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LOW VOLTAGE SINGLE-PHASE HYBRID INVERTER

H8000S/H10000S/H12000S

User Manual

Preface

・All information contained in this document is the property of the battery system manufacturer. No part of this document may be reproduced or copied in any commercial form. Internal use is permitted.

・For any devices and/or software other than the product described in this document, the manufacturer makes no express or implied warranties or guarantees, including but not limited to any implied warranties of merchantability, fitness for a particular purpose, accuracy, or completeness, the accuracy or completeness of the reply.

・Under no circumstances shall the manufacturer, its distributors, or resellers be liable for any indirect, incidental, or consequential damages resulting from failure to follow the guidelines in this document.

・Specifications in this document are subject to change without prior notice. While every effort has been made to ensure the completeness, accuracy, and timeliness of this document, the manufacturer reserves the right to implement changes as necessary without advance notification. The manufacturer is not responsible for any losses arising from this document, including but not limited to omissions, printing errors, calculation mistakes and errors contained herein.

About this document

This manual features product information, installation, operation, and maintenance instructions.

This manual cannot contain complete information about photovoltaic (PV) systems. Readers can obtain more information about other equipment at https://www.hinen.com or the web page of the appropriate module manufacturer.

Validity

This manual applies to the following inverter models:

•H8000S •H10000S •H12000S

Hereinafter referred to as inverters, unless otherwise stated.

*Machines with an emergency stop switch function.

Target group

・Qualified persons responsible for the installation and commissioning of inverters.

・Inverter owners who are able to interact with inverters.

How to Use This Manual

Please read this manual and other relevant documents before performing any operation on the inverter.
The documents must be properly kept and readily available at all times.
Due to product development, the content may be updated or revised periodically. This manual may change in subsequent versions of the inverter.
You can obtain the latest version of the manual by visiting 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.

Contents

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 structions.
	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

• This chapter contains important safety and operating instructions. Please read and save this manual for future reference.

• All batteries and AC power must be disconnected from the inverter for at least 5 minutes before any wiring or electrical work is performed on the inverter to ensure that the inverter is completely isolated and to avoid electrical shock.

• The surface temperature of the inverter may exceed 60°C during operation, make sure it has cooled before touching it and keep the inverter out of the reach of children.

• Do not open the inverter or replace any parts without the manufacturer's authorization, otherwise the warranty commitment of the inverter will be void.

• Use and operate the inverter according to the instructions in this user manual, otherwise the protective design of the inverter may be affected and the warranty commitment of the inverter will be void.

• Please take appropriate measures to protect the inverter from static electricity damage, the manufacturer is not responsible for any damage caused by static electricity.

• The negative photovoltaic terminal (PV-) and the negative battery terminal (BAT-) on the inverter side are not grounded by default.

• The PV modules used on the inverter must meet IEC61730 Class A. The total open-circuit voltage of the PV strings/arrays must be lower than the maximum rated DC input voltage of the inverter, and any damages caused by PV over-voltage are not covered by the warranty.

• The output terminal of the distribution box on the off-grid side should be marked with "Main Switch EPS Power Supply", and the output terminal of the distribution box on the common load side should be marked with "Main Switch Inverter Power 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.

Important Safety Instruction

DANGER

Danger to life due to electric shock when live components or cables are touched.

There is high voltage in the conductive components or cables of the product. Touching live parts and cables can result in death or lethal injuries due to electric shock.

• Do not touch non-insulated parts or cables.

• Disconnect the product from voltage sources and make sure it cannot be reconnected before working on the inverter or the battery pack.

• After disconnection, wait for 5 minutes until the capacitors have discharged.

• Do not open the product.

• Wear suitable personal protective equipment for all operations on the product.

CAUTION

Risk of burns due to hot heatsink and housing.

• The heatsink and housing can get hot during operation.

• During operation, do not touch any parts other than the cover of the inverter.

NOTICE

Damage to the inverter due to electrostatic discharge.

• Touching electronic components can cause damage to or destroy the inverter through electrostatic discharge.

• Ground yourself before touching any component.

NOTICE

Damage due to cleaning agents.

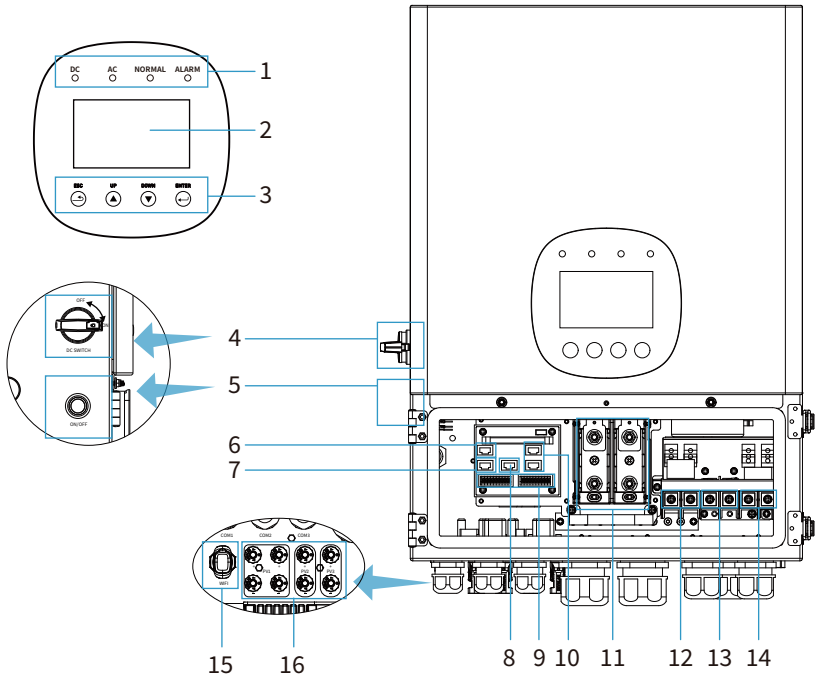
• The use of cleaning agents may cause damage to the product and its components.

• Clean the product and all its components only with a cloth moistened with clear water.

02 Product Introduction

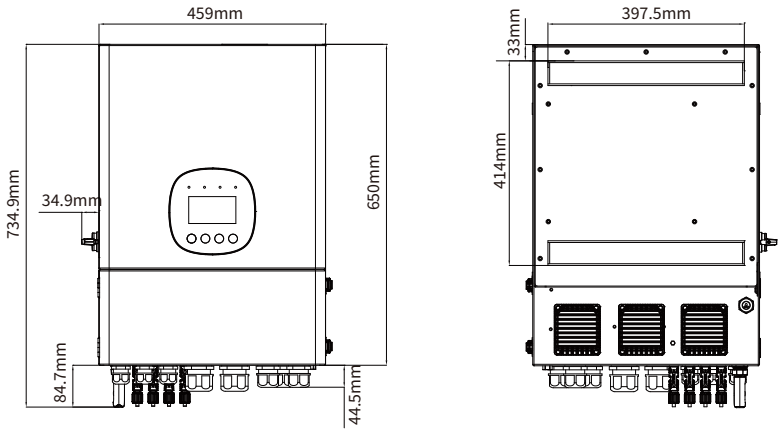
This is a multifunctional inverter that integrates an inverter, a solar charger, and a battery charger into one unit. It provides uninterruptible power support in a compact and sleek design. Its comprehensive LCD display offers user configurable and easy-to-use button operation for functions such as battery charging, AC charging/solar charging, and providing acceptable input voltage for different applications.

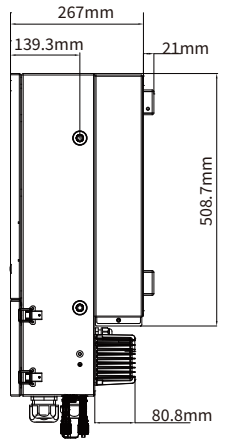
2.1 Product Overview

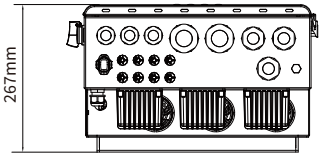


1. Inverter indicator	2. LCD display	3. Function button	4. DC switch
5. Power switch	6. Meter/CT port	7. Battery port	8. DRM
9. Function Port	10. Parallel Port	11. Battery Input Connector	12. Grid Port
13. Generator port	14. Load Port	15. WiFi Interface	16. PV input Port

2.2 Product Size







2.3 Basic System Architecture

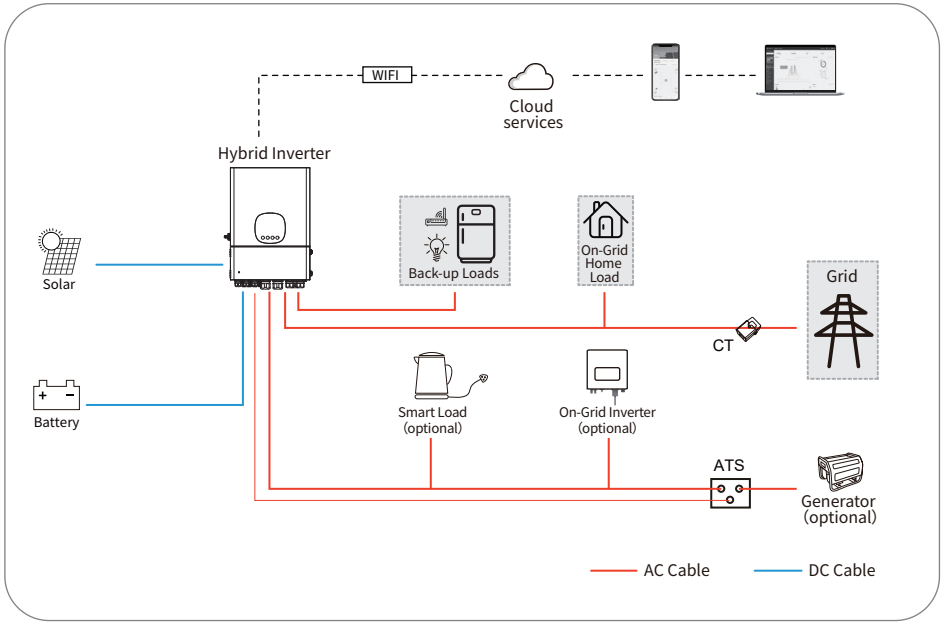
The following figure shows the basic application of this inverter.

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.



03 Product Installation

3.1 Checking Before Installation

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

Upon receipt of the Hybrid Inverter, please check the following parts for loss or damage.
*The pictures shown here are for reference only. Actual product and quantity are subject to delivery.

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

★ For parallel use only.

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

⚠ Warning:Installation Precautions:

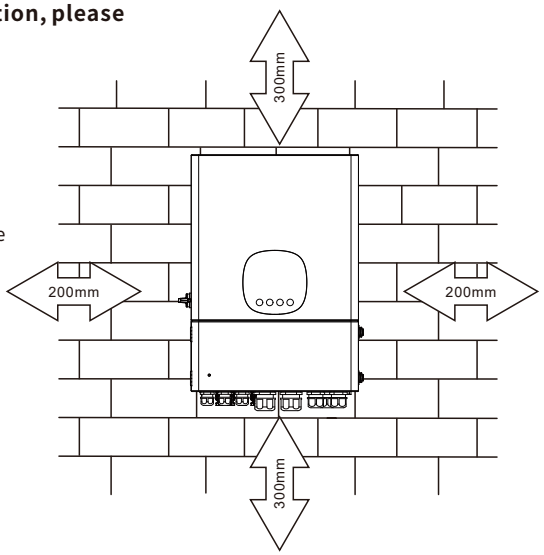
This hybrid inverter is designed for outdoor use (IP65). Make sure that the installation location complies with the following conditions:

- Avoid direct sunlight, rain and snow during installation and operation.
- Avoid places where highly flammable materials are stored.
- Avoid places where an explosion may occur.
- Avoid being placed directly in cold air.
- Not near a TV aerial or aerial cable.
- Not above an altitude of approximately 3000 meters.
- Not in an environment with precipitation or humidity greater than 95%.

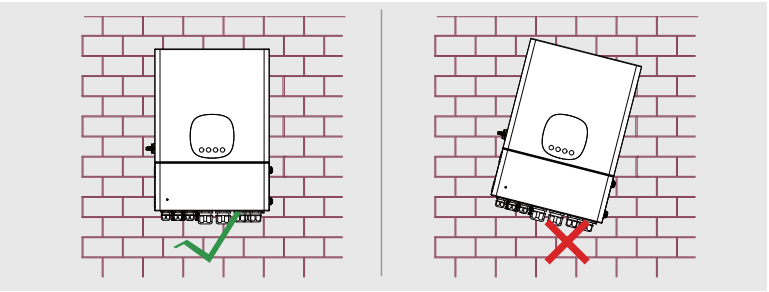
⚠ WARNING	Avoid direct sunlight, rain and snow during installation and operation.

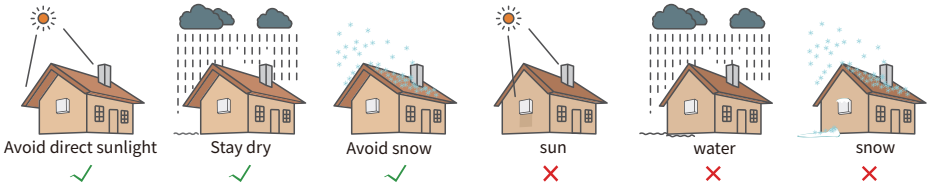
Before selecting the mounting location, please consider the following points:

- Do not install the inverter on flammable building materials.
- Mount on a solid surface.
- Install the inverter at eye level so that the LCD display can be read at all times.
- For air circulation and heat dissipation, leave a clearance of approx. 200 mm and approx. 300mm above and below the unit.
- The ambient temperature should be between 0°C and 55°C to ensure optimum operation.
- The recommended mounting position is vertically on the wall.
- Make sure that other objects and surfaces are as shown in the diagram below to ensure adequate heat dissipation and enough space to remove the wires.



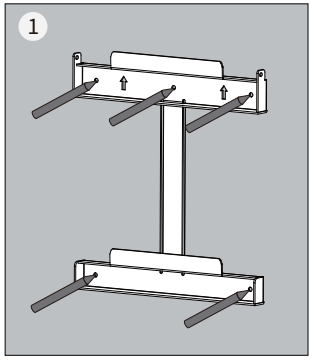
⚠ Install only on concrete or other non-combustible surfaces.

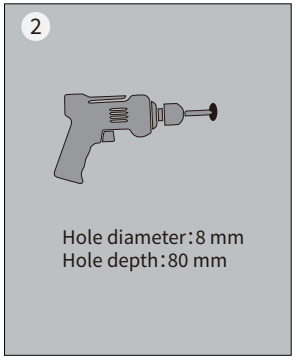


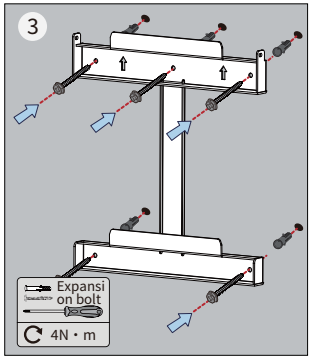


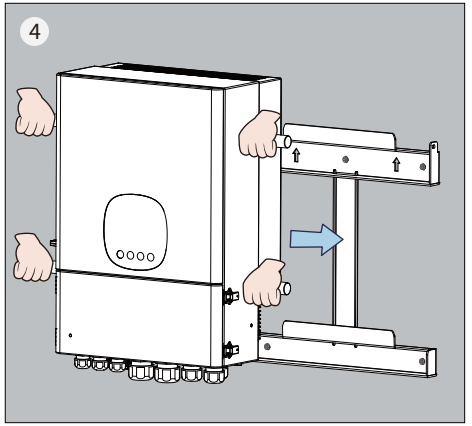
WARNING Please keep in mind that the inverter is heavy! Please be careful when removing it from the package.

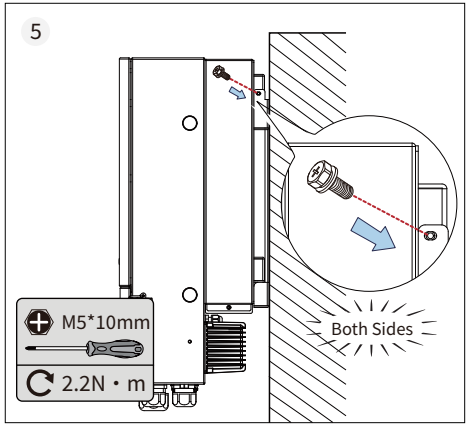
1. Mark the holes using a marker.
2. Drill 5 holes in the wall to a depth of 80mm using the recommended drill bit (as shown in the picture below).
3. Align the holes of the bracket with the marked positioning holes on the wall, then insert the expansion screws into the holes. Use a tool to tighten them to the specified torque, ensuring the bracket is securely attached to the wall.
4. Carefully lift the inverter to the top of the bracket, align it with the installation slot, and slowly lower it to ensure the locking mechanism clicks into place.
5. Install the fixing screws on both sides.
6. Remember to remove the handles after installation.

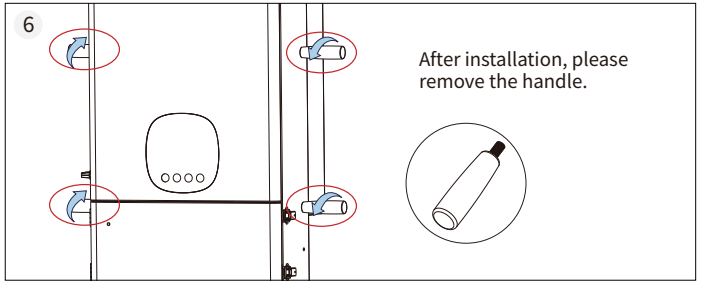






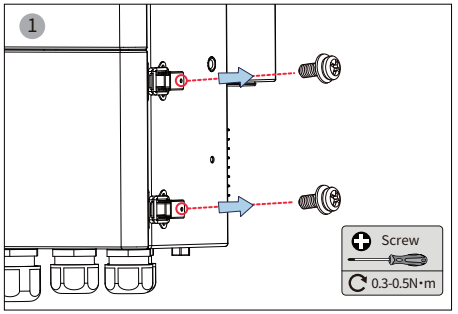


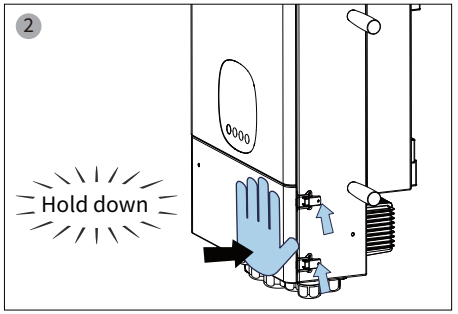


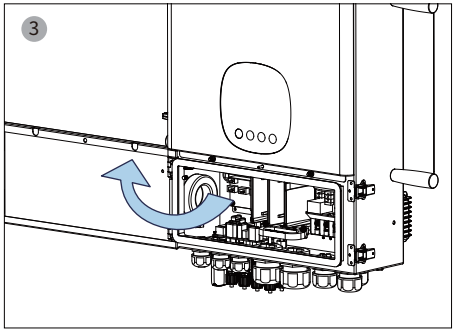


Before connecting all the wires, please follow the steps below to unscrew the cover.

1. First, Unscrew the bolts on the toggle latch.
2. Press the inverter cover firmly with your hand before opening the toggle latch.
3. Finally, open the cover.







WARNING

·Regardless of whether opening or closing the cover, always manually press the cover first before unlocking or securing the toggle latch.

· After completing the wiring, press the cover to align the screw holes on the latch with those on the chassis, then tighten the screws. The recommended torque is 0.3-0.5N·m. Avoid over-tightening to prevent screw breakage.

04 Electrical Connections

Safety precautions

Precautions:

DANGER

· This product operates at high voltage. Before connecting the cables, ensure that all circuit breakers and switches connected with 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.

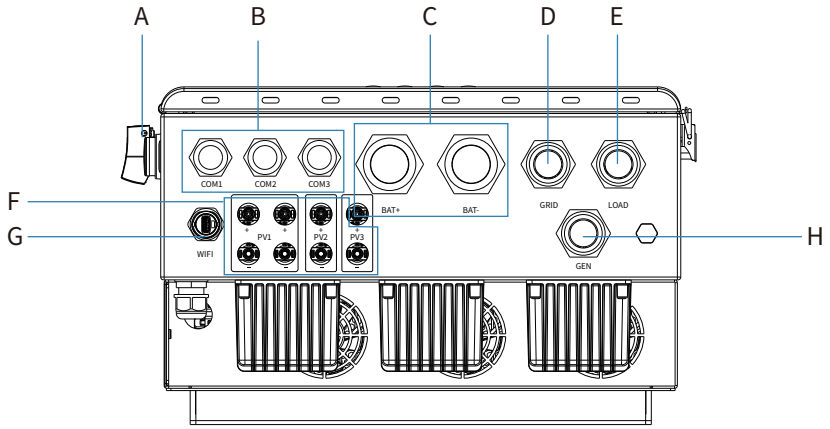
· Operators must wear appropriate personal protective equipment when connecting cables.

NOTICE

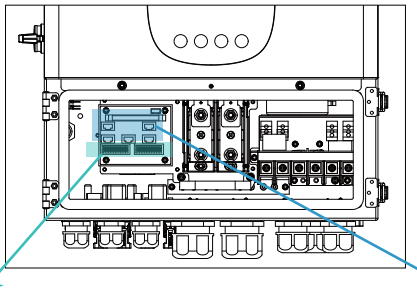
· The cable colors shown in the electrical connection diagrams provided in this chapter are for reference only.

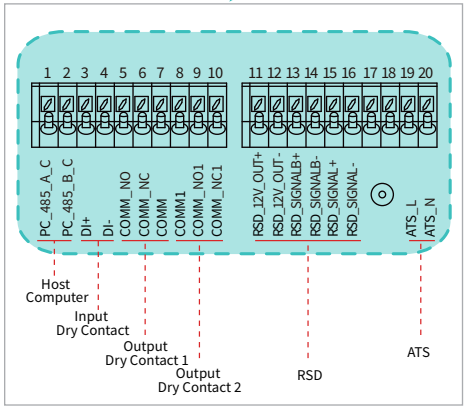
· Select cables according to local cable specifications (green and yellow cables are only used for PE)

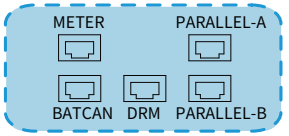
4.1 Port Definition



No.	Port Definition	Function Description
A	DC switch	DC Switch.
B	COM communication terminal	Can be used for parallel function, battery BMS communication, meter communication connection.
C	Battery connection terminal	Battery power line interface.
D	GRID connection terminal	Grid interface.
E	LOAD connection terminal	Back up load interface.
F	PV connection terminal	PV interface.
G	WIFI	Used to connect WIFI logger.
H	GEN connection terminal	Can be used to connect smart loads, generators or the third party on-grid inverters.







PARALLEL-A: Parallel communication port 1 (CAN interface).
PARALLEL-B: Parallel communication port 2 (CAN interface).
METER：Connect the meter for communication.
BATCAN：In the lithium battery mode, communicate with the BMS via CAN.
DRM：Used for external demand response to start the equipment.

Wire number	grout	Definition	Functions	Description
1	upper computer	PC_485_A_C		
2		PC_485_B_C		
3	Input and output dry contacts	DI+	Reserved	Reserved
4		DI-	Reserved	Reserved
5		COMM_NO	Generator dry contact	A dry contact signal for starting the diesel generator. When the "generator signal" is activated, the open-circuit contacts "COMM_NO" and "COMM" will close.For more details on dry contact-related settings, refer to the LCD settings descriptions on battery setting page 3 and auxiliary dry contact setting.
7		COMM		
6		COMM_NC	Reserved	Reserved
8		COMM1	Reserved	Reserved
9		COMM_NO1	Reserved	Reserved
10		COMM_NC1	Reserved	Reserved
11	RSD	RSD_12V_OUT+	Positive Power Supply	When the battery is connected and the inverter is in the "ON" state, the inverter will supply 12V DC to the RSD.
12		RSD_12V_OUT-	Negative Power Supply	
13		RSD_SIGNALB+	Dry Contact Input	When the terminals "RSD_SIGNALB +" and "RSD_SIGNALB -" are short-circuited with an additional wire, the 12V DC power at "RSD_12V_out+" and "RSD_12V_out-" will disappear immediately.
14		RSD_SIGNALB-		
15		RSD_SIGNAL+	RSD	When a 12V DC is input to the terminals "RSD_voltage signal+" and "RSD_voltage signal-", the 12V DC at "RSD_12V_output+" and "RSD_12V_output-" will disappear immediately.
16		RSD_SIGNAL-		
17	--	--	--	--
18	--	--	--	--
19	ATS	ATS_L		
20		ATS_N		

Detailed PIN function of the inverter meter port

RJ45 PIN	Definition (METER)
1	METER_485_B
2	ICT2+
3	ICT1+
4	5V
5	METER_485_A
6	ICT1-
7	GND
8	ICT2-

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	DRM_REF
6	DRM_COM
7	GND
8	NC

Detailed PIN functions of the inverter BMS port:

RJ45 PIN	Definition (BMS)
1	BMS_WAKE
2	GND
3	EX_NTC
4	BMS_CANH
5	BMS_CANL
6	NC
7	NC
8	NC

NOTICE

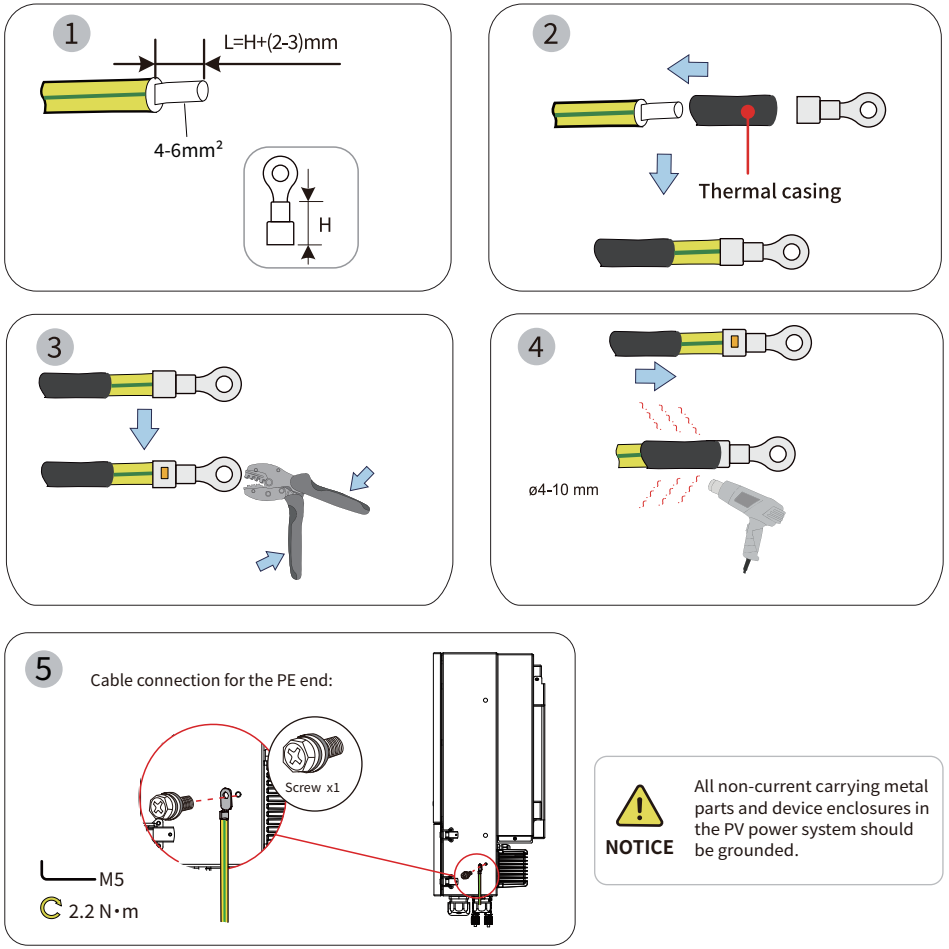
When the inverter is in the off-grid state, the N wire needs to be connected to the ground.
During final installation, a circuit breaker complying with the standards of IEC 60947-1 and IEC 60947-2 shall be installed together with the equipment.

4.2 Grounding Connection

NOTICE

Electric shock hazard
Before doing electrical connection, please ensure the PV switch & all AC and BAT circuit breakers in the energy storage system are switched OFF and cannot be reactivated.

The grounding cable should be connected to the grounding busbar on the grid side to prevent electric shock.



NOTICE

All non-current carrying metal parts and device enclosures in the PV power system should be grounded.

4.3 PV Connection

CAUTION: Before connecting the PV modules, install a DC circuit breaker separately between the inverter and the PV modules.

WARNING! All wiring must be completed by qualified personnel.

WARNING! Using suitable cables to connect PV modules is crucial for the safe and efficient operation of the system. To reduce the risk of injury, please use the appropriate cable sizes recommended below.

Model	Wire Gauge
8/10/12KW	10AWG/6mm²

WARNING

When using photovoltaic modules, ensure that the PV+ and PV- of the solar panels are not connected to the system grounding rod.
A photovoltaic junction box with surge protection function is required. Otherwise, when the photovoltaic modules are struck by lightning, the inverter may be damaged.

PV Module Selection:

When selecting suitable PV modules, please be sure to consider the following requirements:

1.The open-circuit voltage (Voc) of the PV module must not exceed the inverter' s maximum PV array open-circuit voltage.

2.The open-circuit voltage (Voc) of the PV module should be higher than the minimum battery voltage.

3.The PV modules used for connection to this inverter must comply with Class A certification standards.

Solar Charging Mode			
	MPPT Charger		
Inverter Model	8kW	10kW	12kW
PV Input Voltage	370V (100V~500V)		
PV Array MPPT Voltage Range	100V-425V		
No. of MPP Trackers	3	3	3
No. of Strings per MPP Tracker	3/2+1+1	3/2+1+1	3/2+1+1

WARNING

When the PV array is exposed to sunlight, it will supply DC voltage to the PCE.

PV Module Cable Connection:

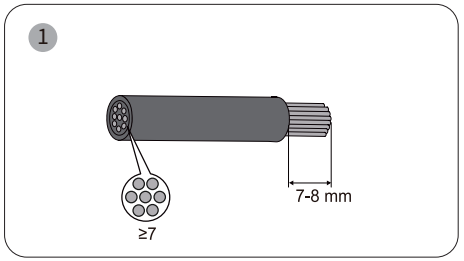
1. Strip the insulation layer of the PV cable to an appropriate length.

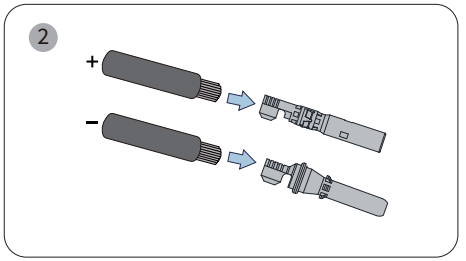
2. Insert the stripped cable into the PV pin contact.

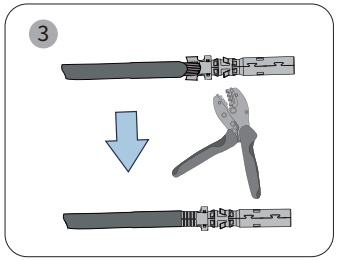
3. Ensure that the polarity of the PV cable matches that of the PV pin contact. Crimp the connection using a crimping tool. Pay attention to the correct crimping position.

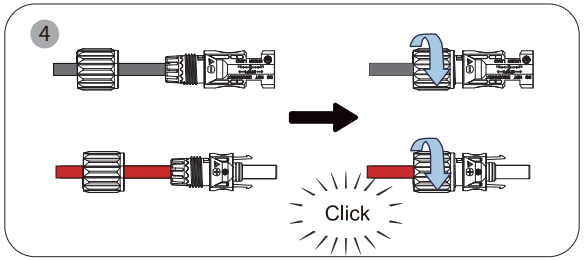
4. Insert the PV cable into the PV connector. If properly connected, a "click" sound will be heard. Gently pull back on the cable to ensure it is securely connected. Tighten the locking nut. Before making the connection, confirm that the PV connector polarity is correct.

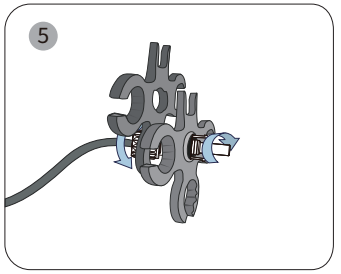
5. Use a voltage measuring device that complies with local regulations to measure the positive and negative voltages of the assembled PV connector. Ensure the open-circuit voltage does not exceed the input limit of 500 V.

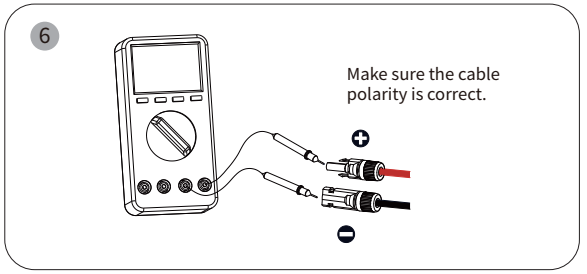




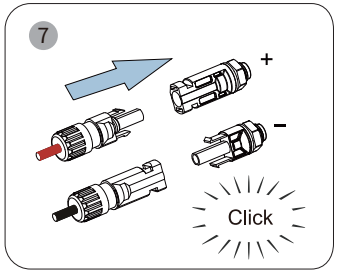








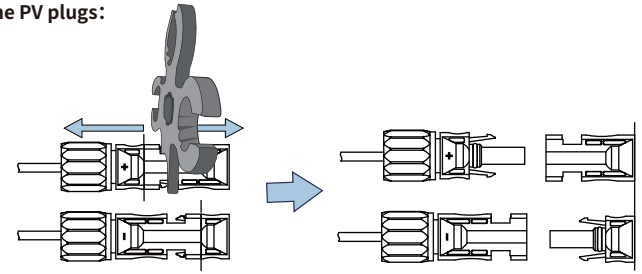
Remove the PV terminal cover and connect the assembled PV connectors to the corresponding terminals until a "click" sound is heard.
The PV+ from the string side must be connected to the PV+ on the inverter side, and the PV− from the string side must be connected to the PV− on the inverter side.



WARNING

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 Seal any unused PV terminals with the original terminal caps. If all PV terminals are connected, store the waterproof caps properly. After removing a connector from a terminal, reinstall the cap immediately.

4.4 Battery Connection

To ensure safe operation and compliance, a separate DC overcurrent protector or disconnecting device is required between the battery and the inverter. In some applications, a switching device may not be required, but an overcurrent protector is still needed. Please refer to the typical amperage in the table below for the fuse or circuit breaker size required.

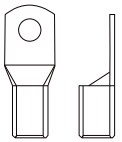
WARNING: All wiring must be performed by qualified personnel.

WARNING: To reduce the risk of injury, use the appropriate cable and terminal sizes recommended below. It is important for the safe and efficient operation of the system that the proper cables are used to connect the battery.

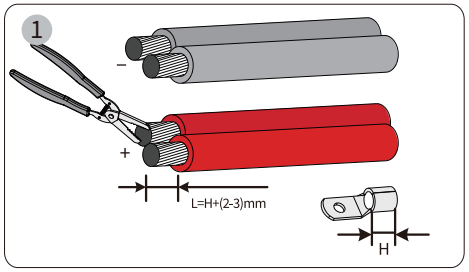
Recommended battery cable and terminal sizes:

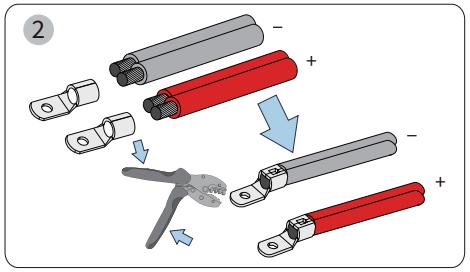
Model	Typical Amperage	Wire Gauge	Outer Diameter
8/10/12KW	240A	2*3 AWG/2*35mm²	2*Φ12mm

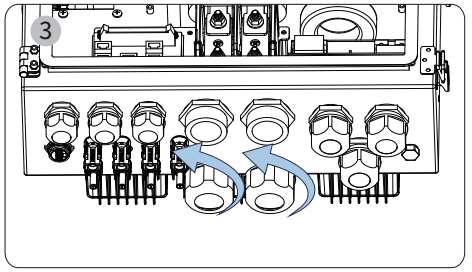
Battery Terminal 2

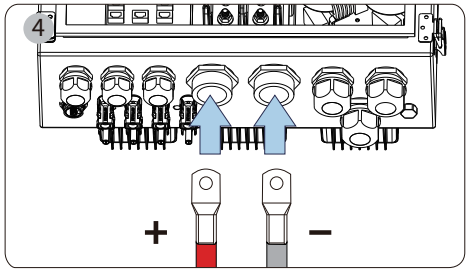


Please follow the steps below to connect the battery:
1. Strip the insulation layer of the battery power cable to an appropriate length.
2. Insert the stripped cable into Battery Terminal No. 2. Use a battery crimping tool to crimp it.
3. Twist off the cap from the BAT+ and BAT- ports in a counterclockwise direction.
4. Route the battery cables through the machine's positive and negative terminals.

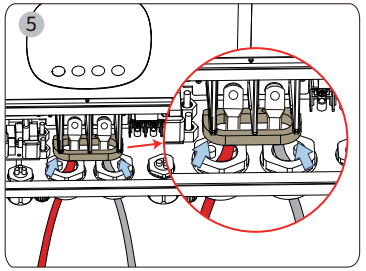


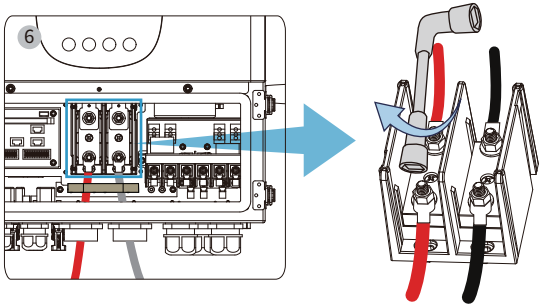






5. Thread the battery cable through the magnetic ring. (If no magnetic ring is present, omit this step.)
6. Use a suitable screwdriver to remove the bolt, install the battery connector, then tighten the bolt with the screwdriver, ensuring the bolt is turned clockwise.





NOTICE Ensure the battery and inverter are connected with correct polarity.
Turn the inverter connector clockwise to secure it in a waterproof position, preventing access by children or entry of insects.

WARNING Before making the final DC connection or turning on the DC circuit breaker/isolation switch, make sure that the positive (+) terminal is connected to the positive (+), and the negative (−) terminal is connected to the negative (−). Reversing battery polarity can damage the inverter.

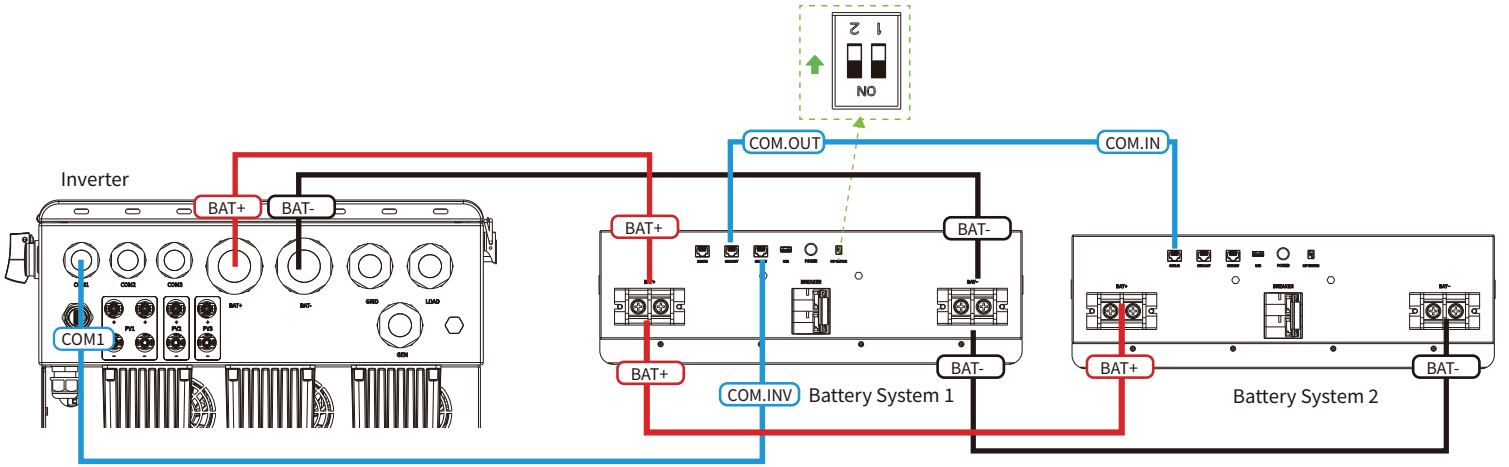
NOTICE

This inverter supports connection to lithium battery systems or lead-acid battery systems. Please confirm the type of battery system before connection. If the wrong system is selected, the inverter system may not function properly.

4.4.1 Lithium Battery System Connection

Single Battery Connection

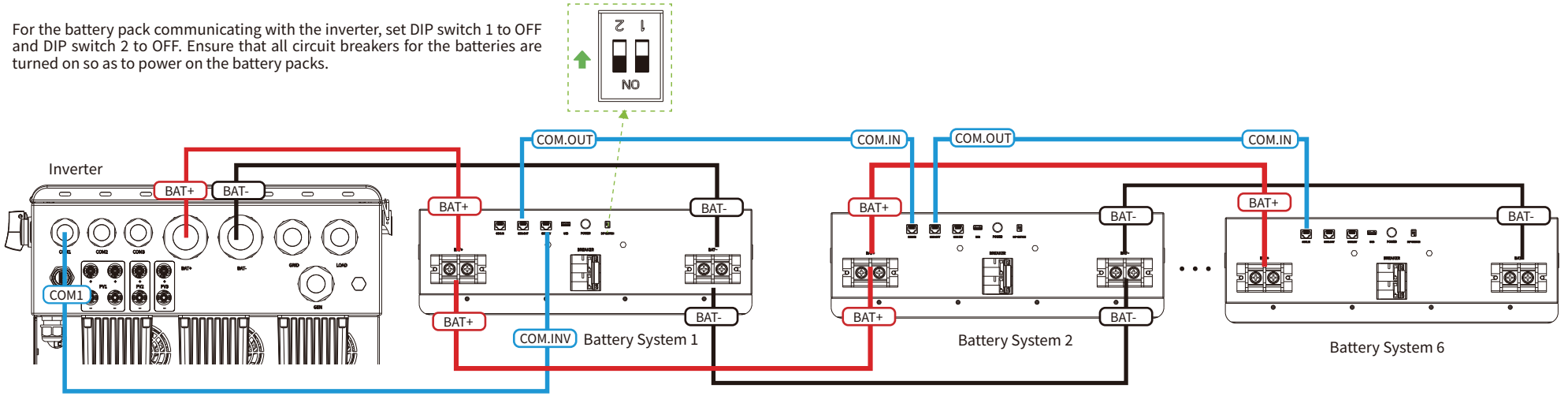
1. Refer to Section 4.4 for the installation of the battery's positive and negative terminals.
2. For BMS communication, connect one end to the inverter's COM 1 terminal and the other end to the battery's COM-INV terminal. COM-IN and COM-OUT terminals do not need to be connected for a single battery pack.
3. For detailed information on how to connect the battery BMS connector, refer to the BMS port introduction.
4. This diagram is for reference only. See the battery manual for specific details.



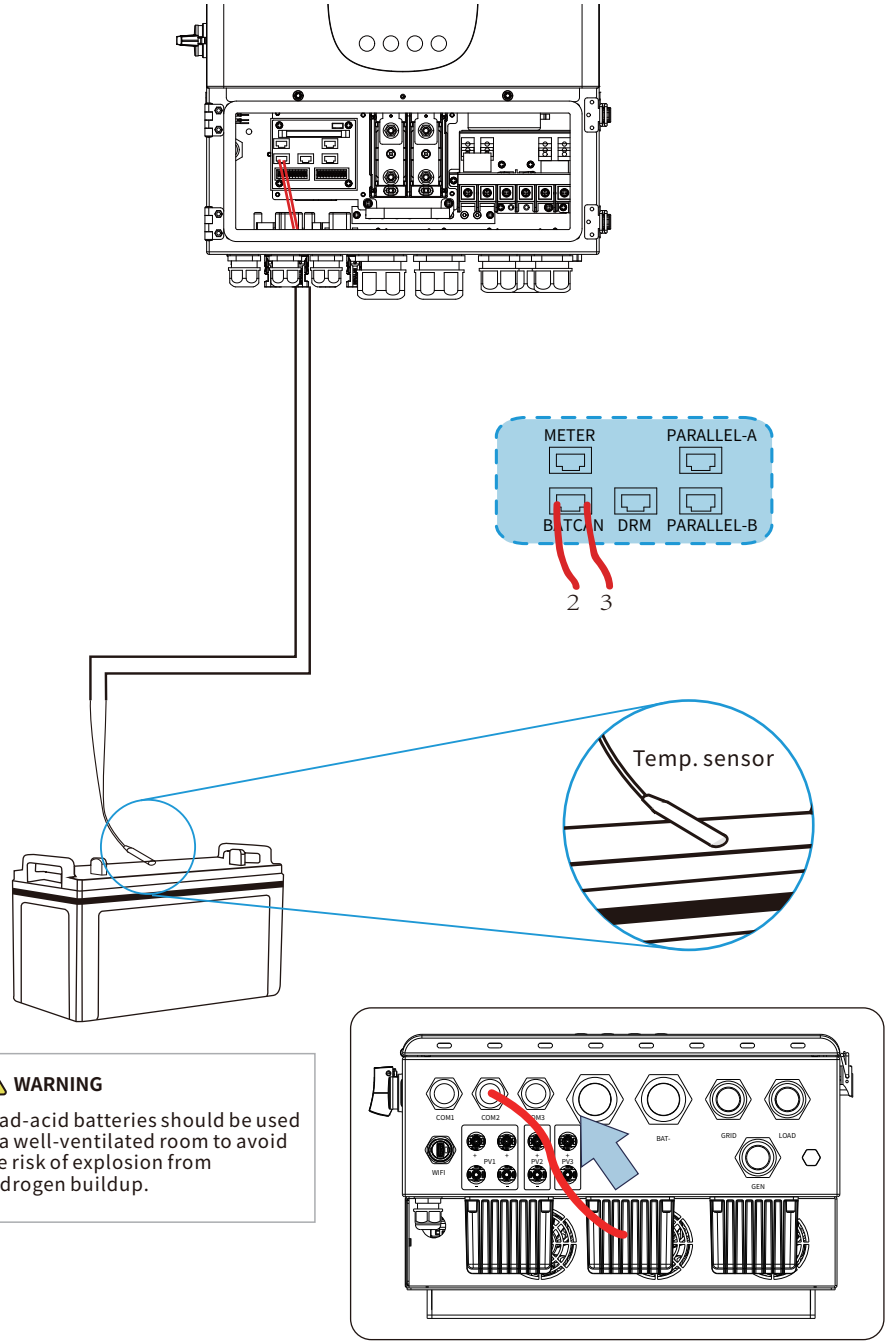
Battery Pack Parallel Wiring Configuration

In the battery system, connect the positive terminal of each battery pack to the positive terminal and the negative terminal to the negative terminal. The inverter communication line should be connected to the COM-INV terminal of the main battery pack. The COM-OUT terminal of the main battery pack should be connected to the COM-IN terminal of the subsequent battery pack, and so on.

For the battery pack communicating with the inverter, set DIP switch 1 to OFF and DIP switch 2 to OFF. Ensure that all circuit breakers for the batteries are turned on so as to power on the battery packs.



4.4.2 Lead-Acid Battery Connection



WARNING

Lead-acid batteries should be used in a well-ventilated room to avoid the risk of explosion from hydrogen buildup.

4.5 AC Cable Connection Guide

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

Before connecting to the grid, install a separate AC circuit breaker between the inverter and the utility grid. Additionally, it is recommended to install an AC circuit breaker between the backup load and the inverter. This ensures the inverter can be safely disconnected during maintenance and provides full protection against overcurrent.

There are three wiring terminals labeled "GRID," "LOAD," and "GEN." Do not connect the input and output connectors incorrectly.

NOTE

- All wiring work must be carried out by qualified personnel. Using appropriate cables for connecting the AC input terminals is essential for system safety and efficient operation. To reduce the risk of injury, please use the recommended cables listed below.
- Before connecting the grid, load, and GEN ports, be sure to turn off the AC circuit breaker or isolation switch.

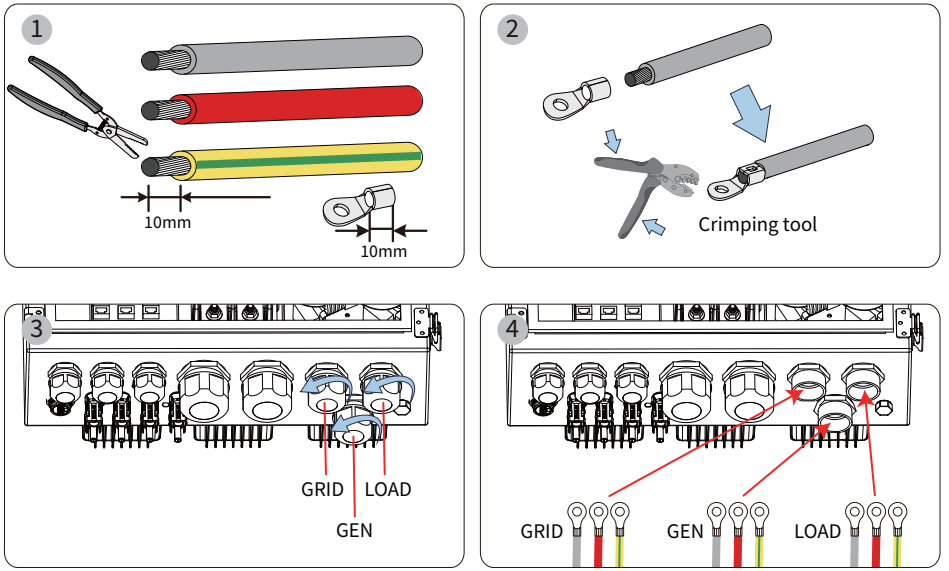
Model	Wire Gauge	Outer Diameter (mm)
8/10/12KW	1*6AWG/13~16mm²	8~9mm

4.5.2 On-Grid & Off-Grid Connection

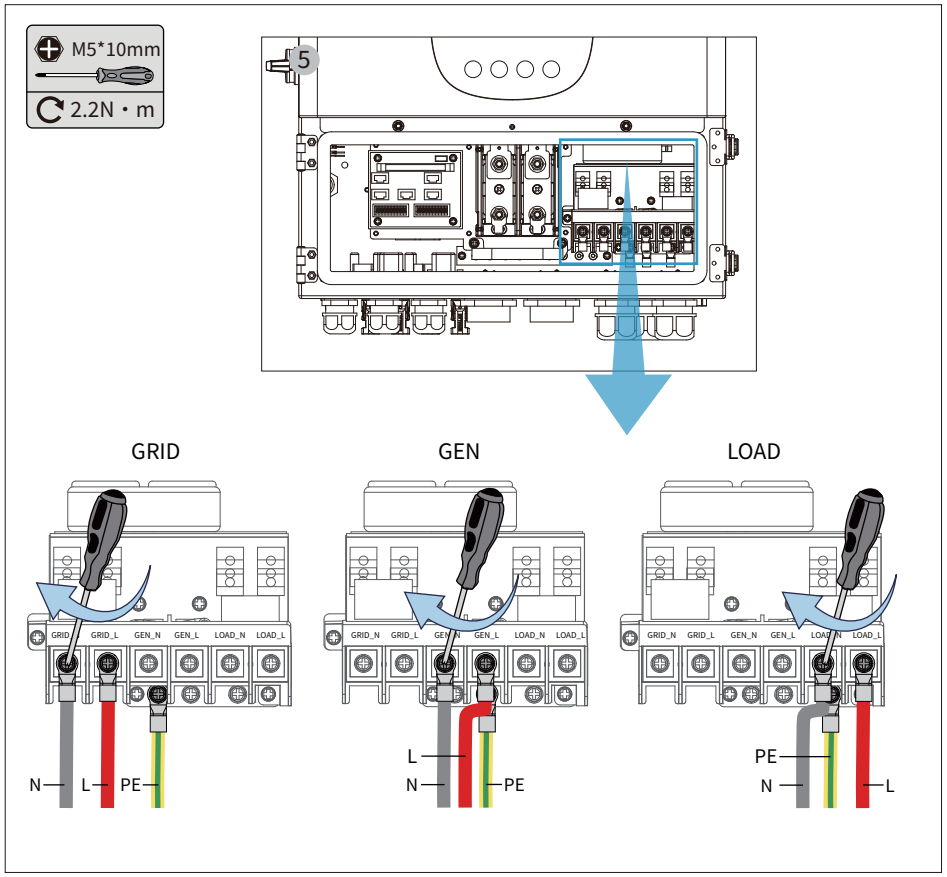
Before connecting the AC cables, ensure the inverter is completely isolated from both DC and AC power sources.

Please follow the steps below to perform AC input/output connections:

1. Strip the insulation of the L (Line), N (Neutral), and ground conductors to the appropriate length. Insert the L, N, and ground conductors into the terminals1.
2. Use a crimping tool to crimp the conductors. Ensure the wires are correctly assigned and firmly inserted into the terminals.
3. Remove the LOAD, GEN, and GRID caps. As shown in the figure below, take off the plugs and sealing covers.
4. Connect the LOAD, GEN, and GRID ports to their corresponding terminals respectively.



5. Unscrew the bolts and insert the wires according to the polarity indicated on the terminal board. Be sure to connect the corresponding N (Neutral), L (Line), and PE (Protective Earth) wires to their respective terminals, then tighten the terminal screws to ensure a secure connection.



DANGER!

Before powering on the inverter, seal the unused LOAD, GRID, and GEN terminal ports with the provided plug seals. Failure to do so may expose high voltage, resulting in electric shock, serious injury, or death.

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 10ms (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 12KW inverter is capable of delivering a continuous output of 12000VA 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 6KVA.
- Capacitive load: a single capacitive load up to 6KVA.

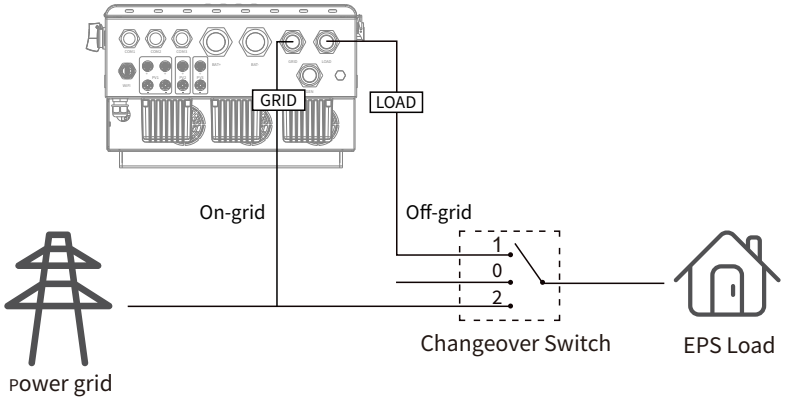
(Do not connect any load with high inrush current at startup)

Note: To improve user experience and facilitate maintenance, 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 switched to the on-grid output to ensure proper operation of the load.

Generator connection

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."

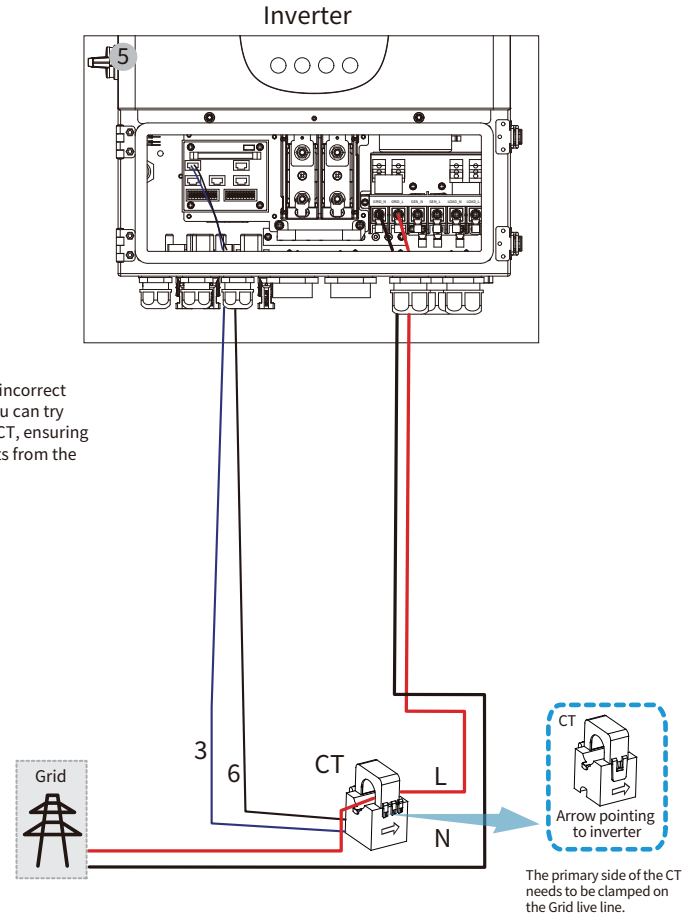
The limitations for connecting the PV inverter to the GEN port are detailed as follows:

Inverter model	H8000S	H10000S	H12000S
Nominal Input Voltage of PV Inverter (V)	220/230/240	220/230/240	220/230/240
Max. Input Current of PV Inverter (A)	52.2	52.2	52.2
Recommended AC Breaker	80A	80A	80A
Recommended Cable (mm^2)	13~16	13~16	13~16

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



- If the data read by the CT is incorrect due to an installation fault, you can try reversing the direction of the CT, ensuring that the arrow on the CT points from the grid to the inverter.

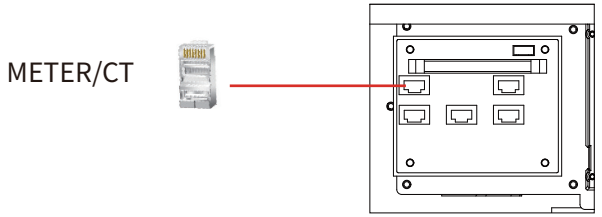
NOTICE

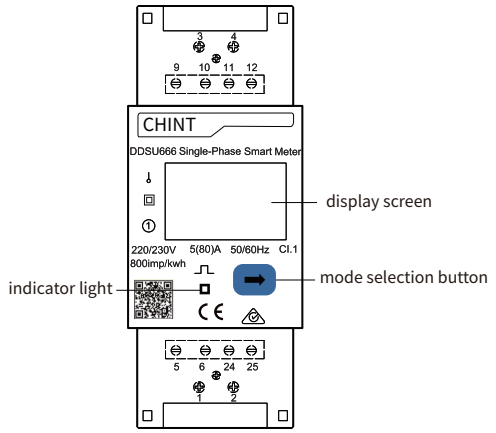
- One CT can only be used for one inverter.
- When the reading of the load power on the LCD is not correct, please reverse the CT arrow.

4.7 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.





CHINT DDSU666

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

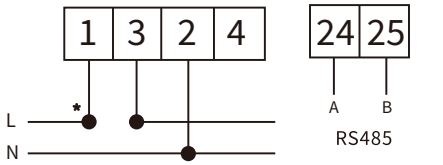
Notice: The CHINT DDSU666 smart meter is recommended to use with this product. Carefully read all relevant instructions when using the smart meter.

Smart meter use

Item	User interface	Description	Item	User interface	Description
1	Imp kWh 000 1.20	Current positive active energy Imp = 1.20kWh	7	U 220.0 V	Voltage U=220.0V
2	Exp kWh 000 1.00	Current reverse active energy Exp = 1.00kWh	8	I 5.000 A	Current I=5.000A
3	NO. Modbus	Modbus	9	P 1.100 kW	Active power P=1.100kW
4	NO. n- 8n1	8Data bits,None Parity,1 Stop Bit	10	Ft 1.000	Power factor Ft=1.000
5	NO. n- 003	Comm.Add=03	11	F 50.00	Frequency F=50.00Hz
6	NO. bAUd-3	baud rate to be 9600bps			

Smart meter wiring

Notice: Prior to power up, check the wiring is correct, wiring diagram is as follow:



Voltage signal

(only for instruments connected via current transformer):

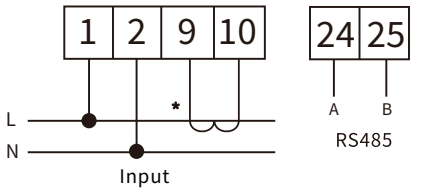
2-------UN (N phase voltage input terminal)

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)



Voltage signal

(only for instruments connected via current transformer):

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

Current signal:

1-------L (L line current output terminal)
9-------IL *(L line current input terminal)
10-------IL (L line current output terminal)

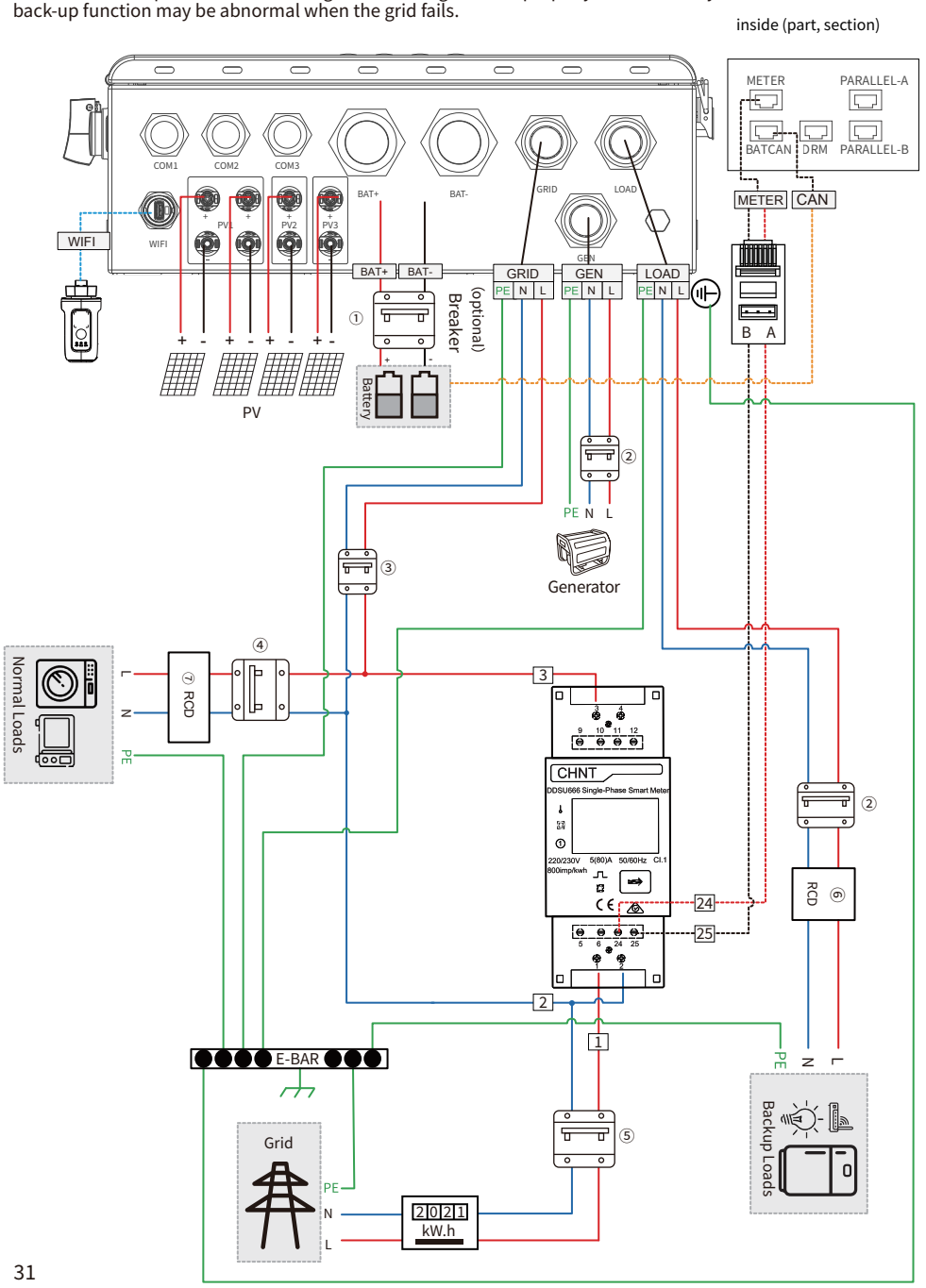
RS485 communication cable:

24-------A (RS485 A terminal)
25-------B (RS485 B terminal)

Wiring Diagram with Smart Meter

This diagram is an example for grid systems without special requirements on electrical wiring connection (with smart meter).

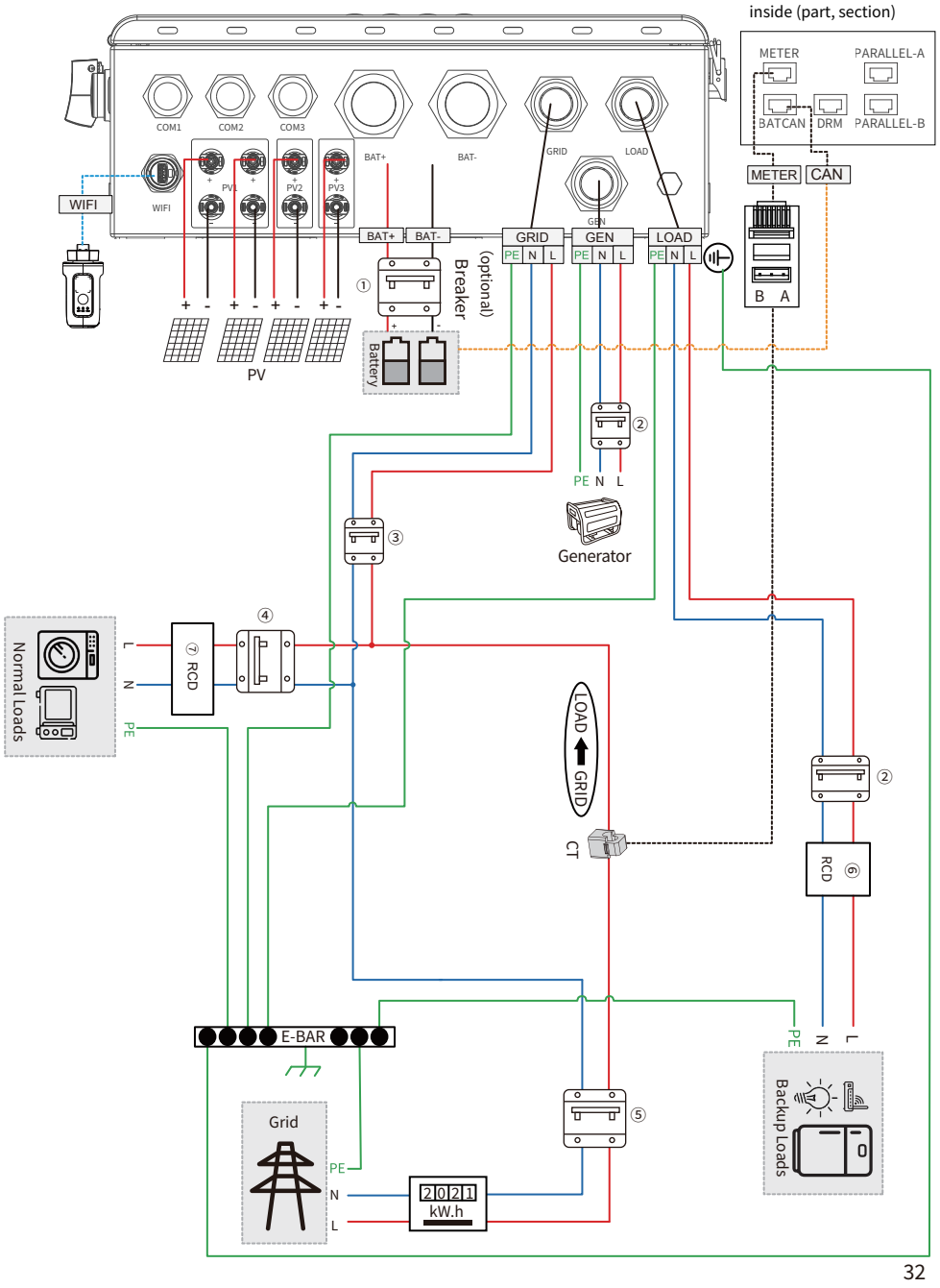
Note: The back-up PE line and earthing bar must be grounded properly and effectively. Otherwise the back-up function may be abnormal when the grid fails.



Wiring Diagram with CT

This diagram is an example for grid systems without special requirements on electrical wiring connection (with CT).

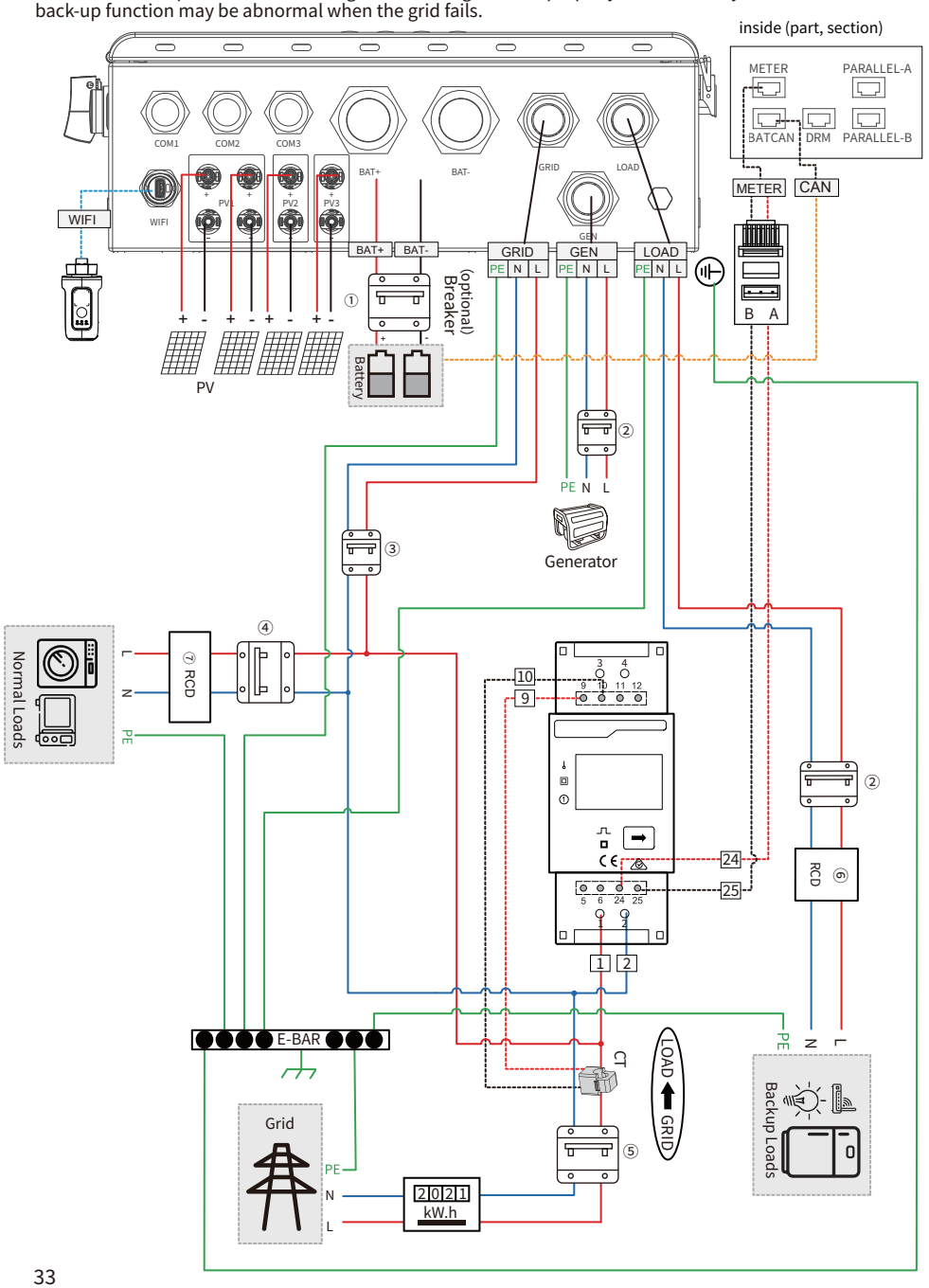
Note: The back-up PE line and earthing bar must be grounded properly and effectively. Otherwise the back-up function may be abnormal when the grid fails.



Wiring Diagram with Smart Meter plus CT

This diagram is an example for grid systems without special requirements on electrical wiring connection (Smart meter with CT) .

Note: The back-up PE line and earthing bar must be grounded properly and effectively. Otherwise the back-up function may be abnormal when the grid fails.



Model	① (optional)	②	③	④	⑤	⑥	⑦
H8000S	360A/100V DC Breaker	80A/230V AC Breaker	100A/230V AC Breaker	Depends on Loads	Main Breaker	80A/230V 30mA RCD (Type A)	100A/230V 30mA RCD (Type A)
H10000S	360A/100V DC Breaker	80A/230V AC Breaker	100A/230V AC Breaker				
H12000S	360A/100V DC Breaker	85A/230V AC Breaker	100A/230V AC Breaker				

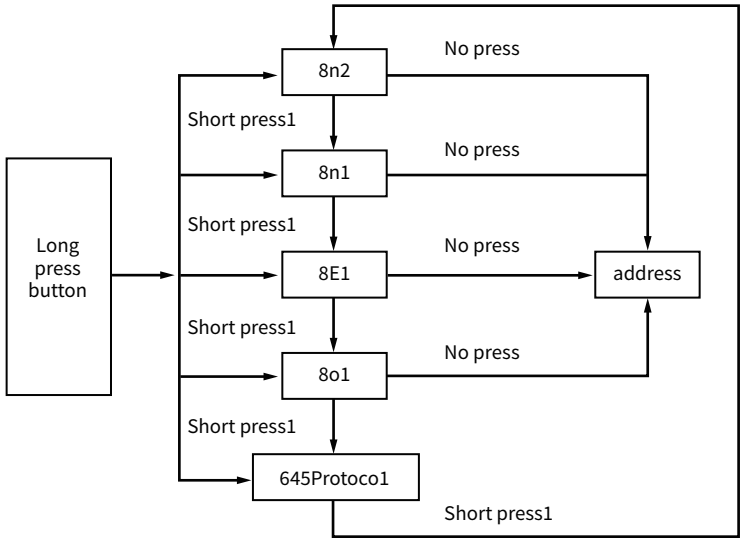
Note

- If the battery has integrated a readily accessible internal DC breaker, then no additional ① DC breaker is required.
- The use of ⑥ ⑦ 30mA RCD is recommended but not mandatory, please comply with local regulations for the system installation.

Configure meter

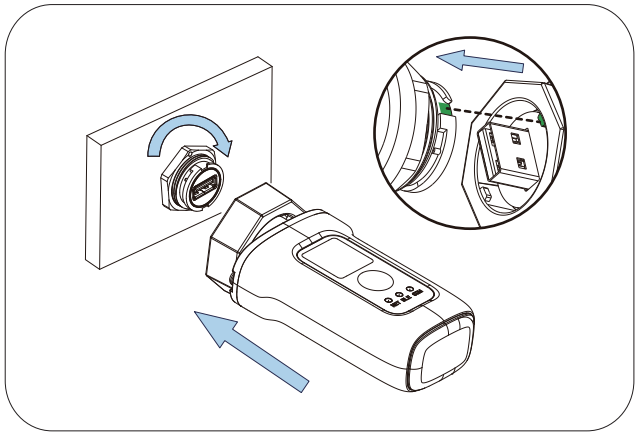
Model	Grid Meter Address	PV Meter Address
DDSU666	3	2

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

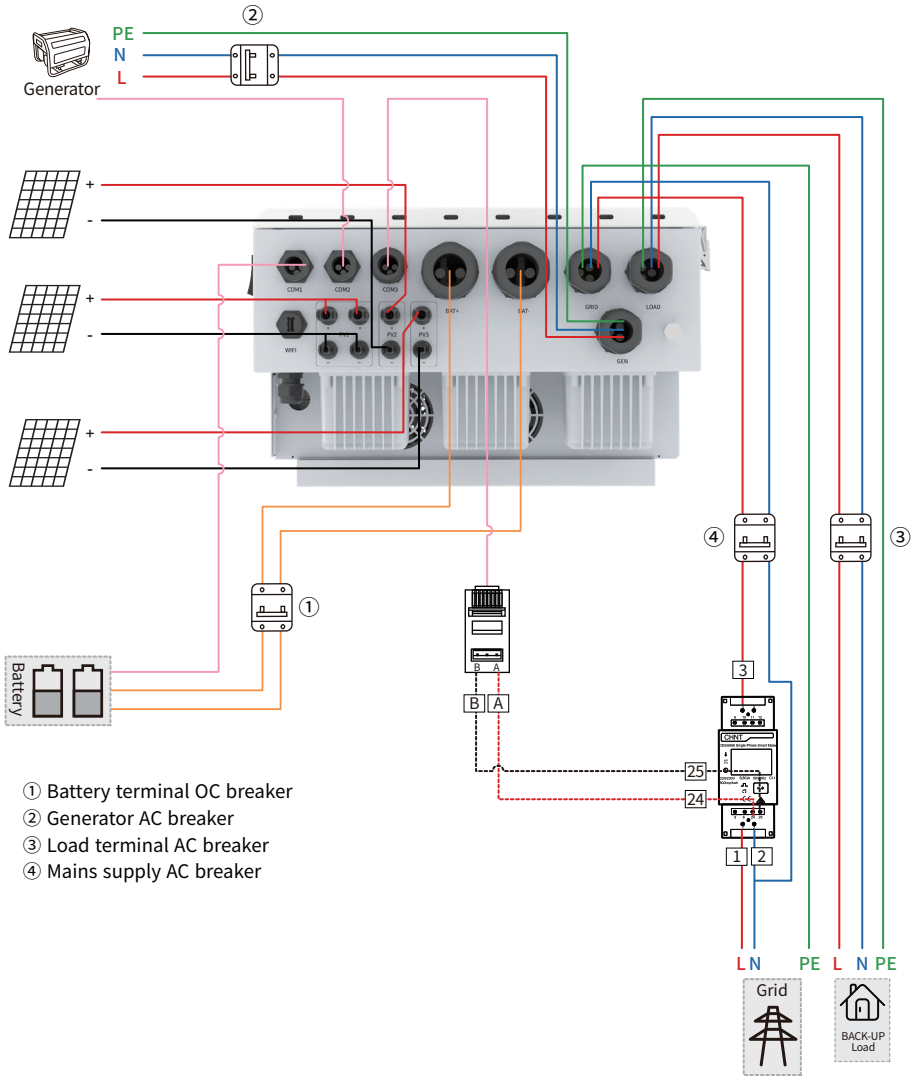


4.8 WIFI Connection

Install the WiFi logger onto the inverter communication port as shown in the diagram.

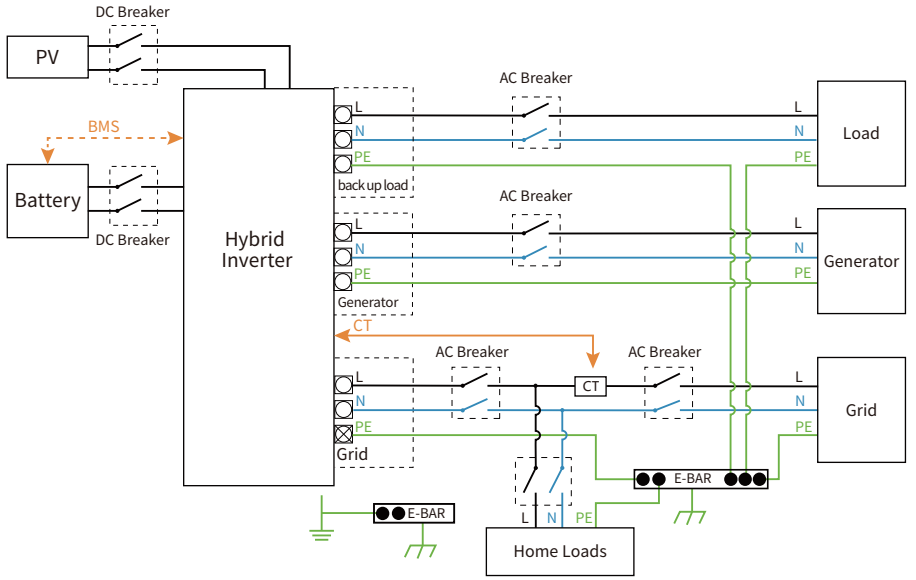


4.9 Inverter Wiring System



① Battery terminal OC breaker
② Generator AC breaker
③ Load terminal AC breaker
④ Mains supply AC breaker

This diagram is an example of a grid system and does not imply specific requirements for electrical wiring connections.
Note: The backup PE wire and grounding rod must be properly and effectively grounded. Otherwise, the backup function may operate abnormally in the event of a grid fault.

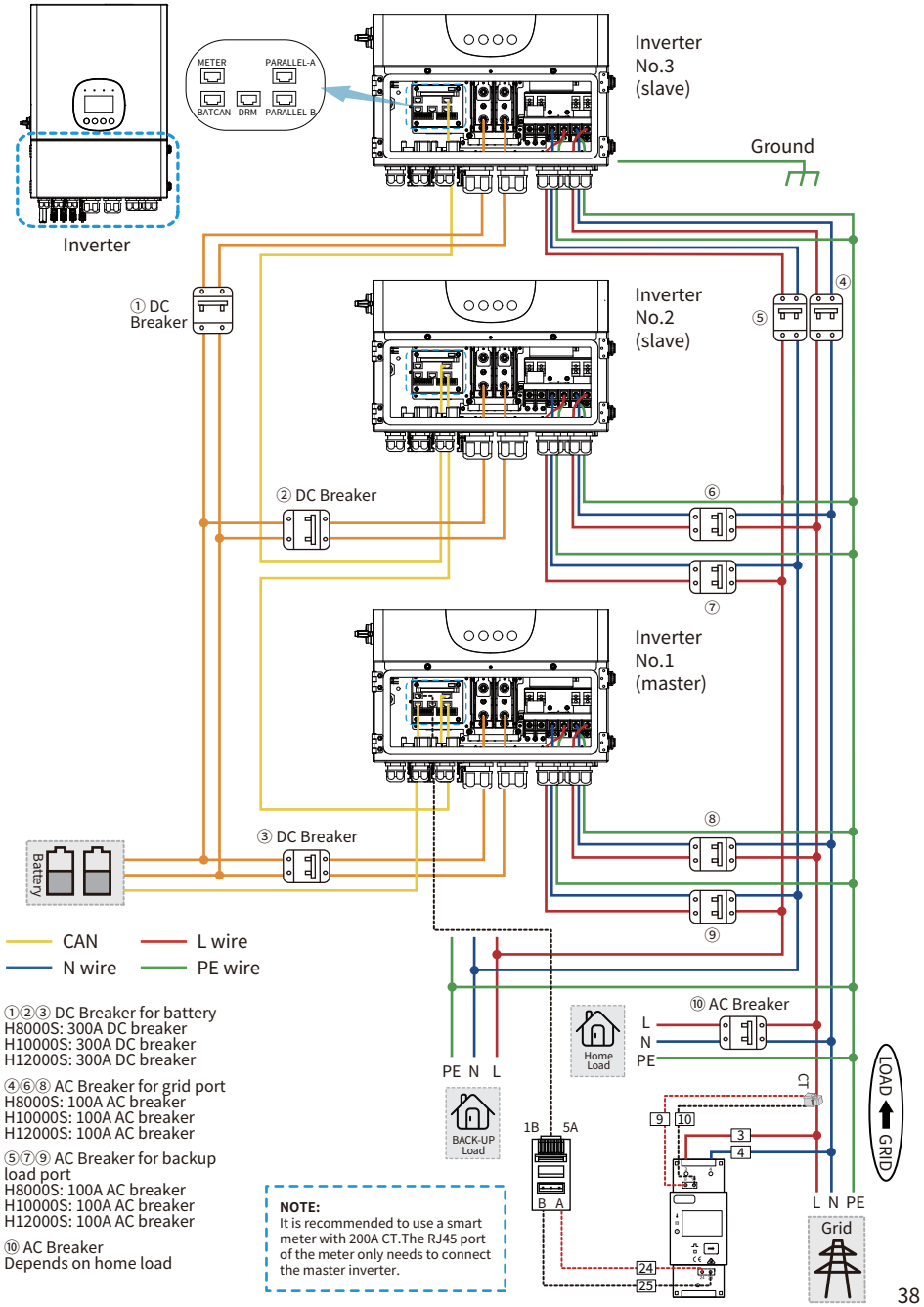


4.10 Parallel Connection

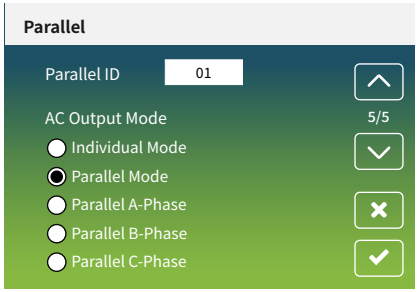
For electrical connections between multiple battery banks, refer to the battery manual.

4.10.1 Parallel Connection Wiring in Single-Phase System

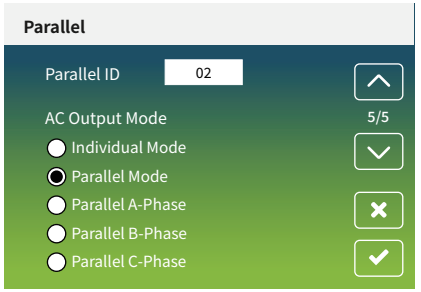
NOTE For the parallel system, please choose the "Zero export to CT " mode.



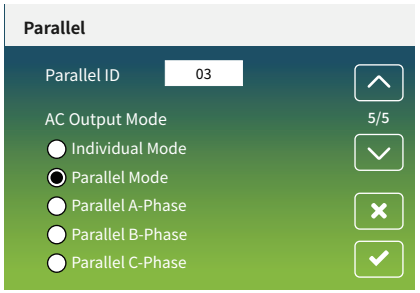
Master inverter



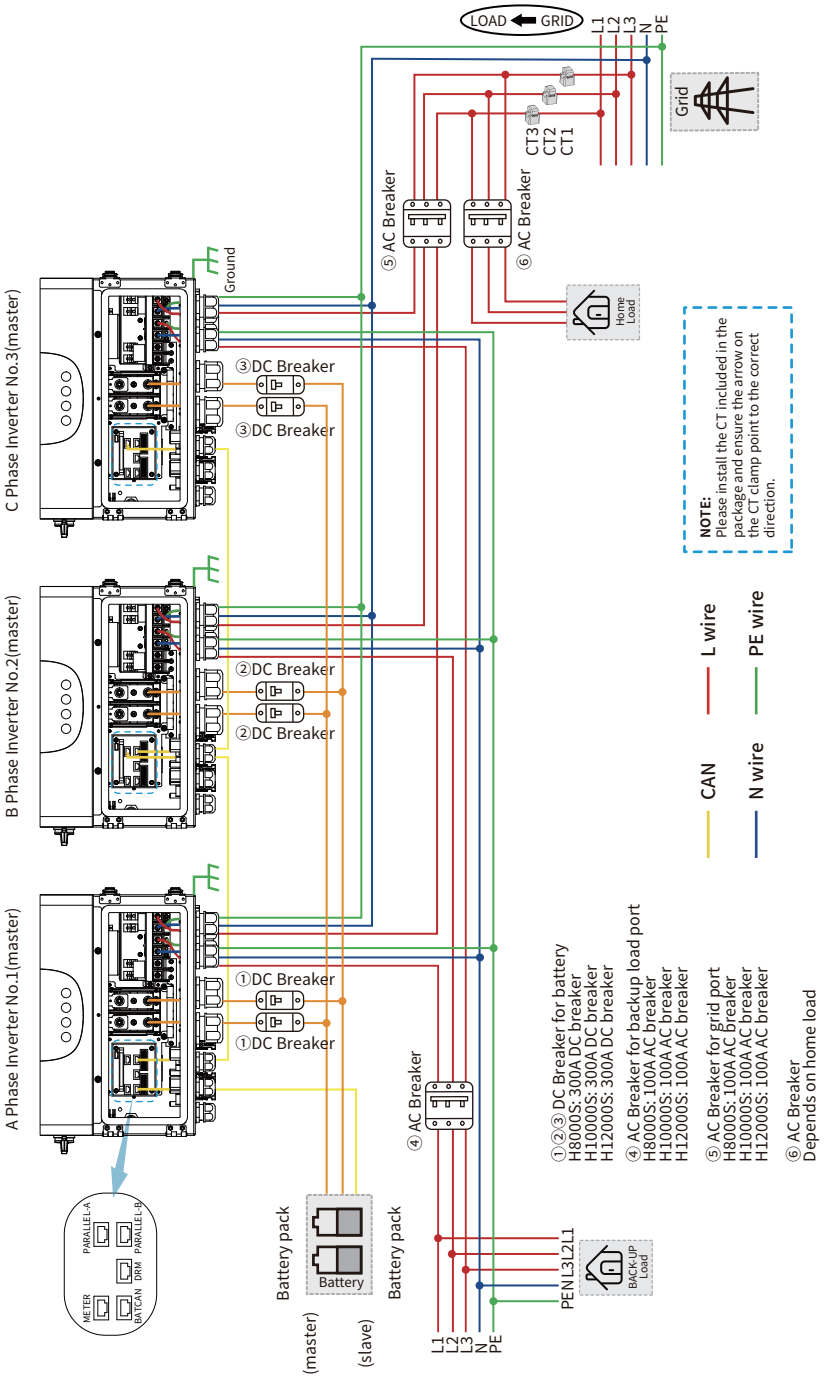
Slave Inverter



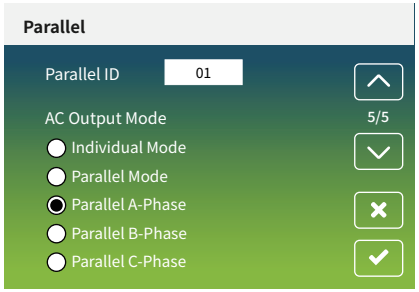
Slave Inverter



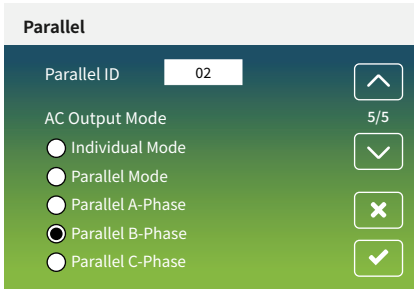
4.10.2 Parallel Connection Wiring in Three-Phase System



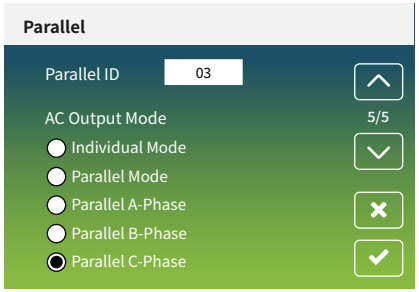
Master inverter



Slave Inverter



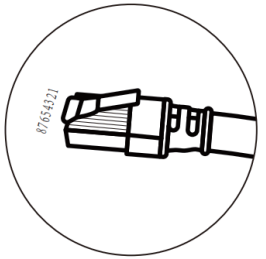
Slave Inverter



4.11 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.

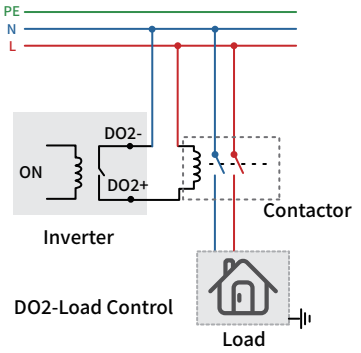
Mode	Requirement
DRM0	Operate the disconnection device.
DRM1	Do not consume power.
DRM2	The consumed power should not exceed 50% of rated power.
DRM3	Do not consume more than 75% of rated power and reactive power of the source, if possible.
DRM4	Increase power consumption (subject to constraints from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

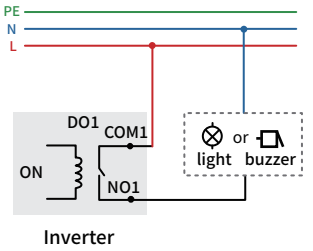


*The DRM is only for regions with AS/NZW 4777.2 safety regulations.

4.12 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.





4.13 Ground Fault Alarm

4.13.1 Inverter Ground Fault

The inverter complies with ICE 62109-2 13.9.
If the inverter experiences a ground connection fault, the inverter's fault indicator will illuminate and the APP will send a fault notification.

4.13.2 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.

05 System Commissioning

5.1 Check Before Powering On

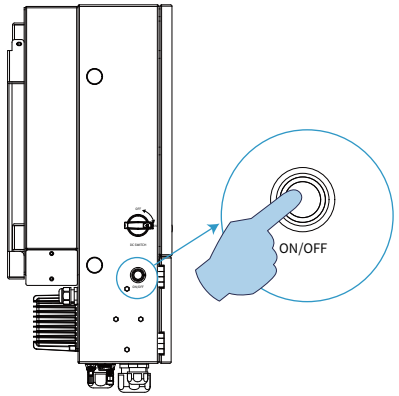
Before powering on the battery system, be sure to check the following to prevent system damage:

1. The equipment is securely installed, and the installation location allows for easy operation and maintenance.
2. Sufficient ventilation space is provided, with no external objects or parts left on top of the machine.
3. Protective grounding, power cables, communication cables, and terminal resistors are correctly and firmly connected.
4. Cable bundling complies with routing requirements, is reasonably distributed, and shows no damage.
5. The AC circuit breaker is properly selected.
6. Unused ports have been sealed.
7. All safety signs and warning labels on the machine are unaltered and uncovered.

5.2 Powering On the System

Power on the Inverter

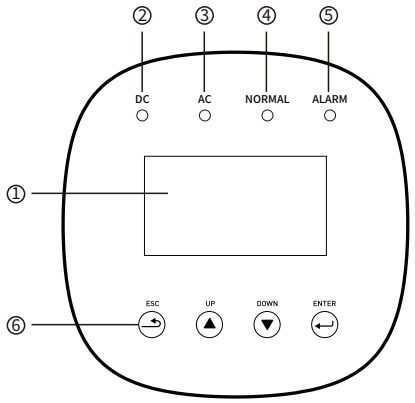
1. Turn on the DC circuit breaker between the battery and the inverter.
2. Turn on the DC circuit breaker between the PV string and the inverter (if any).
3. Turn the PV switch at the left side of the inverter to the ON position.
4. If the battery is lithium battery, press the power button on the battery to turn it on.
5. Turn on the battery switch on the left side of the inverter by pressing the button.
6. Turn on the AC circuit breaker between the inverter and the grid.
7. Observe the LEDs to check the operating status of the inverter.



5.3 Operation and Display

The operation and display panel shown in the figure below is located on the front panel of the inverter. It includes four indicator LEDs, four function buttons, and an LCD screen used to display operating status and input/output power information.

1. LCD Display
2. DC indicator
3. AC indicator
4. NORMAL indicator
5. ALARM indicator
6. Function buttons



LED Indicator

LED Indicator		Messages
DC	Green LED (Solid Light)	PV connected properly
AC	Green LED (Solid Light)	Normal grid connection
Normal	Green LED (Solid Light)	The inverter is always on in grid-connected mode and blinks in off-grid mode.
Alarm	Red LED (Solid Light):	The inverter fault is always on and the alarm is flashing.

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 Powering Off the System

Power off the inverter

1. Turn off the AC circuit breaker between the inverter and the grid.
2. Turn off the DC circuit breaker between the PV string and the inverter (if any).
3. Turn the PV switch on the left side of the inverter to OFF position.
4. Turn off the battery switch on the left side of the inverter by pressing the button.
5. Press the power button on the battery to turn it off.
6. Turn off the DC circuit breaker between the battery and the inverter.
7. Check the state of the inverter.
8. Wait until all the LEDs and OLEDs go out to ensure the inverter has shut down completely.

06 APP Monitoring

6.1 Downloading and Login

Step 1: Downloading the App

Make sure that the mobile phone meets the following requirements:
- Mobile phone operating system: Android 8.0 or later, iOS 14.0 or later.
- The mobile phone can access the Internet.
- The mobile phone supports WLAN or Bluetooth.

Method 1: Search Hinen Solar in Google Play (Android) or App Store (iOS) to download and install the app.

Method 2: Scan the QR code below to download and install the app.

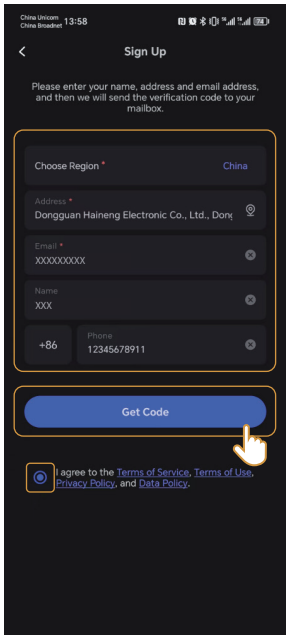
Hinen SOLAR APP

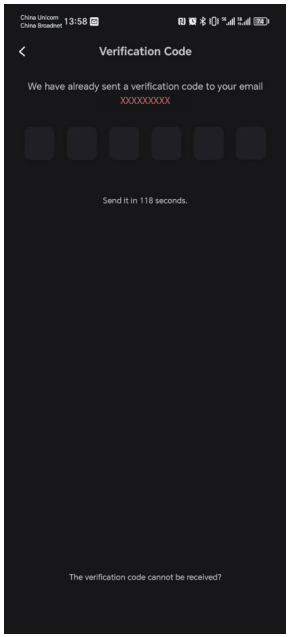
Hinen INSTALL APP

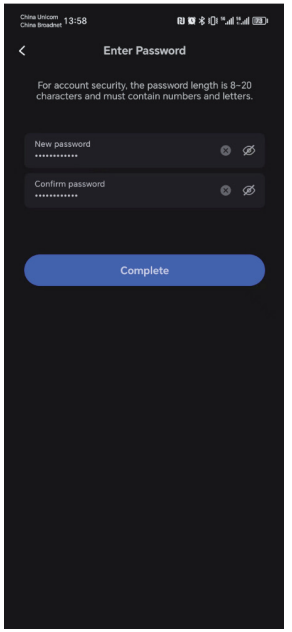
Tips:
This document takes version 1.0.5 as an example to introduce relevant operations. The screenshots given in this document are for illustration purposes only. Interfaces in different periods may differ. The actual interface display shall prevail.

Step 2: 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.

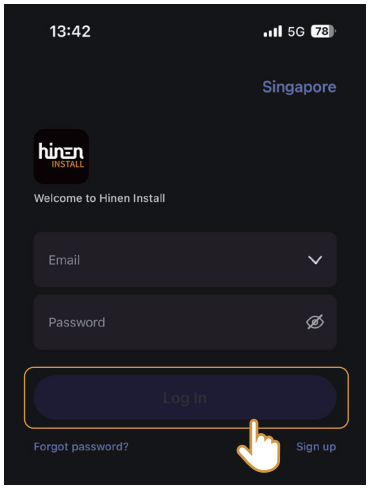






Step 3: Log in

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

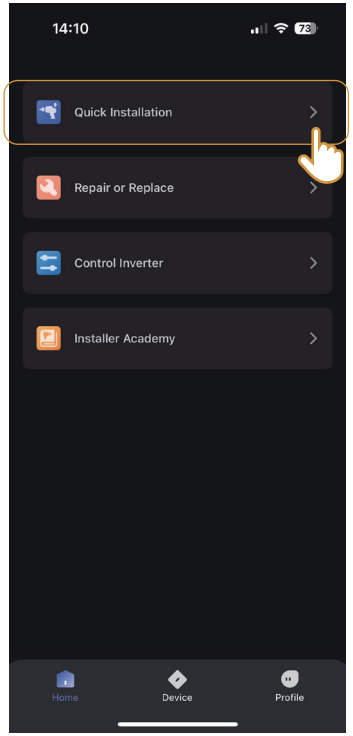


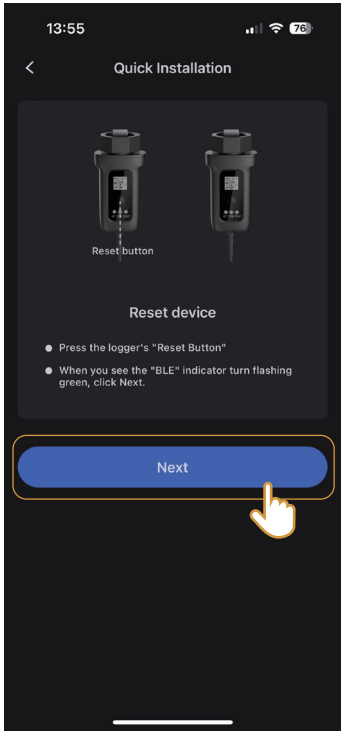
6.2 Quick Installation

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.

6.2.1 Connecting to the Logger

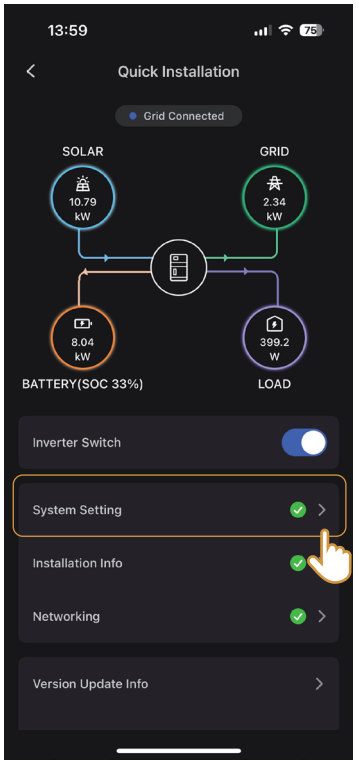
After login, click "Quick Installation" on the home page. Follow the instructions to reset the logger and tap " Next" to connect the logger.

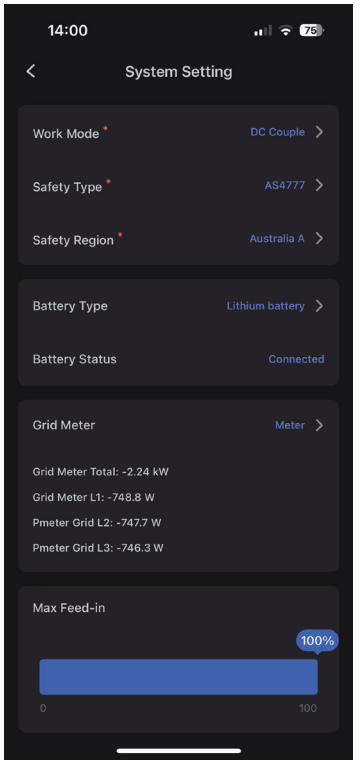




6.2.2 Configuring Parameters

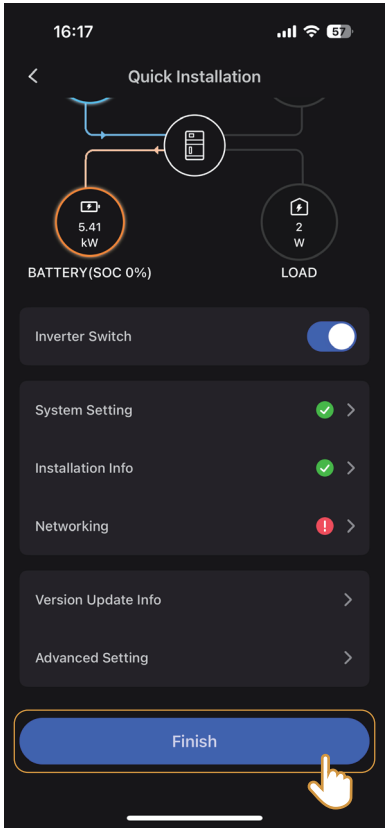
Tap the toggle to turn on or off the inverter. Tap System Setting, Installation Info, Networking to fill in the relevant information to complete quick installtion.





6.2.3 Version Update

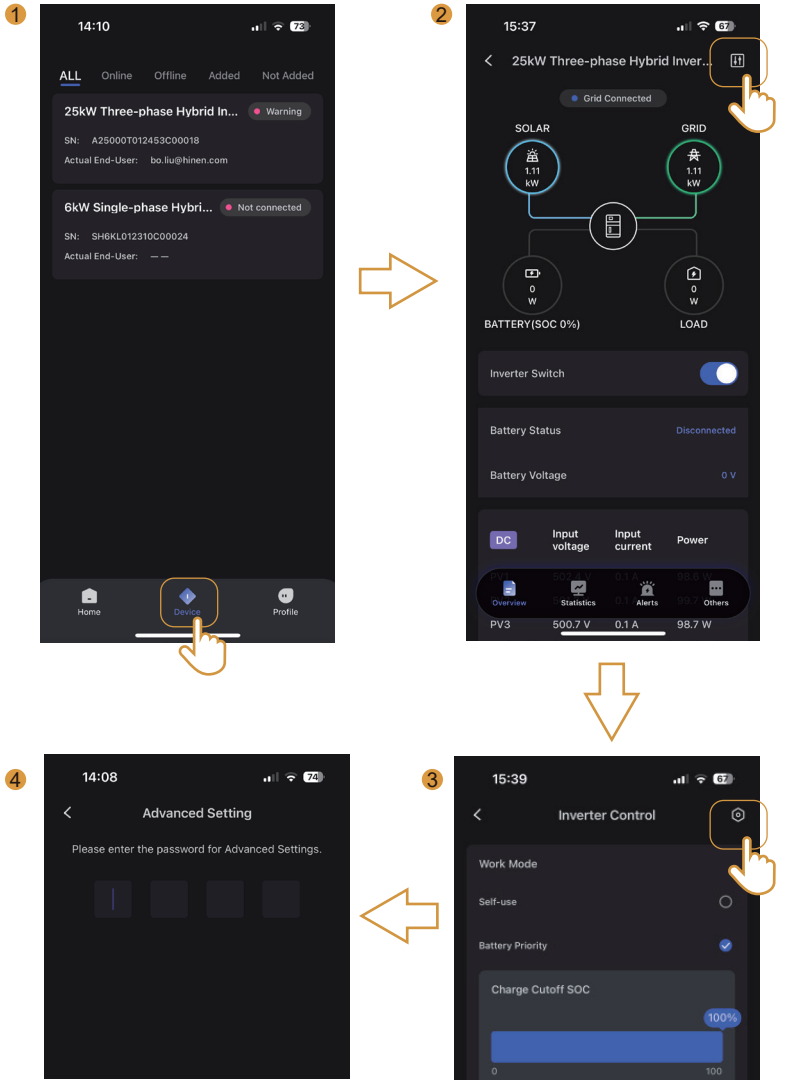
Tap "Version update Info" to check if the current version is the latest. If not, tap "Update".
After finishing all the setups, tap "Finish" at the bottom to complete quick installation.



6.3 Advanced Settings

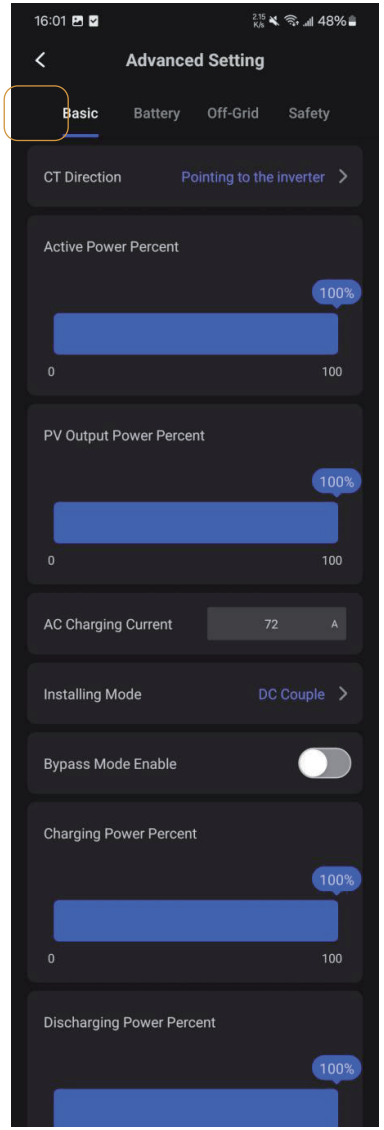
Warning:
The following Settings with '⚠' can not be modified randomly. Otherwise the system error will be caused. Please read through the function of the relevant Settings first. If you need to change, please contact our after-sales staff!

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.



6.3.1 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 bypass mode according to the actual situation.



• **CT Direction:** When installing the CT, ensure that the current direction of the CT is from the grid to the inverter, which means the arrow on the CT clamp should point to the inverter. If the app power display is incorrect, you can select "Pointing to the Grid" to adjust the direction of the CT.

• **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%.

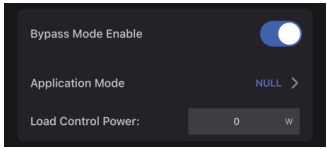
• **PV output power percent:** The PV output power can be limited by configuring the PV output percent. Take the 6kW inverter whose maximum PV output power is 11.4kW as an example. If the PV output power percent is set to 50%, the maximum PV output power is 5.7kW.

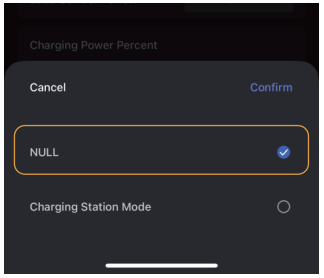
• **AC charging current:** Indicates the maximum valid value of current drawn from some phase of the grid. The default value varies with power levels of different inverters.

• **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.

• **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 the system is a grid-connected inverter system, it can be set to "Charging Station Mode." In this case, a three-phase 6CT electricity meter must be used, where CT1-CT3 measure the power of each phase of the grid, and CT4-CT6 measure the load power of each phase of the grid-connected side. When the total power of the grid-side 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-side 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 load power of the grid-connected side as measured by CT4-CT6. This mode is mainly used in underground garages.





• **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.

• **Application Mode*:** The function is only available for Hinen three-phase high-voltage hybrid inverters.

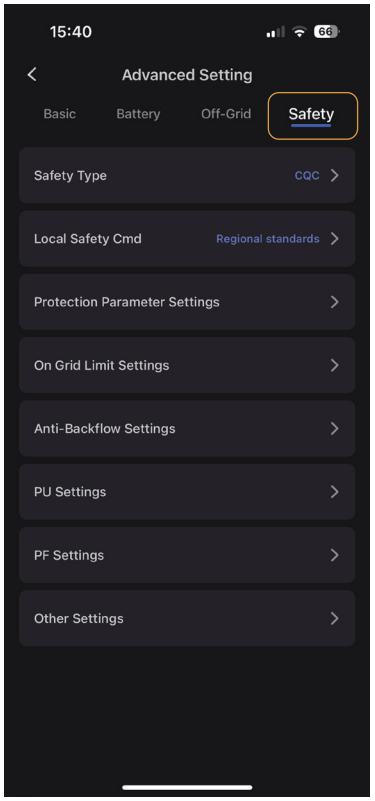
• **Charging power percent:** Take the 6kW inverter as an example. If charging power percent is set to 60%, the inverter will charge the battery at a maximum of 3.6kW.

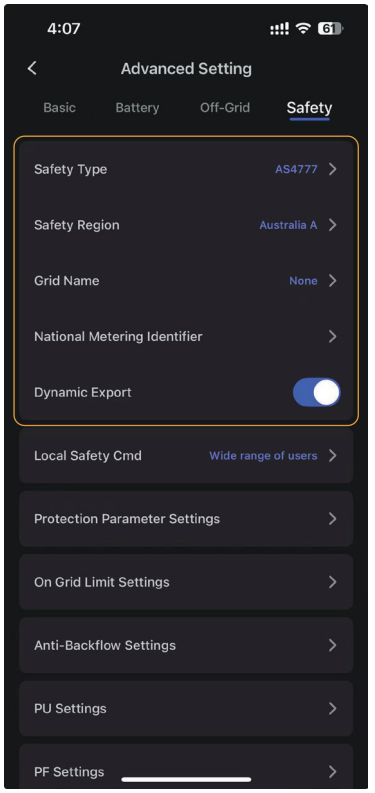
• **Discharging power percent:** Take the 6kW inverter as an example. If charging power percent is set to 60%, the inverter will discharge the battery at a maximum of 3.6kW.

6.3.2 Safety Standard

The safety type must be set correctly, otherwise it can cause a disturbance in the energy storage system and lead to problems with the grid operator. If you are not sure which safety standard is valid for your country or purpose, contact your grid operator for information on which safety standard is to be configured.

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

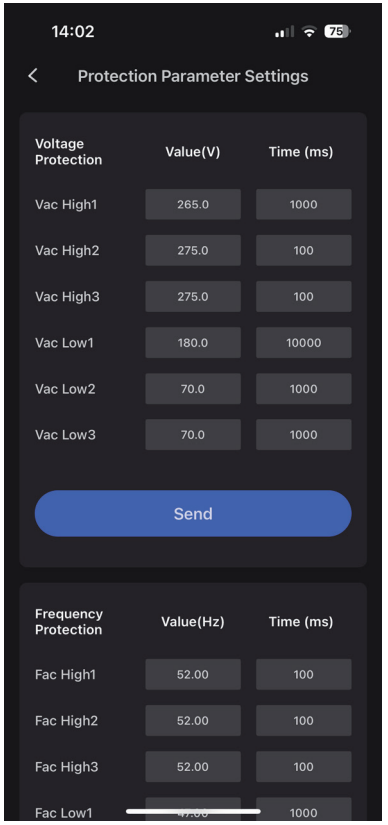


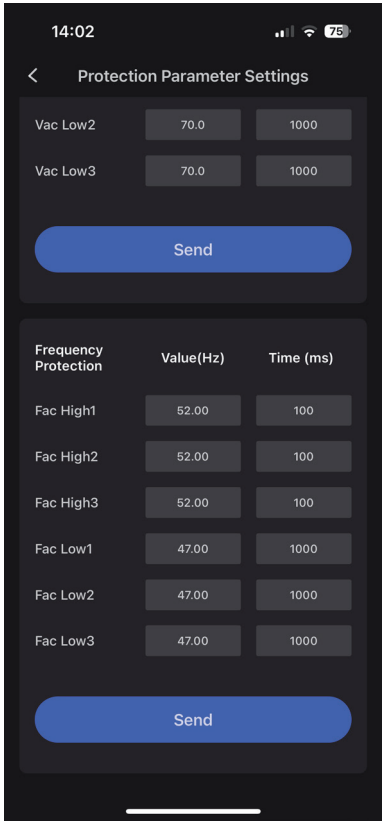


6.3.3 Protection Parameter Setup ⚠

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.





6.3.4 On-grid Limits Setup ⚠

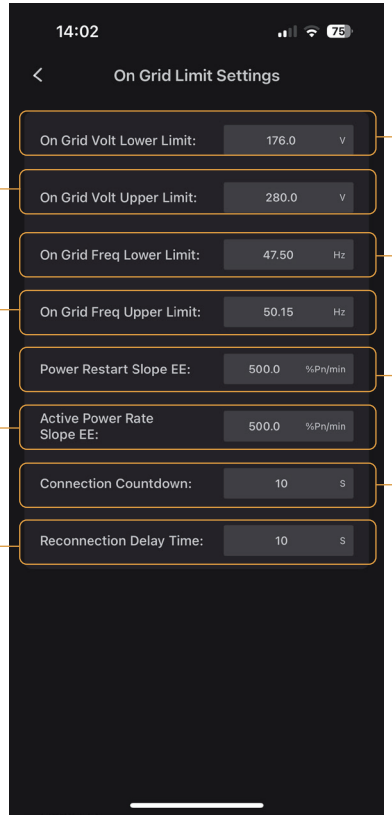
The inverter will detect the voltage and frequency of the grid before connecting to the grid. When the grid voltage and frequency are within the normal range, the inverter can be connected to the grid. Otherwise, the inverter cannot be connected to the grid.

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.

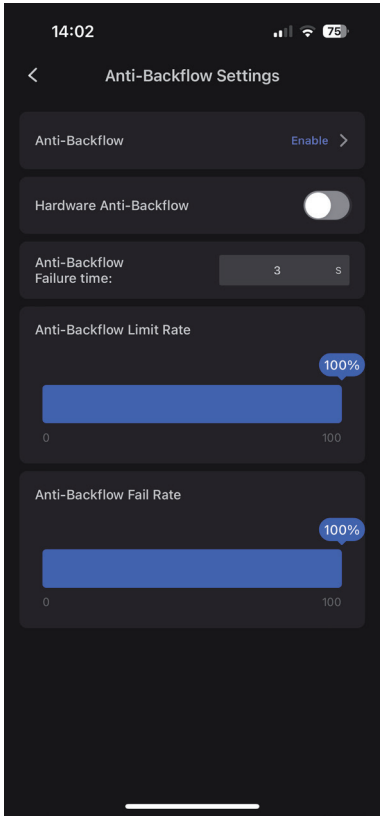
Connection Countdown: The countdown for the inverter to connect to the grid.

6.3.5 Export Limit Setting ⚠

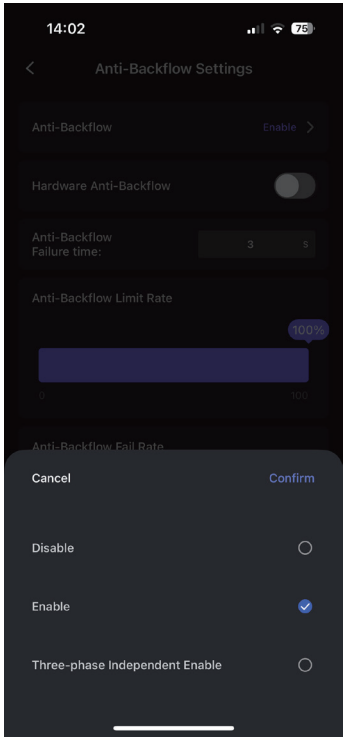
The anti-backflow function mainly limits the current output from the inverter to the grid, thus preventing power from feeding into the grid. In some cases, it is also referred to as export limitation or zero export. The anti-backflow function is a software-based limit. When the output power exceeds the 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 6kW*60%=3.6kW.

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.

6.3.6 More information

For more information about Hinen APP, please scan the QR code below to get user guide and tutorial.

Hinen Solar APP -- User Manual

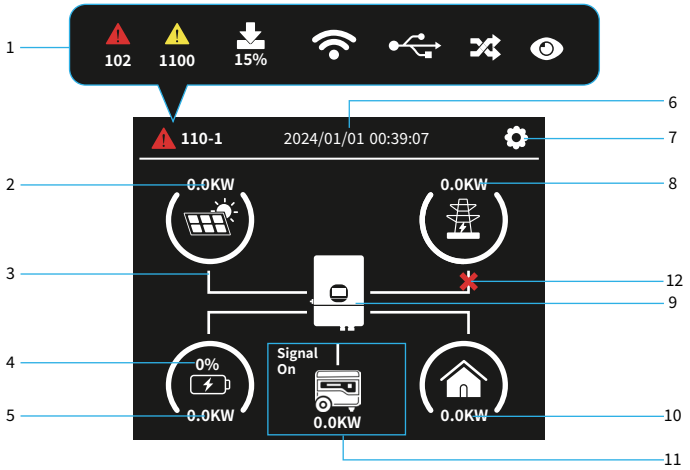
Hinen Solar APP -- Video Guide

Hinen Install APP -- User Manual

Hinen Install APP -- Video Guide

07 LCD Display Icons

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/Battery voltage
5	Battery power parameters
6	Time
7	Settings Icon
8	Grid power parameters
9	Inverter parameters
10	Load power parameters
11	generator power parameters
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/Battery voltage: Displays the remaining SOC.Display the lithium battery SOC or the voltage of the lead-acid battery.

5. Battery Power Parameters:The digital display shows the power value. The arc display shows the current power level. Select to enter the battery parameters page.

6. Time: The middle of the upper part of the screen is the RTC time of the system.

7. Settings: Select to enter the menu 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 "×" 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.

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.

• Use the dropdown menu to modify the parameters: After selecting by pressing "OK," a selection box will pop up. Press the up or down keys briefly to browse the options. Press ESC to cancel or press ENTER to confirm.

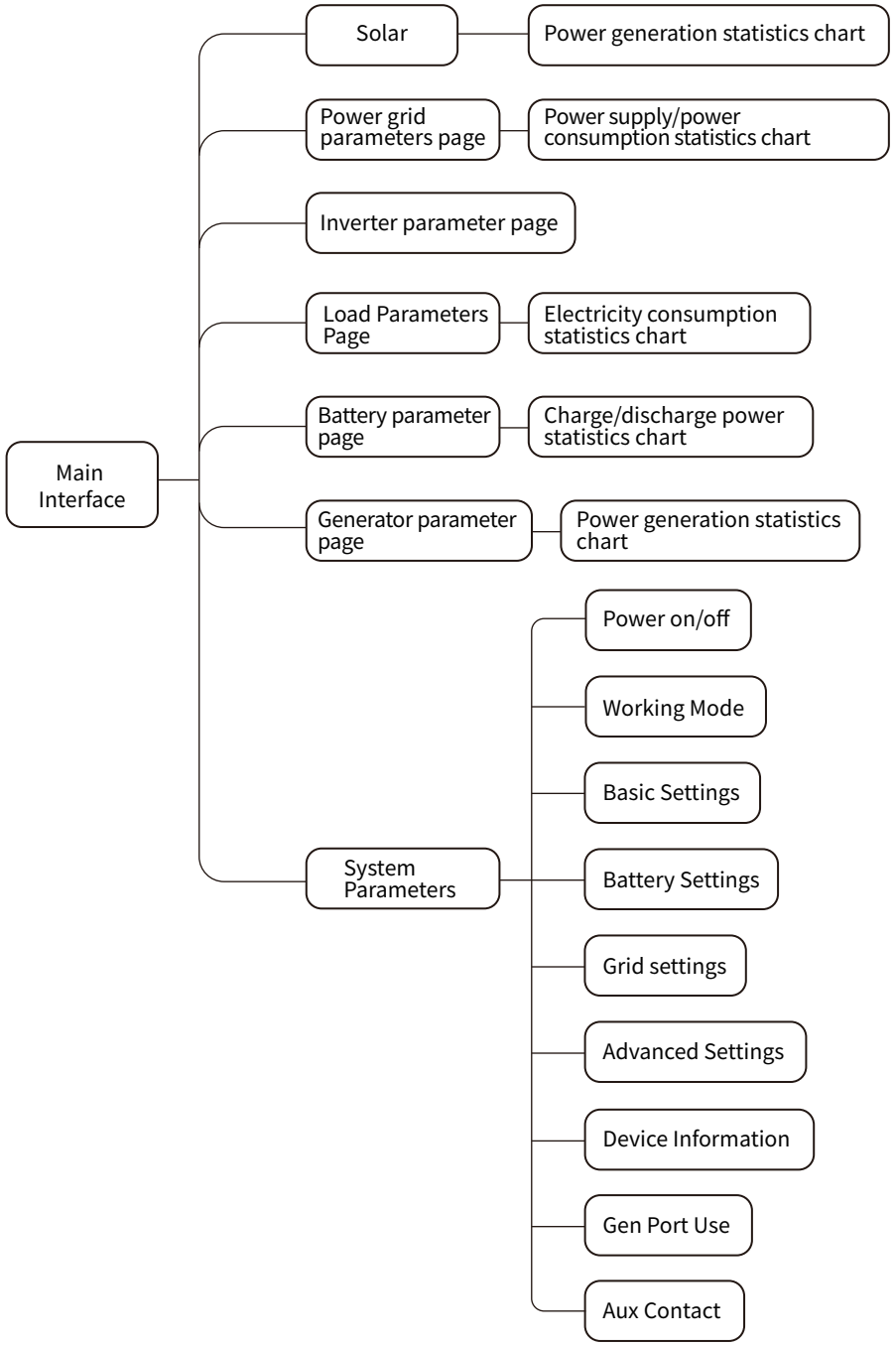
• Radio button: Press Enter to select and press Enter again to cancel.

• The ▲ sign in the navigation bar represents page up; the ▼ sign in the navigation bar represents page down.

• The " ✔ " symbol in the navigation bar indicates saving the current page's parameter changes and returning. The " ✖ " symbol in the navigation bar indicates canceling the current page's parameter changes and returning. Pressing ESC will exit the page directly without saving.

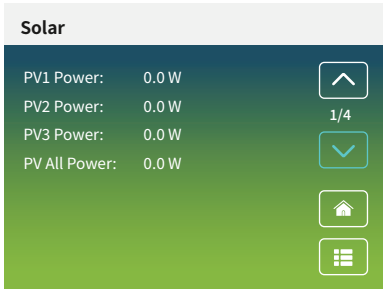
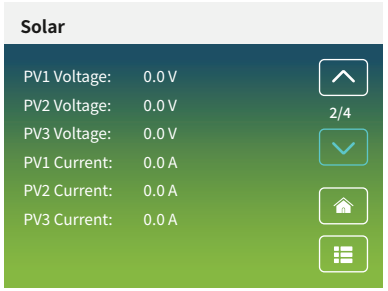
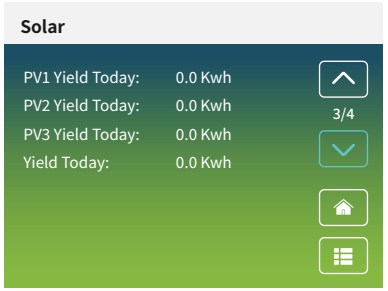
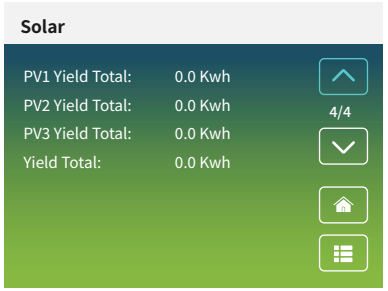
• After power-on, if you only use the GUI, parameter modifictaion will not be saved by default when power is off accidentally. You have to click Lock Change in Basic Settings to enter the password so as to save the modified parameters.

LCD operation flow chart

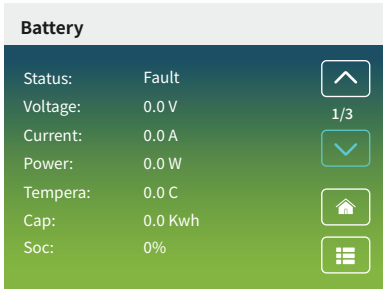
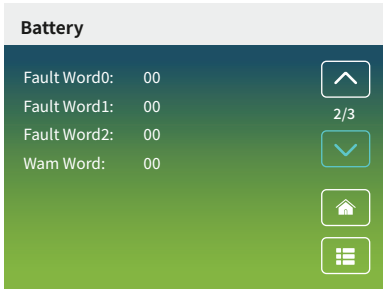
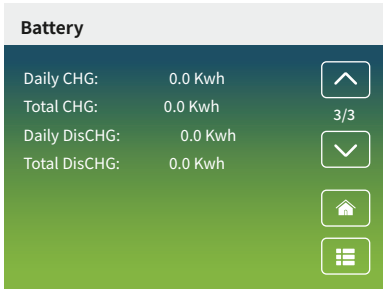


7.2 Running Parameters

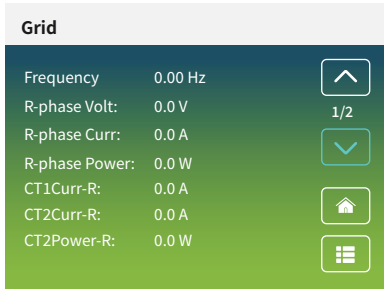
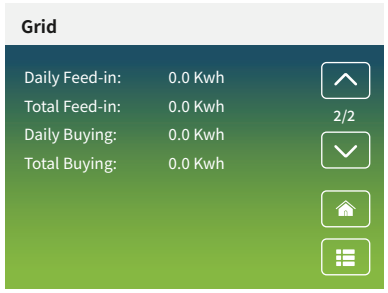
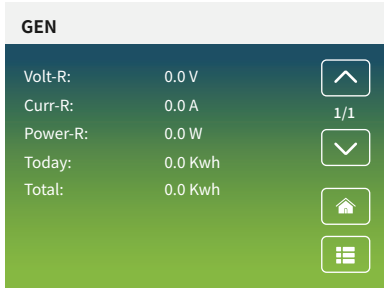
PV Parameter Interface

	PV String Power (PV1-PV3) and Total PV Power.
	PV1-PV3 String Voltage and Current Values.
	Display the PV power generation for the day.
	Display the historical PV power generation.

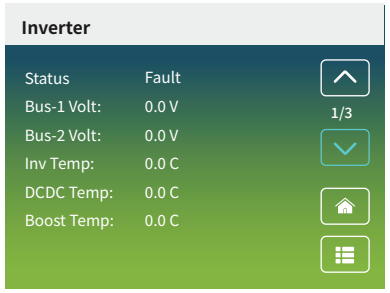
Battery Parameter Interface

	Display real-time battery status parameters such as voltage and current.
	Display the battery fault codes and warning codes.
	Dispaly the historical charge and discharge capacity of the battery in total and the charge and discharge for the day.

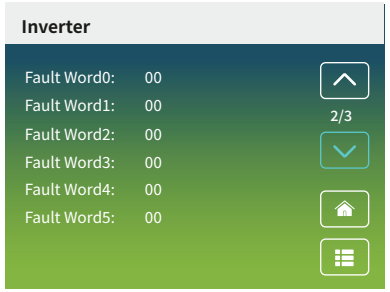
AC Terminals Parameter Interface

	Display real-time voltage, frequency, current and real-time grid power parameters.
	Display the amount of electricity fed into the grid.
	Real-time display of the generator's voltage, frequency, current and real-time generator power.

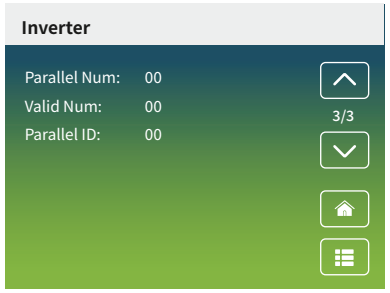
Inverter Parameter Interface



Display real-time inverter temperature, voltage and other parameters.

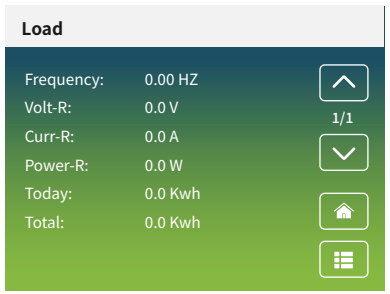


Display the status parameters for inverter fault values in real-time.



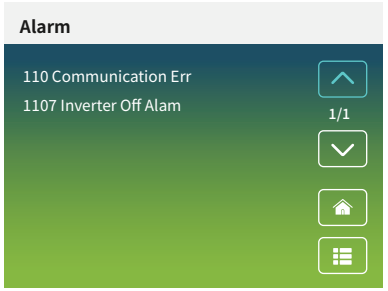
Parallel Num: Current total number of parallel machines.
Valid Num: The current effective number connected to the grid.
Parallel ID: The parallel ID of the current machine.

Load Parameter Interface



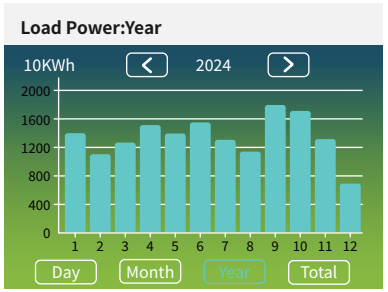
Displays status parameters such as load voltage value and load power value, as well as power consumption.

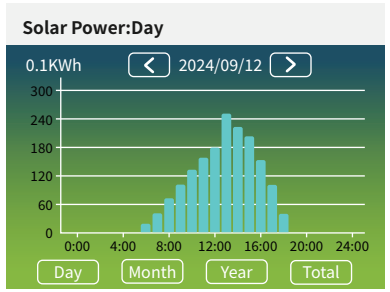
Fault Page

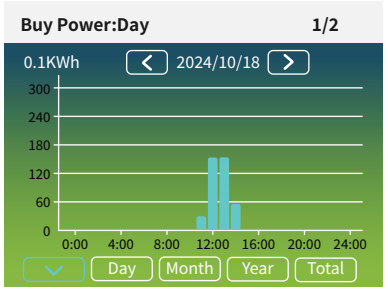


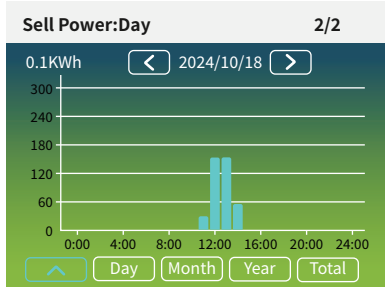
Click Fault or Alarm to enter.

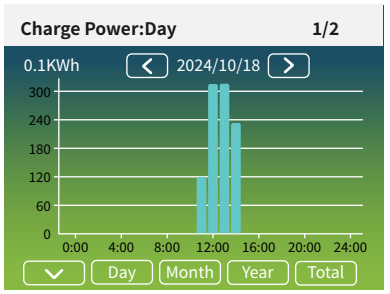
7.3 Diagram Page - Solar & Load & Grid & Battery

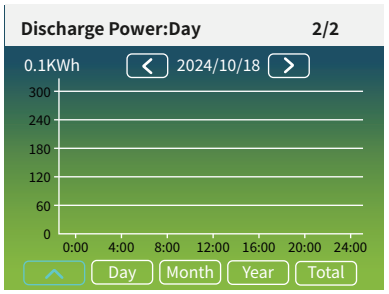






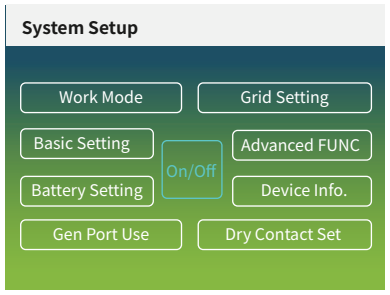




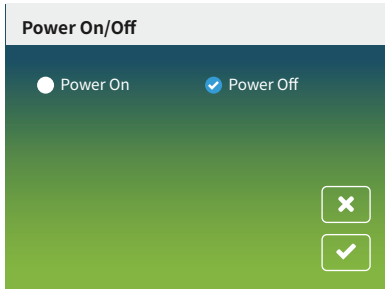


Press the OK button on the solar power or load power page to navigate to the power curve page. You can choose the year, month, day or the total information. Using the arrows to make your selections, you can examine the historical monthly power generation and total power information, as well as the hourly 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



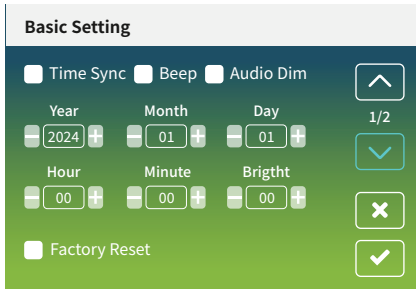
This is the system menu interface, where you can select the corresponding operation item.



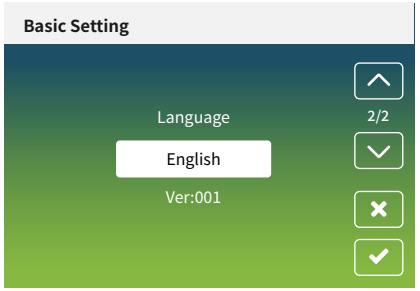
This is the system startup/shutdown page.

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. Rated Power, 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, Microinveter or grid-tied inverter will shut down.
*** Micro Inv Input ON:** When the battery SOC is lower than the set value, Microinveter 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 cutsoff:** 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.

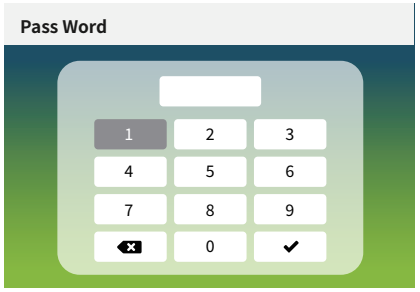
7.5 Basic Setup Menu



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.
Beep: It will sound when an alarm or fault occurs.
Audio Dim: The screen brightness is automatically adjusted over time.
Bright: brightness.

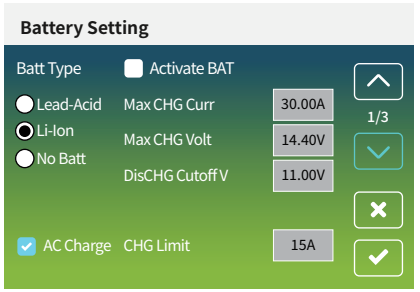


This is the language selection page.

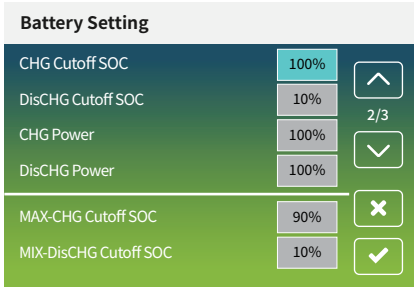


When you click on an option that requires a password, the page will pop up automatically. Click to enter the correct password.

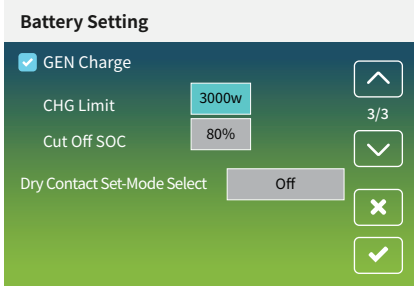
7.6 Battery Setup Menu

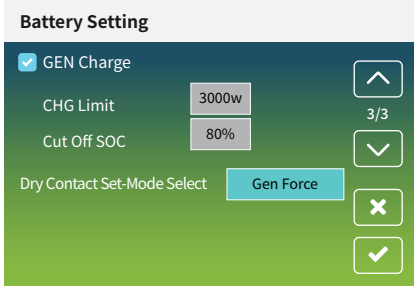


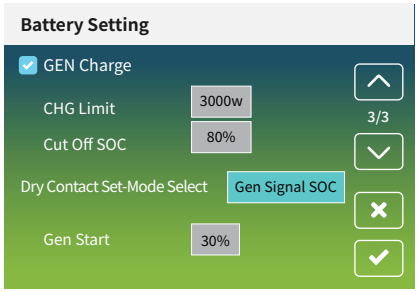
Batt Type: Types of Batteries.
AC Charge: AC Charge Enable. You can choose whether to use the grid to charge the battery.
Activate BAT: Activate Battery. After enabling this setting, the inverter can wake up the battery.
CHG Limit: AC Charge Current Limit. The charge current of the connected generator is 15A.
MAX CHG Curr: CC Current.
MAX CHG Volt: LV Voltage.
DisCHG Cutoff V: CV Voltage.

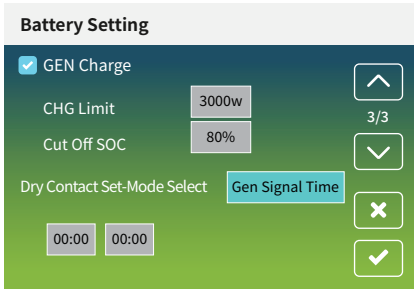


CHG Power: When the battery discharge is terminated, it is charged at a percentage of the rated power.
DisCHG Power: When the battery is discharged, it is discharged at a percentage of the rated power.
CHG Cutoff SOC: The SOC at which the battery charging stops.
DisCHG Cutoff SOC: When the battery energy is fed to the grid, it reaches this SOC value and the discharge is terminated.
MAX-CHG CutOffSoc: The battery charge SOC must not exceed this value.
MIN-DisCHG CutOffSoc: The minimum SOC during battery discharge must not exceed this value.



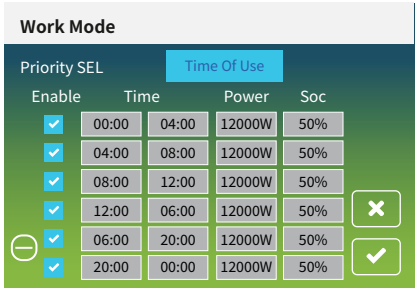






GEN Charge: Uses the GEN input of the system to charge battery bank from a connected generator.
CHG Limit: The charging power of the connected generator is 3000W.
Stop SOC = 80%: The generator stops charging when it reaches this set value.
Gen Start: When the SOC is at 30%, the system will automatically 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.

7.7 System Working Mode Setup Menu



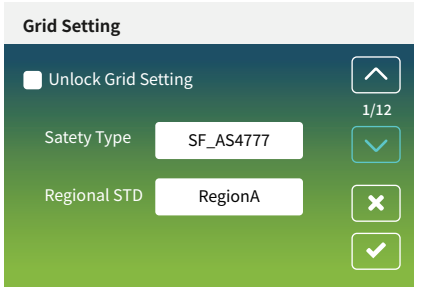
Set the battery charging and discharging power percentage and cut-off SOC in different time periods.
Self-Use: The inverter will draw power from PV, battery, and grid in order to supply the load. The default working mode is "Self-Use".
Battery First: After the energy is allocated to satisfy load demands, any surplus energy is subsequently directed towards charging the battery first.
Feed-In First: After the energy is allocated to satisfy load demands, any surplus energy is prioritized for export to the grid.

Time of Use:
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.
Enable: Is the setting for this time period valid.
(For example: • During 01: 00-05: 00 When the **Power** setting is set to 80%, the **SOC** setting is set to 90%, it will change the battery until battery SOC reaches 90%.
• During 05: 00-06: 00 When the **Power** setting is set to -80%, the **SOC** setting is set to 10%, it will dischange the battery until battery SOC reaches 10%.
• During 06: 00-07: 00 When the **Enable** setting is not configured, it will operate in **Self-Use Mode.**)

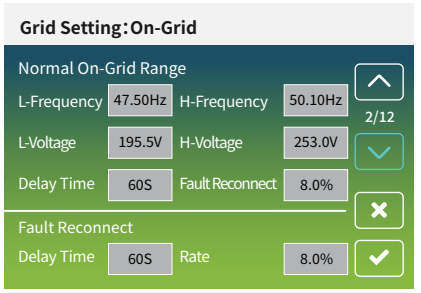
Hold Mode:
Time: Start time and end time.
Power: Maximum charge/discharge power rating.
SOC: Cut-off SOC value.
Enable: Indicates whether the power grid is operational during this time period.
(For example: • During 01: 00-05: 00 When, the **SOC** setting is set to 90%, battery SOC is lower than 90 %, and When the **Enable** setting is configured. it will use grid to change the battery until battery SOC reaches 90%.
• During 05: 00-06: 00 When the **SOC** setting is set to 20%, battery SOC is higner than 20 %. it will dischange the battery until battery SOC reaches 20%.
• During 06: 00-07: 00 When, the **SOC** setting is set to 90%, battery SOC is lower than 90 %, and When the **Enable** setting is notconfigured.it will not use grid to change the battery.

⊖:Control the number of time periods.

7.8 Grid Setup Menu

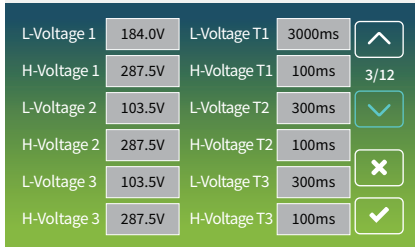


Unlock Grid Setting: Before changing the grid parameters, enable this function with password 8888. Then you can change the grid parameters.
Satety Type: Please select the safety code of corresponding countries and regions.
Regional STD: When the Australian safety code SF-AS4777 is selected, it will appear. This is used to select safety codes for different regions.



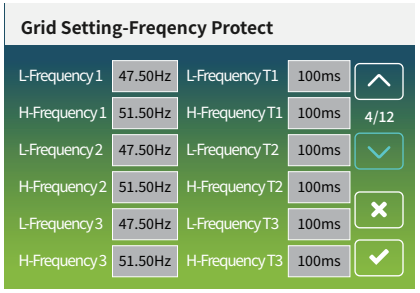
Normal On-Grid Range L-Frequency: Lower limit of grid-connected frequency.
Normal On-Grid Range H-Frequency: Upper limit of grid-connected frequency.
Normal On-Grid Range L-Voltage: Lower limit of grid-connected voltage.
Normal On-Grid Range H-Voltage: Upper limit of grid-connected voltage.
Normal On-Grid Range Delay Time: Grid-connected delayed time when powering on.
Normal On-Grid Range Fault Reconnect: Grid-connected loading rate when powering on.
Fault Reconnect Delay Time: Fault grid-reconnected time.
Fault Reconnect Rate: Fault grid-reconnected loading rate.

Grid Setting-Voltage Protect



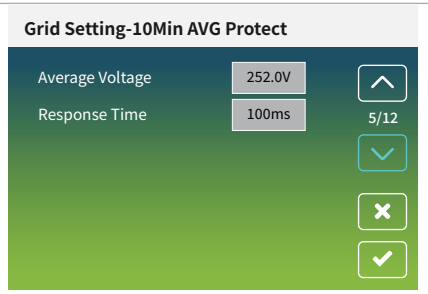
L-Voltage 1: Low voltage protection value of Grid first-order protection.
L-Voltage T1: Low voltage protection time of Grid first-order protection.
H-Voltage 1: High voltage protection value of Grid first-order protection.
H-Voltage T1: High voltage protection time of Grid first-order protection.
L-Voltage 2: Low voltage protection value of Grid second-order protection .
L-Voltage T2: Low voltage protection time of Grid second-order protection.
H-Voltage 2: High voltage protection value of Grid second-order protection.
H-Voltage T2: High voltage protection time of Grid second-order protection.
L-Voltage 3: Low voltage protection value of Grid third-order protection.
L-Voltage T3: Low voltage protection time of Grid third-order protection.
H-Voltage 3: High voltage protection value of Grid third-order protection.
H-Voltage T3: High voltage protection time of Grid third-order protection.

Grid Setting-Freqency Protect



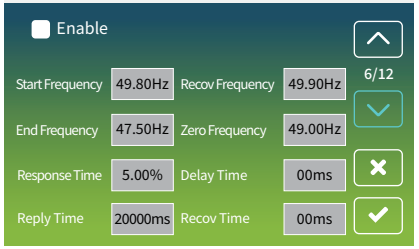
L-Frequency 1: Low-frequency protection value of Grid first-order protection.
L-Frequency T1: Low-frequency protection time of Grid first-order protection.
H-Frequency 1: High-frequency protection value of Grid first-order protection.
H-Frequency T1: High-frequency protection time of Grid First-order protection.
L-Frequency 2: Low-frequency protection value of Grid second-order protection.
L-Frequency T2: Low-frequency protection time of Grid second-order protection.
H-Frequency 2: High-frequency protection value of Grid second-order protection.
H-Frequency T2: High-frequency protection time of Grid Second-order protection.
L-Frequency 3: Grid protection third-order low-frequency protection value.
L-Frequency T3: Grid protection third-order low-frequency protection time.
H-Frequency 3: Grid protection third-order high-frequency protection value.
H-Frequency T3: Grid protection third-order high-frequency protection time.

Grid Setting-10Min AVG Protect



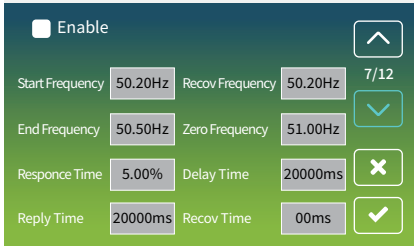
The average voltage protection value within 10 minutes and response time.

Grid Setting-Low Frequency Upload



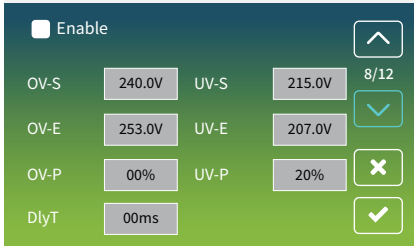
Enable: Underfrequency loading->Enable
Start Frequency: Underfrequency loading->Start frequency
Recov Frequency: Underfrequency loading->Recovery point frequency
End Frequency: Under frequency loading->end frequency
Zero Frequency: Underfrequency loading->Zero power point frequency
Response Time: Under-frequency loading-> load reduction slope
Delay Time: Under frequency loading->delayed time
Reply Time: Under frequency loading -> response time
Recov Time: Underfrequency loading->Resume delayed time

Grid Setting-Over Frequency Derat

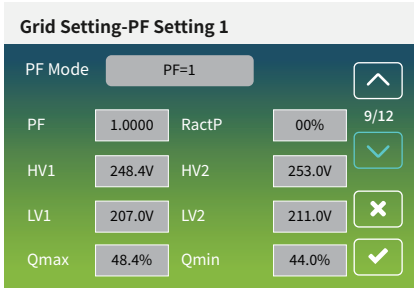


Enable: Over frequency load reduction->Enable
Start Frequency: Over frequency load reduction->Start frequency
Recov Frequency: Overfrequency load reduction -> recovery point frequency
End Frequency: Over frequency load reduction->end frequency
Zero Frequency: Over-frequency load reduction -> zero power point
Responce Time: Over frequency load reduction -> load reduction slope
Delay Time: Over frequency load reduction->delayed time
Reply Time: Over frequency load reduction -> response time
Recov Time: Over frequency load reduction -> recovery delayed time

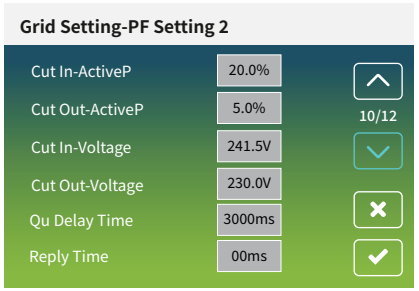
Grid Setting-PU



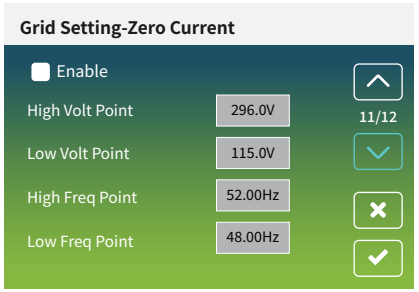
Enable: PU setting Enable
OV-S: Voltage active -> overvoltage point
UV-S: Voltage active -> undervoltage point
OV-E: Voltage active->overvoltage ends
UV-E: Voltage active->undervoltage ends
OV-P: Voltage active -> overvoltage power
UV-P: Voltage active -> undervoltage power
DlyT: Voltage active->overvoltage delayed time



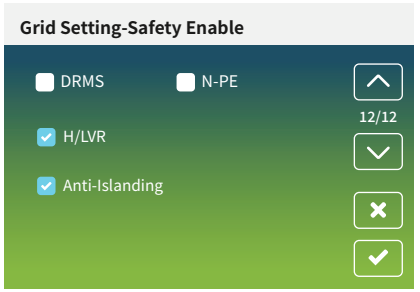
PF Mode: PF mode setting.
PF: Power factor setting.
RactP: Percentage of reactive power in lagging/leading reactive power mode.
HV1: The start point of overvoltage in reactive mode.
HV2: The end point of overvoltage in reactive mode.
LV2: The start point of undervoltage in reactive mode.
LV1: The end 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.



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 oepration in default PF mode.
Qu Delay Time: Reactive delayed time in voltage reactive mode.
Reply Time: Response time in voltage reactive mode.

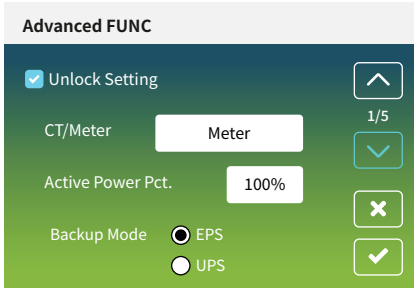


Enable: Zero current->Enable
High Volt Point: Zero current->Enable
Low Volt Point: Zero current -> low voltage point
High Freq Point: Zero current->high frequency point
Low Freq Point: Zero current -> low frequency point

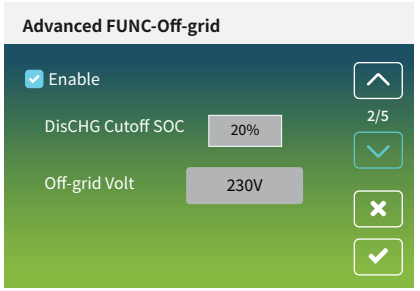


DRMS: System parameters->Logical interface DRMS enable
N-PE: System Parameters->N Line to PE Enable
H/LVR System Parameters->High and Low Voltage Ride Through Enable
Anti-Islanding: System parameters->anti-is-landing enable

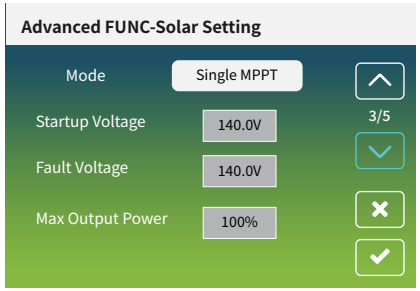
7.9 Advanced Function Setup Menu



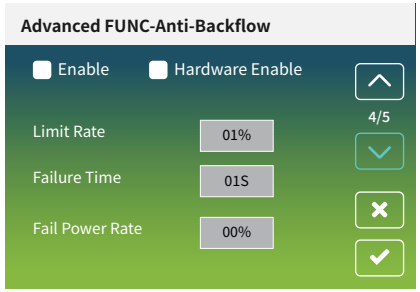
Unlock Setting: Before changing the advanced function parameters, please use password 8888 to enable this function. Then you can change the advanced parameters.
CT/Meter: The current selection is current transformer or meter.
Activer Power Pct.: The percentage of active power output by the inverter.
EPS: Emergency Power Supply is suitable for home backup power system, switching time 100ms.
UPS: Uninterrupted Power Supply is suitable for power supply of important equipment, switching time 10ms.



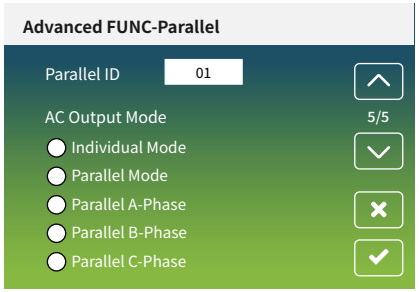
Enable: The off-grid function is enabled.
DisCHG Cutoff SOC: Off-grid discharge cut-off SOC.
Off-grid Volt: Off-grid output voltage



Mode: System Parameters->PV Mode
Startup Voltage: System parameters->PV start voltage
Fault Voltage: System parameters->PV fault voltage
Max Output Power : System parameters->Max PV output power

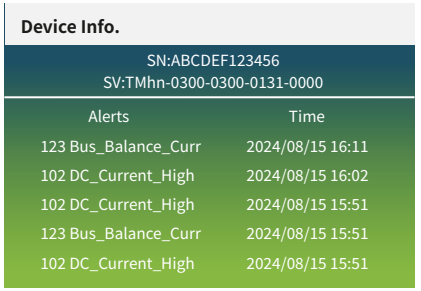


Enable: System parameters->anti-backflow enable
Hardware Enable: System Parameters->Hardware Anti-Backflow Enable
Limit Rate: System parameters->anti-reverse flow limit power
Failure Time: System parameters->Anti-backflow failure time
Fail Power Rate: System parameters->anti-backflow failure power



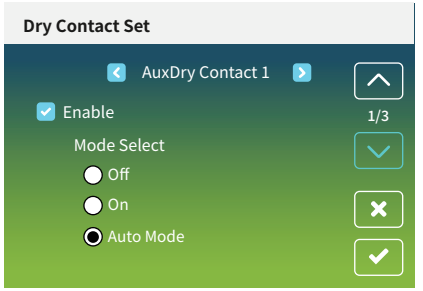
Parallel ID: After setting Power OFF on the Power On/Off interface and setting AC Out Mode to Parallel Mode, you need to select the Parallel ID for the inverter. (Different inverters cannot be set to the same Parallel ID)
AC Output Mode: After setting Power OFF on the Power On/Off interface, you can change this setting. For a single-phase parallel system with multiple inverters, select Parallel Mode.
(After completing the switch settings, this option can be configured. For a three-phase system with multiple inverters, the corresponding phase can be set.)

7.10 Device Info Setup Menu

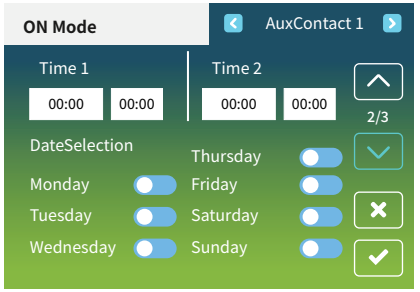


SN: The serial number of the device.
SV: The software version number of the current device.
Alerts: Display the historical faults and alarms. Press up and down buttons to turn pages.
Time: Display the time when historical faults and alarms occurred. Press up and down buttons to turn pages.

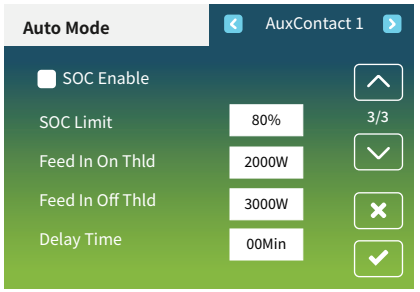
7.11 Auxiliary Dry Contact Setting



AuxDry Contact 1: There are two auxiliary dry contacts with selectable left and right settings.
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.
ModeSelect: 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.



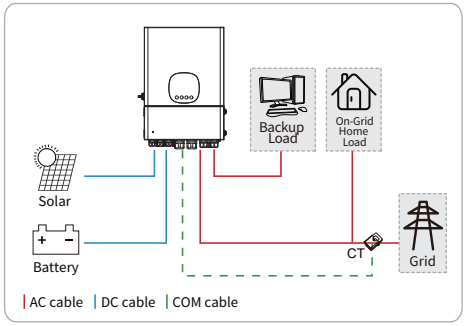
Settings for each time period.



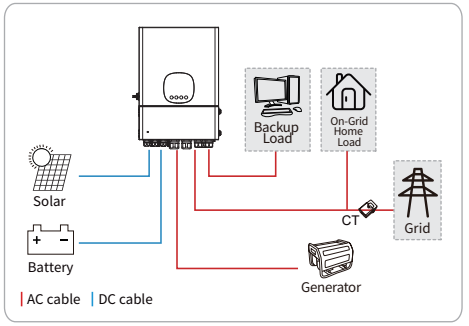
SOC Enable: When checked, the battery SOC is greater than **SOC Limit** to turn on the dry contact, less than **SOC Limit** to turn off the dry contact.
When unchecked, the feed power is greater than **Feed In On Thld** to turn on the dry contact, and less than **Feed In Off Thld** to turn off the dry contact .
Dalay Time: Dry Contact Off Delay Time.

7.12 Mode

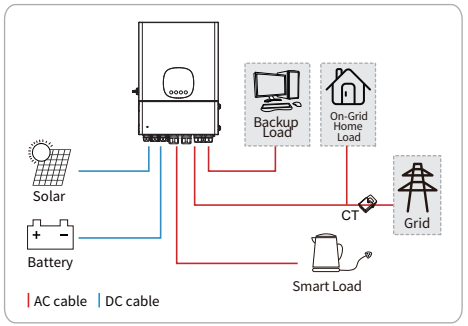
Mode I: Basic



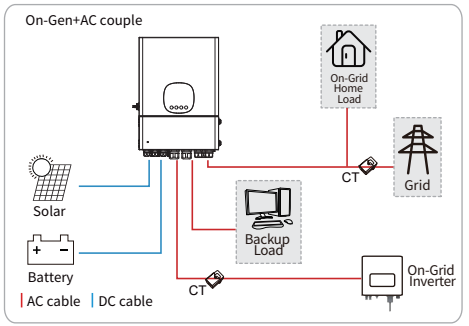
Mode II: With Generator



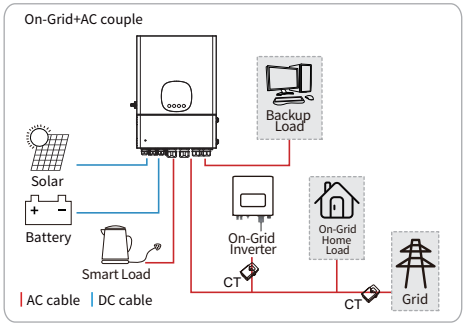
Mode III: With Smart-Load



Mode IV (1) : AC Couple



Mode IV (2) : 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 Discription	Suggestion
120	DC soft start fault	1. Restart inverter. 2. If error message still exists, contact manufacturer.
121	Buck-boost current sampling fault	1. Restart inverter. 2. If error message still exists, contact manufacturer.
123	Bus balance current fault	1. Restart inverter. 2. If error message still exists, contact manufacturer.
124	Inverter soft start fault	1. Restart inverter. 2. If error message still exists, contact manufacturer.
125	Emergency stop switch activated	1. Check if the emergency power off switch is pressed.
126	Grid frequency synchronization signal fault	1. Check the parallel connection of the inverter. 2. If error message still exists, contact manufacturer.
127	Parallel ID conflict	1. Check the parallel ID setting of the inverter. 2. If error message still exists, contact manufacturer.
128	Parallel CAN module communication failure	1. Restart inverter. 2. If error message still exists, contact manufacturer.
129	Parallel CAN communication cable disconnected	1. Check the parallel connection of the inverter. 2. If error message still exists, contact manufacturer.
145	Boost hardware overcurrent protection	1. Restart inverter. 2. If error message still exists, contact manufacturer.
146	Boost software overcurrent protection	1. Restart inverter. 2. If error message still exists, contact manufacturer.
203	Neutral-to-ground detection fault	1. Check PE to ensure that the PE line contact is good. 2. If error message still exists, contact manufacturer.

Main Error Code	Fault Discription	Suggestion
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.
207	DCI too high	1. Restart inverter. 2. If error message still exists, contact manufacturer.
209	Auto test 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 exisits, 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.

09 Technical Specifications

Item \ Model	H8000S	H10000S	H12000S
Inverter Parameters			
Model	H8000S	H10000S	H12000S
PV Input Specification			
Recommended max. PV input power	18000W	18000W	18000W
Max. PV input voltage	500V		
Startup input voltage	100V		
Rated PV input voltage	370V		
MPPT voltage range	100V – 425V		
No. of independent MPPT inputs	3		
No. of PV strings per MPPT	3 / 2+1+1		
Max. PV input current	28A /16A / 16A		
Max. DC short-circuit current	44A / 25A / 25A		
Battery Port Specification			
Battery voltage range	40V – 60V		
Rated battery voltage (Vdc)	48V		
Max. charge / discharge current	240A / 240A	240A / 240A	240A / 240A
Max. charge / discharge power	12000W	12000W	12000W
Grid Port Specification			
Max. AC power from grid	18000W	18000W	18000W
Max.AC input current from grid	78.2A	78.2A	78.2A

Rated AC output power	8000W	10000W	12000W
Rated AC output apparent power	8000VA	10000VA	12000VA
Max. AC output apparent power	8800VA	11000VA	13200VA
Max. AC output current	38.3A	47.8A	57.4A
Rated AC voltage	L / N / PE, 220V / 230V / 240V		
AC voltage range	185V – 265V		
Rated grid frequency	50Hz		
Grid frequency range	48HZ – 51.5Hz		
Harmonic (THD)	< 3% (at rated power)		
Power factor at rated power / Adjustable power factor	0.8 leading – 0.8 lagging		
Generator Port Specification			
Max. AC power from GEN	12000W	12000W	12000W
Rated AC input power	12000W	12000W	12000W
Max.AC input current from GEN	52.2A	52.2A	52.2A
Max. AC input apparent power	13200VA	13200VA	13200VA
Max. AC output current	57.4A	57.4A	57.4A
Rated AC voltage	L / N / PE, 220V / 230V / 240V		
AC voltage range	185V – 265V		
Rated GEN frequency	50Hz		
Back-up Port Specification			
Rated voltage	L / N / PE, 220V / 230V / 240V		
Rated grid frequency	50Hz		
Output voltage harmonic (THD)	< 3%		

Switch time to emergency mode	⩽10ms		
Rated output power	12000W	12000W	12000W
Peak output power	13200W	13200W	13200W
Efficiency			
Max. efficiency / European efficiency	97.8% / 96.5%		
Protection & Function			
Grid monitoring	Yes		
DC reverse polarity protection	Yes		
AC short - circuit protection	Yes		
Leakage current protection	Yes		
DC switch (solar)	Yes		
Surge protection	DC type II / AC type III		
Battery input reverse polarity protection	Yes		
IV scan and diagnosis	Yes		
General Data			
Topology (solar / battery)	Transformerless		
Dimensions (W * H * D)	459*650*267mm		
Weight	48.5KG		
Mounting method	Wall-mounting bracket		
Cooling method	Smart Cooling		
Noise (typical)	< 50dB (A)		
DI / DO	DI * 1 / DO * 2 / DRM		
DC connection type	MC4 (PV) / Plug and play connector (battery)		

AC connection type	Plug and play connector
Protective class	Class I
Country of manufacture	Made in China
System Parameters	
Degree of protection	IP65
Ambient temperature range	-20°C ~ +60°C
Relative humidity (Non-condensing)	15% – 95%
Max. operating altitude	3000 (>2000 derating)
Display	LED digtal display and LED indicator
Monitor	RS485, WLAN, Ethernet, CAN
Warranty	5 Year Product Warranty(optional 10 year)
Certification & Standard	
Certification	CB, CE, UKCA, SONCAP, RCM, ROHS
Standard	NRS 097-2-1:2024 Edition 3 EN IEC 61000-6-1:2019, EN IEC 61000-6-3:2021 EN 61000-3-12:2011, EN IEC 61000-3-11:2019EN IEC 61000-6-1:2019, EN IEC 61000-6-3:2021 EN 61000-3-12:2011, EN IEC 61000-3-11:2019

Cycle life *：Test Conditions，90% DOD,0.5C Charge & 1C Discharge at +25±2°C