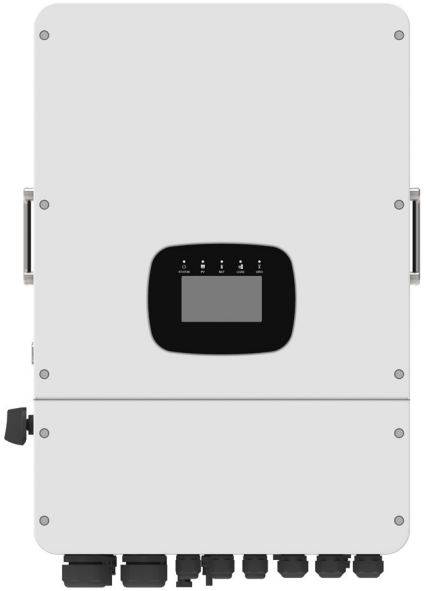
User Manual

Hybrid Inverter



HUA-8K3P-BL

HUA-10K3P-BL

HUA-12K3P-BL

HUA-15K3P-BL

CONTENTS

1.About This Manual

This manual provides product information, safety warnings, installation guidelines, operating instructions, and maintenance guidance for the **HUA-8-15K3P-BL** hybrid inverter series. Please read this manual carefully before installing and using the inverter, and keep this manual properly for future reference.

This manual may be updated from time to time throughout the product lifecycle. You can visit our website to view the latest version.

2. Safety Symbols

	Danger - high voltage and electric shock!
	Failure to observe any warnings contained in this manual may result in injury.
	There is high temperature on the surface of the inverter, and it is forbidden to touch it during equipment operation, otherwise it may cause burns.
	Refer to the operating instructions.
	Delayed discharge After the device is powered off, please wait for 5 minutes until the device is completely discharged.
	CE mark.
	Products shall not be disposed as household waste.
	PE protective conductor.

· Read all safety symbols before use.

· The device is internally charged with hazardous voltage. To prevent electric shocks, do not disassemble the device by yourself. If your device needs to be repaired, contact a qualified local service center.

· The grid input and alternating current (AC) output carry high voltage. Do not touch the wiring terminals.

· To minimize the risk of electric shocks, disconnect all wiring before attempting any maintenance.

· To prevent electric shocks, do not open the terminal cover while the device is operating.

· Use only cables that conform to specifications.

· The device must be installed by qualified professionals. Improper installation may cause electric shocks or fires.

· Keep the device out of children's reach.

· Do not install the device in harsh environments, such as damp, greasy, flammable, explosive, or dusty locations.

· Touching the casing during device operation may cause burn injuries.

· We recommend that you install suitable fuses or circuit breakers externally for the device.

· Before routing or adjusting the wiring, make sure that the fuses or circuit breakers for the PV array, grid, and battery terminals are disconnected. Always wear insulated gloves during wiring.

· After installing the device, verify that all connections are secure to prevent loose contacts, which may lead to heat accumulation and fires.

· When the device operates in off-grid mode, make sure that it is the only power source of the load. Parallel connection of the device with other AC power sources will damage the device and appliances and is therefore prohibited.

· The installation of the inverter must comply with local regulations.

To minimize injury risks, you can use only deep-cycle lead-acid rechargeable batteries for charging.

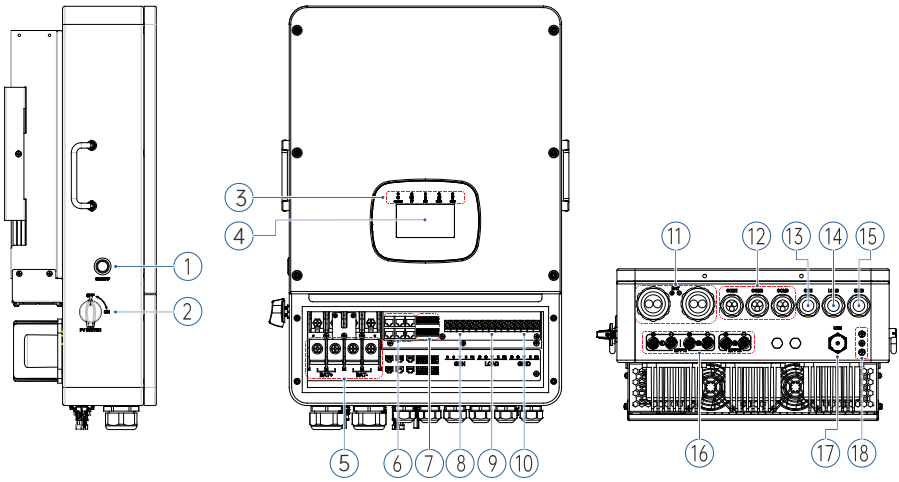
Please read through the safety warnings and operating instructions in this chapter and keep this manual handy for future reference.

Manufacturer is not responsible for device damage or personal injury resulting from failure to install, operate, or configure the device in accordance with this chapter or the applicable provisions in this manual.

3.Product Introduction

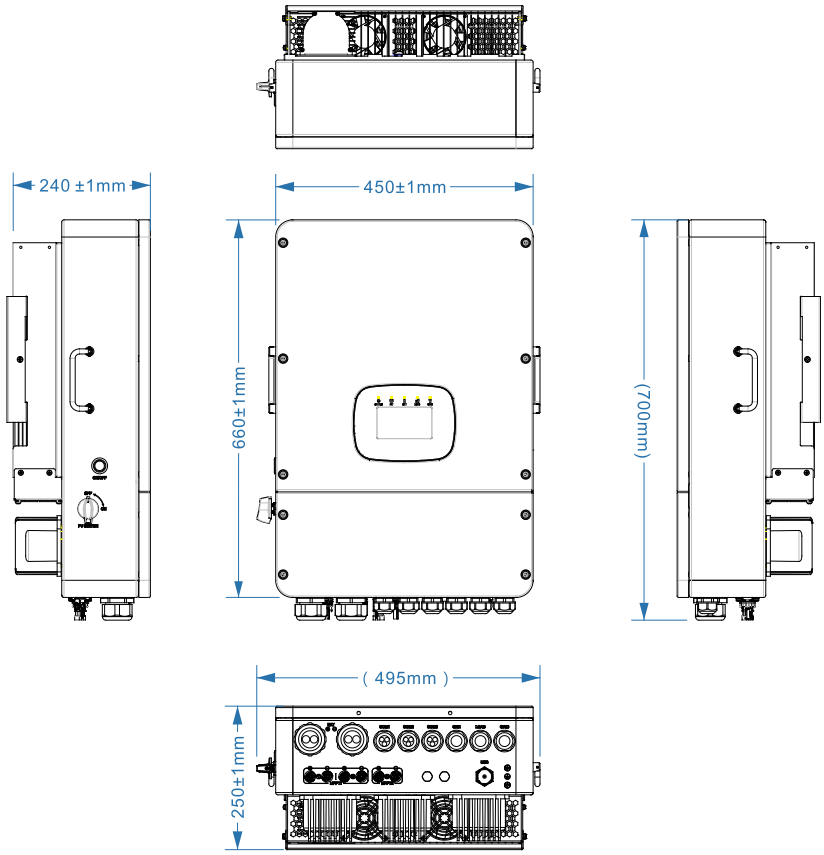
This is a multifunctional hybrid energy storage and grid-tied inverter. This innovative device integrates solar energy storage, grid charging, sine wave AC output, smart meter, intelligent communication module, and other features and is controlled by a digital signal processor (DSP). With fast response, high reliability, superior performance, and multiple working modes, it can efficiently support diverse scenarios. For example, it intelligently manages power for loads, stores power to batteries, or feeds power back to the grid.

3.1 Overview



1	Battery on/off Switch	**6**	COM Ports (RJ45)	**11**	BAT	**16**	PV Input Ports
2	PV Switch	**7**	COM Ports	**12**	COM1-3	**17**	USB
3	Status Indicators	**8**	GEN Port	**13**	GEN	**18**	Earth Connectors
4	LCD Touch Panel	**9**	LOAD Port	**14**	LOAD		
5	Battery Ports	**10**	GRID Port	**15**	GRID		

3.2 Dimensions

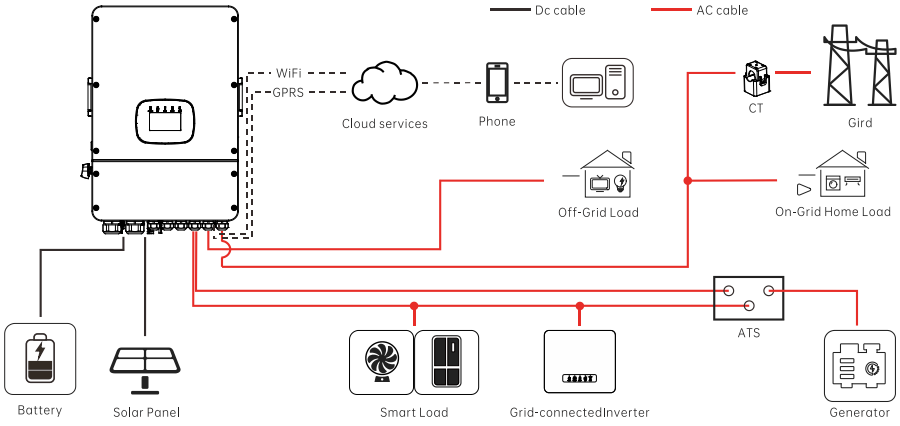


3.3 Features

- Uninterruptible power supply
- Support for peak shaving and valley filling of the grid
- Continuous charging with a maximum current of 290A
- Prolonged maximum 15kW full-power discharging without derating
- Compatibility with lead-acid and lithium-ion batteries, with 2 battery inputs
- Maximum 200% oversize of PV array size, and 160% of PV input power
- Supports long-term 150% imbalance output
- Maximum 2 times of the rated power, 10 seconds overload output
- Dedicated generator interface, support AC coupling input, or intelligent load output
- Universal Serial Bus (USB)-based or online software upgrade
- Continuous and stable operation under high temperatures

3.4 System Architecture

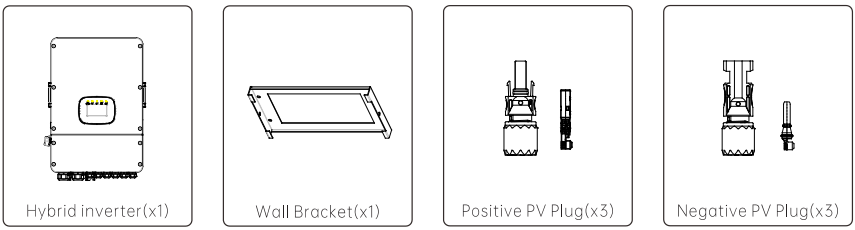
The following diagram shows a typical system architecture of an energy storage inverter.

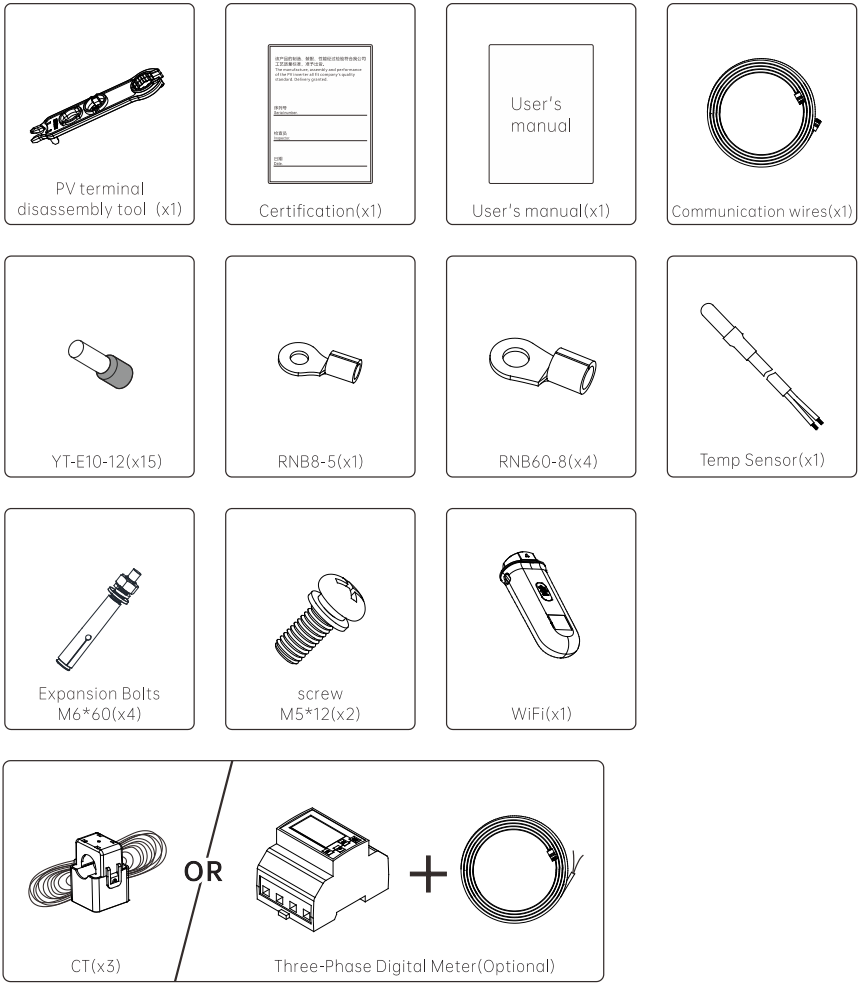


4. Installation and Wiring

4.1 What's in the Box

Before installation, check all items in the package box for damage. The box contains the following items:





4.2 Product Handling Requirements

Transportation, relocation, and installation must comply with national and regional laws, regulations, and applicable standards.

When moving the device to the installation location, keep in mind the following notes to prevent personal injury or device damage during handling:

· Assign adequate manpower when lifting or moving the device to prevent personal injury due to overexertion.

· Wear protective gloves to prevent cuts from metal.

· Maintain balance while carrying the device to prevent dropping.

· Avoid placing the device directly on the ground to prevent scratches on the metal casing.

4.3 Installation Guidelines

● **Precautions:**

· Make sure that the mounting surface is flat, dry, vertical, and free from concavity.

· Avoid installing the device in areas exposed to sunlight, rain, snow, etc. Direct sunlight, high temperatures, and other adverse conditions may cause output power derating.

· Ensure sufficient space for ventilation, heat dissipation, and operational accessibility.

· Do not install the device in flammable, explosive, corrosive, or toxic environments.

· Keep the device away from TV antennas or antenna cables to prevent interference.

· Install the device at an altitude of up to 3,000 meters above sea level.

· Avoid environments with humidity levels exceeding 95%.

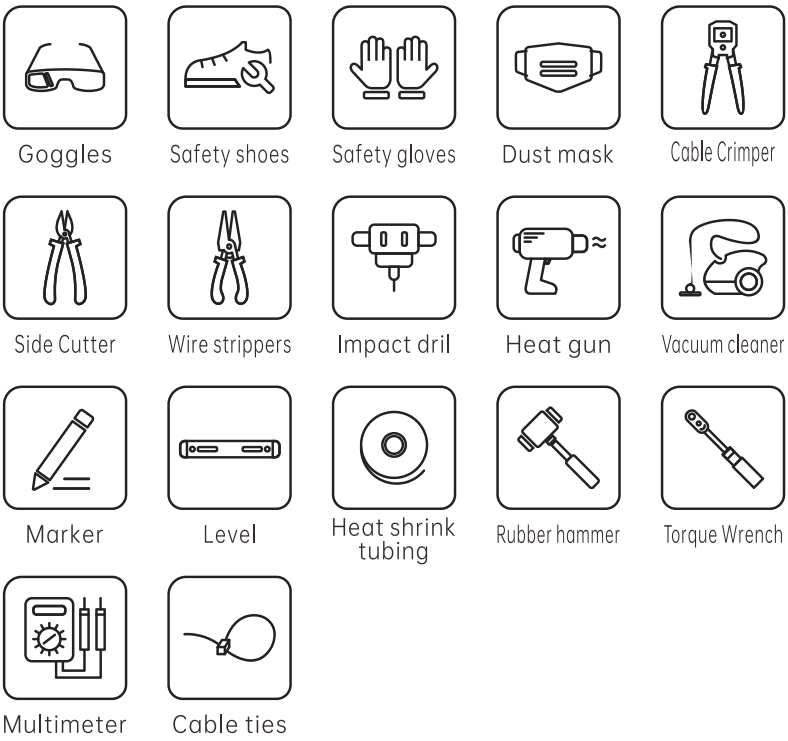
· Install the device in locations inaccessible to unauthorized personnel.

· Install the device at a height that facilitates operation and maintenance to ensure the visibility of indicators and labels and the accessibility of terminals.

· For outdoor installation in regions threatened by salinization, consult Manufacturer beforehand. Such regions are typically within 500 meters from coastlines and are affected by factors such as onshore wind, rainfall, and terrain.

· The direct current (DC) and communication cables between the battery and inverter must be shorter than 3 meters. Make sure that their distance meets this requirement.

● **Installation tools**



● **Installation environment**

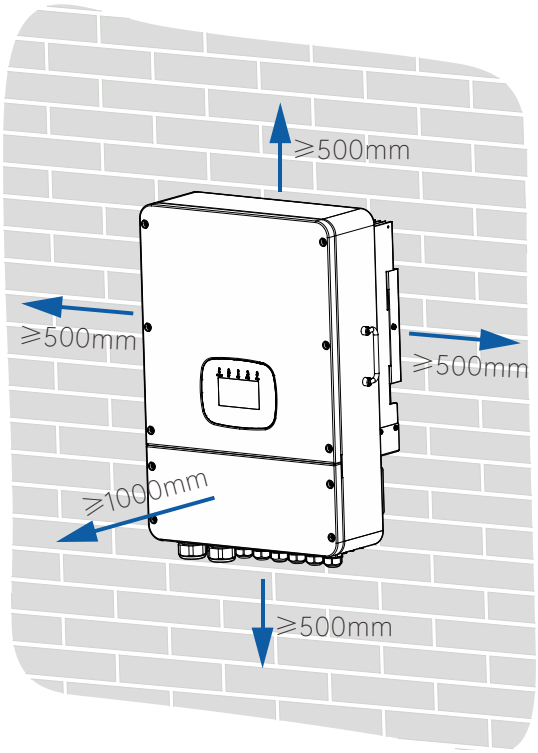
Install the device on a vertical load-bearing wall of concrete or other non-combustible material and observe the following:

· Install the inverter at eye level for easy reading of the liquid crystal display (LCD).

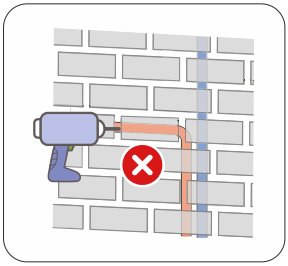
· Keep the ambient temperature between -25° C and 60° C for optimal performance.

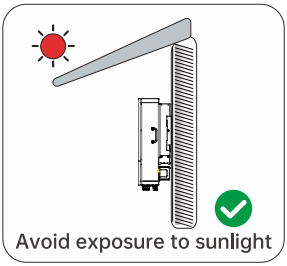
· Maintain sufficient clearance around the inverter, as shown in the diagram below, to ensure adequate space for heat dissipation and wiring access.

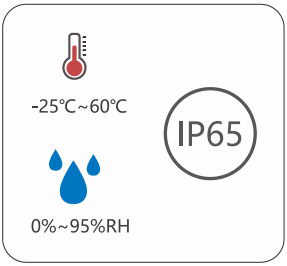
The following diagrams illustrate the requirements for the installation environment.

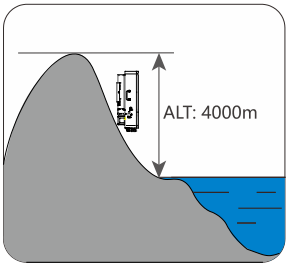


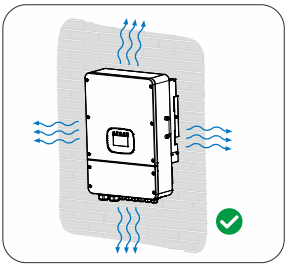

Children no touch

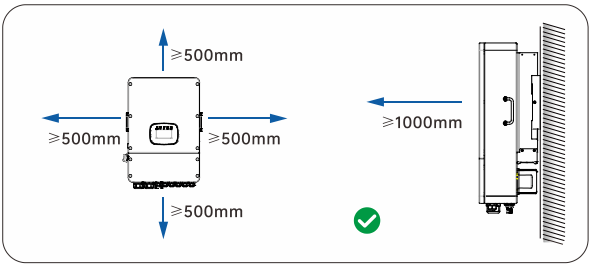


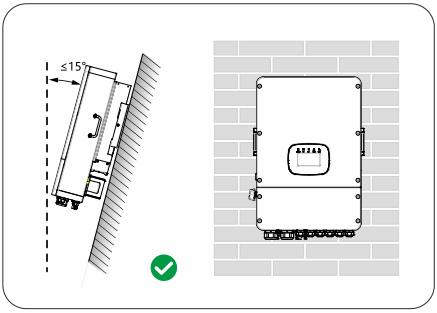

Avoid exposure to sunlight

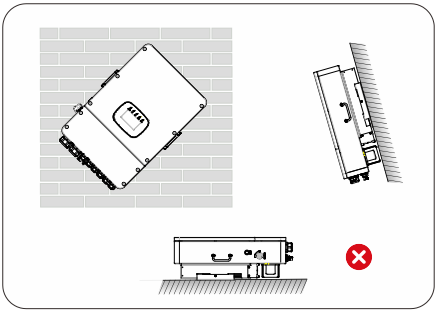

-25℃~60℃
IP65
0%~95%RH


ALT: 4000m

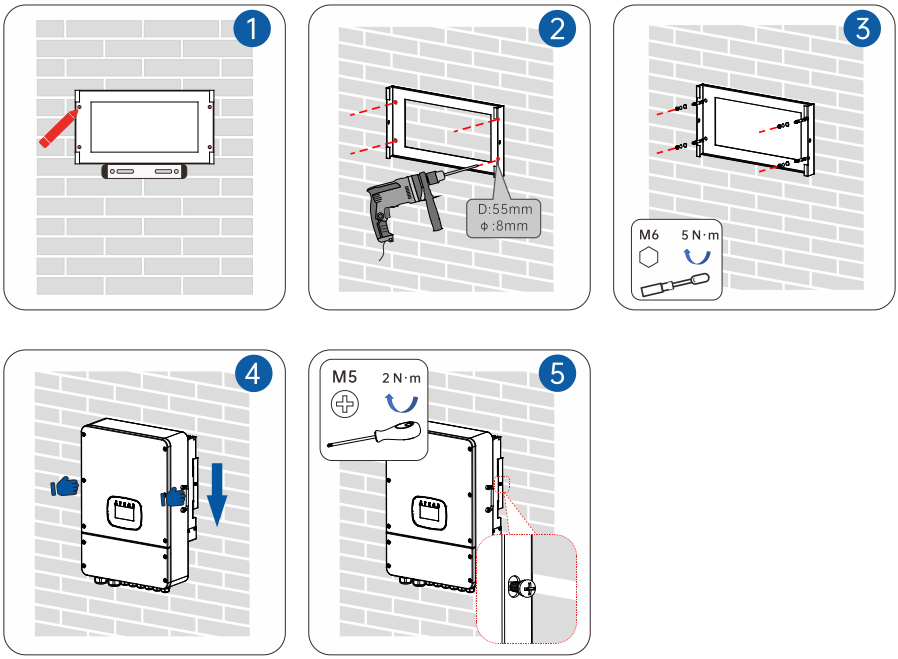



≥500mm
≥500mm
≥500mm
≥500mm
≥1000mm


≤15°



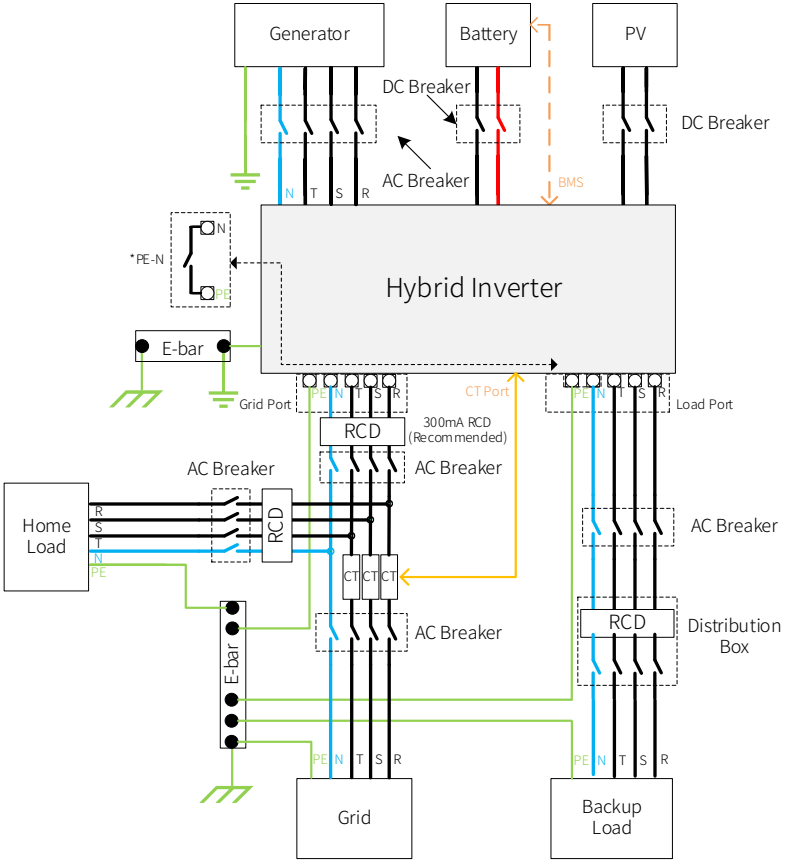
Installation steps



4.4Inverter System Wiring Diagram

1.System connection diagram for Non-PEN grid connection:

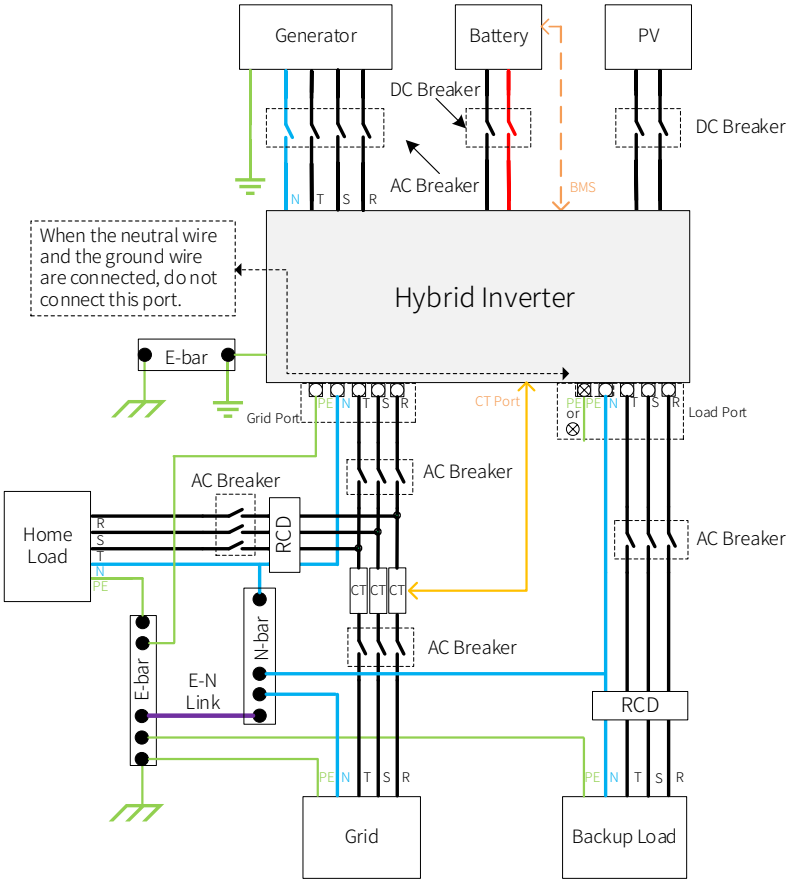
This diagram is an example for an application in which neutral is separated from the PE in the distribution box.
For countries such as China, Germany, the Czech Republic, Italy, etc., please follow local wiring regulations !
Note: Backup function is optional in German market. please leave backup side empty if backup function is not available in the inverter.



*PE-N: When the inverter operates in the Off-grid mode, the neutral point on the standby side and PE are connected through an internal relay.
Additionally, when the inverter operates in the On-grid mode, this internal relay will open.

2.System connection diagram for PEN grid connection:

This diagram shows an application example where the neutral line is connected to the PE in the distribution box. For instance, in countries such as Australia, New Zealand, and South Africa.
(Please follow the local wiring regulations!)



4.5 Wiring Preparations

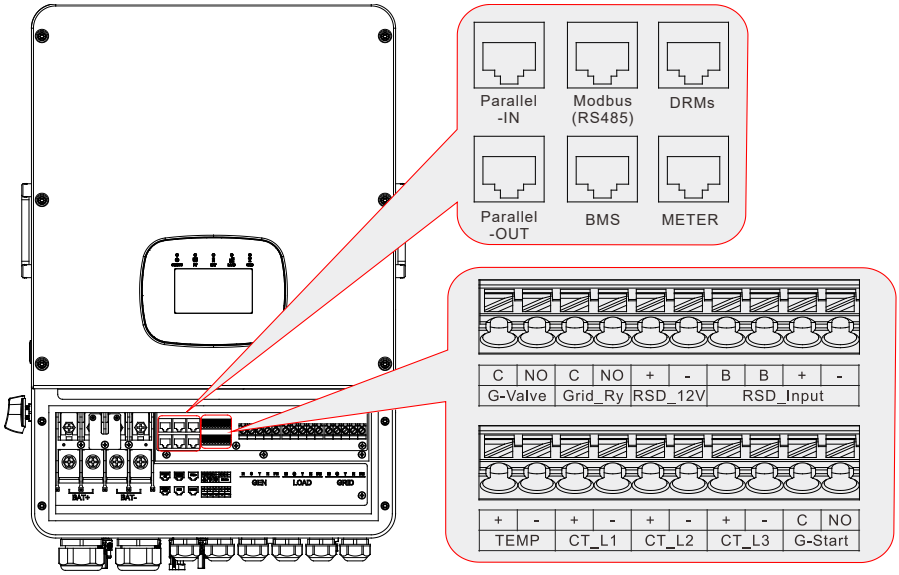
Before connecting to the grid, external wiring and switch circuit breakers must be prepared. Independent AC circuit breakers must be installed respectively between the inverter and the grid, as well as between the backup load and the inverter. This will ensure that the inverter can be safely disconnected during maintenance and is completely protected from overcurrent. The recommended AC circuit breakers for the load port, grid port, and battery port are as follows. All wiring work must be completed by qualified personnel. Using the appropriate cables for AC input connections is crucial for system safety and efficient operation. To reduce the risk of injury, please use the recommended cables below.It is recommended to use 5-core wire.

There are three terminal blocks labeled "GRID", "LOAD", and "GEN". Do not connect the input and output connectors incorrectly. The battery terminal block is labeled "BAT", with two

Inverter Model	Port	Cable Specifications	Maximum Operating Current	Recommended Circuit Breaker Specifications
HUA-15K3P-BL	GRID	10.0mm²/6AWG	50A	4P-63A
	LOAD	10.0mm²/6AWG	50A	4P-63A
	GEN	10.0mm²/6AWG	45A	4P-63A
	BAT	50.0mm²*2/0AWG*2	290A	2P-250A*2
HUA-12K3P-BL	GRID	10.0mm²/6AWG	50A	4P-63A
	LOAD	10.0mm²/6AWG	50A	4P-63A
	GEN	10.0mm²/6AWG	45A	4P-63A
	BAT	35.0mm²*2/1AWG*2	250A	2P-200A*2
HUA-10K3P-BL	GRID	10.0mm²/6AWG	50A	4P-63A
	LOAD	10.0mm²/6AWG	50A	4P-63A
	GEN	10.0mm²/6AWG	45A	4P-63A
	BAT	35.0mm²*2/1AWG*2	220A	2P-150A*2
HUA-8K3P-BL	GRID	10.0mm²/6AWG	50A	4P-63A
	LOAD	10.0mm²/6AWG	50A	4P-63A
	GEN	10.0mm²/6AWG	45A	4P-63A
	BAT	25.0mm²*2/2AWG*2	180A	2P-150A*2
All	MPPT	2.5mm²/12AWG each wire	20A	/

4.6 Wiring of Internal Signal Terminals and Port

1. Terminal definitions



2. Communication port signal definitions

● **BMS port pinout**

1	BMS_RS485_B	5	BMS_CANL
2	BMS_RS485_A	6	GND
3		7	
4	BMS_CANH	8	

● **METER port pinout**

1	METER_RS485_B	5	METER_RS485_A
2	METER_RS485_A	6	GND
3	GND	7	
4	METER_RS485_B	8	

● **Modbus port pinout**

1	USER_RS485_B	5	USER_RS485_A
2	USER_RS485_A	6	GND
3	GND	7	
4	USER_RS485_B	8	

● **DRMS port pinout**

1	DRM1/5	5	GND
2	DRM2/6	6	DRM0
3	DRM3/7	7	
4	DRM4/8	8	

● **Parallel-IN and Parallel-OUT ports**

These ports are used for parallel signal connections. For more information, see sections about parallel connections.

3.RSD signals

● "BB" RSD short-circuit signal: If you short-circuit these two signal terminals, the inverter is forced to shut down (emergency stop).

● "+-" RSD voltage signal: This 12V signal stops the inverter in case of emergency.

● "RSD12V" output signal: This supplies power to the rapid shutdown (RSD) module.

4.Dry Contact signal

● G-Start: In the generator setting page, when "Gen Port Function" is set to "Generator En" or "Generator Force En", if the lithium battery SOC or lead-acid voltage is lower than the set start value, this dry contact signal will be connected; if the lithium battery SOC or lead-acid voltage is higher than the set diesel generator shutdown value, this dry contact will be disconnected. When "Gen Port Function" is set to "Smart Load Output", if the lithium battery SOC or lead-acid voltage is higher than the set start value, the G-Start dry contact signal will be disconnected.

● G-Valve/Grid-Ry: Reserve dry contact signal ports. They can be used as SG-1/SG-2 signal control ports for SG-Ready devices, such as heat pumps and smart loads, as required.

5.CT signals

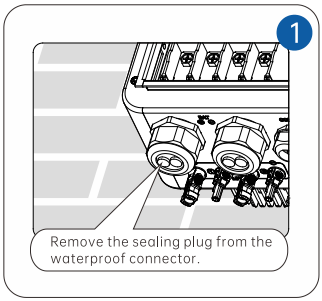
● CT-L1/CT-L2/CT-L3: You can connect this port to an external current transformer (CT) , corresponding to the R/S/T phases respectively,for anti-reverse power protection. For more information, see the CT wiring diagram.

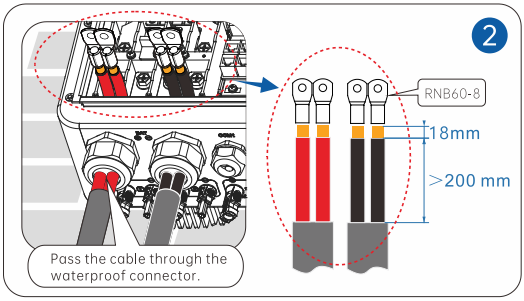
6.TEMP signals

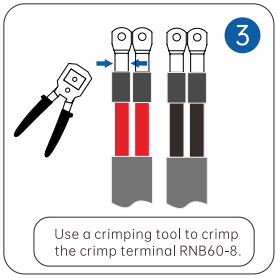
● TEMP: This port is for detecting the temperature of the lead-acid battery.

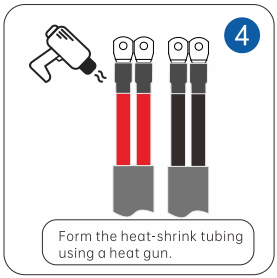
4.7 Battery Connection

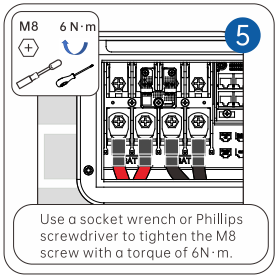
1.Battery wiring steps





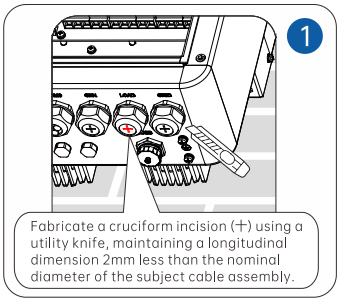


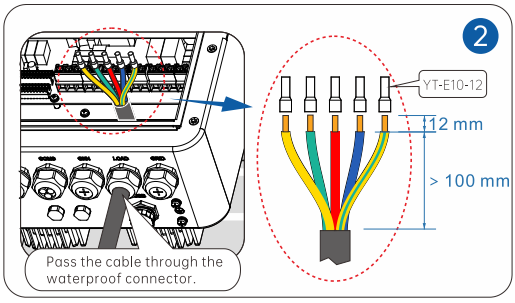


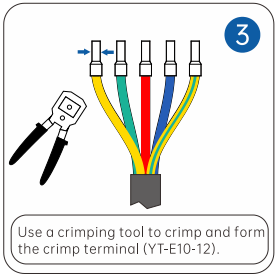


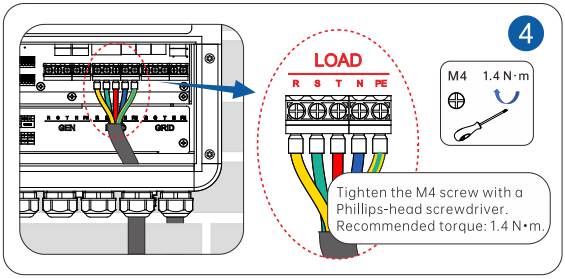
4.8 AC Connection

1.Load wiring steps

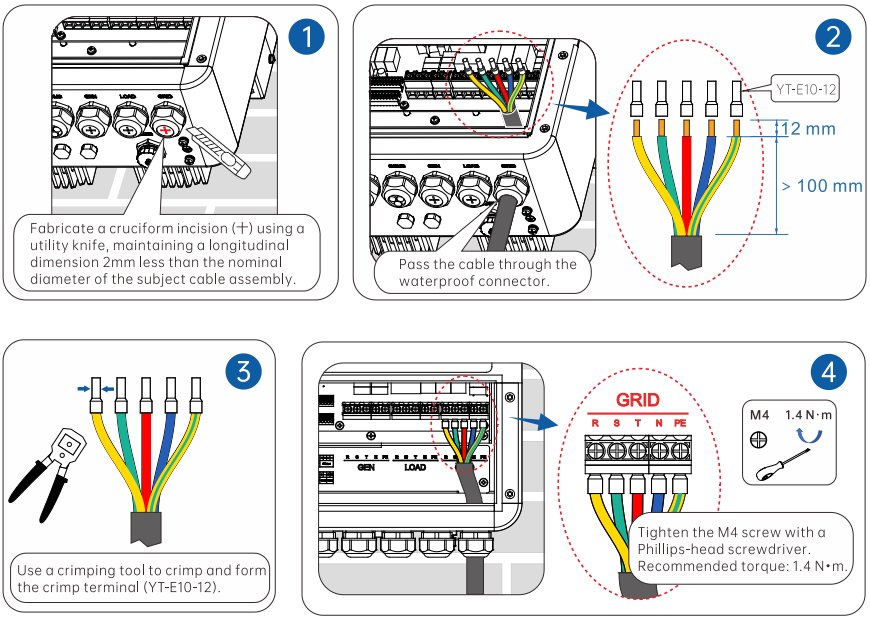




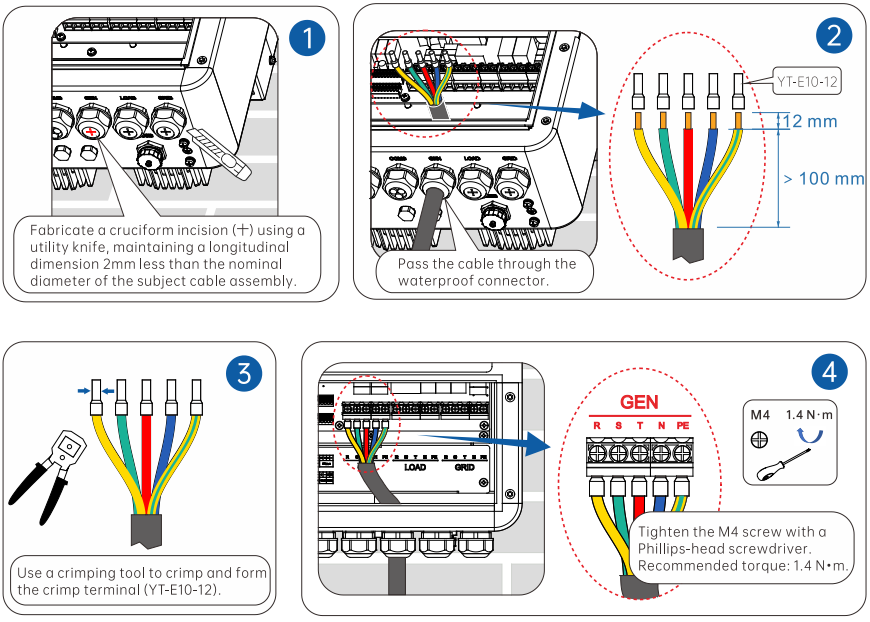




2.Grid wiring steps



3.Generator wiring steps

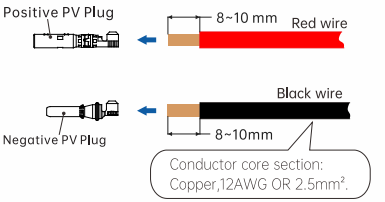


4.9 PV Array Connection

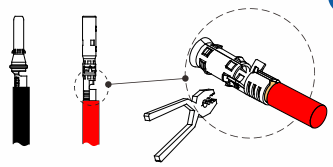
1.PV cable specifications

Before connecting the PV arrays, please install an independent DC breaker between the inverter and the PV arrays. MPPT1/MPPT2 can support a maximum input current of 27A/20A. When the current of PV arrays are less than 13.5A, two strings can be connected in parallel to MPPT1, and the inverter can be connected to three strings. When the current of PV arrays are greater than 13.5A but less than 20A, only one string can be connected to MPPT1, and the inverter can be connected to two strings.

use the PV plugs and connectors fromthe accessory box. 1

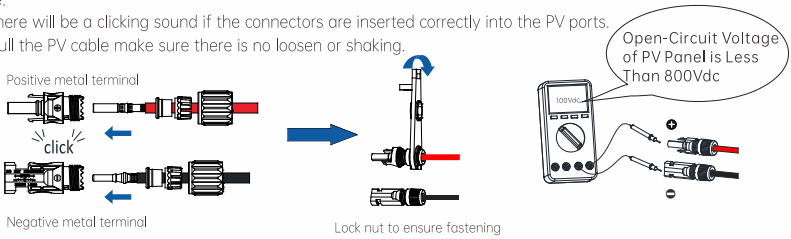


Connect the PV cable to the PV connectors. 2



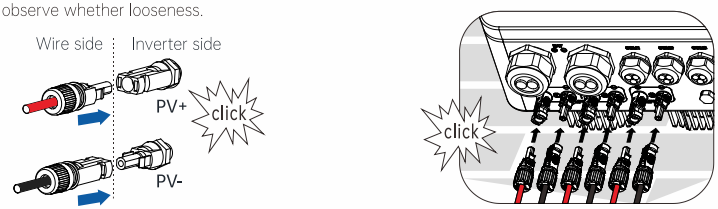
Note:
Please make sure cable can't put out from terminal after pressing.

Screw the cap on and plug it into the inverter side. 3
Make sure the cable polarity is correct.
Note:
1.There will be a clicking sound if the connectors are inserted correctly into the PV ports.
2.Pull the PV cable make sure there is no loosen or shaking.



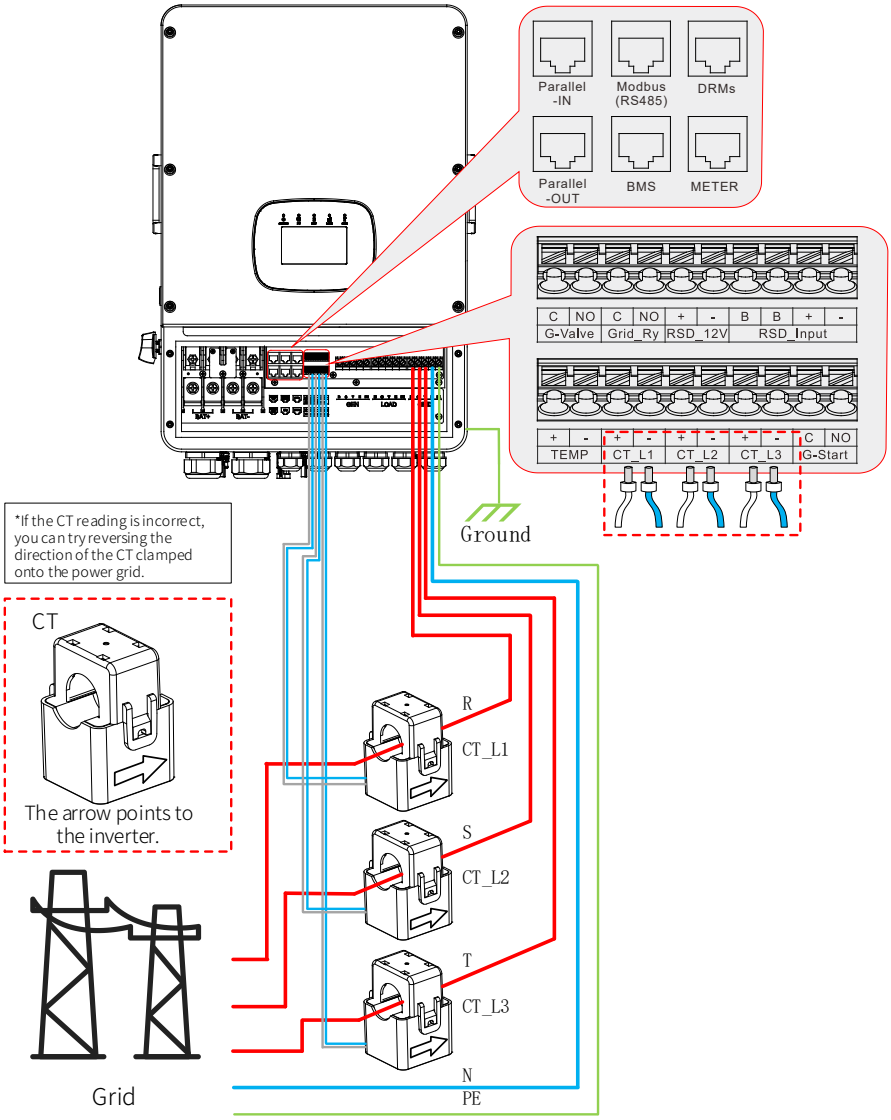
The polarity of the PV strings must not be connected in a reverse manner. Otherwise,the inverter could be damaged.

Note: 4
1.Please make sure the PV input voltage/current not beyond the specification before plug in;
2.When installing the PV terminal, pay attention to the distinction between the positive and negative terminals and the one-to-one correspondence between the terminals and hybrid inverter;
3.When the terminal is docked, there is a click sound. After the terminal is locked, gently pull the PV cable to observe whether looseness.



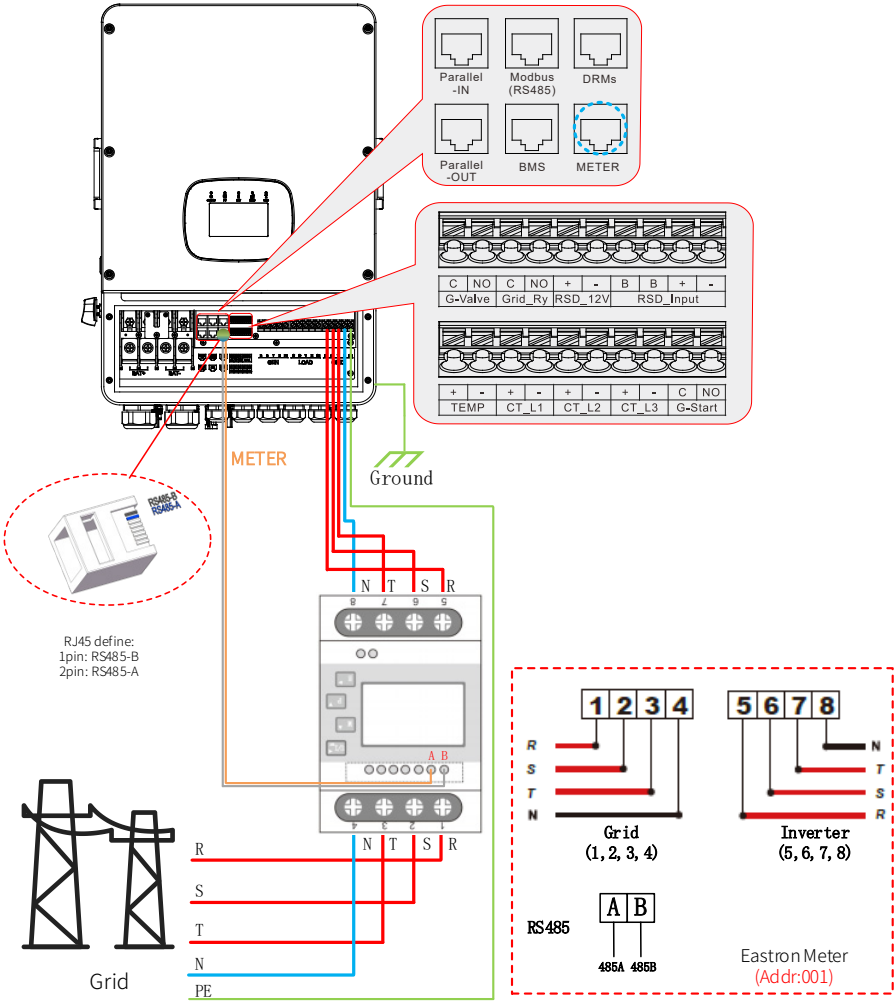
4.10 CT Connection

1. CT wiring diagram

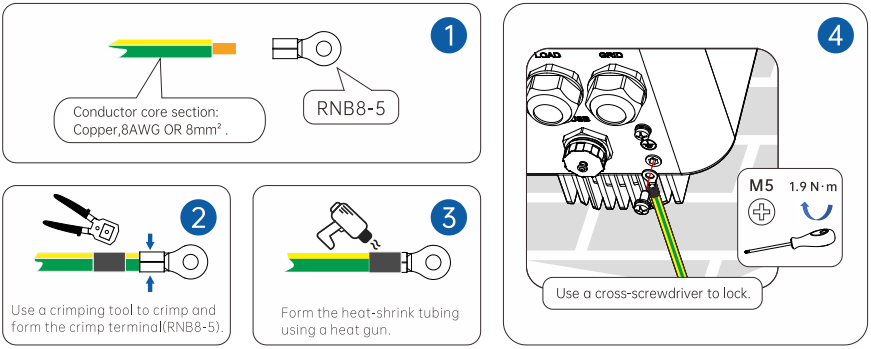


4.11 Meter Connection

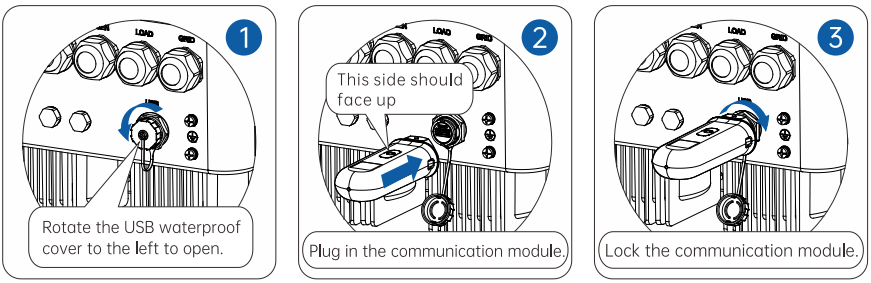
1. Wiring diagram of meter connection:



4.12 Grounding Connection

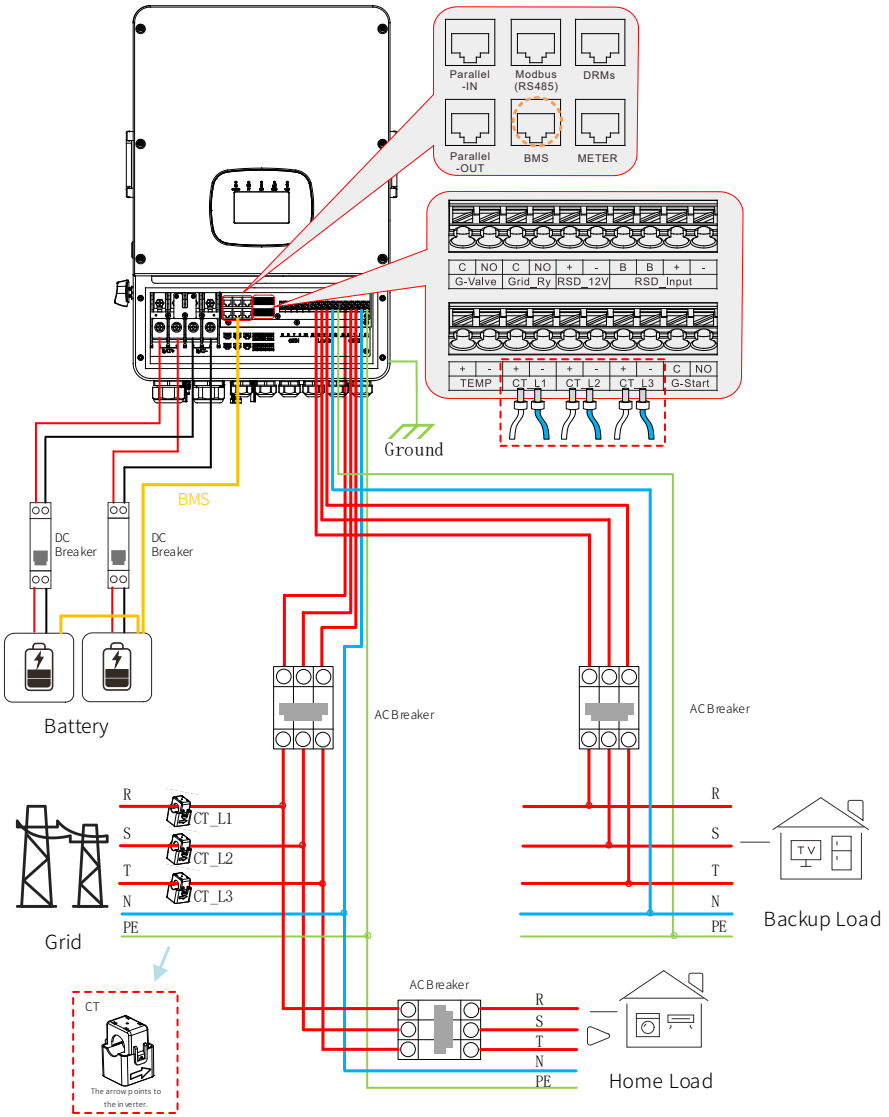


4.13 Communication Module Installation



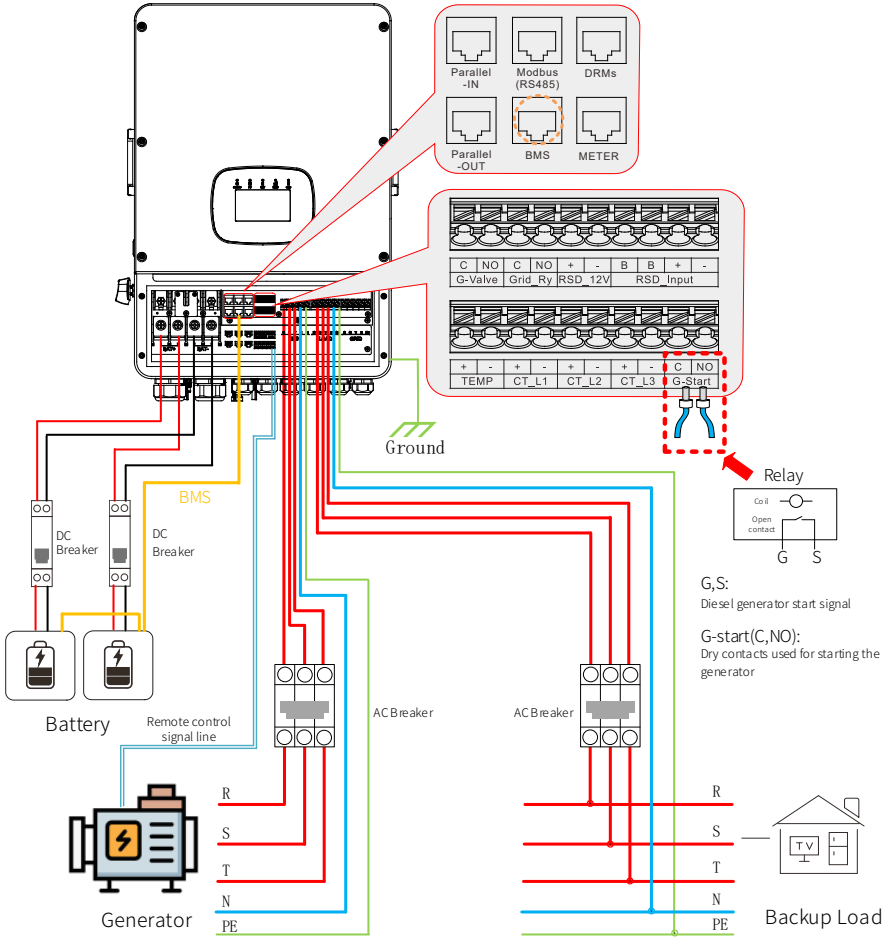
4.14 Typical Application Diagram Of On-grid Wiring

The wiring diagram is shown as follows. When multiple batteries are connected in parallel, to ensure current sharing among the batteries, the power lines of the batteries should be as equal in length as possible.



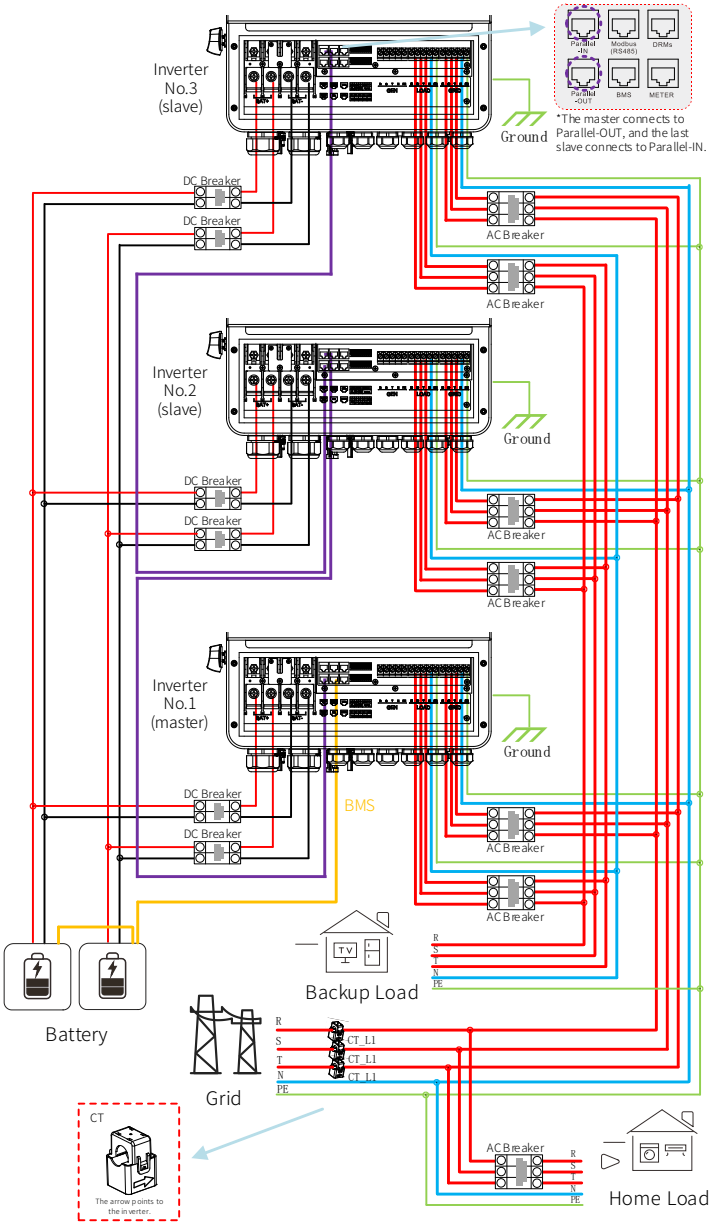
4.15 Typical Application Diagram Of Diesel Generator

The wiring diagram is shown as follows.

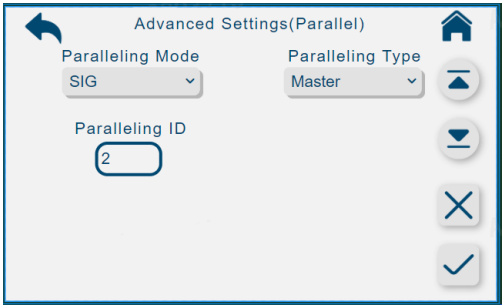


4.16 Three Phase Parallel Connection Diagram

Take an example of 3 units in parallel both on-grid and off-grid.

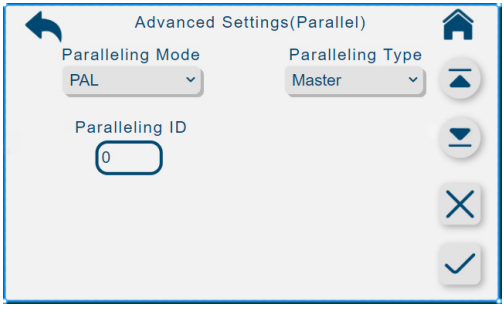


● Inverter configuration for parallel connection

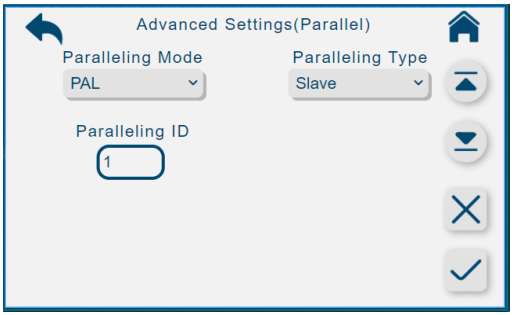


Advanced Settings(Parallel)	
Parameter	Description
Paralleling Mode	SIG: specifies that only one inverter is connected. PAL: sets the inverter to parallel connection mode.
Paralleling Type	Master: sets the inverter as the master. Slave: sets the inverter as a slave unit.
Paralleling ID	The ID of the paralleled inverter. Value range: 0 to 12.

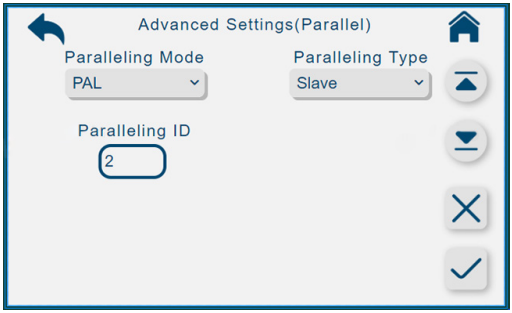
● Configuration steps for single-phase parallel connection
1. Close the battery circuit breaker for each inverter.
2. Close the battery ON/OFF switch of each inverter.
3. Set the paralleling parameters for Inverter No.1 as follows:



4.Set the paralleling parameters for Inverter No.2 as follows:



5.Set the paralleling parameters for Inverter No.3 as follows:

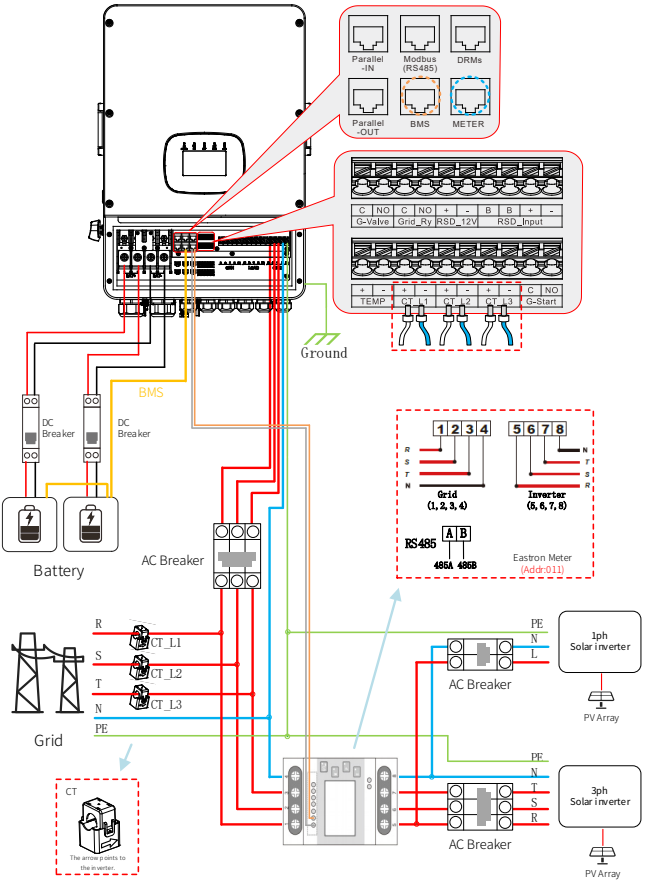


6. Open the battery ON/OFF switch of each inverter.
7. Close PV switch, and then the grid breaker, load breaker for each inverter.
8. Close the battery ON/OFF switch of each inverter.

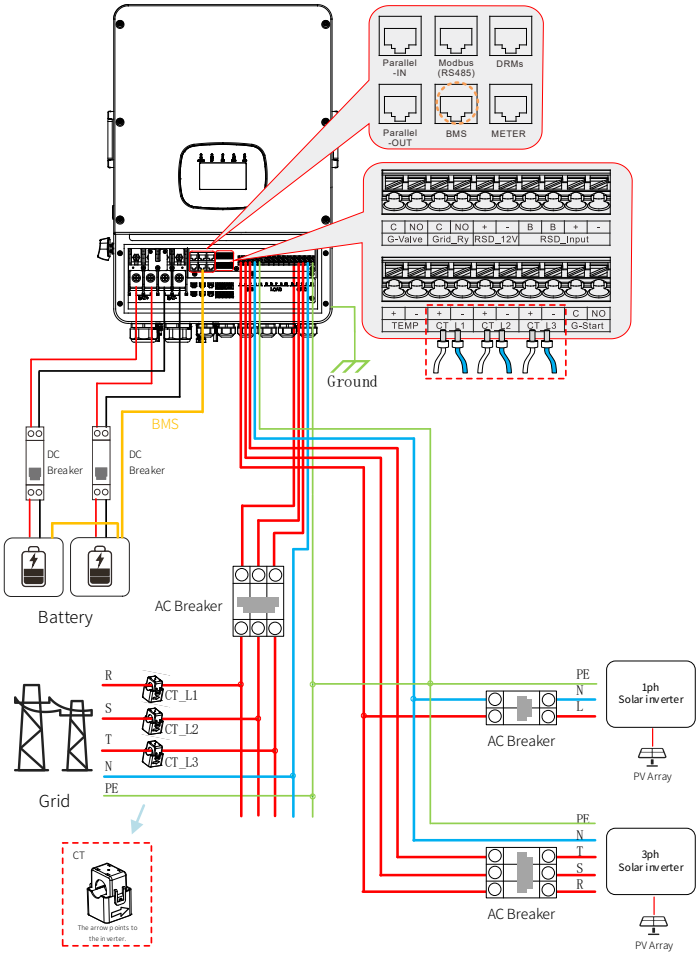
4.17 AC Coupling Application Diagram

If a single-phase or three-phase photovoltaic inverter has already been installed, when it is necessary to add energy storage, the following block diagram can be followed to assemble an AC-coupled system.

● Solution 1: the AC output of the photovoltaic inverter is connected to the power grid. Only the installation of a three-phase electricity meter and signal lines is required, which should be connected to the METER interface of the hybrid inverter.
The hybrid inverter reads the electricity meter and collects the photovoltaic data. For detailed requirements, please refer to the "Power Detection Method" function.



● Solution 2: the AC output of the photovoltaic inverter is connected to the GEN interface of the hybrid inverter. The hybrid inverter will directly collect the photovoltaic data. Under this wiring scheme, it will no longer be possible to connect a diesel generator. For the setup requirements, please refer to the "Generator settings" function.

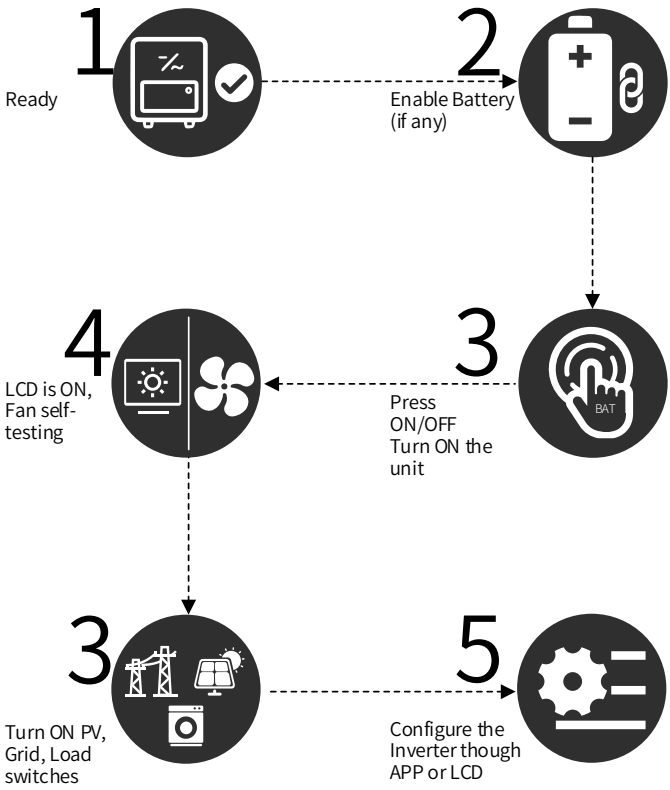


5.Inverter Power-on Procedure

5.1 Precheck

1. Make sure that the inverter is reliably installed in a well-ventilated clean location that facilitates operation and maintenance.
2. Verify that the PE wire, DC input cables, AC output cables, and communication cables are correctly and firmly connected.
3. Confirm that all cables are properly routed and damage-free.
4. Make sure that the reserved cable entry holes are blocked with waterproof plugs.
5. Make sure that all cable entry holes in use are properly sealed.
6. Check that the voltage and frequency at the grid connection point meet the requirements.

5.2 Inverter Power-on

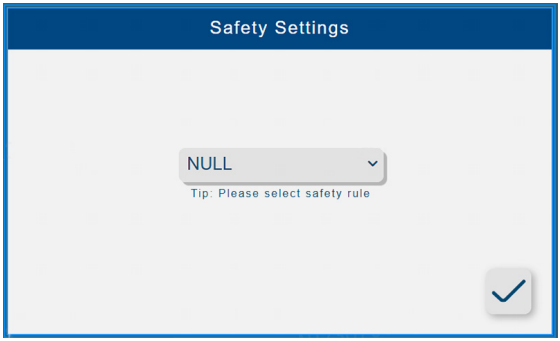


Power-on steps: Close the battery circuit breaker > Push battery ON/OFF button > Close the PV switch > Close the PV circuit breaker > Close the grid circuit breaker > Close the load circuit breaker.

5.3 Power-on Navigation Interface (First Power-on)

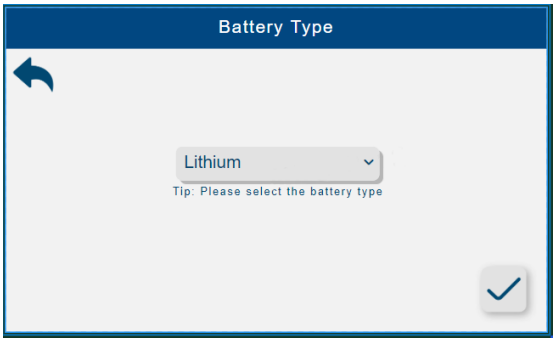
When the device is powered on for the first time, it will initially enter the startup navigation interface.

1. Please select the appropriate safety regulations and grid connection certification standards as required by the local power grid company:



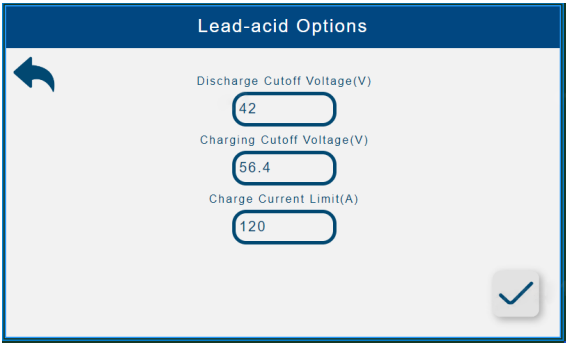
Setting interface of "Safety Settings"	
settings	instructions
Safety Settings	Select the grid code, and the options are described as follows: NULL: No settings, use the default standard set by the device at the factory Click √ to enter the "Battery Type" setting interface. (Notes: New grid code may be added in the future, but they are not included in the above list.)

2. Select the type of connected batteries:



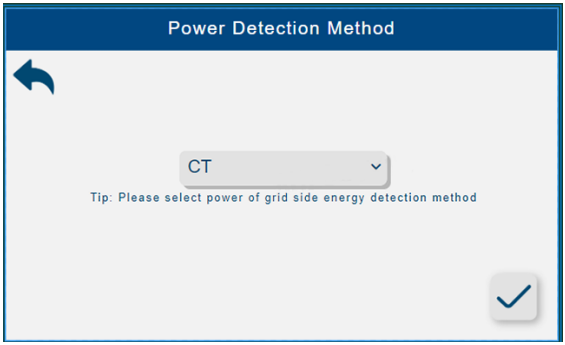
Setting interface of "battery Type"	
settings	instructions
Battery Type	Please select "Lithium" or "Lead-acid" , "No battery" based on the connected battery, and click √ to proceed to the next page.

3. When the battery type setting interface selects "lead acid battery", it will enter the "lead acid Options" parameter setting interface. Selecting lithium ion battery can skip this step.



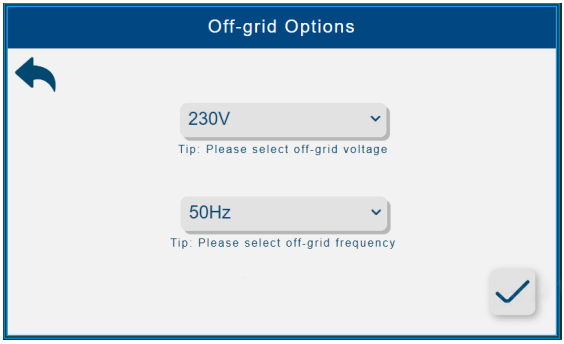
Setting interface of "Lead-acid Options"	
settings	instructions
Lead acid Options	Discharge Cutoff Voltage (V): In off-grid mode, the battery stops discharging when its voltage reaches this set value. (Setting range: 40 - 52, default value: 42) Charging Cutoff Voltage (V): The battery stops charging when its voltage reaches this set value. (Setting range: 48 - 59.2, default value: 56.4) Charge Current Limit (A): This setting value represents the maximum charging current for the machine battery (refer to the allowable maximum charging current of the selected battery for setting) (Setting range: 1 - 290, default value: 120)

4. Select the power sampling method on the grid side and



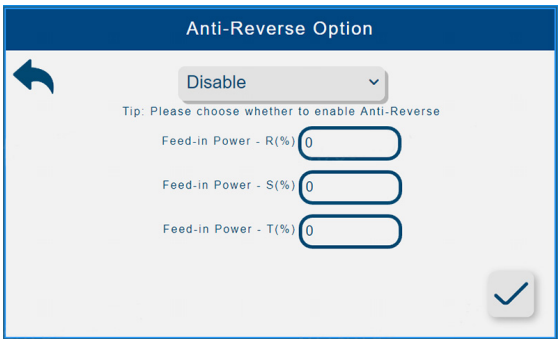
Setting interface of "Power detection method"	
settings	instructions
Power detection method	Based on the connected device, select "CT" or "Meter", "Disable". Click √ to enter the "Off-grid options" Setting Interface.

5. Proceed to the "Off-grid options" settings.



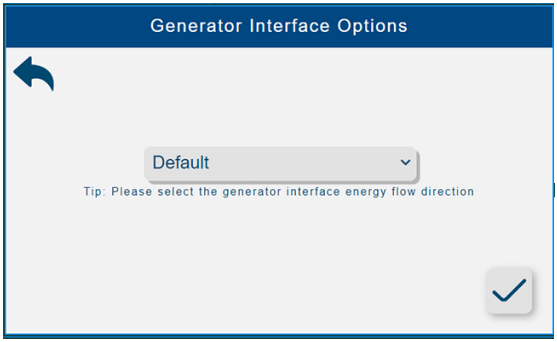
Setting interface of "Off-grid options"	
settings	instructions
Off-grid options	Please select "Off-grid Voltage" and "Off-grid Frequency", and click √ to enter the "Zero feed-in option" Setting Interface.

6. Proceed to the "Anti-Reverse Option" settings.



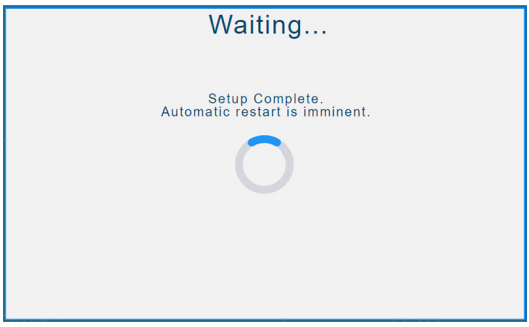
Setting interface of "Anti-Reverse Option"	
settings	instructions
Anti-Reverse Option	Please select "Enable" or "Disable" for anti-reverse option; Feed-in power - R (%) : Please set the feed-in power percentage for phase R of the grid (setting range: 0% - 100%) Feed-in power - S (%) : Please set the feed-in power percentage for phase S of the grid (setting range: 0% - 100%) Feed-in power - T (%) : Please set the feed-in power percentage for phase T of the grid (setting range: 0% - 100%) and click √ to enter the "Diesel Interface Option" Setting Interface.

7. Proceed to the "Generator Interface Options" settings.



Setting interface of "Generator Interface Options"	
settings	instructions
Generator Interface Options	Please select the interface function of the diesel generator. The options are as follows: **Default**: Under this mode, the diesel generator port has no output and is in a disconnected state internally. **Generator En:** Under this mode, the inverter will, based on the settings of this interface for turning on/off the battery SOC (in lithium battery mode) or the battery voltage (in lead-acid battery mode), detect that the diesel generator port has been connected to the generator. Then, it will use the generator to supply power to the load. After the diesel generator charging is enabled, the diesel generator can charge the battery. **Generator Force En:** Under this mode, the generator will be forced to start. Based on the discharge cut-off SOC (for lithium battery mode) or the discharge cut-off voltage (for lead-acid battery mode), if it is detected that the diesel generator can also charge the battery, the diesel generator will be forced to charge the battery. **Smart Load Output:** Under this mode, the intelligent load switch will operate according to the settings on this interface to either activate or deactivate the battery's SOC (in lithium battery mode) or the battery voltage (in lead-acid battery mode). **AC Couple On SecEPS Side:** Under this mode, it is supported to connect the grid output port of another photovoltaic machine to the Gen port of this machine. Click √ to enter the device restart waiting interface.

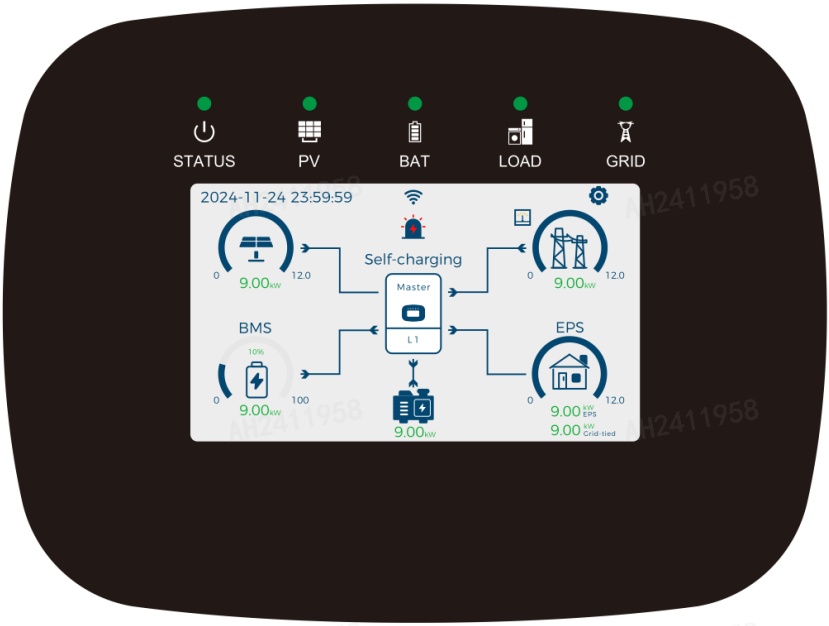
8. Device restart waiting interface



Interface of "Waiting..."	
settings	instructions
Waiting	The parameters are being set. Please wait for the device to complete its restart.

5.4 Indicator Check

1.The following diagram shows the indicators.



2.Normal operation logic of indicators:

● Inverter operation status

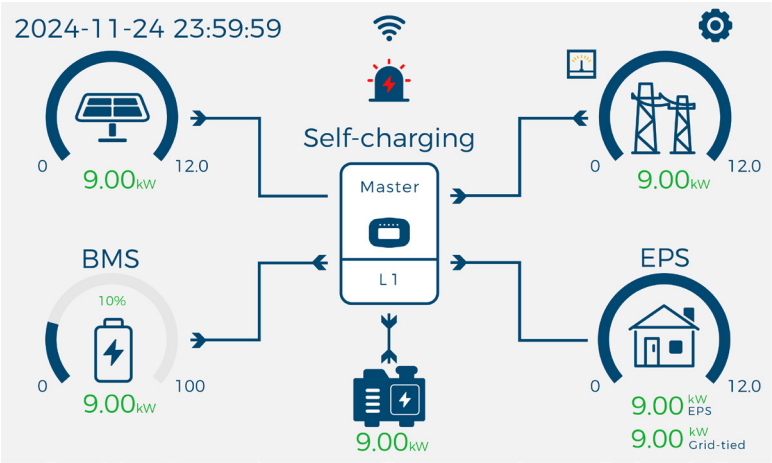
	No Fault	Fault	Warning	Upgrading
STATUS	LED keeps green	The red LED stays on	the green LED blinking for 1 second	the green LED blinking for 0.5 second

● Port status

	Voltage detected on Port	Power presents on Port	Upgrading
PV	the green LED blinking for 1 second	LED keep green	the green LED is flashing for 0.5 second
BAT	the green LED blinking for 1 second	LED keep green	the green LED is flashing for 0.5 second
LOAD	the green LED blinking for 1 second	LED keep green	the green LED is flashing for 0.5 second
GRID	the green LED blinking for 1 second	LED keep green	the green LED is flashing for 0.5 second
NOTE: Five LED flash at the same time when updating the program.			

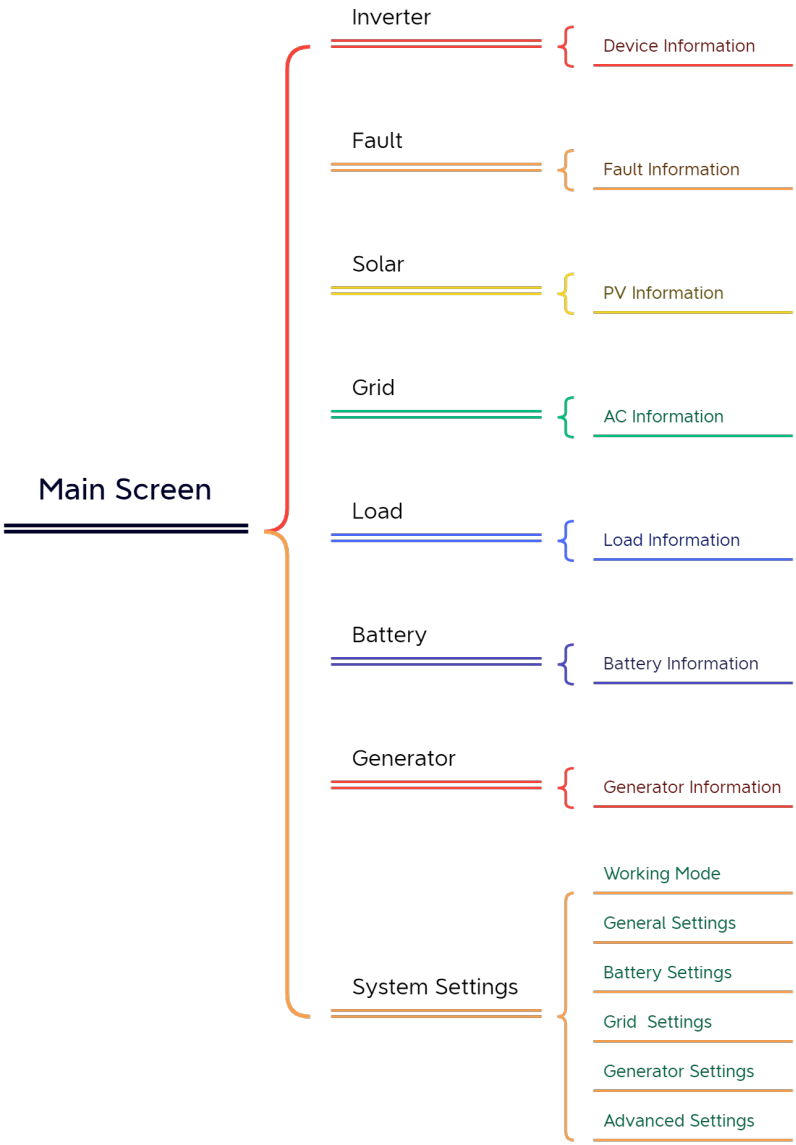
6.System Information

6.1 Homepage



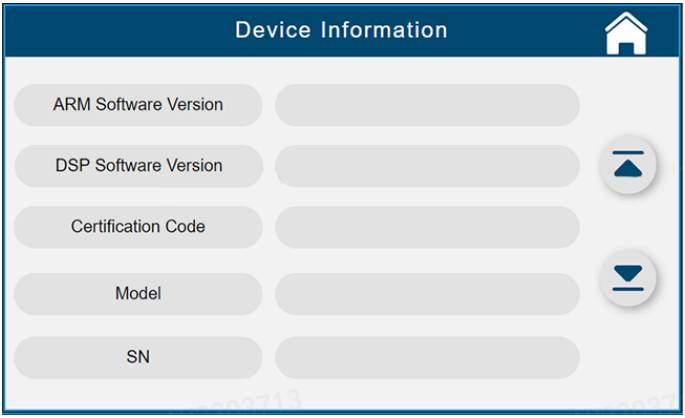
Homepage	
Icon	Description
2024-11-24 23:59:59	The system time.
Standby	The System status Standby: The machine is in standby mode OnGrid: There is an electricity grid Off-Grid: There is no electricity grid Fault: The machine has a fault Flash: The software/firmware upgrade Bypass: There is no PV and the battery cannot discharge Self-charging: The PV capacity cannot independently power the load; the PV can only charge the battery.
	If displayed, this icon indicates that the inverter is connected to a meter.
	If displayed, this icon indicates that the inverter metric sampler is connected to the internet.
	Tap this icon to go to the PV Information page.
	Tap this icon to go to the Battery Information page.
	Tap this icon to go to the Generator Information page. This icon is displayed only when a generator is connected.
	Tap this icon to go to the Load Information page.
	Tap this icon to go to the AC Information page.
	Tap this icon to go to the Device Information page.
	This icon indicates that there is a fault with the current device. Click on this icon to enter the fault alarm information interface.
	Tap this icon to go to the System Settings page.
BMS	Indicate that the current device has successfully communicated with the lithium battery.
	This ring indicates the current proportion of PV power.
	This ring indicates the current battery capacity.
	This ring indicates the current power proportion of the grid.
	This ring indicates the current power proportion of the Load port.

6.2 LCD Operation Flow Chart



6.3 Device Information

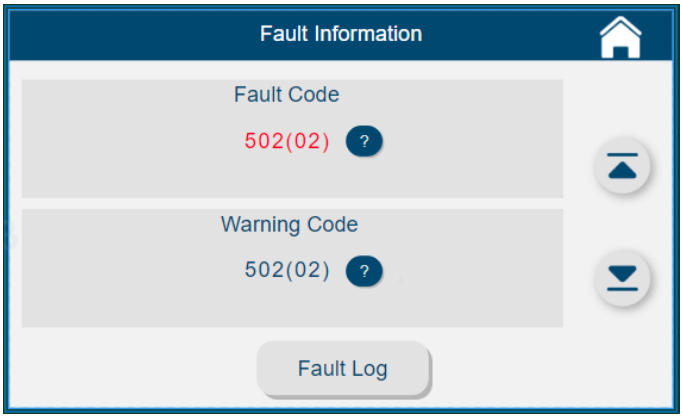
● Tap  to go to the Device Information page, as shown below:



Device Information	
Parameter/Icon	Description
ARM Software Version	The version of the communication software.
DSP Software Version	The version of the DSP software.
Certification Code	The security certification code.
Model	The model of the inverter.
SN	The serial number of the inverter.
	Tap this icon to return to the homepage.
	Tap the Page Down or Page Up icon to turn pages.

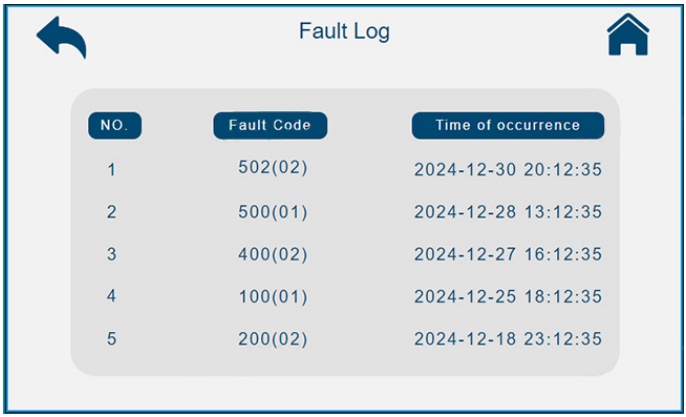
6.4 Fault Information

● Tap  to go to the Fault Information page, as shown below:



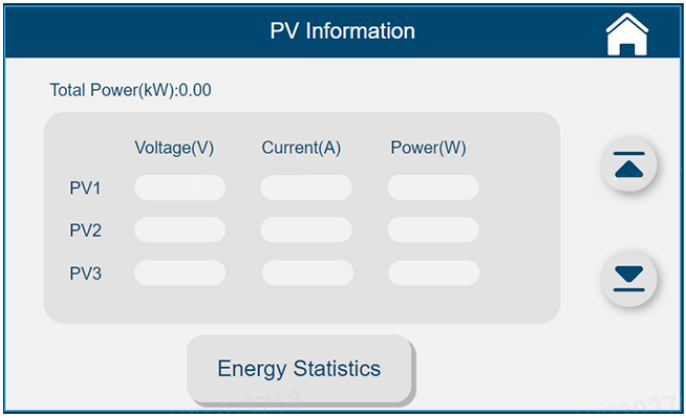
Fault Information	
Parameter/Icon	Description
Fault Code	The fault code.
Warning Code	The warning code.
Fault Log	Tap this icon to go to the Fault Log page.
	Tap this icon to view the specific fault or alarm of the device.
	Tap this icon to return to the homepage.
	Tap the Page Down or Page Up icon to turn pages.

● Tap Fault Log to go to the Fault Log page.



6.5 PV Information

● Tap to go to the PV Information page, as shown below:

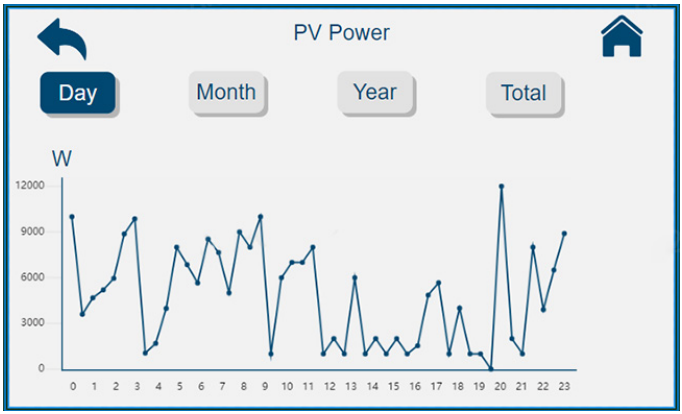


The following table describes the icons on the PV Information page.

PV Information	
Icon	Description
Energy Statistics	Tap this icon to go to the PV Power page.

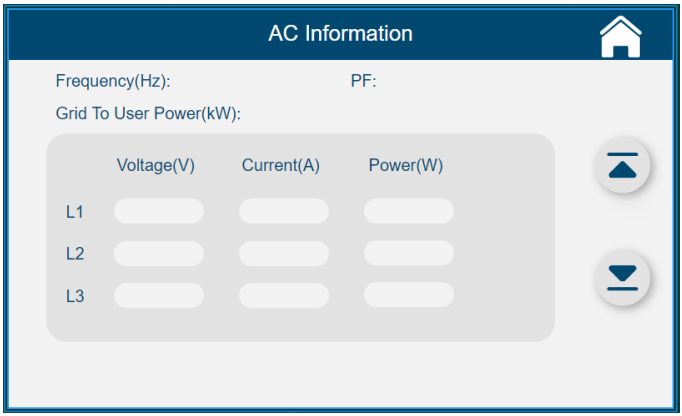
	Tap this icon to return to the homepage.
	Tap the Page Down or Page Up icon to turn pages.

Tap Energy Statistics to go to the PV Power page. You can view the statistical curve of PV power by day, month, or year, or the total amount.



6.6 AC Information

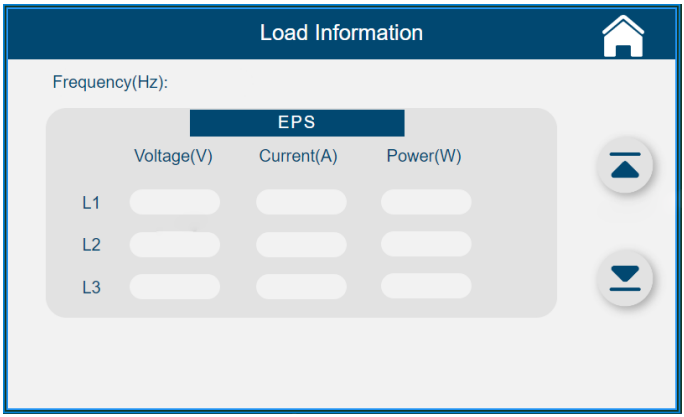
● Tap to go to the AC Information page, as shown below:



AC Information	
Parameter/Icon	Description
Voltage(V) Current(A)	Display the grid voltage and current. When the CT mode is "Disable", it will display the voltage and current values of the machine's Grid port.
Power(W)	The active power fed to or supplied from the grid.
Frequency(Hz)	The frequency at the grid port of the inverter.
PF	The power factor.
	Tap this icon to return to the homepage.
	Tap the Page Down or Page Up icon to turn pages.

6.7 Load Information

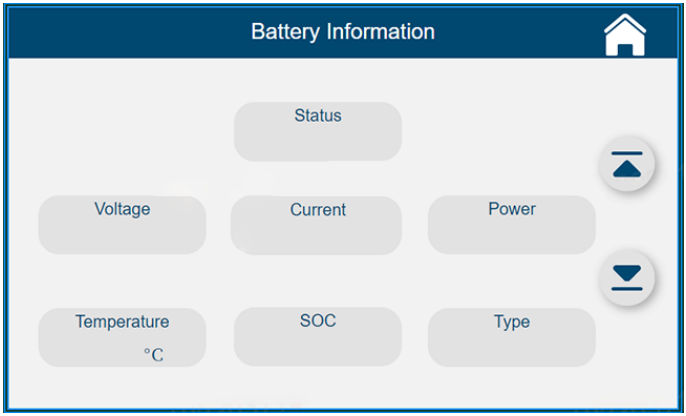
● Tap  to go to the Load Information page, as shown below:



Load Information	
Parameter/Icon	Description
Voltage(V) Current(A)	The voltage and current at the emergency power supply (EPS) port of the inverter.
Power(W)	The active power at the EPS port of the inverter.
Frequency(Hz)	The frequency at the EPS port of the inverter.
	Tap this icon to return to the homepage.
	Tap the Page Down or Page Up icon to turn pages.

6.8 Battery Information

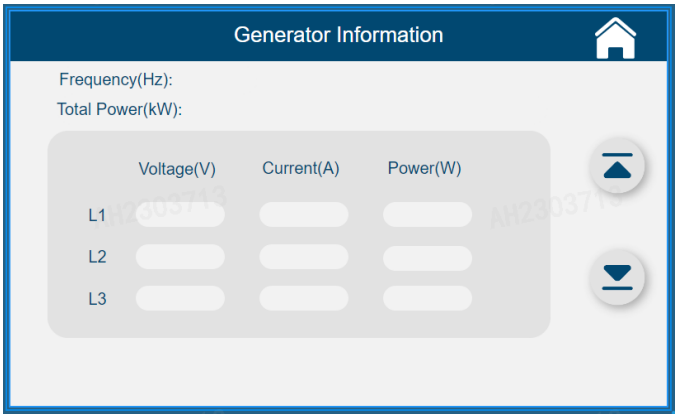
● Tap  to go to the Battery Information page, as shown below:



Battery Information	
Parameter/Icon	Description
Status	Discharge: The battery is discharging. Charge: The battery is being charged. Standby: The battery is in standby mode.
Voltage(V) Current(A)	The voltage at the battery port of the inverter. The current at the battery port of the inverter.
Power(W)	The power at the battery port of the inverter.
Temperature(℃)	The battery temperature.
SOC	The battery SOC.
Type	The battery type. Lead-Acid: The lead-acid battery is in use. Lithium: The lithium-ion battery is in use.
	Tap this icon to return to the homepage.
	Tap the Page Down or Page Up icon to turn pages.

6.9 Generator Information

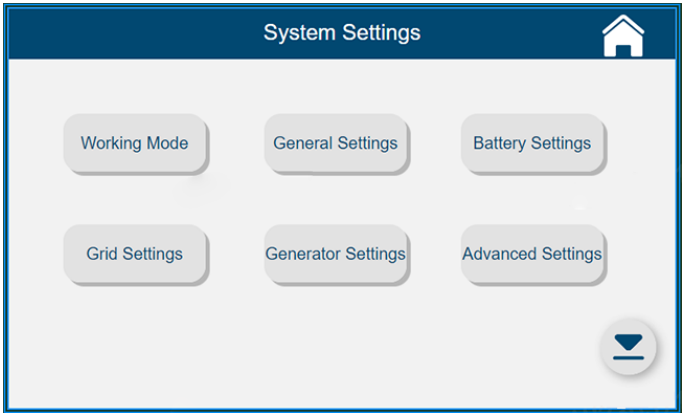
● Tap  to go to the Generator Information page, as shown below:



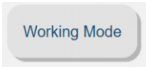
Generator Information	
Parameter/Icon	Description
Voltage(V) Current(A)	The voltage and current at the generator port of the inverter.
Power(W)	The active power at the generator port of the inverter.
Frequency(Hz)	The frequency at the generator port of the inverter.
	Tap this icon to return to the homepage.
	Tap the Page Down or Page Up icon to turn pages.

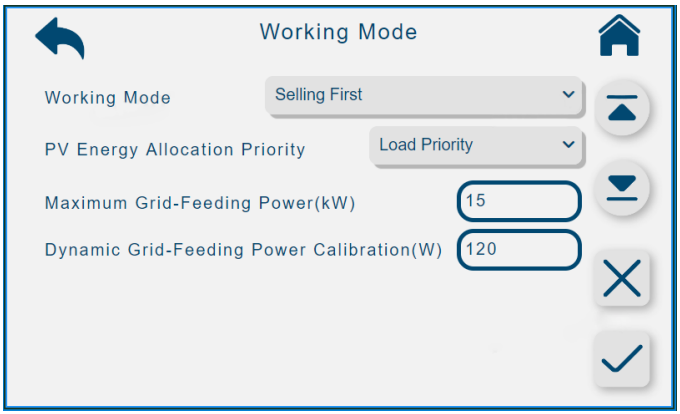
6.10 System Settings

● On the homepage, tap  in the upper-right corner to go to the System Settings page, as shown below:



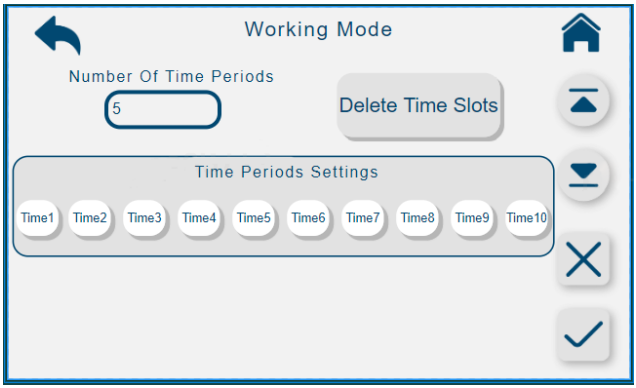
6.10.1 Working Mode

● Tap  to go to the Working Mode page, as shown below:

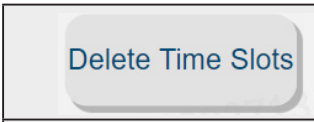
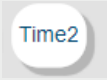


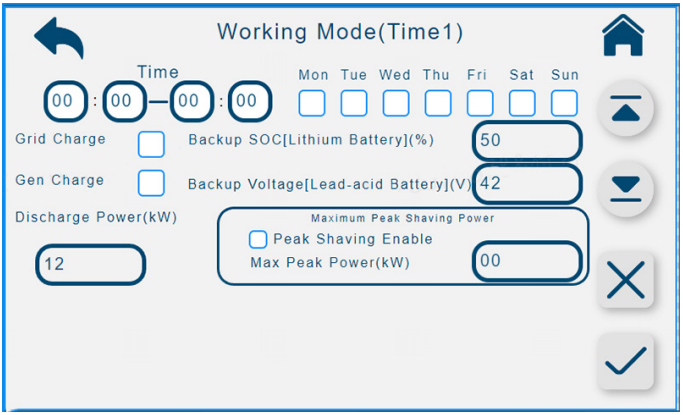
Working Mode	
Parameter/Icon	Description
Working Mode	**Selling First:** This mode allows inverter to sell the PV generation surplus to the gird. If Time Slot function is enabled at the same time, then inverter can sell battery energy to grid. **Zero Sell To EPS:** Hybrid inverter only supply power to EPS port connected load; in this mode, the hybrid inverter will not supply Grid-tied load nor sell energy to Grid. **Zero Sell To Grid Load:** Hybrid inverter will power the EPS load and Grid-tied load. In this mode, hybrid inverter will not sell energy to grid, this mode requires CT or Digital Meter attached to the inverter. in above 3 working modes, if battery is needed for energy scheduling, then Time Slots function need to be enabled; Time Slots function can work with Peak Shaving function together. ● If Time Slots function is enabled, during the time period specified,battery will be discharged to the load and sell energy to grid if PV is insufficient, if the battery SOC is higher than the setting SOC. While when PV is excessive, battery will be charged instead. If Time Slots function is not enabled, battery will not discharge, if PV is insufficient, the shortage will be taking from the grid. ● If Peak Shaving and Time Slots are enabled at the same time, Peak Shaving prioritized over Time Slots. When shaving power cannot cover load power, battery will discharge to meet the shortage. When shaving power is greater than load power, battery will be charged if current SOC is below the backup SOC, if AC charging is set allowed, battery can be charged through grid.

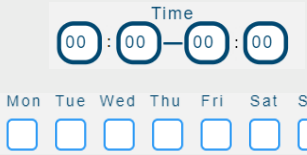
Working Mode	● If Grid Charge in Time Slots function is enabled, and AC Charge in General Setting is enabled, then the battery can be charged form the grid. **Solar Sell To EPS:** This mode is based on the Zero Sell To EPS. In this mode, excess PV power can be fed back into the grid. **Solar Sell To Grid Load:** This mode is based on the Zero Sell To Grid Load. In this mode, excess PV power can be fed back into the grid.
PV Energy Allocation Priority	**Load Priority：** prioritizes supplying PV power to the loads. **Battery Priority：** prioritizes using PV power to charge the battery.
Maximum Grid-Feeding Power(kW)	The maximum grid-feeding power. Value range: 0 to 15.
Dynamic Grid-Feeding Power Calibration(W)	The dynamic compensation for grid-feeding power offset. Larger values improve the effectiveness of anti-reverse power protection. Value range: 0 to 200.
✓	Tap this icon to save parameter changes.



Working Mode	
Parameter/Icon	Description
Number Of Time Periods	The number of active time periods. For example, if you set the value to 2, Time1 and Time2 become active. The value 0 disables the Time Period feature. Value range: 0 to 10. Default value: 0.

	Tap this icon to clear the settings of all time periods and disable the Time Period feature.
	Tap the icon for an active time period to go to its configuration page.
	Tap this icon to save parameter changes.

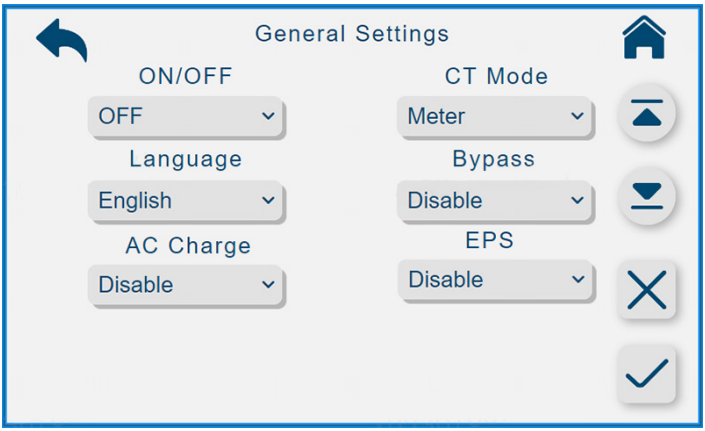


Working Mode	
Parameter/Icon	Description
	The time period and days of the week. You must specify days of the week for a time period. The 10 time periods cannot overlap. The settings for working conditions on this page take effect during the specified time period.
Grid Charge	Specifies whether the battery can be charged by the grid during the specified time period.
Gen Charge	Specifies whether the battery can be charged by the generator during the specified time period.

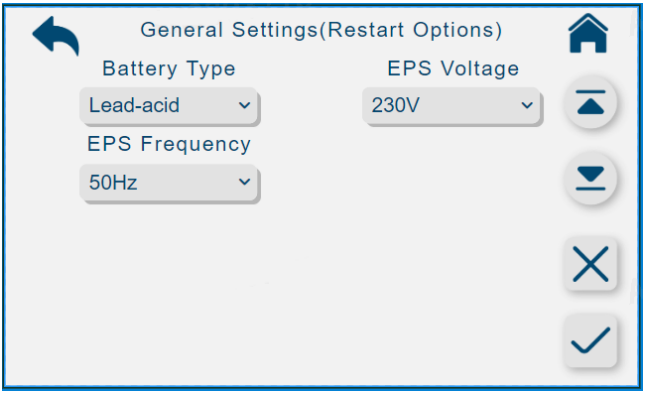
Backup SOC[Lithium Battery](%)	The target backup SOC of the lithium-ion battery. If the actual SOC is higher than this value, the battery discharges during the specified time period. Otherwise, the battery is charged during the specified time period. Default value: 50. Value range: 0 to 100. If the specified value is lower than that of the End Of Discharge SOC(%) parameter on the Battery Settings(Lithium) page, the latter is used.
Backup Voltage[Lead-acid Battery](V)	The target backup voltage of the lead-acid battery. Default value is 42V.If the actual battery voltage is higher than this value, the battery discharges during the specified time period. Otherwise, the battery is charged during the specified time period. Value range: 40 to 59.2. If the specified value is lower than that of the Discharge Cutoff Voltage(V) parameter on the Battery Settings(Lead-acid) page, the latter is used.
Discharge Power(kW)	The maximum discharging power of the battery. It represents the output power of the inverter. Default value: 15. Value range: 0 to 15.
	The Peak Shaving Enable parameter specifies whether to enable peak shaving. The Max Peak Power parameter specifies the maximum AC input power supplied from the generator or grid. The two parameters are mutually exclusive. If you select Peak Shaving Ensable, the Max Peak Power parameter will take effect. By default, Peak Shaving Enable is not selected. Value range: 0 to 15.
	Tap this icon to save parameter changes.

6.10.2 General Settings

● Tap  to go to the General Settings page, as shown below:



General Settings	
Parameter/Icon	Description
ON/OFF	ON: enables inverter output and battery charge/discharge. This is the default value. OFF: disables inverter output and battery charge/discharge.
Language	English: sets the display language to English. To add more languages, please contact manufacturer.
CT Mode	Meter: measures the grid power with a meter. CT: measures the grid power with a CT. This is the default value. Disable: disables the meter or CT. You can select this value if no meter or CT is connected.
AC Charge	Specifies whether to enable AC charging. Disable: disables AC charging. Enable: enables AC charging. This is the default value.
Bypass	Specifies whether to enable bypass. Disable: disables bypass. Enable: enables bypass. This is the default value.
EPS	Specifies whether to enable EPS. Disable: disables EPS. Enable: enables EPS. This is the default value.
	Tap this icon to save parameter changes.

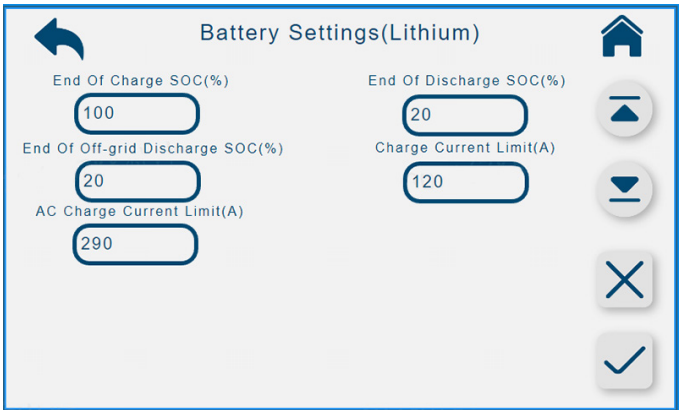


General Settings(Restart Options)	
Parameter/Icon	Description
Battery Type	Lead-acid: uses the lead-acid battery. Lithium: uses the lithium-ion battery. This is the default value. The lithium-ion battery works over the Pylon protocol.
EPS Voltage	The output voltage of the EPS port. Default value: 230VAC. Valid values: 200VAC, 208VAC, 220VAC, 230VAC, and 240VAC.
EPS Frequency	The output frequency of the EPS port. Default value: 50Hz. Valid values: 50Hz and 60Hz.
	Tap this icon to save parameter changes.

6.10.3 Battery Settings

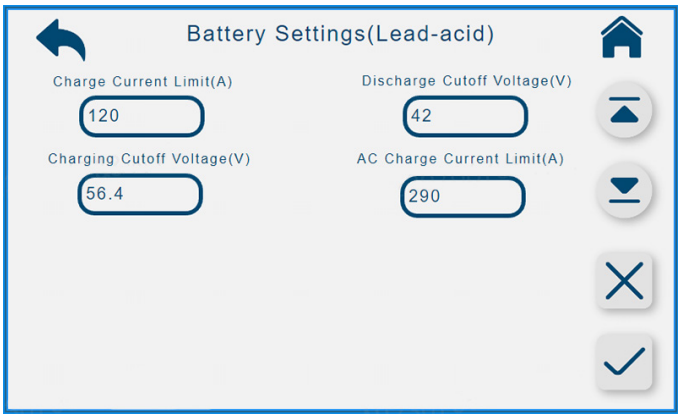
● Tap Battery Settings to go to the Battery Settings page.

1.Configure the lithium-ion battery on the Battery Settings(Lithium) page.



Battery Settings(Lithium)	
Parameter	Description
End Of Charge SOC(%)	The SOC at which the lithium-ion battery stops being charged. Value range: 10 to 100. Default value: 100.
End Of Discharge SOC(%)	The SOC at which the lithium-ion battery stops discharging when the inverter is connected to the grid. Value range: 10 to 100. Default value: 20.
End Of Off-grid Discharge SOC(%)	The SOC at which the lithium-ion battery stops discharging when the inverter is disconnected from the grid. Value range: 10 to 100. Default value: 20.
Charge Current Limit(A)	This setting value represents the maximum charging current for the machine battery (please refer to the allowable maximum charging current of the selected battery for setting) (The setting range is 1 to 290, default is 120A)
AC Charge Current Limit(A)	This setting value represents the maximum charging current for the machine battery when using AC power to charge battery. (The setting range is 1 to 290, default is 290A)
When you tap the input box, a numeric keypad appears. After you enter the values, tap ✓ to apply the settings.	

2. Tap the Page Down icon to go to the Battery Settings(Lead-acid) page.



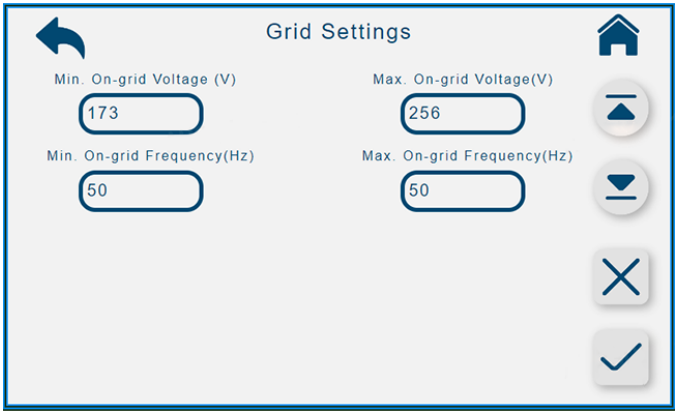
Battery Settings(Lead-acid)	
Parameter	Description
Charge Current Limit(A)	The maximum charging current for battery charging. The value cannot be greater than the maximum allowable charging current of the battery. Value range: 1 to 290. Default value: 120.
Discharge Cutoff Voltage(V)	The battery voltage at which the lead-acid battery stops discharging when the inverter is disconnected from the grid. Value range: 40 to 52. Default value: 42.
Charging Cutoff Voltage(V)	The battery voltage at which the lead-acid battery stops being charged. Value range: 48 to 59.2. Default value: 56.4.
AC Charge Current Limit(A)	This setting value represents the maximum charging current for the machine battery when using AC power to charge battery. (The setting range is 1 to 290, default is 290A)
When you tap the input box, a numeric keypad appears. After you enter the values, tap ✓ to apply the settings.	

General specifications of lead-acid batteries

Battery Type	Absorption Stage	Float Stage	Equalization Voltage
AGM (or PCC)	14.2V (57.6V)	13.4V (53.6V)	14.2V (57.6V)
Gel	14.1V (56.4V)	13.5V (54.0V)	
Wet	14.7V (59.0V)	13.7V (55.0V)	14.7V (59.0V)

6.10.4 Grid Settings

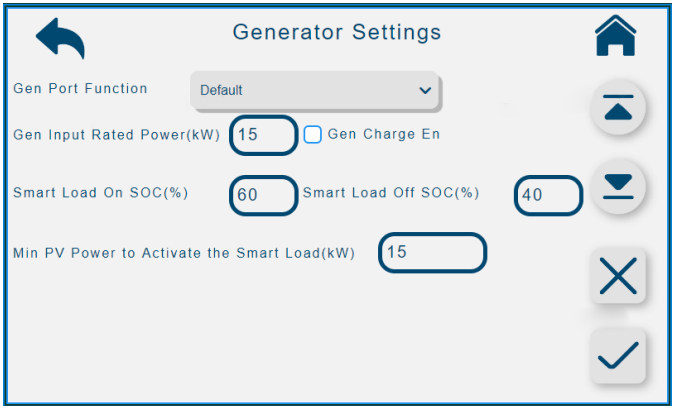
● Tap Grid Settings to go to the Grid Settings page, as shown below:



Grid Settings	
Parameter	Description
Min. On-grid Voltage (V)	The minimum grid voltage for grid connection. If the grid voltage is lower than this value, the inverter disconnects from the grid and triggers an alarm. Value range: 46 to 240. Default value: as specified by the security certification.
Max. On-grid Voltage(V)	The maximum grid voltage for grid connection. If the grid voltage is higher than this value, the inverter disconnects from the grid and triggers an alarm. Value range: 200 to 290. Default value: as specified by the security certification.
Min. On-grid Frequency(Hz)	The minimum grid frequency for grid connection. If the grid frequency is lower than this value, the inverter reports an error. Value range: 47 to 50.1 if you set the EPS Frequency parameter to 50Hz or 57 to 60.1 if you set the EPS Frequency parameter to 60Hz.
Max. On-grid Frequency(Hz)	The maximum grid frequency for grid connection. If the grid frequency is higher than this value, the inverter reports an error. Value range: 49.9 to 53 if you set the EPS Frequency parameter to 50Hz or 59.9 to 63 if you set the EPS Frequency parameter to 60Hz.
When you tap the input box, a numeric keypad appears. After you enter the values, tap ✓ to apply the settings.	

6.10.5 Generator Settings

● Tap Generator Settings to go to the Generator Settings page and configure the GEN port, as shown below:

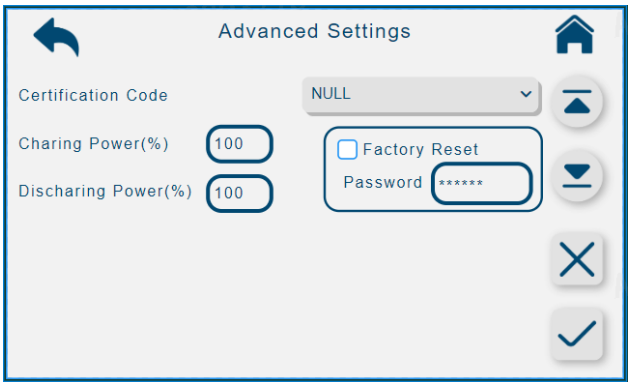


Generator Settings	
Parameter	Description
Gen Port Function	**Default**: Under this mode, the diesel generator port has no output and is in a disconnected state internally. **Generator En:** Under this mode, the inverter will, based on the settings of this interface for turning on/off the battery SOC (in lithium battery mode) or the battery voltage (in lead-acid battery mode), detect that the diesel generator port has been connected to the generator. Then, it will use the generator to supply power to the load. After the diesel generator charging is enabled, the diesel generator can charge the battery. **Generator Force En:** Under this mode, the generator will be forced to start. Based on the discharge cut-off SOC (for lithium battery mode) or the discharge cut-off voltage (for lead-acid battery mode), if it is detected that the diesel generator can also charge the battery, the diesel generator will be forced to charge the battery. **Smart Load Output:** Under this mode, the intelligent load switch will operate according to the settings on this interface to either activate or deactivate the battery's SOC (in lithium battery mode) or the battery voltage (in lead-acid battery mode). **AC Couple On SecEPS Side:** Under this mode, it is supported to connect the grid output port of another photovoltaic machine to the Gen port of this machine. Click √ to enter the device restart waiting interface.

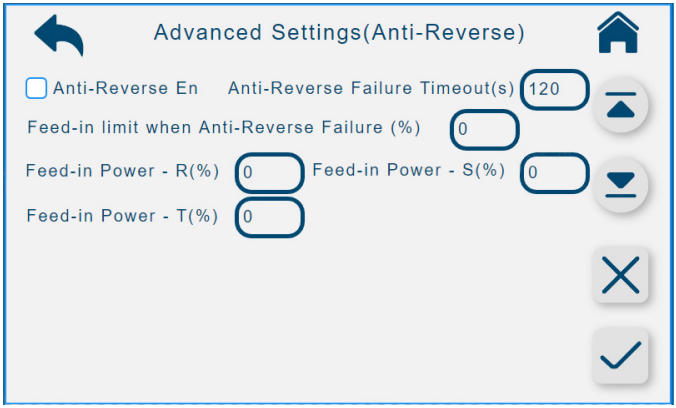
Gen Charge En	Specifies whether to enable battery charging by the generator.
Gen Input Rated Power(kW)	The maximum input power of the generator. Value range: 0 to 15.
Smart Load On SOC(%)/Gen Off SOC(%)	These two parameters apply to the lithium-ion battery. For the smart load switch, if the battery SOC exceeds the value of the Smart Load On SOC(%) parameter, the battery discharges to the GEN port. For the generator, if the battery SOC exceeds the value of the Gen Off SOC(%) parameter, the generator stops charging the battery and the generator dry contact opens. Value range: 10 to 100.
Smart Load Off SOC(%)/Gen On SOC(%)	These two parameters apply to the lithium-ion battery. For the smart load switch, if the battery SOC falls below the value of the Smart Load Off SOC(%) parameter, the battery will stop discharging to the GEN port. For the generator, if the battery SOC falls below the value of the Gen On SOC(%) parameter, the generator dry contact closes and the generator starts charging the battery. Value range: 10 to 100.
Smart Load On Volt(V)/Gen Off Volt(V)	These two parameters apply to the lead-acid battery. For the smart load switch, if the battery voltage exceeds the value of the Smart Load On Volt(V) parameter, the battery discharges to the GEN port. For the generator, if the battery voltage exceeds the value of the Gen Off Volt(V) parameter, the generator stops charging the battery and the generator dry contact opens. Value range: 48 to 59.2.
Smart Load Off Volt(V)/Gen On Volt(V)	These two parameters apply to the lead-acid battery. For the smart load switch, if the battery voltage falls below the value of the Smart Load Off Volt(V) parameter, the battery will stop discharging to the GEN port. For the generator, if the battery voltage falls below the value of the Gen On Volt(V) parameter, the generator dry contact closes and the generator starts charging the battery. Value range: 40 to 52.
Minimum Power for PV Smart Load Activation (kW)	If you set the Gen Port Function parameter to Gen Smart En, the smart load switch is turned on only if the PV power exceeds this value. Value range: 0 to 15.
When you tap the input box, a numeric keypad appears. After you enter the values, tap ✓ to apply the settings.	

6.10.6 Advanced Settings

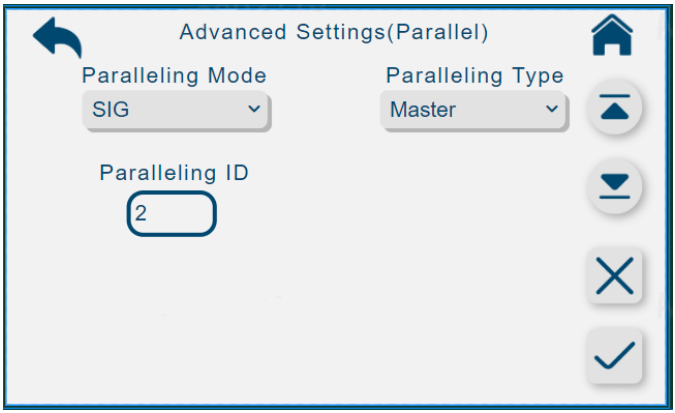
● Tap Advanced Settings to go to the Advanced Settings page, as shown below:



Advanced Settings	
Parameter	Description
Certification Code	The security certification code, as specified by the security certification.
Charging Power(%)	The charging power percentage. The inverter limits the maximum charging power based on this percentage. Value range: 0 to 100.
Discharging Power(%)	The discharging power percentage. The inverter limits the maximum discharging power based on this percentage. Value range: 0 to 100.
	To restore factory settings, select Factory Reset and enter the password **666666.**



Advanced Settings(Anti-Reverse)	
Parameter	Description
Anti-Reverse En	After enabling the feed-in power function, the other parameters of this interface will take effect only after the enabling is completed.
Anti-Reverse Failure Time(s)	The timeout period for anti-reverse power protection. If meter communication is lost for the specified period, the inverter limits the grid-feeding power based on the value of the Feed-in Power Failure Percent(%). Value range: 30 to 120.
Feed-in limit when Anti-Reverse Failure (%)	The feed-in power failure percentage. After the timeout period for anti-reverse protection, the inverter limits the grid-feeding power based on this percentage. Value range: 0 to 100.
Feed-in Power - R(%)	The R/L1 phase feed-in power percentage when when meter communication is normal. Value range: 0 to 100.
Feed-in Power - S(%)	The S/L2 phase feed-in power percentage when meter communication is normal. Value range: 0 to 100.
Feed-in Power - T(%)	The T/L3 phase feed-in power percentage when meter communication is normal. Value range: 0 to 100.



Advanced Settings(Parallel)	
Parameter	Description
Paralleling Mode	SIG: specifies that only one inverter is connected. PAL: sets the inverter to parallel connection mode.
Paralleling Type	Master: sets the inverter as the master. Slave: sets the inverter as a slave unit.
Paralleling ID	The ID of the paralleled inverter. Value range: 0 to 12.

7. Use the App

Scan the QR code below with your mobile phone to obtain the installation package of the APP, and follow the instructions in the APP to install and register.

8. Fault and Warning Codes

Code Type	Code	Fault/Warning	Solution
Fault code	100	Grid voltage beyond the allowable range	1. Check the grid voltage and restart the inverter. 2. If the fault persists, contact the manufacturer.
	101	Grid frequency beyond the allowable range	1. Check the grid frequency and restart the inverter. 2. If the fault persists, contact the manufacturer.
	102	Grid disconnected	1. Power off the inverter and check grid connections. 2. If the fault persists, contact the manufacturer.

Fault code	103	Excessive DC component in the output current	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	105	Bypass overload	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	200	Low off-grid output voltage	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	201	High off-grid output voltage	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	202	Off-grid output short circuit	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	203	Off-grid output overload	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	204	Abnormal DC component in the output voltage	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	300	Reverse battery polarity	1. Properly connect the battery terminals. 2. If the fault persists, contact the manufacturer.
	301	Battery open circuit	1. Properly connect the battery terminals. 2. If the fault persists, contact the manufacturer.
	302	Battery output overload	1. Make sure that the load does not exceed the battery discharge rating. 2. If the fault persists, contact the manufacturer.

Fault code	304	LLC converter soft-start failure	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	305	High battery voltage	1. Check the battery voltage. 2. If the fault persists, contact the manufacturer.
	306	LLC overcurrent protection	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	307	Battery communication fault	1. Check whether the lithium-ion battery is enabled. 2. Make sure that the lithium-ion battery is correctly connected to the inverter.
	308	BMS fault	1. Check the status of the lithium-ion battery. 2. If the fault persists, contact the manufacturer.
	400	High PV input voltage	1. Immediately open the DC switch and check the voltage. 2. If the fault persists after the voltage returns to normal, contact the manufacturer.
	401	Low casing insulation resistance (Riso)	1. Power off the inverter and check the casing grounding. 2. If the fault persists, contact the manufacturer.
	402	Ground-fault circuit interrupter (GFCI) fault	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	403	PV panel short circuit	1. Properly connect the PV input terminals. 2. Restart the inverter. 3. If the fault persists, contact the manufacturer.
	404	Reverse PV polarity	1. Properly connect the PV terminals. 2. If the fault persists, contact the manufacturer.
	405	Arc-fault circuit interrupter (AFCI) fault	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	500	Abnormal BUS voltage	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	501	Abnormal BUS voltage sampling	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.

Fault code	502	Internal communication fault	1. Power off the inverter and check the communication cables. 2. If the fault persists, contact the manufacturer.
	503	Automatic diagnosis fault	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	504	Mode type mismatch	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	505	Thermometer connection fault	1. Power off the inverter and check the connection of the temperature sampling module. 2. If the fault persists, contact the manufacturer.
	506	Overtemperature protection	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	507	Relay fault	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	508	Overcurrent protection	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	509	Anti-reverse power output timeout	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	510	Communication protocol version mismatch	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	511	Fan fault	1. Check the fan wiring. 2. Restart the inverter. 3. If the fault persists, contact the manufacturer.
	512	CT/Meter overcurrent	1. Check whether the load power exceeds the rated capacity. 2. If the fault persists, contact the manufacturer.
	513	Inverter paralleling fault	1. Check the communication cables for inverter paralleling. 2. Check the paralleling parameters of the inverter.
	514	Inverter soft-start failure	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.

Warning code	100	Meter communication exception	1. Make sure that the meter is correctly connected to the inverter. 2. Make sure that the distance between the inverter and meter meets the requirement. 3. Rewire and restart the inverter and meter. 4. If the warning persists, contact the manufacturer.
	101	Reverse meter polarity	1. Properly connect the meter terminals. 2. If the warning persists, contact the manufacturer.
	102	Reverse CT polarity	1. Properly connect the CT terminals. 2. If the warning persists, contact the manufacturer.
	103	Grid power unavailable	1. Make sure that the inverter is connected to the grid. 2. If the warning persists, contact the manufacturer.
	104	Grid voltage beyond the allowable range	1. Check the grid voltage and restart the inverter. 2. If the warning persists, contact the manufacturer.
	105	Grid frequency beyond the allowable range	1. Check the grid frequency and restart the inverter. 2. If the warning persists, contact the manufacturer.
	106	No generator output voltage	1. Confirm the generator status and restart the generator. 2. If the warning persists, contact the manufacturer.
	107	Generator output voltage beyond the allowable range	1. Check the generator voltage and restart the generator. 2. If the warning persists, contact the manufacturer.

Warning code	108	Generator output frequency beyond the allowable range	1. Check the generator frequency and restart the generator. 2. If the warning persists, contact the manufacturer.
	109	Anti-reverse power output timeout	1. Restart the inverter. 2. If the warning persists, contact the manufacturer.
	200	Off-grid output overload	1. Restart the inverter. 2. If the warning persists, contact the manufacturer.
	302	Low battery SOC	The battery level is low. Please charge the battery.
	304	Abnormal BMS information	1. Restart the battery. 2. If the warning persists, contact the manufacturer.
	305	Low battery voltage	1. Check the battery voltage. 2. If the warning persists, contact the manufacturer.
	501	Fan exception	1. Check the fan wiring. 2. Check the fan for foreign object obstruction. 3. If the warning persists, contact the manufacturer.
	502	Electrically erasable programmable read-only memory (EEPROM) read/ write exception	1. Restart the inverter. 2. If the warning persists, contact the manufacturer.

9. Product Specifications

Technical Data	HUA-8K3P-BL	HUA-10K3P-BL	HUA-12K3P-BL	HUA-15K3P-BL
Solar Input Data				
Recommended Max. PV Array Size (Wp)	16000	20000	24000	30000
Max. PV Input Power(W)	12800	16000	19200	24000
Max. Input Voltage(V)	800	800	800	800
Start-up Voltage(V)	160	160	160	160

Rated Input Voltage(V)	550	550	550	550
MPPT Operating Voltage Range(V)	160~650	160~650	160~650	160~650
MPPT Voltage Range (full load) (V)	350~650	350~650	350~650	400~650
Max. Input Current per MPPT(A)	27+20	27+20	27+20	27+20
Max. Short Circuit Current per MPPT(A)	40+30	40+30	40+30	40+30
Number of MPPTs	2	2	2	2
Number of Strings per MPPT	2+1	2+1	2+1	2+1
Max. Inverter Backfeed Current to The Array(A)	0	0	0	0
Battery Data				
Battery Type	Lead-acid or Lithium-ion			
Rated Battery Voltage(V)	48	48	48	48
Battery Voltage Range(V)	40~60	40~60	40~60	40~60
Max. Charge/ Discharge Current(A)	180	220	250	290
Max. Charge/ Discharge Power(W)	8000	10000	12000	15000
Battery Communication	CAN/RS485	CAN/RS485	CAN/RS485	CAN/RS485
Number of Battery Input	2(in parallel)	2(in parallel)	2(in parallel)	2(in parallel)
AC Input/Output Data (Grid, Load & Generator)				
Rated AC Input/ Output Active Power(W)	8000	10000	12000	15000

Max. AC Input/Output Apparent Power (VA)	8800	11000	13200	16500
Peak Apparent Power (off-grid)	2 times of rated power, 10s			
Rated AC Input/ Output Current(A)	12.2/11.6/11.2	15.2/14.5/13.9	18.2/17.4/16.7	22.8/21.8/20.9
Max. AC Input/Output Current(A)	13.4	16.7	20	25
Max. Three-phase Unbalanced Output Current(A)	18.2	22.8	27.3	34.1
Max. Continuous AC Passthrough (A)	50	50	50	50
Max. Continuous GEN Passthrough (A)	45	45	45	45
Max. Output Fault Current(A)	26.8	33.4	40	50
Max. Output Over Current Protection(A)	73.5	73.5	73.5	73.5
Rated Input/Output Voltage(V)	220/380, 230/400, 240/415			
Input/Output Voltage Range(V)	0.85Un-1.1Un			
Grid Connection Form	3L+N+PE			
Rated Grid Frequency/Range (Hz)	50/45~55, 60/55~65			
Power Factor	0.8 leading~0.8 lagging			
THDi (nominal power)	<3%			
DC Injection Current	＜ 0.5%In			
Switch time(ms)(Typ)	4			

Efficiency				
Max. Efficiency	97.6%	97.6%	97.6%	97.6%
European Efficiency	97.0%	97.0%	97.0%	97.0%
MPPT Efficiency	＞99%	＞99%	＞99%	＞99%
Protection				
PV Reverse Polarity Protection	yes	yes	yes	yes
Anti-Islanding Protection	yes	yes	yes	yes
Output Short Protection	yes	yes	yes	yes
Ground fault monitoring	yes	yes	yes	yes
Insulation Resistance Monitoring	yes	yes	yes	yes
Over-current Protection	yes	yes	yes	yes
Over-temperature Protection	yes	yes	yes	yes
AC/DC Surge Protection	TYPE II(DC), TYPE II(AC)			
AFCI Protection	Optional	Optional	Optional	Optional
DC Switch	yes	yes	yes	yes
Residual Current Monitoring	yes	yes	yes	yes
Grid Monitoring	yes	yes	yes	yes
General Data				
Dimension (W*H*D) (mm)	450×660×240(Excluding connectors)			

Weight(kg)	< 39
Relative Humidity	0~100%
Operating Temperature Range(°C)	-40 to +60, >45 Derating
Storage Temperature(°C)	-45 to +85
Noise Emission(dB)	< 55
Altitude(m)	3000
Cooling Method	Intelligent Air Cooling
Ingress Protection	IP65
Over Voltage Category	OVC II(DC), OVC III(AC)
Topology	Non-Isolated
Protective Class	I
Communication Interface	RS485/CAN/Bluetooth/WIFI, LAN/4G/GPRS (optional)
Power Grid Side Energy Detection Method	3CTs, Meter(optional)
Display	LCD & APP
Standby / Internal Consumption(W)	<25(night)
PV Connector	MC4 compatible connector(Max.6mm^2)
Battery Connector	Connector(Max.60mm^2)
AC Connector	Connector(Max.10mm^2)