Photovoltaic Energy Storage Inverter

User's Manual



Model:KE-8KC5LSUF, KE-10KC5LSUF, KE-12KC5LSUF, KE-12K5C5LSUF, KE-13K2C5LSUF

Version: V3.0-2026.10

Catalogue

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1.Safety Instruction

1.1 How to Use This Manual

- This manual contains important information about the product, guidelines, operation and maintenance. It applies to the following models: **KE-8KC5LSUF, KE-10KC5LSUF, KE-12KC5LSUF, KE-12K5C5LSUF, KE-13K2C5LSUF.**
- Installation, layout, electrical wiring, system commissioning, as well as operation, maintenance and overhaul of this inverter must be carried out only by personnel with corresponding professional qualifications. Ordinary non-professional users and individuals without valid and legal operation qualifications are strictly prohibited from conducting unauthorized operations.
- Personnel must strictly comply with current national standards and specifications related to electrical safety, as well as the technical and safety requirements specified in this manual throughout the entire operation process. Any personal safety accidents, equipment damage, and associated derived risks, economic and legal liabilities arising from non-compliant operations or unauthorized work shall be independently borne by the installation entity and responsible party.
- This manual must be properly kept by the user or certified operator to ensure it is available for reference at any time. In the event of loss, the electronic version may be downloaded from the official website, or requested from the service department via email.

1.2 Meanings of Symbols in the Manual

Symbol	Description
	**DANGER:** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	**WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	**CAUTION:** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
	**NOTICE:** No personal injury hazard. Used for operational instructions to prevent equipment or property damage.

1.3 Safety statement



- This chapter contains important safety instructions. Please read and keep this manual for future reference.
- Ensure compliance with local requirements and regulations when installing this inverter.
- Live operation is prohibited! Disconnect power before installation, removal, or wiring.
- To achieve optimal performance of the inverter, select appropriate cable sizes and necessary protective devices in accordance with specifications.
- Do not disassemble, connect, or disconnect any cables during operation.
- Strictly follow the sequence when switching on/off the circuit breakers for each inverter interface.
- Do not open the terminal cover while the inverter is in operation.
- Ensure the inverter is properly grounded.
- Do not cause short circuits between AC output and DC input.
- Do not disassemble the unit. All maintenance and repairs must be performed by a professional service center.
- Never charge a frozen battery.

2.Product Presentation

2.1 Product Description

Energy storage hybrid inverter connects and coordinates the control of photovoltaic, energy storage battery, power grid and load, so as to provide stable, safe and clean electric energy for household, commercial and industrial users to meet the energy needs under different scenarios.

2.2 Product Features

- Supports multiple energy storage battery types including lead-acid batteries and lithium-ion batteries.
- Support single-phase and split-phase pure sine wave output.
- Support voltage adjustment of each phase within the range of 100~130V.
- Supports 2-channel PV input, with the function to track 2-channel MPPT maximum power charging/carrying capacity simultaneously. The MPPT efficiency reaches up to 99%, and the maximum single-channel current is 22A.
- Two output modes available: mains bypass and inverter output, with uninterruptible power supply (UPS) function.
- Two charging modes: PV-only charging and hybrid charging.
- Supports scheduled battery charging and scheduled battery discharging.
- Energy-saving mode for single unit to reduce no-load power loss.
- Multiple protection functions to fully protect PV modules, storage batteries, loads and the controller itself.
- Capacitive smart touch large screen, menu-based operation for intuitive and convenient parameter configuration.
- Supports 256 event logs; supports 512 days of historical data storage.
- Built-in Bluetooth and Wi-Fi with native cloud platform access capability; automatic time synchronization after connection.

2.3 System Block Diagram

The following figure shows the system application scenario of this product. A complete system consists of the following parts:

1. Photovoltaic modules: convert light energy into direct current, which can be used to charge the battery through inverter, or directly converted into alternating current to supply power to the load.

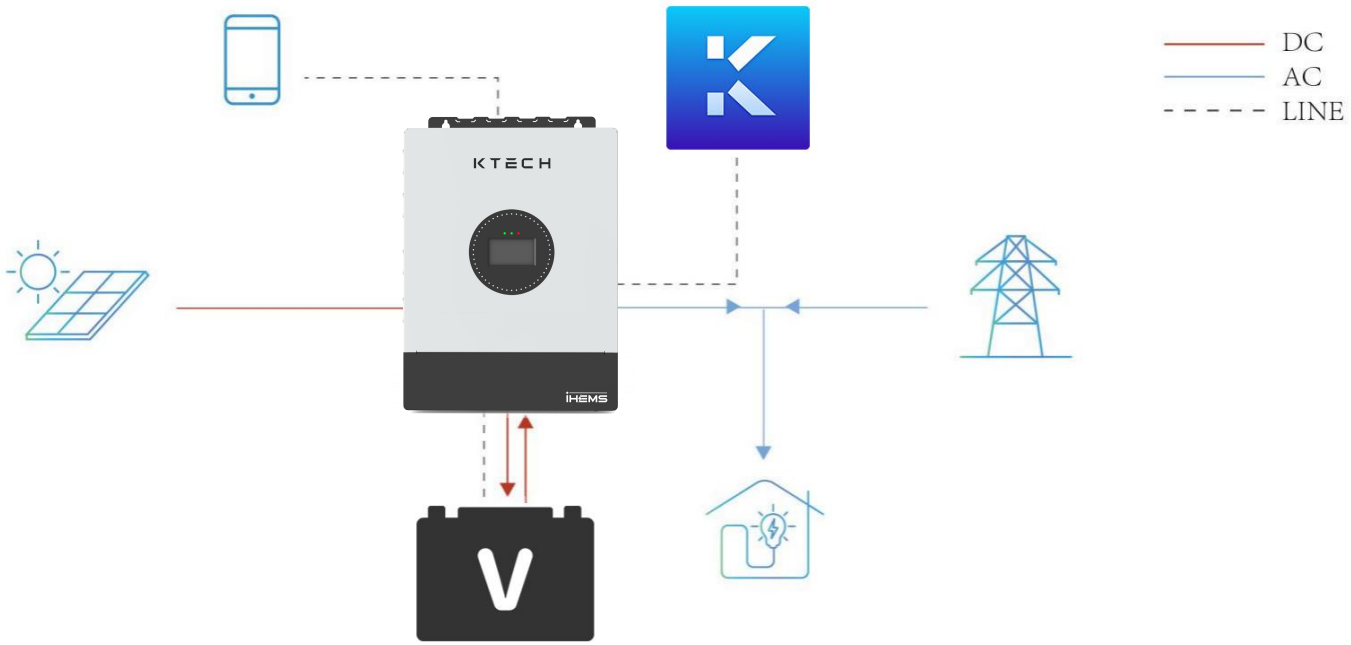
2. Mains power or generator: Connected to an AC input and can charge the battery while supplying the load. The system can generally also operate without utility power or a generator when the battery and photovoltaic modules are powering the load.

3. Battery: The function of the battery is to ensure the normal power supply to the system load when photovoltaic power is insufficient or there is no grid power.

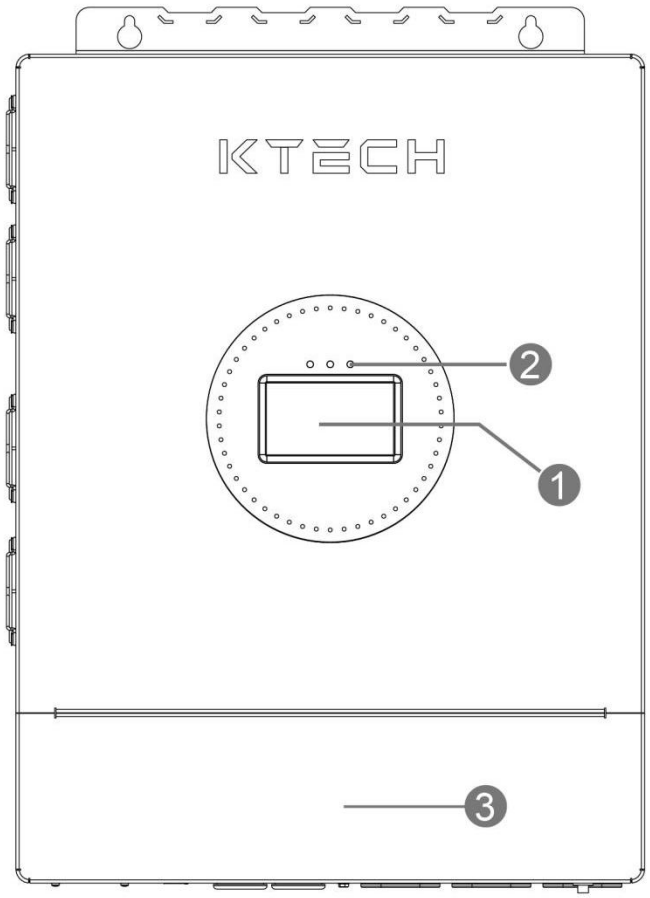
4. Load: Can connect to various household and office loads, including refrigerators, lights, televisions, fans, air conditioners, and other AC loads.

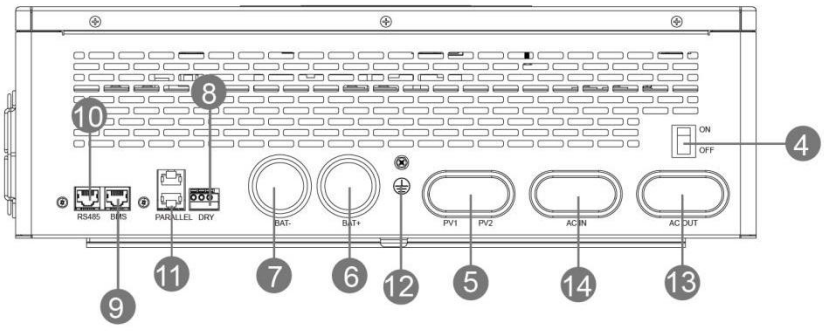
5. Inverter: The energy conversion device for the whole system.

Actual application scenario diagram:



3.Product Overview





1	Capacitive Touch Screen	**2**	LED Indicator	**3**	Terminal Protective Cover
4	ON/OFF Rocker Switch	**5**	PV Input (1/1)	**6**	Battery Terminal (Positive)
7	Battery Terminal (Negative)	**8**	Dry Contact	**9**	BMS Port
10	RS485 Port	**11**	Parallel Communication Port	**12**	Grounding Screw
13	AC Output	**14**	AC Input		

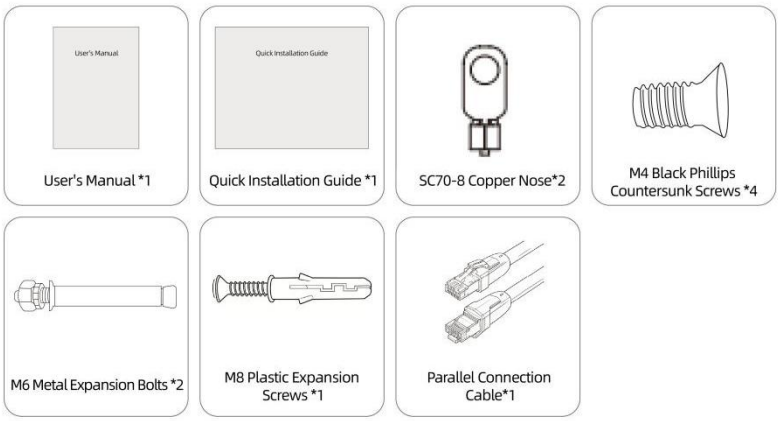
4.Installation

4.1 Product Packaging

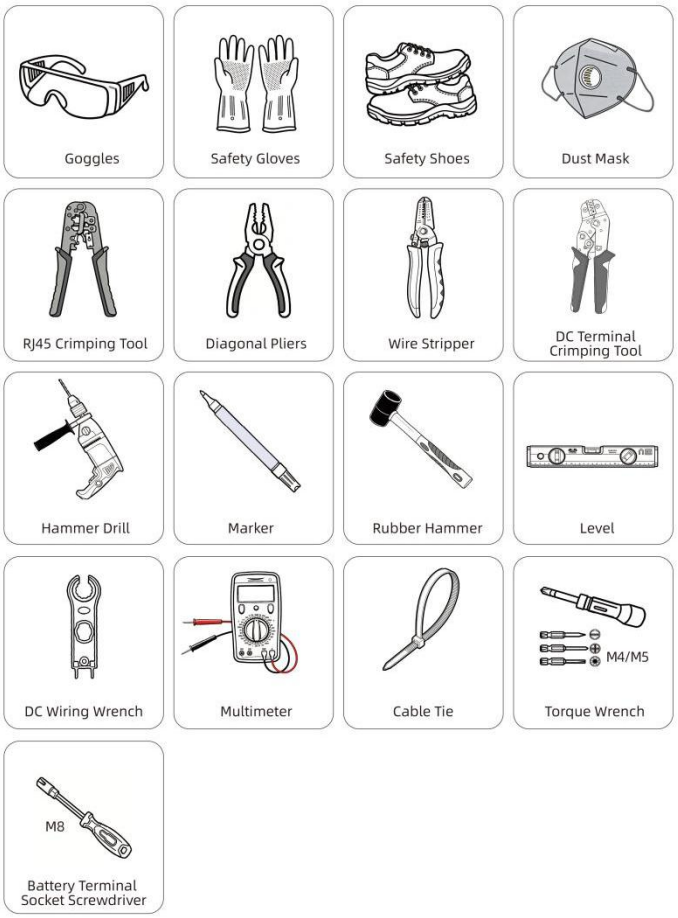
Before installation, inspect the equipment and verify that all accessories inside the package are intact and free of damage.

- **Parts List**

The accessories of this product shall match the items listed in this list. (Note: Optional accessories are provided on request and not included as standard equipment. Pictures are for illustration only; the actual product shall prevail.)



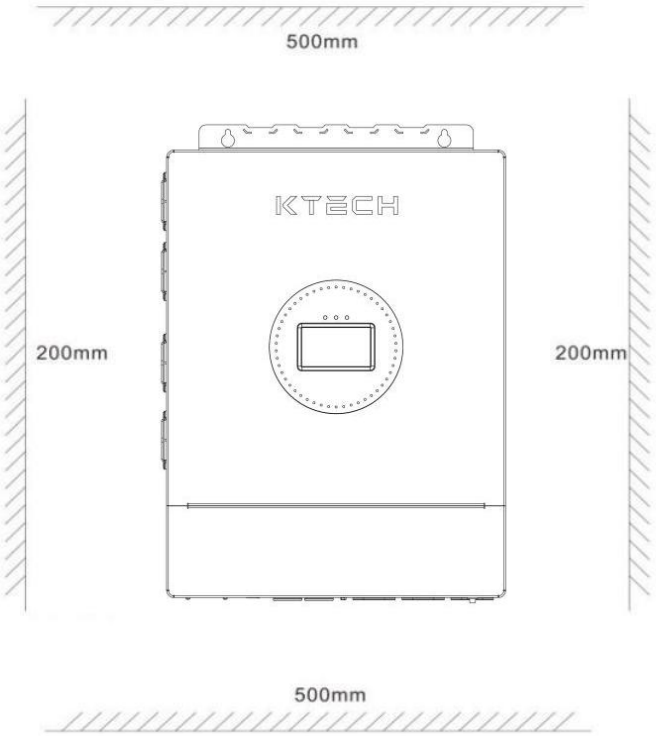
- **List of Installation Tools**



4.2 Selecting the Installation Location

This product is for indoor use only (protection level IP20). Before choosing an installation location, users should consider the following factors:

- Select a sturdy wall for inverter installation.
- Install the inverter at a height level with the line of sight.
- Ensure sufficient clearance around the inverter: ≥200mm on both sides and ≥500mm at the top.
- Ambient temperature: -10~55℃; avoid direct sunlight, humidity, and dust! To ensure optimal operation.





- Do not install the inverter near highly flammable materials.
- Do not install the inverter in potentially explosive areas.
- Do not install the inverter and lead - acid batteries in an enclosed space.



- Do not install the inverter in direct sunlight.
- Do not install or use the inverter in a humid environment.

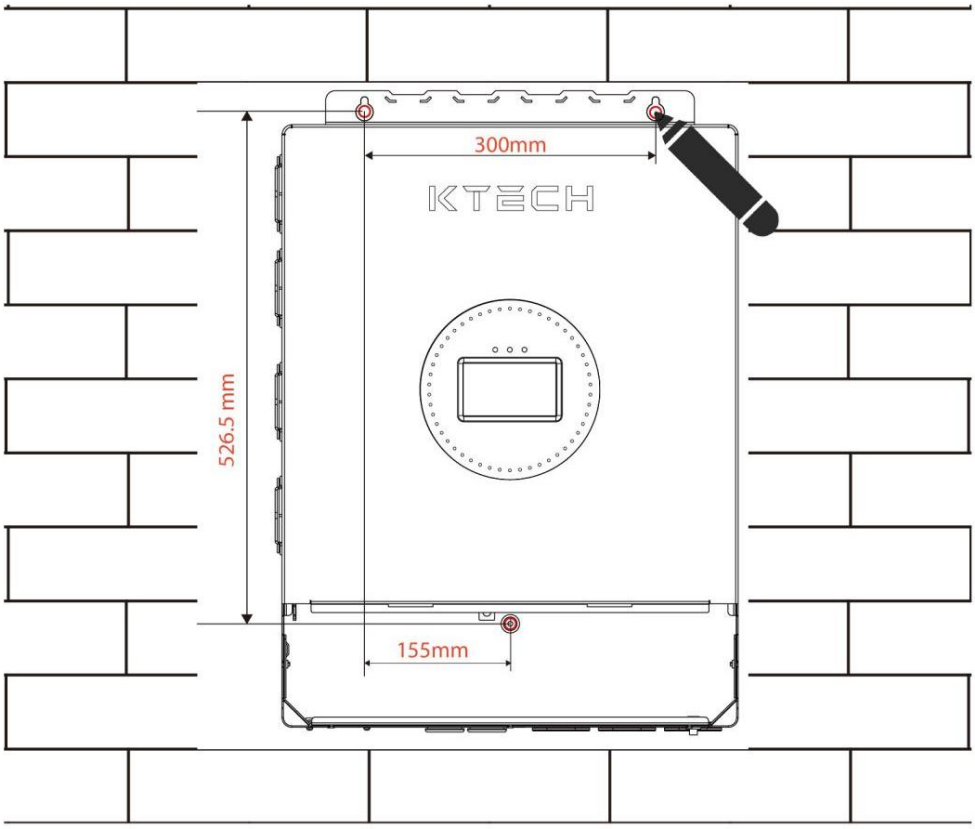
4.3 Install the Machine

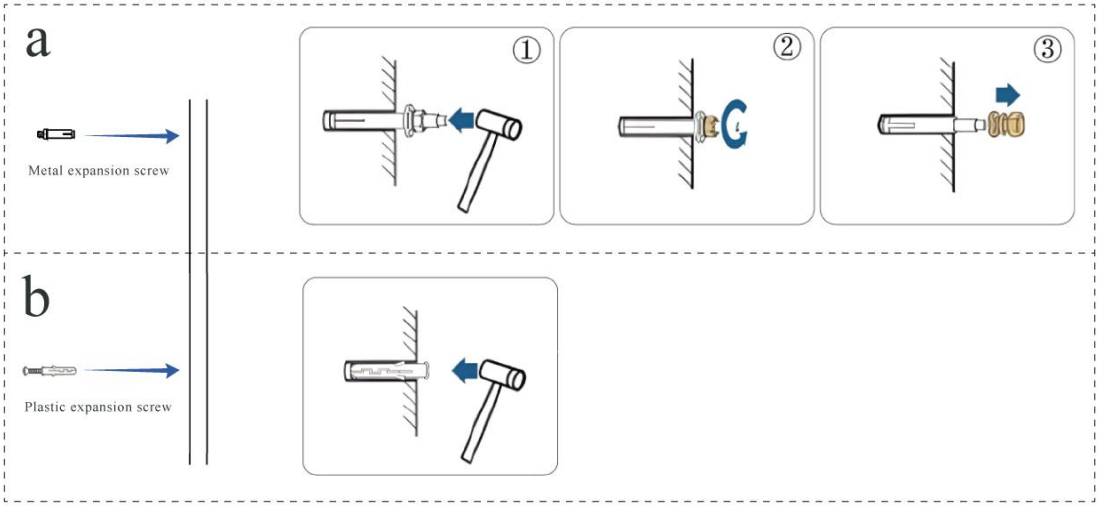
4.3.1 Mounting Dimensions and Wall Drilling Schematic Diagram

Drill 3 mounting holes on the wall with an electric drill according to the specified dimensions and the hole positions on the inverter.

a. Tap the metal expansion bolts into the wall, tighten the nuts to expand the expansion feet of the expansion bolts; then remove the washers and nuts.

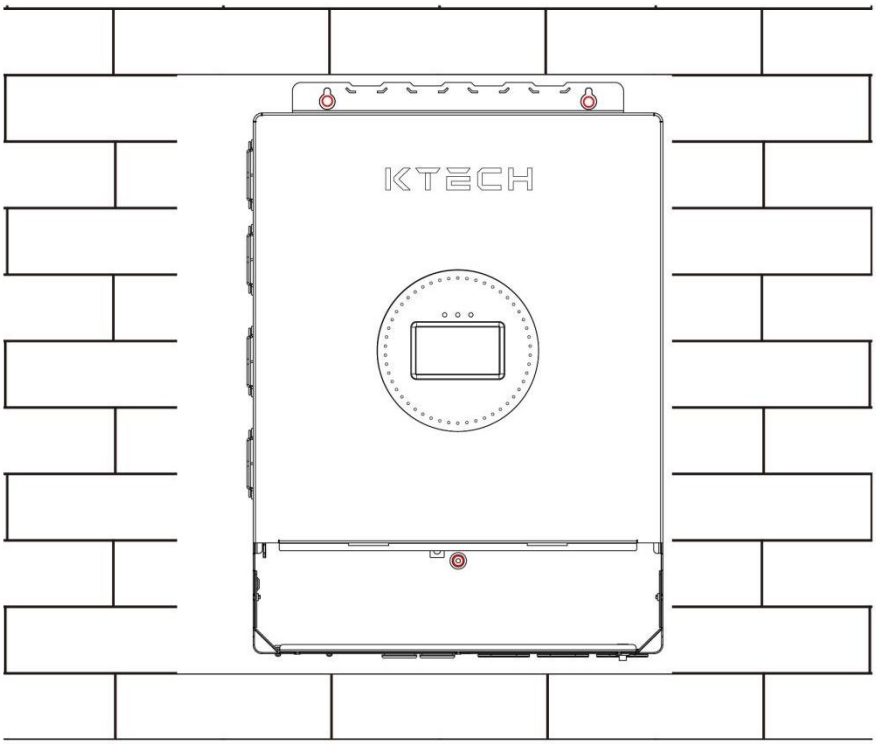
b. Tap the plastic expansion tubes into the wall.

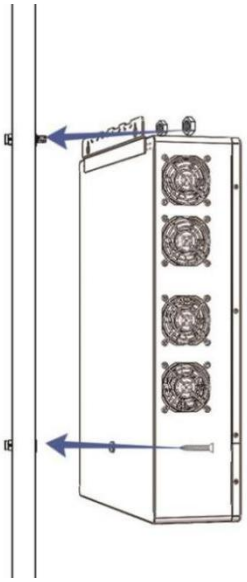




4.3.2 Installing the Inverter

Align the inverter with the pre-drilled load- bearing wall and fix it in place. Tighten the nuts of the metal expansion bolts, then screw in the plastic expansion screws to ensure firm and reliable installation.



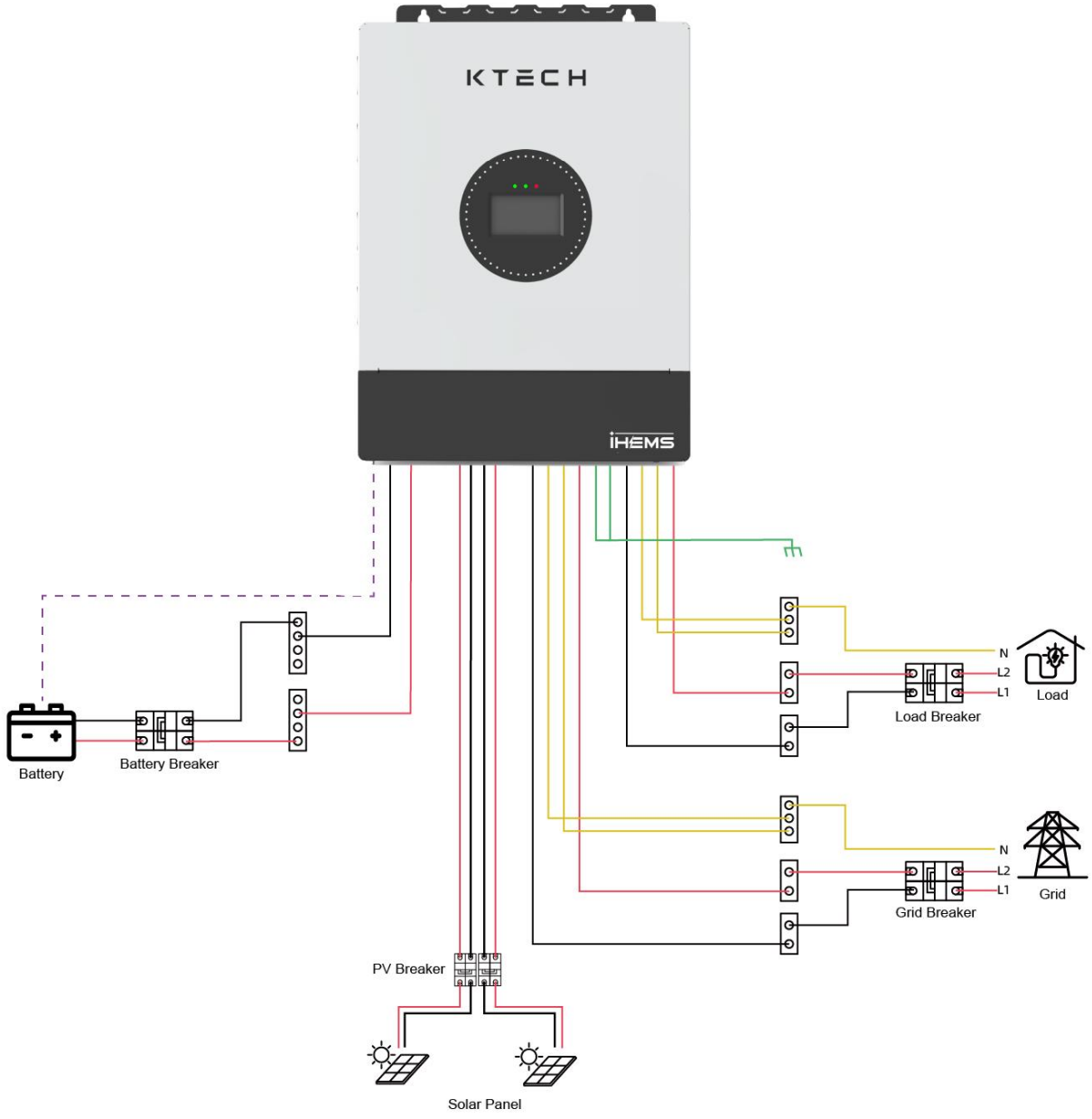


NOTICE

• When using the equipment in areas with poor air quality, the dust-proof net is prone to being blocked by airborne particles. Regularly disassemble and clean the dust-proof net to avoid affecting the internal air flow velocity of the inverter. Otherwise, it may trigger the over-temperature protection fault of components, affecting power supply and the service life of the inverter.

5.Wiring

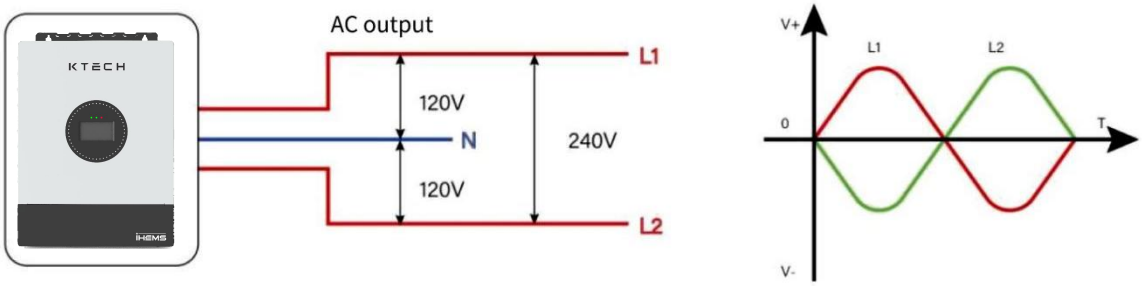
5.1 Single Unit Split-Phase Wiring Diagram



NOTICE

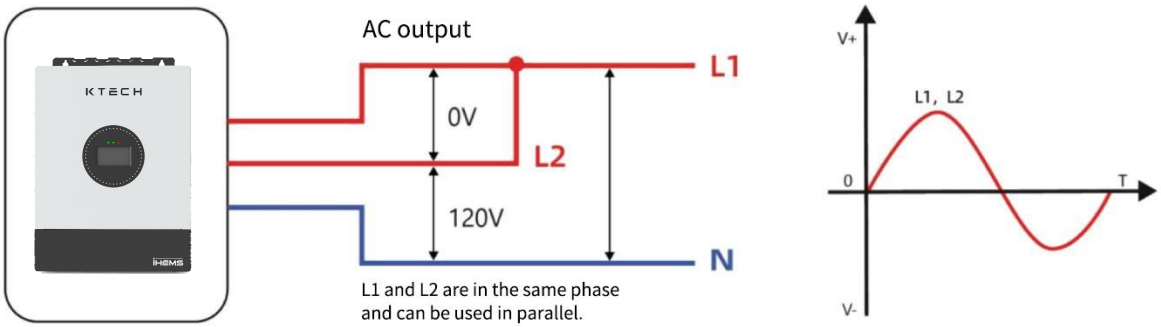
- Do not reverse battery polarity.
- Due to variations among production batches, the arrangement or position of device terminals may differ slightly. However, the wiring principle and method remain unchanged. Always refer to the markings on the actual unit.

5.2 Split-phase Mode (Default)



Item	Description
Applicable Models	KE-8KC5LSUF, KE-10KC5LSUF, KE-12KC5LSUF, KE-12K5C5LSUF, KE-13K2C5LSUF
AC Output Phase Voltage (L - N)	100~130V, 120V default
AC Output Line Voltage (L1 - L2)	200~260V, 240V default

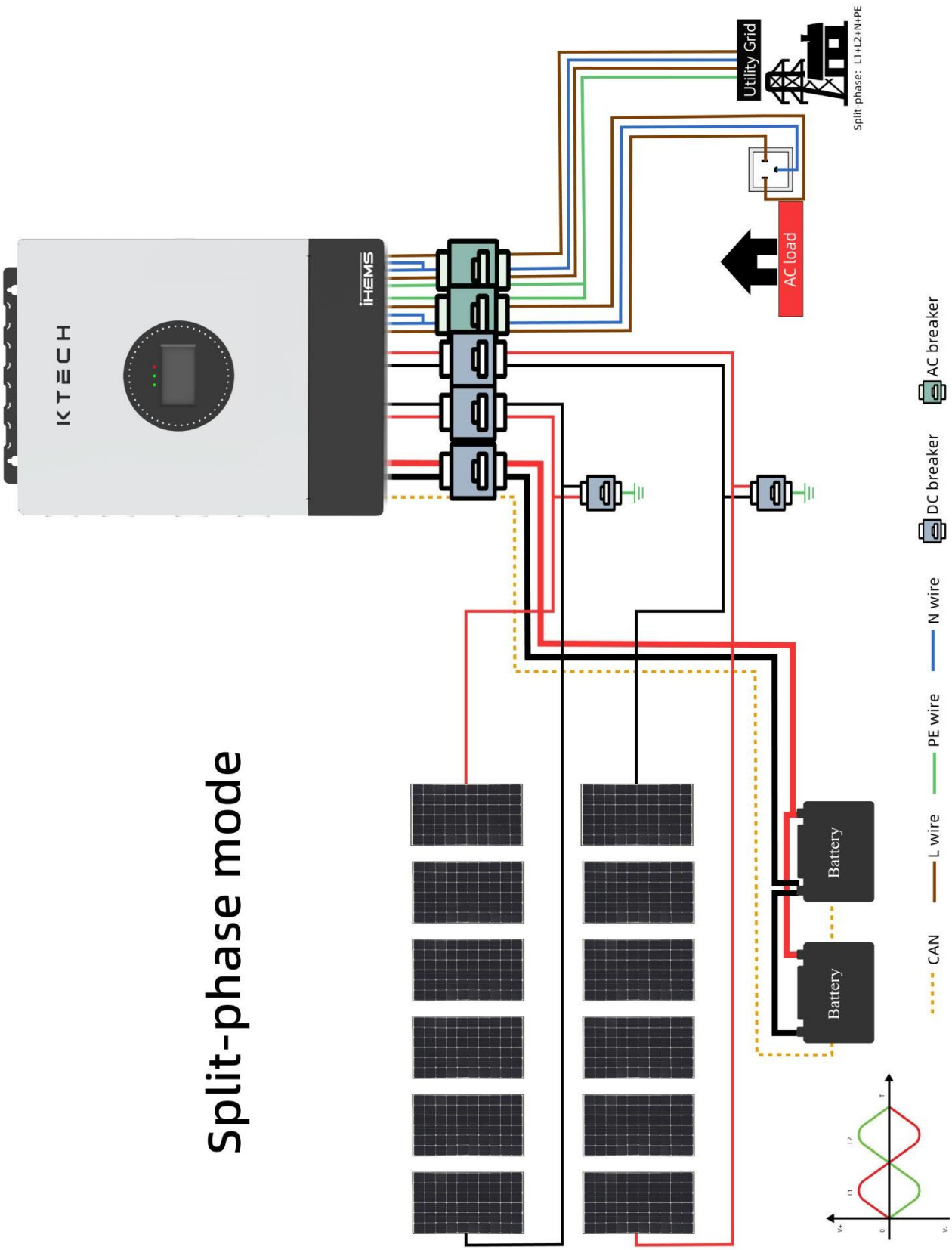
5.3 Single-phase mode



Item	Description
Applicable Models	KE-8KC5LSUF, KE-10KC5LSUF, KE-12KC5LSUF, KE-12K5C5LSUF, KE-13K2C5LSUF
AC Output Phase Voltage (L - N)	100~130V, 120V default

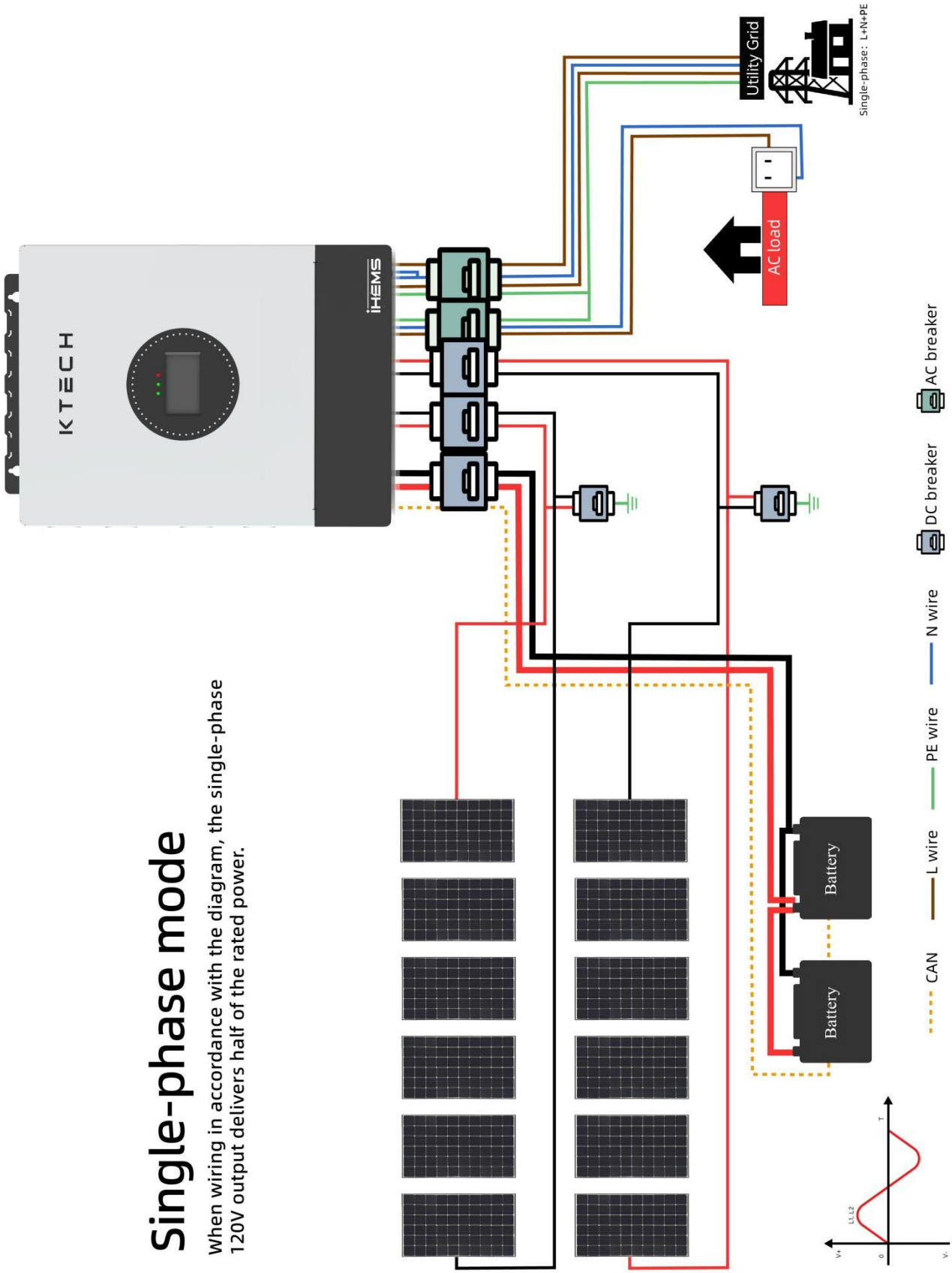
NOTICE

- Users can change the output voltage through the setting menu.
- The output voltage can be set within the range of100V to 130V


Split-phase mode
Utility Grid
Split-phase: L1+L2+N+PE
AC load
KTECH
iHEMS
Battery
Battery
AC breaker
DC breaker
N wire
PE wire
L wire
CAN

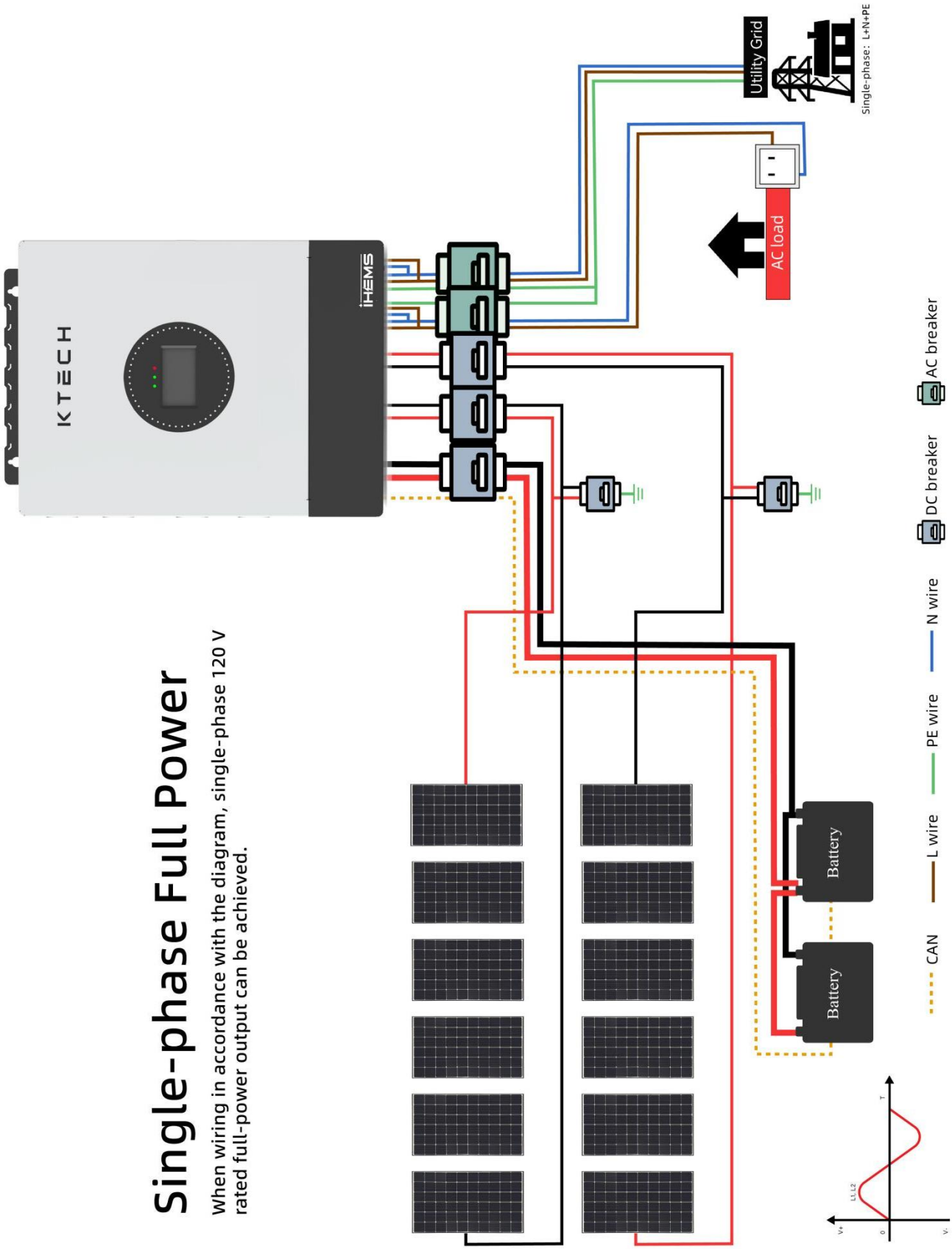
Single-phase mode

When wiring in accordance with the diagram, the single-phase 120V output delivers half of the rated power.



Single-phase Full Power

When wiring in accordance with the diagram, single-phase 120 V rated full-power output can be achieved.

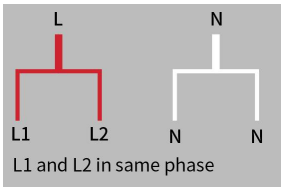


5.4 Cable and Circuit Breaker Selection

·Photovoltaic input

Model	Cable Size	Maximum Input Current	Circuit Breaker Specification
KE-8KC5LSUF KE-10KC5LSUF KE-12KC5LSUF KE-12K5C5LSUF KE-13K2C5LSUF	6mm²/ 10 AWG	22A	2P-32A

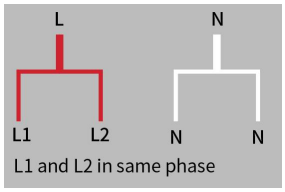
·AC Input

Model	Output Mode	Wiring Diagram	Maximum Current	Cable Size	Circuit Breaker Specification
KE-8KC5LSUF KE-10KC5LSUF KE-12KC5LSUF KE-12K5C5LSUF KE-13K2C5LSUF	Split-phase		63A(L1/L2/N/N)	13mm²/ 6 AWG (L1/L2/N/N)	3P-80A
	Single-phase		63A (L1/L2) 126A(L/N)	13mm²/6 AWG(L1/L2) 25mm² /4 AWG (L/N)	2P-160A

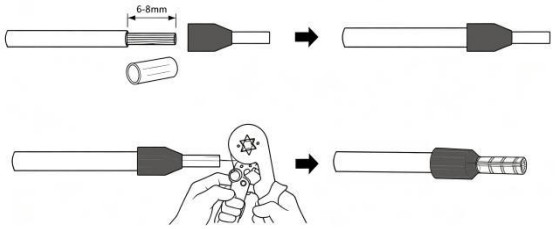
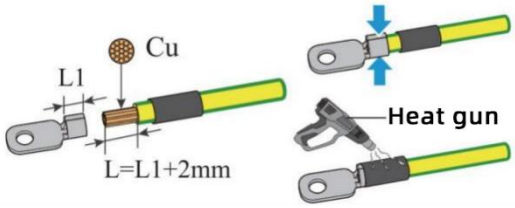
·Battery

Model	Cable Size	Maximum Current	Circuit Breaker Specification
KE-8KC5LSUF	50mm²/ 1/0 AWG	180A	2P-200A
KE-10KC5LSUF	50mm²/ 1/0 AWG	200A	2P-250A
KE-12KC5LSUF KE-12K5C5LSUF KE-13K2C5LSUF	70mm²/ 2/0 AWG	250A	2P-400A

·AC Output

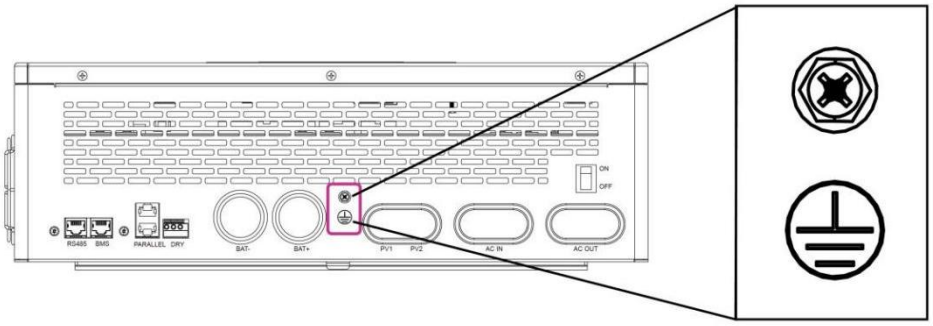
Model	Output Mode	Wiring Diagram	Maximum Current	Cable Size	Circuit Breaker Specification
KE-8KC5LSUF KE-10KC5LSUF KE-12KC5LSUF KE-12K5C5LSUF KE-13K2C5LSUF	Split-phase		63A(L1/L2/N/N)	13mm²/ 6 AWG (L1/L2/N/N)	3P-80A
	Single-phase		63A (L1/L2) 126A(L/N)	13mm²/6 AWG(L1/L2) 25mm² /4 AWG (L/N)	2P-160A

NOTICE

• **For the photovoltaic input, AC input, and AC output terminals.** 1.Use a wire stripper to remove 6 - 8mm of the insulation layer of the cable. 2.Fix a ferrule at the end of the cable (the ferrule needs to be prepared by the user).	
• **Battery Terminal** 1.Use a wire stripper to remove 6 - 8mm of the insulation layer of the cable. 2.Fix the cable lugs (provided with the box) at the end of the cable.	

5.5 Grounding

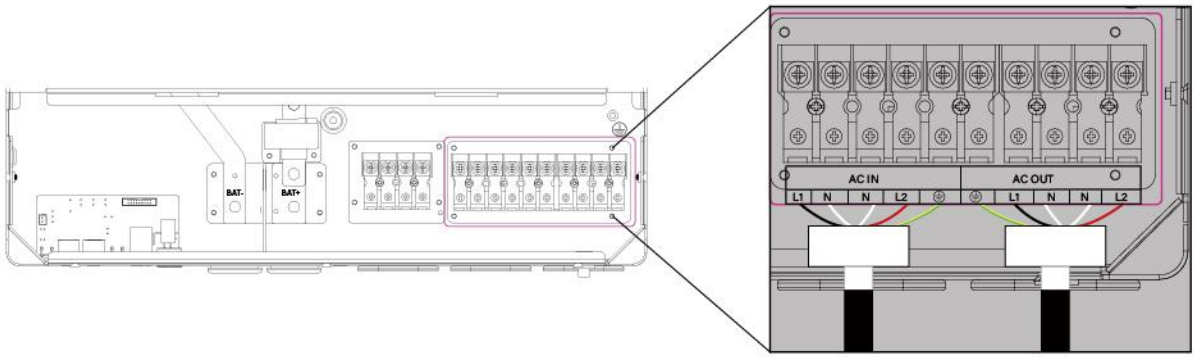
Please ensure the grounding terminal is securely connected to the grounding busbar.



NOTICE

The cross-sectional area of the grounding conductor shall be no less than 4 mm^2 and it shall be routed as close to the grounding point as possible.

5.6 AC Input/Output Wiring

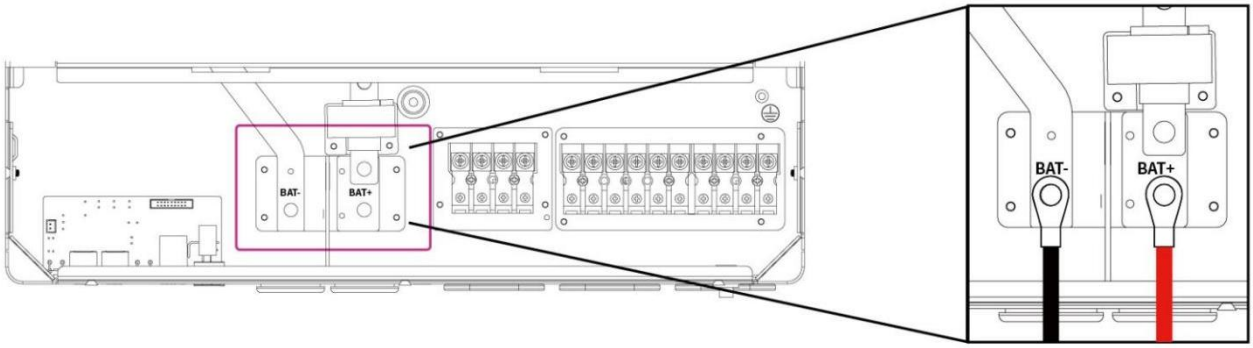


DANGER

- Only one neutral-to-earth bond is permitted in the system.
- Reversing the L/N wires will cause faults or equipment damage.
- Incorrect connection between grid input and load output may result in faults or damage.
- It is strictly prohibited to leave any interface disconnected or improperly connected.
- Before connecting AC input and output, the circuit breaker must be turned off to avoid electric shock hazards. Live working is strictly forbidden.
- Ensure the cables used meet the requirements. Undersized or poor-quality cables pose serious safety risks.

5.7 Battery Wiring

Connect the battery positive and negative cables according to the cable positions and sequence shown in the figure below.

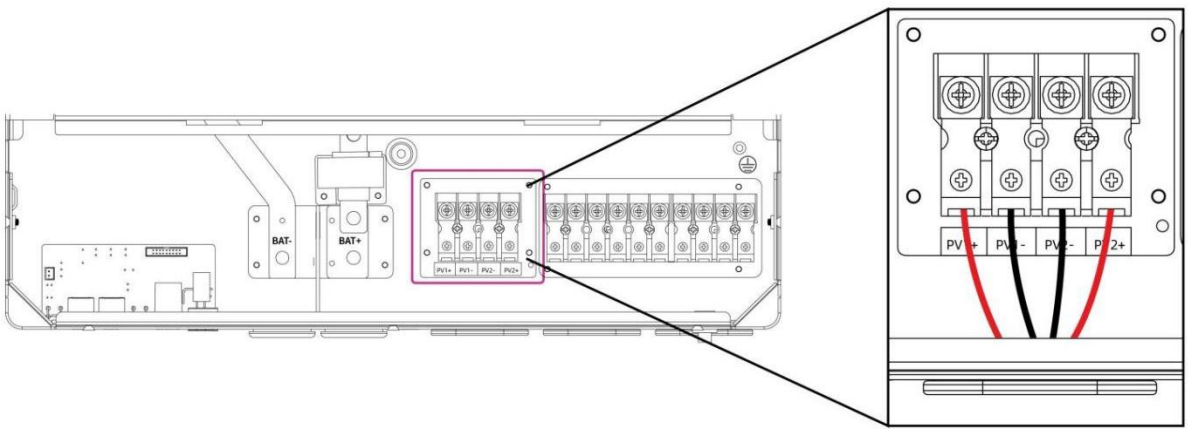




- Successful communication between the lithium-ion battery and the inverter is mandatory.
- Before connecting the battery, the circuit breaker must be disconnected to avoid the danger of electric shock. Do not operate with electricity.
- Please ensure that the positive and negative poles of the battery are connected correctly. Do not reverse the connection, otherwise, it may damage the inverter.
- Please check whether the cable used is sufficient to meet the requirements. Cables that are too thin or of poor quality may pose serious safety hazards.

5.8 Photovoltaic Wiring

Connect the positive and negative wires of the photovoltaic circuits according to the cable position and sequence shown in the figure below.

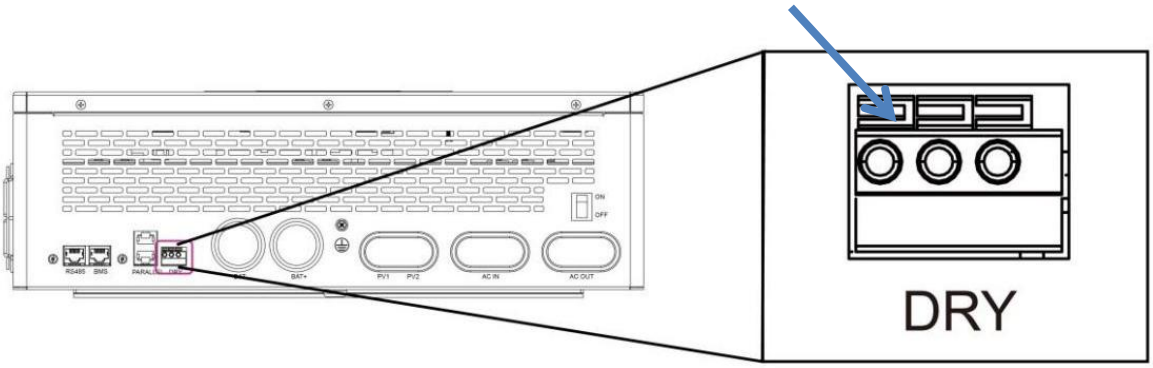




- Before connecting the PV, the circuit breaker must be disconnected to avoid the danger of electric shock, and live operation is not allowed.
- Make sure that the open circuit voltage of the PV module in series does not exceed the maximum open circuit voltage of the inverter (this value is 500V), otherwise the inverter may be damaged.
- Measure the PV voltage first (must be ≤ the inverter's maximum input voltage) before turning on the PV interface circuit breaker.
- For the same MPPT tracker, ensure the PV modules have consistent orientation, tilt angle, and specifications.
- The number of PV modules per MPPT channel shall be the same.
- PV interfaces and PV arrays must be used independently. Under no circumstances shall PV arrays or PV interfaces be shared.

5.9 Dry Contact Wiring

Use a small-sized screwdriver to push in the direction indicated by the arrow, and then insert the communication cable into the dry contact port. (The cross-sectional area of the communication cable is 0.2~1.5mm^2)



5.10 Final Installation

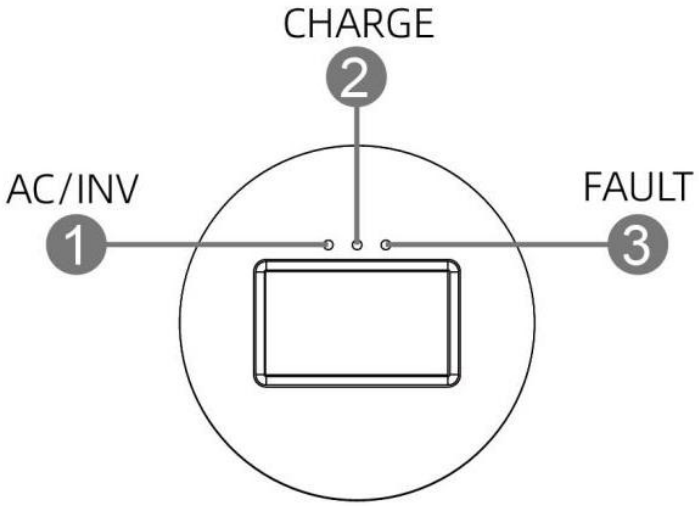
After ensuring that the wiring is reliable and the wire sequence is correct, restore the terminal protection cover to its original position.

5.11 Inverter Start-up

- Step 1: Close the battery circuit breaker.
- Step 2: Press the boat switch at the bottom of the inverter, and the screen and indicator light up, indicating that the inverter has been activated.
- Step 3: Close the circuit breakers of photovoltaic, AC input and AC output in turn.
- Step 4: Start the load one by one in order of power from small to large.

6.Interface Operation (Based on UI version 1.3.0.16)

6.1 LED Indication



Pilot lamp	Color	Description
1.AC/INV	Green	Steady on: Mains bypass output
		Flashing: Inverter output
2.CHARGE	Green	Steady on: Charging completed
		Flashing: Charging in progress
3.FAULT	Red	Flashing: A fault has occurred

6.2 Liquid Crystal Display and Operation

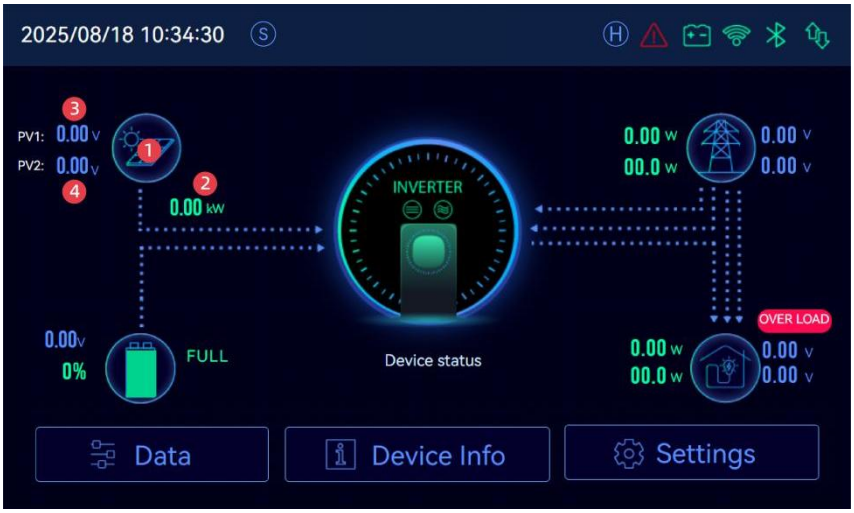
6.2.1Home Page

● Time & Status Bar



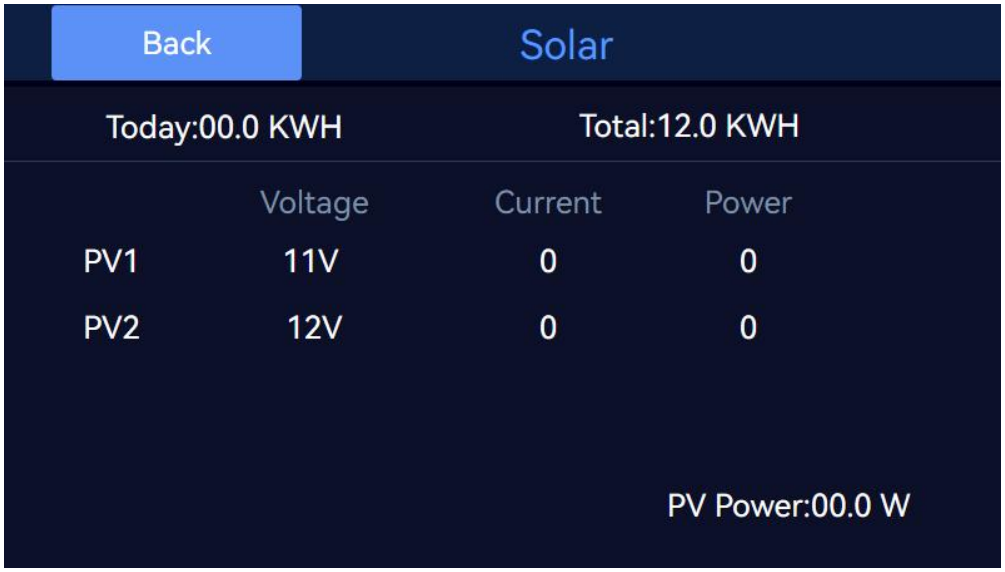
No.	Description
1	Display the current time on the device.
2	Master/Slave Indicator: This icon is hidden in single-unit mode. In parallel mode, the "M" icon appears for the master unit, and the "S" icon appears for the slave unit.
3	Cloud Platform Connection Status: This icon is displayed when the cloud platform connection succeeds.
4	Device Fault Icon: The icon is gray when the device operates normally, and turns red when a fault occurs.
5	Battery BMS Communication Icon: This icon turns green if the battery is connected and BMS communication is normal; it remains gray when no battery connection is established.
6	Wi-Fi Icon: This icon turns green when the device connects to 2.4G Wi-Fi, and gray when disconnected.
7	Bluetooth Icon: This icon turns green when the APP successfully connects to the device via Bluetooth, and gray when disconnected.
8	Device Communication Icon: This icon is green under normal operation; otherwise it is gray. (Note: Contact technical staff for assistance if this icon stays gray.)

● PV Data

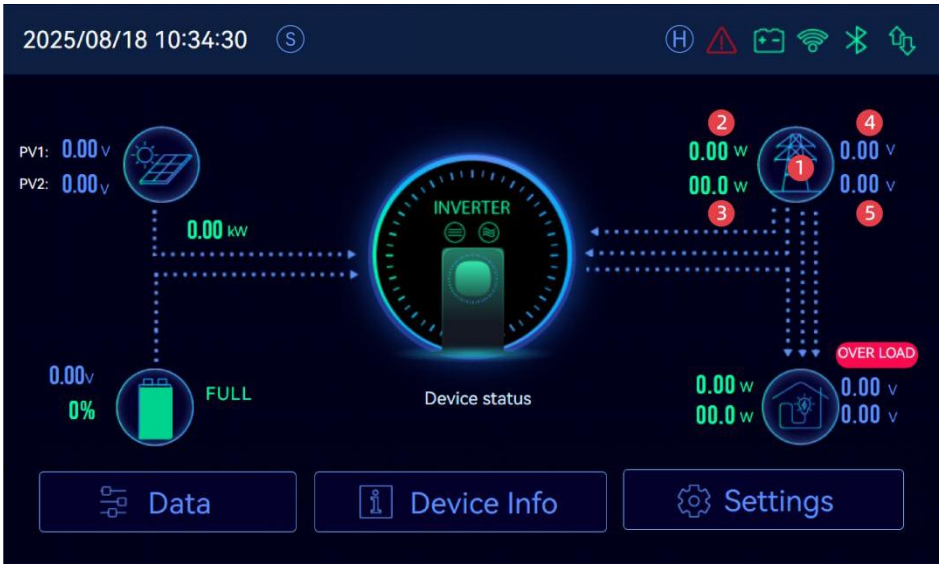


No.	Description
1	Press and hold this icon for approximately 1 second to enter the detailed PV data page.
2	Real-time total PV power
3	Real-time voltage of PV1
4	If the unit supports two PV channels, this item shows the real-time voltage of PV2. If the unit only supports one PV channel, this data is not available.

Press and hold the PV icon for 1 second to enter this page for detailed data inquiry.



● Grid Data



No.	Description
1	Press and hold for approximately 1 second to enter the detailed grid data page.
2	This data is not available for single-phase units. For split-phase units, this value shows the real-time power of Grid L1.
3	For single-phase units, this value displays grid power. For split-phase units, this value shows the real-time power of Grid L2.
4	For single-phase units, this value displays grid frequency. For split-phase units, this value shows the real-time voltage of Grid L1.
5	For single-phase units, this value displays grid voltage. For split-phase units, this value shows the real-time voltage of Grid L2.

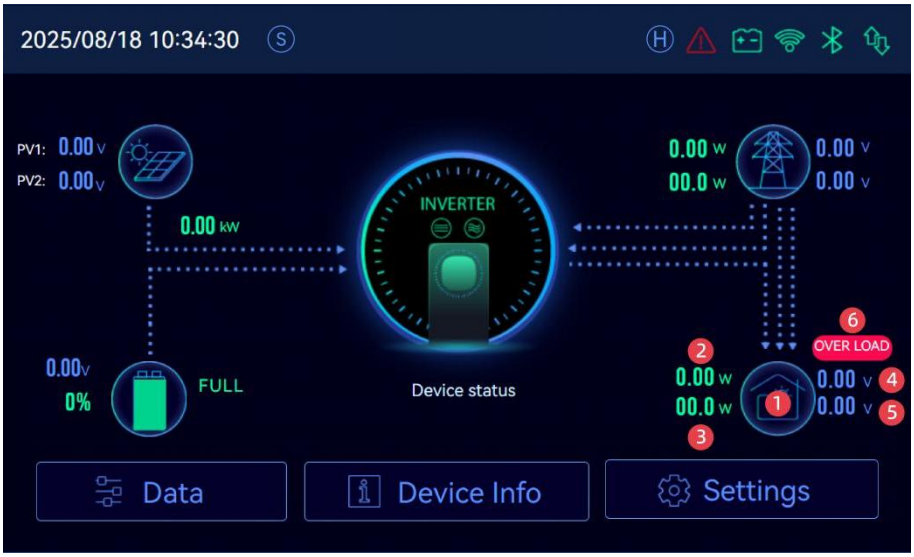
Grid data varies by unit model. For split-phase units, the following page will be displayed: The displayed data are the voltage, active power and apparent power of L1 and L2 respectively.



For single-phase units, the following page will be displayed: The displayed data are voltage, active power and apparent power respectively. The top section of the page shows the daily grid-tied energy and total grid-tied energy.



● Load Data



No.	Description
1	Press and hold for approximately 1 second to enter the detailed load data page.
2	For single-phase units, this value shows the real-time load voltage. For split-phase units, this value shows the real-time power of Load L1.
3	No data is displayed for single-phase units. For split-phase units, this value shows the real-time power of Load L2.
4	For single-phase units, this value shows the real-time load power. For split-phase units, this value shows the real-time voltage of Load L1.
5	No data is displayed for single-phase units. For split-phase units, this value shows the real-time voltage of Load L2.
6	This icon appears when the unit is overloaded.

Data on the Load page varies by model. For split-phase units, the following page will be displayed:

The displayed data are active power, apparent power and load ratio of Load L1 and L2 respectively.



For single-phase units, the page on the right will be displayed:

The displayed data are the active power, apparent power and load ratio of the load. The data at the top show the daily load consumption and total load consumption.

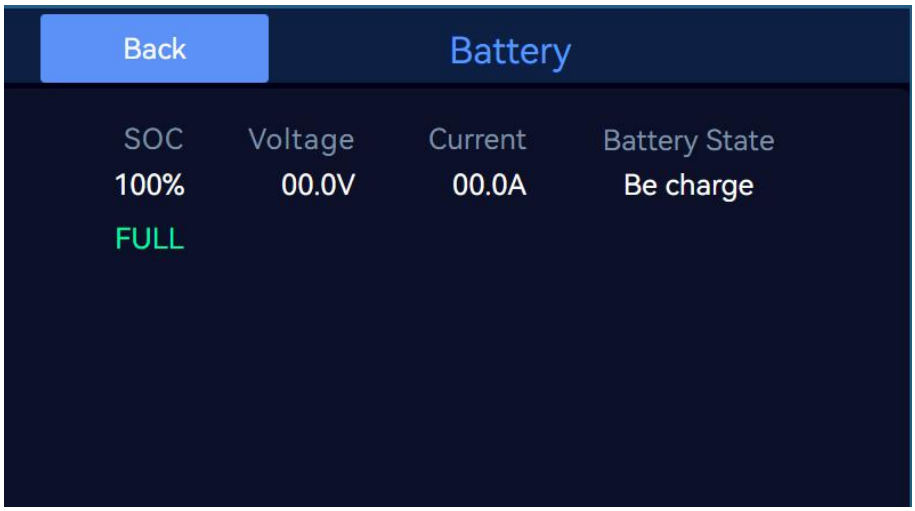


● Battery Data

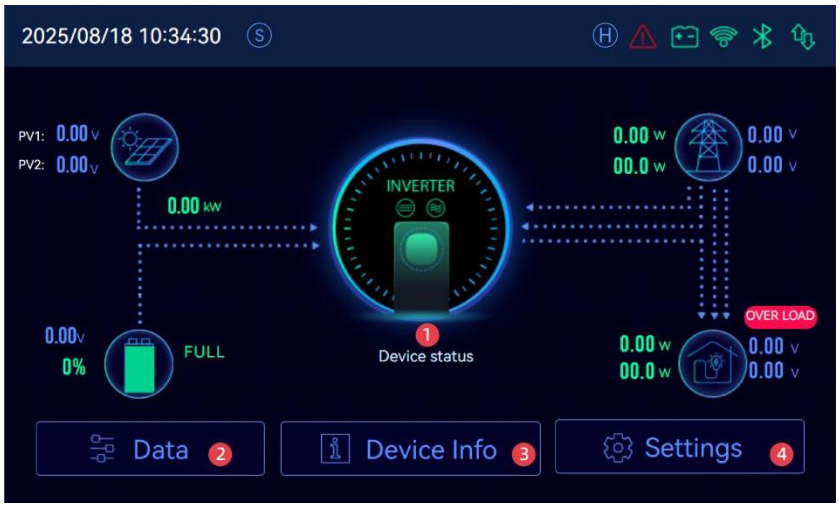


No.	Description
1	Press and hold this icon for approximately 1 second to enter the detailed battery data page.
2	Real-time battery voltage
3	Battery capacity percentage
4	When this text is displayed, it means the battery is fully charged.

Press and hold the Battery icon for 1 second to enter this page and view detailed data.



6.2.2 Operating Status & Main Menu



Press and hold the inverter icon in the center of the screen to activate the manual shutdown function. After shutdown, the inverter stops outputting, and "Manual Shutdown" will be shown in the device status area. To restore output, press and hold the inverter icon again.

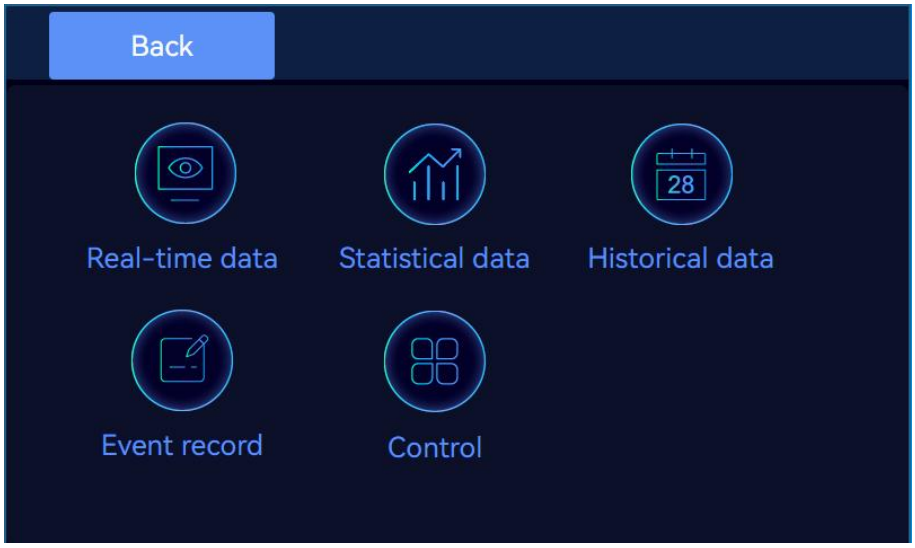
No.	Description
1	Operating status of the unit
2	Tap this icon to open the data menu page for viewing.
3	Tap this icon to enter the unit information page.
4	Tap this icon to enter the setting menu page of the unit.

▶ Unit Information



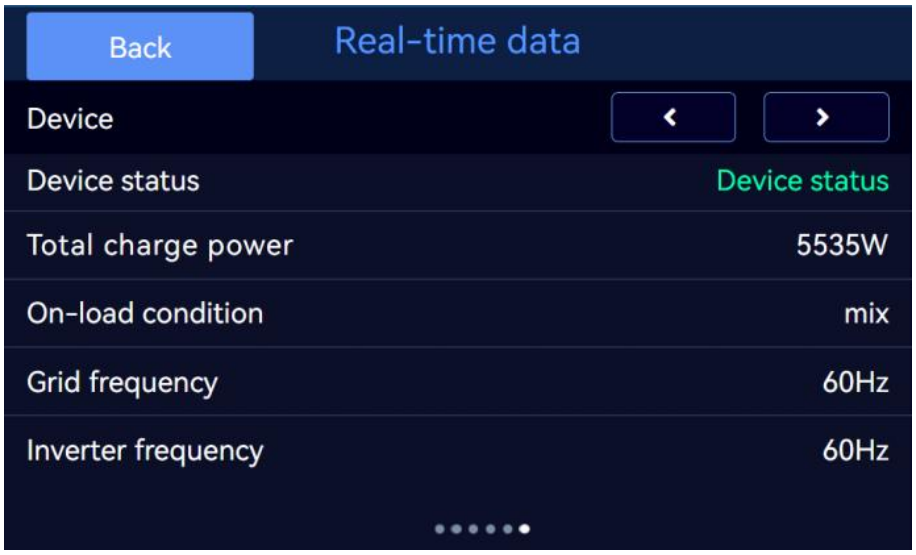
Display Text	Description
Hardware	Current hardware version number of the unit
Software Version	Current software version number of the unit. To check whether the unit is on the latest version, ensure the unit is under manual shutdown. After the unit connects to Wi-Fi, tap the Check Update option on the side. If not up to date, users may choose to update the current version.
Display UI Version	Current display UI version number of the unit. To check whether the unit is on the latest version, ensure the unit is under manual shutdown. After the unit connects to Wi-Fi, tap the Check Update option on the side. If not up to date, users may choose to update the current version.
Unit SN	SN code of the unit
Max Supported Battery Voltage	Maximum battery voltage supported by the unit
Language	After tapping this item, users can select the UI language on the page.

▶ Function Menu Data



Icon	Description
	Click to enter the real-time data interface
	Click to enter the statistics interface
	Click to enter the historical data interface
	Click to enter the event log data interface
	Click to enter the control function options interface

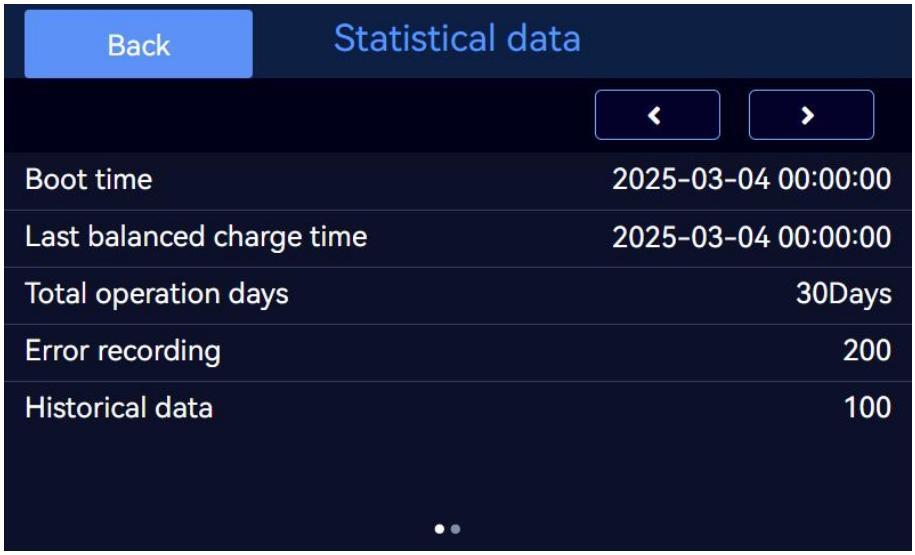
▶ Real-Time Data Interface



Tap “ < ” and “ > ” to switch pages.

Page	Information	Display Content
1	Unit	Unit status, total charging power, load status, grid frequency, inverter frequency
2	Fault	Fault Info 1, Fault Info 2, Fault Info 3, Fault Info 4
3	Current	Average grid-tied load current, PV charging current, mains charging current
4	Temperature	PV heatsink temperature, inverter heatsink temperature, battery heatsink temperature
5	Voltage	Total bus voltage, positive bus voltage, negative bus voltage. (Some models display high/low bus; some models display high/low bus plus total, positive and negative.)
6	Communication Status	Bluetooth status, Wi-Fi status, cloud platform connection status, RS485-1 communication status, RS485-2 communication status, BMS communication status

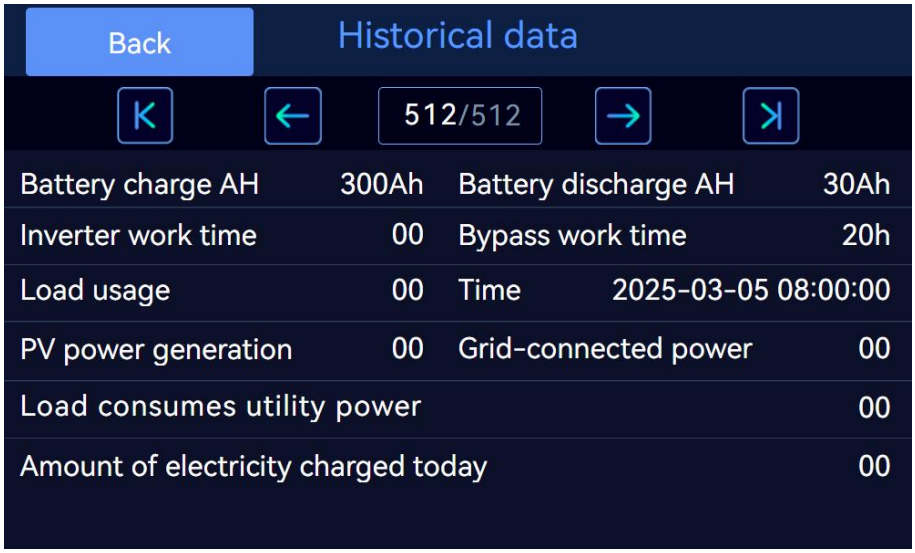
▶ Statistics



Tap “ < ” and “ > ” to switch pages. This interface consists of 2 pages, and the display contents are as follows:

Page	No.	Parameter Name
1	1	Charging Ampere-hours
	2	Discharging Ampere-hours
	3	Inverter Operating Time
	4	Bypass Operating Time
	5	Charging Energy
	6	Load Consumption
2	7	Power-on Time
	8	Last Balanced Charging Time
	9	Total Operating Days
	10	Total Event Records
	11	Total Historical Data

▶ Historical Data



If there is a large amount of historical data, tap the current page number, enter the required record number using the on-screen keypad, and you will jump to that record.

No.	Parameter Name
1	Battery Charging Ampere-hours
2	Battery Discharging Ampere-hours
3	Inverter Operating Time
4	Bypass Operating Time
5	Load Power Consumption
6	Time
7	PV Generation Energy
8	Grid-tied Energy
9	Load Consumption from Mains
10	Mains Charging Energy

▶ Event Record

Tap the "Event Data Record" menu to enter the event record list page (as shown in Figure 1). Tap any record in the list to jump to the detail page (as shown in Figure 2) and view the detailed information of this record.

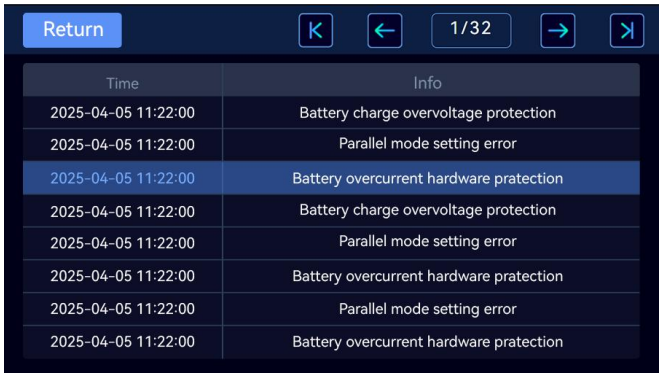


Figure 1

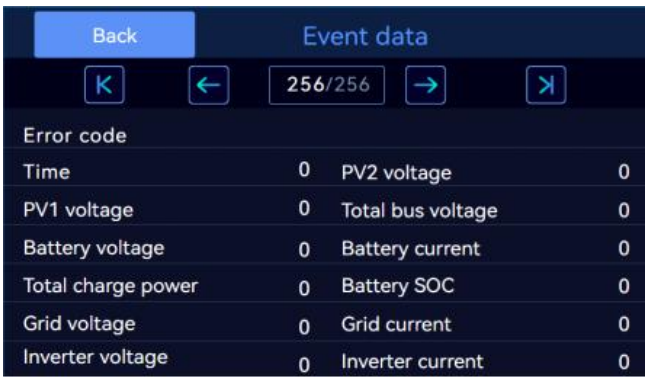


Figure 2

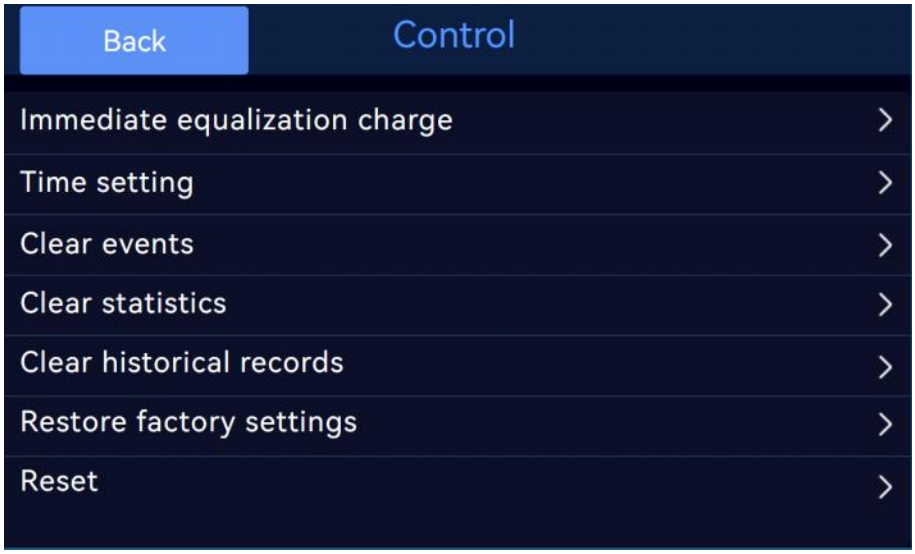
Note: If the time of a record in Figure 1 is 0, it means no fault occurred for this record.

The detailed information of the record shown in Figure 2 is as follows:

No.	Parameter Name	No.	Parameter Name
1	Fault Code	15	Average Grid-tied Load Current
2	Fault Occurrence Time	16	Unit Status
3	PV1 Voltage	17	PV2 Voltage
4	Battery Voltage	18	Total Bus Voltage
5	Total Charging Power	19	Battery Current
6	Grid Voltage	20	Battery SOC Capacity
7	Inverter Voltage	21	Grid Current
8	Load Current	22	Inverter Current
9	Load Active Power	23	Load Rate
10	Grid Frequency	24	Mains Charging Current
11	PV Heatsink Temperature	25	Inverter Frequency
12	Inverter Heatsink Temperature	26	Battery Charging Status
13	Battery Heatsink Temperature	27	PV Charging Current
14	Load Apparent Power	28	Total PV Power

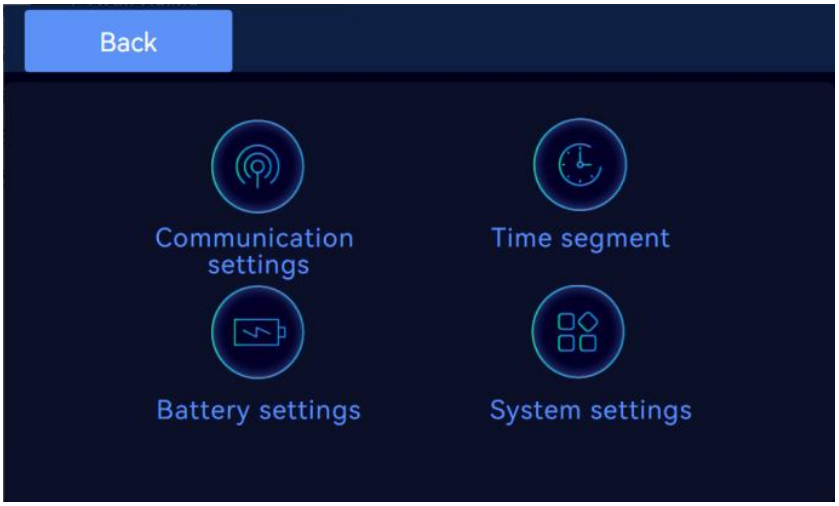
▶ Control Function

The control functions are shown in the table below. After users tap the ">" arrow, tapping Confirm will execute all functions except **Set Time**, which opens an additional page for configuration.



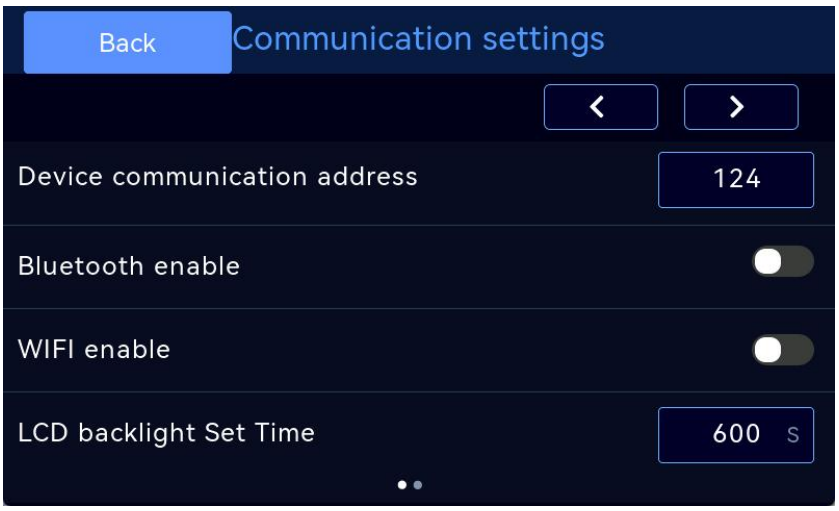
No.	Parameter Name
1	Start Immediate Balanced Charging
2	Time Setting (When setting the time, the time zone information must be set accurately. The time zone parameter affects the next time synchronization of the unit and has a direct impact on the timing execution of time-period functions.)
3	Clear Event Data
4	Clear Statistical Data
5	Clear Historical Data
6	Restore Factory Defaults
7	Reset

● Setting Parameters



Icon	Description
	Tap to enter the communication data setting page.
	Tap to enter the time-of-use charging & discharging time setting page.
	Tap to enter the battery parameter setting page.
	Tap to enter the system parameter setting page.

▶ Communication Data Setting



In parameter setting, tap the input box to bring up the keypad for data entry; tap the switch icon to toggle it on or off.

Page	No.	Parameter Name
1	1	Device Communication Address
	2	Bluetooth Enable
	3	Wi-Fi Enable
	4	LCD Backlight Time Setting
2	1	RS485-1 Parameter Setting
	2	RS485-2 Parameter Setting

▶ Periodic Charge and Discharge Settings



In the time-of-use charge/discharge setting interface, the time parameters for each charge/discharge period can be set only when the corresponding enable function is active. If the enable function is not turned on, the configured period parameters will not take effect.

Supports switching between charge and discharge modes. Allows customization of multiple charge/discharge periods for any day of the week: after checking the desired weekday(s), set the start and end times for charging and discharging, and the system will automatically control battery charging/discharging according to the settings.

Option		No.	Parameter Name
Charge	Weekday Checkbox (Mon- Sun)	1	Time-of-Use Charge Enable
		2	Period 1 Charge Start & End Time Setting
		3	Period 2 Charge Start & End Time Setting
		4	Period 3 Charge Start & End Time Setting
		5	Period 4 Charge Start & End Time Setting
		6	Period 5 Charge Start & End Time Setting
		7	Period 6 Charge Start & End Time Setting
		8	Period 7 Charge Start & End Time Setting
		9	Period 8 Charge Start & End Time Setting
		10	Period 9 Charge Start & End Time Setting
Discharge	Weekday Checkbox (Mon- Sun)	1	Time-of-Use Discharge Enable
		2	Period 1 Discharge Start & End Time Setting
		3	Period 2 Discharge Start & End Time Setting
		4	Period 3 Discharge Start & End Time Setting
		5	Period 4 Discharge Start & End Time Setting
		6	Period 5 Discharge Start & End Time Setting
		7	Period 6 Discharge Start & End Time Setting
		8	Period 7 Discharge Start & End Time Setting
		9	Period 8 Discharge Start & End Time Setting
		10	Period 9 Discharge Start & End Time Setting

▶ Battery Parameter Settings

When "Setting Parameters" or "Type Parameters" is displayed in green, it indicates that the interface is in place, and each parameter can be set through drop-down options and input boxes.



●Setting Parameter

Page	Main Option	Sub Option	Description
1	Battery type	Lead-acid	Lead-acid battery
		Lithium (Default)	Lithium battery
	Battery system voltage	48V (Default)	The voltage of the battery system is fixed at 48V and cannot be changed
	Nominal battery capacity	1~9999AH (Default 100AH)	It can be input in the range of 1~9999AH, and step by 1 AH
	Temperature compensation	-(3~5)MV/℃/2V (Default -3.0mV/℃)	Setting range- (3-5) MV, step 0.1mV, users can set according to the battery parameters, 0: No compensation
2	Battery SOC of inverter to grid transfer	5~100% (Default 20%)	It can be input in the range of 5~100%, and the step is 1%. Under the inverter priority mode, when the SOC capacity is less than or equal to this value, it switches to mains power.
	Battery SOC of grid to inverter transfer	10~100% (Default 90%)	It can be input in the range of 10 to 100%, with a step of 1%. In the inverter priority mode, the SOC capacity is greater than or equal to this value and switches to inverter.

	Battery voltage of inverter to grid transfer	36~68V (Default 43.6V)	It can be input in the range of 36~68V with a step of 0.1 V.
	Battery voltage of grid to inverter	36~68V (Default 56.8V)	It can be input in the range of 36~68V with a step of 0.1 V.Under Inverter Priority Mode, switch to inverter when voltage is above this setpoint.
3	Maximum allowed charge current	0~250A (Default 250A)	It can be input in the range of 0~250A, step by 1A, and set to 0 to prohibit the system from charging
	Stop charge	1~10A (Default 5A)	It can be input in the range of 1~10A and step 1A
	Stop Charge SOC	50~100% (Default 100%)	It can be input in the range of 50~100%, and the step is 1%
	Charge recovery SOC	5~30% (Default 5%)	It can be input in the range of 5~30%, and the step is 1%
4	Activation current of lithium battery	1~20A (Default 3A)	It can be input in the range of 1~20A with a step of 0.1 A.
	Charging activation method	OFF (Default)	Do not activate (lead-acid batteries only)
		PULSE	Adopt intermittent control (except for lead-acid batteries)
	Discharge cut-off SOC	5~100% (Default 10%)	It can be input in the range of 5~100%, and the step is 1%.The battery ceases discharging when SOC reaches its set value.
	SOC low alarm	10~100% (Default 15%)	It can be input in the range of 10~100%, and the step is 1%. A low-power alarm is triggered when the battery SOC drops to the setpoint.

●Type Parameter

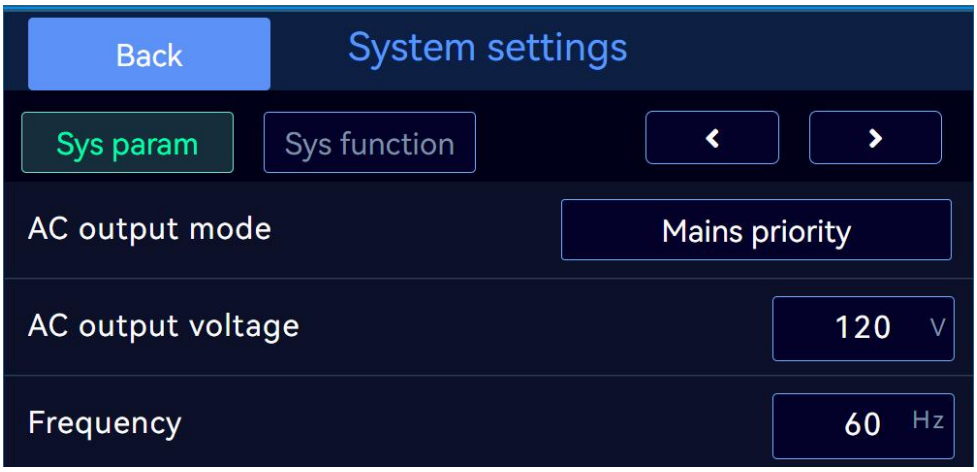
Page	Main Option	Sub Option	Description
1	Over-voltage threshold	36~68V (Default 60V)	It can be input in the range of 36~68V with a step of 0.1V
	Equalizing charge voltage	36~68V (Default 58V)	It can be input in the range of 36~68V with a step of 0.1V and is only valid when the battery type is open lead- acid battery, sealed lead-acid battery.

	Boost charge voltage	36~68V (Default 57.6V)	It can be input in the range of 36~68V with a step of 0.1V and is valid for lithium battery type.
	Float charge voltage	36~68V (Default 55.2V)	It can be input in the range of 36~68V with a step of 0.1V. This parameter cannot be set after successful BMS communication
2	Boost charge recovery voltage	36~68V (Default 52V)	It can be input in the range of 36~68V with a step of 0.1V
	Battery over-discharge recovery voltage	36~68V (Default 50.4V)	When the battery pack voltage drops below the"over-discharge protection voltage" during discharge triggering, the inverter re-sets the allowable supply voltage to the preset value when the battery voltage recovers to this level during charging. The input range is 36-68V with a 0.1V step adjustment, and the parameter must exceed the preset "over-discharge voltage".
	Battery under-voltage warning level	36~68V (Default 44V)	When the batter voltage is lower than this voltage, the device will give an undervoltage alarm and output without shutdown. It can be input within the range of 36~68V with a step of 0.1V.It is valid for lithium battery type.
	Battery over-discharge voltage	36~68V (Default 42V)	When the battery voltage is lower than this judgment point, and the inverter output is turned off after triggering the value of "over discharge delay", it can be input within the range of 36~68V, step by 0.1V, and it is valid for lithium battery type.
3	Discharge limit voltage	36~68V (Default 40V)	When the battery voltage is lower than the value of this parameter, the output is immediately turned off. The input can be in the range of 36~68V, with a step of 0.1V
	Over-discharge time delay	0~60s (Default 5s)	When the battery voltage is lower than the parameter " overcharge voltage", and the inverter output is turned off after triggering the delay time set by this parameter, the input range can be 0~60s, and the step is 1s. It is valid for lithium battery.

	Equalizing charge time	0~300 MIN (Default 120 MIN)	Can be input in the range of 0~ 300 MIN, step 1MIN, only when the battery type is open lead-acid battery and sealed lead-acid battery.
	Boost charge time	0~300 MIN (Default 120 MIN)	Refers to the continuous charging time when the voltage reaches the parameter "Increase charging volt - age" and the set voltage. It can be input in the range of 0~300 MIN, step by 1 minute, and it is valid for battery types of lithium battery.
4	Equalizing charging interval	1~300D(days) (Default 30)	Set to 0 to be off.It can be input within the range of 1~300 days, with a step of 1 day, and is only valid when the battery type is open lead-acid battery,
	Equalize the charge timeout	5~900 MIN (Default 240 MIN)	It can be input within the range of 5~900 minutes, with a step of 1 minute, and is only valid when the battery type is open lead-acid battery, sealed lead-acid battery.

▶ System Settings

When "System Parameters" or "System Functions" is displayed in green, it indicates the current interface. All parameters can be set via dropdown options and input fields.



●System Parameter

Page	Main Option	Sub Option	Description
1	AC output mode	Mains priority	**Mains priority:** PV supplies power to loads and the battery first. When PV is insufficient, mains power supplements; the battery only supplies power to loads when mains power is unavailable. (The battery can discharge when scheduled discharge function is enabled.) **Priority: Photovoltaic > Mains power > Battery**
		Inverter priority (Default)	**Inverter Priority:** PV supplies power to loads with priority, and surplus energy charges the battery. When PV power is insufficient, the battery supplements power to feed the loads. **For lithium battery (with BMS communication):** Determined by the parameter [Battery SOC of inverter to grid transfer]. When the battery SOC drops to the set threshold, the system switches to utility power to carry the load. When the battery SOC rises back to the set value of [Battery SOC of grid to inverter transfer], the system switches back to power supply from the inverter side. **For lead-acid battery (without BMS communication):** Determined by the voltage parameter [Battery voltage of inverter to grid transfer]. When the battery voltage falls below this set value, the system switches to utility power to carry the load. When the battery voltage rises back to the set value of [Battery voltage of grid to inverter transfer], the system switches back to power supply from the inverter side. **Priority: Photovoltaic > Battery > Mains power**

	AC output voltage	100~130V (Default 120V)	It can be input in the range of 100~130V with a step of 1V.
	Frequency	45~ 65Hz (Default 60Hz)	It can be input in the range of 45~65Hz and step 1Hz.
2	Parallel mode	Single(Default)	Users can select the corresponding parameter Settings according to different parallel operation requirements, and the default single machine mode is selected.
		Split phase master	
		Slave	
		Three-phase master	
	Parallel phase	Phase A (Default)	
		Phase B	
		Phase C	
	Battery parallel mode	Unified (Default)	Select this option when multiple parallel inverters share one battery bank or a common DC bus.
		Independent	Select this option when each inverter is equipped with an independent battery bank and the DC sides are not interconnected.
3	Battery charge mode	Hybrid (Default)	Give priority to photovoltaic charging. When the photovoltaic power is insufficient, switch to the mains power supply. When performing inversion, only photovoltaic charging can be initiated.
		PV Only	Only photovoltaic charging is allowed, and mains charging is not started
	Charge current limit	SET	The maximum battery charging current shall not exceed the minimum value between the set parameter Battery Maximum Charging Current and the BMS limit value.
		BMS (Default)	
		INV	
	Mains charge current limit	0~100A (Default 100A)	It can be input in the range of 0~100A and step 1A.
4	BMS protocol	PYLON (Default)	This item is set to Pylon by default.
		DYNESS	Selecting this option indicates that the DYNESS communication protocol is selected.
		Deye	Selecting this option indicates that the Deye communication protocol is selected.

	PV output priority	Load priority (Default)	In this mode, the PV output gives power to the load first.
		Charge priority	In this mode, the PV output charges the battery first.
	BMS communication fault shutdown	Enable	When the communication fault shutdown switch is turned on, the unit will stop and trigger fault BMS Communication Fault without communication, and run normally after communication recovers.
		Disable(Default)	If the communication fault shutdown switch is disabled, the unit will trigger fault 58 BMS Communication Fault when communication is lost and operate under non-communication mode. The unit will run normally once communication is restored.
5	AC input mode	APL	The input voltage range is 90~140V
		UPS (Default)	The input voltage range is 90~140V
	Grid type (only displayed on the split-phase inverter)	240/120V (L1-L2 180°) (Default)	For normal applications, select this option when the split-phase inverter is connected and outputs split-phase power. In this mode, the phase difference between L1 and L2 at the device input/output is 180°, with an L-N voltage of 120V and an L-L voltage of 240V.
		208/120V (L1-L2 120°)	Select this option when multiple split-phase inverters are connected in parallel to form a three-phase system and output three-phase power. In this mode, the phase difference between L1 and L2 at the device input/output is 120°, with an L-N voltage of 120V and an L-L voltage of 208V.
		0/120V (L1-L2 0°)	Select this option when the split-phase inverter is connected and outputs single-phase power. In this mode, L1 and L2 are in the same phase at the device input/output, with an L-N voltage of 120V and an L-L voltage of 0V.

●System function

Page	Main Option	Sub Option	Description
1	NPE ground shorting function	Enable (Default)	
		Disable	
	Energy saving mode	Enable (Default)	If the energy-saving mode is enabled and the output active power is less than 50W for 5 consecutive minutes, the inverter will enter energy-saving mode, i.e., the inverter output will be turned off. It will then restart the inverter output after 30 minutes and continue monitoring the output power. There are two ways to exit energy-saving mode within these 30 minutes: 1. Disable the energy-saving function; 2. Restart the inverter (power off and then power on).
		Disable	
	Automatic restart after overload	Enable (Default)	
		Disable	
	Automatic restart after over-temperature	Enable (Default)	
		Disable	
2	Buzzer alarm	Enable	
		Disable (Default)	
	Mode shift alerted	Enable	
		Disable (Default)	
	Overload bypass function	Enable (Default)	
		Disable	

6.3 Fault Information

Fault code	Description	Fault code	Description
1	Battery voltage low	33	Parallel CAN communication failure
2	Battery over current software	34	Parallel communication address setting error
3	Battery no connect	35	Parallel current sharing fault
4	Battery undervoltage stops discharging	36	Parallel mode, battery voltage difference is large
5	Battery overcurrent hardware protection	37	the mains input source is inconsistent
6	Battery charge overvoltage protection	38	Parallel mode, hardware sync signal failure
7	Bus overvoltage hardware protection	39	Abnormal DC component of inverter voltage
8	Bus overvoltage software protection	40	Parallel program versions are inconsistent
9	PV overvoltage protection	41	Parallel wiring fault
10	PV Boost overcurrent software protection	42	Serial number is not set at the factory
11	PV Boost overcurrent hardware protection	43	Parallel mode setting error
12	SPI communication error	44	Battery voltage is lower than discharge limit voltage
13	Bypass overload protection	45	Battery radiator over-temperature protection
14	Inverter overload protection	46	Overload warning
15	Inverter overcurrent hardware protection	47	Battery discharge current overcurrent
16	Slave chip request shutdown fault	48	Leakage current protection
17	Inverter short circuit protection	49	PV insulation protection

18	Bus soft start fault	50	AFCI communication fault
19	PV radiator over-temperature protection	51	AFCI channel 1 fault
20	Inverter radiator over-temperature protection	52	AFCI channel 2 fault
21	Fan fault	53	AFCI channel 3 fault
22	Memory fault	54	AFCI channel 4 fault
23	Model setting error	55	GFCI device fault
24	Positive and negative bus voltages are unbalanced	56	RSD rapid shutdown
25	Bus short circuit	58	BMS communication fault
26	Inverter AC output is fed back to bypass AC output	59	BMS Error
27	Mains input phase error	60	BMS low temperature alarm(Effective after successful BMS communication)
28	Bus voltage low protection	61	BMS over temperature alarm(Effective after successful BMS communication)
29	Battery SOC is below the alarm value(Effective after successful BMS communication)	62	BMS overcurrent alarm(Effective after successful BMS communication)
30	Battery SOC is below the discharge cutoff set value(Effective after successful BMS communication)	63	BMS undervoltage alarm(Effective after successful BMS communication)
31	Battery Discharge Disabled (Effective after successful BMS communication)	64	BMS overvoltage alarm(Effective after successful BMS communication)
32	Parallel control CAN communication failure	/	/



- This manual only lists some of the inverter fault codes. As inverter fault diagnosis involves multi-dimensional hardware detection, software logic interaction and operating condition adaptation, certain low-probability faults, deep-seated faults requiring professional diagnostic tools, and associated faults linked with supporting equipment are not included in this manual temporarily.
- Troubleshooting and resolution of such faults must be performed by our company's authorized professional technicians using dedicated diagnostic tools and background systems. Do not attempt any operation by yourself, so as to avoid equipment damage or potential safety hazards.

Notes:

1) OTA Update: The device cannot perform OTA update when it is in the following states: Mains Operation, Inverter Operation, Inverter-to-Mains Switching, Mains-to-Inverter Switching, PV Charging Only, or Fault.

Solution: For UI version 1.3.0.7 and above, long-press the large icon on the main interface to manually shut down the device before proceeding with the update.

2) When Setting Charging Current: The set value of mains charging current must always be less than the set value of maximum charging current.

3) In Fault State: When modifying parameters in general settings, a secondary confirmation is required.

4) In Parallel Operation State (Device as Master Unit): The device does not allow parameter modification when it is in the following states: Mains Operation, Inverter Operation, Inverter-to-Mains Switching, Mains-to-Inverter Switching, or PV Charging Only.

5) In Parallel Operation State (Device as Slave Unit): The device does not allow parameter modification when it is in the following states: Mains Operation, Inverter Operation, Inverter-to-Mains Switching, Mains-to-Inverter Switching, or PV Charging Only. In other states, only the following three parameters can be modified: [Parallel Operation Mode], [Grid Type], and [Parallel Operation Phase].

6) "Output frequency" and "Factory reset" can only be modified under "Fault" or "Manual stop" states; modification is not allowed under other equipment states.

7.Protection Functions

No.	Protection Function	Instructions
1	PV Current Limiting Protection	When the charging current or power of the configured photovoltaic array exceeds the rated current or power of the inverter, charging will be carried out at the rated current and power.
2	PV Overvoltage Protection	If the photovoltaic voltage exceeds the maximum value allowed by the hardware, the machine will report a fault and stop the photovoltaic boost to output a sinusoidal AC wave.
3	Night Anti-Backflow Protection	At night, because the battery voltage is greater than the voltage of the PV module, it will prevent the battery from discharging to the PV module.
4	AC Input Overvoltage Protection	When the mains voltage exceeds 140V per phase, the mains charging will be stopped and the inverter output will be switched
5	AC Input Undervoltage Protection	When the mains voltage per phase is lower than 90V, the mains charging will be stopped and the inverter output will be switched.
6	Battery Overvoltage Protection	When the battery voltage reaches the overvoltage break point, PV and mains power will be automatically stopped to prevent overcharging of the battery.
7	Battery Undervoltage Protection	When the battery voltage reaches the low voltage break point, the discharge of the battery will be automatically stopped to prevent excessive discharge of the battery.
8	Battery Overcurrent Protection	When the battery current exceeds the hardware's allowable range, the machine will turn off the output and stop discharging the battery.
9	AC Output Short-Circuit Protection	When a short circuit fault occurs at the load output end, the output AC voltage will be immediately turned off and output again after one minute. If the output is still short circuit after three attempts, the power must be manually recharged and turned on before normal output can be restored.
10	Heat Sink Overtemperature Protection	When the internal temperature of the inverter is too high, the inverter will stop charging and discharging; when the temperature returns to normal, the inverter will resume charging and discharging.

11	Overload Protection	After triggering overload protection, the inverter will resume output after 3 minutes. If overloaded for 5 consecutive times, the output will be shut down until the inverter restarts.(102% <110%)± 10%: Error, output will be shut down after 5 minutes.
12	AC Backfeed Protection	Prevent the battery inverter AC from backflowing to the bypass AC input.
13	Bypass Overcurrent Protection	Software detection.
14	Bypass Wiring Error Protection	When the phase of the two bypass inputs is different from the phase of the inverter phase, the machine will prohibit the bypass from being switched on to prevent the load from being powered off or short-circuited when the bypass is switched on.

8.Product Maintenance

8.1 Troubleshooting

Fault Code	Meaning	Cause	Solution
/	The screen is not displaying	There is no power input, or the device switch is not turned on.	Check whether the battery circuit breaker or PV circuit breaker is closed; ensure the switch is in the "ON" state.
01	Battery voltage low	The battery voltage is lower than the value set in the "battery under-voltage warning voltage" parameter	Charge the battery until the battery voltage is higher than the value set in the parameter.
03	Battery no connect	The battery is not connected, or the lithium battery BMS is in discharge protection mode	Check whether the battery is reliably connected; check whether the circuit breaker of the battery is closed; ensure that the BMS of the lithium-ion battery can communicate normally.
04	Battery undervoltage stops discharging	The battery voltage is lower than the value set by the parameter "overcharge voltage"	Perform a manual reset. Turn off the power and restart.Automatic reset: Charge the battery until its voltage is higher than the value set in the parameter item "Over - discharge Recovery Voltage".
06	Battery charge overvoltage protection	The battery is overvoltage	Turn off the power manually and restart. Check whether the battery voltage exceeds the limit. If so, discharge the battery until the voltage is below the overvoltage of the battery
13	Bypass overload protection	The output power or output current of the side road is overloaded for a certain period of time	Reduce the load power and restart the device. For more details, refer to item 11 in the protection function
14	Inverter overload protection	The output power or output current of the inverter is overloaded for a certain period of time	

19	PV radiator over-temperature protection	The temperature of the photovoltaic radiator exceeds 80℃ for 3s	When the radiator temperature cools below the overtemperature recovery temperature, normal charging and discharging are resumed
20	Inverter radiator over-temperature protection	The temperature of the inverter radiator exceeds 90℃ for 3s	
21	Fan fault	The hardware detects a fan failure	After powering off, manually turn the fan to check if there is any foreign object blocking it.
26	Inverter AC output is fed back to bypass AC output	The AC output relay is stuck	Manual restart, if the fault occurs again after restart, you need to contact the after-sales service to repair the machine
27	Mains input phase error	The AC input phase is not consistent with the AC output phase	Ensure that the phase of the AC input is the same as that of the AC output. For example, if the output is in split mode, the input must also be in split mode

8.2 Maintenance

To maintain optimal long-term performance, it is recommended to perform the following checks twice a year:

1. Confirm that the air flow around the inverter is not blocked, and remove any dirt or debris on the radiator.
2. Check all exposed wires to see if their insulation is damaged due to sun exposure, friction with surrounding objects, dry rot, damage by insects or rodents, etc. Repair or replace the wires if necessary.
3. Verify that the indicators and displays are consistent with the equipment operation. Pay attention to any fault or error displays and take corrective measures if necessary.
4. Examine all the wiring terminals for signs of corrosion, insulation damage, high temperature, burning/discoloration, and tighten the terminal screws.
5. Check for dirt, nesting insects, and corrosion, and clean the insect - proof net regularly as required.

6. If the lightning arrester has failed, replace the failed one in a timely manner to prevent lightning-strike damage to the inverter and even other equipment of the users.



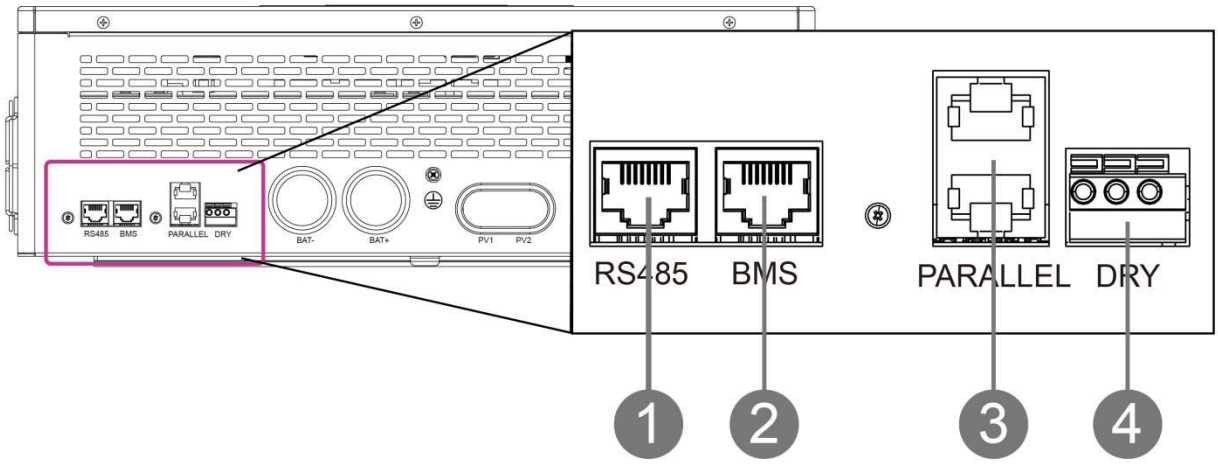
Before performing any inspection or operation, make sure that the inverter is disconnected from all power sources and that the capacitors are fully discharged to avoid the risk of electric shock.

The following causes of machine problems are not covered by the KTECH ' s standard warranty:

1. The product has exceeded the warranty period (except for the service of extending the warranty period signed by both parties).
2. Failure to operate according to the product manual or relevant installation and maintenance requirements, failure or damage caused by non-product specified working environment, storage or use. Such as incorrect use of installation distance, ventilation, waterproof cap, etc.
3. Unauthorized KTECH's disassembly, maintenance or modification of the machine.
4. Products obtained through unauthorized channels by KTECH.
5. Faults and damages caused by unforeseen or human factors or force majeure, such as storm weather, flood, lightning, overvoltage, insect damage and fire.
6. Unauthorized modification, design change or replacement of parts.
7. Intentional damage or defacement, making indelible marks, theft, etc.
8. Natural wear and tear and aging.
9. Not used in accordance with correct safety requirements (e.g. VDE standards).
10. Other failures or damages not caused by the KTECH product's own quality issues.
11. Damages caused during transportation (including scratches on the product casing resulting from collisions to the packaged product during transportation).
12. Due to the harsh environment, the machine shell is rusted and corroded.

9.Communication

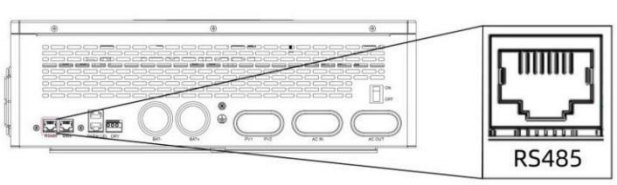
9.1 Overview

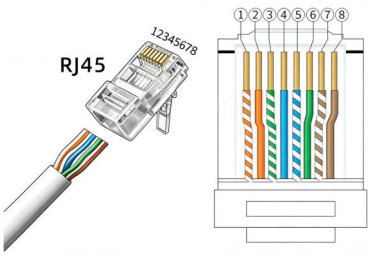


1	RS485 Port	**2**	BMS Port	**3**	Parallel Port	**4**	Dry Contact

9.2 RS485 Port

Port RS485 is a data expansion port.

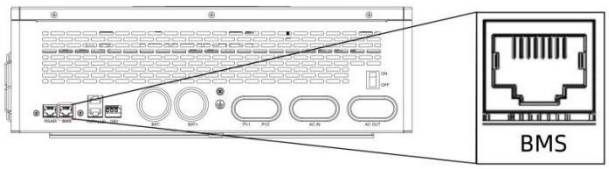


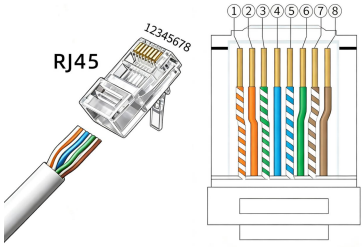


RJ45	Definition
Pin 1	5V
Pin 2	GND
Pin 3	/
Pin 4	/
Pin 5	/
Pin 6	/
Pin 7	RS485-A
Pin 8	RS485-B

9.3 BMS Port

The BMS port is used to connect to the BMS of the lithium-ion battery.





RJ45	Definition
Pin 1	5V
Pin 2	GND
Pin 3	/
Pin 4	CANH
Pin 5	CANL
Pin 6	/
Pin 7	RS485-A
Pin 8	RS485-B

When the communication cable is properly connected and the protocol is matched, the communication is successful, and the battery icon in the upper right corner of the inverter's display screen is illuminated, as shown in the figure:



When the communication cable is not connected, incorrectly connected, or disconnected after being connected, or the communication protocol is mismatched, the communication fails, and the communication icon in the upper right corner remains unlit, as shown in the figure:



NOTICE

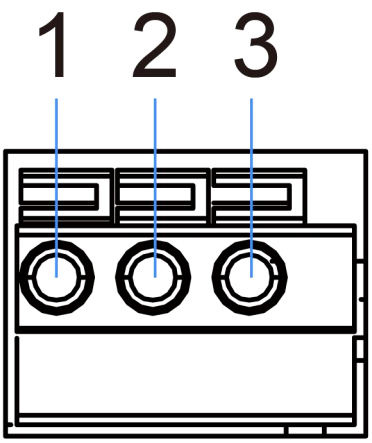
· The inverter supports communication with lithium battery BMS via CAN or RS485. Please verify matching of the communication protocol before use.

· If you use a standard RJ45 Ethernet cable, check the pin definition according to the communication method: for RS485 communication, pins 1 and 2 usually need to be cut off; for CAN communication, no pins need cutting and the cable can be used directly.

9.4 Dry Contact Port

3-pin Dry Contact:

Function of dry contact port: Generator remote start / stop



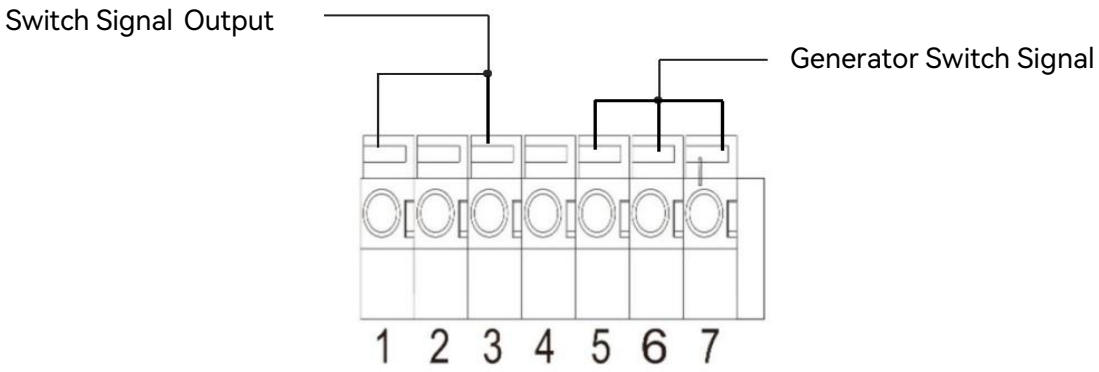
Function	Description
Generator Remote Start/Stop	When the battery voltage reaches the undervoltage alarm voltage or the voltage point for switching from battery to mains power, pins 2 to 1 are in a normally open state, and pins 3 to 1 are in a normally closed state. When the battery voltage reaches the voltage point for switching from mains power to battery or the battery is fully charged, pins 2 to 1 are in a normally closed state, and pins 3 to 1 are in a normally open state. (Output specifications for pins 1/2/3: 125V/1A, 230V/1A, 30V/1A)

NOTICE

If you need to use the remote start/stop function of the generator with dry contacts, please ensure that the generator is equipped with an ATS and supports remote start/stop.

7-pin Dry Contact:

The dry contact port has two functions: 1. Switch signal output 2. generator remote start/stop.



Note: The number of dry contact interface terminals, pin function definitions, and other specifications may vary depending on the model or version. Please refer to the actual device. Any equipment damage, functional abnormalities, or safety risks resulting from failure to follow the required procedures shall be borne solely by the user.

Function	Description
Switch signal output	When the battery voltage reaches the discharge cut-off voltage, the voltage from pin 3 to pin 1 is 0V; when the battery is in normal charge/discharge mode, the voltage from pin 3 to pin 1 is 5V.
Remote start/stop of the generator	When the battery voltage reaches the under-voltage alarm voltage or the battery switches to the mains voltage point, pins 6 to 5 are in the normally open state, and pins 7 to 5 are in the normally closed state.When the battery voltage reaches the voltage point where mains power switches to the battery or when the battery is fully charged, pins 6 to 5 remain in a normally closed state while pins 7 to 5 stay in a normally open state. (Pins 5/6/7 output 125V/1A, 230V/1A, 30V/1A)



If you need to use the remote start/stop function of a generator with dry contacts, please ensure the generator is equipped with an ATS and supports remote start/stop.

9.5 Bluetooth

The inverter is equipped with a built-in Bluetooth module, which can be connected and used through the Xiaoai Assistant or Wisehome APP (the Wisehome APP can be downloaded by scanning the QR code below, or from the official website or by contacting us to obtain the installation package).

IOS

Android

Chinese Android

9.6 Wi-Fi

After setting up the internet access APP, it can be connected to the Xiaoai Assistant/Wisehome cloud platform.

Note: When setting the WIFI name within the app, the Wi-Fi name must consist of English letters and numbers (name length < 32 characters) and cannot contain Chinese characters or special symbols. The password must consist of English letters and numbers (password length ≥ 8, < 16 characters) and cannot contain Chinese characters or special symbols.

For stable communications, ensure the home Wi-Fi operates on 2.4GHz and supports WPA2 protocol.5GHz is not supported.

10.Product Parameter Table

Model	KE-8KC5LSUF	KE-10KC5LSUF	KE-12KC5LSUF	KE-12K5C5LSUF	KE-13K2C5LSUF
Inverter Output					
Rated Output Power(W)	8000	10000	12000	12500	13200
Rated Output Voltage(V)	120/240				
Rated Frequency(Hz)	50/60				
Overload Capability	110% 5min; 200% 5s				
Output Waveform	Pure Sine Wave				
Transfer Time	10ms (Typical value); Max 15ms for single unit, max 30ms for parallel operation				
Max.Number of Parallel Units	6				
Total Harmonic Distortion of Voltage(THDv)	<3% (Rated power)				
DC Current Output	<0.5% x Rated current				
Eco Mode / Energy Saving Mode	Support				
Battery					
Battery Type	Lead-acid or Lithium Iron Phosphate Battery				
Rated Battery Voltage(V)	48				
Voltage Range(V)	40~60				
Lithium-ion Battery Charging Strategy	BMS Adaptive				
Max.Charge Current(A)	180	200	250		
Max.Discharge Current(A)	180	200	250		
PV Input					
Number of MPPT Trackers	1				
Max.Input Power(W)	12000	15000	18000		
Max.Input Current(A)	22+22				
Max.Input Short-Circuit Current(A)	33+33				
Max.Open-Circuit Voltage (Voc)(V)	500				
Rated MPPT Voltage(V)	375				
MPPT Start-up Voltage(V)	100				
MPPT Operating Voltage Range(V)	125~425				
Utility / Generator Input					
Input Voltage Range(V)	90~280				
Input Frequency Range(Hz)	50/45-55, 60/55-65				
Bypass Overload Current(A)	63				

Efficiency	
Max. Efficiency	97.6%
Euro Efficiency	96.5%
MPPT Tracking Efficiency	99%
Protection	
Integrated Protection	Over-temperature protection, overload protection, short-circuit protection, PV overvoltage protection, PV overcurrent protection, battery overvoltage protection, leakage current protection, surge protection
Surge Protection Level	DC Type II / AC Type III
General	
Dimensions (H×W×D)(mm)	620 x 470 x 147
Weight(kg)	25.5
Ingress Protection (IP) Rating	IP20
Operating Temperature Range	-10~55℃ (>45℃ Derating)
Noise Level @ 1m	≤45 @ 25℃ (77°F)
Type of Cooling	Intelligent Air Cooling
Warranty	1 Year
Communication	
Communication Port	RS485/CAN/Wi-Fi/Bluetooth
Certification	
Overview	UL 1741, CSA , FCC Part 15B

Note:

The rated output power of 13.2 kW for this unit is only applicable under Grid Operation Mode. When switched to Inverter Mode, the maximum allowable output power of the equipment is 12.5 kW. If a 13.2 kW load is connected while operating in Inverter Mode, the unit will run under overload conditions, resulting in abnormal temperature rise. In severe cases, this will cause permanent hardware damage to the inverter.

11.Parallel Connection Wiring

11.1 Introduction

- Ensure the inverter software is updated to the latest version before parallel operation.
- A maximum of 6 inverters can be connected in parallel.
- When using the parallel operation function, correctly, firmly and reliably connect the parallel communication cables.
- Recommended specifications for parallel cables: RJ45 connector (8-pin crystal head), length 2 meters, Cat6 shielded network cable (with ferrite core shielding). The cable connection diagram is as follows:

Parallel cable *1 

11.2 Precautions for Connecting the Standby Cable

1. PV Wiring:

When connecting inverters in parallel, different units must be connected to separate PV arrays or PV sources. Do not connect the same PV source to multiple inverters.

2.Battery Wiring:

a) When multiple inverters share the same battery bank, connect the battery positive and negative terminals to the corresponding busbars. Power is branched from the busbars to each inverter: BAT+ to BAT+, BAT- to BAT-. All branch cables shall have the same gauge and length. Double-check wiring before power-on. Select the [Unified] mode for battery parallelism during inverter paralleling.

b) When each inverter is equipped with its separate battery, connect the battery positive and negative terminals to the inverter accordingly: BAT+ to BAT+, BAT- to BAT-. Confirm compatible battery specifications and secure wiring before connection. Select the [Independent] mode for battery parallelism during inverter paralleling.

3.AC OUT Wiring:

a) Split-Phase to Split-Phase Parallel Connection Cable

When connecting for split-phase parallel operation, all inverters must have their L terminals interconnected, N terminals interconnected, and PE terminals interconnected. Ensure the

connections are correct before powering on, and that the wiring length and gauge are identical. Avoid connection errors to prevent abnormal output in the parallel system.

B）Split-Phase to Three-Phase Parallel Connection Cable

When connecting for split-phase to three-phase parallel operation, all inverters must have their N terminals interconnected and their PE terminals interconnected. The L lines of all units sharing the same phase must be connected together, but the AC output L lines of different phases must not be connected together. Other precautions are the same as those for split-phase parallel inverter connections.

4. AC IN Wiring:

When connecting for split-phase parallel operation,all inverters must have their L terminals interconnected, N terminals interconnected, and PE terminals interconnected. Ensure the connections are correct before powering on, and that the wiring length and gauge are identical. Avoid connection errors to prevent abnormal output in the parallel system. Additionally, do not connect multiple different AC input sources to prevent damage to the inverters or external electrical equipment. Ensure the AC input source is consistent and singular.Split-Phase to

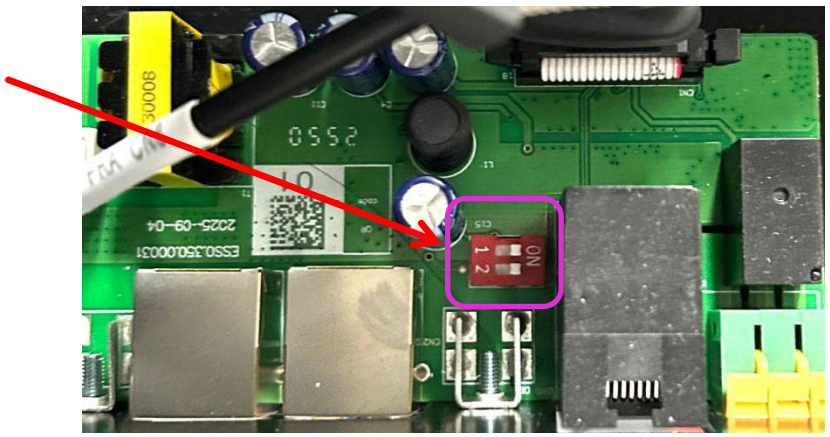
When connecting for split-phase to three-phase parallel operation,all inverters must have their N terminals interconnected and their PE terminals interconnected. The L lines of all units sharing the same phase must be connected together, but the AC input L lines of different phases must not be connected together.

5. Parallel Communication Cable Wiring:

The communication cables are used for split-phase parallel or split-phase to three-phase parallel connections. When connecting the units, follow a daisy-chain approach: the male connector (output) of one unit must connect to the female connector (input) of the unit requiring parallel operation. Do not connect a unit's male connector to its own female connector. Additionally, ensure secure connections for the parallel communication cables of each unit to prevent the cables from loosening, detaching or poor contact, which may cause abnormal system output or equipment damage.

Reminder: Set the parallel communication pins of the first and last inverters to the ON position, and set the inverters between them to the OFF position.The two switches in the "ON" position correspond to address 1.The switches in the "OFF" position correspond to their respective addresses 0.

Paralleling communication port DIP switch



NOTICE

1. Before powering on and lighting up the screen, check the wiring against the wiring diagram above to verify correctness and prevent system faults.
2. All connections shall be securely fastened to avoid loose wires that may cause abnormal system operation.
3. When connecting the AC output to loads, perform wiring in accordance with the requirements of electrical load equipment to prevent damage to load devices.
4. The AC output voltage shall be set uniformly, or configured only on the master unit. In parallel operation, the voltage set on the master unit shall prevail. The master will forcibly overwrite the settings of all slave units to maintain consistency. This parameter can only be modified in standby mode.
5. The unit is factory-set to stand-alone mode. If parallel or three-phase functions are required, enable parallel mode via the touchscreen. Configuration procedure: Power on one unit at a time while keeping other units powered off, then set the parallel mode and phase according to the on-site system operating mode. For split-phase parallel connection, configure in sequence: split-phase parallel master, slave, slave. For split-phase to three-phase parallel connection, configure in sequence: three-phase parallel master, slave, slave; set phases as Phase A, Phase B, Phase C respectively. After successful configuration of one unit, turn off its switch and wait for power-down. Configure the remaining units one by one. Once all units are configured, power on all units simultaneously to enter operating status.
6. After the system runs, confirm that the measured output voltage is correct before connecting loads and performing settings.

11.3 Split-phase parallel connection

1.The diagram for the connection of communication cables for inverter parallel operation is as follows:

Diagram 1 for split mounting bracket inverter: Tighten the screws after connecting the parallel communication cables.

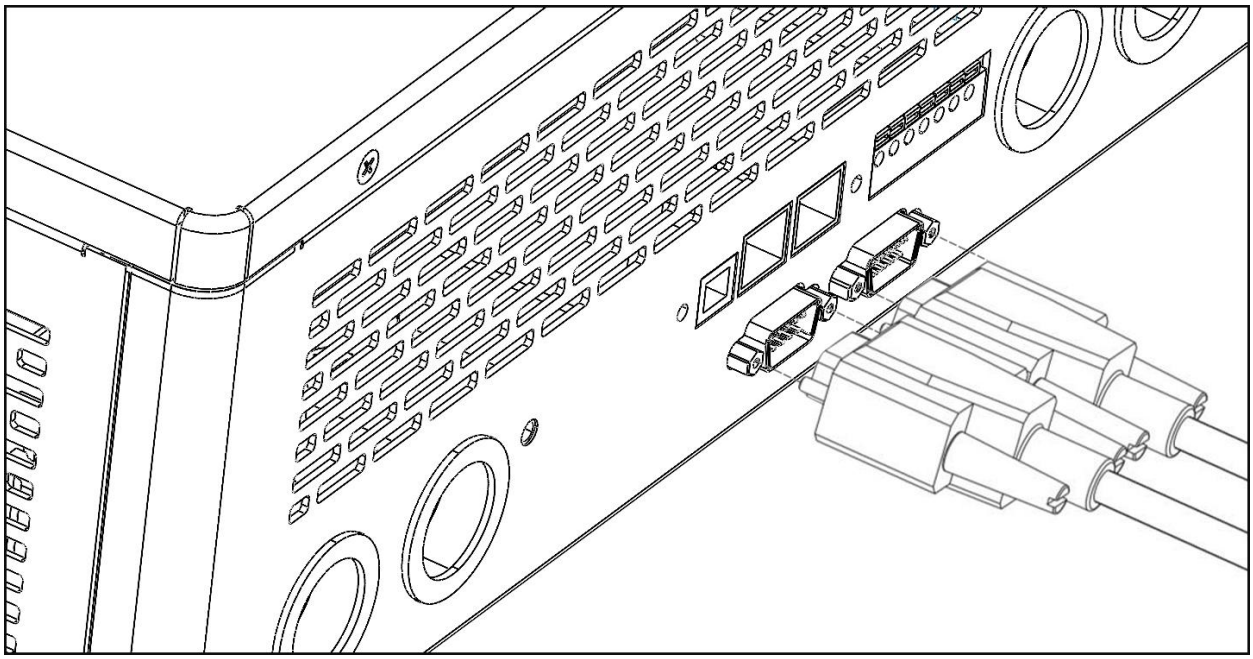
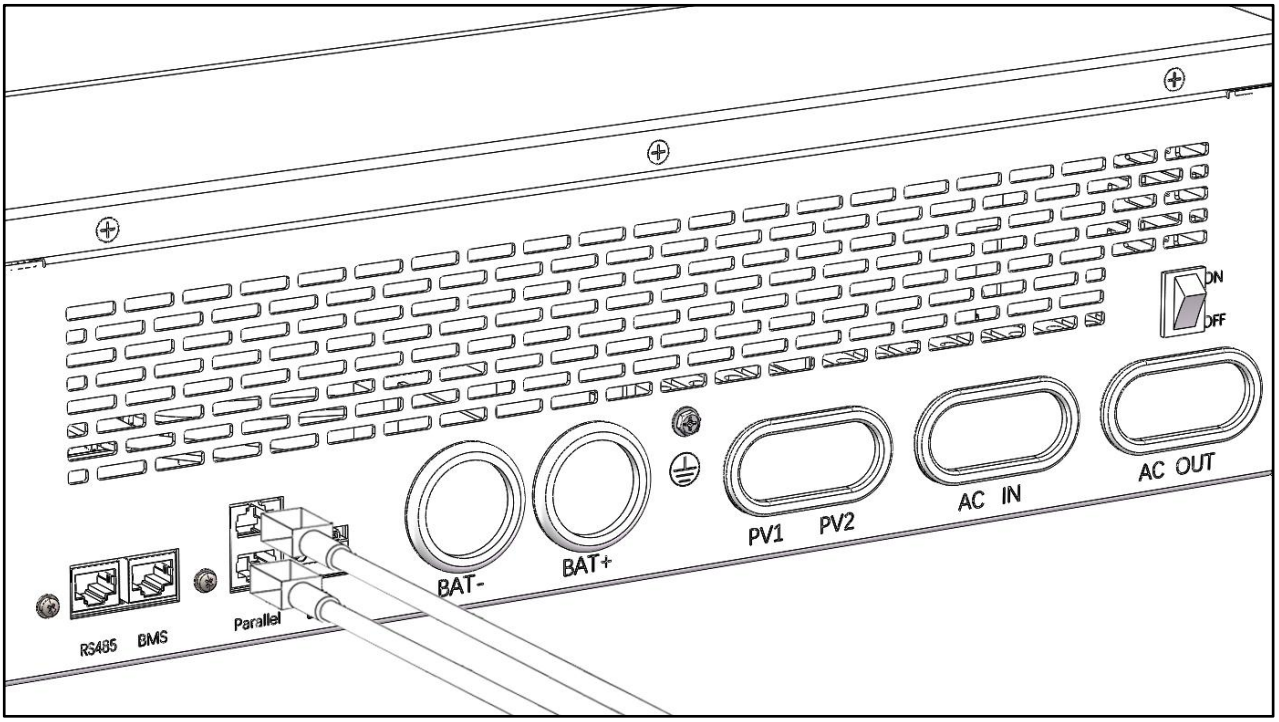
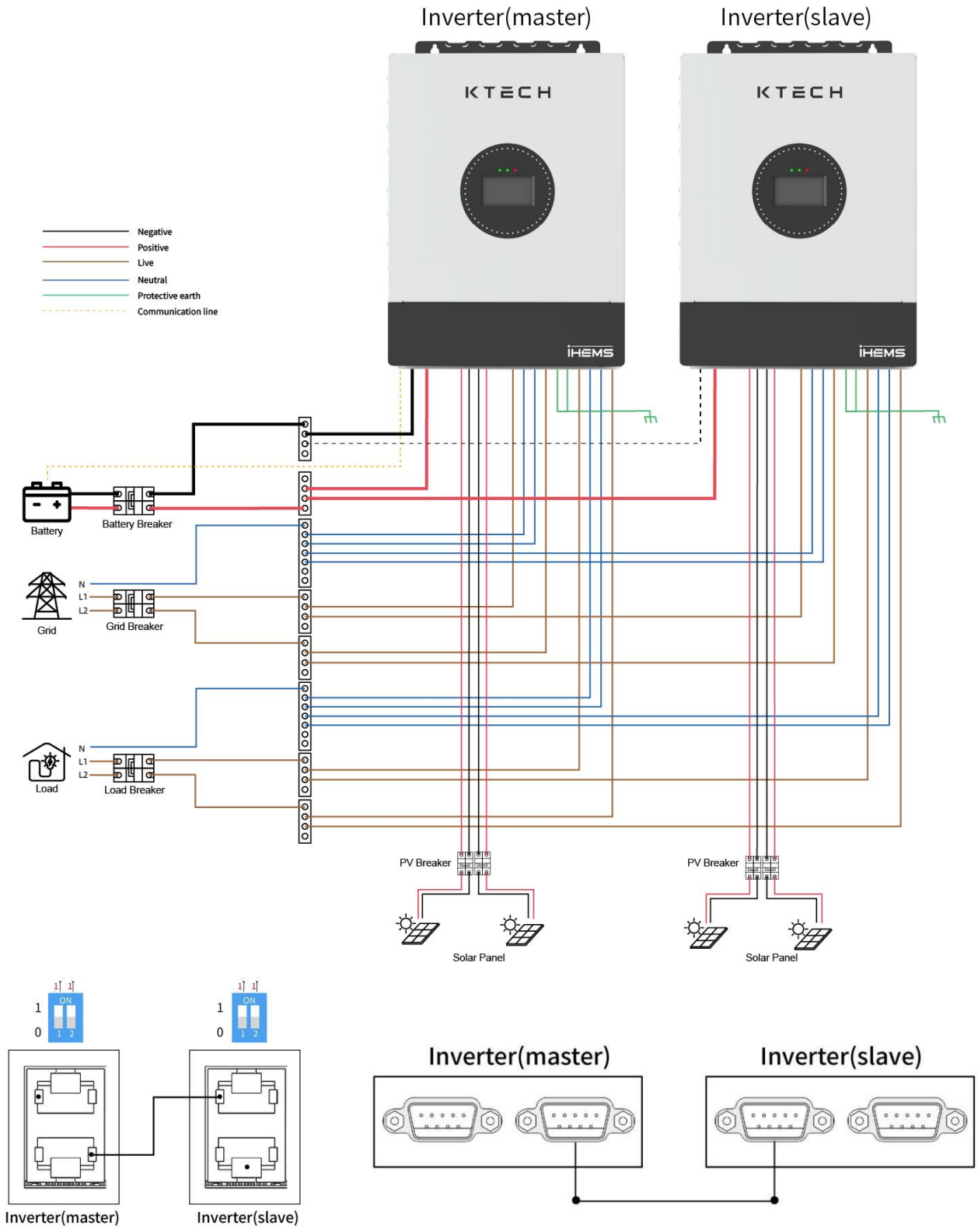


Diagram 2 for split mounting bracket inverter:

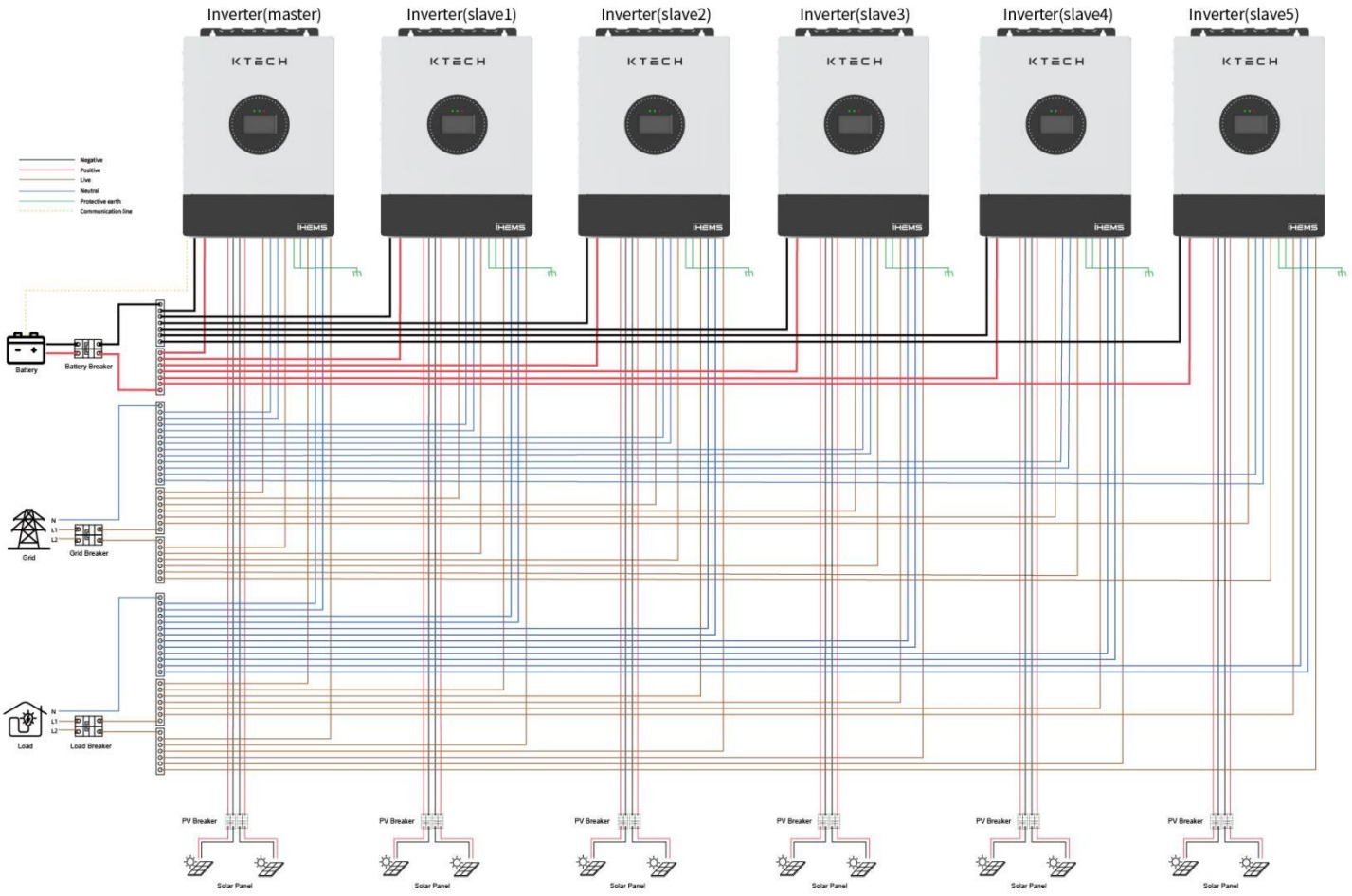


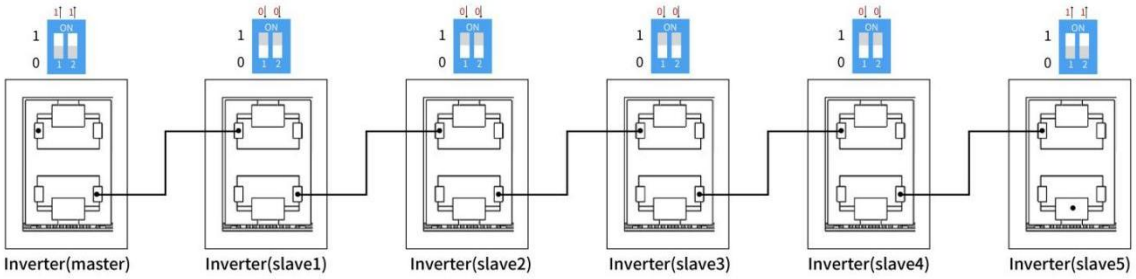
2.When multiple units are connected in parallel, the connection diagram is as follows:

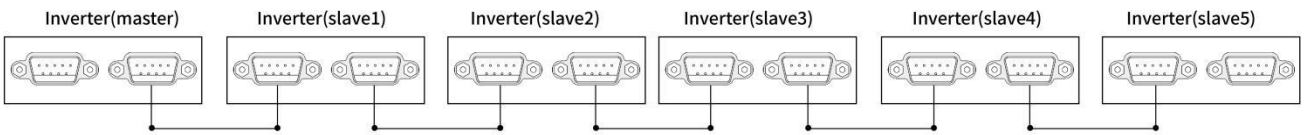
a) Parallel Connection System with Two Inverters:



b) Parallel Connection System with Six Inverters:







DANGER

- The PV port shall be used independently at all times during connection!
- Read the instruction manual carefully and follow the guidelines strictly before parallel connection!

3. Split Phase-Split Phase (Two / Three Or Multiple Units) UI Interface Operation

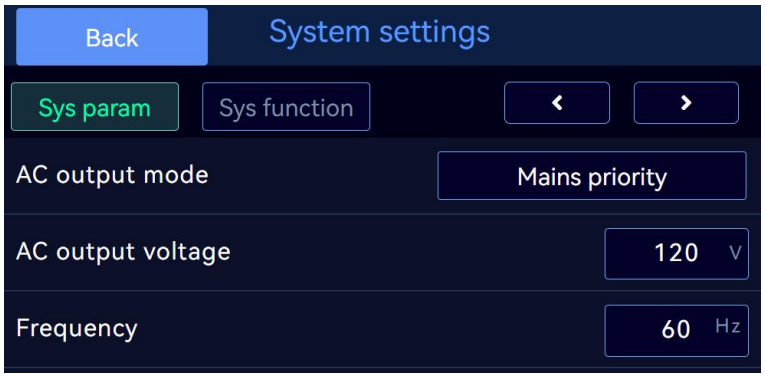
Steps:

The following operations must be performed using only battery power after all cables are connected. All other circuit breakers must remain off.

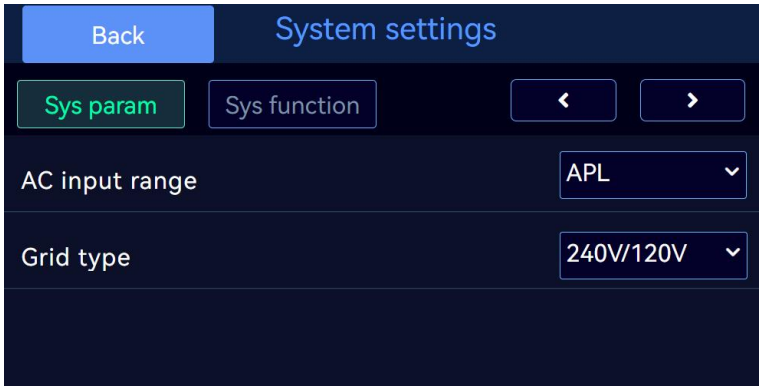
First, turn on the master unit's rocker switch while keeping the slave units off to configure the parallel settings on the master.

1) Verify that both the UI and software versions are the latest.

2) Ensure the AC output voltage and frequency match the local utility grid.

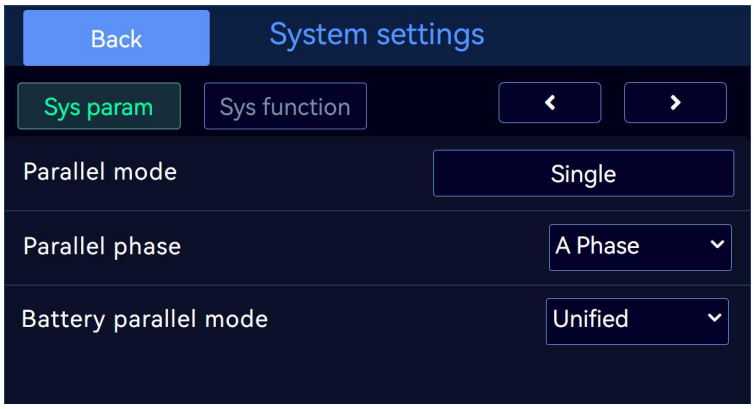


3) Set Grid Type to 240V/120V(L1-L2 180°)

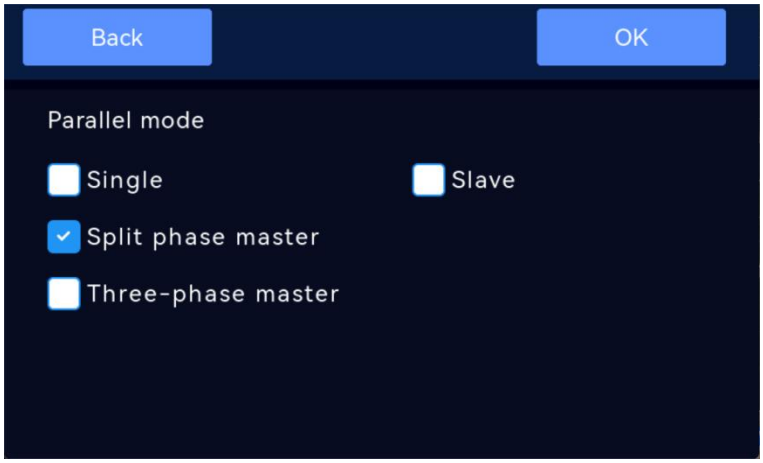


4) To change the Parallel Mode,Parallel Phase and Battery Parallel Mode

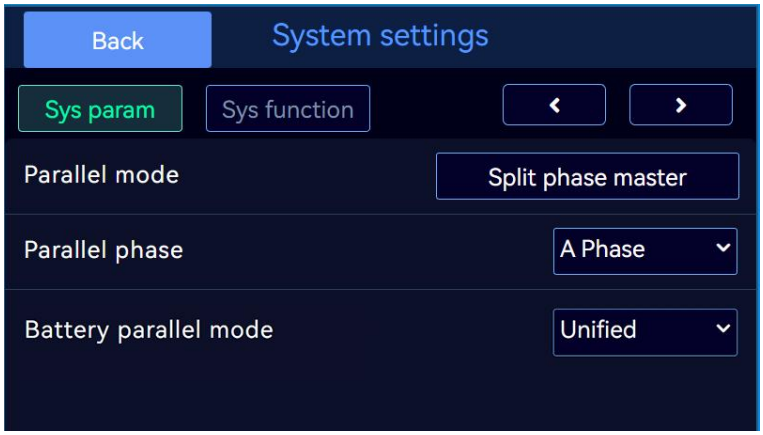
Navigate to: Settings > System Settings > System Parameters



Navigate to: Settings > System Settings > System Parameters > Parallel Mode, and select “Split Phase Master”.



Navigate to: Settings > System Settings > System Parameters > Parallel Phase, and select “A Phase”> Battery parallel mode, and select “Unified”.



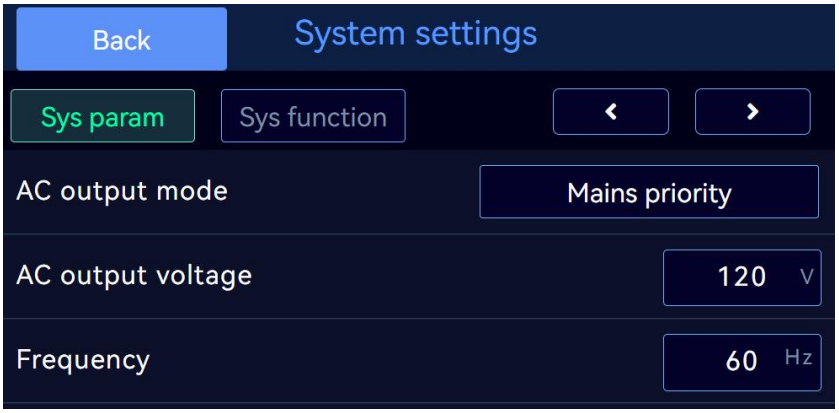
NOTICE

After completing the above steps and returning to the main interface, if the inverter reports a parallel fault, this is normal because the other parallel units are not powered on. No action is required.

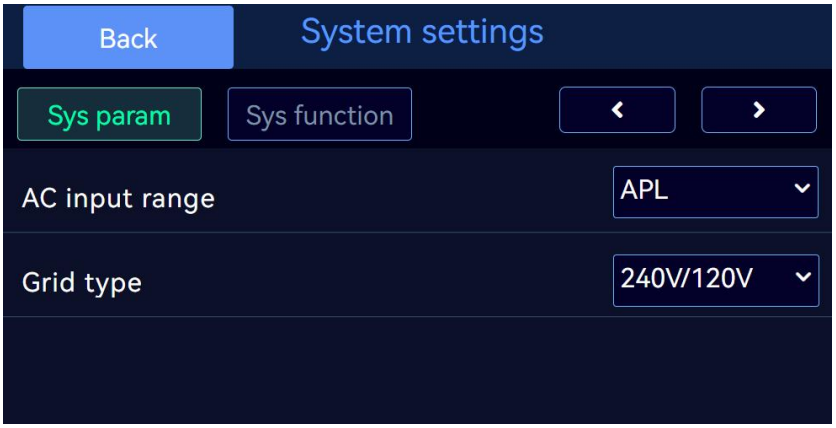
Turn off the master unit, power on a slave unit, and then configure the parallel settings for the slave unit.

1) Verify that the UI and software versions are the latest and consistent with the master unit.

2) Ensure the AC output voltage and frequency match the local utility grid.

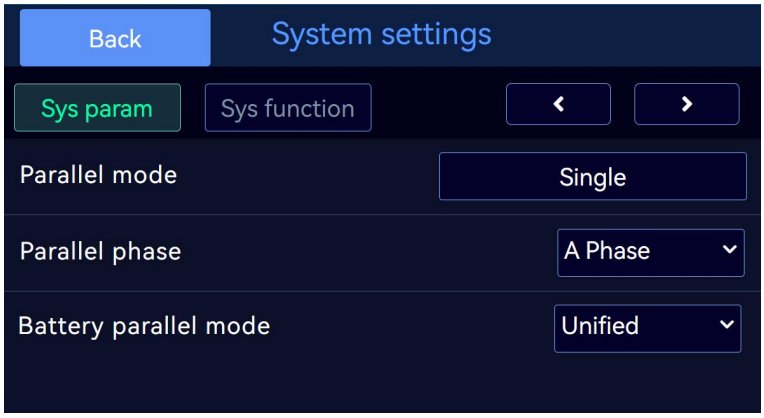


3) Set Grid Type to 240V/120V(L1-L2 180°)

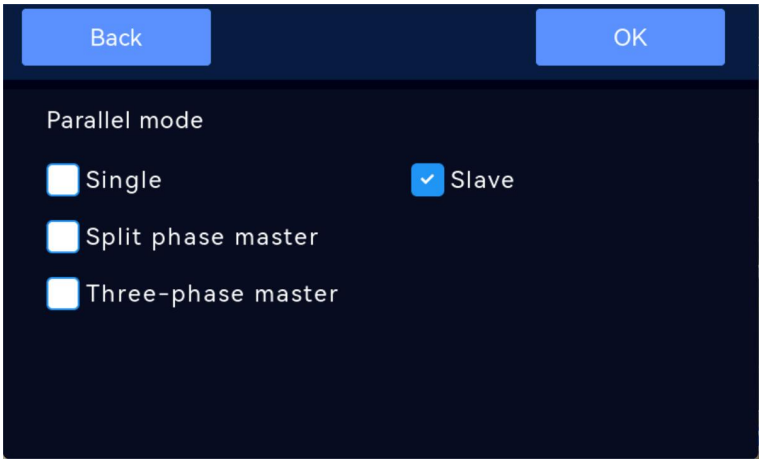


4) Change the Parallel Mode,Parallel Phase and Battery Parallel Mode.

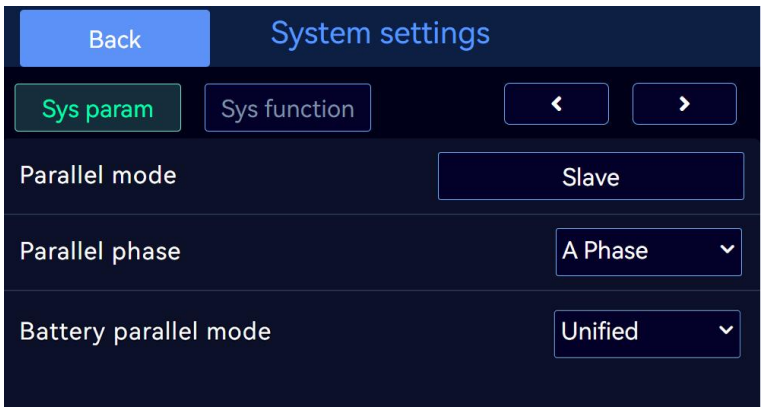
Navigate to: Settings > System Settings > System Parameters



Navigate to: Settings > System Settings > System Parameters > Parallel Mode, and select “slave”.



Navigate to: Settings > System Settings > System Parameters > Parallel Phase, and select “A Phase”> Battery parallel mode, and select “Unified”.





If there are multiple slave units, repeat the above steps for each. During the setup process, one and only one unit must be powered on at a time. After completing the above steps and returning to the main interface, if the inverter reports a parallel fault, this is normal because the other parallel units are not powered on yet; no action is required. Once all units have been configured, power them on simultaneously, and the parallel fault will clear.

Note:

Please follow the power-on sequence below:

1. Turn on the battery switch and wait for 30 seconds to confirm the battery is operating stably with no errors. Then, turn on the DC breaker.
2. Turn on the inverter switch and wait for the unit to stabilize.
3. Before turning on the AC breaker, use a multimeter to measure the utility voltage and verify that the two utility lines (L1/L2) are balanced.
4. Before turning on the PV breaker, use a multimeter to measure the open-circuit voltage to ensure it does not exceed the MPPT input open-circuit voltage rating (500V for this model). After all breakers are turned on, allow the system to run with no load for ten minutes. Confirm there are no alarms, the voltage is normal, and the system is operating stably.
5. Gradually turn on the loads in order from smallest to largest power rating. Observe whether the L1/L2 voltage and current are stable and balanced. Ensure the system runs stably for at least 30 minutes

11.4 Three-Phase Parallel Connection Diagram

1.The diagram for the connection of communication cables for inverter parallel operation is as follows:

Diagram 1 for split mounting bracket inverter: Tighten the screws after connecting the parallel communication cables.

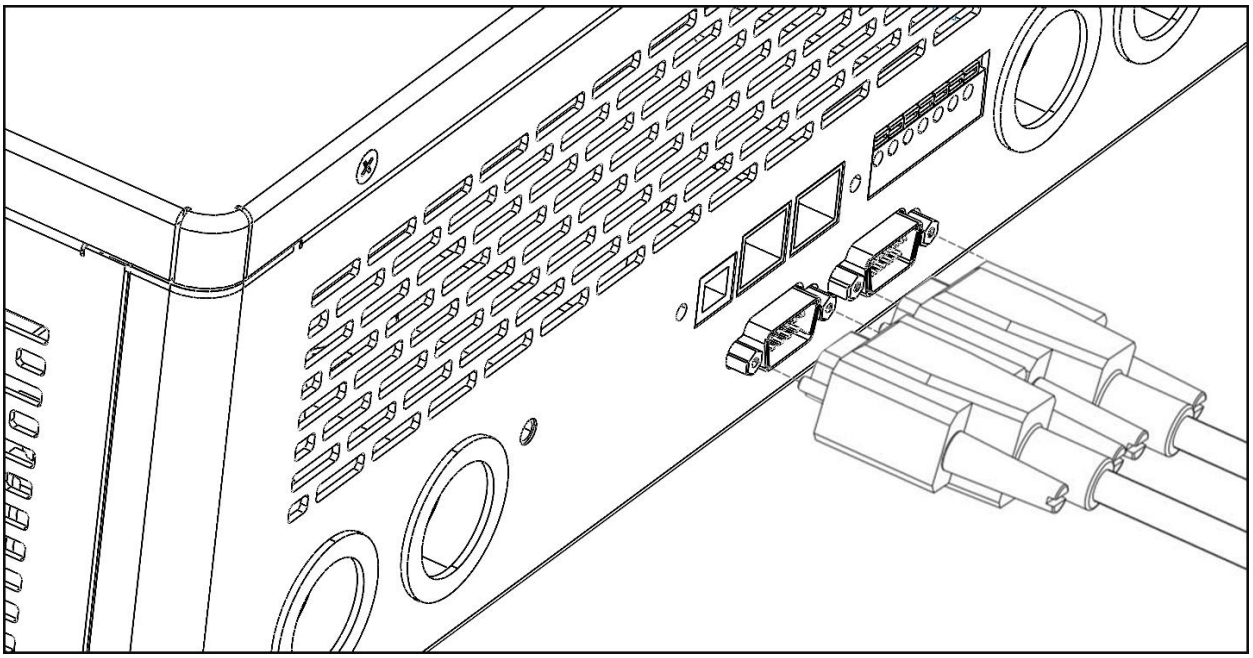
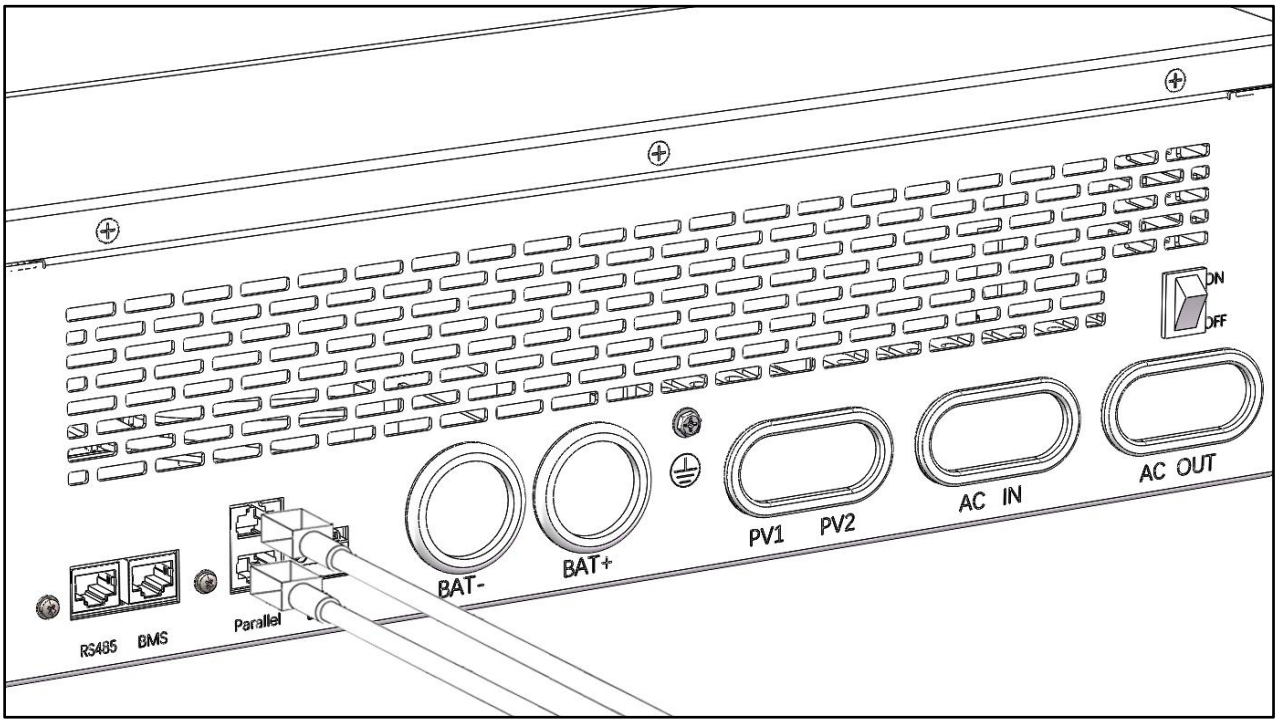
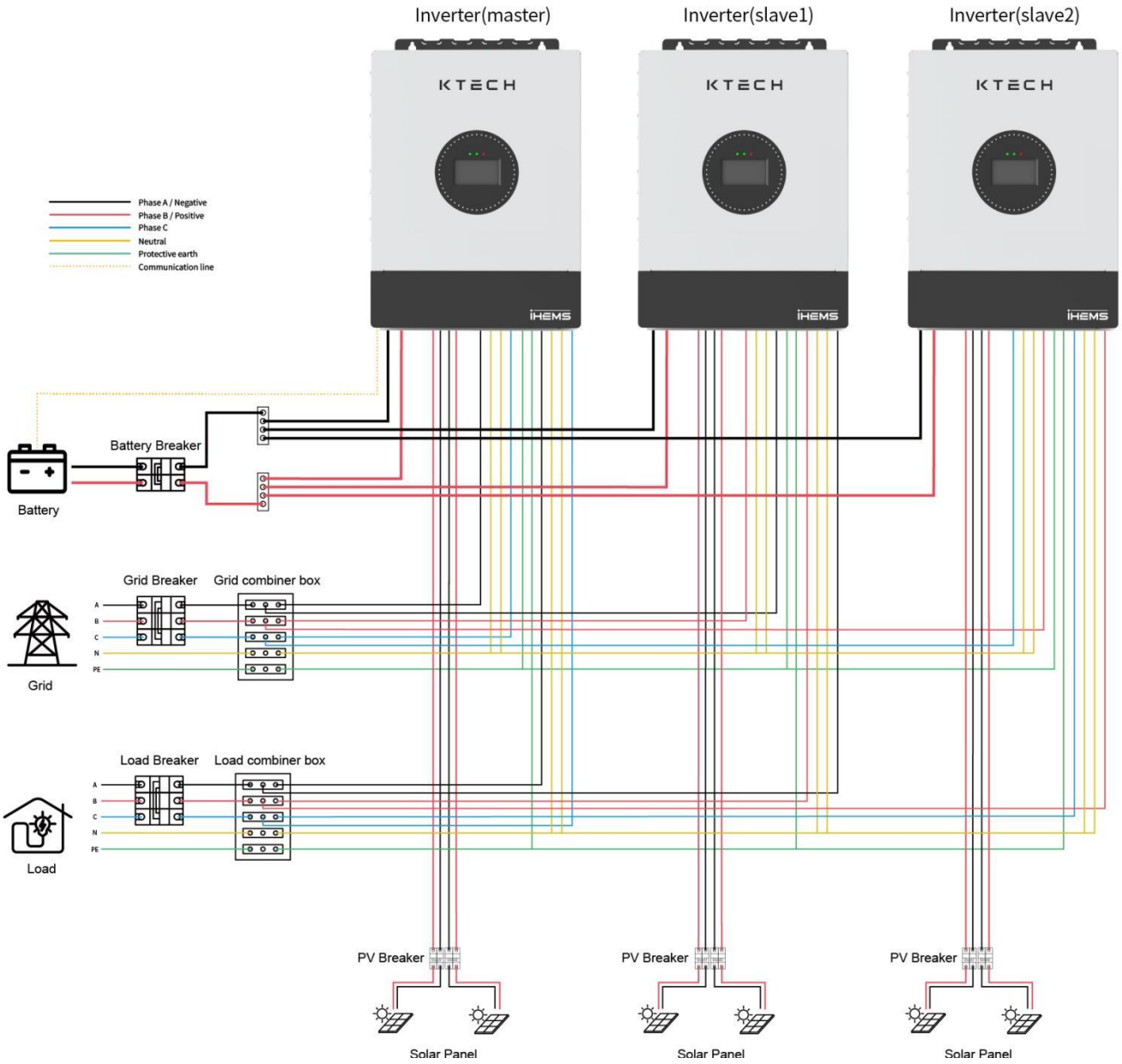
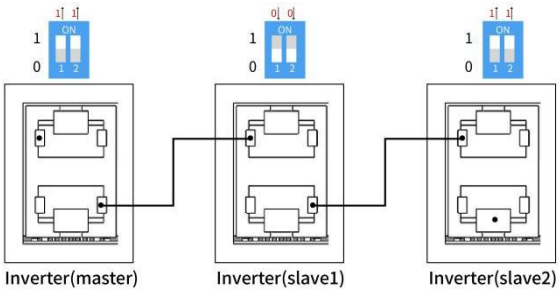


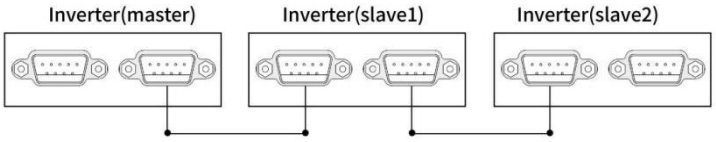
Diagram 2 for split mounting bracket inverter:



2.Three units in three-phase configuration:







DANGER

- The PV port shall be used independently at all times during connection!
- Read the instruction manual carefully and follow the guidelines strictly before parallel connection!

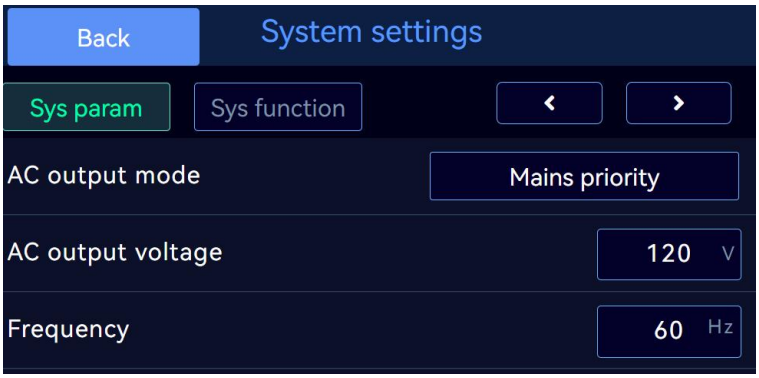
3.UI Operation Steps for Three Inverters in Three-Phase Parallel System:

The following operations must be performed using only battery power after all cables are connected. All other circuit breakers must remain off.

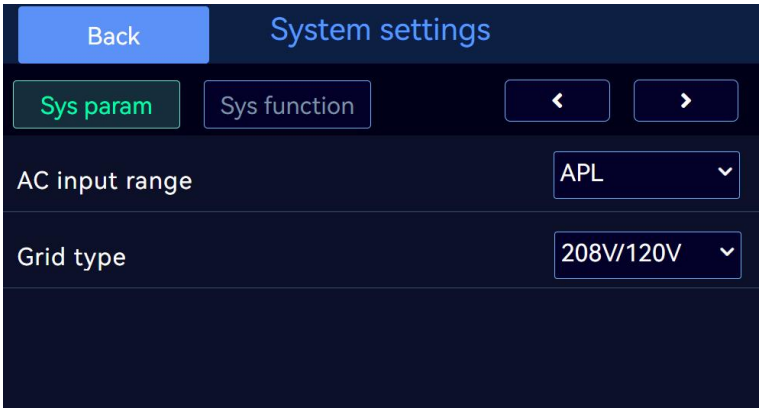
First, turn on the master unit's rocker switch while keeping the slave units off to configure the parallel settings on the master.

1) Verify that the UI and software versions are the latest.

2) Ensure the AC output voltage and frequency match the local utility grid.

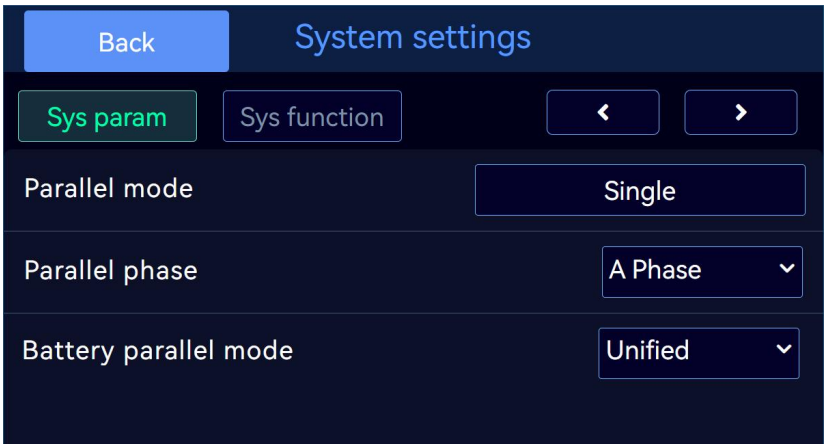


3) Set the Grid Type to 208V/120V(L1-L2 120°).

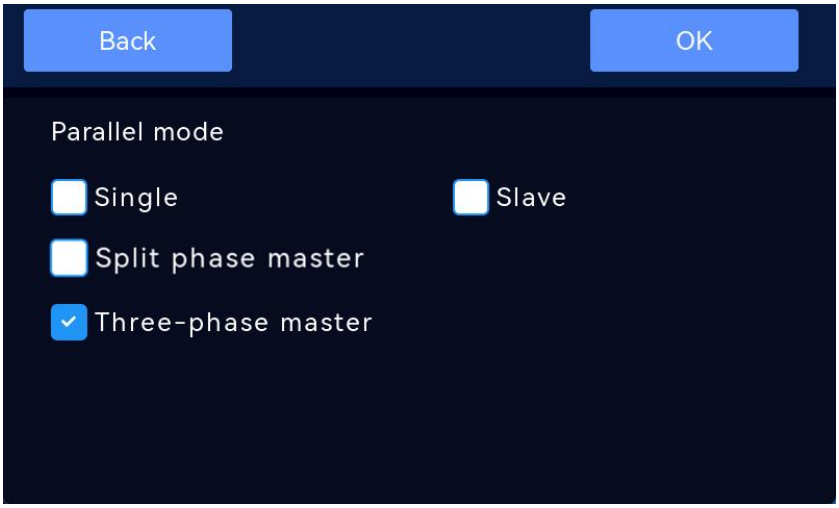


4) To change the parallel mode,Parallel Phase and Battery Parallel Mode.

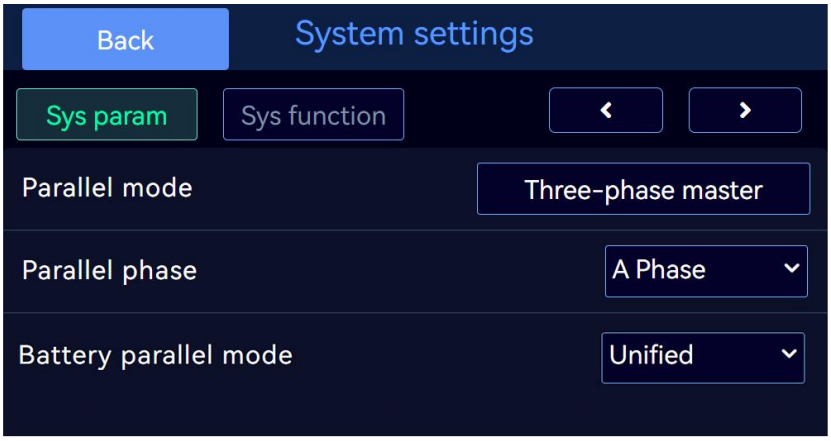
Navigate to: Settings > System Settings > System Parameters



Navigate to: Settings > System Settings > System Parameters > Parallel Mode, and select "Three-Phase Master".



Navigate to: Settings > System Settings > System Parameters > Parallel Phase, and select "A Phase"> Battery parallel mode, and select "Unified".



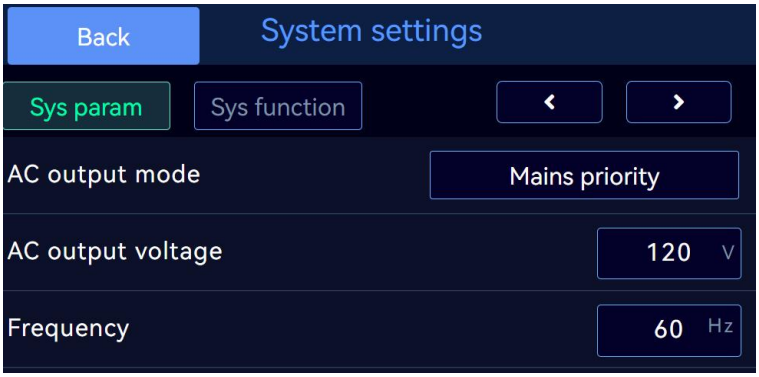
NOTICE

After completing the above steps and returning to the main interface, if the inverter reports a parallel fault, this is normal because the other parallel units are not powered on. No action is required.

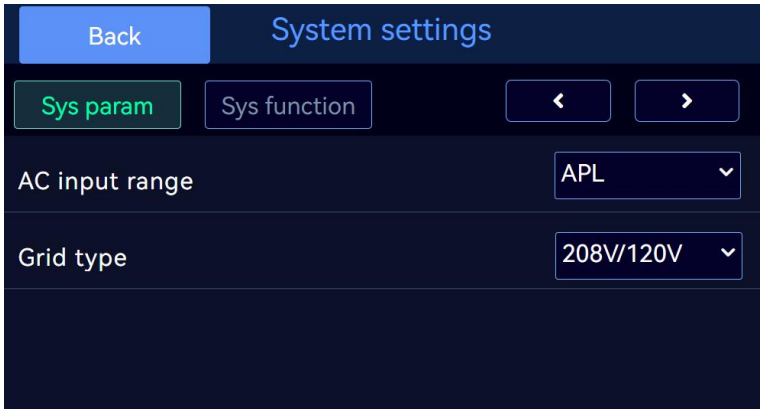
Power off the master unit, power on Slave 1, and configure the parallel settings for Slave 1.

1) Verify that the UI and software versions are the latest and consistent with the master unit.

2) Ensure the AC output voltage and frequency match the local utility grid.

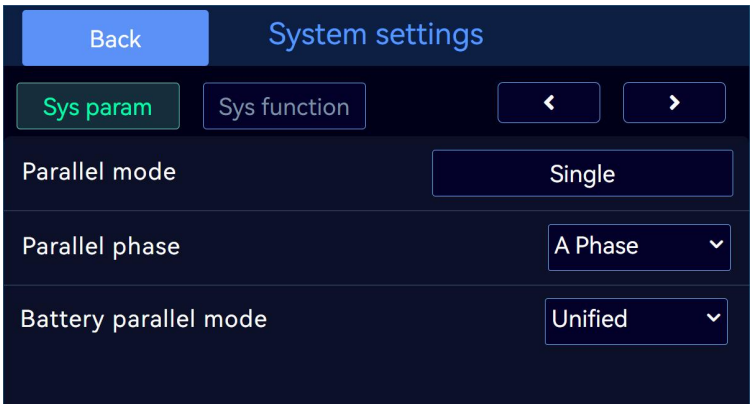


3) Set the Grid Type to 208V/120V(L1-L2 120°).

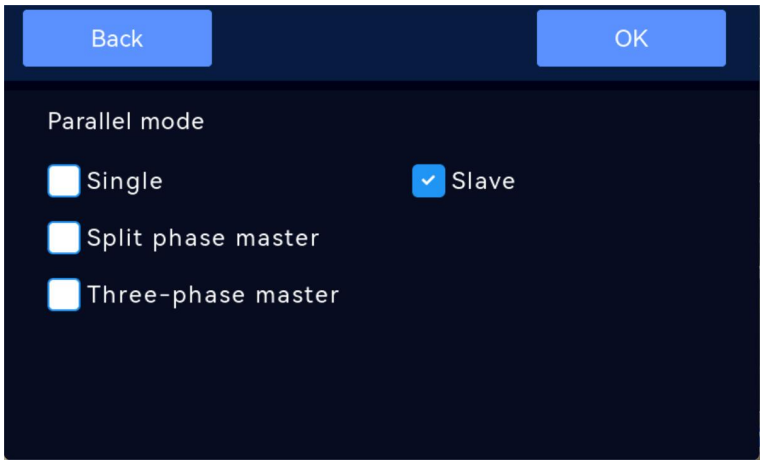


4) To change the parallel mode,Parallel Phase and Battery Parallel Mode.

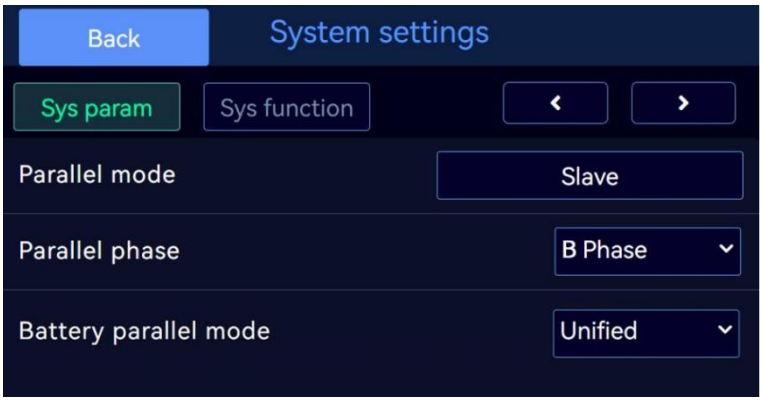
Navigate to: Settings > System Settings > System Parameters



Navigate to: Settings > System Settings > System Parameters > Parallel Mode, and select “Slave”.



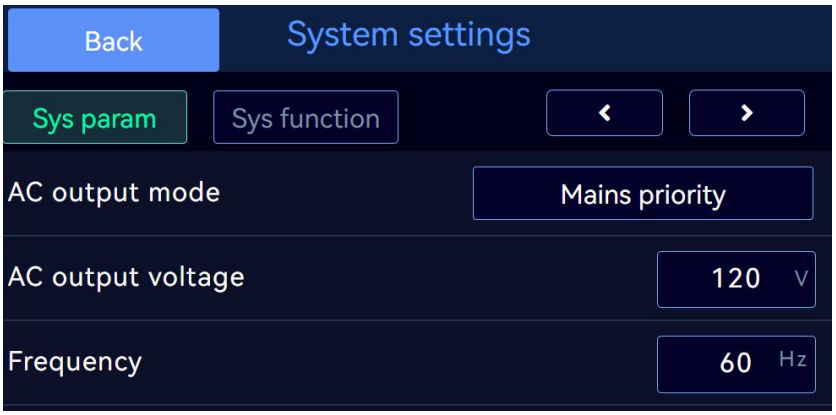
Navigate to: Settings > System Settings > System Parameters >Parallel Phase, and select “B Phase”> Battery parallel mode, and select “Unified”.



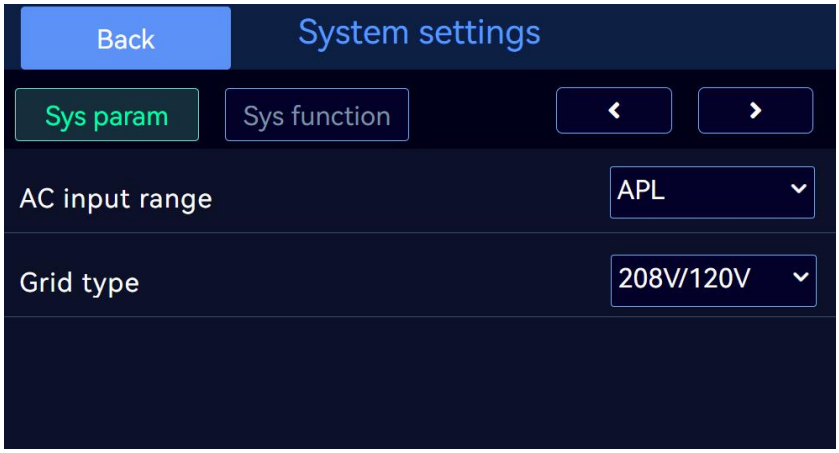
Power off Slave 1, power on Slave 2, and configure the parallel settings for Slave 2.

1) Verify that the UI and software versions are the latest and consistent with the master unit.

2) Ensure the AC output voltage and frequency match the local utility grid.

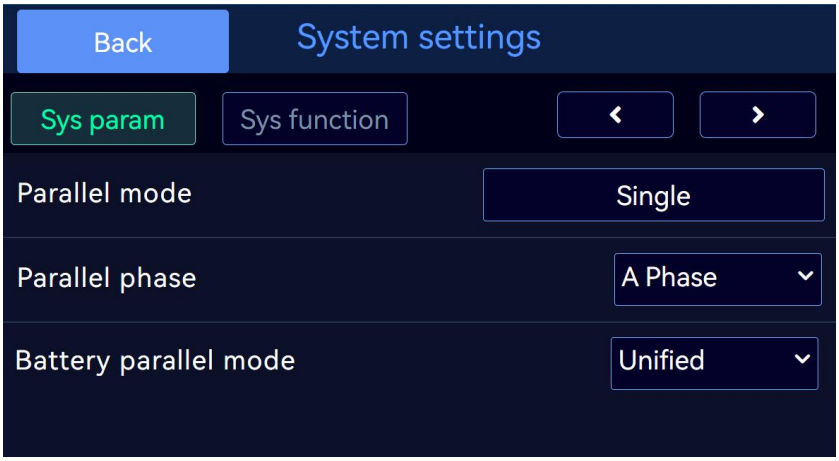


3) Set the Grid Type to 208V/120V(L1-L2 120°).

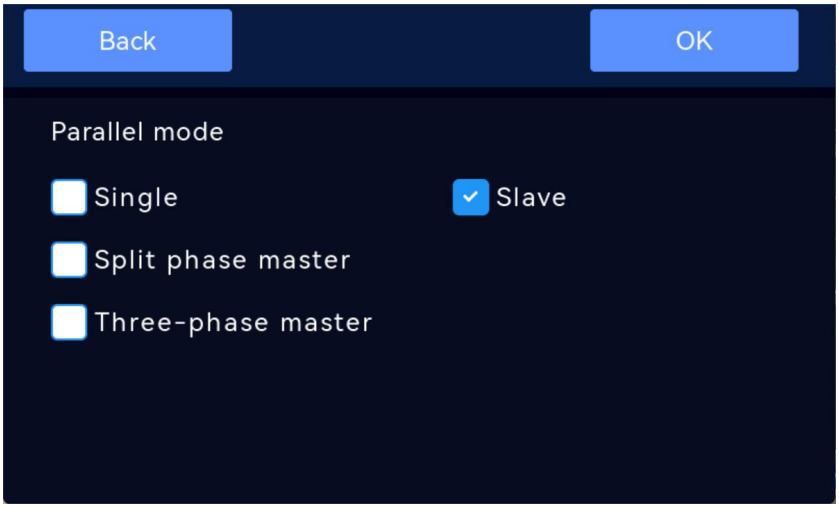


4) To change the parallel mode,Parallel Phase and Battery Parallel Mode.

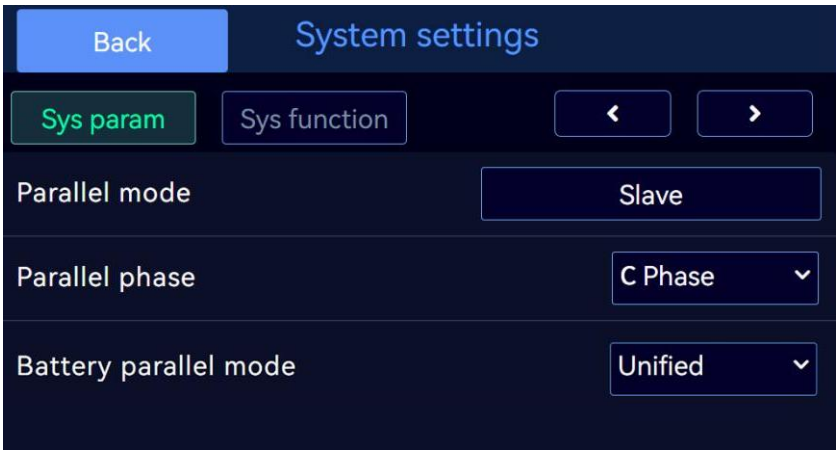
Navigate to: Settings > System Settings > System Parameters



Navigate to: Settings > System Settings > System Parameters > Parallel Mode, and select “Slave”.



Navigate to: Settings > System Settings > System Parameters > Parallel Phase, and select “C Phase”> Battery parallel mode, and select “Unified”.



After the configuration of Slave 2 is completed, turn off the switch.



During configuration, only one unit shall be powered on at any time. After completing the above steps and returning to the main interface, if the inverter reports a parallel fault, this is normal. Since the other parallel units have not been configured and powered on, no action is required. Once all units are fully configured, power all units on simultaneously; the parallel fault will clear.

Notice:

Please follow this power- on sequence:

Turn on the battery switch and wait for 30 seconds. Confirm the battery runs stably without alarms, then close the circuit breaker.

1. After turning on the inverter switch, wait for the unit to stabilize.
2. Before closing the circuit breaker, use a multimeter to verify stable grid voltage.
3. Before closing the circuit breaker, measure the open- circuit voltage with a multimeter to ensure it does not exceed the MPPT open- circuit voltage (500V for this model). After all devices are enabled, run under no load for ten minutes to confirm the system has no alarms and the voltage is normal and stable.
4. Turn on loads gradually from low to high power. Observe whether the voltage and current of Phase A, B and C are stable and balanced, and keep the system running stably for no less than 30 minutes.

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