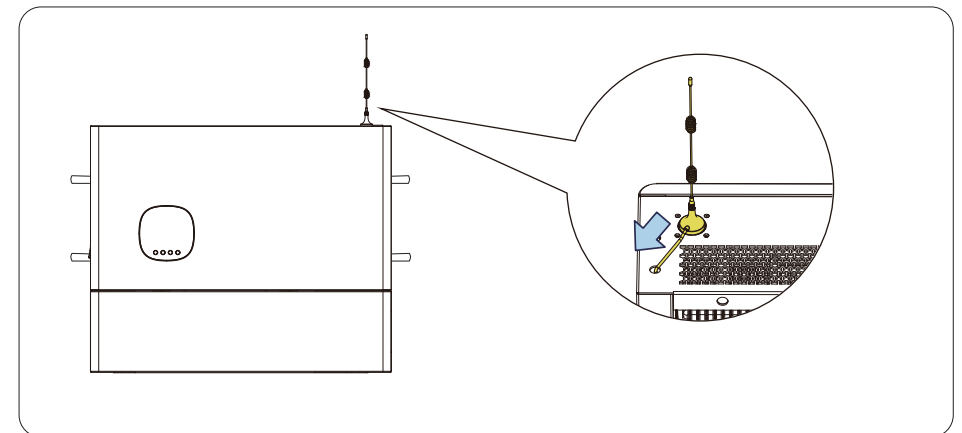


Step 2: After tightening the bolts, use a marker to mark the drilling holes through the bracket holes. Next, remove the bolts and the bracket, and drill holes. Then install the bracket with expansion screws.



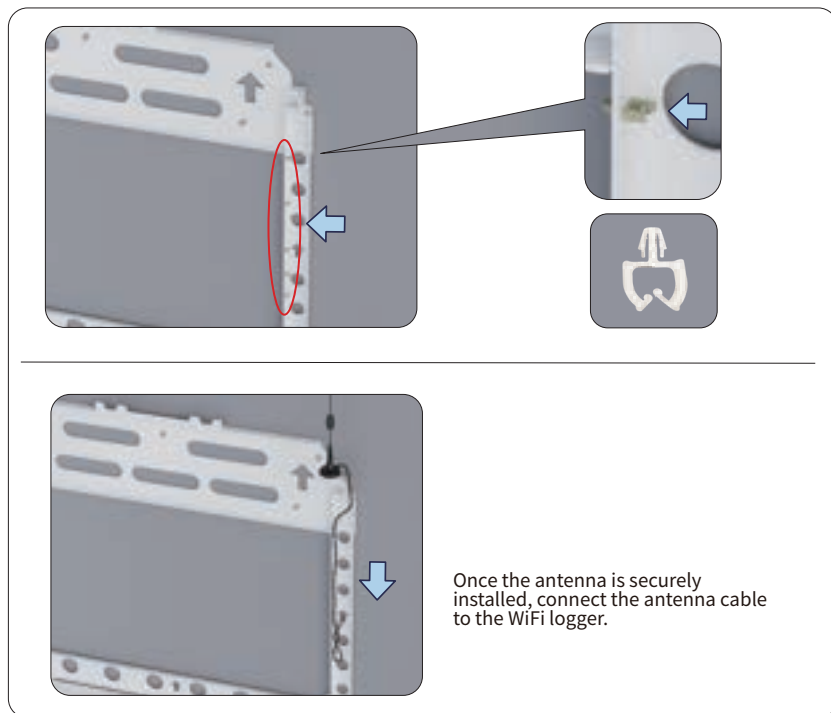
Inverter Antenna Installation

To enhance the communication signal, please connect an external antenna to the WIFI logger.



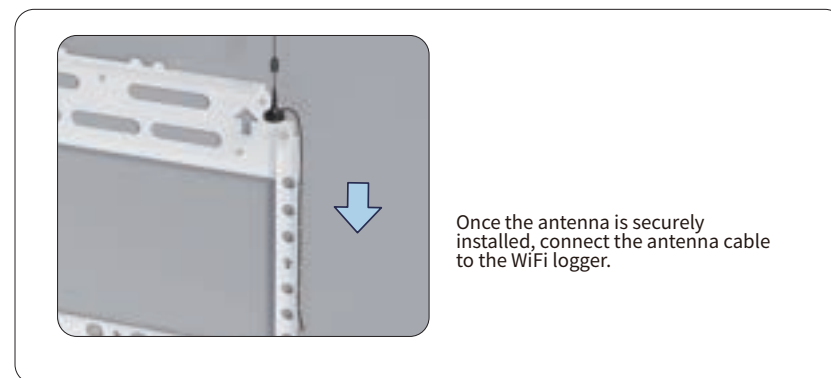
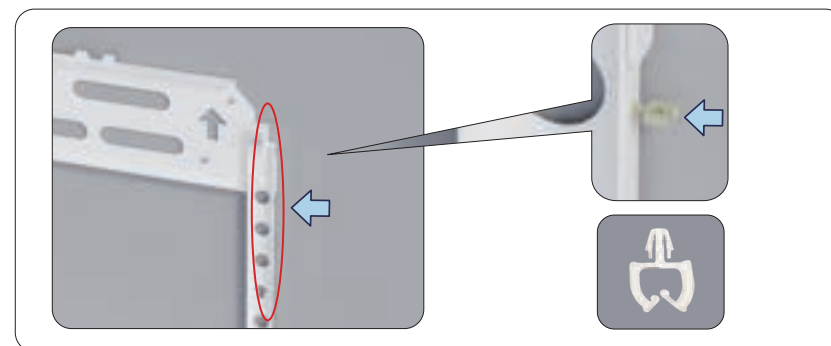
Method 1: Install the antenna first, then the inverter.

Next, attach the antenna cable along the positioning clips, install the inverter, and plug the antenna cable into the WiFi logger.



If the inverter is already installed, align the positioning clips with the pre-drilled holes on the outer side of the wall mount bracket, insert and secure them.

Then, attach the antenna cable along the positioning clips and plug it into the WiFi logger.

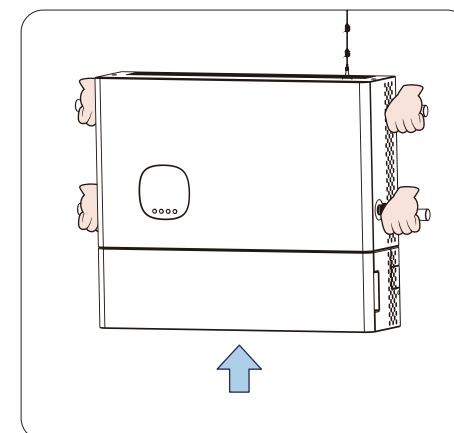
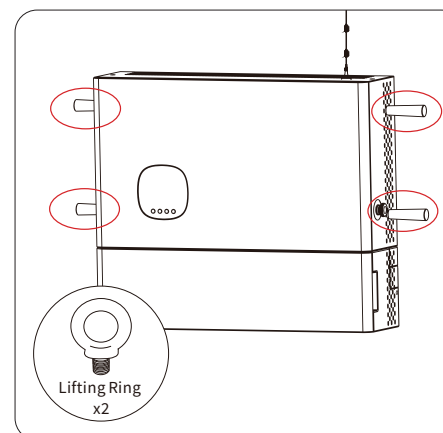


Inverter Installation

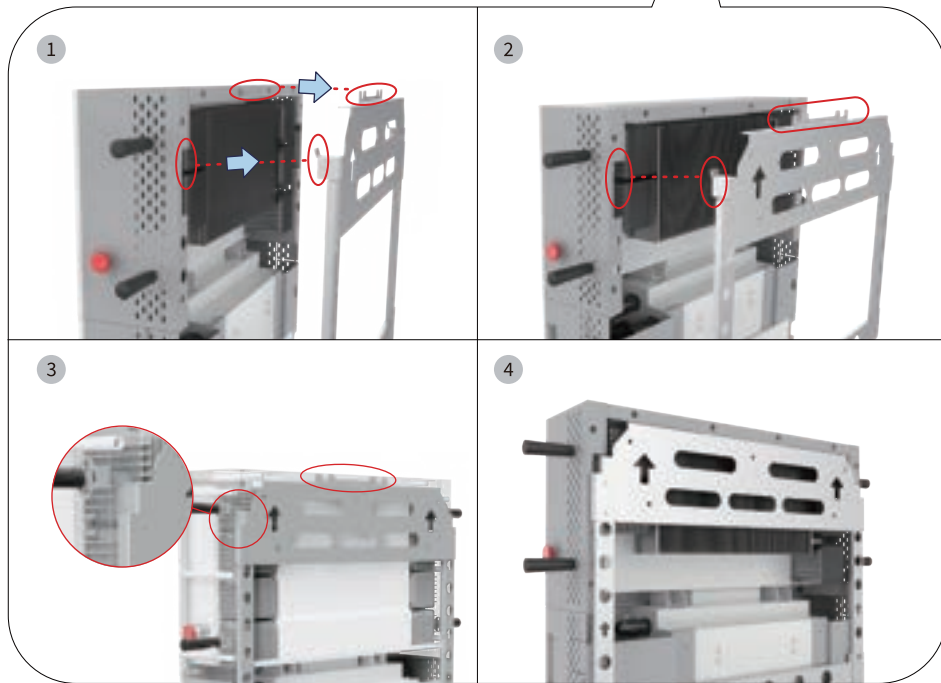
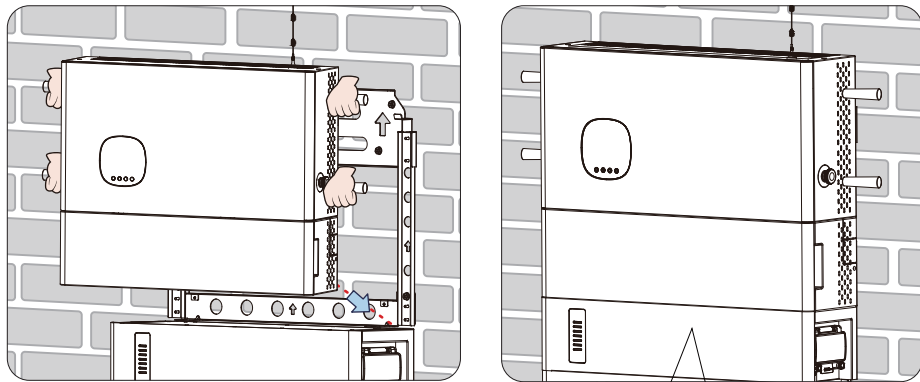


1. The inverter is heavy! Take care when removing it from the packaging.
2. Have at least two people help with the inverter installation using the movable handles or lifting rings.
3. Since the inverter is heavy, choose the appropriate method to lift and install it. After installation, make sure to remove the movable handles or lifting rings.

Step 1: Two people stand on two sides of the inverter to lift the inverters by movable handles or lifting rings.



Step 2: Align the back of the inverter with the wall mount bracket for installation.

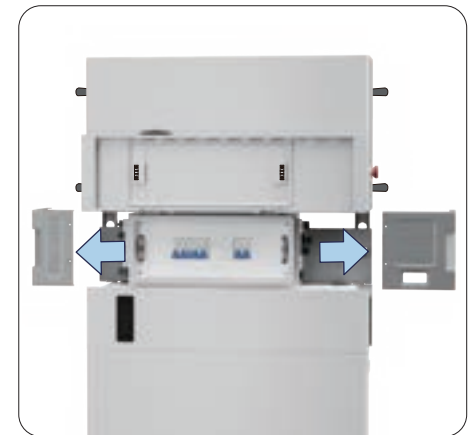
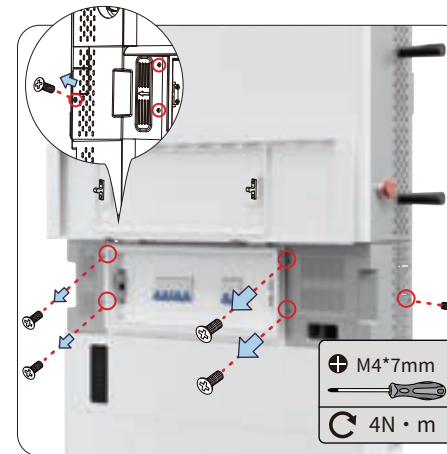


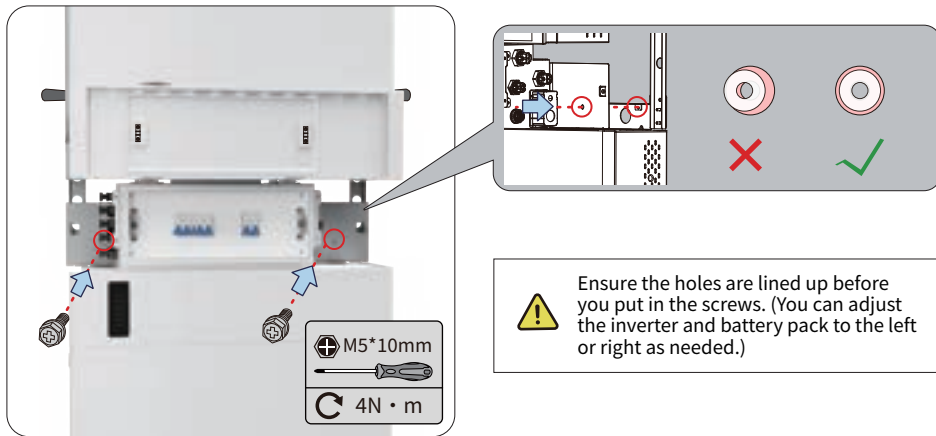
Step 3: Pull the control box cover of inverter forward.

Step 4: Flip the pulled-out control box cover upwards to 180°.

Step 5: Remove the screws on both sides of the control box cover and push the side cover out to both sides.

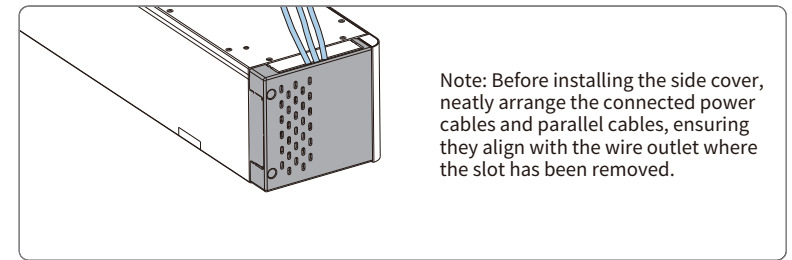
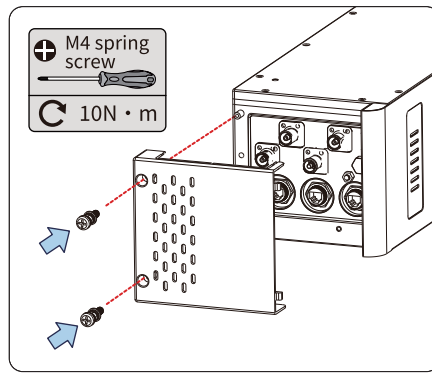
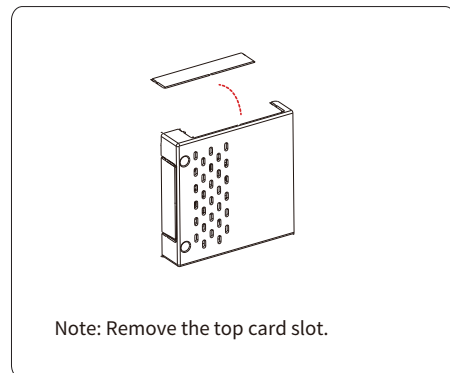
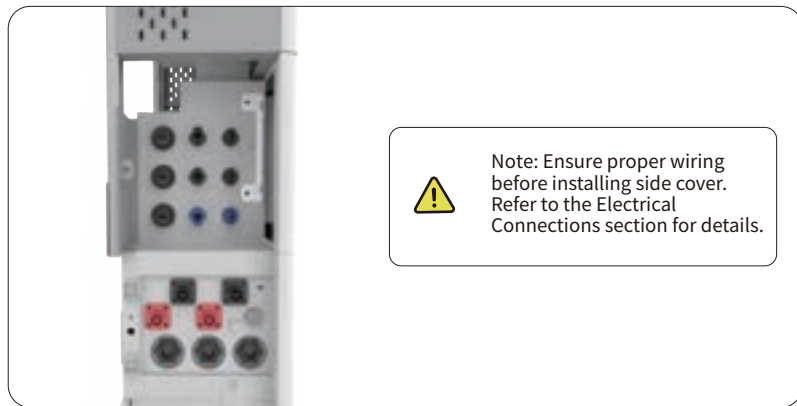
Step 6: Tighten screws between the two side holes inside the control box and the wall mount bracket to secure.



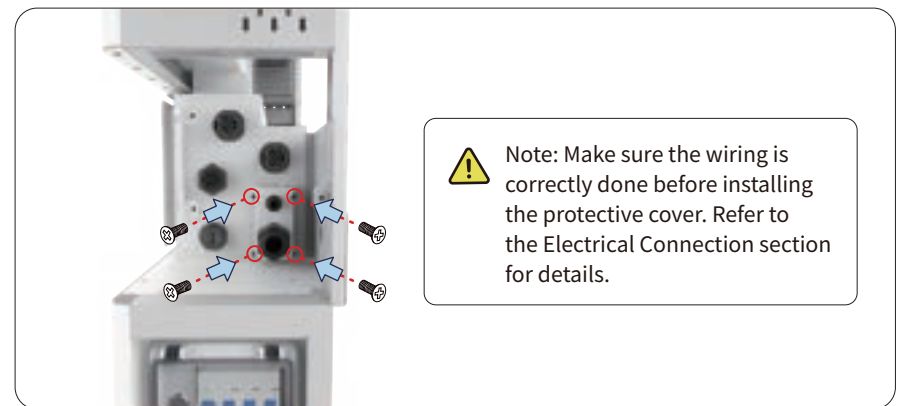
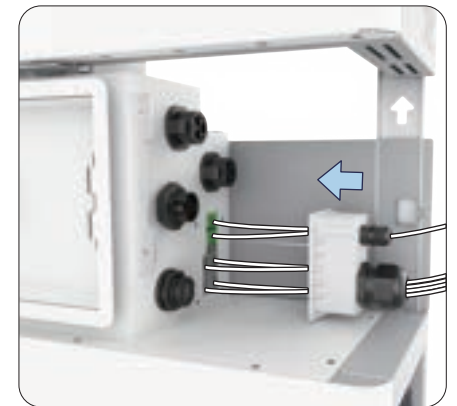
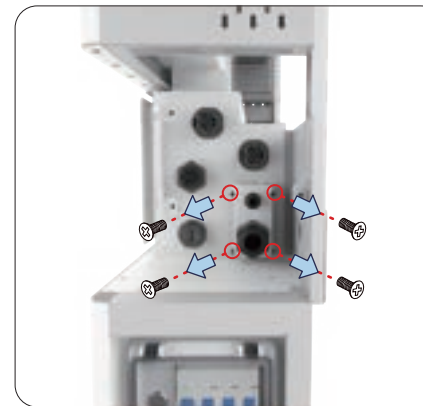


Step 7: After the high-voltage battery and inverter are wired, install the battery port bar. (See battery manual for battery wiring and Section 4 of this manual for inverter wiring.)

Step 8: Remove the slot at the outlet location of the control box side cover, and when wiring is complete, install the control box side cover.

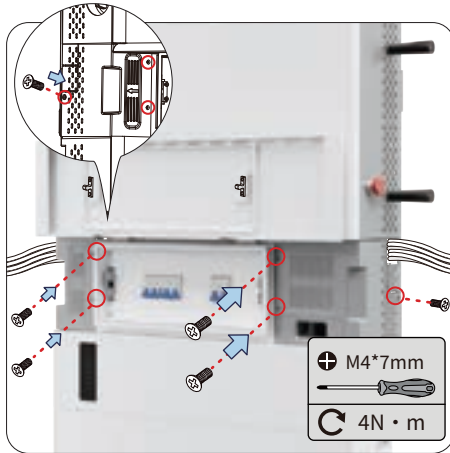
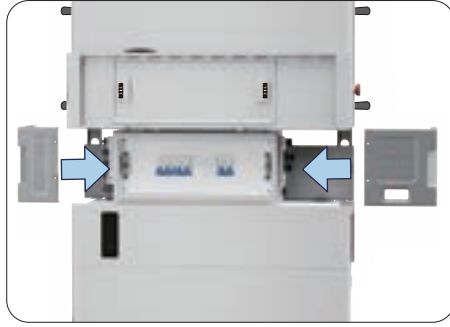
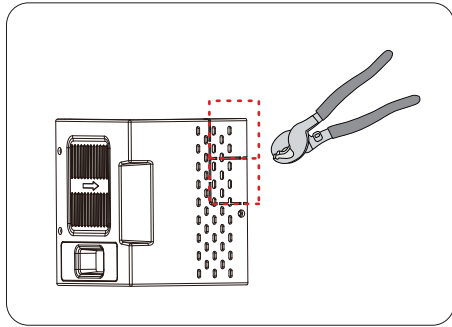


* If other parallel communication cables need to be connected on the inverter, remove the four screws on the protective cover first and wiring can be done. (Please refer to Section four of this manual for detailed wiring instructions.)



Step 9: Once the wiring is done, trim the side covers on each side of the control box along the dotted lines so the wires can go through.

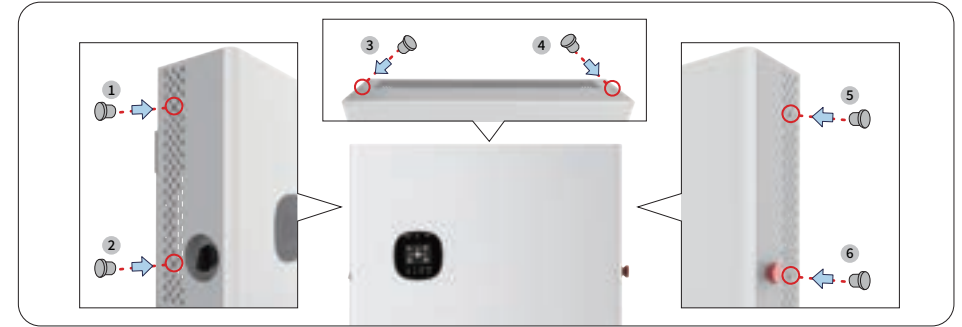
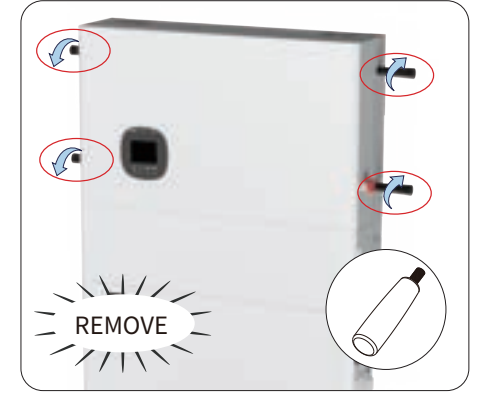
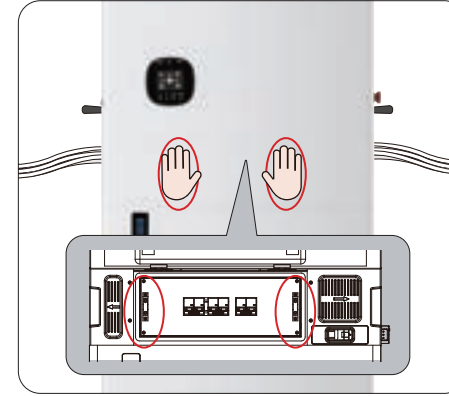
Step 10: Install the inverter control box side cover.



Step 11: Press the locking buckle in the middle of the control box with both hands.

Step 12: After installation and commissioning, remove the handles on the inverter.

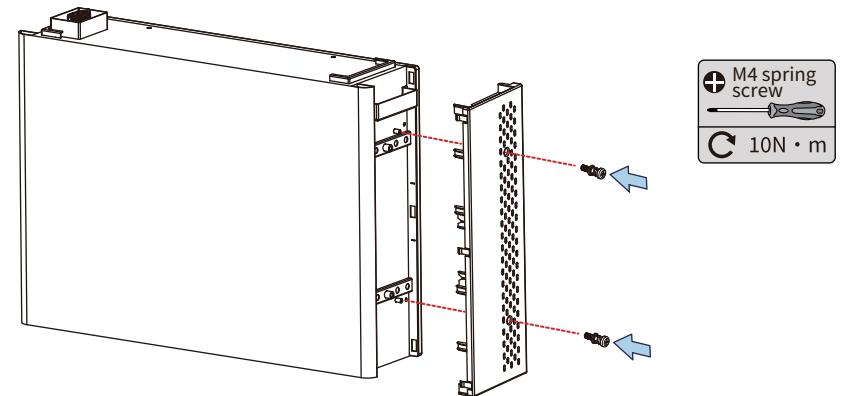
Step 13: After removing the handles, insert plugs to the six holes.



Battery side cover installation

Step 1: Complete the installation of the battery system or all-in-one machine according to the above steps.

Step 2: Align the screw holes of the side cover with the two holes on the side of the battery, and use a screwdriver to tighten the spring screws on the side cover. (Side covers need to be installed on both sides.)



04 Electrical Connections

Safety Precautions

Precautions:



DANGER

- This product operates at high voltage. Before connecting the cables, ensure that all circuit breakers and switches linked to the inverter and battery pack are turned off. Failing to do so may expose you to dangerous voltage levels, which can lead to electric shock.
- Strictly comply with all safety rules in this manual and heed safety signs on the equipment while using it.
- Ensure that all operations, cables, and component specifications meet local laws and regulations during electrical connections.
- Group cables of the same type together and keep them separate from different types. Do not mix or cross them.
- When crimping the terminal, ensure the cable's conductor is fully touching the terminal. Avoid crimping the cable insulation with the terminal, as this may cause the device to malfunction or overheat during use, causing damage to the inverter ports.



WARNING

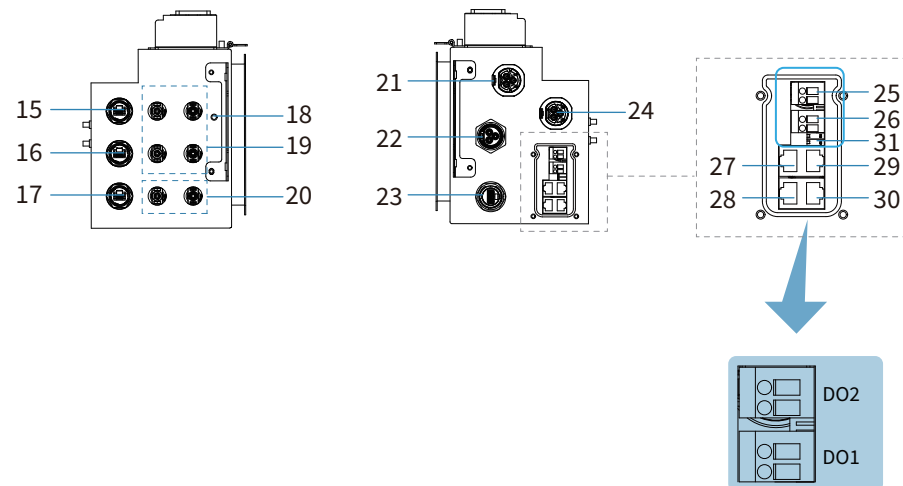
- Damage to the energy storage system caused by incorrect cable connection is not covered by the warranty.
- Only certified electricians can connect the cables.
- Operators must wear appropriate personal protective equipment when connecting cables.



NOTICE

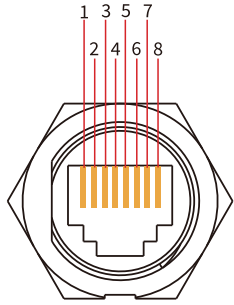
- The cable colors shown in the electrical connection diagrams provided in this chapter are for reference only.
- Select cables according to local cable specifications (green and yellow cables are only used for PE)

4.1 Port Definition



No.	Port Definition	Function Description
15	Meter /CT1 port 1	For the Smart Meter or CT1.
16	Meter /CT2 port 2	For the Smart Meter or CT2.
17	BAT COM port	For Li-ion battery, communication is via CAN.
25	DO2	Dry contact output. The DO2 can be set to one of the functions as follows: Earth Fault Alarm, Load Control and Generator Control.
26	DO1	Dry contact output. The DO1 will control the bypass contactor under certain logic.
27	Parallel port A	For parallel operation.
28	DI	Dry contact input of external bypass contactor.
	EV COM port	For electric vehicle charging equipment, communication is via CAN.
29	Parallel port B	For parallel operation.
30	DRM	For external Demand Response Enabling Device.
31	S1	CAN matching resistor. For terminal identification by setting the DIP switches when the inverters are operated in parallel to ensure the stability of signal transmission.

Detailed PIN function of inverter meter 1/2 port



RJ45 PIN	Definition (METER1)	Definition (METER2)
1	METER485-B	METER485-B
2	IGRID_LOADN1	IGRID_LOADN2
3	485-3B	485-3B
4	--	--
5	METER485-A	METER485-A
6	485-3A	485-3A
7	--	--
8	IGRID_LOADP1	IGRID_LOADP2

Detailed PIN functions of the inverter BMS port:

RJ45 PIN	Definition (BMS)
1	WEKE UP
2	GND-COM
3	VCC
4	CANH
5	CANL
6	GND_BMS
7	--
8	--

Detailed PIN function of the inverter parallel communication port:

RJ45 PIN	Definition (Parallel port A/B)
1	CAN-H1
2	CAN-L1
3	EV_CANH
4	CAN-CF-H
5	CAN-CF-L
6	EV_CANL
7	CAN-SYNC-H
8	CAN-SYNC-L

Detailed PIN function of the inverter electric vehicle communication port:

RJ45 PIN	Definition (EVCOM)
1	EV_CANL
2	EV_CANH
3	--
4	GND-COM
5	--
6	--
7	D13_A
8	D13_B

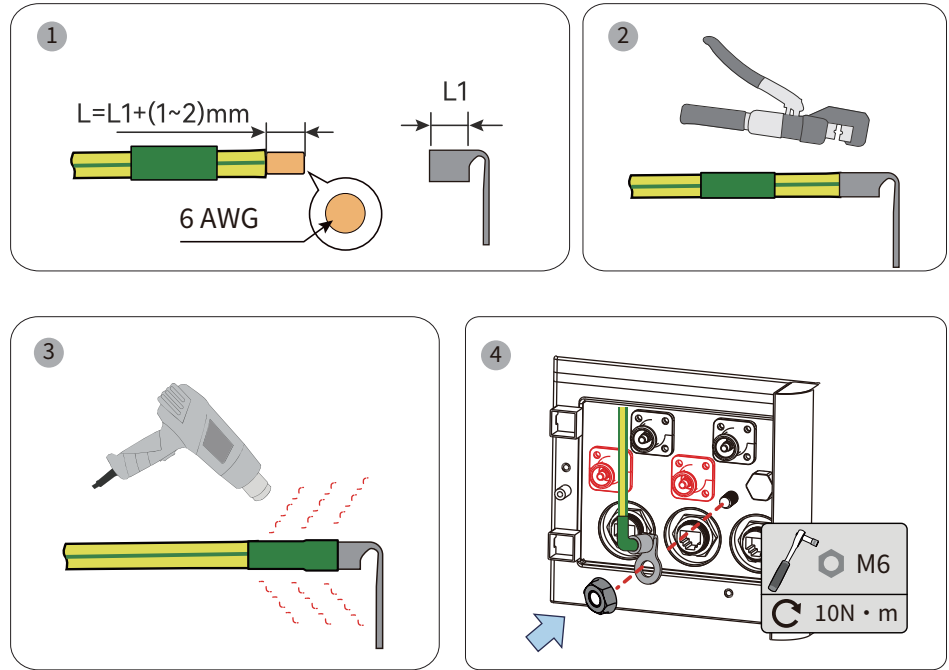
Detailed PIN function of the inverter DRM port:

RJ45 PIN	Definition (DRM)
1	DRM1/5
2	DRM2/6
3	DRM3/7
4	DRM4/8
5	REF
6	COM
7	GND-COM
8	--

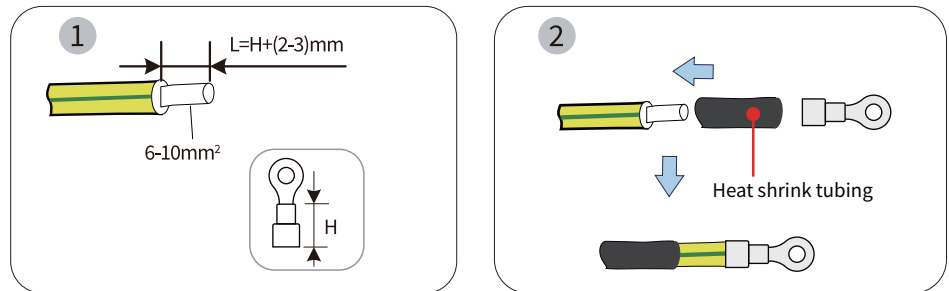
4.2 Ground Connection

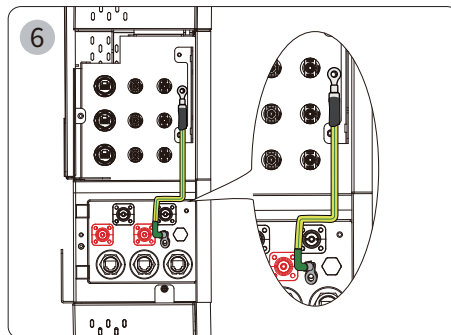
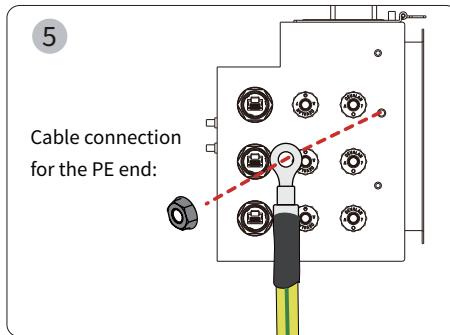
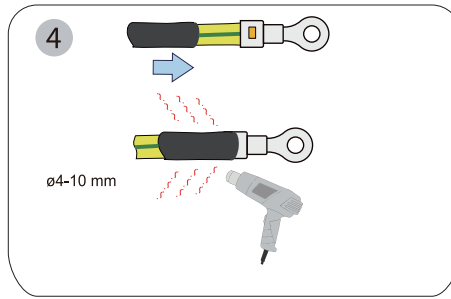
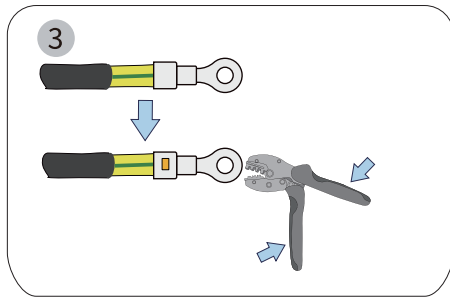
Connect the ground cables of the battery module and the inverter.

Battery ground terminal:



Inverter control box ground terminal:





Note: All non-current-carrying metal parts and equipment casings in the photovoltaic power generation system should be grounded.

4.3 PV Connection

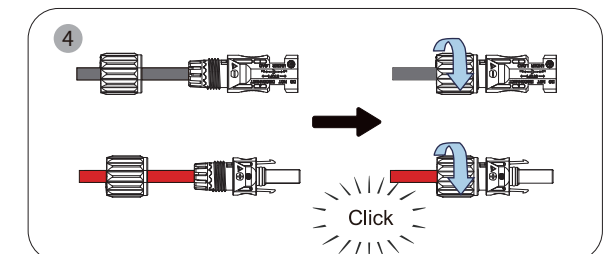
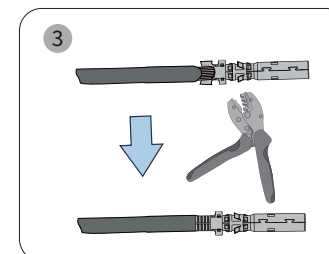
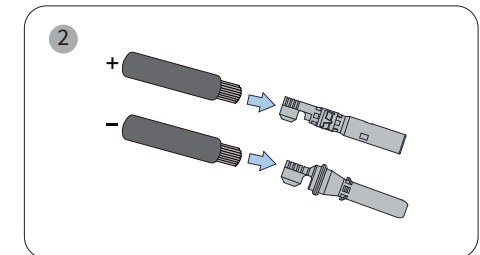
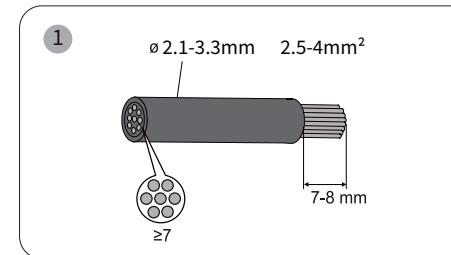


Notice:

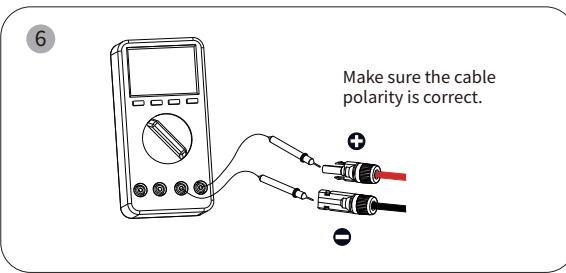
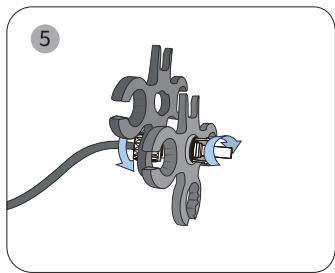
1. PV Connection is only suitable for the hybrid inverter.
2. When the photovoltaic array is exposed to light, it supplies Ad.c. voltage to the PCE.

Before connecting PV strings to the Hybrid inverter, ensure the following:

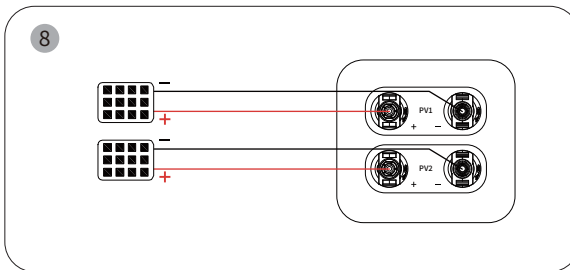
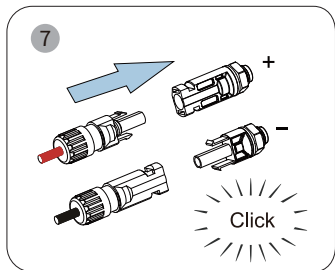
- Ensure that the open circuit voltage of the PV strings does not exceed the maximum DC input voltage (530VDC). Violation of this condition will void the warranty.
- Ensure the polarity of the PV connector is correct.
- Ensure that the PV switch, grid circuit breaker, AC backup power supply and AC grid are all in the off state.
- Ensure that the PV resistance to ground is greater than 34kOhms($R = V_{MAX} PV / 30 \text{ mA}$). A warning that there is a risk of shock hazard if the total minimum resistance requirement is not met.
- The PV strings mustn't be connected to the ground or grounding conductor.
- Use the PV connector in the accessory box for PV connection. Damage caused by using incompatible terminals is not covered by the warranty.
- The BAT connector is similar to the PV connector. Make sure the connector is correct before use. The inverter uses the MC4 PV connector. Please assemble the PV connector according to the figure below. PV wire cross-section requirements: 2.5-4 mm².



- Strip 7-8 mm of insulation from each DC cable.
- The conductor cross-section should be 2.5-4 mm².
- Insert the stripped cable into the PV pin contact. Make sure the the PV cable and PV pin contact are of the same polarity. Crimp it with crimping tool for PV terminal.
- Thread the PV cable through swivel nut and insert the cable into the PV connector. A "Click" will be heard if it is connected correctly.



- Tighten the swivel nut and the connector with an MC4 PV connection wrench.
- Gently pull the cable backward to ensure firm connection.
- Verify that the PV connectors have the correct polarity before connection and ensure that the open circuit voltage does not exceed the input limit of 530V under any circumstances.

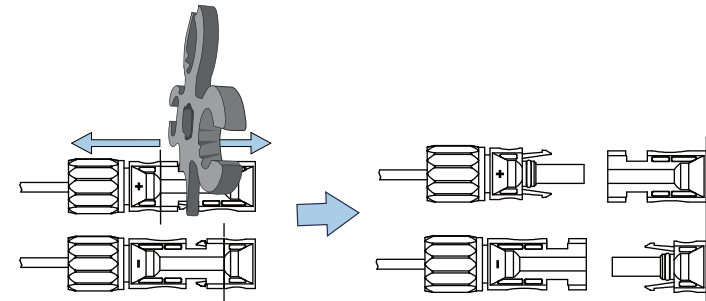


- Connect the PV connector to the inverter. If connected correctly, there should be a "click" sound.



The polarity of the PV strings must not be connected in a reverse manner. Otherwise, the inverter could be damaged.

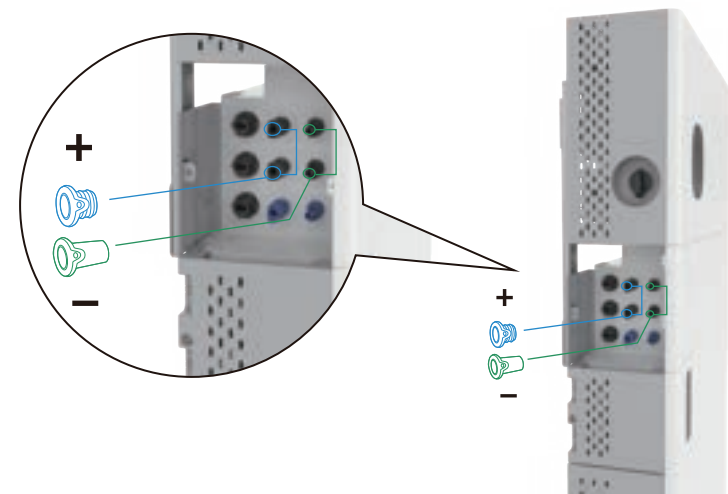
Remove the PV plugs:



Warning: Please use pv disassembly tools to remove the PV plug.

Notice:

If the PV port is unused, put on a dust cap to keep rain and dust out of the inverter.



4.4 Battery Wiring Connection

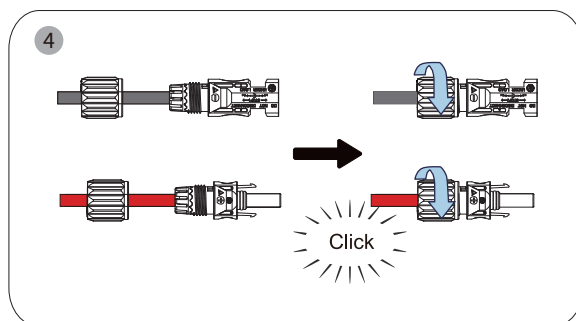
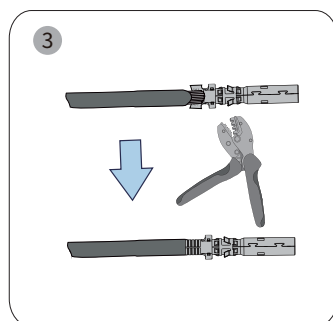
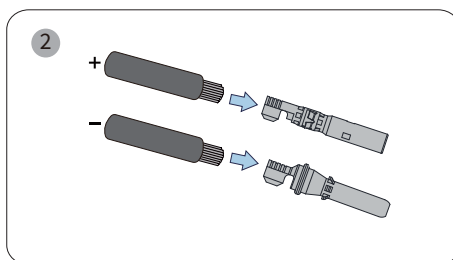
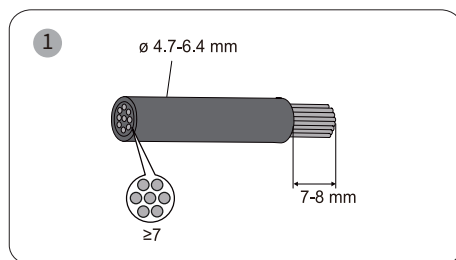
The inverter, which has BAT+, BAT-, and BAT COM ports, only supports connection with lithium-ion batteries and does not support lead-acid batteries. It lacks remote battery temperature monitoring for lead-acid battery.

4.4.1 Power Cable Connection

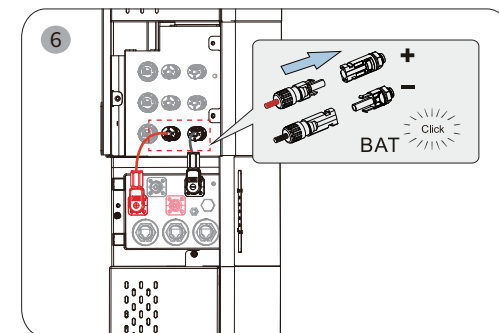
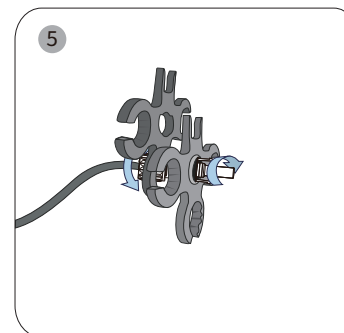
Connect the positive and negative power cable (BAT+, BAT-) of the battery module to the inverter's ports (BAT+, BAT-).

Warning

- Use the BAT connectors provided in the accessory box for battery connections. Damage resulting from the use of incompatible connectors is not covered by the warranty.
- BAT connectors are similar to PV connectors. Ensure the connectors are correctly matched before use.
- Verify the polarity (+/-) of the battery connectors before connecting. Incorrect polarity or the absence of a battery will disable the backup function.

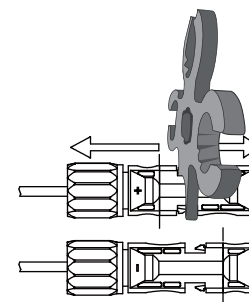


- Strip the insulation of the battery power cable to a length of 7-8mm.
- Ensure the cross-sectional area of the conductor is greater than 8.3 mm².
- Insert the stripped cable into the pin contact. Make sure the battery cable and pin contact are of the same polarity. Crimp it with crimping tool.
- Thread the battery cable through swivel nut and insert the cable into the connector. A "Click" will be heard if it is connected correctly.

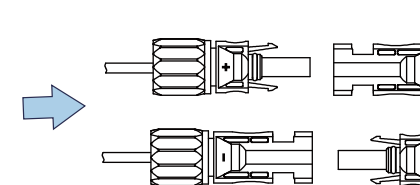


- Tighten the swivel nut and the connector using MC4 wrench.
- Gently pull the cable backward to ensure firm connection.
- Connect the positive and negative battery connectors to the inverter. If they snap into place correctly, there should be a "click".

Remove the Battery plugs

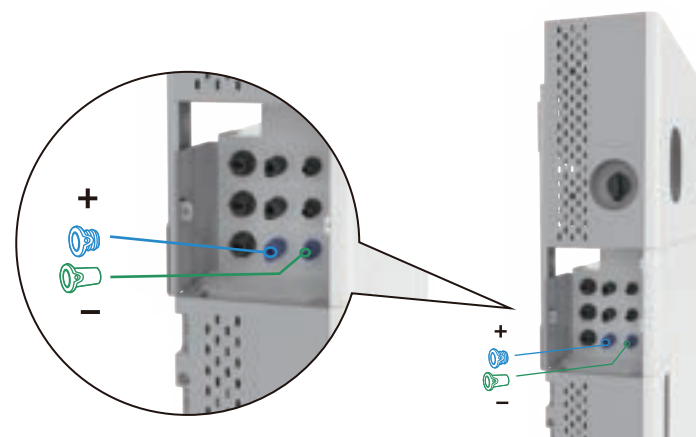


Warning: Please use disassembly tools to remove the Battery connector.



Notice:

If the battery port is unused, put on a dust cap to keep rain and dust out of the inverter.



Battery protection

Battery charging and discharging are limited to protect the battery in the following cases:

- Battery SOC is lower than 1-DOD (depth of discharge).
- The battery voltage is lower than the discharge voltage.
- Battery overheating protection is activated.
- Abnormal communication with the lithium battery.
- Lithium battery BMS limit is reached.

When the current limit protection occurs:

- In grid-connected mode, battery charging and discharging operations may be abnormal.
- In off-grid mode, the inverter will not supply power to the backup terminal.

Note

- The off-grid discharge cut-off SOC is set at 20%. In off-grid scenarios, the battery cannot be further discharged once it hits this level. When the SOC goes above 25%, the battery can be discharged again.
- The on-grid discharge cut-off SOC is set at 10%. Under on-grid conditions, the battery cannot be further discharged once it hits this level. When the SOC is greater than 15%, the battery can be discharged again.
- Setting the DOD can prevent the battery from being fully drained. Once the DOD limit is hit, the load will only be powered by the solar energy or grid. In instances where the battery has received minimal or no charging for several days, it may still undergo self-discharge to maintain communication with the inverter. Batteries from different manufacturers may exhibit varying responses, but if the SOC falls to a specific level, the inverter will charge the battery slightly to maintain the SOC. This protection mechanism prevents the battery SOC from dropping to 0%.

4.4.2 Communication Cable Connection

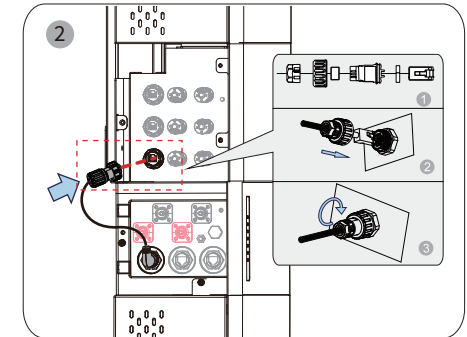
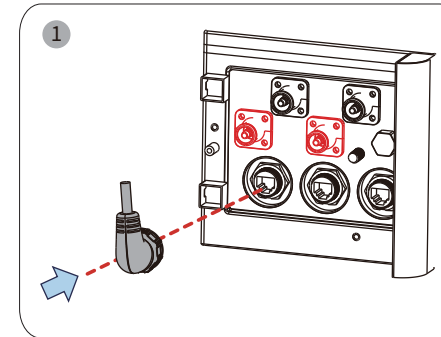
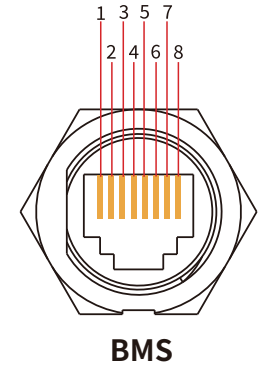
All battery information is managed and monitored by the battery management system (BMS), which uploads the data to the inverter via a communication cable. This allows users to remotely monitor the battery information, such as voltage, current, power, temperature, etc., on the LCD screen or Hinen APP.

Warning

- Battery communication cables are generally provided by the battery manufacturer and you can choose whether to use them or not depending on the actual installation.
- Battery communication cables can use industry-standard network cables (recommended type: Cat5e, UTP, UV-resistant for outdoor use).
- If you need to prepare your own communication cable, recommended specifications are standard network cable and RJ45 connector.

Interface Definition

RJ45 PIN	Definition (Inverter BMS)
1	WAKE UP
2	GND-COM
3	VCC
4	CANH
5	CANL
6	GND-BMS
7	--
8	--



Notice:

If you are using the lithium-ion battery, it is not necessary to install the temperature thermal sensor.

4.5 AC Connection

4.5.1 Requirements for AC Cable Connections to On-Grid and Off-Grid Sides

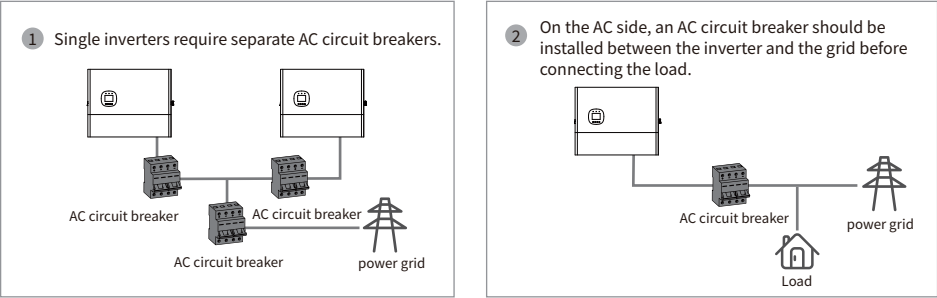
When the inverter is connected to the grid, add an external AC circuit breaker to isolate the grid from the inverter if necessary.

The requirements for the grid-connected AC circuit breaker are as follows:

Inverter model	AC Circuit Breaker Specifications
The 5KW inverter	32A/230V(DZ47-60 C32)

* For details on AC circuit breaker specifications for other types of inverters, refer to the system wiring diagram.

Note: If the AC circuit breaker is not installed on the off-grid side, the inverter may be damaged when short circuit occurs.



The inverter has not been tested to AS/NNZS 4777.2:2020 Section for multiple phase combinations has not been conducted. Therefore multiple phase combinations should not be used, or external devices should be used in accordance with the requirements of AS/NNZS 4777.1.

4.5.2 On-Grid & Off-Grid Connection

Before connecting the AC cables, ensure that the inverter is completely isolated from both DC and AC power.

- 1. Generally the N is black, the L is red, and the PE is yellow-green.
- 2. The grounding line of the AC cable must be longer than both the neutral (N) line and the live (L) line to guarantee that the grounding line can bear the last strain in the event that the AC cable is inadvertently dislodged or pulled.

Common AC cable specifications are as follows. It is recommended to use 8 AWG wire for the AC cable.

Description		Value	
A	Cable diameter	10-14mm	
B	Cable length stripped	20-25mm	
C	The length of the conductor	12-13mm	
D	Conductor cross-sectional area	Load	4-6mm²
		Grid	6-10mm²
		GEN	6-10mm²

Off-grid Connection

The inverter supports both on-grid and off-grid functions. It will transmit power through the on-grid port when the grid is on and through the off-grid port when the grid is off.

- Notice :**
- Use the load connector provided in the accessory box. Damage caused by incompatible connectors is not covered under the warranty.
 - Ensure the AC load power rating is within the AC output power rating of the inverter to prevent an "overload" warning and potential shutdown.
 - For non-linear loads, ensure the surge power is within the AC load output power range of the inverter.

1 Strip the cable sheath to a length of 20-25mm and insulation of the wires to a length of 7-8mm.

2 Disassemble the load connector counterclockwise and remove the components in sequence.

3 Insert the conductors to the terminals and crimp it with a crimping tool. Avoid crimping the cable insulation with the terminal . Thread the AC cable through the connector.

4 According to the markings on the connector, use a screwdriver to secure all conductors to the corresponding terminals with a torque of 2 N·m.

Assemble the components in order and make sure to tighten them.

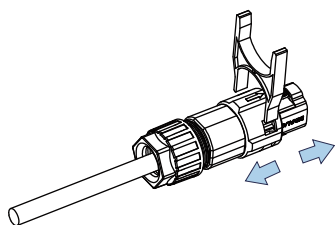
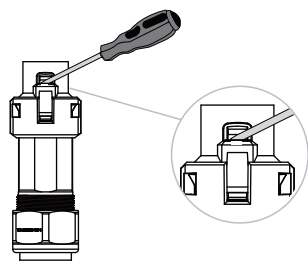
Plug the load connector to the inverter and tighten it.

- 5 Align the square opening of the load connector with the buckle on the inverter's Load port and push the load connector in. You will hear a "click" sound if the buckle is properly inserted into the load port.



Removal operation:

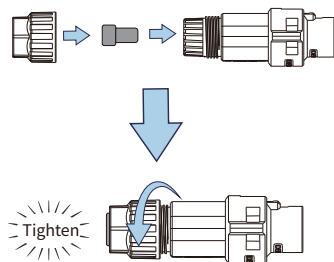
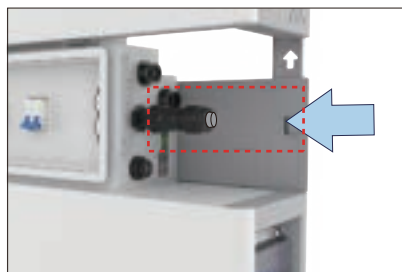
- 1 To remove the load connector, use a tool to press the buckle on the inverter's Load port to disengage the connector from the inverter.
- 2 Insert the H-type tool to disassemble the AC load connector.



Warning: Turn off the power supply and disconnect the equipment from the grid. Have a professional installer remove the load connector.

Note:

If the Load port is not in use, kindly ensure that a dust cap is installed on the load connector to protect the inverter from rain and dust intrusion.

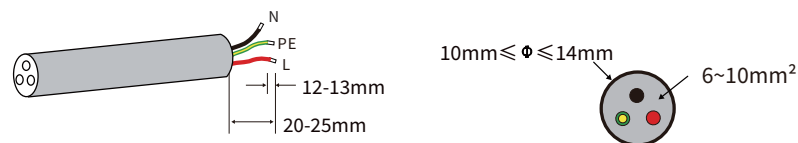


On-grid Connection

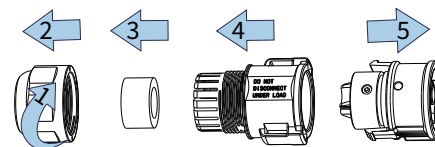
Notice: Use the grid connector provided in the accessory box. Damage caused by the use of an incompatible connector is not covered under the warranty.

- All electrical connections must comply with local and national standards.
- The inverter can only be connected to the grid with permission from the local grid company.

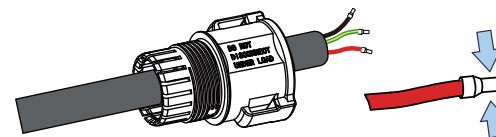
- 1 Strip the cable sheath to a length of 20-25mm and insulation of the wires to a length of 7-8mm.



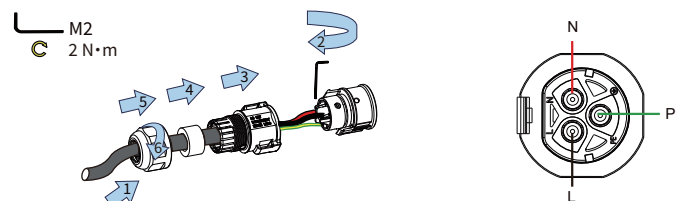
- 2 Disassemble the grid connector counterclockwise and remove the components in sequence.



- 3 Insert the conductors to the terminals and crimp it with a crimping tool. Avoid crimping the cable insulation with the terminal. Pass the AC cable through the connector.



- 4 According to the markings on the connector, use a screwdriver to secure all cables to the corresponding terminals with a torque of 2 N·m. Assemble the parts in order and make sure they are tightened.

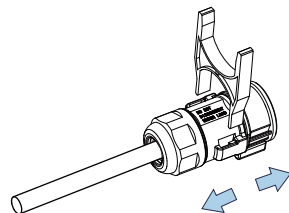
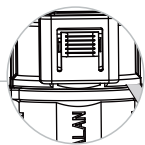
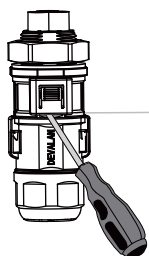


- 5 Align the square opening on the grid connector with the buckle on the inverter Grid port and insert the grid connector.
If the buckle is inserted into the Grid port correctly, there will be a "click" sound.



Removal operation:

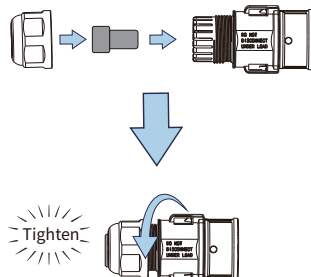
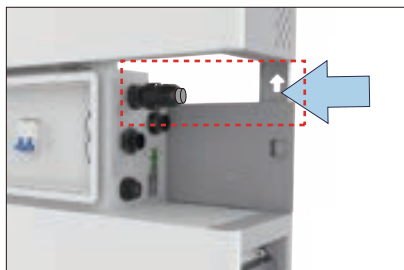
- 1 To remove the grid connector, use a tool to press the buckle on the inverter's Grid port to disengage the connector from the inverter.
- 2 Plug in the H-type tool and pull the connector from the port.



Warning: Turn off the power supply and disconnect the equipment from the grid. Have a professional installer remove the grid connector.

Notice:

If the Grid port is not used, install a dust cap on the grid connector to prevent rain and dust from entering the inverter.



Declarations for the Back-up Function

The backup output of hybrid inverters is capable of managing overload conditions. Additionally, the inverter reduces its power output to protect itself in high temperatures.

1. For standard installations of photovoltaic systems involving energy storage inverters, it is generally essential to connect the inverter to photovoltaic panels and batteries. Any consequences resulting from non-compliance with this requirement are excluded from the manufacturer's warranty and liability.
2. In general, the off-grid switching time is less than 20ms (the minimum requirements of the EPS). However, various external factors could stop the system from entering off-grid mode. Therefore, we recommend users to be fully informed and follow the instructions below:
 - Do not use this function if the load requires a stable power supply for reliable operation.
 - Do not connect loads that may exceed the maximum off-grid capacity.
 - Avoid loads that may generate high starting current surges, such as high-power pumps.
 - The battery current may be limited by factors including, but not limited to, temperature and weather conditions.

Acceptable Loads

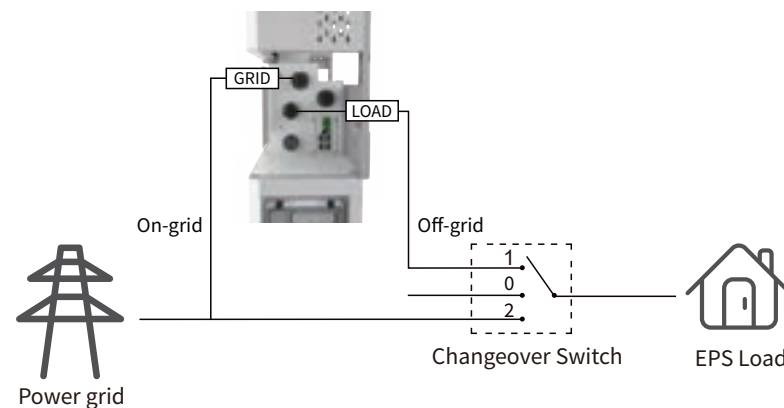
The off-grid functionality of the 5KW inverter is capable of delivering a continuous output of 4000VA for connected loads. Additionally, the inverter is equipped with self-protection mechanism that reduces output at high ambient temperatures.

- Inductive load: a single inductive load up to 4KVA.
- Capacitive load: a single capacitive load up to 4KVA.

(Do not connect any load with high inrush current at startup)

Note: For improved user experience and maintenance convenience, it is recommended that a changeover switch be installed. The changeover switch changes the way the load is powered by adjusting the circuit breaker connection, including three options: initial state, on-grid power and off-grid power.

1. The off-grid load is powered by the off-grid end.
0. Off-grid loads are isolated.
2. The off-grid load is powered by the grid-connected end.



Note: If the off-grid output is not operating properly, the changeover switch can be manually rotated to the on-grid output to ensure proper operation of the load.

Generator connection



Notice: Generator connection is only for the hybrid inverter.

The GEN port can be connected to the PV inverter, diesel generator, or smart load, and the wiring method for the GEN port is the same as that described in "On-grid Connection."
The limitations for connecting the PV inverter to the GEN port are detailed as follows:

Inverter model	A3600S	A4600S	A5000S
Nominal Input Voltage of PV Inverter (V)	230	230	230
Max. Input Current of PV Inverter (A)	34.1	34.1	34.1
Recommended AC Breaker	50A/230V	50A/230V	50A/230V
Recommended Cable (mm ²)	6~10	6~10	6~10

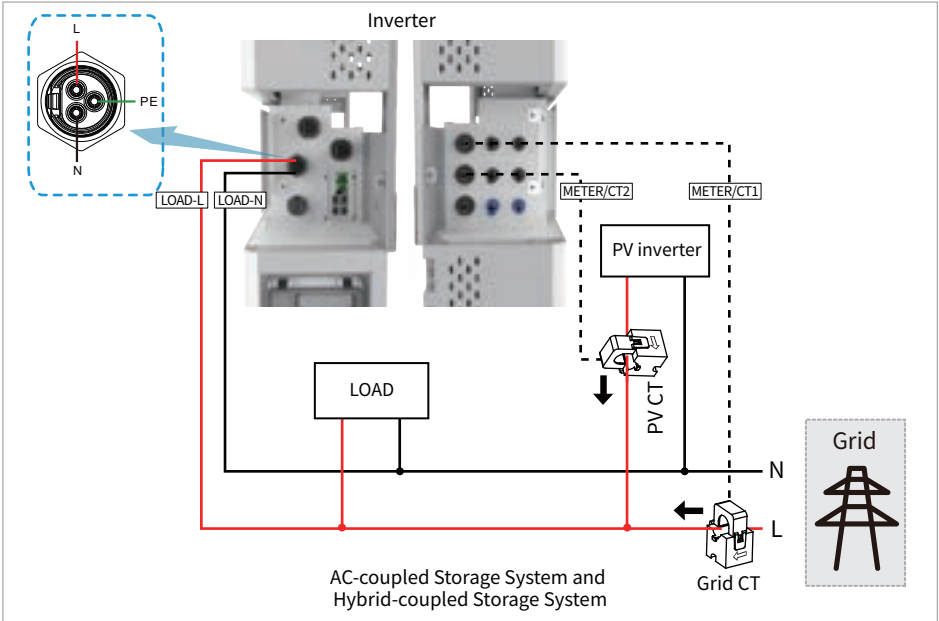
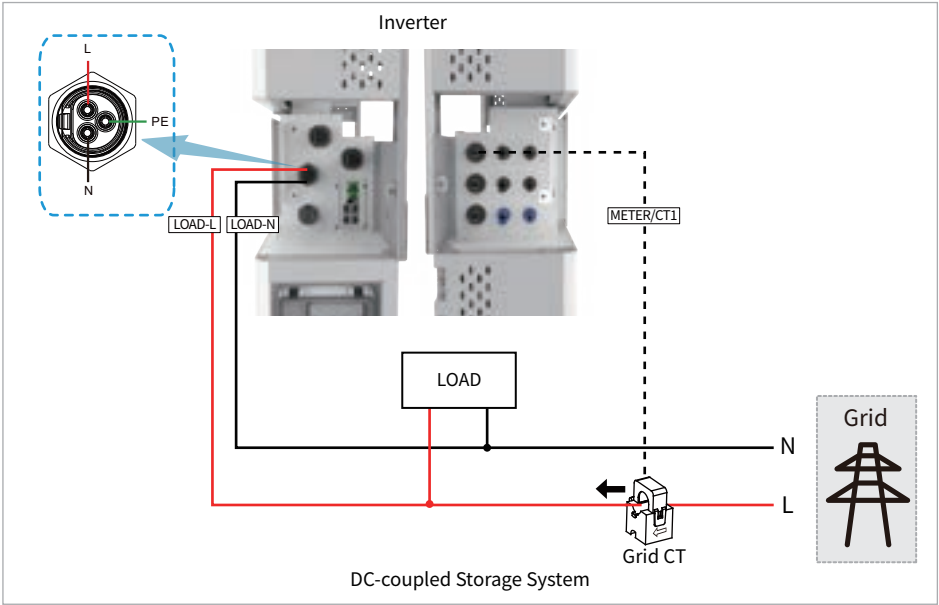


Notice

- Please use the GEN connector provided in the accessory box.
- Select the appropriate AC breaker in accordance with local laws and regulations.
- The PV inverter connected must have the function of overfrequency protection.

4.6 CT Connection

4.6.1 CT Connection



Notice

- One CT can only be used for one inverter.
- When the reading of the load power on the LCD is not correct, please reverse the CT arrow.

4.6.2 Smart Meter Connection

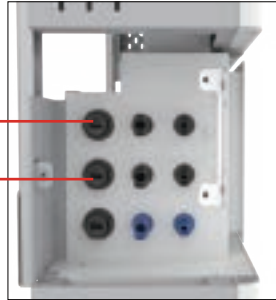


Before connecting the smart meter, make sure the AC cable is completely isolated from the AC power supply.

Note • Please read all relevant instructions carefully when using a smart meter.
• It is recommended to use the [Chint] DDSU666 smart meter with this product.

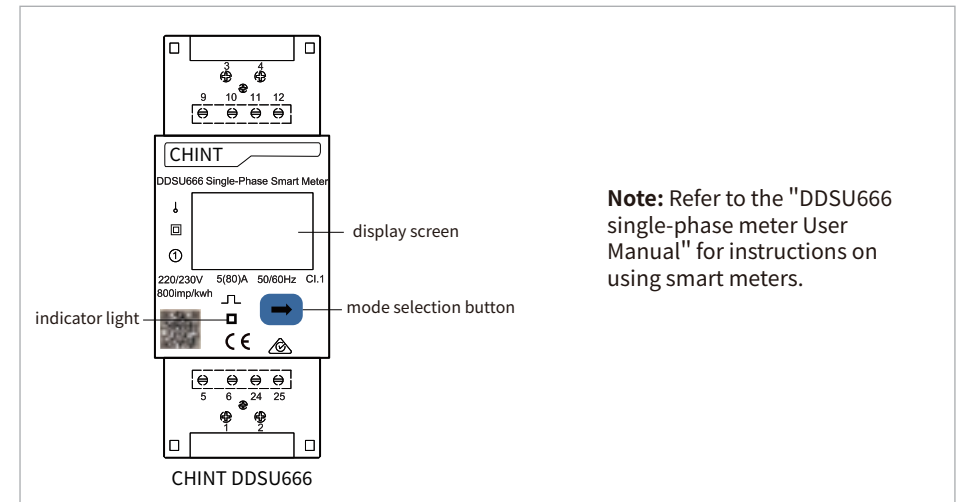
METER/CT1

METER/CT2



Smart meter use

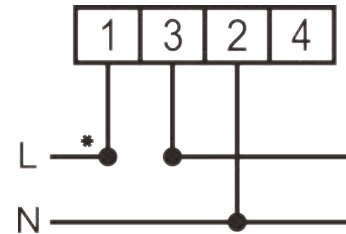
Item	User interface	Description	Item	User interface	Description
1		Current positive active energy Imp = 1.20kWh	7		Voltage U=220.0V
2		Current reverse active energy Exp = 1.00kWh	8		Current I=5.000A
3		Modbus	9		Active power P=1.100kW
4		8Data bits,None Parity,1 Stop Bit	10		Power factor Ft=1.000
5		Comm.Add=11	11		Frequency F=50.00Hz
6		baud rate to be 9600bps			



Note: Refer to the "DDSU666 single-phase meter User Manual" for instructions on using smart meters.

Notice: The CHINT DDSU666 smart meter is recommended to use with this product. Carefully read all relevant instructions when using the smart meter.

Smart meter wiring



Voltage signal
(only for instruments connected via current transformer):

2-----UN (N phase voltage input terminal)

Current signal:

1-----L* (L line current input terminal)

3-----L (L line current output terminal)

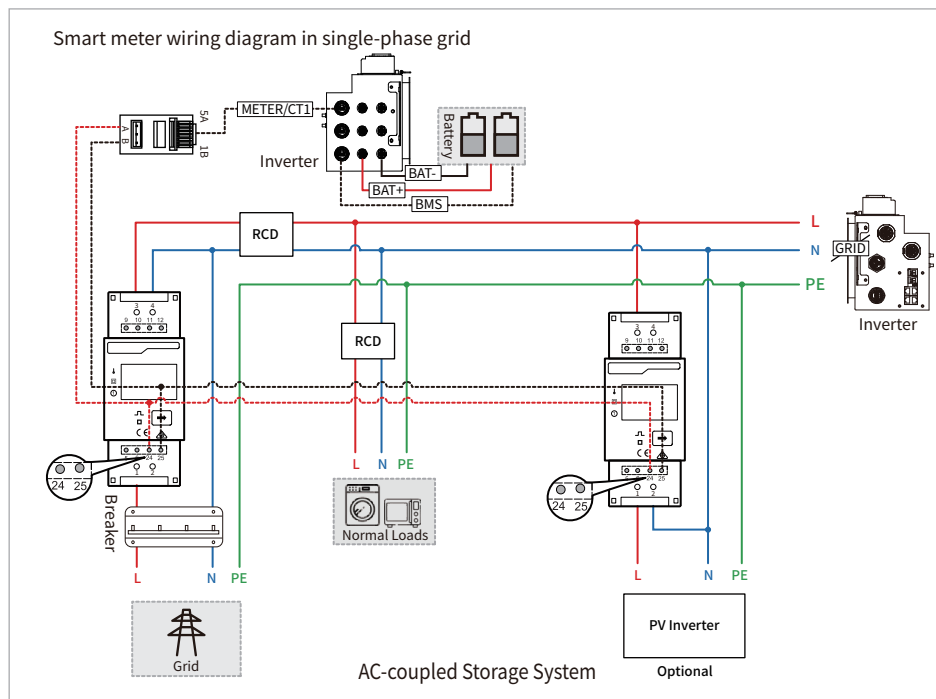
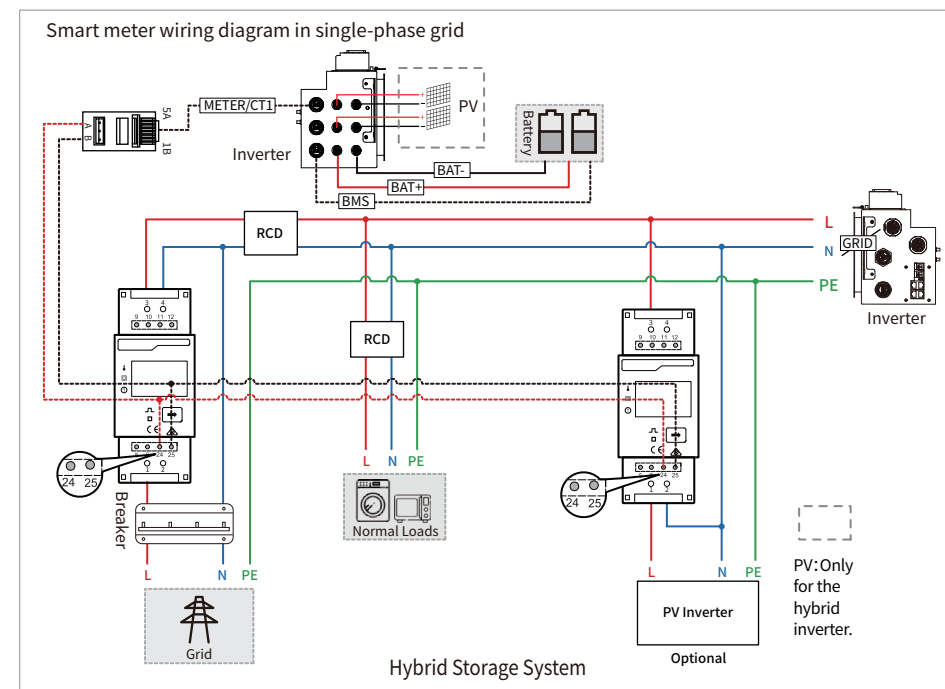
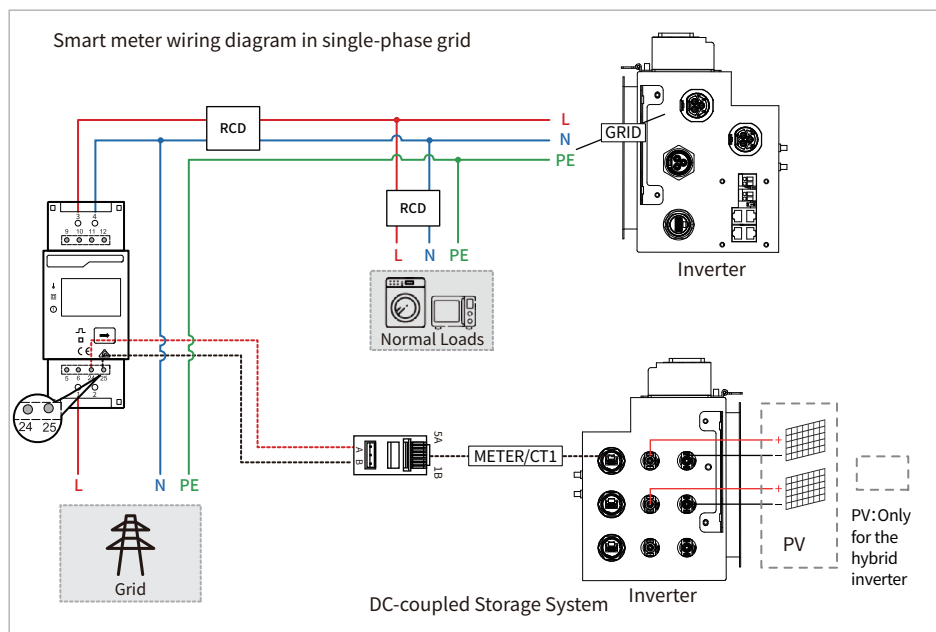
RS485 communication cable:

24-----A (RS485 A terminal)

25-----B (RS485 B terminal)



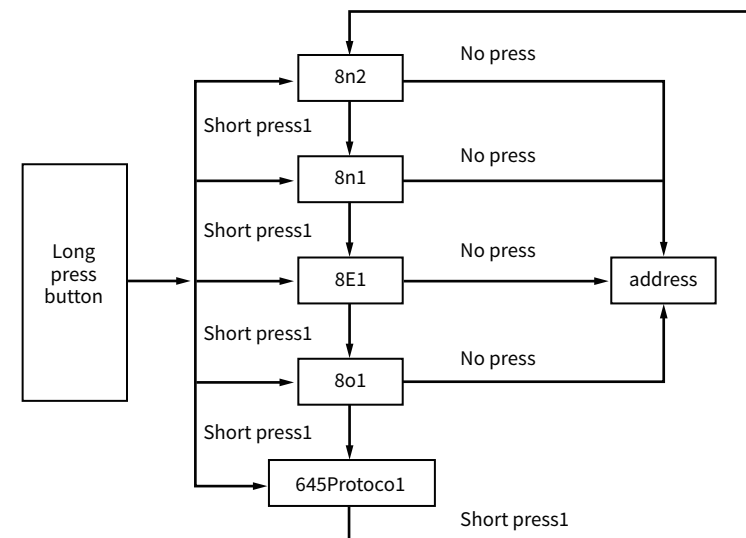
RS485



Configure meter

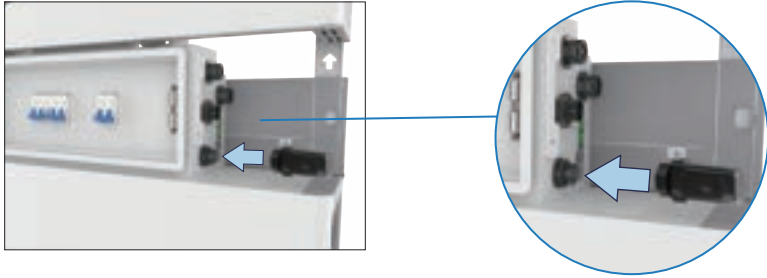
Model	Grid Meter Address	PV Meter Address
DDSU666	3	2

The Meter can set the communication address and baud rate through buttons.



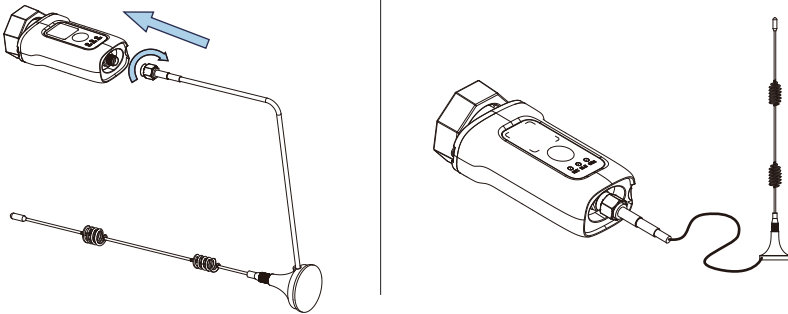
4.7 Connect WIFI Logger

The WIFI communication function is only applicable to the WIFI logger, please refer to the following figure to install the WiFi logger.

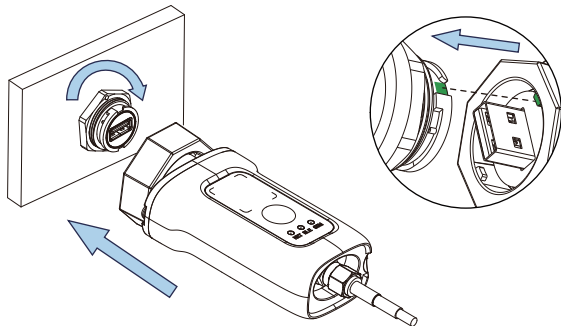


Wifi Logger Installation

Connect an external antenna to enhance the signal strength of the logger.



Assemble logger to the inverter communication interface as shown in the diagram.



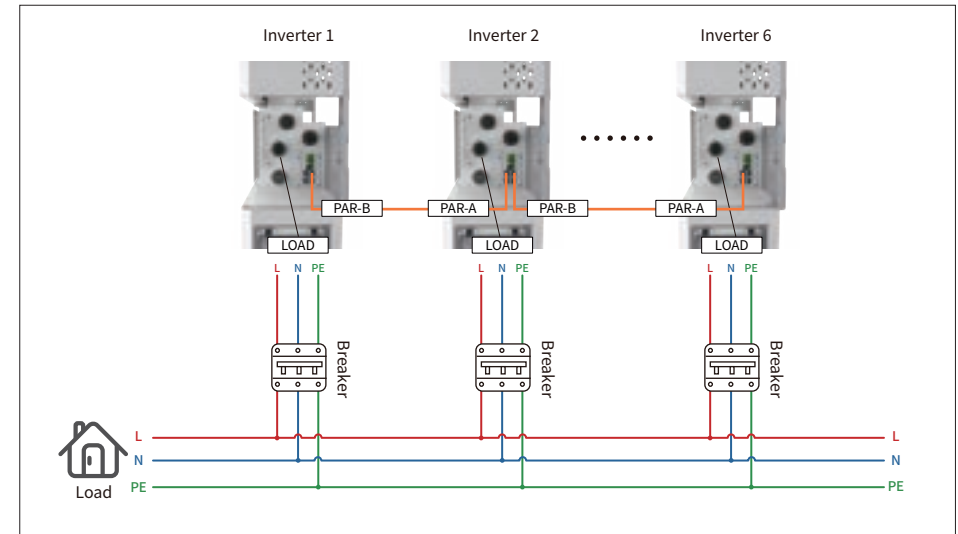
4.8 Parallel Connection

Refer to the battery manual for electrical connections between multiple battery packs.

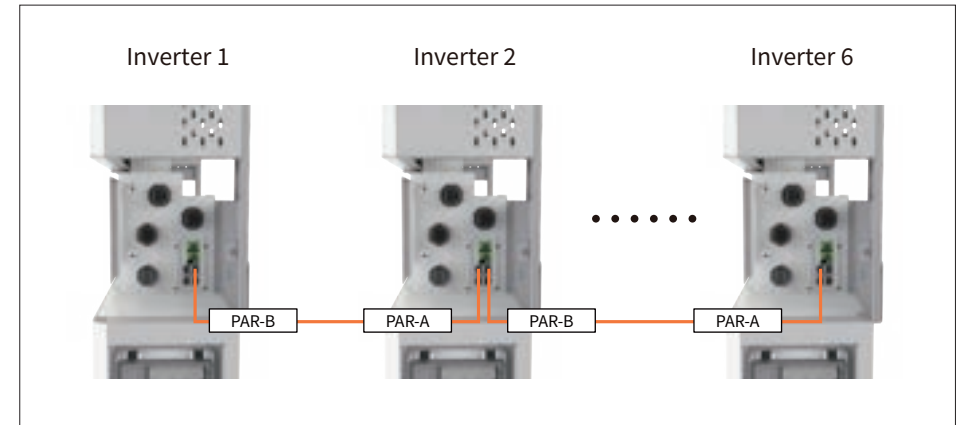
For electrical connection between inverter and battery pack, please refer to chapter 4.4 of this manual. An inverter system can connect up to 6 clusters of battery pack. It is recommended to install battery clusters side by side.

4.8.1 Off-Grid Parallel Connection

Power line connection

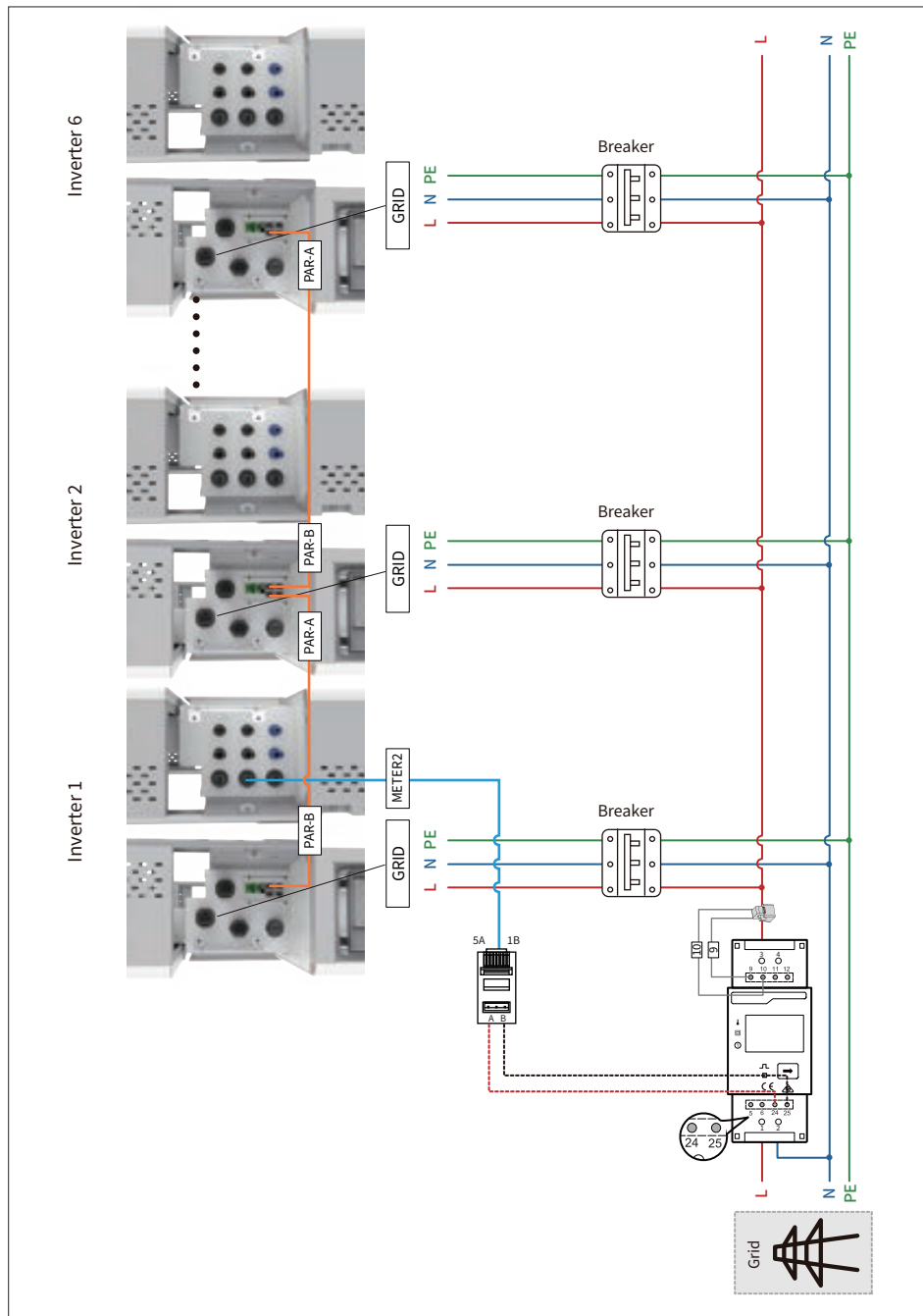


Communication cable connection

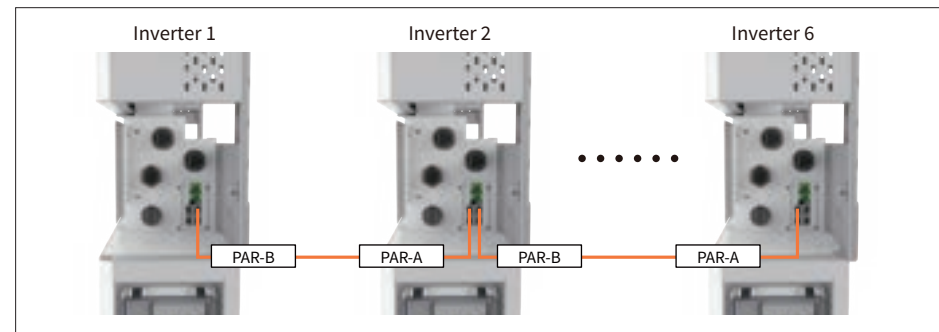


4.8.2 Grid-Connected Parallel Connection

Power line connection

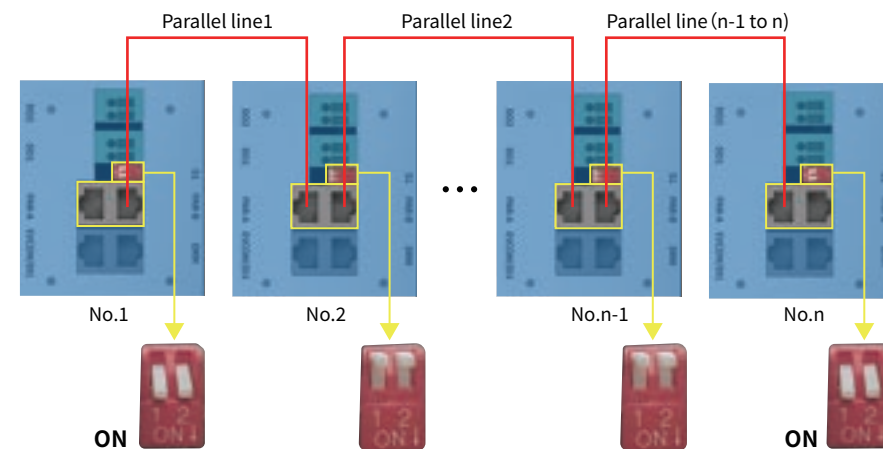


Communication cable connection



4.8.3 Turn on DIP switch

The inverter is terminally identified by setting the DIP switches to ensure stable signal transmission. In a parallel system, please set the DIP switches of the first and end inverter to ON status.



Parallel

Parallel ID 01

AC Output Mode

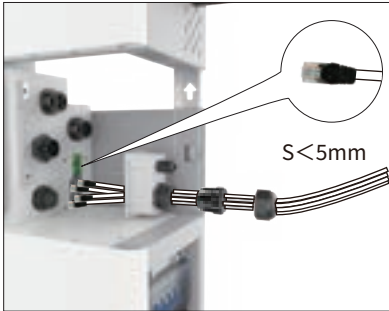
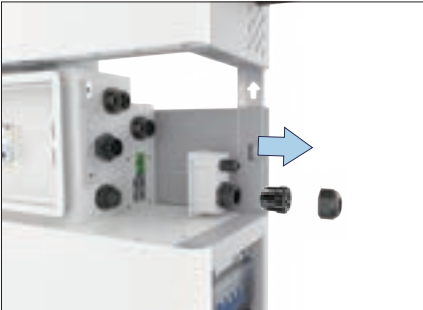
Individual Mode

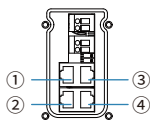
Parallel Mode

The optional range is 01~06.

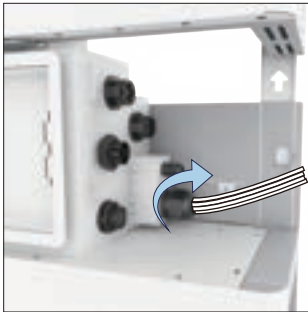
Please fill in the parallel ID according to the actual situation.

Installation of waterproof cover



- 
- ①. Parallel port A
 - ②. EV COM port
 - ③. Parallel port B
 - ④. DRM

Notice: To ensure the device's optimal waterproof performance, please be sure to use a cable for the connection.



After connecting the wires, please reinstall the waterproof cover.

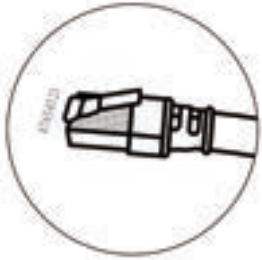
Notice: If certain functions are not in use, please cover the unused ports with waterproof plugs.



4.9 DRM Connection

The inverter provides an RJ45 socket for connecting to a demand response enabling device (DRED). The DRED asserts demand response modes (DRMs). The inverter detects and initiates a response to all supported demand response commands within 2s. The following table lists the DRMs supported by the inverter.

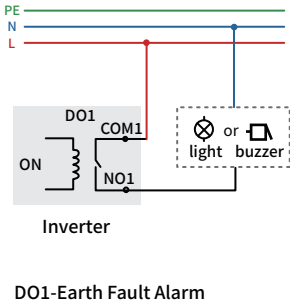
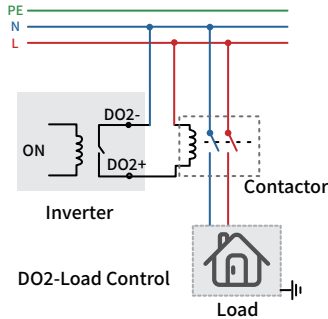
Mode	Requirement
DRM0	Operate the disconnection device.
DRM1	Do not consume power.
DRM2	The consumed power should not exceed 50% of rated power.
DRM3	Do not consume more than 75% of rated power and reactive power of the source, if possible.
DRM4	Increase power consumption (subject to constraints from other active DRMs).
DRM5	Do not generate power.
DRM6	The generating power shall not exceed 50% of the rated power.
DRM7	Do not generate power more than 75% of rated power and sink reactive power, if possible.
DRM8	Increase power generation (subject to constraints from other active DRMs).



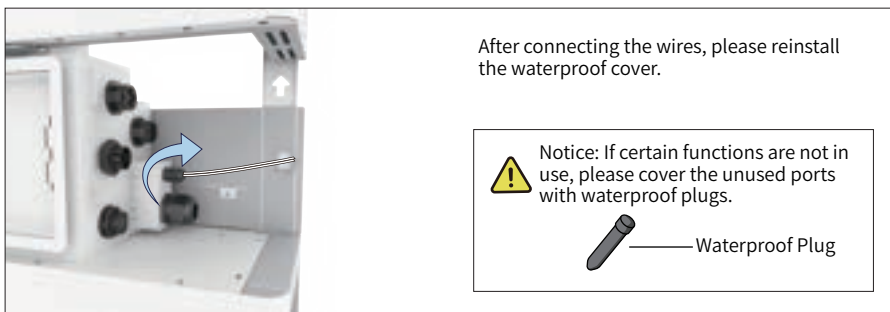
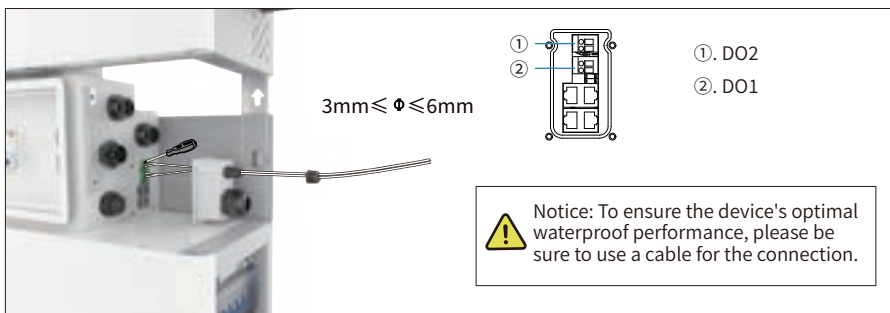
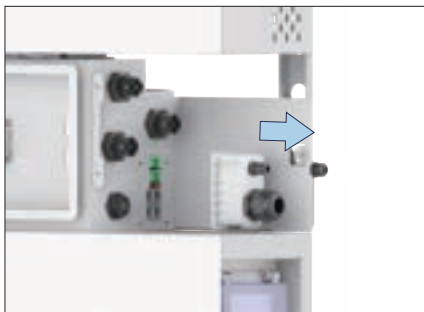
*The DRM is only for regions with AS/NZW 4777.2 safety regulations.

4.10 DRY Connections

The inverter has integrated a multiple-function dry contact (DO1 and DO2). DO1: Dry contact output. The DO1 can be set to one of the functions as follows: Earth Fault Alarm, Load Control and Generator Control. DO2: Dry contact output. The DO2 will control the bypass contactor under certain logic.



Installation of waterproof cover



4.11 Ground Fault Alarm

4.11.1 Inverter Ground Fault

The inverter complies with ICE 62109-2 13.9.

If the inverter ground connection fault occurs, the inverter's fault indicator will light up and the APP will send a fault notification.

4.11.2 External Ground Fault

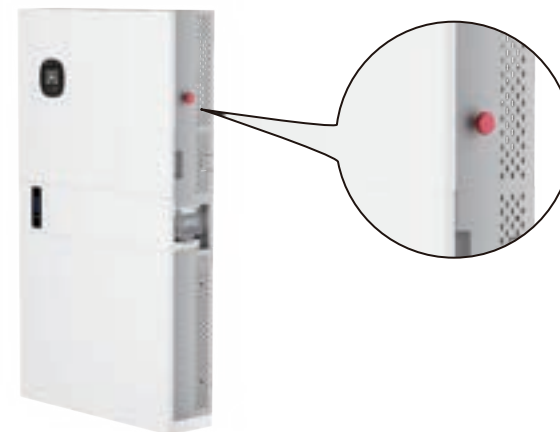
The inverter has an integrated multifunctional dry-contact (DO relay) that can be used for external alarms for earth faults. The external alarm needs to be powered by the grid. Additional equipment required includes an indicator light and/or a buzzer.

If a ground fault occurs:

- The DO dry-contact will automatically switch on, signaling a ground fault alarm.
- The inverter's internal buzzer will beep.
- The Ethernet communication port can be used to send alarms remotely.

4.12 EPO Switch

The Emergency Power Off (EPO) switch is designed to enhance safety and reduce potential damage by swiftly cutting off power to equipment or systems during emergencies or hazardous situations. The hybrid inverter can be connected to the EPO switch. Upon activation of the EPO switch, the inverter will shut down all power sources, including both the grid and battery, rendering the EPS function inoperative.



* EPO switch is only available for models A3600S-E, A4600S-E, A5000S-E; AC3600S-E, AC4600S-E, AC5000S-E.

05 System Operation

5.1 Check Before Powering On

When powering up the battery system, be sure to check the following to prevent system damage.

1. The equipment is firmly installed, and the installation position is convenient for operation and maintenance.
2. Provide enough space for heat dissipation without external objects or parts left on top of the machine.
3. Protective ground, power wires, communication wires, termination resistors are connected correctly and firmly.
4. Cables are bundled according to cable routing requirements and are properly arranged without damage.
5. AC circuit breakers are reasonably selected.
6. Unused ports are blocked.
7. All safety signs and warning labels on the machine are not altered or covered.

5.2 System Power-on

Boot steps



Caution

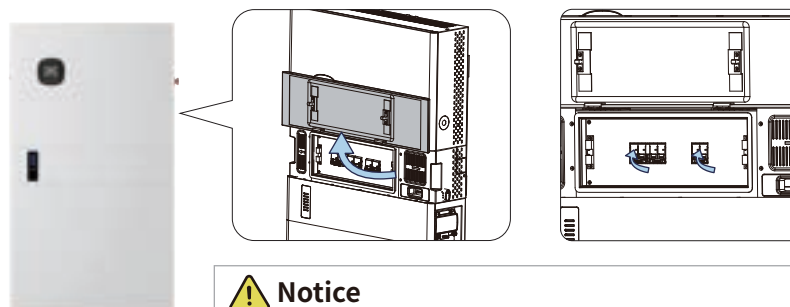
1. Check the AC voltage with a multimeter set to AC position before turning on the AC switch between the inverter and the power grid to ensure it is within the specified range.
2. Make sure to turn on the Battery DC breaker before turning on the Solar DC switch and the Grid AC switch.
3. When connecting the power line, please note that the red wire is positive (+) and the black wire is negative (-).

Power on the system:

1. Turn on the circuit breaker between the battery and the inverter (if any). Turn on the circuit breaker on the battery system.
2. Press the battery power button to power on the battery system.
3. Wait for the battery to wake up the inverter. The LCD screen will light up and the self-check process will begin.
- 4*. Turn on the DC circuit breaker between the PV strings and the inverter (if any).
- 5*. Turn the PV switch on the inverter to the ON position.
6. Turn on the Grid circuit breaker and Load circuit breaker in the inverter control box.
7. Turn on the AC circuit breaker between the inverter and the grid.
8. Observe the LED indicator to confirm the operational status of the inverter.

* : Only for the hybrid inverter.

• After performing the above steps, if there is no fault in the system, the inverter has successfully started.



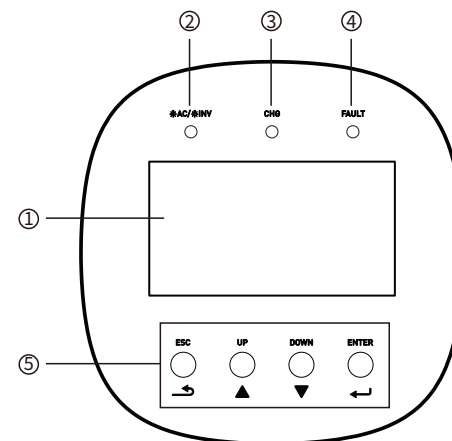
Notice

After the battery system is started, please ensure that the communication between the inverter and the battery system is normal within 15 minutes. If the inverter and the battery system cannot communicate normally, the battery system will be switched off automatically and powered off.

5.3 Indicator Status

The operation and LCD display shown in the figure below is located on the front panel of the inverter. It includes three indicator lights, four function buttons and a liquid crystal display to show the operating status and input/output power information.

1. LCD display
2. Status indicator
3. Charging indicator
4. Fault indicator
5. Function buttons



LED Indicator

LED Indicator		Description	
AC/INV	Green	Solid On	On-grid mode.
		Flashing	Off-grid mode.
CHG	Green	Solid On	The battery is fully charged in on-grid mode or off-grid mode.
		Flashing	The battery is charging in on-grid mode or off-grid mode.
FAULT	Yellow	Solid On	Fault occurs in the inverter.
		Flashing	Warning condition occurs in the inverter.

Function Buttons

Button	Description
ESC	To exit setting mode
UP	To go to previous selection
DOWN	To go to next selection
ENTER	To confirm the selection in setting mode or enter setting mode

5.4 System Power-off



WARNING

- When powering off the system, follow the operating instructions and safety regulations.
- After the inverter is powered off, the residual electricity and heat released from the system may still cause electric shocks and burns. Therefore, please wear protective gloves and wait 5 minutes before operating the system.

Power off the system

If maintenance or inspection is required, please follow these steps to power off the system:

1. Send a shutdown command via the LCD screen or Hinen APP to shut down the inverter.
2. Turn off the AC circuit breaker between the inverter and the grid.
- 3*. Turn off the DC circuit breaker between the PV array and the inverter (if any).
- 4*. Turn the PV Switch on the inverter to the OFF position.
5. Press the battery power button for 3 seconds to power off the battery.
6. Turn off the circuit breaker between the inverter and the battery.
7. Check the operating status of the inverter.
8. Wait for all LED or OLED indicator to light off, making sure the inverter has been completely powered off.

* : Only for the hybrid inverter.

5.5 EPS and UPS Selection

The UPS is featured with a rapid grid disconnection detection, with the switching from grid-connected to off-grid operation typically occurring within 10ms. However, certain countries and regions mandate strict disconnection time requirements, often exceeding 100ms. In such cases, the UPS, which has fast disconnection function, must be disabled. For scenarios requiring rapid grid-to-off-grid switching, the UPS function can be activated.

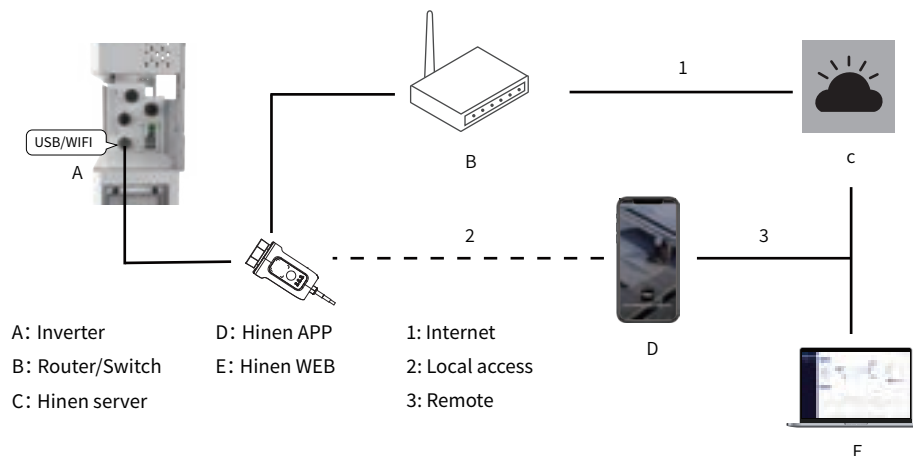
The EPS (Emergency Power Supply) function is designed for standard grid connection and disconnection after the UPS function is disabled. It detects grid anomalies in accordance with safety regulations and performs the switch between grid-connected and off-grid operation once the specified delay time is met. The grid anomaly detection and disconnection time for EPS function are generally configurable, with typical settings greater than 20ms. Therefore, it is suitable for countries and regions with stringent regulatory requirements.

To meet safety standards, the inverter is configured by default to enable the EPS function. For any required modifications to this setting, please contact and consult a qualified professional installer.

06 APP

6.1 Internet Connection

With the WIFI logger installed, view corresponding information through Hinen APP or Hinen WEB.



6.2 Downloading and Login

Method 1

Download and install the App through the following application stores:

- MyApp (Android, mainland China users).
- Google Play (Android, users other than mainland China ones)
- App Store (iOS)

Method 2

Scan the following QR code to download and install the App according to the prompt information.

Hinen Solar is designed to help end users monitor and manage their inverter systems more conveniently. Hinen Install, tailored for installation personnel, offers comprehensive features for installation, debugging, configuration, and troubleshooting, all protected by an authorized password or Hinen authorization to ensure secure operations. Both apps enhance the user experience with a simple, intuitive interface and efficient functions, making it easier for users to manage their photovoltaic power generation systems.



Hinen SOLAR



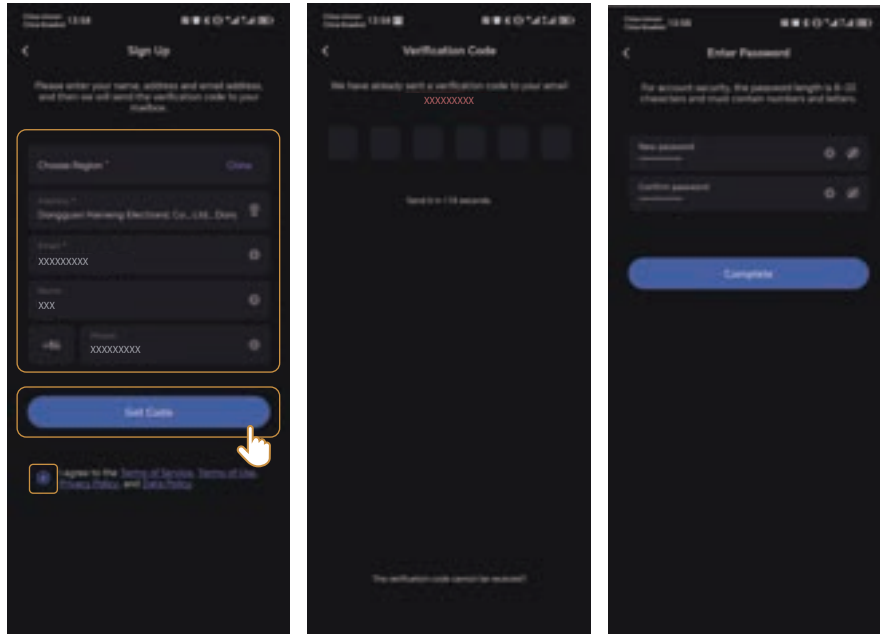
Hinen INSTALL

Notice:

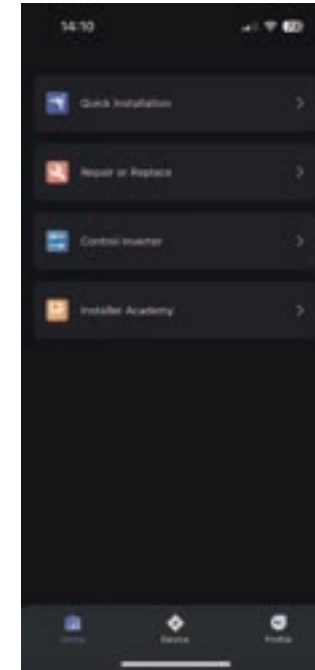
1. The screenshots in this manual are based on the V1.0.5 application for Android, and the actual user interface may differ.
2. The setup instructions in this manual may not be the latest version, if you need any help, please contact HINEN for the latest version.

Sign up

Please select your region, enter your address, email address, name and phone number, click "I agree to the Terms of Service, Terms of Use, Privacy Policy and Data Policy" and then click "Get Code". Enter the verification code you have received. After the code is verified successfully, please enter your password to complete the registration.

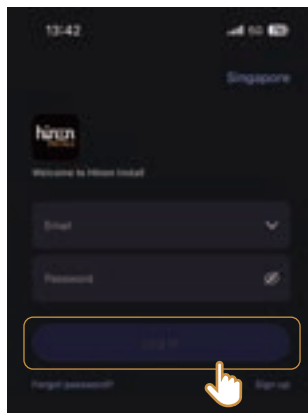


After login, you can go to the home page, which mainly includes "Quick Installation", "Repair and Replace", "Control Inverter", and "Installer Academy".



Log in

After registration, enter your account and password, and tap login.



Click the link below to access the detailed Hinen App user manual.
<https://www.hinen.com/pages/smart-energy-management-system>

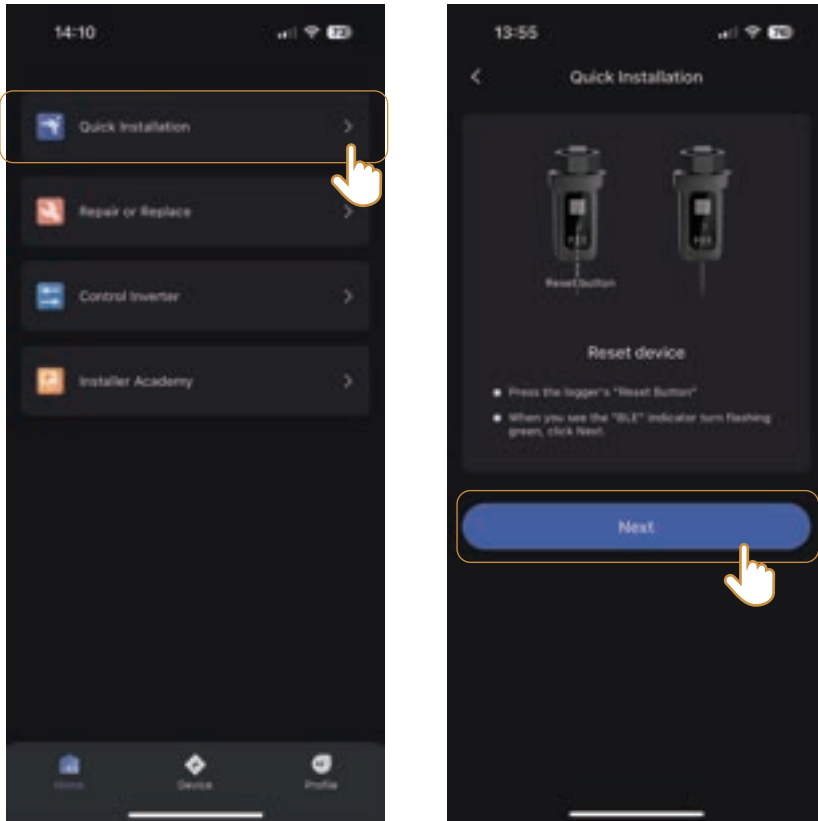
6.3 Quick Installation

Tips:

During the quick installation process, please ensure that both Bluetooth and location services are enabled and the application is granted with Bluetooth and permission access.

6.3.1 Connecting to the Logger

After login, click "Quick Installation" on the home page. Follow the instructions to reset the logger and tap "Next" to connect the logger.



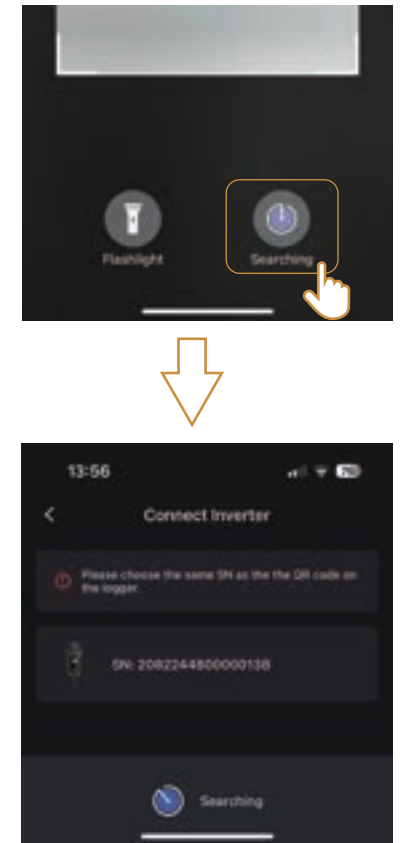
Methods of connecting the logger are as follows.

Method 1: Scan the QR code of the logger.



You can find the QR code on the logger.

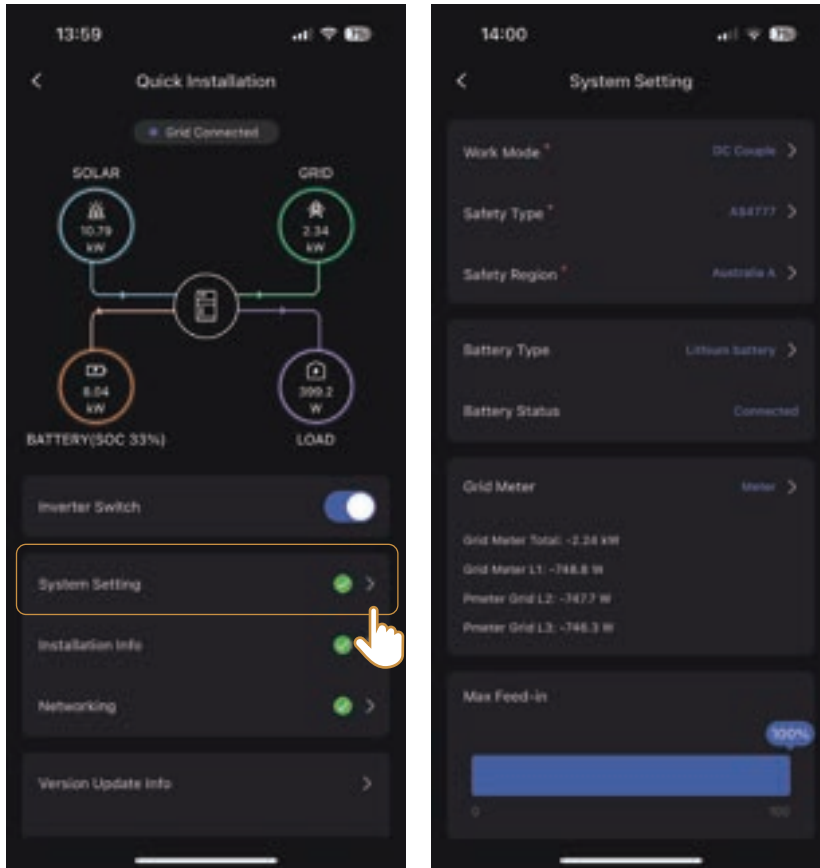
Method 2: Tap "Searching" to connect the logger.



Warning: Before setting any parameters, read through user manual of the app and the inverter to fully learn the functions and features of the product. If the inverter parameters are set improperly, the inverter may malfunction and damage the battery, which will affect the inverter's power generation.

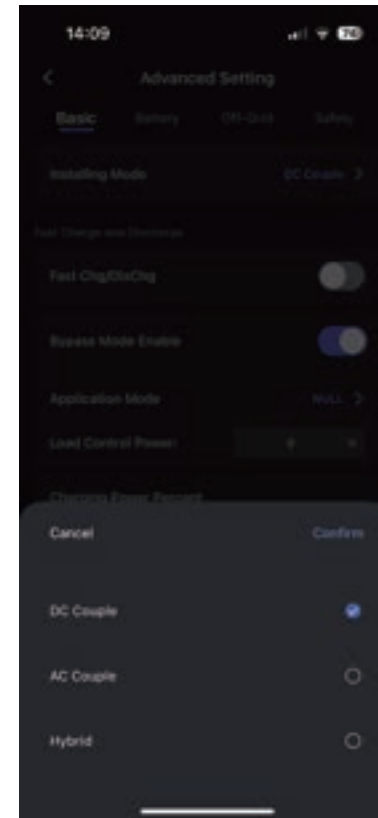
6.3.2 System Setup

On completion of connecting the logger, you can enter home page of "Quick Installation". Tap "System Setting" and fill in the relevant information to complete the system setup.



You can set the installing mode, safety type, battery type, grid meter, maximum feed-in power percentage, etc., according to the actual situation.

There are three installing modes: DC Couple, AC Couple and Hybrid.



When to Choose AC Couple:

- The system already has a third-party PV inverter installed, and you need to connect it to Hinen's inverter.

When to Choose DC Couple:

- This is a new installation with both PV panels and batteries.
- The system does not include a third-party PV inverter.

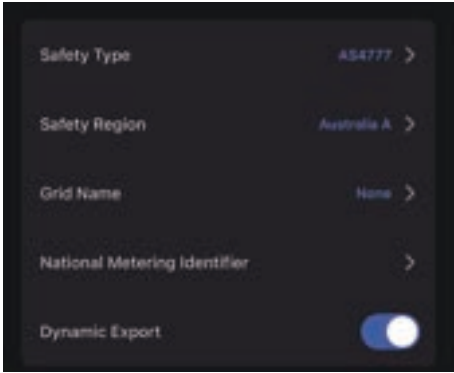
When to Choose Hybrid Mode:

- The system needs to support both AC Couple and DC Couple functionalities.
- The installation includes both new PV panels and an existing PV system, which are connected to Hinen's inverter.

Safety Type: Please select the safety type according to the actual situation. The following table outlines the safety regulations applicable to each country.

Safety regulation	Area	Safety regulation	Area
Null	N/A	NI_G99	United Kingdom
CQC	China	NI_G98	
EN50549	Europe	IRELAND	
BELGIUM	Belgium	CEI_021	Italy
VDE0126	France	NRS097	South Africa
AS4777	Australia	TOR	Austria
NewZealand	New Zealand	POLAN	Poland
N4105	Germany	SPAIN	Spain
G99	United Kingdom	JAPAN	Japan
G98		/	/

If AS4777 is selected as safety type, the following information need to be configured:



Regional Standards: There are four main regions including A, B, C and NZ, which stands for New Zealand region. For compliance with AS/NZS4777.2:2020, please select from Australia A/B/C. It is advisable to consult your local grid operator to select the appropriate regional standard.

Regional Standards	Electrical Company
Australia A	N/A
Australia B	N/A
Australia C	N/A
New Zealand	N/A

Grid Name: Select the correct grid operator. You can choose None, South Australia Power Network, Jemena, City Power, Powercor Australia, or United Energy Services.

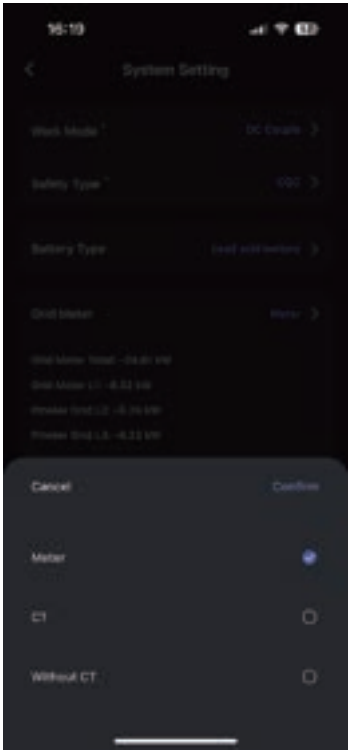
National Meter Identifier: Please fill in the national meter identifier.

Dynamic Export: You can enable or disable this function.

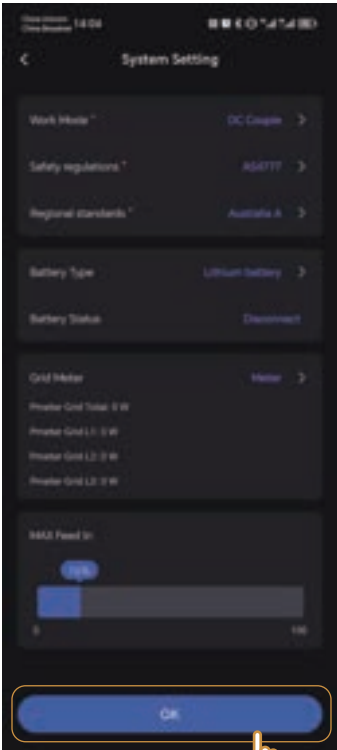
Tap "Battery type" to select lithium battery, lead acid battery, or none. Please select according to the real situation.

MAX Feed In: You can limit the feed-in power to the grid. The actual feed-in power to the grid is calculated by multiplying the inverter's rated power by the percentage you have configured in Max Feed-in setting. Take a 6kW inverter as an example. If you configure the parameter to 80%, the inverter will feed power to the grid at a maximum of 4.8kW.

Tap "Grid Meter" to select "Meter", "CT", or "Without CT", and check the related information of the grid.

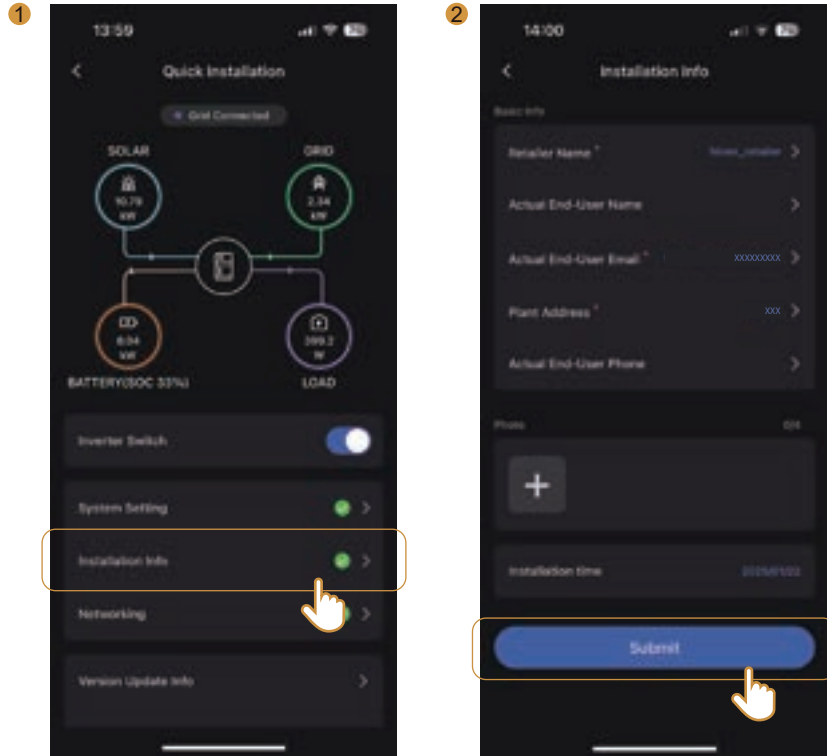


On completion of configuration, tap "OK".



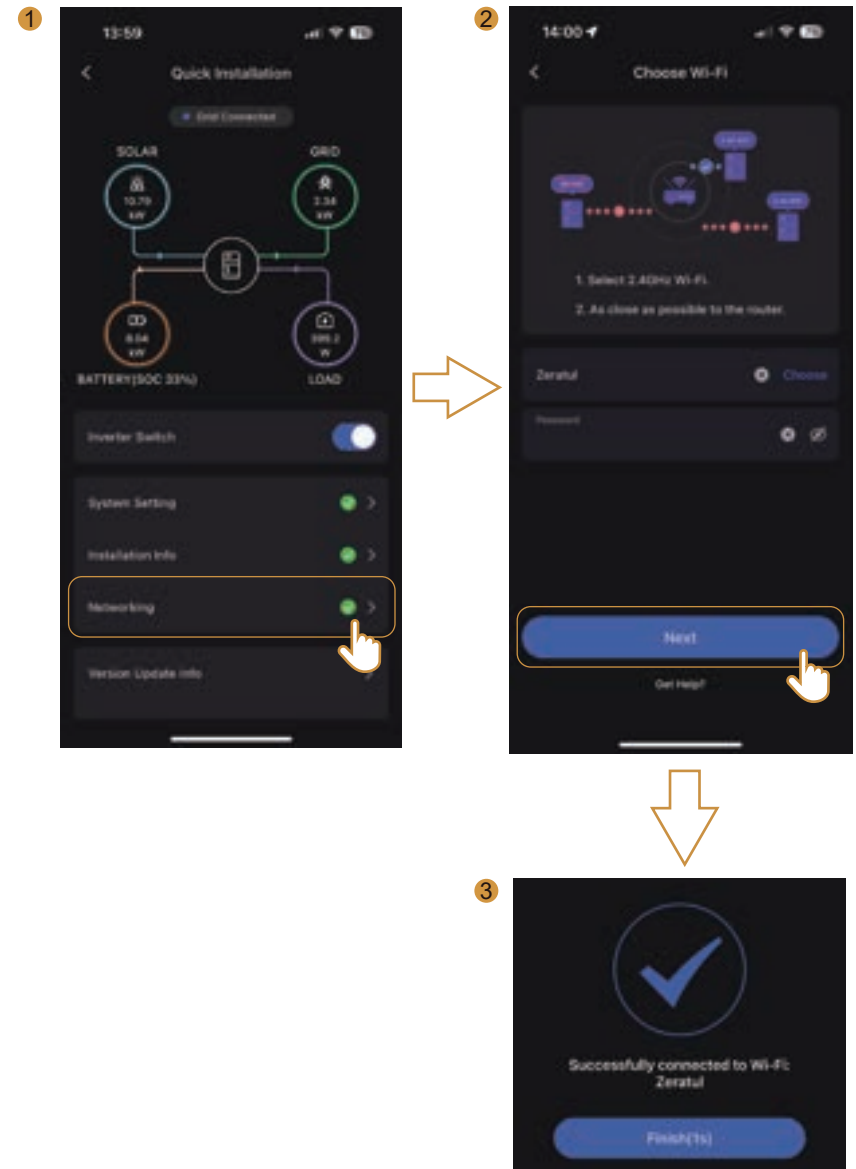
6.3.3 Adding Installation Information

Tap "Installation Info" to enter the "Installation Info" page. Please enter correct retailer name, actual end-user name and email address, plant address, actual end-user phone number, and photos. On completion of filling in the information, click "Submit".



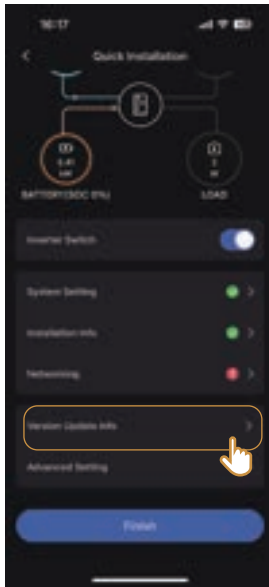
6.3.4 Configuring Network

Tap "Networking" and fill in the WiFi name and password. Once successfully networked, tap "Finish".



6.3.5 Version Update

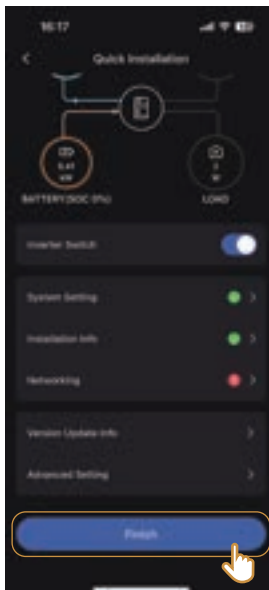
Tap "Version update Info" to check if the current version is the latest. If not, tap "Update".



6.3.6 Advanced Settings

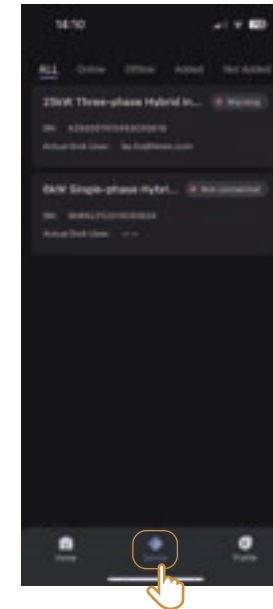
Tap "Advanced Setting" to configure the parameter and function in compliance with the local law and regulation. Refer to Chapter 5 for the specific settings.

After finishing all the setups, tap "Finish" at the bottom to complete quick installation.



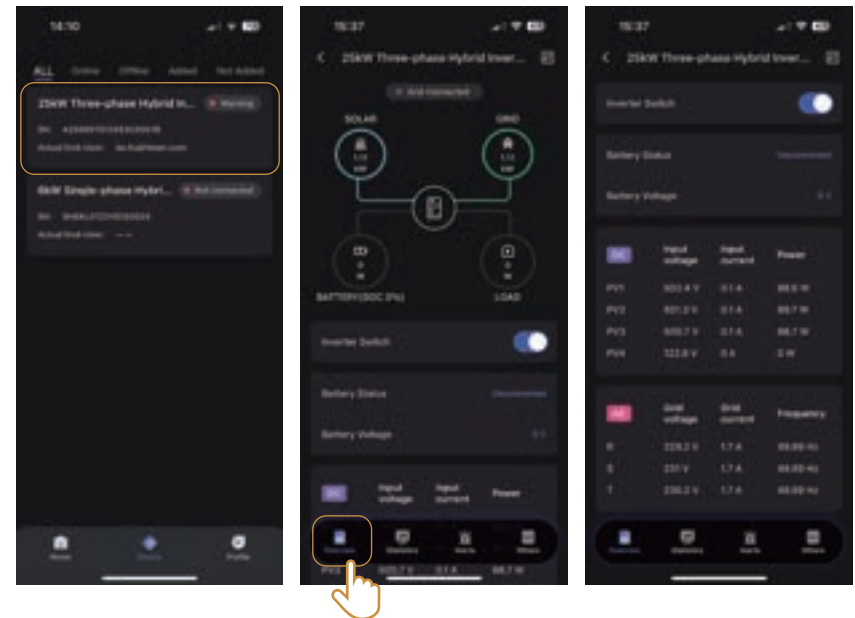
6.4 Controlling the Inverter Remotely

Tap "Device" to check all the devices you have installed, including online devices, off-line devices, added devices, and not added devices. Tap the corresponding device to check the real-time running information of the system and control the inverter remotely.



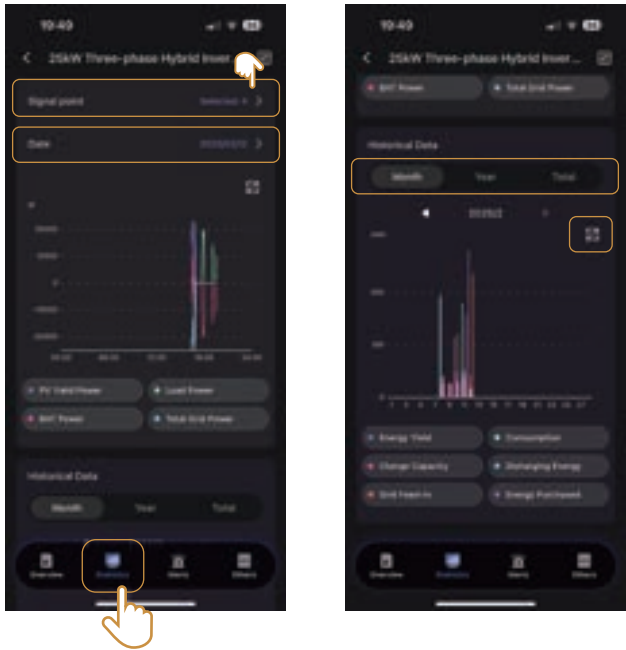
6.4.1 Overview of Device

Tap "Overview" to control the operation of the inverter and check the real-time running status of the inverter, including the data of battery, PV, grid, and load.



6.4.2 Viewing Graph Data

Tap "Statistics" to check the graph data of the device. Tap "Signal point" to select up to six signal points you want to view, and tap "Confirm" to check the graph data.

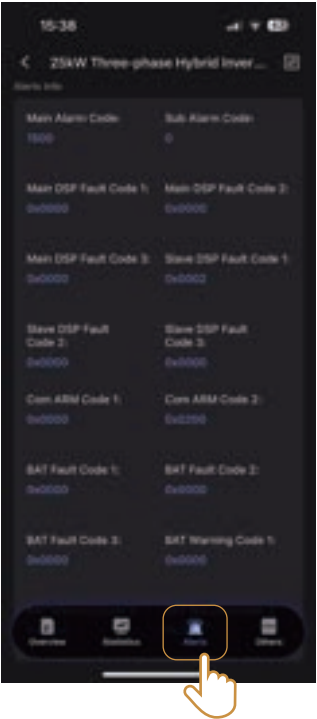


Tap "Date" to check the graph of the day. You can check the graph data by filtering month, year, and total. Tap the icon  to check the graph data on landscape.



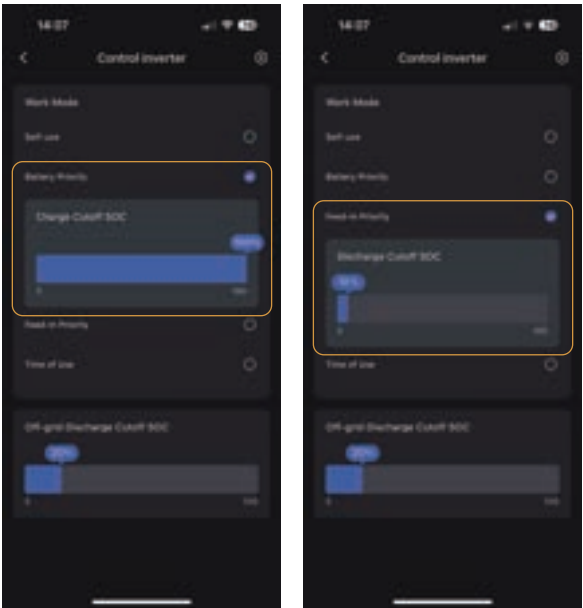
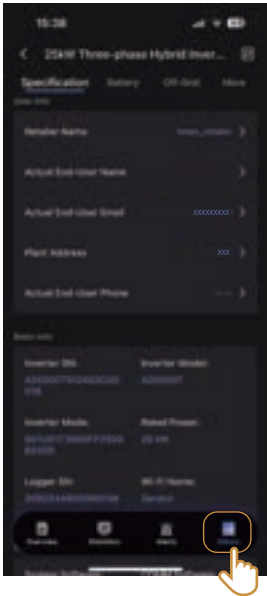
6.4.3 Viewing Alarm Information

Tap "Alerts" to check the alarm code and error code.



6.4.4 Viewing other information

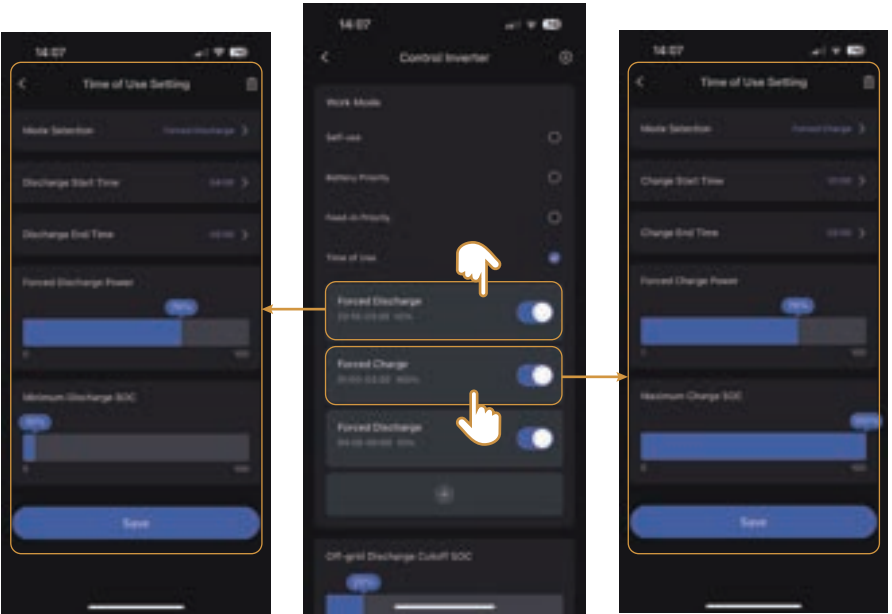
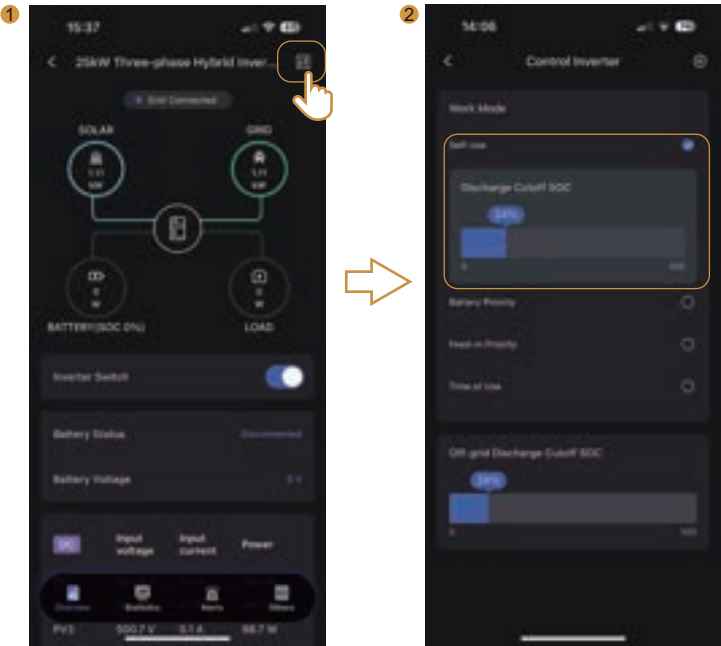
Tap "Others" to check the user information, basic information, battery information, off-grid information, and more.



Battery Priority mode Feed-in Priority mode

6.4.5 Work Mode Setup

Tap the icon  to enter "Control Inverter" page to configure the work mode and cut-off SOC. Please refer to the following table for details.



Time-of-use mode

The definition of work modes and parameter settings are described in the following table.

Work Mode	Definition	Parameter Settings
Self-use	- PV power is preferentially supplied to satisfy the load. - Excess power is charged to the battery, and any surplus is then fed to the grid. - If PV power is insufficient to meet the load, the load is first supplemented by the battery, followed by the grid. - This mode minimizes reliance on the grid, with electricity generated by PV being used first.	You can set discharge cut-off SOC as needed according to your needs. If you set discharge cut-off SOC at 20%, the battery will stop discharging in on-grid state when the battery SOC hits 20%.
Battery Priority	- PV power prioritizes charging the battery. - Excess power supplies the load, and any surplus is fed to the grid. - If PV power cannot fully charge the battery, the battery is charged by the mains. - The load is prioritized to use solar energy; any uncovered load is supplemented by mains power. - In this mode, PV power is used first, followed by grid power.	- You can set charge cut-off SOC as needed. If you set the charge cut-off SOC at 90%, the battery will stop charging when the SOC hits 90%. - You can set the charging power percent on "Advanced Setting" page.
Feed-in Priority	- PV power prioritizes satisfying the load, and excess power is fed to the grid. - If the PV power fed to the grid cannot be met, the battery supplements. - If PV generation cannot meet the load, the battery is prioritized to discharge to supplement the load. If still insufficient, the uncovered load is met by mains. - In this mode, PV prioritizes satisfying the load and exporting power to the grid. Excess energy charges the battery only when PV power exceeds the feed-in power plus load power.	- You can set discharge cut-off SOC as needed. If you set discharge cut-off SOC at 20%, the battery will stop discharging in on-grid state when the SOC hits 20%. - You can restrict the maximum power sent to the grid by adjusting the MAX Feed-in parameter on system setting page. - You can configure the discharging power percent on "Advanced Setting" page.
Time of use	- This mode is designed to maximize energy cost savings based on a user-defined schedule. - Users can set 3 time periods via the Hinen App to enable forced charging or discharging.	- You can select force charge/discharge, set charge/discharge start time, charge/discharge end time, force charging/discharging power, and cut-off SOC as needed. Tap the icon  on the upper right corner to delete the current time slot. - Take the 6KW inverter as an example. If you set the charging power at 50%, it means the inverter will charge the battery with the power of 3 KW at most.

6.5 Advanced Settings

Warning:

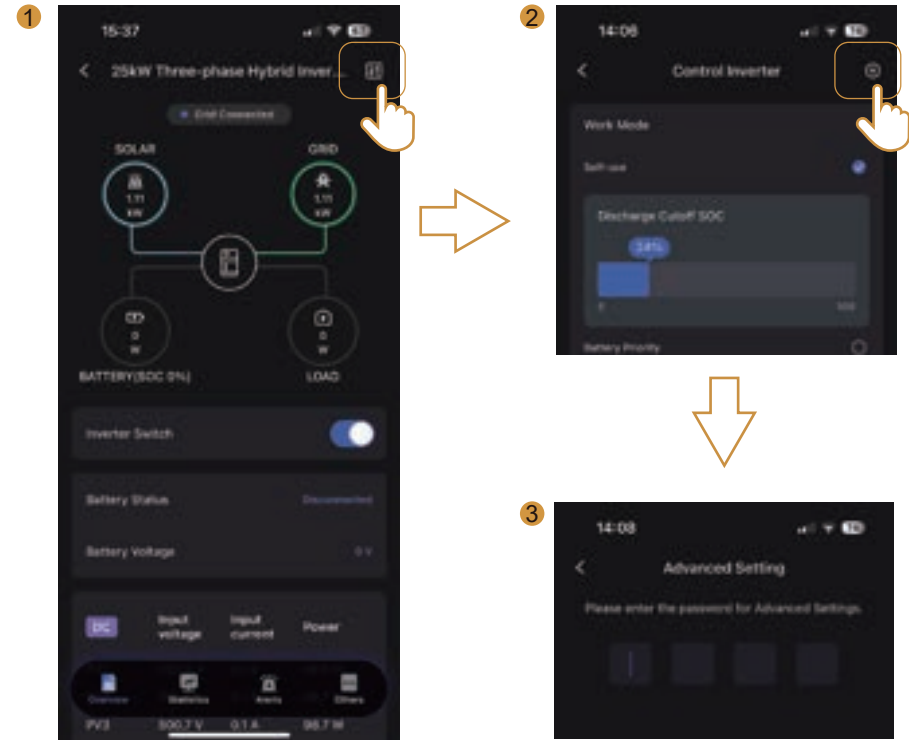
The following Settings with '

There are two methods to enter "Advanced Setting" page.

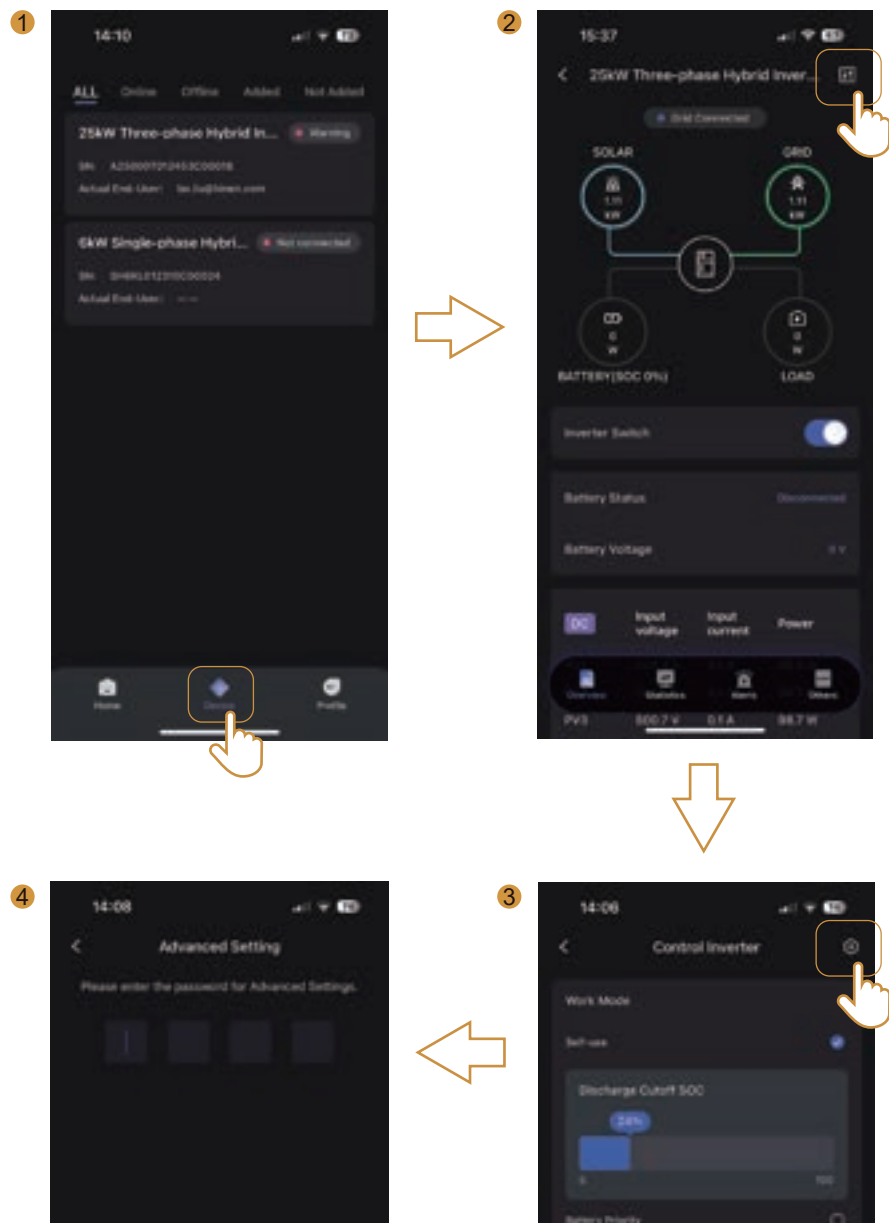
Local mode: Tap "Control Inverter" on the home page. After the device is connected successfully, tap the icon  >  on the upper right corner of "Control Inverter" page, and enter the password to enter "Advanced Setting" page.

Tips:

Please make sure your Bluetooth is always on. Otherwise the device will fail to be connected.

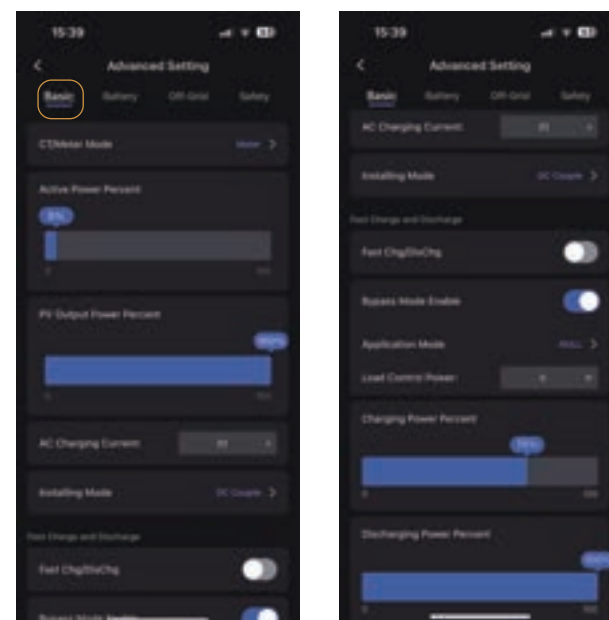


Remote control: Tap "Device" and select the device you want to check to enter device details page. Then tap the icon  to enter "Control Inverter" page, and tap the icon  to enter the password to enter "Advanced Setting" page.

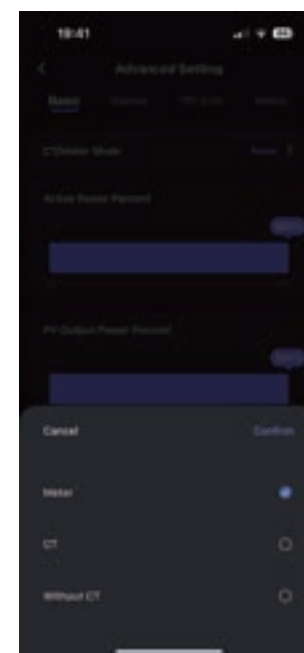


6.5.1 Basic Settings

On "Basic" page, you can configure the active power percent, PV output power percent, AC charging current, installing mode, charging power percent, discharging power percent, and enable or disable fast charge and discharge or bypass mode according to the actual situation.



• **CT/Meter Mode:** You can select "CT", "Meter", or "without CT" based on the site installation.

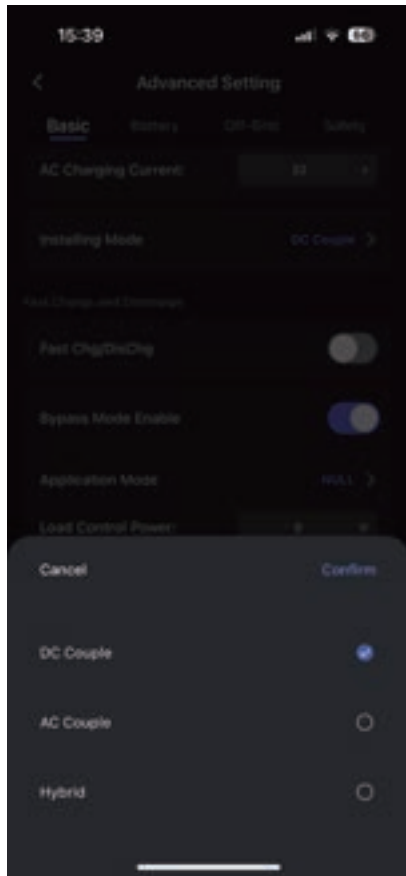


- **Active power percent:** This is the inverted power percent in grid-connected state. Take the 6kW inverter as an example. If the active power percent is configured at 60%, the maximum AC output power of the inverter is 3.6kW in grid-connected state. The default setting is 100%.

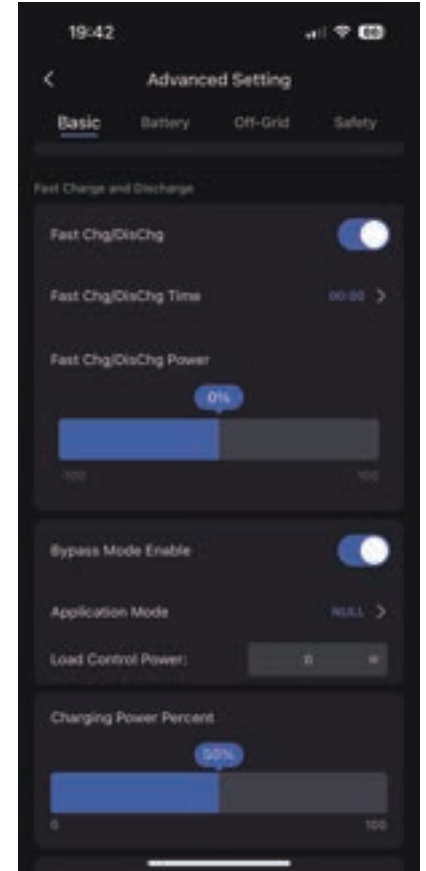
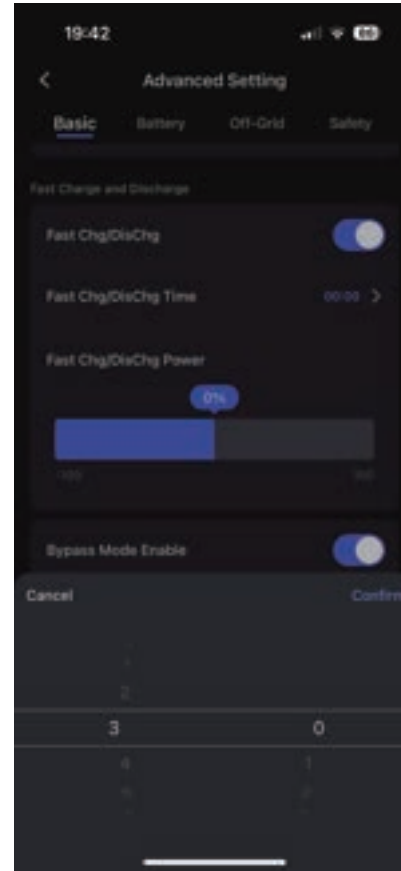
- **PV output power percent:** The PV output power can be limited by configuring the PV output percent. Take the 6kW inverter whose maximum PV output power is 11.4kW as an example. If the PV output power percent is set to 50%, the maximum PV output power is 5.7kW.

- **AC charging current:** Indicates the maximum valid value of current drawn from some phase of the grid. The default value varies with power levels of different inverters.

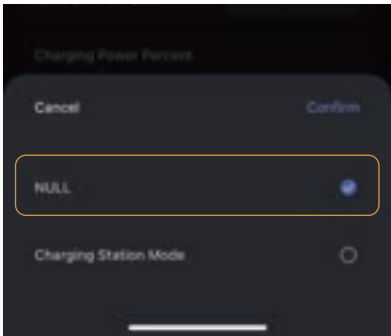
- **Installing Mode:** You can select AC Couple, DC Couple, or hybrid mode depending on the actual situation. For specific configuration, please refer to step 2 in Chapter 2.



- **Fast Charge and Discharge:** If fast charge and discharge is enabled, the fast charge/discharge time and power can be configured. The setting value -100% ~0 indicates the maximum percentage of fast discharging power, while 0-100% indicates the maximum percentage of fast charging power. 0% indicates no charging or discharging. Take the 6kW inverter as an example. Configure the Fast Chg/DisChg Power to -60%, and the system will discharge the battery at a maximum of 3.6kW. Configure the Fast Chg/DisChg Power to 80%, and the system will fast charge the battery at a maximum of 4.8kW. If you set the Fast Chg/DisChg Time at 3, the whole fast charge or discharge process with the power configured will last 3 hours from the moment the Fast Chg/DisChg is enabled.



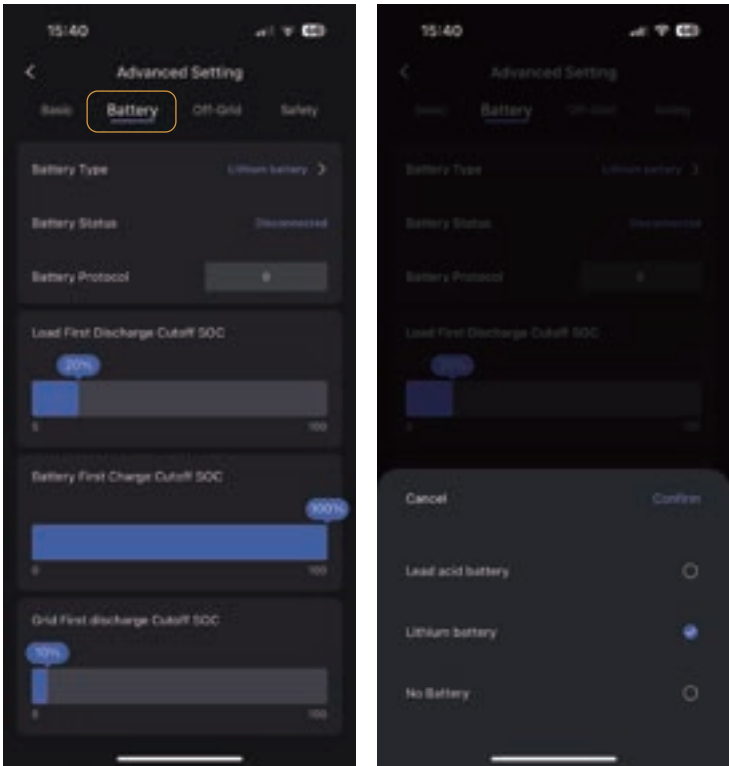
- Bypass mode Enable:** If bypass mode is enabled in grid-connected state, when the battery and PV can not supply power, the energy required by the back-up port will be supplied by the power grid through inverter's bypass.
- Application Mode:** This mode is set to "null" by default. If it is an inverter grid -connected system, "Charging Station Mode" can be configured, which is mainly used in underground garages. In this case, a three-phase 6CT electricity meter must be used, where CT1, CT2, and CT3 measure the power of each phase of the grid, and CT4, CT5, CT6 measure the grid-connected load power of each phase. When the total power of the grid-connected load (L1+L2+L3) is less than the set Load Control Power, the inverter grid-connected system will draw power from the grid to charge the battery, and the power drawn will be the set Load Control Power. When the total power of the grid-connected load (L1+L2+L3) exceeds the set Load Control Power, the battery will discharge to supply energy to the load, and the discharge power will be equal to the total grid-connected load as measured by CT4, CT5, and CT6.



- Load Control Power:** If the "Charging Station Mode" is selected in application mode, load control power can be set, the setting range of which is 0 to 65535W. The default setting value is 0W.
- Charging power percent:** Take the 6kW inverter as an example. If charging power percent is set to 60%, the inverter will charge the battery at a maximum of 3.6kW.
- Discharging power percent:** Take the 6kW inverter as an example. If charging power percent is set to 60%, the inverter will discharge the battery at a maximum of 3.6kW.

6.5.2 Battery Setup

On "Battery" page, if your battery type is lithium battery, you can configure battery protocol, and cut-off SOC in different work modes. The battery status indicates whether the battery is connected successfully.

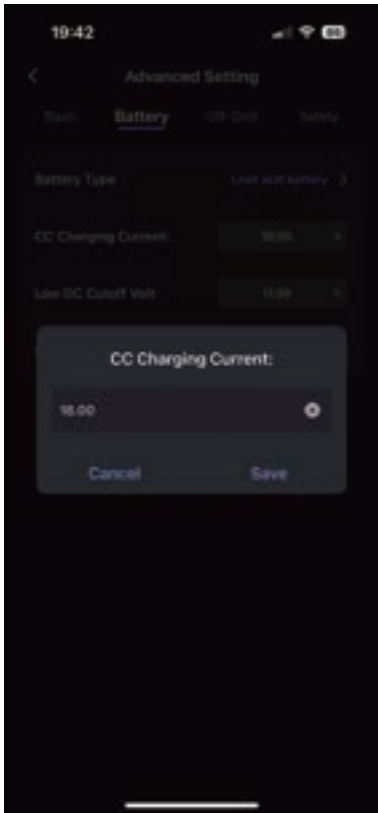


Please refer to the battery protocol code in the following table and select the correct one.

Battery Protocol Code			
Three-phase Inverter		Single-phase Inverter	
0	GOODWE high pressure	0	PYLON low pressure
1	SHOTO_HV	1	HINEN low pressure
2	PYLON high pressure	2	GROWATT low pressure
3	HINEN high pressure	3	Growcol_LV
4-20	Battery 4~20	4	SHOTO_LV
-	-	5-20	Battery 5~20

If you select lead acid battery, the following parameters can be configured.

- CC Charging Current: refers to the maximum charging current.
- Low DC Cutoff Volt: refers to the minimum discharging voltage.
- CV Charging Volt: refers to the maximum charging voltage.

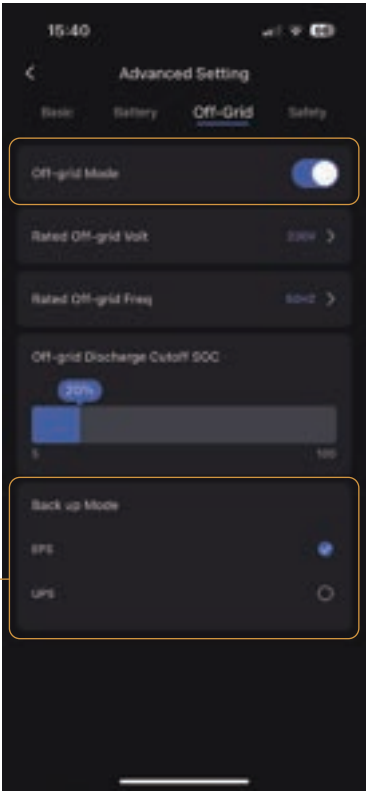


6.5.3 Off-grid Setup ⚠

Safety regulations vary in different countries, so please set the rated off-grid voltage, rated off-grid frequency and back-up mode in compliance with the local laws and regulations.

- Off-grid mode:** The off-grid mode is enabled by default. When blackout occurs or the inverter cannot be connected to the grid, the EPS port will power the load immediately.
- Off-grid Discharge Cutoff SOC:** The setting logic is the same as introduced in work mode section.
- Back-up Mode:** The UPS function is featured with a rapid grid disconnection detection, with the switching time from grid-connected to off-grid operation typically occurring within 10ms. However, certain countries and regions mandate strict disconnection time requirements, often exceeding 100ms. In such cases, the UPS fast disconnection function must be disabled. For scenarios requiring rapid grid-to-off-grid switching, the UPS function can be activated.
The EPS function is designed for standard grid connection and disconnection after the UPS function is disabled. It detects grid anomalies in accordance with safety regulations and performs the switch between grid-connected and off-grid operation once the specified delay time is met. The grid anomaly detection and disconnection time for EPS function are generally configurable, with typical settings greater than 20ms. Therefore, it is suitable for regions with strict regulatory requirements.
To meet safety standards, the inverter is configured by default to enable the EPS function. For any required modifications to this setting, please contact and consult the qualified professional installer.

Back up Mode

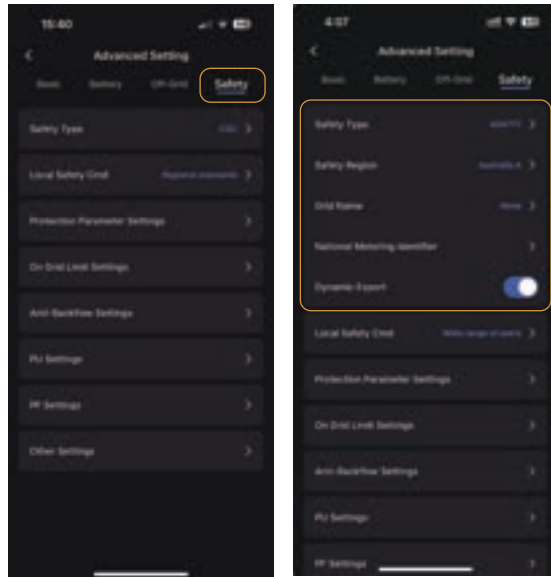


6.5.4 Safety Setup ⚠

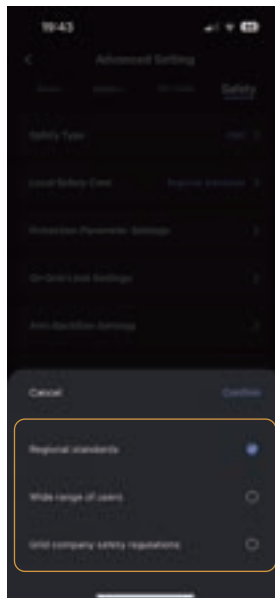
On "Safety" page, safety type can be configured. The safety type varies in different countries. Please refer to the settings in "Quick Installation" for detailed instruction.

Notice:

If AS4777 is selected, please select "Safety Region", "Grid Name", fill in the "National Metering Identifier", and enable or disable "Dynamic Export".



The local safety command includes "Regional standards", "Wide range of users", and "Grid company safety regulations". The default setting is "Regional standards". "Wide range of users" applies to African areas. Please configure in compliance with local laws and regulations.

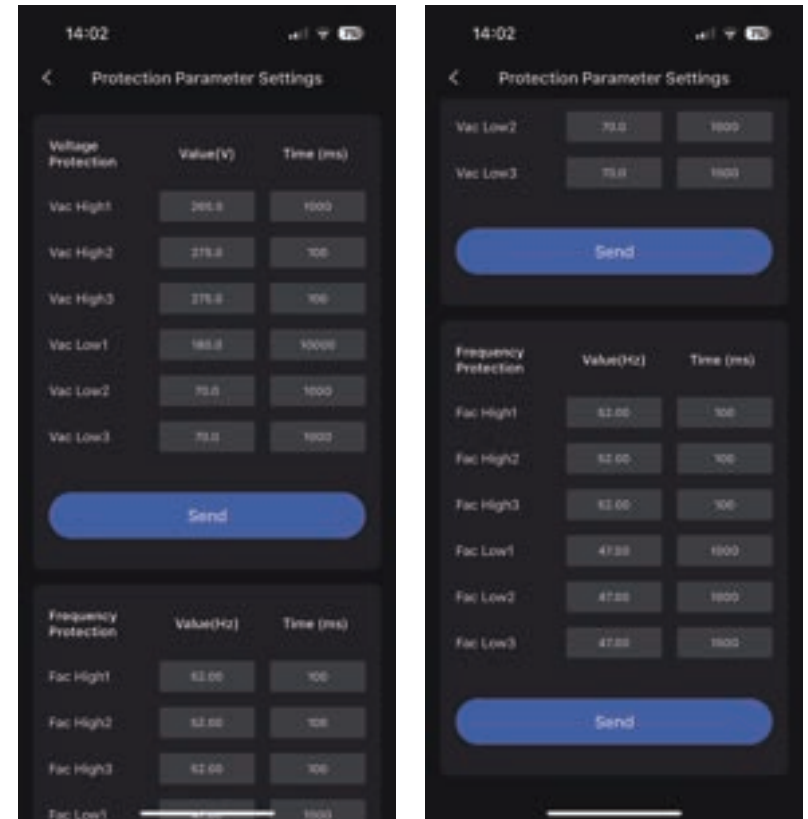


6.5.4.1 Protection Parameter Setup ⚠

Tap "Protection Parameter Settings" on "Safety" page to enter parameter setting. The safety regulations vary in different countries, so please set the voltage and frequency protection parameters in compliance with local laws and regulations. The voltage parameter should be configured in the following logic: Vac Low 1 > Vac Low 2 > Vac Low 3, Vac High 1 < Vac High 2 < Vac High 3. The same logic can be applied to the frequency protection parameters.

Notice:

Make sure the system can be connected to the grid before configuring the protection parameters.



6.5.4.2 On-grid Limits Setup ⚠

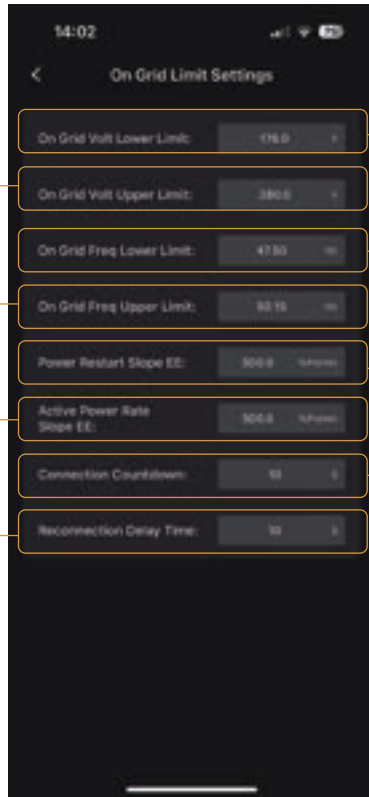
The inverter will detect the voltage and frequency of the grid before connecting to the grid. When the grid voltage and frequency are within the normal range, the inverter can be connected to the grid. Otherwise, the inverter cannot be connected to the grid.

On Grid Volt Upper Limit: The grid voltage can not be higher than this value when the inverter is connected to grid.

On Grid Freq Upper Limit: The grid frequency can not be higher than the value when the inverter is connected to grid.

Active Power Rate Slope EE: The rate at which the inverter increases its output power when it first connects to the grid. The value range is 1.0-1000.0 Pn/min.

Reconnection Countdown: The countdown for the inverter to reconnect to the grid.



On Grid Volt Lower Limit: The grid voltage can not be lower than this value when the inverter is connected to grid.

On Grid Freq Lower Limit: The grid frequency can not be lower than this value when the inverter is connected to grid.

Power Restart Slope EE: The load rate at which the inverter increases power when reconnecting to the grid after grid disconnection. The value range is 1.0-3000.0 Pn/min.

Connection Countdown: The countdown for the inverter to connect to the grid.

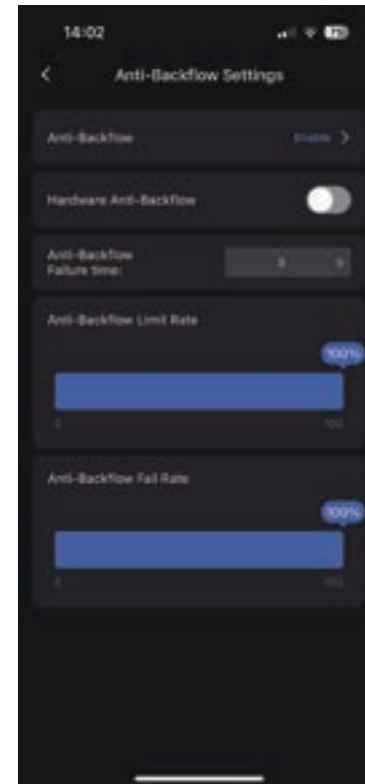
6.5.4.3 Anti-Backflow Setting ⚠

The anti-backflow function mainly limits the current output from the inverter to the grid, thus preventing power from feeding into the grid. In some cases, it is also referred to as export limitation or zero export. The anti-backflow function is a software-based limit. When the output power exceeds the software limit, the inverter will reduce the output power so that it reaches the specified limit within 15 seconds.

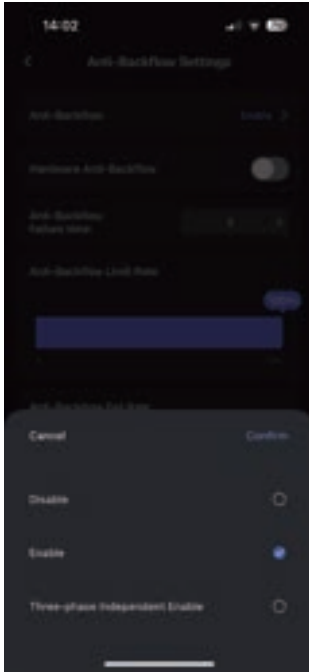
Hinen inverters are equipped with a hardware anti-backflow function. If enabled, the inverter will disconnect from the grid within 5 seconds if the output power exceeds the hardware limit.

Notice:

This function requires CTs or meter to be properly installed prior to use.



Anti-backflow function: It is disabled by default. Enabling the anti-backflow function prevents the inverter from feeding power into the grid. If a three-phase system is used, you can select "Three-phase independent Enable" for each phase.



Hardware Anti-backflow: Click the icon  to enable or disable this function. The icon  indicates that the function is enabled, while the icon  indicates it is disabled. If you enable the hardware anti-backflow, the inverter will be disconnected from the grid when the output power exceeds the hardware limit.

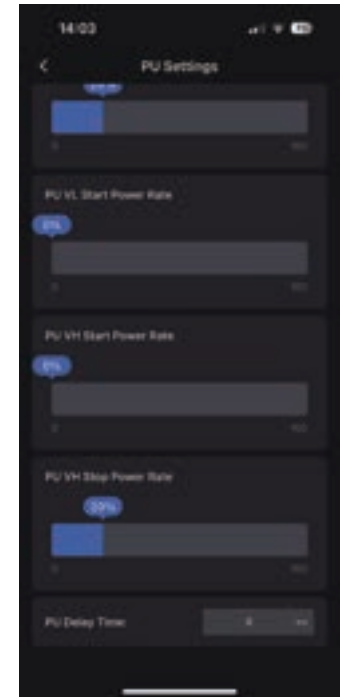
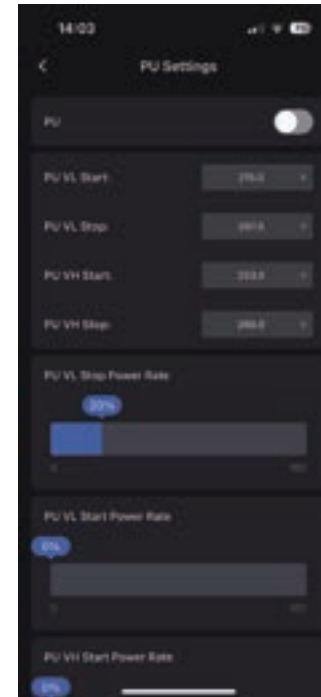
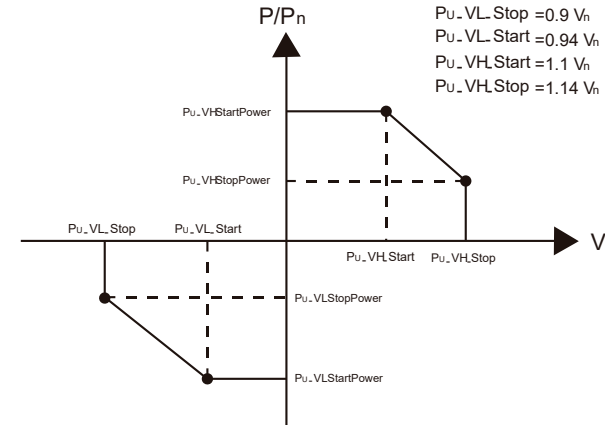
Anti-Backflow Failure time: In the event of a malfunction or damage to the meter, the anti-backflow function will fail. Setting an anti-backflow failure time in advance ensures that the device will automatically activate the anti-backflow function after a meter failure. For example, if the anti-backflow failure time is set to 120 seconds, the device will automatically enable the anti-backflow function 120 seconds after the meter fails.

Anti-backflow Limit Rate: Once you enable the anti-backflow function, you can set this parameter to limit the power fed to the grid, the value range of which is between 0 and 100%. Take a 6kW inverter as an example. If the anti-backflow limit rate is set to 60%, the inverter will feed power to the grid at a maximum of $6\text{kW} \times 60\% = 3.6\text{kW}$.

Anti-backflow Fail Rate: In cases where the meter or CT fails, this setting determines the percentage of power the inverter can feed into the grid. Take the 6kW inverter as an example. If the Anti-backflow Fail Rate is set to 60%, the inverter will feed power to the grid at a maximum of 3.6kW when the Meter or CT fails.

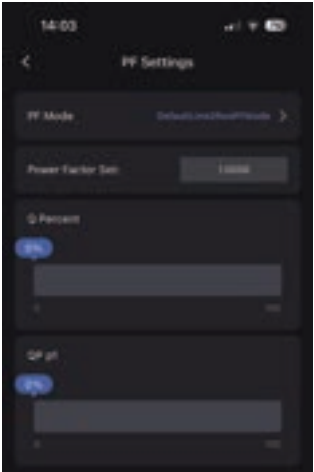
6.5.4.4 PU Settings ⚠

The PU settings have been pre-configured according to the safety standards of different countries. Please do not modify them without proper authorization. Active power control with an active power standard curve $P=F(V)$ is shown in the figure below.

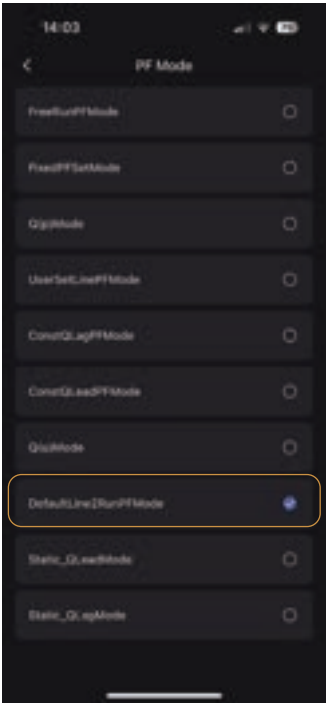


6.5.4.5 PF Settings ⚠

The power factor is applicable in certain countries. Please follow the local grid requirements.



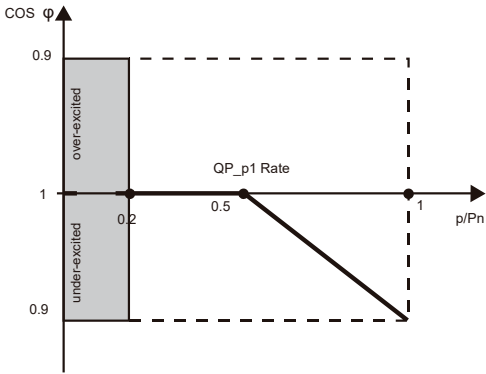
PF mode settings are shown as follows:



Mode	Comment
Free Run PF Mode	The PF is fixed at +1.000.
Fixed PF Set Mode	Power factor
Q(P) Mode	QP_p1 Rate
User Set Line PF Mode	/
ConstQ Lead PF Mode	Q_Percentage
ConstQ Lag PF Mode	Q_Percentage
Q(u) Mode	QU_Percent Max
	QU_Q2 Percent
	QU_Q3 Percent
	QU_Percent Min
	QU_UV_Stop
	QU_UV_Start
	QU_OV_Start
	QU_OV_Stop
	Qu Delay Time
	Qu Lock in Power
	Qu Lock Out Power
Default Line2 Run PF Mode	/
Static_Q Lead PF Mode	/
Static_Q Lag PF Mode	/

Q(p) Mode: The power factor of the inverter varies with the change in the inverter 's output power.

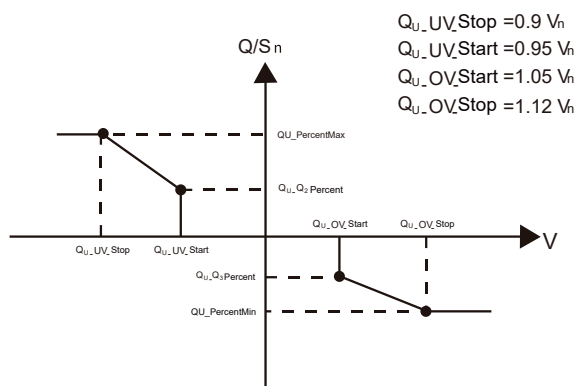
Reactive power control, reactive power standard curve $\cos \varphi = f(P)$



ConstQ Lag/Lead Mode: Reactive power can be adjusted by changing the current phase angle.

Q(u) Mode: The reactive power output of the inverter varies with changes in the grid voltage.

Reactive power control, reactive power standard curve $Q = f(V)$



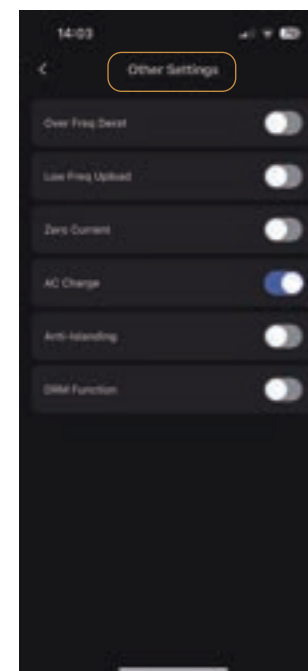
Reactive power can be adjusted via the power factor. With a fixed power factor, the reactive power setting value can be calculated based on the current power. The range of PF is from -0.8 to 0.8.

Leading: The inverter is drawing reactive power from the grid.

Lagging: The inverter is supplying reactive power to the grid.

6.5.4.6 Other Settings ⚠

Enter the "Other Settings" page to enable or disable the following functions based on actual conditions.



Over Freq Derat Curve: In some countries and regions, when the grid frequency exceeds the over-frequency derating trigger frequency, the inverter should reduce active power at a certain slope to lower the grid frequency. Please enable or disable this function based on actual conditions.

Low Freq Upload: In some countries and regions, when the grid frequency drops below the frequency threshold for power increase, the device should increase active power output to raise the grid frequency. Please enable or disable this function based on actual conditions.

Zero Current: When the zero current function is enabled, if the voltage is too high or too low before the first and second-stage grid protection time, the current will drop to zero. During the first and second-stage grid protection time, voltage and current will return to normal. If the protection time exceeds the first and second-stage grid protection time, the grid will disconnect. If the voltage is too high or too low for a short period, the current will immediately drop to zero. Once the voltage returns to normal, the current will also return to normal.

AC Charge: After enabling AC charging, the grid will be allowed to charge the battery.

Anti-Islanding: The inverter uses Active Frequency Drift (AFD) method (also known as frequency offset) to prevent islanding effects. The anti-islanding function is enabled by default to protect equipment and personnel from harm.

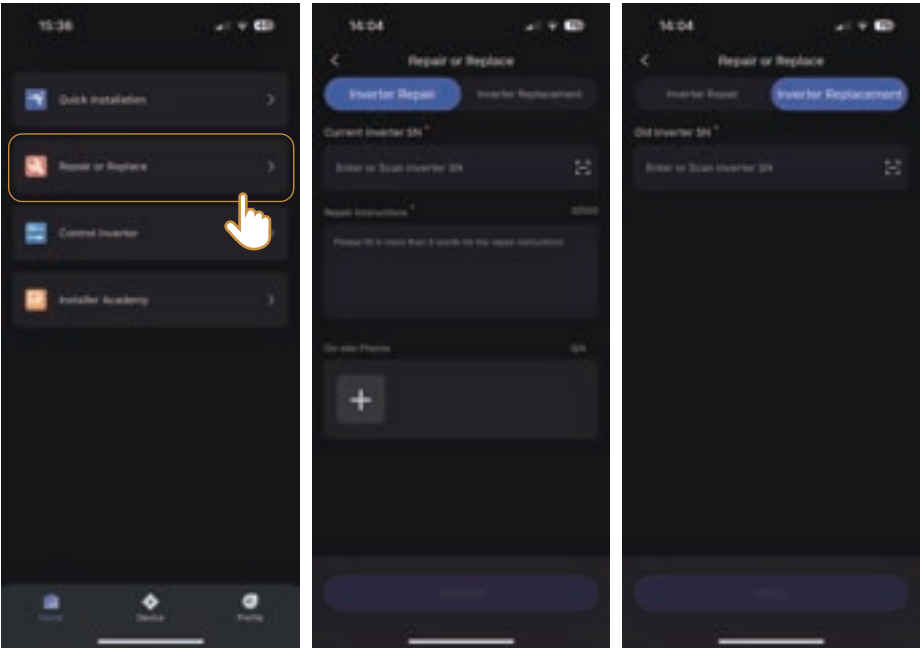
DRM Function: The DRM function is a demand response method required by the NZS4777.2 standard and is only applicable to NZS4777.2. It is disabled by default.

6.6 Repair and Replacement

Tap "Repair or Replace" to enter the corresponding page. Please select "Inverter Repair" or "Inverter Replacement" and submit the relevant information based on the real situation.

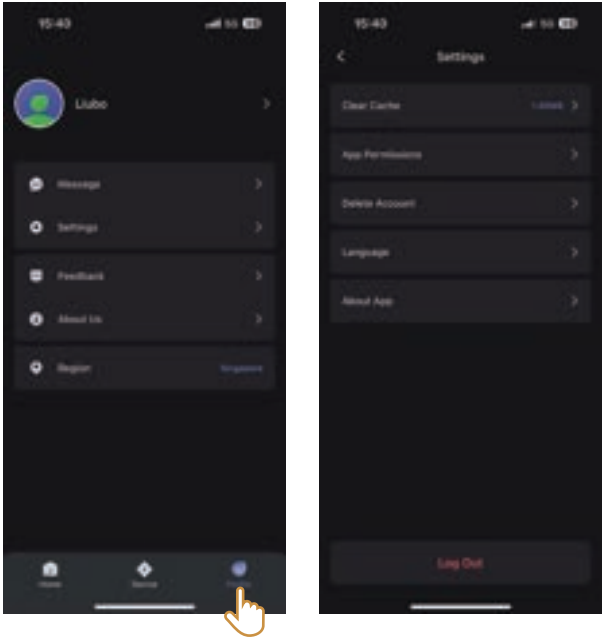
Caution:

Repair or replacement of the products should be conducted by professional personnel!

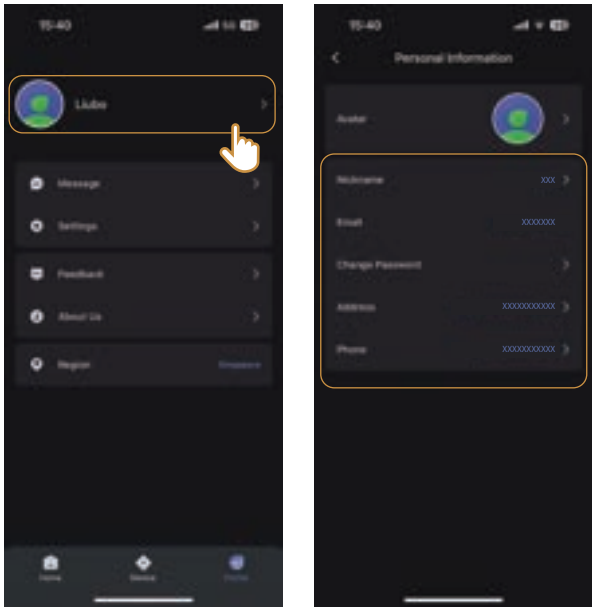


6.7 Personal Information

Tap "Profile" to check personal information and submit feedback. Tap "Settings" to delete account, select language, view the App version and log out.

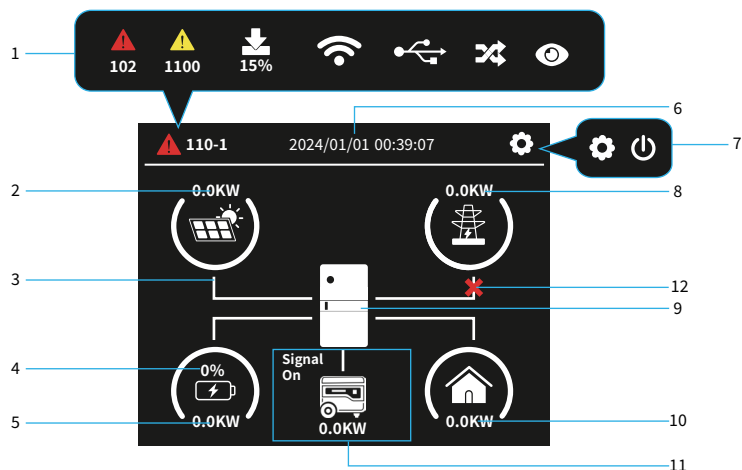


Tap the avatar to configure your personal information or change the password.



07 LCD Screen

7.1 Main Screen



ICON	Description
1	Alarm code/download progress/WIFI/USB logo/parallel status
2	PV parameters
3	Energy flow lines
4	Battery SOC level
5	Battery power parameters
6	Time
7	Settings Icon/Switchboard Icon
8	Grid power parameters
9	Inverter parameters
10	Load power parameters
11	generator power parameters (Only for the hybrid inverter)
12	The grid is disconnected

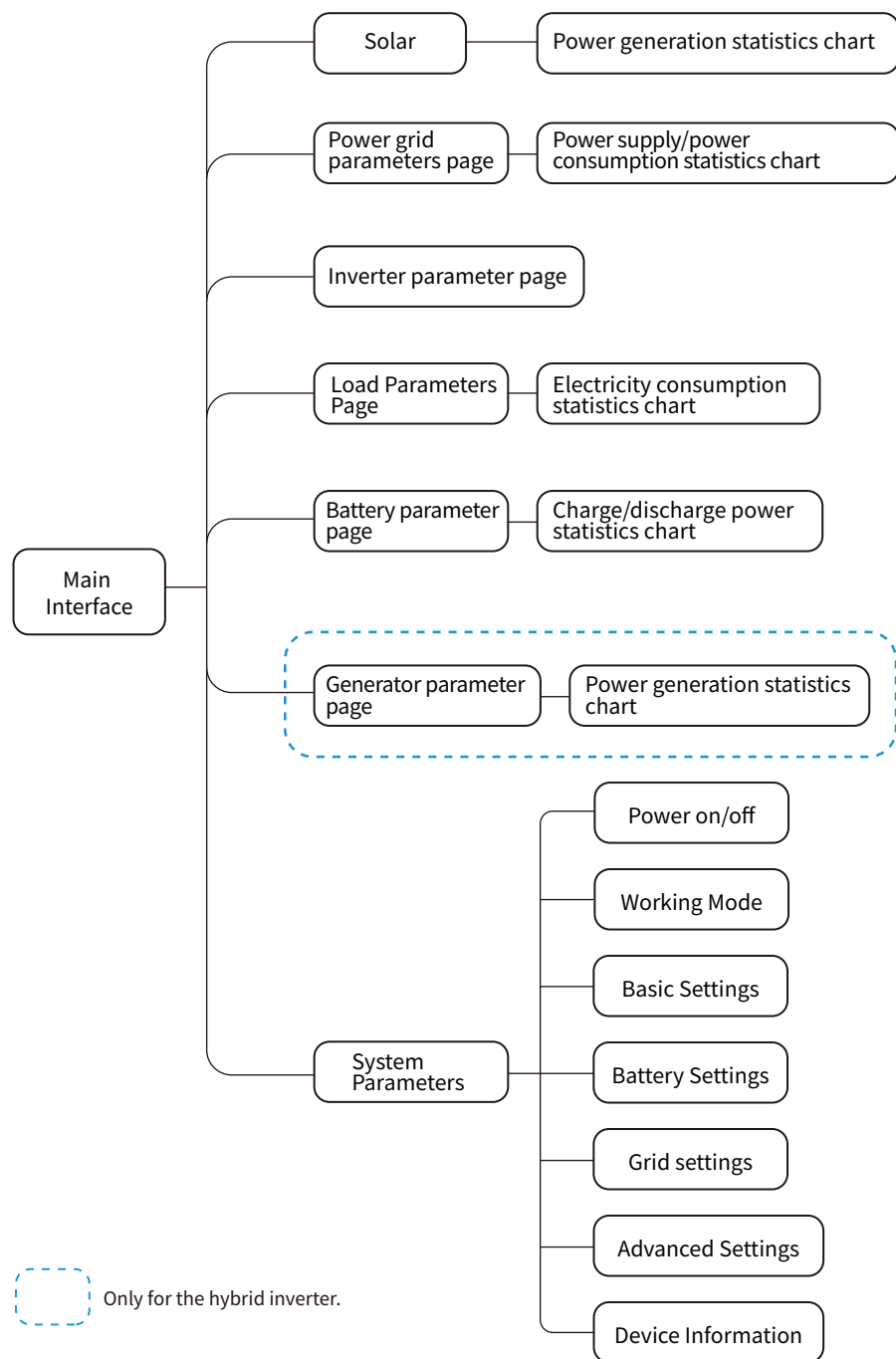
1. Information prompt window: It can display the main fault warning, download progress, WIFI, USB flash drive or logger connection status, firmware upgrade status and parallel status, etc.
2. PV parameter: The arc displays the current power level, and the number displays the power value in real time. Select to enter the PV parameter page.
3. Energy flow line: The green block indicates the direction of energy flow.
4. Battery SOC level: Displays the remaining SOC.
5. Battery power parameters: The number displays the current SOC or voltage value. The arc displays the current power level, and the number displays the real-time power value. Select to enter the battery parameter page.
6. Time: The middle of the upper part of the screen is the RTC time of the system.
7. Settings Icon/Switchboard Icon: Select to go to the Menu page or the On/Off page.
8. Grid power parameters: The arc displays the current power level, and the numbers display the real-time power value. Select to enter the grid parameter page.
9. Inverter parameters: Select to enter the inverter parameter page.
10. Load power parameters: The arc displays the current power level, and the number displays the real-time power value. Select to enter the load parameter page.
- 11* Generator power parameters: The arc displays the current power level, and the digital displays the real-time power value. Select to enter the generator parameter page. (This will only be displayed when the generator is connected and the generator port voltage is greater than 50V.)
12. If the power grid is disconnected, the icon "x" will be displayed.
13. Corresponding button operation: Press the Enter button to enter the selection mode, and the corresponding button icon turns blue. Switch the selection icon by pressing Up/Down button and then press Enter to confirm the selection or press Back to exit the selection mode.

* Only for the hybrid inverter.

Operating Instructions:

- Long press Up and Down buttons to switch the page control quickly; press ESC to exit the current page.
- Press the ENTER key and the blinking cursor will appear in the input box, indicating you can modify the parameter. Long press the up or down button to add or subtract by ten. Just short press the up or down button for once to add or subtract by one. Press the ESC key or ENTER key again, and the cursor of the input box will blink and disappear, and then exit the current parameter modification.
- Parameter modification with drop-down box: After pressing OK to select, a selection box will pop up. Short press the up or down keys to browse options. Press ESC to cancel or OK to confirm.
- Radio button: Press Enter to select and press Enter again to cancel.
- The ▲ sign in the navigation bar represents page up; the ▼ sign in the navigation bar represents page down.
- The sign in the navigation bar represents saving the parameter modification of the current page and returning. The sign in the navigation bar means canceling the parameter modification of the current page and returning. Press ESC to exit the page directly without saving.
- After power-on, if you only use the GUI, parameter modification will not be saved by default when power is off accidentally. You have to click Lock Change in Basic Settings to enter the password so as to save the modified parameters.

LCD operation flow chart



 Only for the hybrid inverter.

7.2 Running Parameters

PV Parameter Interface * (Only for the hybrid inverter)

Solar1/2 PV1 Voltage:0.0 V PV1 Current:0.0 A PV1 Power:0.0 W PV2 Voltage:0.0 V PV2 Current:0.0 A PV2 Power:0.0 W	Display the voltage, current and power of PV1 and PV2 in real time.
Solar2/2 PV1 Yield Today:0.0 Kwh PV2 Yield Today:0.0 Kwh Yield Today:0.0 Kwh PV1 Yield Total:0.0 Kwh PV2 Yield Total:0.0 Kwh Yield Total:0.0 Kwh	Display the power generation for the current day along with the historical data for PV energy production.

Battery Parameter Interface

Battery1/3 Status:Fault Voltage:0.0 V Current:0.0 A Power:0.0 W Tempera:0.0 C Cap:0.0 Ah Soc:0%	Display real-time battery status parameters such as voltage and current.
---	--

Battery2/3 Fault Word0: 00 Fault Word1: 00 Fault Word2: 00 Wam Word: 00	Display the battery fault codes and warning codes.
Battery3/3 Daily CHG: 0.0 Kwh Total CHG: 0.0 Kwh Daily DisCHG: 0.0 Kwh Total DisCHG: 0.0 Kwh	Dispaly the historical charge and discharge capacity of the battery in total and the charge and discharge for the day.

Grid2/2 Daily Feed-in: 0.0 Kwh Total Feed-in: 0.0 Kwh Daily Buying: 0.0 Kwh Total Buying: 0.3 Kwh	Display the amount of electricity fed into the grid.
GEN1/1 Volt-R: 0.0 V Curr-R: 0.0 A Power-R: 0.0 W Today: 0.0 Kwh Total: 0.0 Kwh	Real-time display of the generator's voltage, frequency, current and real-time generator power.

AC Terminals Parameter Interface

Grid1/2 Frequency 0.00 Hz R-phase Volt: 0.0 V R-phase Curr: 0.0 A R-phase Power: 0.0 W CT1Curr-R: 0.0 A CT2Curr-R: 0.0 A CT2Power-R: 0.0 W	Display real-time voltage, frequency, current and real-time grid power parameters.
--	--

Inverter Parameter Interface

Inverter1/3 Status Fault Bus-1 Volt: 0.0 V Bus-2 Volt: 0.0 V Inv Temp: 0.0 C DCDC Temp: 0.0 C Boost Temp: 0.0 C	Display real-time inverter temperature, voltage and other parameters.
--	---

Inverter2/3

Fault Word0:00

Fault Word1:00

Fault Word2:00

Fault Word3:00

Fault Word4:00

Fault Word5:00

Fault Word6:00

Display the status parameters for inverter fault values in real-time.

Inverter3/3

Fault Code7:652

Fault Code8:0

Fault Code9:0

Parallel Num:1

Valid Number:0

Parallel SN:1

Parallel Num: Current total number of parallel machines.

Valid Number: The current effective number connected to the grid.

Parallel SN: The parallel ID of the current machine.

Load Parameter Interface

Load1/1

Frequency:0.00 HZ

R-phase Volt:0.0 V

R-phase Curr:0.0 A

R-phase Power:0.0 W

Daily CONSUM:0.0 Kwh

Total CONSUM:0.0 Kwh

Displays status parameters such as load voltage value and load power value, as well as power consumption.

Fault Page

Alarm1/1

110 Communication Err

1500 BMS Comm Alarm

1100 Fan Alarm

Click Fault or Alarm to enter.

7.3 Diagram Page - Solar & Load & Grid & Battery

Load Power:Year

10KWh

<2024>

2000

1600

1200

800

400

0

1

2

3

4

5

6

7

8

9

10

11

12

Day

Month

Year

Total

Solar Power:Day

0.1KWh

<2024/09/12>

300

240

180

120

60

0

0:00

4:00

8:00

12:00

16:00

20:00

24:00

Day

Month

Year

Total

Buy Power:Day1/2

0.1KWh

<2024/10/18>

300

240

180

120

60

0

0:00

4:00

8:00

12:00

16:00

20:00

24:00

<

Day

Month

Year

Total

>

Sell Power:Day2/2

0.1KWh

<2024/10/18>

300

240

180

120

60

0

0:00

4:00

8:00

12:00

16:00

20:00

24:00

<

Day

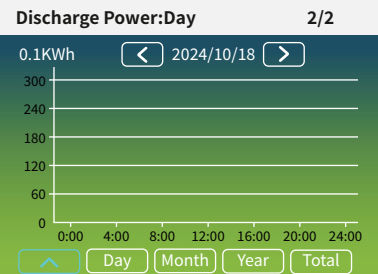
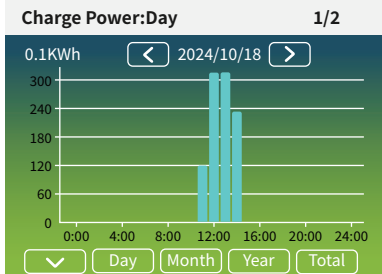
Month

Year

Total

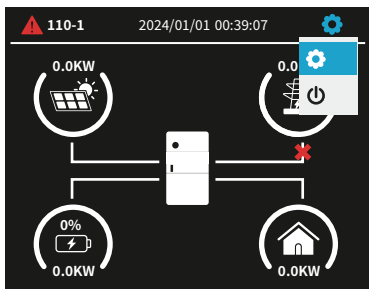
>

112



Press the OK button on the solar power or load power page to navigate to the power curve page. You can choose the year, month, day or the total information. Using the arrows to make your selections, you can examine the historical monthly power generation and total power information, as well as the hourly power information for the previous year. If you would like to view more detailed information, please use the background software.

7.4 System Setup Menu



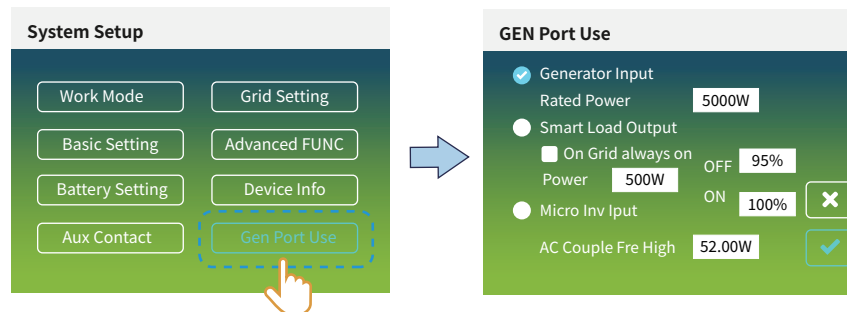
This is the system menu interface, where you can select the corresponding operation item.

Power On/Off

- ☒ Power On
- ☐ Power OFF

This is the system startup/shutdown page.

* This function is only for the hybrid inverter.



Generator input rated power: Allowed Max. power from diesel generator.

Smart Load Output: This mode utilizes the Gen input connection as an output which only receives power when the battery SOC and PV power is above a user programmable threshold.

e.g. Power=500W, ON: 100%, OFF=95%: When the PV power exceeds 500W, and battery bank SOC reaches 100%, Smart Load Port will switch on automatically and power the load connected. When the battery bank SOC < 95% or PV power < 500w, the Smart Load Port will switch off automatically.

Smart Load OFF Batt

- Battery SOC at which the Smart load will switch off.

Smart Load ON Batt

- Battery SOC at which the Smart load will switch on. Meanwhile, the PV input power should exceed the set value (Power) simultaneously, for which the Smart load can switch on.

On Grid always on: When click "on Grid always on" the smart load will switch on when the grid is present.

Micro Inv Input: The GEN input port serves as an input for micro inverters that are AC coupled with on-grid inverters. This functionality is also applicable to on-grid inverters.

* **Micro Inv Input OFF:** When the battery SOC exceeds the set value, Microinverter or grid-tied inverter will shut down.

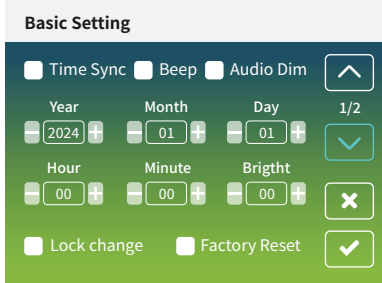
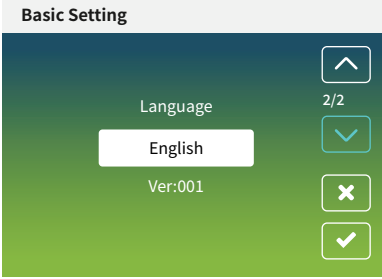
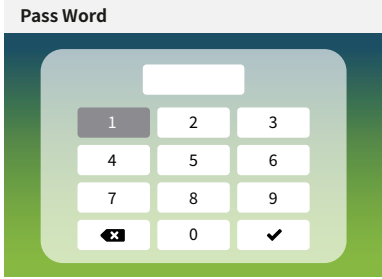
* **Micro Inv Input ON:** When the battery SOC is lower than the set value, Microinverter or grid-tied inverter will start to work.

AC Couple Fre High: If the "Micro Inv input" option is selected, the output power of micro inverter will decrease linearly as the battery SOC approaches the set value(OFF). When the battery SOC equals to the setting value (OFF), the system frequency will align with the set value (AC couple Fre high), causing the microinverter to stop working.

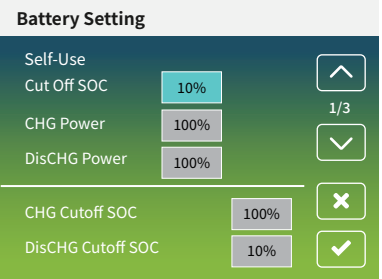
* **MI export to grid cutoff:** Stop exporting power produced by the microinverter to the grid.

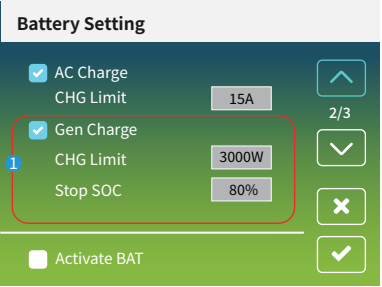
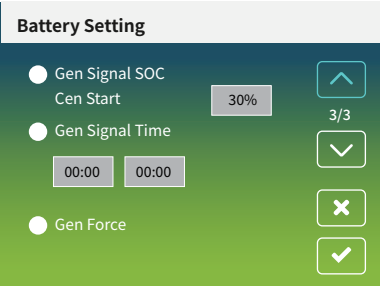
* **Note:** The Micro Inv Input OFF and On functionality is valid only to specific FW versions.

7.5 Basic Setup Menu

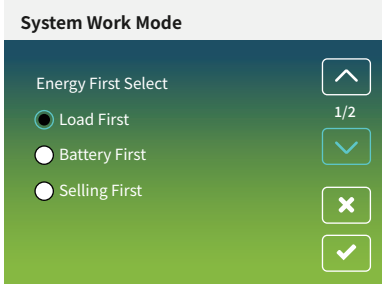
	Time Sync: The modified time is saved to the system in real time. Factory Reset: When you need to reset your machine, contact technical support for a password. RTC time: The current calendar time. Lock change: When you need to save the modified parameters to the machine memory after power failure, use this function. Beep: It will sound when an alarm or fault occurs. Audio Dim: The screen brightness is automatically adjusted over time. Bright: brightness.
	This is the language selection page.
	When you click on an option that requires a password, the page will pop up automatically. Click to enter the correct password.

7.6 Battery Setup Menu

	Cut Off SOC: Battery energy is provided to the load first. When the battery SOC hits the set value, the battery will stop discharging. CHG Power: When the battery discharge is terminated, it is charged at a percentage of the rated power. DisCHG Power: When the battery is discharged, it is discharged at a percentage of the rated power. CHG Cutoff SOC: The SOC at which the battery charging stops. DisCHG Cutoff SOC: When the battery energy is fed to the grid, it reaches this SOC value and the discharge is terminated.
---	---

	AC Charge: You can choose whether to use the grid to charge the battery. CHG Limit: After selecting that the grid can charge the battery, you need to determine the maximum current for charging the battery using the grid. Activate Battery: After enabling this setting, the inverter can wake up the battery. GEN Charge: Uses the GEN input of the system to charge battery bank from a connected generator. CHG Limit: The charge current of the connected generator is 8A. Stop SOC = 80%: The generator stops charging when it reaches this set value.
① Only for the hybrid inverter.	
	Gen Start: When the SOC is at 30%, the system will automatically start the connected generator to charge the battery bank. Gen Signal SOC: Normally open relay that closes when the Gen Start signal state is active. Gen signal Time: The generator dry contact is connected for the time period set below. Gen Force: When the generator is connected, it is forced to start the generator without meeting the conditions.
Only for the hybrid inverter.	

7.7 System Working Mode Setup Menu

	Load First: The inverter will draw power from PV, battery, and grid in order to supply the load. The default working mode is "Load First". Battery First: After the energy is allocated to satisfy load demands, any surplus energy is subsequently directed towards charging the battery first. Selling First: After the energy is allocated to satisfy load demands, any surplus energy is prioritized for export to the grid.
---	--

Work Mode

Time Of Use

Time

Power

SOC

00:00

00:00

0%

0%

00:00

00:00

0%

0%

00:00

00:00

0%

0%

2/2

✓

✗

✓

Set the battery charging and discharging power percentage and cut-off SOC in different time periods.

Time: Start time and end time.

Power: The current power rating of the battery expressed as a percentage. A negative value signifies discharging, while a positive value indicates charging.

SOC: Cut-off SOC value.

7.8 Grid Setup Menu

Grid Setting

Unlock Grid Setting

1/12

Safety Type

SF_AS4777

✓

Regional STD

RegionA

✗

✓

Unlock Grid Setting: Before changing the grid parameters, enable this function with password 8888. Then you can change the grid parameters.

Safety Type: Please select the safety code of corresponding countries and regions.

Regional STD: When the Australian safety code SF-AS4777 is selected, it will appear. This is used to select safety codes for different regions.

Grid Setting:On-Grid

Normal On-Grid Range

LF

47.53Hz

HF

50.17Hz

LV

0.0V

HV

0.0V

Time

30S

Slope

0.0%

2/12

✓

✗

✓

Fault Reconnect

Time

30S

Slope

120.0%

✓

Normal On-Grid Range LF: Lower limit of grid-connected frequency.

Normal On-Grid Range HF: Upper limit of grid-connected frequency.

Normal On-Grid Range LV: Upper limit of grid-connected voltage.

Normal On-Grid Range HV: Lower limit of grid-connected voltage.

Normal On-Grid Range Time: Grid-connected delayed time when powering on.

Normal On-Grid Range Slope: Grid-connected loading rate when powering on.

Fault Reconnect Time: Fault grid-reconnected time.

Fault Reconnect Slope: Fault grid-reconnected loading rate.

Grid Setting-Voltage Protect

UV1

186.0V

UVT1

100ms

OV1

263.0V

OVT1

100ms

UV2

184.5V

UVT2

100ms

OV2

263.0V

OVT2

100ms

UV3

184.5V

UVT3

100ms

OV3

163.0V

OVT3

100ms

3/12

✓

✗

✓

UV1: Low voltage protection value of Grid first-order protection.

UVT1: Low voltage protection time of Grid first-order protection.

OV1: High voltage protection value of Grid first-order protection.

OVT1: High voltage protection time of Grid first-order protection.

UV2: Low voltage protection value of Grid second-order protection .

UVT2: Low voltage protection time of Grid second-order protection.

OV2: High voltage protection value of Grid second-order protection.

OVT2: High voltage protection time of Grid second-order protection.

UV3: Low voltage protection value of Grid third-order protection.

UVT3: Low voltage protection time of Grid third-order protection.

OV3: High voltage protection value of Grid third-order protection.

OVT4: High voltage protection time of Grid third-order protection.

Grid Setting-Freq Protect

UF1

47.53Hz

UFT1

60ms

OF1

51.47Hz

OFT1

60ms

UF2

47.53Hz

UFT2

60ms

OF2

51.47Hz

OFT2

60ms

UE3

47.53Hz

UFT3

60ms

OF3

51.47Hz

OFT3

60ms

4/12

✓

✗

✓

UF1: Low-frequency protection value of Grid first-order protection.

UFT1: Low-frequency protection time of Grid first-order protection.

OF1: High-frequency protection value of Grid first-order protection.

OFT1: High-frequency protection time of Grid First-order protection.

UF2: Low-frequency protection value of Grid second-order protection.

UFT2: Low-frequency protection time of Grid second-order protection.

OF2: High-frequency protection value of Grid second-order protection.

OFT2: High-frequency protection time of Grid Second-order protection.

UF3: Grid protection third-order low-frequency protection value.

UFT3: Grid protection third-order low-frequency protection time.

OF3: Grid protection third-order high-frequency protection value.

OFT3: Grid protection third-order high-frequency protection time.

10Min AVG Protect

Average Voltage

0.0V

Response Time

100ms

5/12

✓

✗

✓

The average voltage protection value within 10 minutes and response time.

Low Frequency Upload ☐ Enable Start: 49.80Hz Recov: 49.90Hz 6/12 End: 46.00Hz Zero: 49.00Hz Slope: 0.00% Delay: 00ms Reply: 00ms Recov: 00ms	Enable: Underfrequency loading->Enable Start: Underfrequency loading->Start frequency Recov: Underfrequency loading->Recovery point frequency End: Under frequency loading->end frequency Zero: Underfrequency loading->Zero power point frequency Slope: Under-frequency loading-> load reduction slope Delay: Under frequency loading->delayed time Reply: Under frequency loading -> response time Recov: Underfrequency loading->Resume delayed time
Over Frequency Derat ☐ Enable Stary: 50.20Hz Recov: 50.10Hz 7/12 End: 52.00Hz Zero: 51.00Hz Slope: 83.33% Recov: 300ms Reply: 100ms Delay: 200ms	Enable: Over frequency load reduction->Enable Stary: Over frequency load reduction->Start frequency Recov: Overfrequency load reduction -> recovery point frequency End: Over frequency load reduction->end frequency Zero: Over-frequency load reduction -> zero power point Slope: Over frequency load reduction -> load reduction slope Recov: Over frequency load reduction -> recovery delayed time Reply: Over frequency load reduction -> response time Delay: Over frequency load reduction->delayed time
PU ☐ Enable OV-S: 0.0V UV-S: 0.0V 8/12 OV-E: 0.0V UV-E: 0.0V OV-P: 00% UV-P: 00% Delay: 00ms	Enable: Over frequency load reduction->delay time OV-S: Voltage active -> overvoltage point UV-S: Voltage active -> undervoltage point OV-E: Voltage active->overvoltage ends UV-E: Voltage active->undervoltage ends OV-P: Voltage active -> overvoltage power UV-P: Voltage active -> undervoltage power Delay: Voltage active->overvoltage delayed time

PE Setting PE Mode PF=1 PF: 1.0000 RactP: 00% 9/12 HV1: 0.0V HV2: 0.0V LV1: 0.0V LV2: 0.0V Qmax: 0.0% Qmin: 25.6%	PF Mode: PF mode setting. PF: Power factor setting. RactP: Percentage of reactive power in lagging/leading reactive power mode. HV1: The start point of overvoltage in reactive mode. HV2: The end point of overvoltage in reactive mode. LV2: The start point of undervoltage in reactive mode. LV1: The end point of undervoltage in reactive mode. Qmax: Reactive power at the end point of undervoltage in reactive mode. Qmin: Reactive power at the end point of overvoltage in reactive mode.
PE Setting ActiveP: Cut In 100.0% Cut Out 0.0% 10/12 Voltage: 0.0V 0.0V Qu Delay Time: 00ms Reply Time: 00ms	Cut In ActiveP: The active power of starting operation in reactive mode. Cut Out ActiveP: The active power of ending operation in reactive mode. Cut In Voltage: The voltage of starting operation in default PF mode. Cut Out Voltage: The voltage of ending operation in default PF mode. Qu Delay Time: Reactive delayed time in voltage reactive mode. Reply Time: Response time in voltage reactive mode.
Zero Current ☐ Enable High Volt Point: 296.0V 11/12 Low Volt Point: 115.0V High Freq Point: 52.00Hz Low Freq Point: 48.00Hz	Enable: Zero current->Enable High Volt Point: Zero current->Enable Low Volt Point: Zero current -> low voltage point High Freq Point: Zero current->high frequency point Low Freq Point: Zero current -> low frequency point
Safety Enable ☐ DRMS ☐ N-PE 12/12 ☒ Arti-Islanding ☐ H/LVRT	DRMS: System parameters->Logical interface DRMS enable N-PE: System Parameters->N Line to PE Enable Arti-Islanding: System Parameters->High and Low Voltage Ride Through Enable H/LVRT: System parameters->anti-islanding enable

7.9 Advanced Function Setup Menu

Advanceddd FUNC

☒ Unlock Setting

1/5

CT/Meter

Meter

Active Power Percent

100%

BackUp Mode

☒ EPS
 ☐ UPS

Off-grid

☒ Enable

2/5

DisCHG Cutoff SOC

20%

Off-grid Volt

230V

Off-grid Freq

☒ 50hz
 ☐ 60hz

Solar Setting

Mode

Single MPPT

3/5

Startup Voltage

140.0V

Fault Voltage

140.0V

Max Out Power

100%

Anti-Backflow

☐ Enable
 ☐ Hardware Enable

4/5

Limit Rate

00%

Failure Time

30S

Fail Power Rate

50%

Unlock Setting: Before changing the grid parameters, enable this function with password 8888. You can then change the advanced parameters.

CT/Meter: Choose current transformer or Meter.

Active Power Percent: The percentage of active power output by the inverter.

UPS: Uninterrupted Power Supply is suitable for power supply of important equipment, switching time 10ms.

Enable: The off-grid function is enabled.

DisCHG Cutoff SOC: Off-grid discharge cut-off SOC.

Off-grid Volt: Off-grid output voltage

Off-grid Freq: Off-grid output frequency.

Mode: System Parameters->PV Mode

Startup Voltage: System parameters->PV start voltage

Fault Voltage: System parameters->PV fault voltage

Max Out Power: System parameters->Max PV output power

Enable: System parameters->anti-backflow enable

Hardware Enable: System Parameters->Hardware Anti-Backflow Enable

Limit Rate: System parameters->anti-reverse flow limit power

Failure Time: System parameters->Anti-backflow failure time

Fail Power Rate: System parameters->anti-backflow failure power

Parallel

Parallel ID

01

5/5

AC Output Mode

☐ Individual Mode
 ☐ Parallel Mode

Parallel ID: After setting Power OFF on the Power On/Off interface and setting AC Out Mode to Parallel Mode, you need to select the Parallel ID for the inverter. (Different inverters cannot be set to the same Parallel ID)

AC Out Mode: After setting Power OFF on the Power On/Off interface, you can change this setting. For a single inverter system, select Individual Mode. For a parallel system with multiple inverters, select Parallel Mode.

7.10 Device Info Setup Menu

Device Info

Device SN:ABCDEF123456

Soft-Ver:TMhn-0300-0300-0131-0000

Alarms	Occurred
123 Bus_Balance_Curr	2024/08/15 16:11
102 DC_Current_High	2024/08/15 16:02
102 DC_Current_High	2024/08/15 15:51
123 Bus_Balance_Curr	2024/08/15 15:51
102 DC_Current_High	2024/08/15 15:51

Device SN: The serial number of the device.

Soft-Ver: The software version number of the current device.

Alarms: Display the historical faults and alarms. Press up and down buttons to turn pages.

Occurred: Display the time when historical faults and alarms occurred. Press up and down buttons to turn pages.

7.11 Auxiliary dry contact setting

AuxContact Set

AuxContact 1

1/3

AUXContact Enable

ModeSelection

☒ OFF
 ☐ ON
 ☐ Auto Mode

AuxContact1: There are two auxiliary dry contacts with selectable left and right settings.

AuxContact Enable: Auxiliary dry contact enable, after checking the box, the auxiliary dry contact will be turned on and off according to the following mode, without checking the box, the auxiliary dry contact will be turned off.

ModeSelection: Mode Selection, **ON Mode** if the time is within the time period set on the second page, the dry contact is open, otherwise closed, **OFF Mode** if the time is within the time period set on the second page, the dry contact is closed, otherwise open, and **Auto Mode** follows the third page to set the dry contact open and closed.

ON Mode

AuxContact 1

2/3

Time 1

00:00

00:00

Time 2

00:00

00:00

DateSelection

Thursday

Monday

Tuesday

Wednesday

Friday

Saturday

Sunday

Settings for each time period.

Auto Mode

AuxContact 1

☐ SOC Enable

SOC Threshold: 80% 3/3

Feed In On Threshold: 2000W

Feed In Off Threshold: 3000W

Delay Time: 00Min

SOC Enable: When checked, the battery SOC is greater than SOC Threshold to turn on the dry contact, less than SOC Threshold to turn off the dry contact.

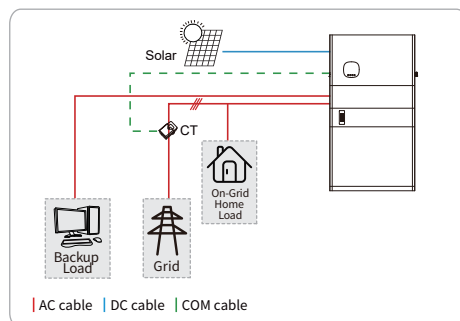
When unchecked, the feed power is greater than **Feed In On Threshold** to turn on the dry contact, and less than **Feed In Off Threshold** to turn off the dry contact.

Delay Time: Dry Contact Off Delay Time.

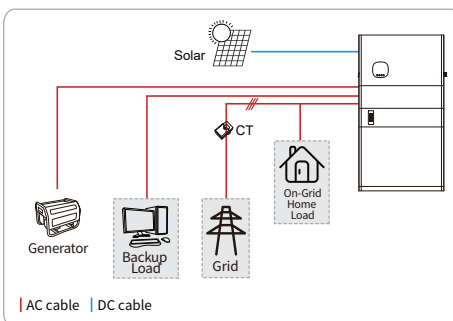
7.12 Mode

Hybrid Inverter

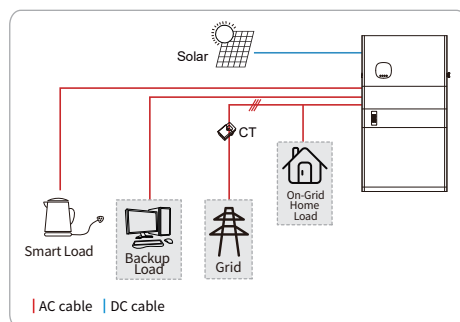
Mode I: Basic



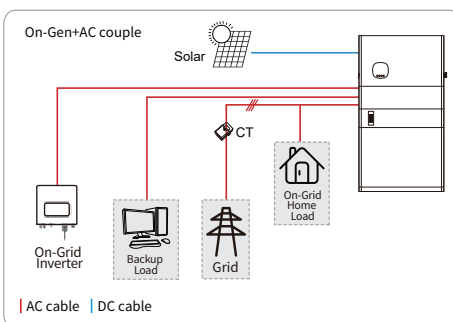
Mode II: With Generator



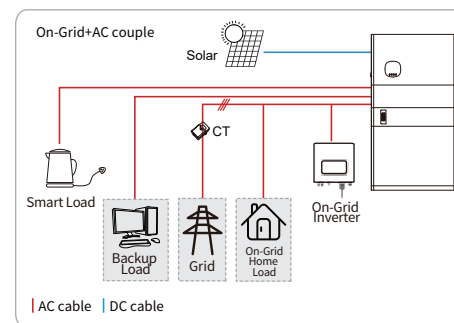
Mode III: With Smart-Load



Mode IV (1) : AC Couple

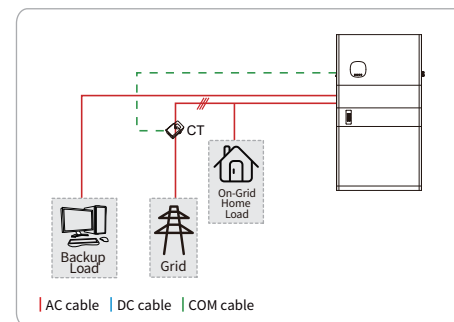


Mode IV (2) : AC Couple

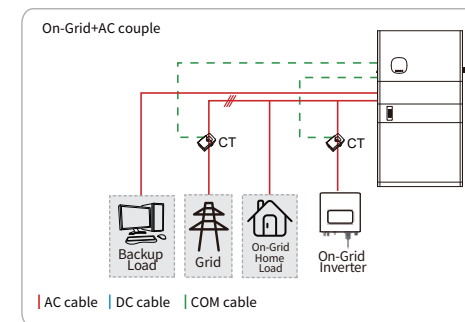


AC-Coupled Inverter

Mode I: Basic



Mode II: AC Couple



The system primarily relies on photovoltaic (PV) power as its first energy source. Following this, the battery bank and the grid are prioritized according to the configured settings. The generator, if accessible, serves as the final backup power source.

08 Maintenance and Troubleshooting

8.1 Routine Maintenance

1. Before performing maintenance, use a multimeter and other instruments to measure the voltage between the metal parts that need to be touched or may be touched and the grounding copper bar to avoid electric shock.
2. During maintenance, pay attention to the warning labels on the inverter to prevent personal injury caused by high voltage.
3. Ensure that the DC input switch and PV switches are all disconnected during maintenance.
4. After completing maintenance, follow the normal operation steps to start the machine.

Danger

1. If you find any problems that may affect the battery or energy storage inverter system, please contact after-sales personnel. Private disassembly is prohibited.
2. If you notice any exposed copper wiring in the conductive wire, do not touch it due to high-voltage risks. Please contact the after-sales team immediately. It is forbidden to disassemble it privately.
3. If any other emergency occurs, please contact after-sales personnel as soon as possible and operate under the guidance of after-sales personnel, or wait for after-sales personnel to operate on-site.
4. During operation, the heat sink and housing of the inverter may become hot. Improper handling of the hot heat sink and housing may cause burns!
 - During operation, do not touch any parts other than the cover.
 - Cool down the heat sink for about 30 minutes before cleaning.

Maintenance checklist	Maintenance cycle
Check if the anti-tipping bracket is installed securely; if it is not, please tighten it in the corresponding location.	Once every 6 months
Inspect whether the enclosure is scratched; if so, please repaint it or contact the after-sales service center.	Once every 6 months
Check whether the exposed wires show signs of wear; if so, replace the affected cables or contact the after-sales service center for assistance.	Once every 6 months
Ensure there is no debris around the battery; if there is, please clean it to prevent any impact on the battery's heat dissipation	Once every 6 months
Check for the presence of water or pests to prevent long-term intrusion to the battery.	Once every 6 months

8.2 Troubleshooting

In the event of a battery system failure, the system may automatically shut down or experience abnormal functions. To address this issue, please follow the troubleshooting methods outlined below. If these methods do not resolve the problem, please contact the after-sales service center. When you contact the service center, please gather the following information to ensure a swift resolution:

1. Battery details, including: serial number, software version, installation date, time of fault occurrence, and frequency of faults.
2. Installation environment specifics, such as weather conditions. Providing photos, videos, or other relevant files can assist in the analysis of the issue.

8.2.1 Fault Code

Main Error Code	Fault Description	Suggestion
102	INV current sampling abnormal	1. Restart inverter. 2. If error message still exists, contact manufacturer.
104	Bus sample fault	1. Restart inverter. 2. If error message still exists, contact manufacturer.
105	Relay fault	1. Restart inverter. 2. If error message still exists, contact manufacturer.
108	NTC Temperature too high	1. After shutdown, check the temperature. Restart the inverter after the temperature is normal. 2. If the error message still exists, contact manufacturer.
109	Bus voltage abnormal	1. Restart inverter. 2. If error message still exists, contact manufacturer.
110	Communication fault	1. After shutdown, check the communication board wiring. 2. If the error message still exists, contact manufacturer.
111	Temperature sensor connection is abnormal	1. After shutdown, check whether the temperature sampling module is connected properly. 2. If the error message still exists, contact manufacturer.
113	Main DSP hardware over current protection	1. Restart inverter. 2. If error message still exists, contact manufacturer.
114	INV software over current protection	1. Restart inverter. 2. If error message still exists, contact manufacturer.
116	GFCI Module damage	1. After shutdown, check the leakage current module. 2. If the error message still exists, contact manufacturer.
118	BUS2 Volt abnormal	1. Restart inverter. 2. If error message still exists, contact manufacturer.

Main Error Code	Fault Description	Suggestion
120	DCDC soft start Abnomal	1. Restart inverter. 2. If error message still exists, contact manufacturer.
121	Buck_boost current abnormal	1. Restart inverter. 2. If error message still exists, contact manufacturer.
123	BUS balance current abnormal	1. Restart inverter. 2. If error message still exists, contact manufacturer.
124	DCAC soft start Abnomal	1. Restart inverter. 2. If error message still exists, contact manufacturer.
125	EPO Fault	1. Check if the emergency power off switch is pressed.
126	Synchronization signal loss	1. Check the parallel connection of the inverter. 2. If error message still exists, contact manufacturer.
127	Parallel ID is duplicated	1. Check the parallel ID setting of the inverter. 2. If error message still exists, contact manufacturer.
128	Parallel CAN communication failure	1. Restart inverter. 2. If error message still exists, contact manufacturer.
129	Parallel CAN communication line failure	1. Check the parallel connection of the inverter. 2. If error message still exists, contact manufacturer.
203	PE abnormal	1. Check PE to ensure that the PE line contact is good. 2. If error message still exists, contact manufacturer.
204	Hardware anti-reverse flow feed-in power abnormal	1.Reduce the power fed into the grid. 2.If error message still exists, contact manufacturer.
206	Leakage current too high	1. Restart inverter. 2. If error message still exists, contact manufacturer.

Main Error Code	Fault Description	Suggestion
207	DCI too high	1. Restart inverter. 2. If error message still exists, contact manufacturer.
209	AutoTest abnormal	1. Restart inverter. 2. If error message still exists, contact manufacturer.
300	EPS port short-circuit Fault	1. After shutdown, check whether the EPS load port is improperly connected and restart the inverter. 2. If error message still exists, contact manufacturer.
305	Parallel output power is unbalanced	1. Restart inverter. 2. If error message still exists, contact manufacturer.
306	Parallel system overload	1. Reduce the load on the inverter system's load port. 2. If error message still exists, contact manufacturer.
400	AFCI Fault	1. After shutdown, check the panel terminal. 2. Restart inverter. 3. If error message still exists, contact manufacturer.
401	The DC input voltage is exceeding the maximum tolerable value	1. Immediately disconnect the DC switch and check the voltage. 2. If the fault code still exists after the normal voltage is restored, contact manufacturer.
402	Low PV Isolation	1. After shutdown, check if panel enclosure is grounded properly. 2. If error message still exists, contact manufacturer.
403	The DC input current is exceeding the maximum tolerable value	1. After shutdown, check whether the panel and cable connection with the panel are abnormal and restart the inverter. 2. If error message still exists, contact manufacturer.

8.2.2 Warning Code

Main Warning Code	Warning Description	Suggestion
1100	Fan function abnormal	1. After shutdown, check the fan connection. 2. Replace the fan. 3. If error message still exists, contact manufacturer.
1105	EPS Relay is abnormal	1. Restart inverter. 2. If error message still exists, contact manufacturer.
1107	The inverter is not turned on	1. Turn on the inverter on the App.
1108	DRMS turned off	1. Check if the DRMS switch is connected or if the button is turned off.
1109	Inv relay sticky	1. Check whether the inverter relay is stickied.
1110	Temperature sensor connection is abnormal	1. After shutdown, check whether the temperature sampling module is connected properly. 2. If the error message still exists, contact manufacturer.
1200	No Utility	1. Please confirm whether grid is lost. 2. If error message still exists, contact manufacturer.
1201	Grid voltage outrange	1. Check whether the AC voltage is in the range of standard voltage specification. 2. If error message still exists, contact manufacturer.
1202	Grid frequency outrange	1. Check whether the frequency is in the range of specification. 2. If error message still exists, contact manufacturer.
1204	Meter abnormal	1. Check if the meter is on. 2. Check whether the machine and the meter connection is normal.
1209	Anti backflow warn	1. Check whether CT or meter connection is abnormal. 2. Check whether CT or meter is connected to the wrong place and whether the direction is correct. 3. If error message still exists, contact manufacturer.
1211	PE ground detection is abnormal	1. Check PE to ensure that the PE line contact is good. 2. If error message still exists, contact manufacturer.

Main Warning Code	Warning Description	Suggestion
1302	Off-grid output voltage is too high	1. Restart inverter. 2. If error message still exists, contact manufacturer.
1303	Off-grid output voltage is too low	1. Check whether the inverter output is greater than the input and restart the inverter. 2. If error message still exists, contact manufacturer.
1304	EPS port overload protection	1. Restart inverter. 2. If error message still exists, contact manufacturer.
1305	Parallel AC Load output overload warning	1. Restart inverter. 2. If error message still exists, contact manufacturer.
1402	DC SPD function abnormal	1. After shutdown, check the DC SPD. 2. If error message still exists, contact manufacturer.
1403	PV short circuits	1. Check whether the PV1, PV2 or other PV wiring is short-circuited. 2. If error message still exists, contact manufacturer.
1405	AC SPD function abnormal	1. After shutdown, check the AC SPD. 2. If error message still exists, contact manufacturer.
1406	PV Reversed	1. Check PV input terminals. 2. If error message still exists, contact manufacturer.
1500	BMS Communication fault	1. Check battery communication cable between the inverter and battery. 2. Check if battery is sleeping. 3. If error message still exists, contact manufacturer.
1510	Lead-acid battery temperature sensor connection is abnormal	1. After shutdown, check whether the temperature sampling module is connected properly. 2. If the error message still exists, contact manufacturer.
1512	BMS failure and neither charge and discharge is allowed	1. Depend on BMS error code. 2. If error message still exists, contact manufacturer.
1513	Lithium battery status abnormal alarm	1. The lithium battery cannot be charged or discharged. Determine the cause of the abnormality based on the battery status. 2. If error message still exists, contact manufacturer.

09 Technical Parameter

9.1 Hybrid Inverter Parameter

Item \ Model	A3600S A3600S-E	A4600S A4600S-E	A5000S A5000S-E
PV Input Specification			
Recommended max. PV input power	7200W	9200W	10000W
Max. PV input voltage	550Vd.c.		
Startup input voltage	90Vd.c.		
Rated PV input voltage	360Vd.c.		
MPPT voltage range	100Vd.c. – 530Vd.c.		
No. of independent MPPT inputs	2		
No. of PV strings per MPPT	1 / 1		
Max. PV input current	16Ad.c. / 16Ad.c.		
Max. PV short-circuit current	20Ad.c. / 20Ad.c.		
Max. inverter backfeed current to the array	0Ad.c.		
Battery Port Specification			
Battery type	Li-ion Battery		
Battery voltage range	80Vd.c. – 460Vd.c.		
Max. charge / discharge current(continuous)	35Ad.c. / 37Ad.c.		
Max. charge / discharge power(continuous)	5000W / 5000W	5000W / 5000W	5000W / 5000W
Communication	CAN		
Charging strategy	BMS instructions		
Battery Expansion	1~2 series-connected 8.9kWh high-voltage battery modules per cluster		

Grid Port Specification

Max. AC input apparent power	7500VA	7500VA	7500VA
Max. AC input current	34.1Aa.c.	34.1Aa.c.	34.1Aa.c.
Max. AC output apparent power	3600VA	4600VA	4999VA
Rated AC output power	3600W	4600W	4999W
Max. AC output current	16.4Aa.c.	21Aa.c.	22.8Aa.c.
Rated AC output current	15.7Aa.c.	20Aa.c.	21.8Aa.c.
AC output inrush current	22.5Aa.c.		
AC input inrush current	22.0Aa.c.		
Rated AC voltage	L / N / PE, 220Va.c. / 230Va.c. / 240Va.c.		
Rated grid frequency	50Hz / 60Hz		
THDI @Full load	< 3%		
Power factor at rated power / Adjustable power factor	> 0.99 (0.8 leading – 0.8 lagging)		
ICC	40A		
ICP	6kA		

GEN Port Specification

Max. AC input apparent power	7500VA	7500VA	7500VA
Rated AC voltage	L / N / PE, 220Va.c. / 230Va.c. / 240Va.c.		
Rated GEN frequency	50Hz / 60Hz		

Backup Port Specification

Max AC output apparent power	5500VA	5500VA	5500VA
Rated output power	3600W	4600W	5000W
Peak output power	7500W 10S	7500W 10S	7500W 10S

Max AC output current	25Aa.c.	25Aa.c.	25Aa.c.
Rated voltage	L / N / PE, 220Va.c. / 230Va.c. / 240Va.c.		
Rated grid frequency	50Hz / 60Hz		
THDV @Linear load	< 3%		
Backup switch time	≤10ms		
Efficiency			
Max. efficiency	97.5%		
European efficiency	96.9%		
Protection & Function			
Grid monitoring	yes		
DC reverse polarity protection	yes		
AC short-circuit protection	yes		
Leakage current protection	yes		
DC switch	yes		
Battery input reverse polarity protection	yes		
Active anti-islanding method	yes (Frequency Shift)		
Over Voltage Category	DC type II / AC type III		
General Information			
Topology (solar / battery)	Transformerless / Transformerless		
Degree of protection	IP65		
Pollution degree classification	External (PD3), Internal (PD2)		
Dimensions (W * H * D)*	730 *555 *180 mm (±4mm)		
Weight*	42kg (±3KG)		

Installation type	Floor stand
Cooling method	Natural cooling
Noise(MAX)	< 30dB
Protective Class	Class I
Ambient temperature	-20°C ~ +60°C (> 45°C derating)
Relative humidity (Non-condensing)	15% – 95%
Max. operating altitude	3000m
Wet locations classification	Yes
Monitor	RS485, WLAN, Ethernet, CAN
Display	LCD+APP
DI / DO	DI * 1 / DO * 2 / DRM
DC connection type	MC4
AC connection type	Plug and play connector
Warranty*	10 years
Country of Manufacture	Made in China
Certification & Standard	
Certification	CB, CE, UKCA, SONCAP, RCM, ROHS
Standard	IEC/EN 62109-1, IEC/EN 62109-2, IEC 62619, IEC 60730-1 Appendix H, IEC/EN 62368-1, EN IEC 61000-6-1/3, IEC 61 000-2-2, CISPR 11, IEC 60529, IEC 60068-2-52, AS/NZS 4777.2, IEC 60947.1, AS 60947.3, VDE-AR-N 4105, EN 50549-1, G98, G99, UN 38.3, MSDS

Dimensions (W * H * D)*: Total dimension of inverter and control box.

Weight*: Total weight of inverter and control box.

Warranty*: Refer to the product warranty terms for details.

9.2 AC-Coupled Inverter Parameter

Item	Model	AC3600S AC3600S-E	AC4600S AC4600S-E	AC5000S AC5000S-E
Battery Port Specification				
Battery type	Li-ion Battery			
Battery voltage range	80Vd.c. – 460Vd.c.			
Max. charge / discharge current(continuous)	35Ad.c. / 37Ad.c.			
Max. charge / discharge power(continuous)	5000W/5000W	5000W/5000W	5000W/5000W	
Communication	CAN			
Charging strategy	BMS instructions			
Battery Expansion	1~2 series-connected 8.9kWh high-voltage battery modules per cluster			
Grid Port Specification				
Max. AC input apparent power	7500VA	7500VA	7500VA	
Max. AC input current	34.1Aa.c.	34.1Aa.c.	34.1Aa.c.	
Max. AC output apparent power	3600VA	4600VA	4999VA	
Rated AC output power	3600W	4600W	4999W	
Max. AC output current	16.4Aa.c.	21Aa.c.	22.8Aa.c.	
Rated AC output current	15.7Aa.c.	20Aa.c.	21.8Aa.c.	
Rated AC voltage	L / N / PE, 220Va.c. / 230Va.c. / 240Va.c.			
Rated grid frequency	50 Hz / 60Hz			
THDI @Full load	< 3%			
Power factor at rated power / Adjustable power factor	>0.99 (0.8 leading – 0.8 lagging)			
ICC	40A			
ICP	6kA			

Backup Port Specification

Max. AC output apparent power	5500VA	5500VA	5500VA
Rated output power	3600W	4600W	5000W
Peak output power	7500W 10S	7500W 10S	7500W 10S
Max. AC output current	25Aa.c.	25Aa.c.	25Aa.c.
Rated voltage	L / N / PE, 220Va.c. / 230Va.c. / 240Va.c.		
Rated grid frequency	50Hz / 60Hz		
THDV @Linear load	< 3%		
Backup switch time	≤10ms		

Efficiency

Max. efficiency	97.5%
European efficiency	96.9%

Protection & Function

Grid monitoring	Yes
DC reverse polarity protection	Yes
AC short-circuit protection	Yes
Leakage current protection	Yes
DC switch	Yes
Battery input reverse polarity protection	Yes
Active anti-islanding method	yes (Frequency Shift)
Over Voltage Category	DC type II / AC type III

General Information

Topology (solar / battery)	Transformerless / Transformerless
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Ingress protection Rating	IP65
Pollution degree classification	External (PD3), Internal (PD2)
Dimensions (W * H * D)*	730 *555 *180 mm (±4mm)
Weight*	39kg (±3KG)
Mounting method	Floor stand
Cooling method	Natural cooling
Noise (MAX)	<30dB
Protective Class	Class I
Ambient temperature	-20°C ~ +60°C (>45°C derating)
Relative humidity (Non-condensing)	15% - 95%
Max. operating altitude	3000m
Wet locations classification	Yes
Monitor	RS485, WLAN, Ethernet, CAN
Display	LCD+APP
DI / DO	DI * 1 / DO * 2 / DRM
DC connection type	MC4
AC connection type	Plug and play connector
Warranty*	10 years
Country of Manufacture	Made in China
Certification & Standard	
Certification	CB, CE, UKCA, SONCAP, RCM, ROHS
Standard	IEC/EN 62109-1, IEC/EN 62109-2, IEC 62619, IEC 60730-1 Appendix H, IEC/EN 62368-1, EN IEC 61000-6-1/3, IEC 61 000-2-2, CISPR 11, IEC 60529, IEC 60068-2-52, AS/NZS 4777.2, IEC 60947.1, AS 60947.3, VDE-AR-N 4105, EN 50549-1, G98, G99, UN 38.3, MSDS

Dimensions (W * H * D)*:Total dimension of inverter and control box.

Weight*:Total weight of inverter and control box.

Warranty*:Refer to the product warranty terms for details.