AOHAI

User Manual

User Manual

HSA-8-12K1P-BL

CONTETS

1.About This Manual

This manual provides product information, safety warnings, installation guidelines, operating instructions, and maintenance guidance for the HSA-8-12K1P-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 （https://www.digitalpoweraohai.cn/Digital.html） 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.

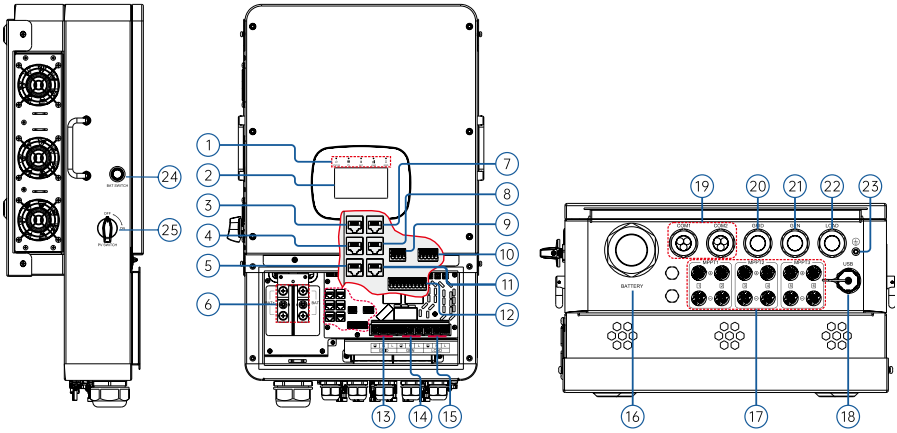
Please read through the safety warnings and operating instructions in this chapter and keep this manual handy for future reference.

Aohai Technology 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

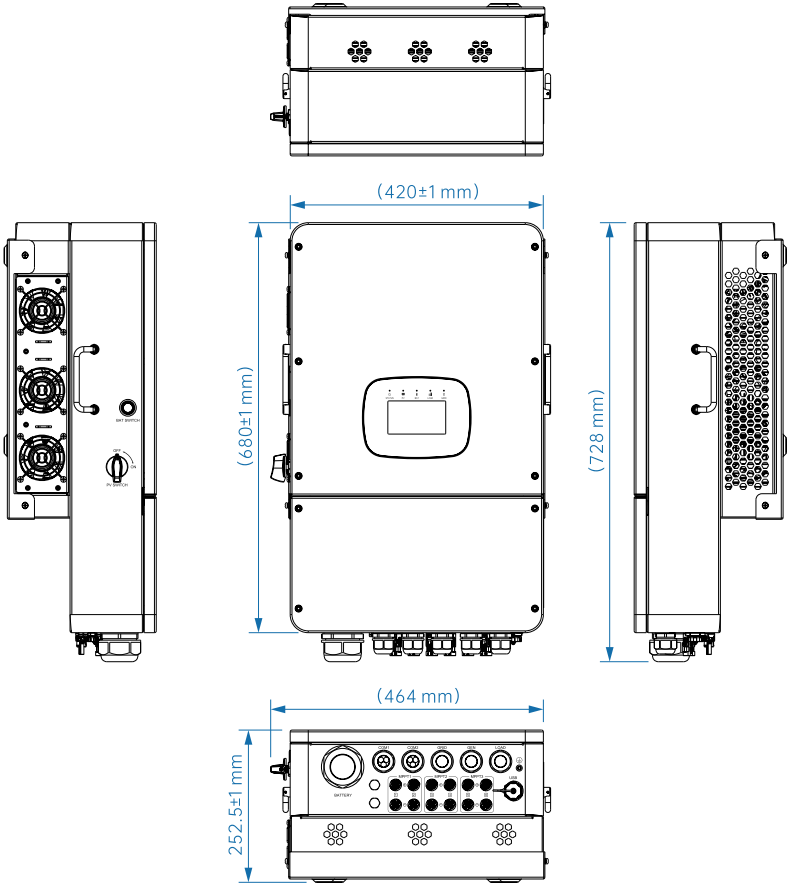
This is a multifunctional hybrid energy storage and grid-tied inverter. This innovative device integrates solar energy storage, grid charging, sine wave AC output, smart meter, intelligent communication module, and other features and is controlled by a digital signal processor (DSP). With fast response, 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	Status indicators	**6**	Battery Input Port	**11**	PALL-OUT	**16**	Battery	**21**	GEN
2	LCD Touch Panel	**7**	DRMS	**12**	GEN & CT & TEMP	**17**	PV input with three MPPT	**22**	LOAD
3	BMS Port	**8**	PALL-IN	**13**	GRID Port	**18**	USB & WiFi & GPRS	**23**	Earth Connection
4	Digital Meter Port	**9**	RSD Port	**14**	GEN Port	**19**	COM Ports	**24**	BAT SWITCH
5	Reserved	**10**	RSD-12V & ATS Port	**15**	LOAD Port	**20**	GRID	**25**	PV SWITCH

3.2 Dimensions



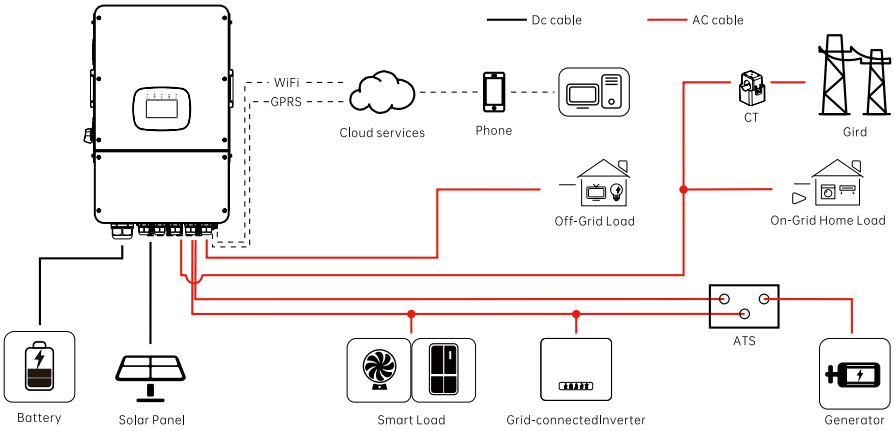
3.3 Features

· Uninterruptible power supply
· Continuous charging with a maximum current of 250A

· Prolonged 12kW full-power discharging without derating
· Compatibility with lead-acid and lithium-ion batteries
· Up to three channels of six inputs of 27A PV current with 18kW PV input power
· Dedicated diesel generator interface
· Universal Serial Bus (USB)-based or online software upgrade
· Dual-channel intelligent load output
· Support for peak shaving and valley filling of the grid
· Continuous and stable operation under high temperatures

3.4 System Architecture

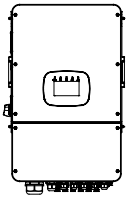
The following diagram shows a typical system architecture of an energy storage inverter.



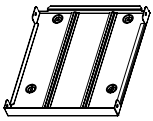
4. Installation and Wiring

4.1 What's in the Box

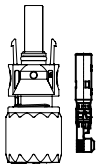
Before installation, check all items in the package box for damage. The box contains the following items:



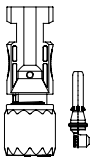
Hybrid inverter (x1)



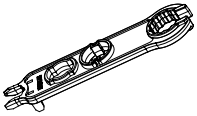
Wall Bracket （x1）*



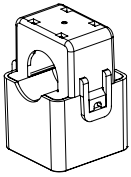
Positive PV Plug (x6)



Negative PV Plug (x6)

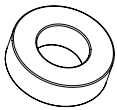


PV terminal disassembly tool（x1）

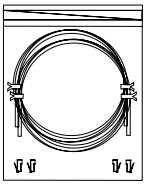


CT（x1）

AC Magnetic Rings（x2）/ BMS COM Magnetic Rings（x1）



Battery Magnetic Rings（x1）



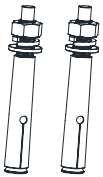
Communication wires（x1）

WiFi（x1）

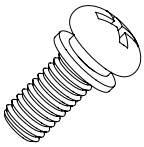
Temp Sensor（x1）

Certification（x1）

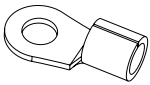
User's manual（x1）



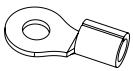
Expansion Bolts M6*60（x4）



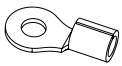
Grounding screw M5*12 (x1)



RNB38-8（x4）



RNB14-5（x9）



RNB8-5（x1）

*The wall mountis located on the back of the product.

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 2,000 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 Aohai Technology 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**

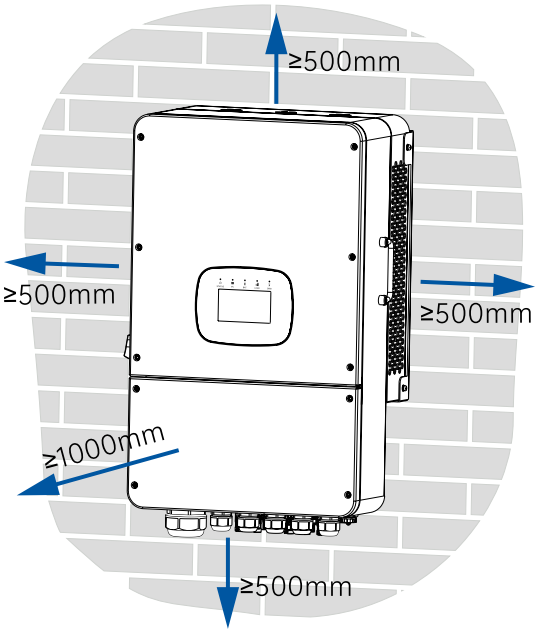
Install the device on a vertical load-bearing wall of concrete or other non-combustible material and observe the following:

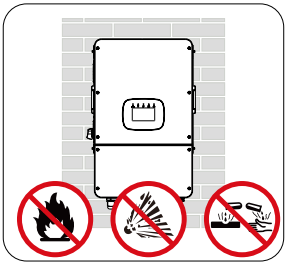
· Install the inverter at eye level for easy reading of the liquid crystal display (LCD).

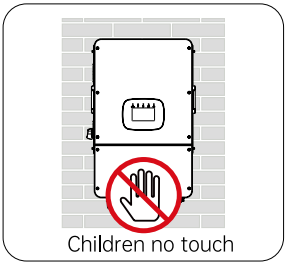
· Keep the ambient temperature between -25° C and 60° C for optimal performance.

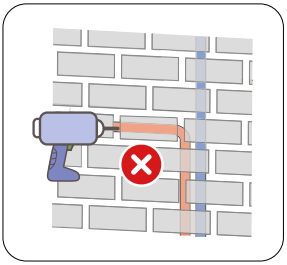
· Maintain sufficient clearance around the inverter, as shown in the diagram below, to ensure adequate space for heat dissipation and wiring access.

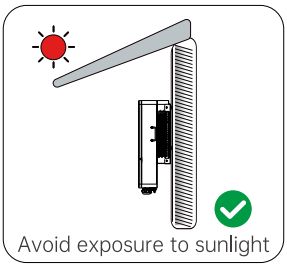
The following diagrams illustrate the requirements for the installation environment.

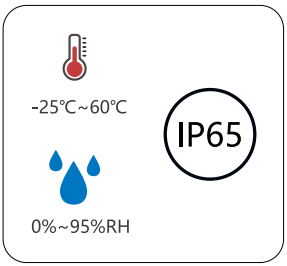


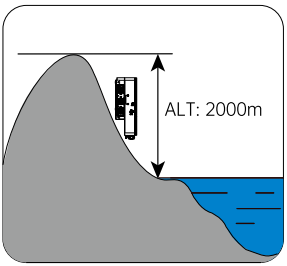


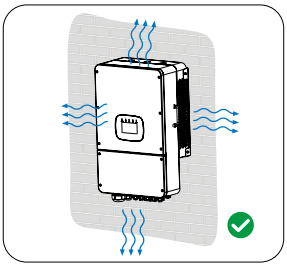

Children no touch

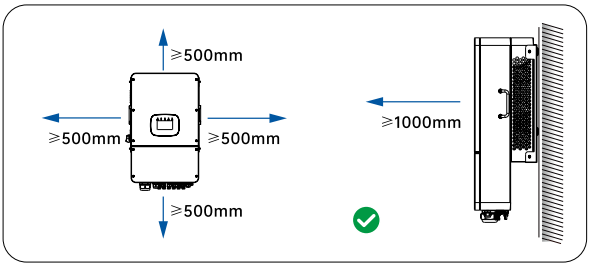


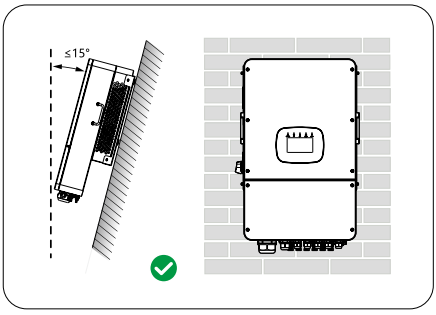

Avoid exposure to sunlight

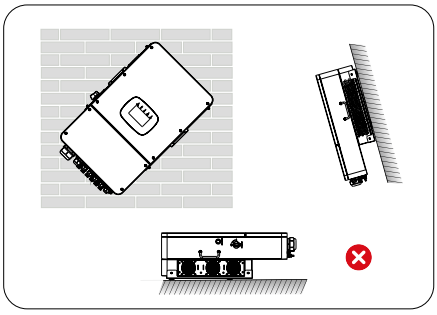

-25℃~60℃
IP65
0%~95%RH


ALT: 2000m

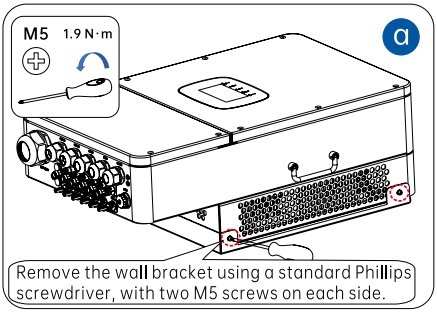


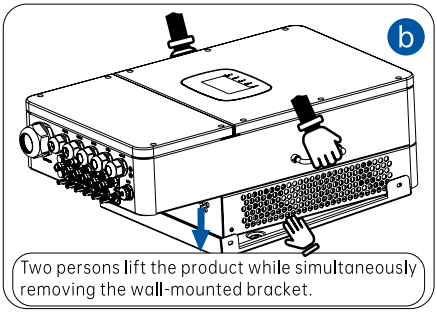

≥500mm
≥500mm
≥500mm
≥500mm
≥1000mm

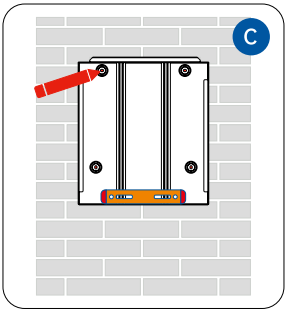

≤15°

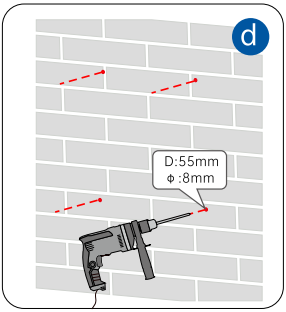


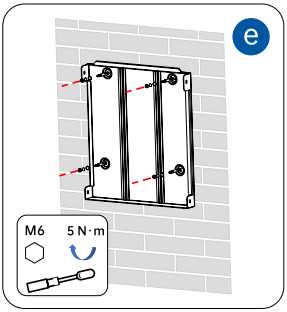
● Installation steps

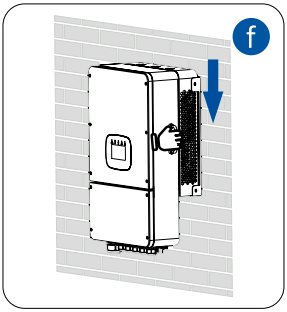


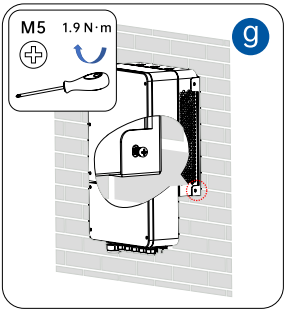








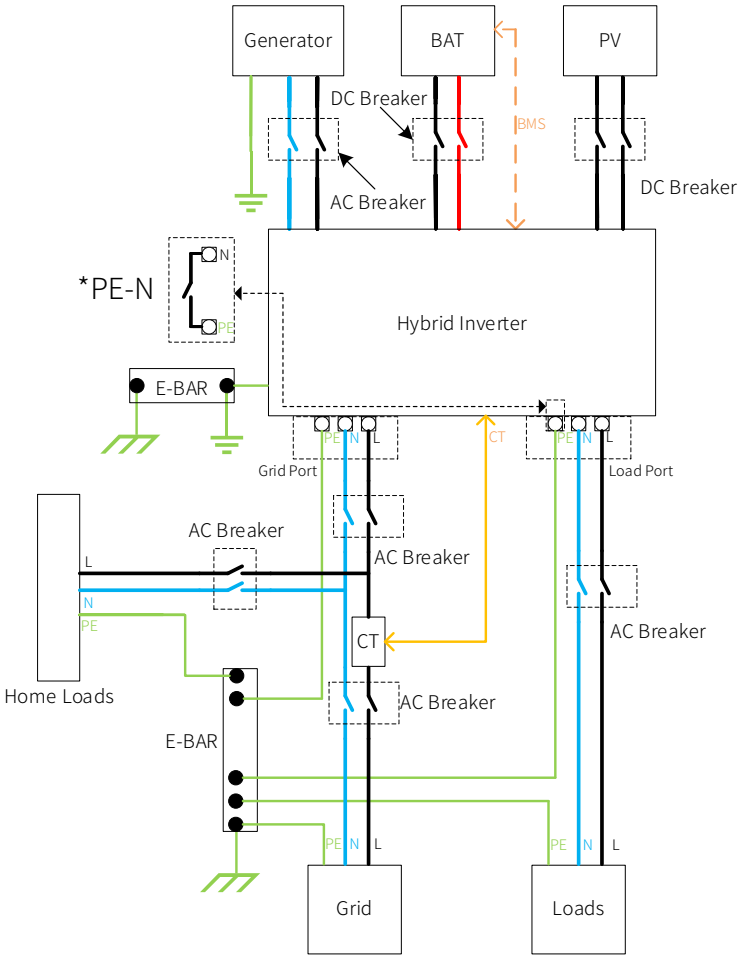




4.4Inverter System Wiring Diagram

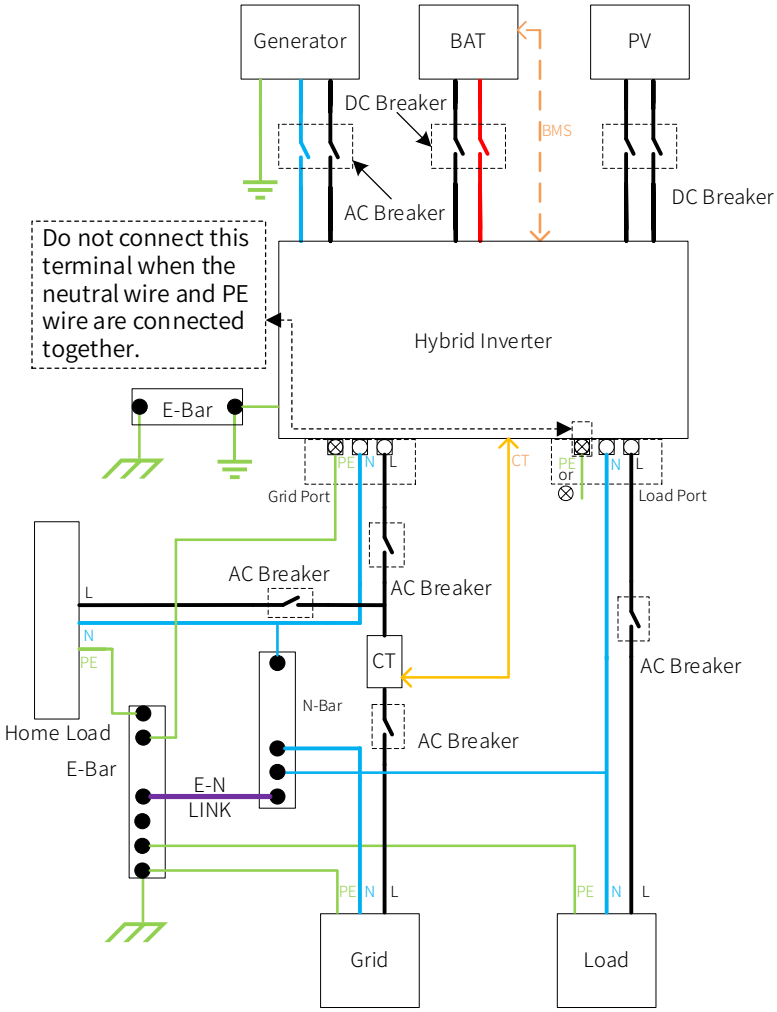
1.System connection diagram for Non-PEN grid connection:

*PE-N: When inverter is in Backup Mode, the Neutral Line is connected to PE through external relay. While in On-Grid Mode, the external relay is open-circuited.



The diagram below is for the application which does not require for PEN connection.
Note: PE line in Backup Port and Earth Link must be grounded properly, or the backup load will be in malfunction when grid goes failure.

2.System connection diagram for PEN grid connection:



This is the reference connection diagram for countries like Australia, New Zealand, South Africa etc., for the application in these countries, Neutral Line is connected to the PE in the power board.
For more detail, please follow local grid regulation

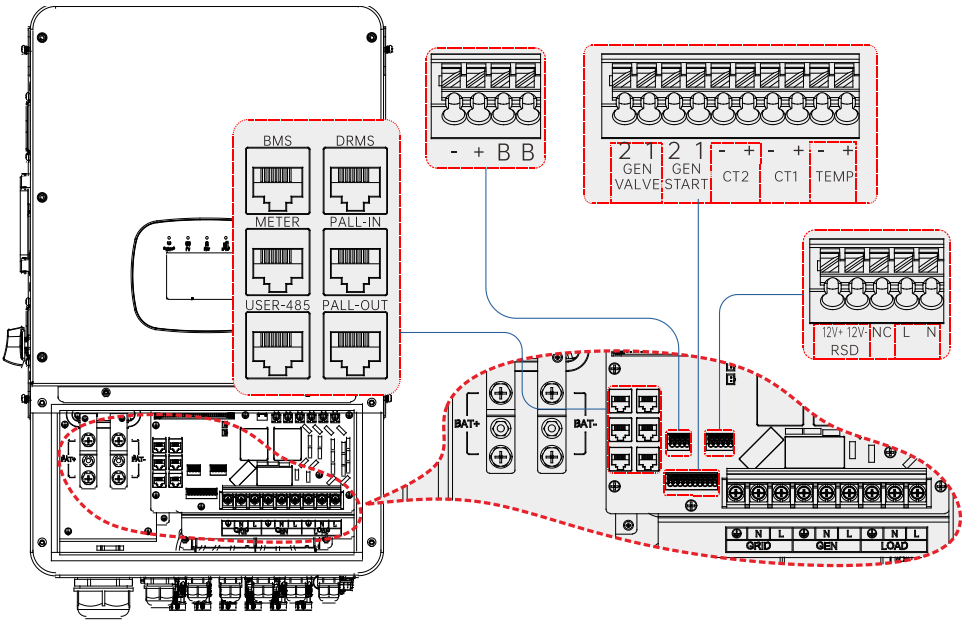
4.5 Wiring Preparations

Specifications of external cables and circuit breakers

Inverter Model	Port	Cable Specifications	Maximum Operating Current	Recommended Circuit Breaker Specifications
HSA-12K1P-BL	GRID	12mm²/6AWG	60A	2P-80A
	LOAD	12mm²/6AWG	60A	2P-80A
	GEN	12mm²/6AWG	60A	2P-80A
	BAT	33.6*2mm²/2AWG*2	250A	2P-300A
HSA-10K1P-BL	GRID	12mm²/6AWG	60A	2P-80A
	LOAD	12mm²/6AWG	60A	2P-80A
	GEN	12mm²/6AWG	60A	2P-80A
	BAT	33.6*2mm²/2AWG*2	220A	2P-300A
HSA-8K1P-BL	GRID	12mm²/6AWG	60A	2P-80A
	LOAD	12mm²/6AWG	60A	2P-80A
	GEN	12mm²/6AWG	60A	2P-80A
	BAT	21.15*2mm²/4AWG*2	190A	2P-250A

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	Reserved	7	GND
4	BMS_CANH	8	WAKE_UP

● **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	

● **USER-485 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	

● **PALL-IN and PALL-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

In diesel engine generator setting page, if "Gen Port Function" is set as "Gen Smart En" or "Gen Force En", this dry contact signal will be shorted when voltage of Lithium battery or Lead-acid battery exceeds the setting limit. If in "Gen Port Function" setting page, any option in these three settings, "Smart Load Smart On", "Smart Load On Grid Always On", "Smart Load Off Grid Immediately Off", is enabled, this dry contact signal will be shorted when voltage of Lithium battery or Lead-acid battery falls below the setting limit.

5.CT signals

● CT1: You can connect this port to an external current transformer (CT) for anti-reverse power protection. For more information, see the CT wiring diagram.

● CT2: You can connect this port to an external CT for anti-reverse power protection. For more information, see the CT wiring diagram.

6.TEMP signals

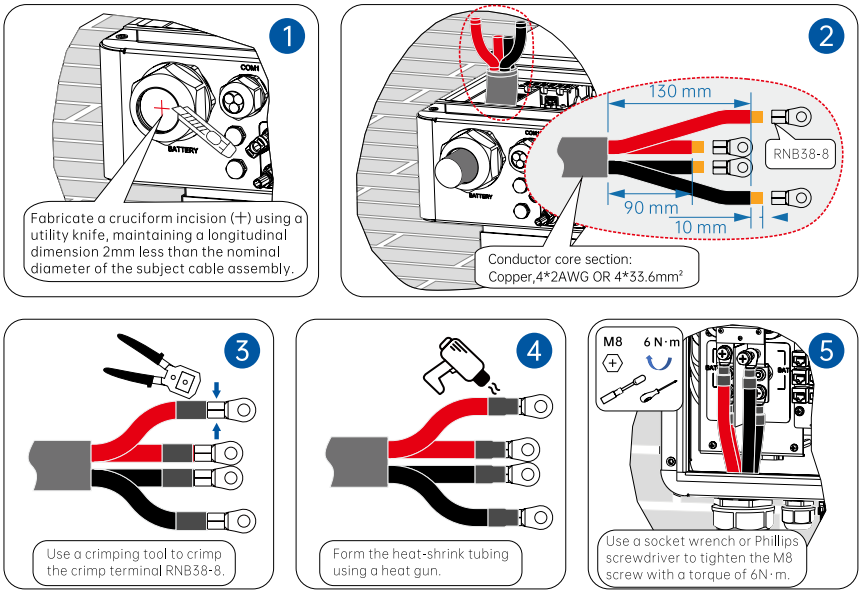
● TEMP: This port is for detecting the temperature of the lead-acid battery.

7.ATS signals

ATS-240V: When "Signal ISLAND MODE" is selected and the inverter is connected to the grid, the voltage at the ATS port remains 0. When "Signal ISLAND MODE" is selected and the inverter is disconnected from the grid, the ATS port outputs 230VAC. By using this port with an external normally open 230VAC relay, you can control the disconnection and connection of N and PE wires.

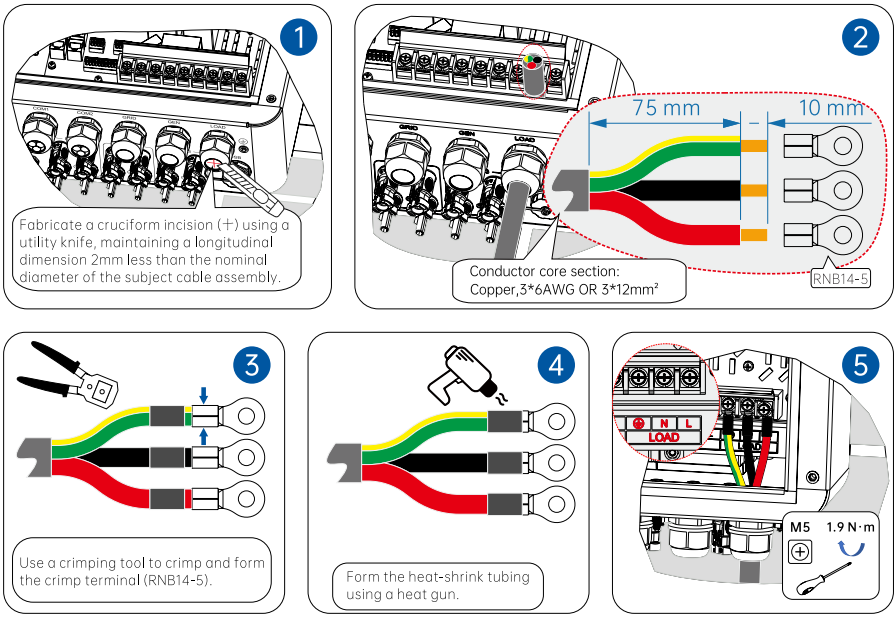
4.7 Battery Connection

1.Battery wiring steps

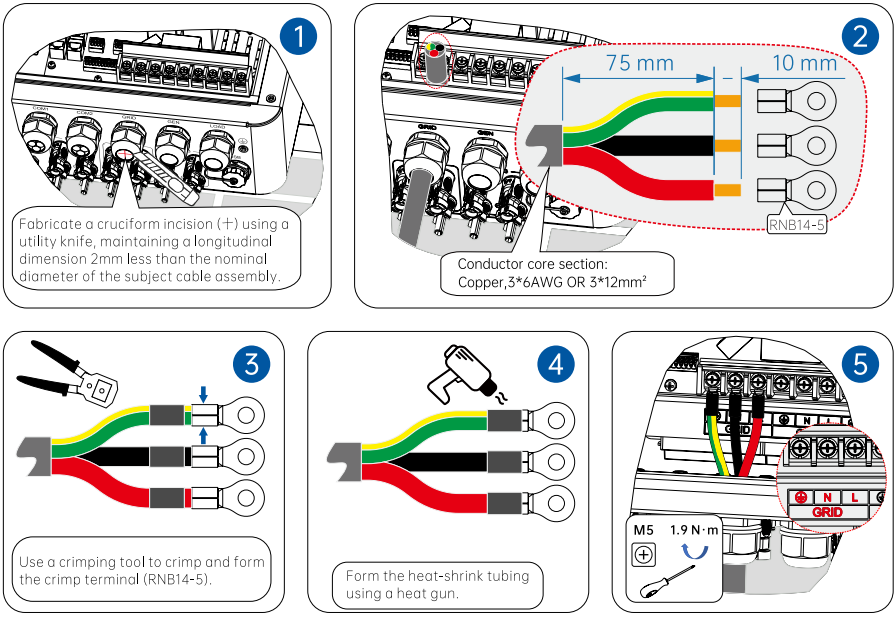


4.8 AC Connection

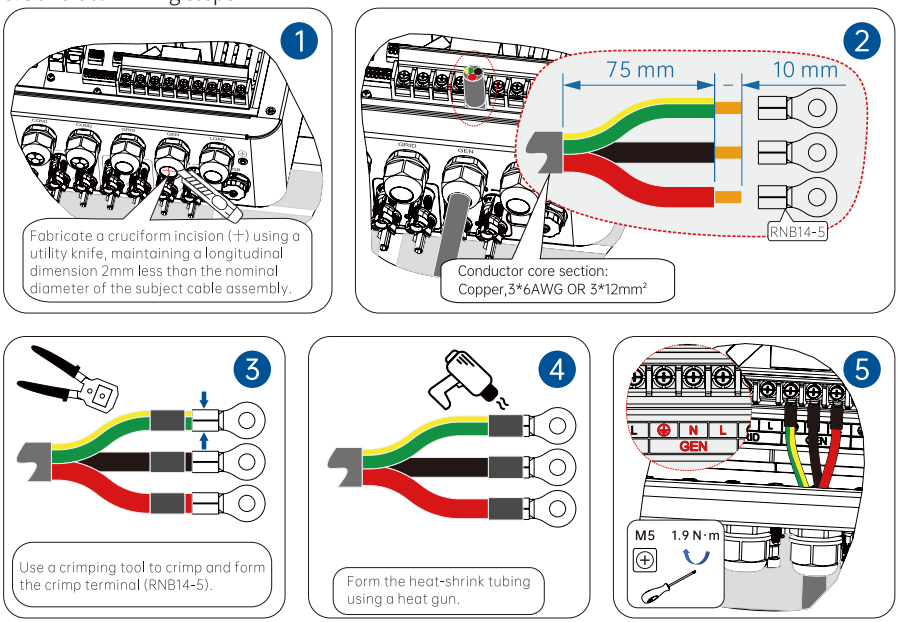
1.Load wiring steps



2.Grid wiring steps



3.Generator wiring steps

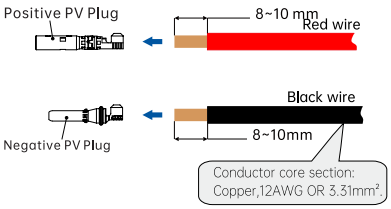


4.9 PV Array Connection

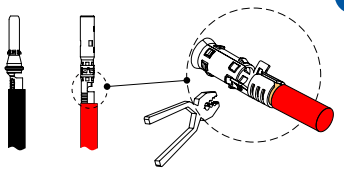
1.PV cable specifications

Each maximum power point tracking (MPPT) channel supports a maximum input current of 27A. If the MPPT current of a single string is less than 14A, six strings can be connected to the inverter, with two parallel strings per channel. If the MPPT current of a single string ranges from 14A to 20A, only three independent strings can be connected to the inverter.

use the PV plugs and connectors fromthe accessory box. 1

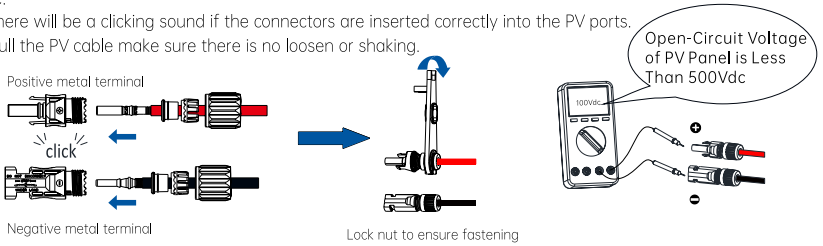


Connect the PV cable to the PV connectors. 2



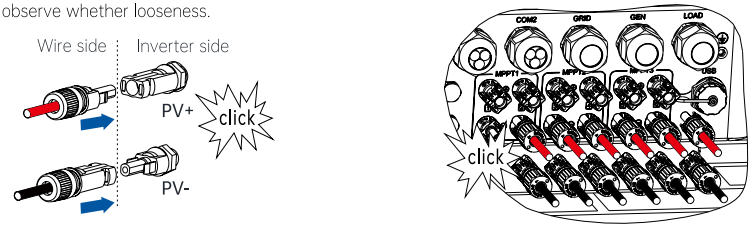
Note:
Please make sure cable can't put out from terminal after pressing.

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.



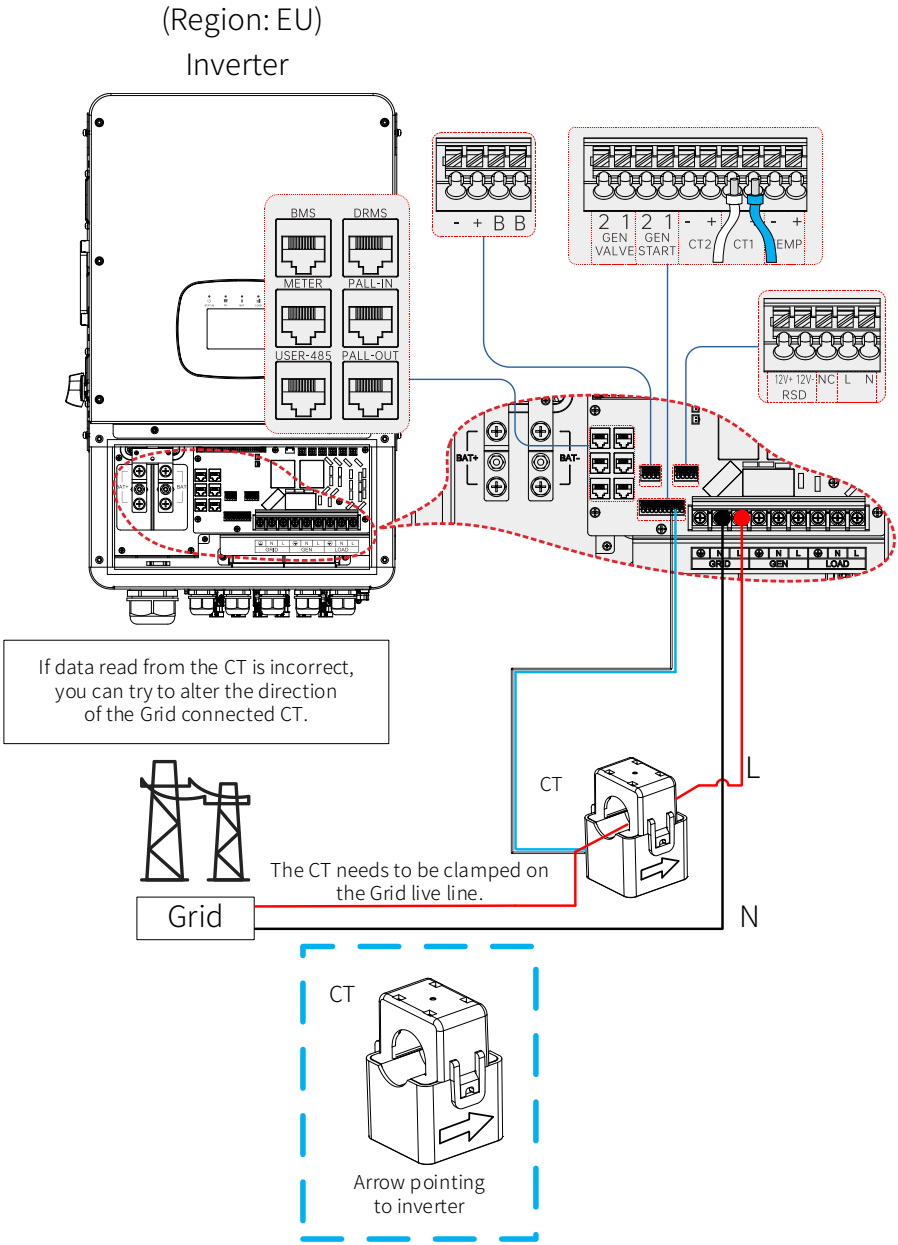
The polarity of the PV strings must not be connected in a reverse manner. Otherwise,the inverter could be damaged.

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.



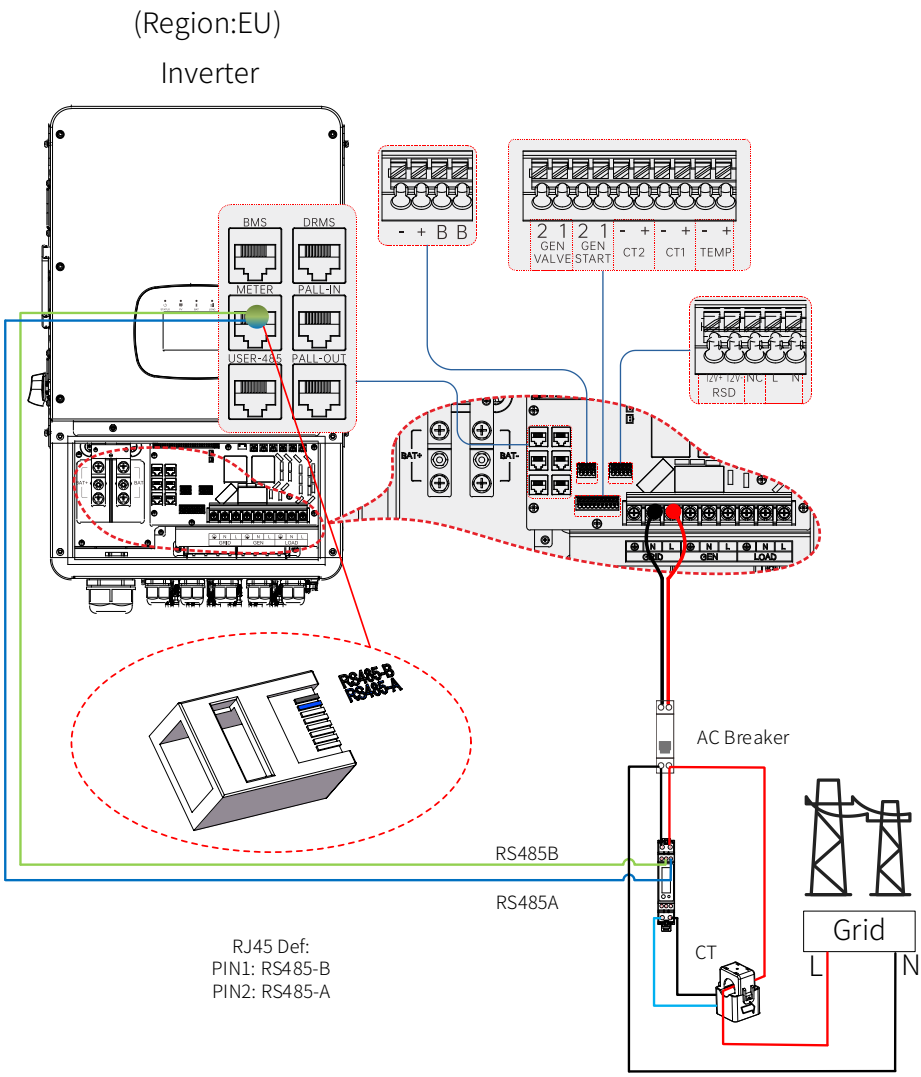
4.10 CT Connection

1. CT wiring diagram

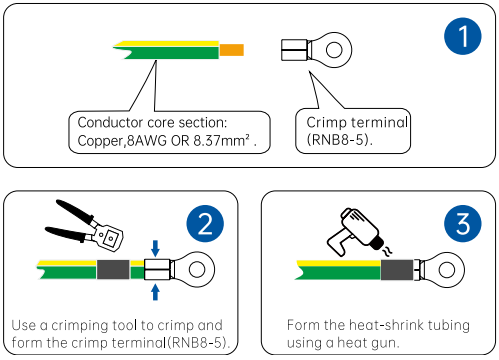


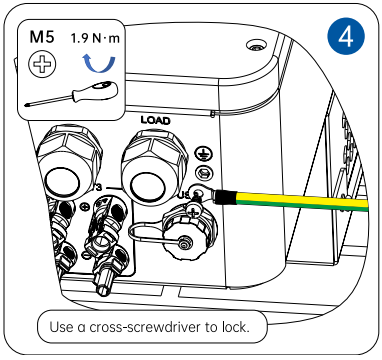
4.11 Meter Connection

1. Wiring diagram of meter connection：

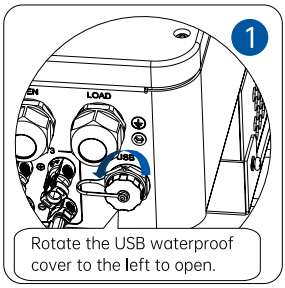


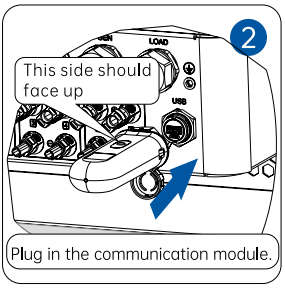
4.12 Grounding Connection

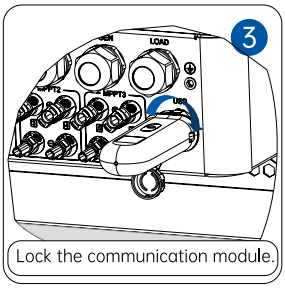




4.13 Communication Module Installation

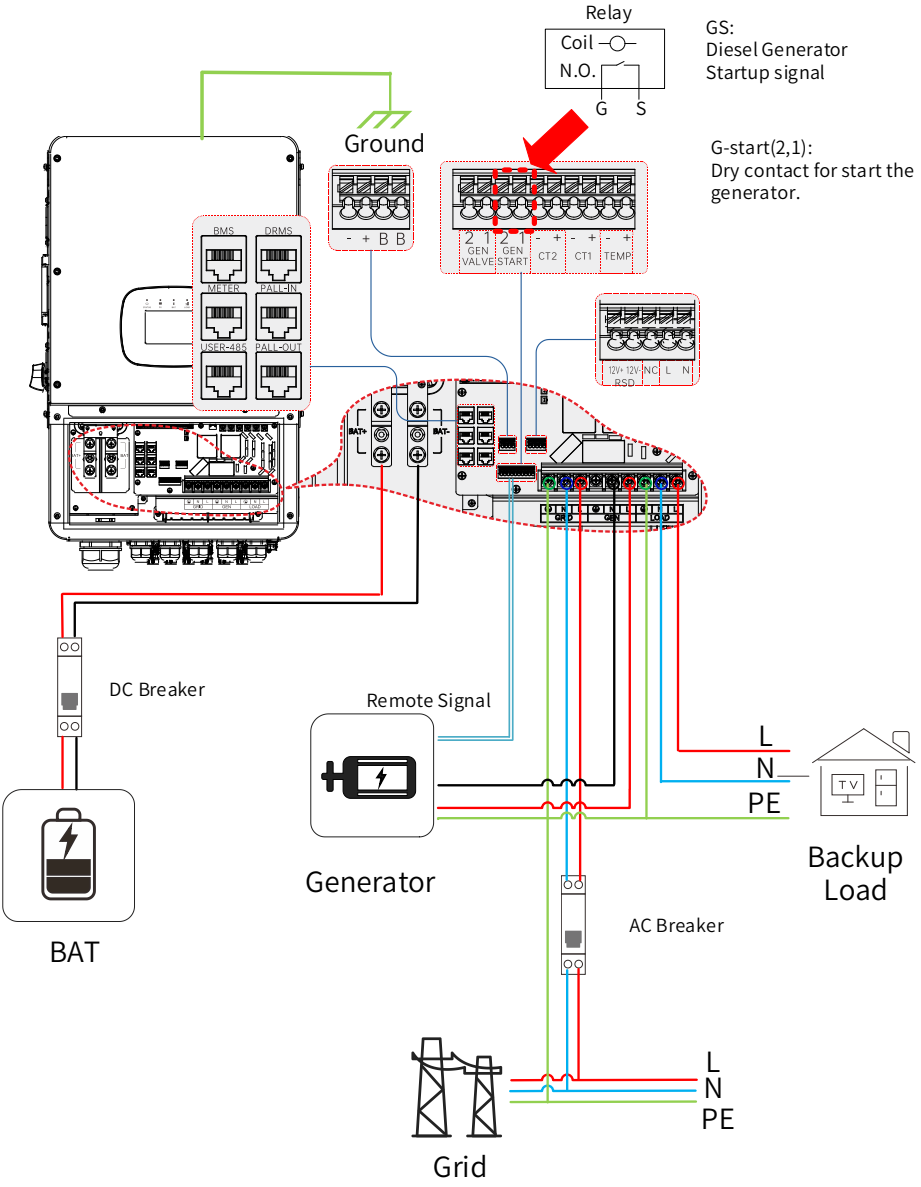






4.14 Diesel Generator Wiring

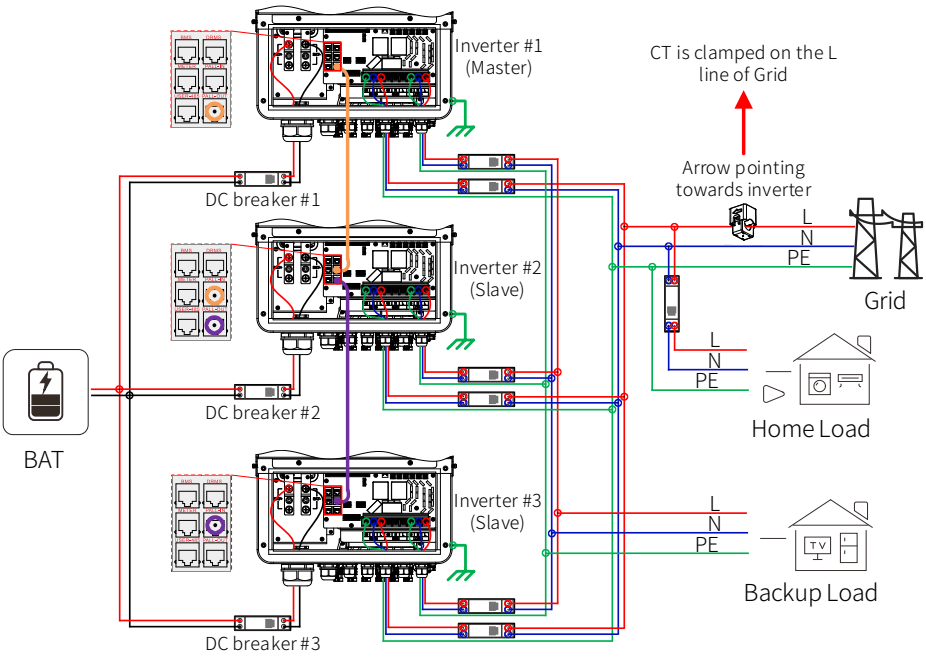
Diesel generator wiring diagram



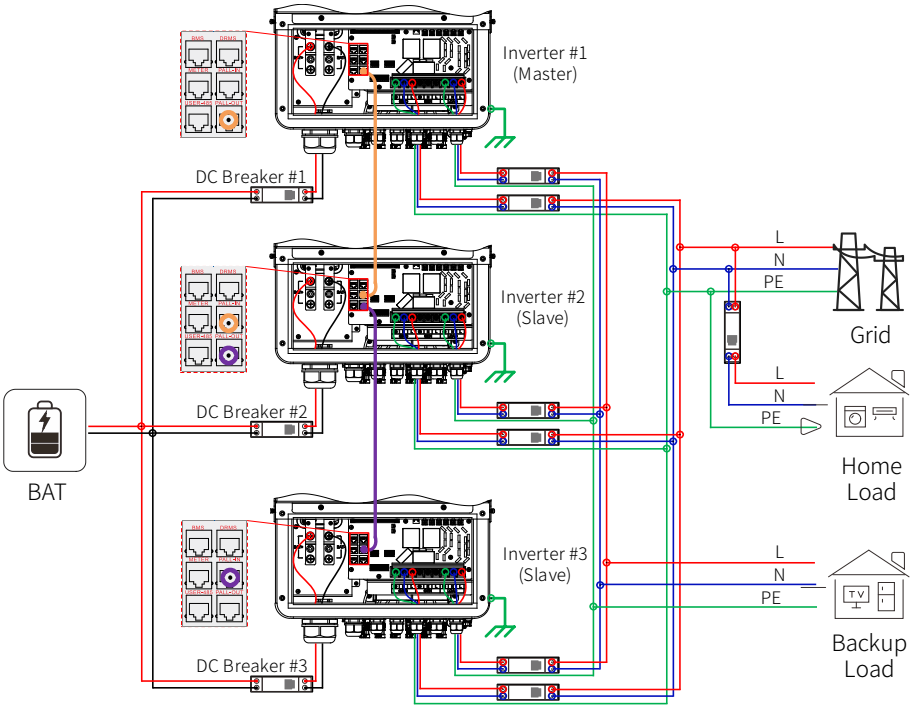
4.15 Single-phase Parallel Connection

● Single-phase parallel connection diagram

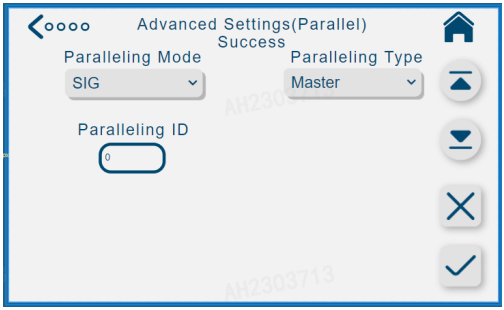
Single phase paralleling with CT clamped:



Single phase paralleling without CT attached:

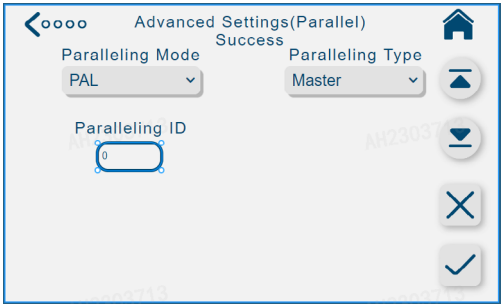


● Inverter configuration for parallel connection

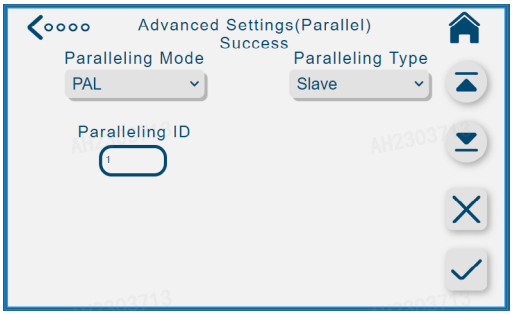


Advanced Settings(Parallel)	
Parameter	Description
Paralleling Mode	SIG: specifies that only one inverter is connected. PAL: sets the inverter to single-phase parallel connection mode. 3P1: sets the inverter output to L1 phase in three-phase parallel connection mode. 3P2: sets the inverter output to L2 phase in three-phase parallel connection mode. 3P3: sets the inverter output to L3 phase in three-phase 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 9.

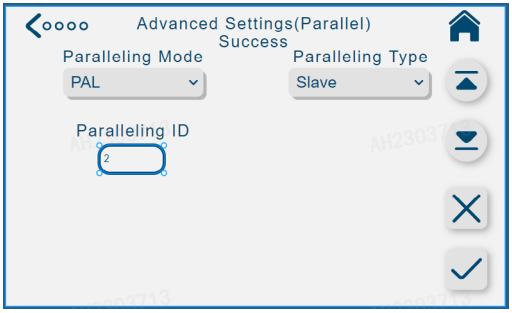
● Configuration steps for single-phase parallel connection
1. Close the battery circuit breaker for each inverter.
2. Close the battery switch of each inverter.
3. Set the paralleling parameters for Inverter 1 as follows:



4.Set the paralleling parameters for Inverter 2 as follows:



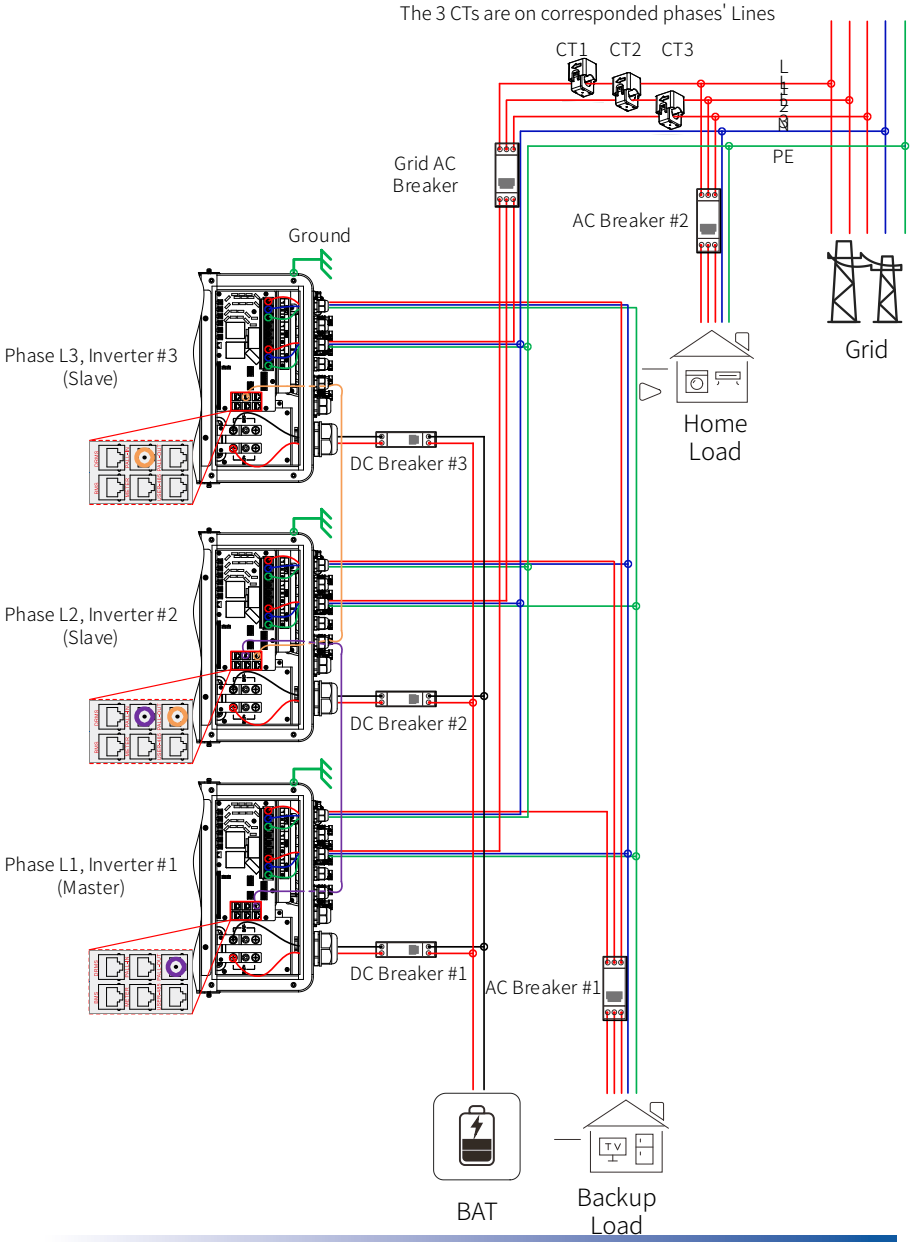
5.Set the paralleling parameters for Inverter 3 as follows:



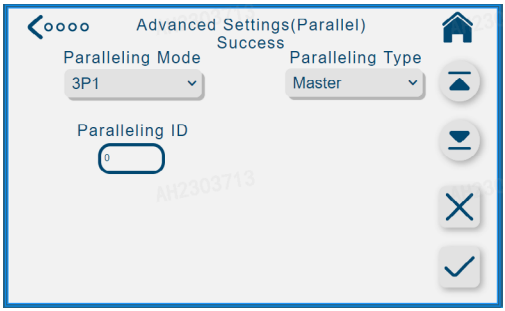
6. Open the battery switch of each inverter.
7. Close the load circuit breaker and then the grid circuit breaker for each inverter.
8. Close the battery switch of each inverter.

4.16Three-phase Parallel Connection

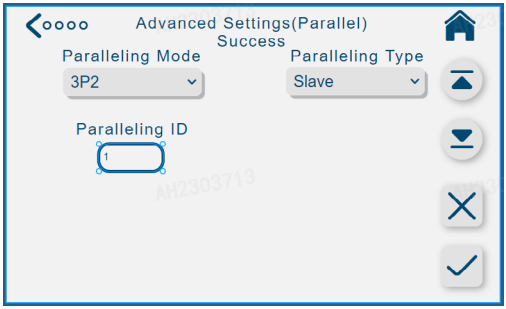
● Three-phase parallel connection diagram



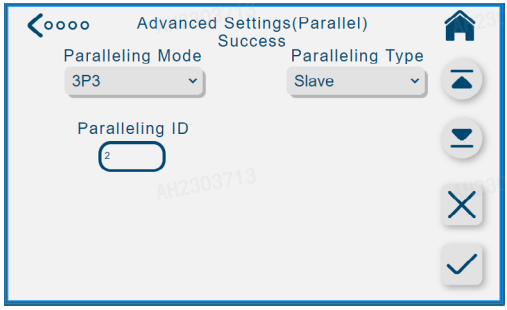
● Configuration steps for three-phase parallel connection
1. Close the battery circuit breaker for each inverter.
2. Close the battery switch of each inverter.
3. Set the paralleling parameters for Inverter 1 as follows:



4. Set the paralleling parameters for Inverter 2 as follows:



5.Set the paralleling parameters for Inverter 3 as follows:



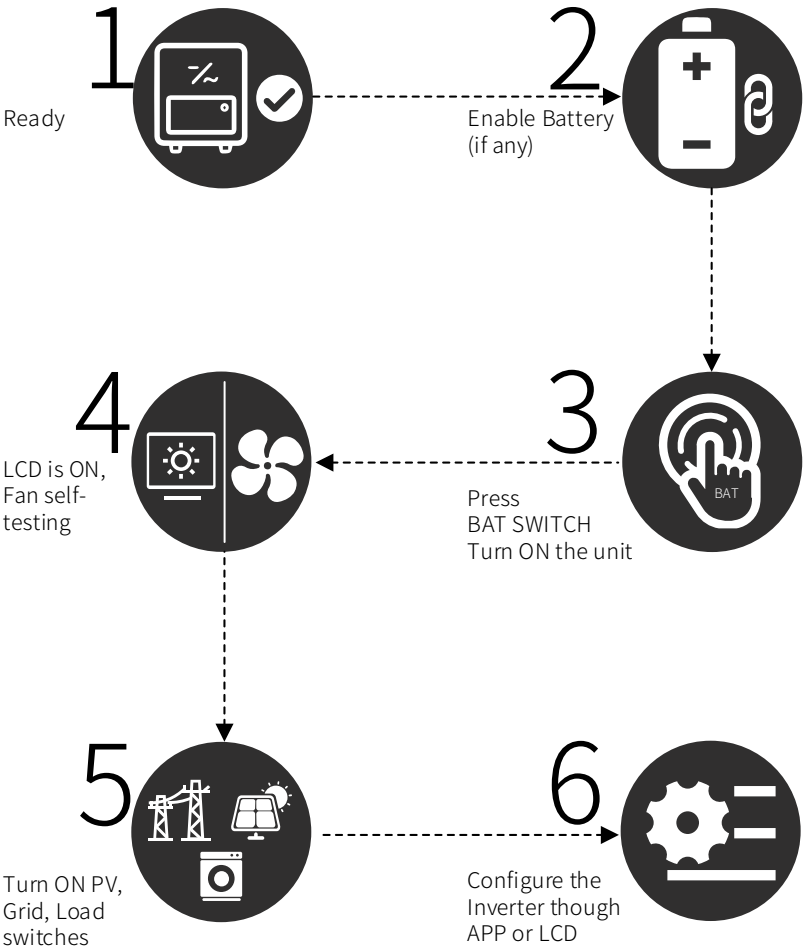
Open the battery switch of each inverter.
7. Close the load circuit breaker and then the grid circuit breaker for each inverter.
8. Close the battery switch of each inverter.

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.

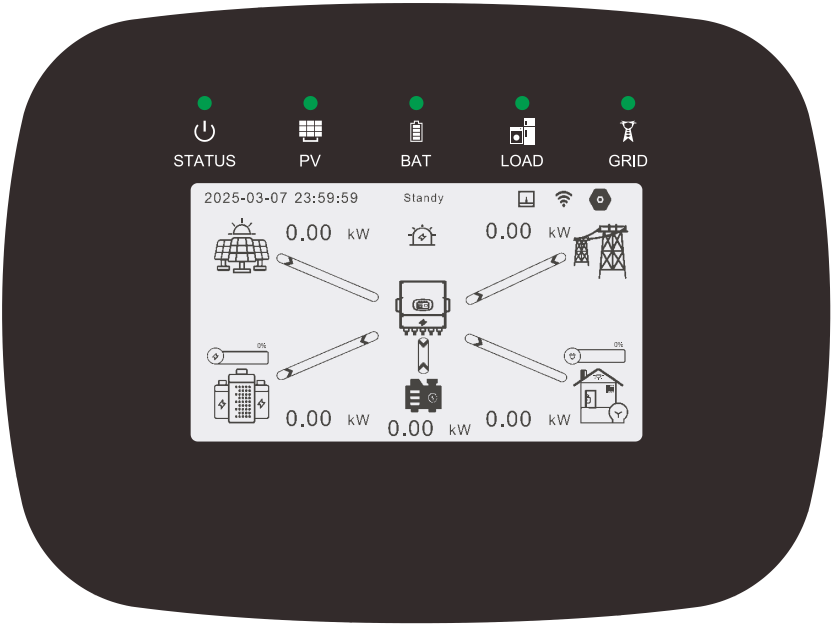
5.2 Inverter Power-on



1.Power-on steps: Close the battery circuit breaker > Close the black start switch > Close the PV circuit breaker > Close the PV switch > Close the grid circuit breaker > Close the load circuit breaker.

5.3 Indicator Check

1.The following diagram shows the indicators.



2.Normal operation logic of indicators:

● Inverter operation status

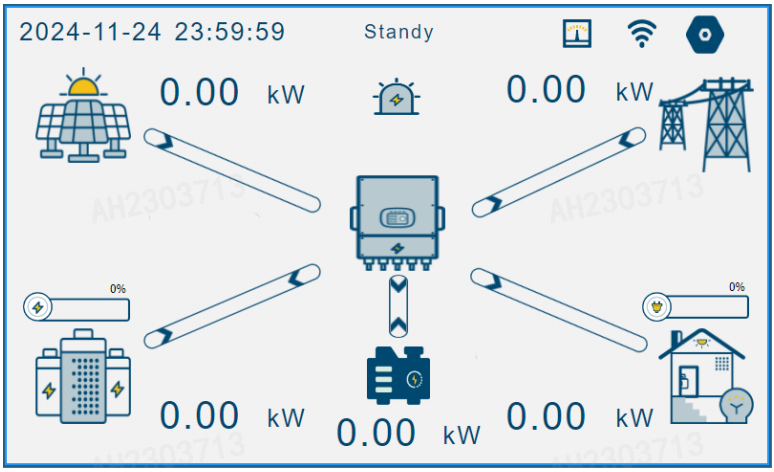
	No Fault	Fault	Warning	Upgrading
STATUS	LED keeps green	The red LED stays on	the green LED blink- ing for 1 second	the green LED blink- ing for 0.5 second

● 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

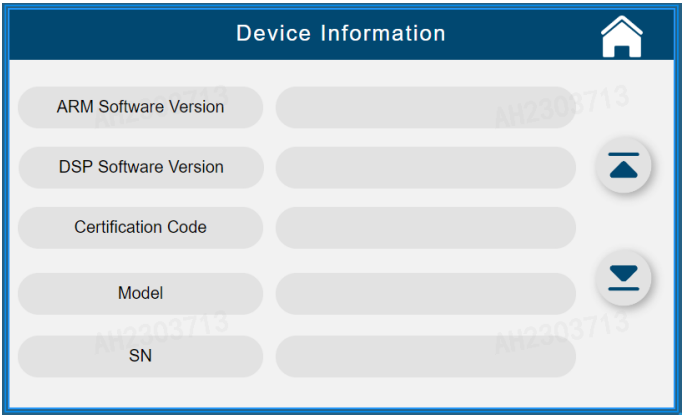
6.1 Homepage



Homepage	
Icon	Description
2024-11-24 23:59:59	The system time.
Standy	The system status. Standby: The inverter is in standby mode. OnGrid: The inverter is connected to the grid. OffGrid: The inverter is disconnected from the grid. Fault: The inverter has encountered a fault. Flash: The inverter is undergoing software upgrade. Bypass: The inverter is in grid bypass mode. Self-charging: The inverter is disconnected from the grid, and only the PV system is charging the battery.
	If displayed, this icon indicates that the inverter is connected to a meter or CT.
	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.
	The current state of charge (SOC) of the battery.
	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.
	Tap this icon to go to the Fault Information page. This icon is displayed only when active faults or warnings exist.
	Tap this icon to go to the System Settings page.
	the load rate of current EPS port

6.2 Device Information

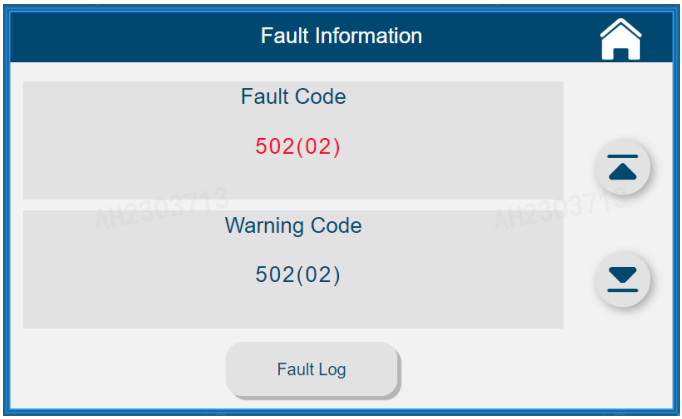
● Tap  to go to the Device Information page, as shown below:



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.

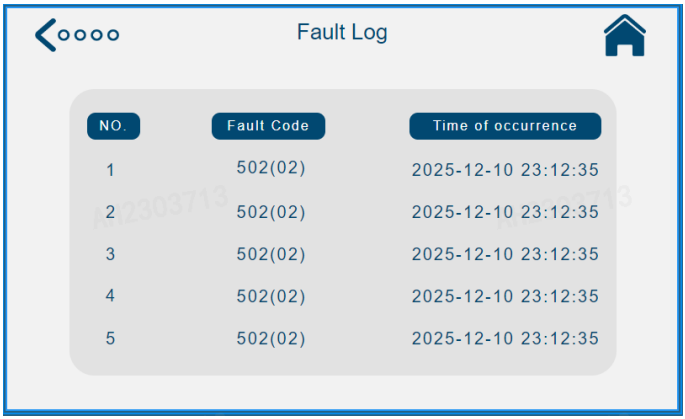
6.3 Fault Information

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



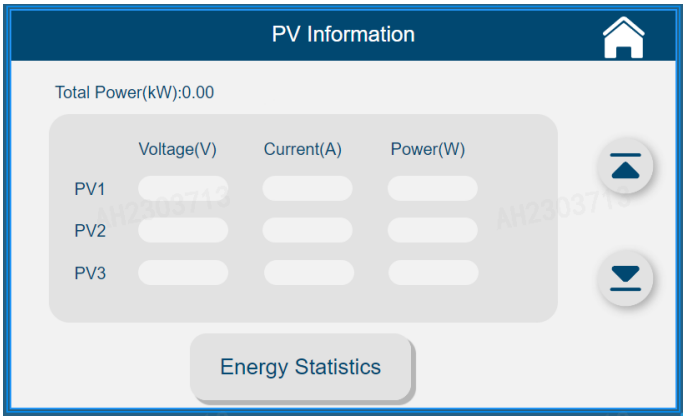
Fault Information	
Parameter/Icon	Description
Fault Code	The fault code.
Warning Code	The warning code.
Fault Log	Tap this icon to go to the Fault Log page.
	Tap this icon to return to the homepage.
	Tap the Page Down or Page Up icon to turn pages.

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



6.4 PV Information

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

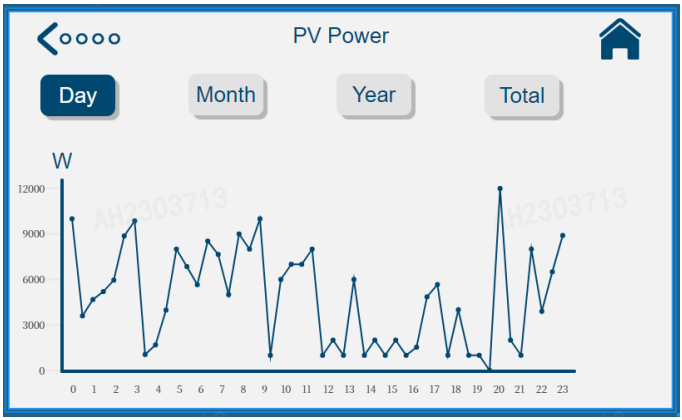


The following table describes the icons on the PV Information page.

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

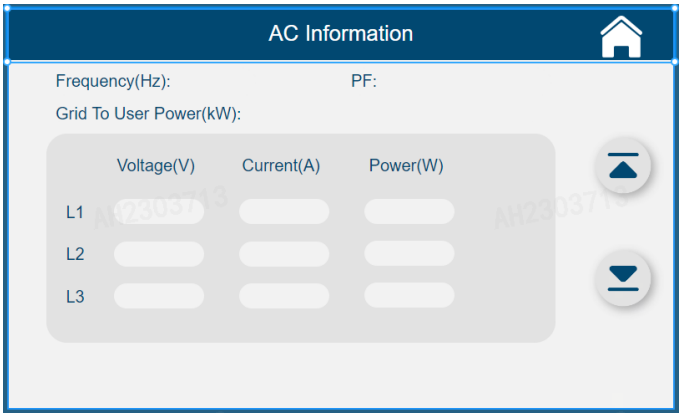
	Tap this icon to return to the homepage.
	Tap the Page Down or Page Up icon to turn pages.

Tap  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.



6.5 AC Information

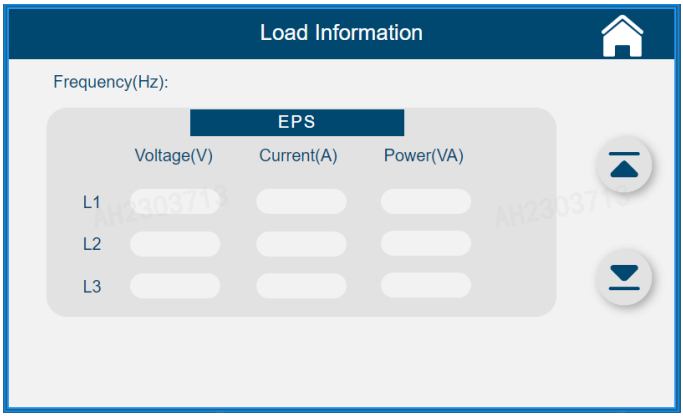
● Tap  to go to the AC Information page, as shown below:



AC Information	
Parameter/Icon	Description
Voltage(V) Current(A)	The voltage and current at the grid port of the inverter.
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.

6.6 Load Information

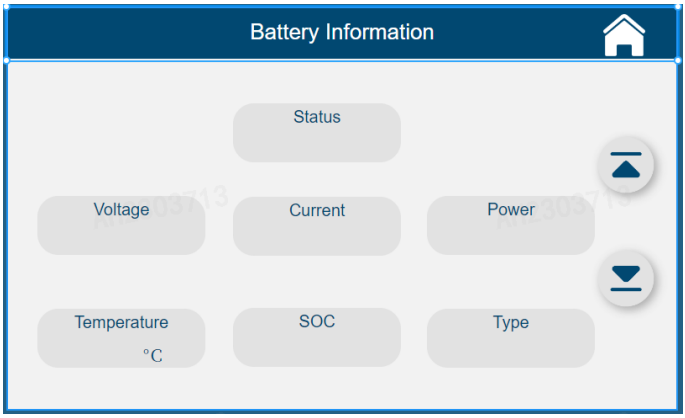
● Tap  to go to the Load Information page, as shown below:



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 apparent 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.

6.7 Battery Information

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

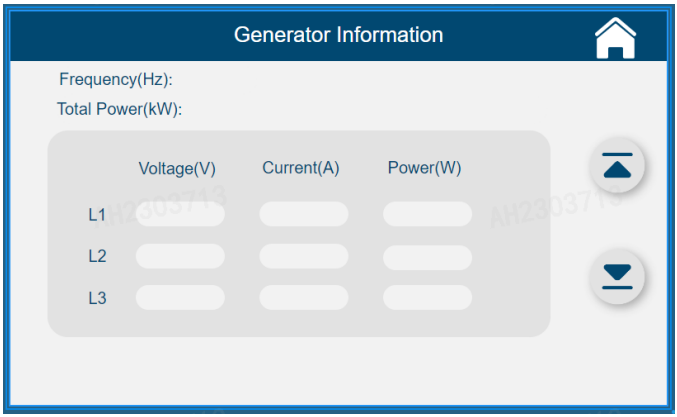


Battery Information	
Parameter/Icon	Description

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.

6.8 Generator Information

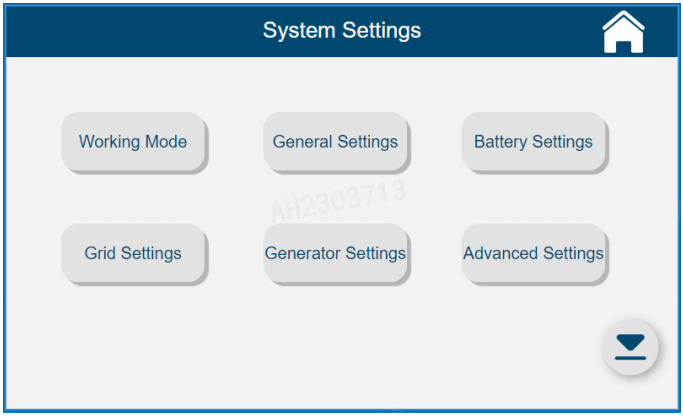
● Tap  to go to the Generator Information page, as shown below:



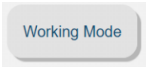
Generator Information	
Parameter/Icon	Description
Voltage(V) Current(A)	The voltage and current at the generator port of the inverter.
Power(W)	The active power at the generator port of the inverter.
Frequency(Hz)	The frequency at the generator port of the inverter.
	Tap this icon to return to the homepage.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

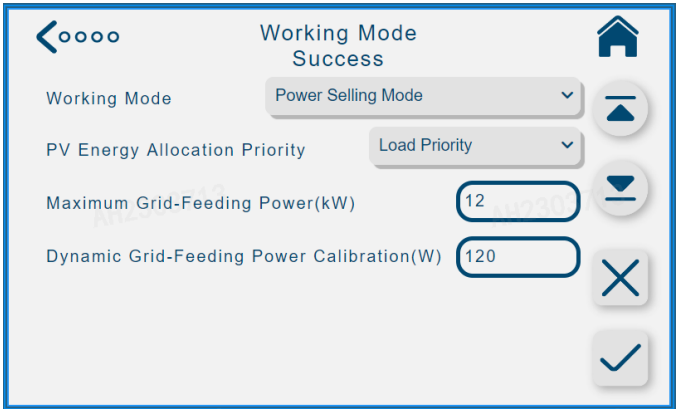
6.9 System Settings

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



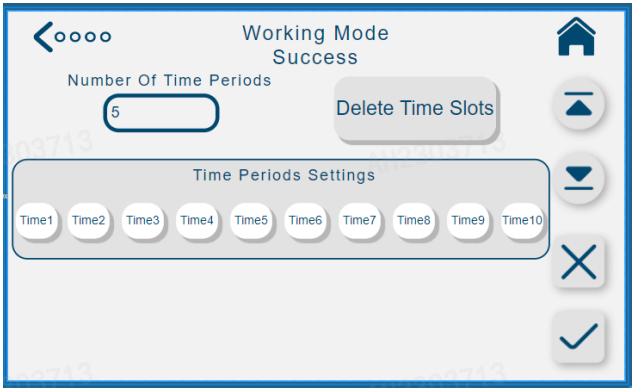
6.9.1 Working Mode

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

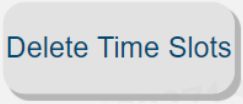
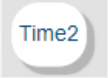


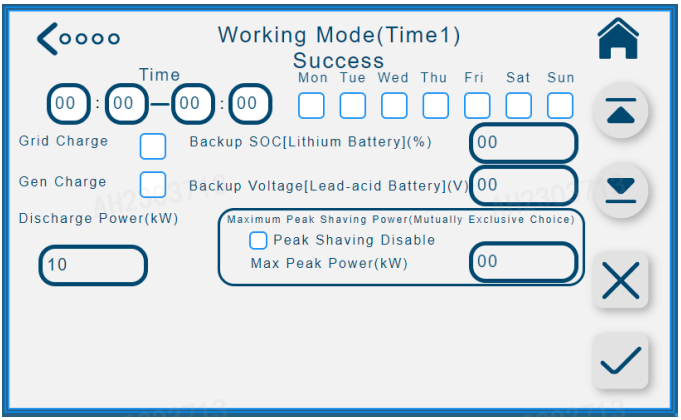
Working Mode	
Parameter/Icon	Description
Working Mode	**Selling First:** In this mode, the hybrid inverter can sell excess power generated by solar panels back to the grid. ● If the Time Period feature is enabled and the battery SOC is higher than the specified SOC during the specified time period, the battery supplies power to the loads when PV generation is insufficient and sells power to the grid. If the Time Period feature is disabled, the battery does not discharge. In this case, the grid supplements power when PV generation cannot meet the load demand. ● If Grid Charge is enabled in Battery Settings or Time Period Settings, the battery can be charged by the grid. **Zero Sell To EPS:** In this mode, the hybrid inverter supplies power only to the connected EPS loads. The hybrid inverter neither supplies power to grid-connected household loads nor sells power to the grid in this mode. ● If the Time Period feature is enabled and the battery SOC is higher than the specified SOC during the specified time period, the battery supplies power to the loads when PV generation is insufficient. If the Time Period feature is disabled, the battery does not discharge. In this case, the grid supplements power when PV generation is insufficient. ● If Grid Charge is enabled in Battery Settings or Time Period Settings, the battery can be charged by the grid. **Zero Sell To Grid Load:** In this mode, the hybrid inverter supplies power to connected backup loads and grid-connected household loads. The hybrid inverter does not sell power to the grid, and a grid-connected CT must be connected in this mode. ● If the Time Period feature is enabled and the battery SOC is higher than the specified SOC during the specified time period, the battery supplies power to the EPS loads and household loads when PV generation is insufficient. If the Time Period feature is disabled, the battery does not dis-

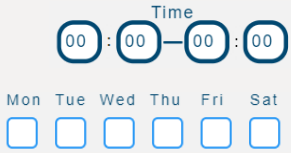
Working Mode	charge. In this case, the grid supplements power when PV generation is insufficient. ● If Grid Charge is enabled in Battery Settings or Time Period Settings, the battery can be charged by the grid. **Solar Sell To EPS:** This mode is based on the Zero Sell To EPS. In this mode, excess PV 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 12.
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.

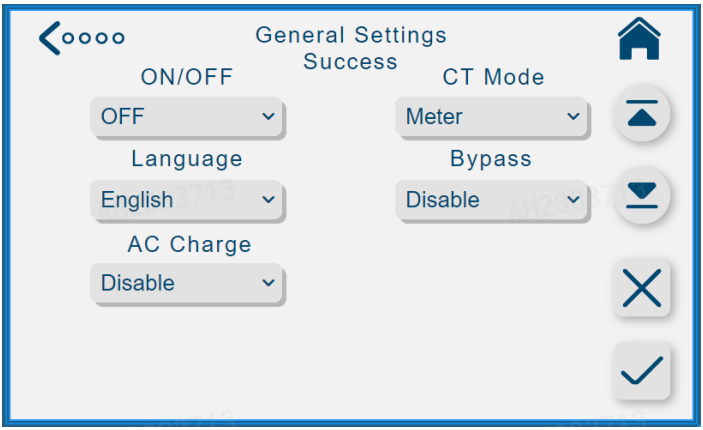


Working Mode	
Parameter/Icon	Description
	The time period and days of the week. You must specify days of the week for a time period. The 10 time periods cannot overlap. The settings for working conditions on this page take effect during the specified time period.
Grid Charge	Specifies whether the battery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

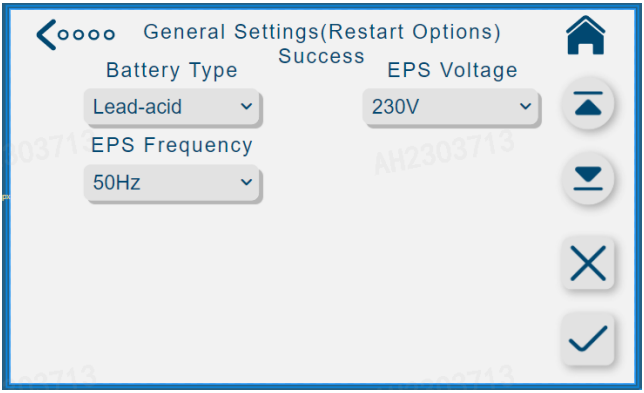
Backup SOC[Lithium Battery](%)	The target backup SOC of the lithium-ion battery. If the actual SOC is higher than this value, the battery discharges during the specified time period. Otherwise, the battery is charged during the specified time period. Default value: 50. Value range: 0 to 100. If the specified value is greater 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 52. If the specified value is greater 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: 12. Value range: 0 to 12.
	The Peak Shaving Disable parameter specifies whether to disable 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 Disable, the Max Peak Power parameter does not take effect. By default, Peak Shaving Disable is not selected.
	Tap this icon to save parameter changes.

6.9.2 General Settings

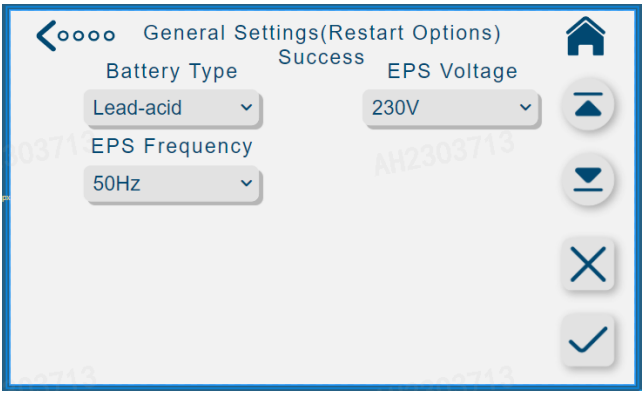
● Tap  to go to the General Settings page, as shown below:



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, contact Aohai Technology.
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.
✓	Tap this icon to save parameter changes.



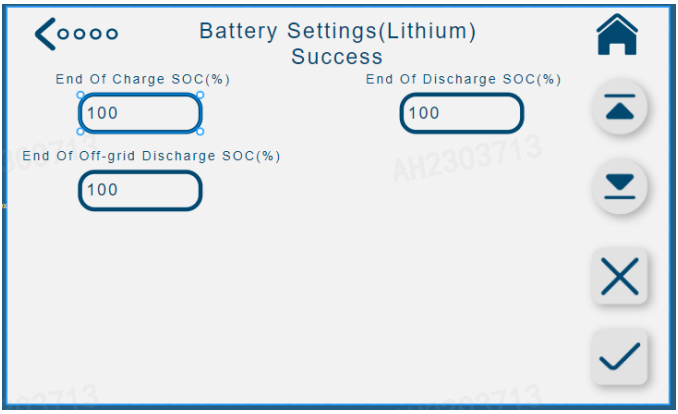
General Settings(Restart Options)	
Parameter/Icon	Description
Battery Type	Lead-acid: uses the lead-acid battery. Lithium: uses the lithium-ion battery. This is the default value. The lithium-ion battery works over the Pylon protocol.
EPS Voltage	The output voltage of the EPS port. Default value: 230VAC. 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.



6.9.3 Battery Settings

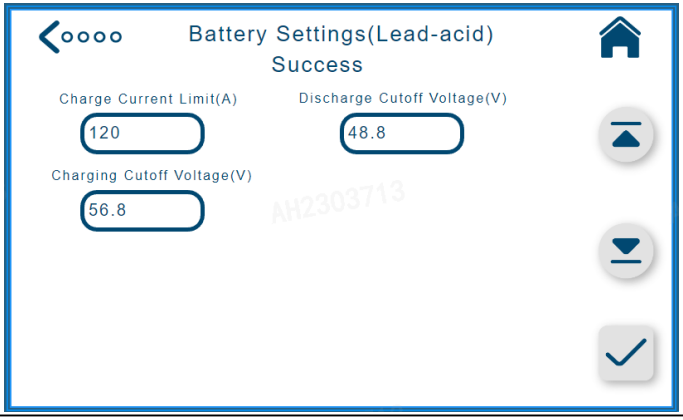
● Tap Battery Settings to go to the Battery Settings page.

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: 10.
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: 10.
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.



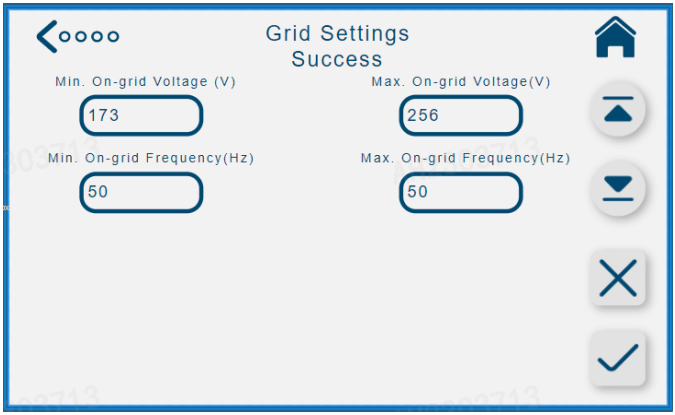
Battery Settings(Lead-acid)	
Parameter	Description
Charge Current Limit(A)	The maximum charging current for battery charging. The value cannot be greater than the maximum allowable charging current of the battery. Value range: 1 to 250. Default value: 60.
Discharge Cutoff Voltage(V)	The battery voltage 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: 56.8.
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 (every 30 days 3hr)*
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)

6.9.4 Grid Settings

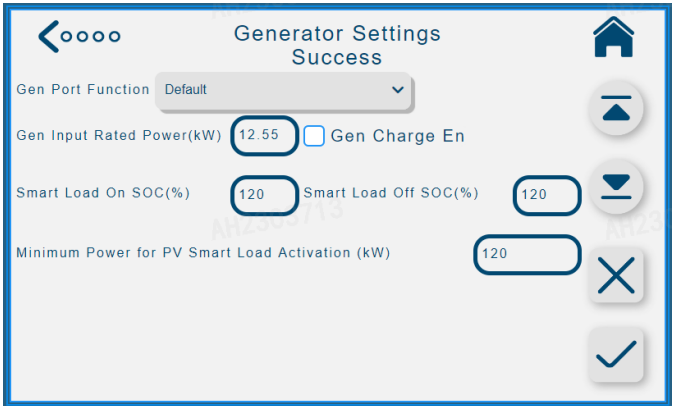
● Tap Grid Settings to go to the Grid Settings page, as shown below:



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.	

6.9.5 Generator Settings

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

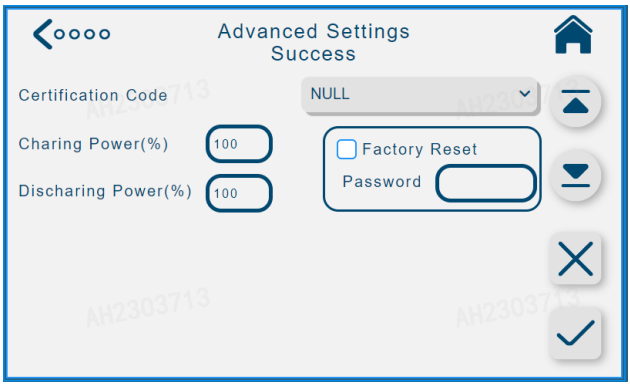


Generator Settings	
Parameter	Description
Gen Port Function	**Default:** The GEN port is disconnected and does not provide output. **Gen Smart En:** The inverter monitors the GEN port to detect whether a generator is connected. If yes, based on the values of the Gen On SOC(%) and Gen Off SOC(%) parameters (for the lithium-ion battery) or the Gen On Volt(V) and Gen Off Volt(V) parameters (for the lead-acid battery) on this page, the inverter automatically starts the generator to power loads. If Gen Charge En is selected, the generator can charge the battery. **Gen Force En:** The inverter monitors the generator's availability. If a generator is connected and Gen Charge En is selected, the inverter forcibly starts the generator to charge the battery based on the value of the End Of Discharge SOC(%) parameter (for the lithium-ion battery) or the Discharge Cutoff Voltage(V) parameter (for the lead-acid battery). **Smart Load Smart On:** The smart load switch operates based on the values of the Gen On SOC(%) and Gen Off SOC(%) parameters (for the lithium-ion battery) or the Gen On Volt(V) and Gen Off Volt(V) parameters (for the lead-acid battery) on this page. **Smart Load On Grid Always On:** The smart load switch remains on as long as the grid is available. **Smart Load Off Grid Immediately Off:** The smart load switch cuts off immediately after the grid is disconnected. **AC Couple On SecEPS Side:** You can connect the grid output of another hybrid inverter to the GEN port of this inverter.

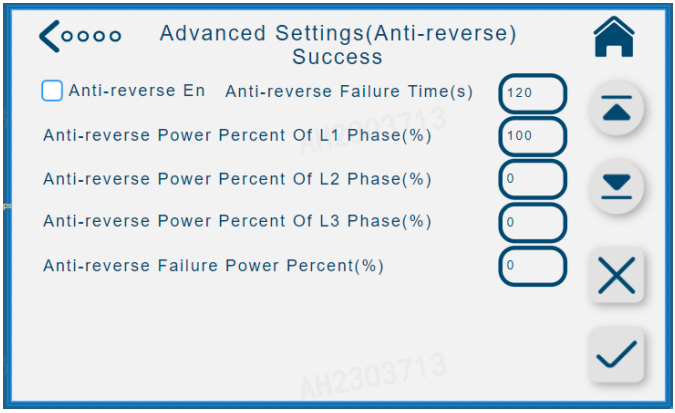
Gen Charge En	Specifies whether to enable battery charging by the generator.
Gen Input Rated Power(kW)	The maximum input power of the generator. Value range: 0 to 12.
Smart Load On SOC(%)/Gen Off SOC(%)	These two parameters apply to the lithium-ion battery. For the smart load switch, if the battery SOC 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 discharges 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 discharges 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 12.
When you tap the input box, a numeric keypad appears. After you enter the values, tap ✓ to apply the settings.	

6.9.6 Advanced Settings

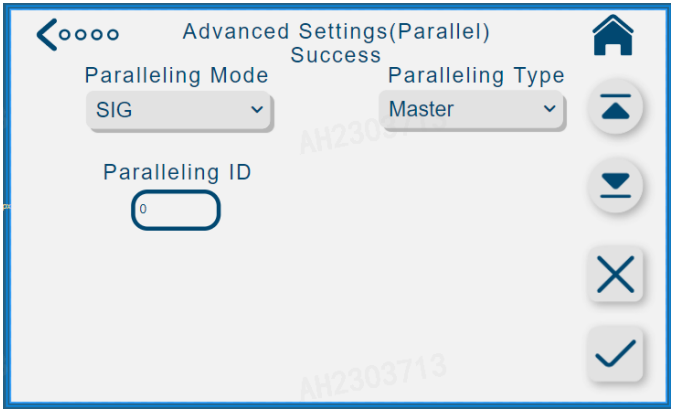
● Tap Advanced Settings to go to the Advanced Settings page, as shown below:



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	Specifies whether to enable anti-reverse power protection. You must select this option for other parameters on this page to take effect.
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 Anti-reverse Failure Power Percent(%) parameter. Value range: 30 to 120.
Anti-reverse Failure Power Percent(%)	The anti-reverse power failure percentage. After the timeout period for anti-reverse power protection, the inverter limits the grid-feeding power based on this percentage. Value range: 0 to 100.
Anti-reverse Power Percent Of L1 Phase(%)	The L1 phase anti-reverse power percentage when meter communication is normal. The inverter limits the grid-feeding power from L1 phase based on this percentage. Value range: 0 to 100.
Anti-reverse Power Percent Of L2 Phase(%)	The L2 phase anti-reverse power percentage when meter communication is normal. The inverter limits the grid-feeding power from L2 phase based on this percentage. Value range: 0 to 100.
Anti-reverse Power Percent Of L3 Phase(%)	The L3 phase anti-reverse power percentage when meter communication is normal. The inverter limits the grid-feeding power from L3 phase based on this percentage. 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 single-phase parallel connection mode. 3P1: sets the inverter output to L1 phase in three-phase parallel connection mode.3P2: sets the inverter output to L2 phase in three-phase parallel connection mode. 3P3: sets the inverter output to L3 phase in three-phase 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 9.

7. Use of the Aohai App

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-reserve 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-reserve 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	HSA-8K1P-BL	HSA-10K1P-BL	HSA-12K1P-BL
Solar Input Data			
Recommended Max. PV Array Size (Wp)	16000	24000	24000
Max. PV Input Power(W)	12000	18000	18000
Max. Input Voltage(V)	500	500	500
Start-up Voltage(V)	120	120	120

Rated Input Voltage(V)	370	370	370
MPPT Operating Voltage Range(V)	120~425	120~425	120~425
MPPT Voltage Range (full load) (V)	150~500	150~500	150~500
Max. Input Current per MPPT(A)	27+27	27+27+27	27+27+27
Max. Short Circuit Current per MPPT(A)	44+44	44+44+44	44+44+44
Number of MPPTs	2	3	3
Number of Strings per MPPT	2+2	2+2+2	2+2+2
Max. Inverter Backfeed Current to The Array(A)	0	0	0
Battery Data			
Battery Type	Lead-acid or Lithium-ion		
Rated Battery Voltage(V)	48	48	48
Battery Voltage Range(V)	40~60	40~60	40~60
Max. Charge/ Discharge Current(A)	190	220	250
Max. Charge/ Discharge Power(W)	8000	10000	120000
Battery Communication	CAN/RS485	CAN/RS485	CAN/RS485
Number of Battery Input	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

Max. AC Input/Output Apparent Power (VA)	8800	11000	13200
Peak Apparent Power (off-grid)	2 times of rated power, 10s		
Rated AC Input/ Output Current(A)	36.4/34.8/33.4	45.5/43.5/41.7	54.6/52.2/50
Max. AC Input/Output Current(A)	38.3	47.9	57.4
Max. Continuous AC Passthrough (grid to load) (A)	60	60	60
Max. Output Fault Current(A)	100	100	100
Max. Output Over Current Protection(A)	150	150	150
Rated Input/Output Voltage(V)	220/230/240	220/230/240	220/230/240
Input/Output Voltage Range(V)	0.85Un-1.1Un	0.85Un-1.1Un	0.85Un-1.1Un
Grid Connection Form	L+N+PE	L+N+PE	L+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%	<3%	<3%
DC Injection Current	＜ 0.5%In	＜ 0.5%In	＜ 0.5%In
Switch time(ms)(Typ)	4	4	4
Efficiency			
Max. Efficiency	97.60%	97.60%	97.60%

European Efficiency	96.50%	96.50%	96.50%
MPPT Efficiency	>99.9%	>99.9%	>99.9%
Protection			
PV Reverse Polarity Protection	yes	yes	yes
Anti-Islanding Protection	yes	yes	yes
Output Short Protection	yes	yes	yes
Ground fault monitoring	yes	yes	yes
Insulation Resistance Monitoring	yes	yes	yes
Over-current Protection	yes	yes	yes
Over-temperature Protection	yes	yes	yes
AC/DC Surge Protection	TYPE II(DC), TYPE II(AC)		
AFCI Protection	Optional	Optional	Optional
DC Switch	yes	yes	yes
Residual Current Monitoring	yes	yes	yes
Grid Monitoring	yes	yes	yes
General Data			
Dimension (W*H*D) (mm)	420×680×252.5(Excluding connectors)		
Weight(kg)	36	37	37
Relative Humidity	0~100%	0~100%	0~100%

Operating Temperature Range(°C)	-40 to +60, >45 Derating		
Storage Temperature(°C)	-45 to +85	-45 to +85	-45 to +85
Noise Emission(dB)	< 45	< 45	< 45
Altitude(m)	2000	2000	2000
Cooling Method	Intelligent Air Cooling		
Ingress Protection	IP65	IP65	IP65
Over Voltage Category	OVC II(DC), OVC III(AC)		
Topology	Non-Isolated	Non-Isolated	Non-Isolated
Protective Class	I	I	I
Communication Interface	RS485/CAN/Bluetooth/WIFI, LAN/4G/GPRS (optional)		
Power Grid Side Energy Detection Method	1CT, Meter(optional)		
Display	LCD & APP	LCD & APP	LCD & APP
Standby / Internal Consumption(W)	<25(night)	<25(night)	<25(night)
PV Connector	MC4 compatible connector(Max.6mm^2)		
Battery Connector	Connector(Max.50mm^2)		
AC Connector	Connector(Max.10mm^2)		

AOHAI

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