

Version: V2.1

# Photovoltaic Energy Storage Inverter

## User Manual



Model:KE-5KC5L1EF / KE-6KC5L1EF

# Catalogue

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# 1. Safety Precautions

## 1.1 How to Use This Manual

- This manual contains important information, guidelines, operation instructions, and maintenance details for the following models: **KE-5KC5L1EF**, **KE-6KC5L1EF**.
- Users must follow the content of this manual during installation, operation, and maintenance.

## 1.2 Meanings of Symbols in the Manual

Symbol	Description
	<b>DANGER:</b> Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	<b>WARNING:</b> Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	<b>CAUTION:</b> Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
	<b>NOTICE:</b> Provides some tips regarding the operation of the product.

## 1.3 Safety statement

### **DANGER**

- 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 Introduction

### 2.1 Product Description

---

The series of energy storage hybrid inverters connect, coordinate, and control photovoltaic systems, energy storage batteries, the power grid, and loads. They provide stable, safe, and clean electrical energy for residential, commercial, and industrial users, meeting energy demands in various scenarios

### 2.2 Product Features

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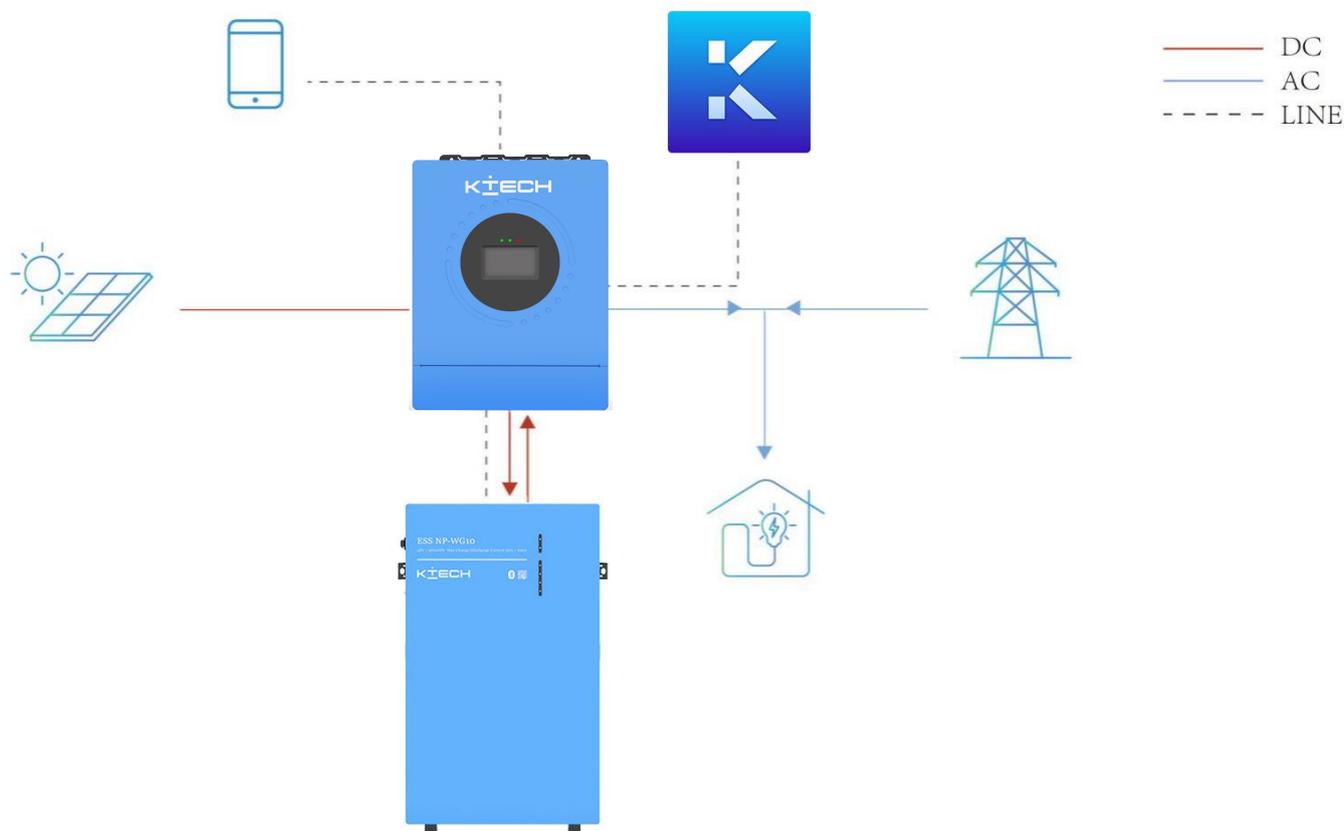
- Supports various types of energy storage batteries, such as lead - acid batteries and lithium - ion batteries.
- Supports single - phase parallel operation and three - phase pure sine - wave output in parallel units.
- The voltage level of 200 - 260V can be selected for single - unit or parallel systems.
- Supports single-channel photovoltaic input and features the function of simultaneously tracking MPPT maximum power charging/carrying capacity for one channel. The MPPT efficiency reaches up to 99.9%, and the maximum current per channel is 27A.
- Features two output modes: mains bypass and inverter output, and has an uninterruptible power supply function.
- Offers four charging modes: photovoltaic only, mains - priority, photovoltaic - priority, and hybrid charging.
- Supports timed battery charging and timed battery discharging.
- The single - unit energy - saving mode function reduces no - load energy loss.
- Equipped with multiple protection functions to comprehensively protect the safety of photovoltaic panels, batteries, loads, and the controller itself.
- Features a capacitive intelligent touch - screen, menu - based operation, and intuitive and convenient parameter setting.
- Supports 256 event records; supports 512 days of historical data storage.
- Built - in Bluetooth and WiFi , providing native cloud - platform access capabilities. It can automatically synchronize time after connection.

## 2.3 System Connection Diagram

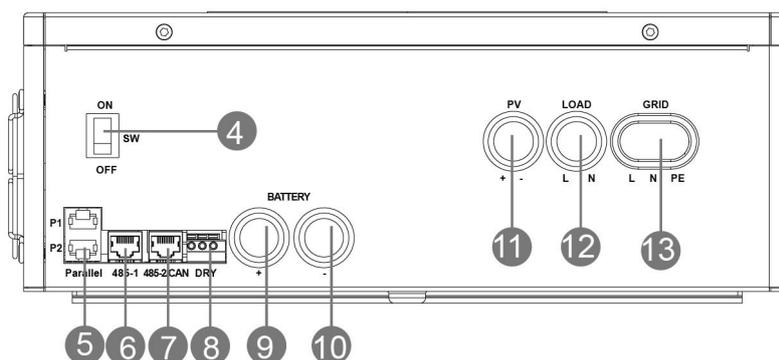
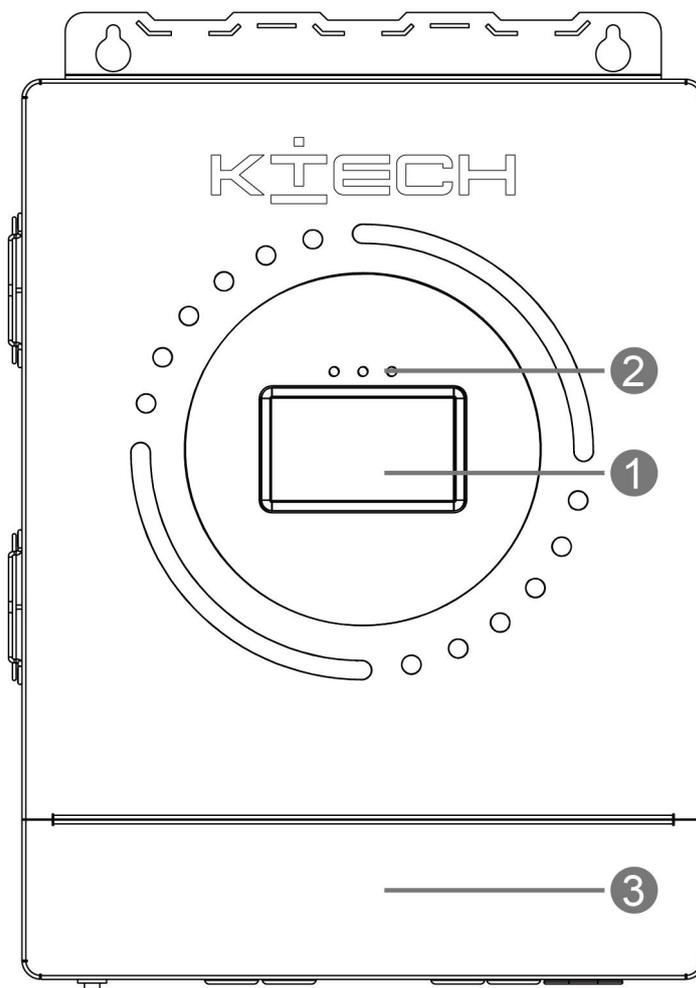
The following figure shows the system application scenarios of this product. A complete system consists of the following parts:

1. Photovoltaic Modules: These convert light energy into DC electrical energy. They can charge the battery through the inverter or be directly inverted into AC power to supply power to the load.
2. Mains Power or Generator: Connected to the AC input, it can supply power to the load and charge the battery simultaneously. When the battery and photovoltaic modules supply power to the load, the system can generally operate without mains power or a generator.
3. Battery: The function of the battery is to ensure the normal power supply to the system load when the photovoltaic power is insufficient or there is no mains power.
4. Loads: Various household and office loads can be connected, including refrigerators, lights, televisions, fans, air conditioners, and other AC loads.
5. Inverter: It is the energy conversion device of the entire system.

### Actual Application Scenario Diagram:



## 2.4 Product Overview



1	Capacitive touch screen	2	LED indicator	3	Terminal protection cover
4	ON/OFF rocker switch	5	Parallel Communication Port	6	RS485-1 Port
7	CAN/RS485-2 Port	8	Dry contact	9	Battery Interface (Positive)
10	Battery Interface (Negative)	11	Photovoltaic Interface	12	AC output (L+N)
13	AC input (L+N+PE)				

## 2.5 Product Parameter Table

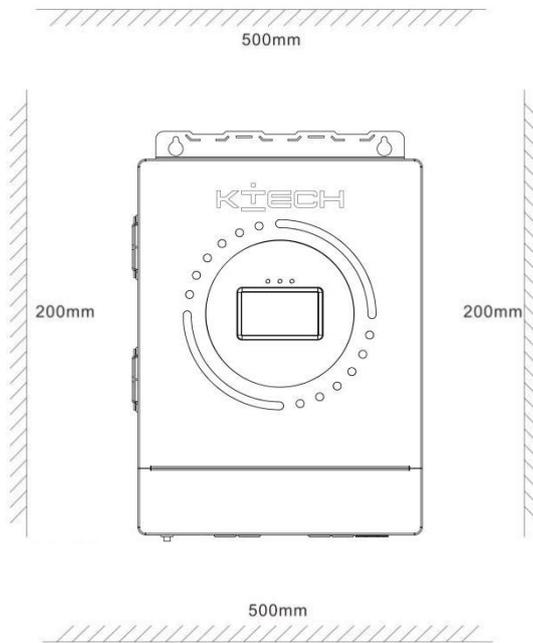
Model	KE-5KC5L1EF	KE-6KC5L1EF
<b>Inverter output</b>		
Output rated power	5,000W	6,000W
Peak output power	10,000W	12,000W
Rated output voltage	230V (Single-phase)	
Rated frequency	50/60Hz	
Output waveform	Pure sine wave	
Switching time	10ms (typical value)	
<b>Battery</b>		
Battery type	Lithium - ion battery / Lead - acid battery / User - defined	
Rated battery voltage	48V	
Voltage range	40~60V	
Maximum photovoltaic charging current	120A	
Maximum mains/generator charging current	100A	
Maximum hybrid charging current	120A	
<b>Photovoltaic Input</b>		
MPPT path	1	
Maximum input power	7500W	9000W
Maximum input current	27A	
Maximum open circuit voltage	500V	
MPPT Operating voltage range	125~425V	
<b>Mains Power/Generator Input</b>		
Input voltage range	170~280V±7V (UPS) ;90~280V±7V (APL)	
Input frequency range	50/60Hz	
Bypass overload current	63A	
<b>Efficiency</b>		
MPPT tracking efficiency	99.9%	
Maximum battery inversion efficiency	93%	
<b>General</b>		
DimensionsW*H*D)	472*355*130mm (Without Bracket)	
Weight	14.5kg (Net weight)	
Ingress protection	IP20, For indoor use only	
Operating ambient temperature	-10~55°C,>45°C derating	
Noise	≤45dB	
Cooling method	Intelligent Air Cooling	
Warranty period	3 Years	
<b>Communication</b>		
Communication method	RS485/CAN/GPRS/WiFi/Bluetooth/4G/LAN (Optional)	
<b>Certification</b>		
Overview	IEC62109-1,IEC62109-2,EN61326-1:2013	

# 3.Installation

## 3.1 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 to install the inverter.
- Install the inverter at a height level with the line of sight.
- Ensure sufficient clearance around the inverter:  $\geq 200\text{mm}$  on both sides and  $\geq 500\text{mm}$  at the top.
- Ambient temperature:  $-10\sim 55^{\circ}\text{C}$ ; avoid direct sunlight, humidity, and dust! To ensure optimal operation.



### **DANGER**

- 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.

### **WARNING**

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

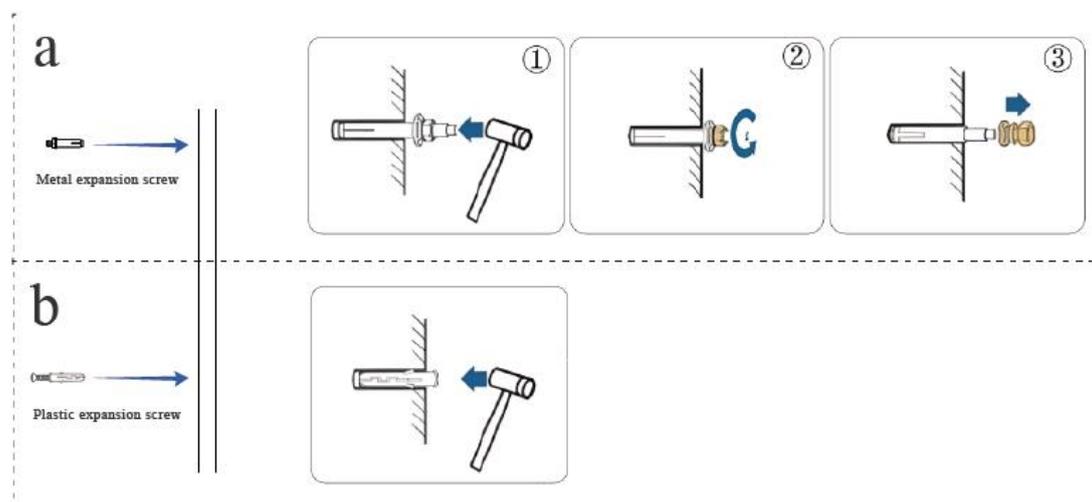
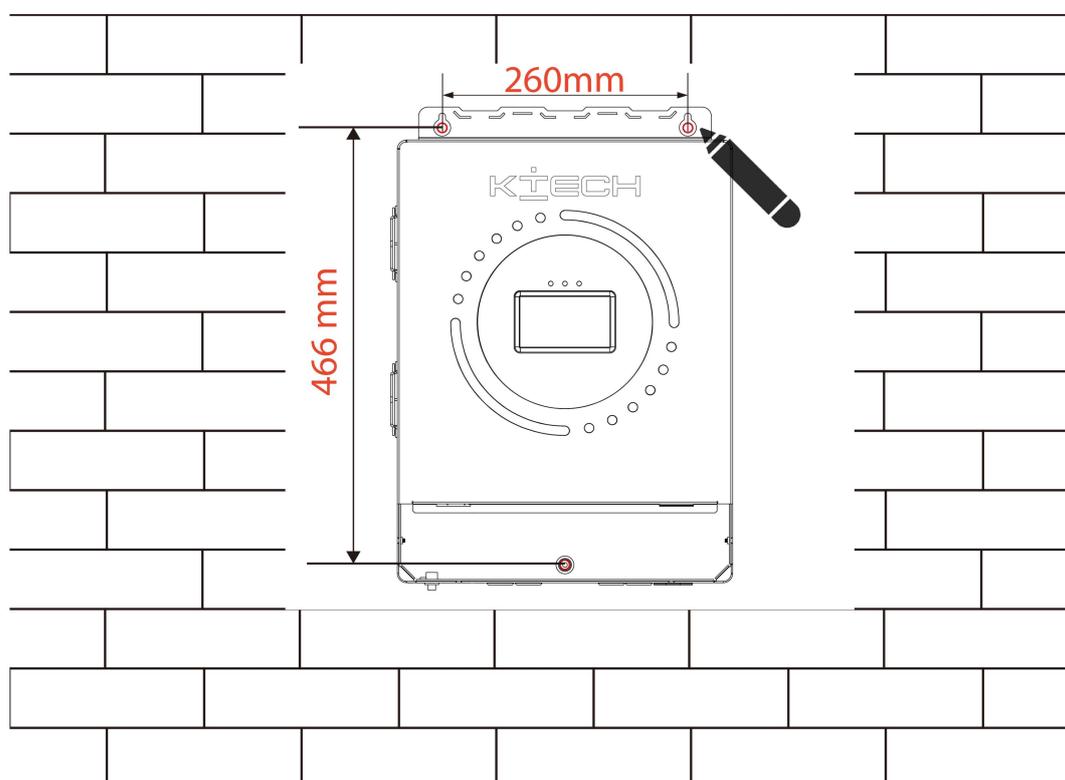
## 3.2 Install the Machine

### 3.2.1 Installing the expansion screws

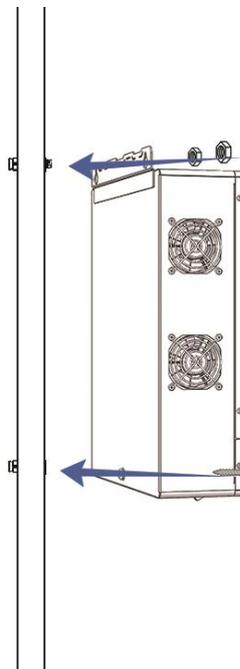
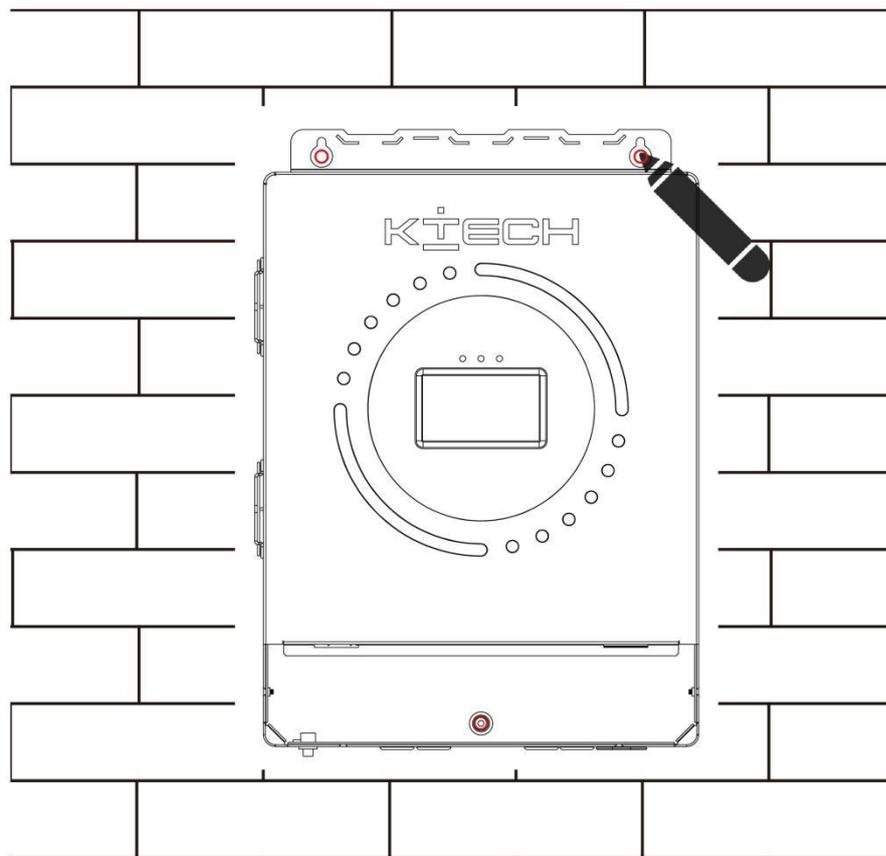
Drill 3 mounting holes on the wall according to the specified dimensions and aligning with the inverter's mounting holes.

a. Drive the metal expansion bolt into the wall, tighten the nut to make the expansion bolt open its expanding feet; then remove the washer and nut.

b. Drive the plastic expansion tube into the wall.



## 3.2.2 Installing the Inverter

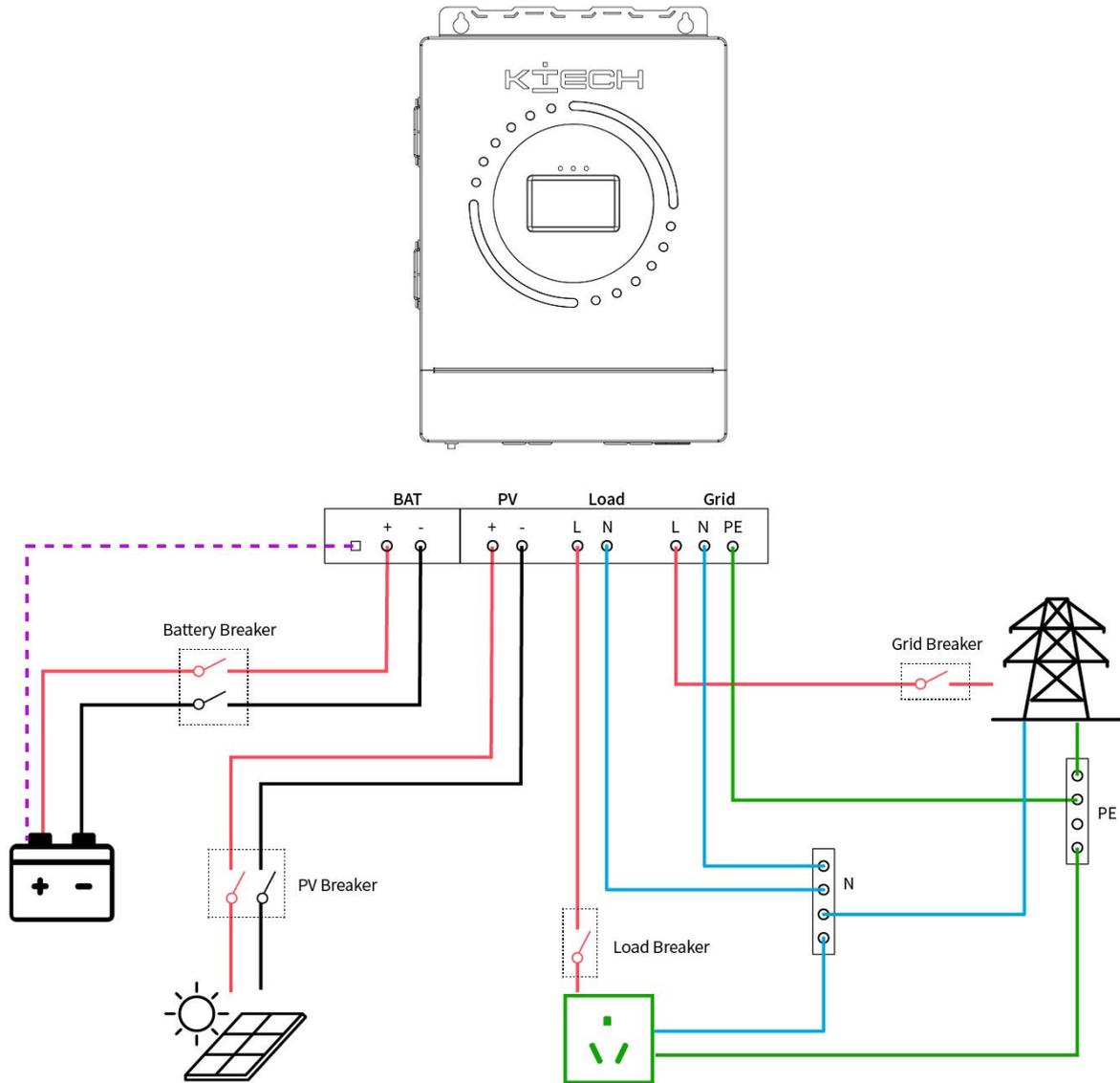


### NOTICE

•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.

### 3.3 Schematic Diagram for Single - phase Connection

 Do not reverse the positive and negative battery!



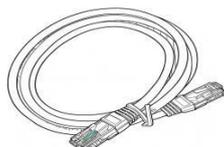
## 3.4 Parallel Wiring Connection

### 3.4.1 Introduction

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- 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 line \*1



### 3.4.2 Precautions for Connecting Parallel Connection Wires

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#### 1) PV Wiring:

When making parallel connections, different inverters should be connected to different PV arrays or PV sources. Do not connect the same PV to different inverters.

#### 2) Battery Wiring:

For single - phase or three - phase parallel connections, all inverters must be connected to the same battery. Connect BAT+ to BAT+ and BAT - to BAT -, and ensure that the connections are correct before power-on, and that the wiring lengths and wire gauges are the same. Incorrect connections may cause abnormal operation of the parallel system output.

#### 3) AC OUT Wiring:

##### a) Single - phase Parallel Wires

When making single - phase parallel connections, for all inverters, connect L to L, N to N, and PE to PE. Ensure that the connections are correct before power-on, and that the wiring lengths and wire gauges are the same. Incorrect connections may lead to abnormal operation of the parallel system output.

##### b) Three - phase Parallel Wires

When making three - phase parallel connections, all inverters must have their N wires connected to each other and their PE wires connected to each other. The L wires of all inverters in the same phase should be connected together, but the L wires of AC outputs in different phases should not be connected.

#### 4) AC IN Wiring:

Single - phase Parallel Connection: For single - phase parallel connections, all inverters must have their L wires connected to each other, N wires connected to each other, and PE wires connected to each other. Ensure that the connections are correct before power-on, and that the wiring lengths and wire diameters are the same. Incorrect connections may cause abnormal operation of the parallel system output. Meanwhile, to avoid damage to the inverter or external electrical equipment, do not have multiple different AC power sources for input. It is necessary to ensure the consistency and uniqueness of the AC power source input.

Three - phase Parallel Connection: When making three - phase parallel connections, all inverters must have their N wires connected to each other and their PE wires connected to each other. The L wires of all inverters in the same phase should be connected together, while the L wires of AC inputs in different phases should not be connected.

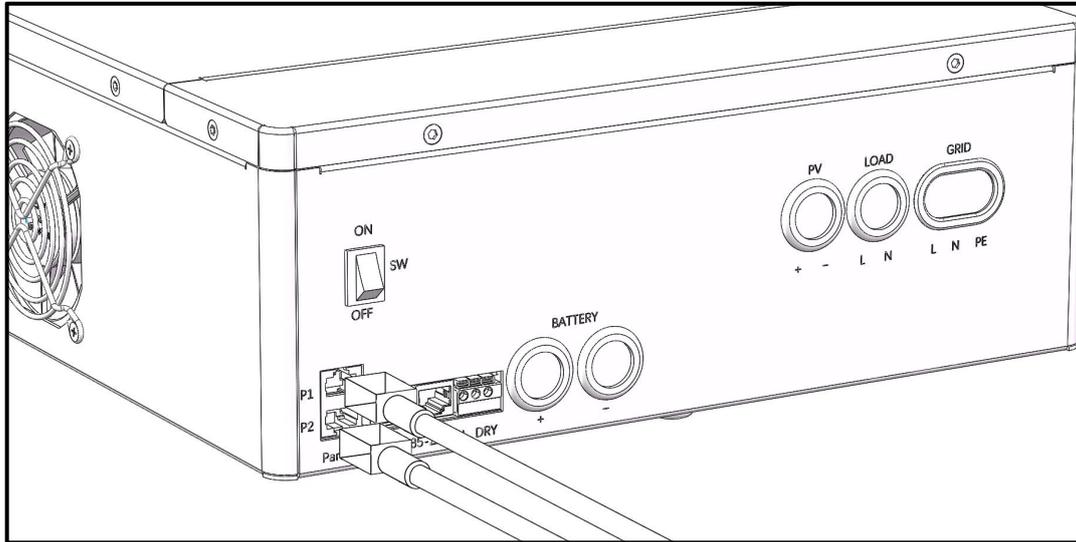
### **5) Parallel Communication Cable Wiring:**

The communication cable is used for single - phase or three - phase parallel connections. When connecting each unit, it should follow a one-out-one-in principle. That is, the male connector (out) of the local unit should be connected to the female connector (in) of the unit to be paralleled. Do not connect the male connector of the local unit to its own female connector. Meanwhile, for each unit, make sure the parallel communication cable is tightened with screws to prevent the cable from falling off or having poor contact, which could cause abnormal operation or damage to the system output.

REMINDER: Put the Parallel operation communication PIN to ON status for the first and the last inverter and OFF for inverters in between. Both switches in the “ON” position translates to address 1. Both switches in the “OFF” position translates to address 0.

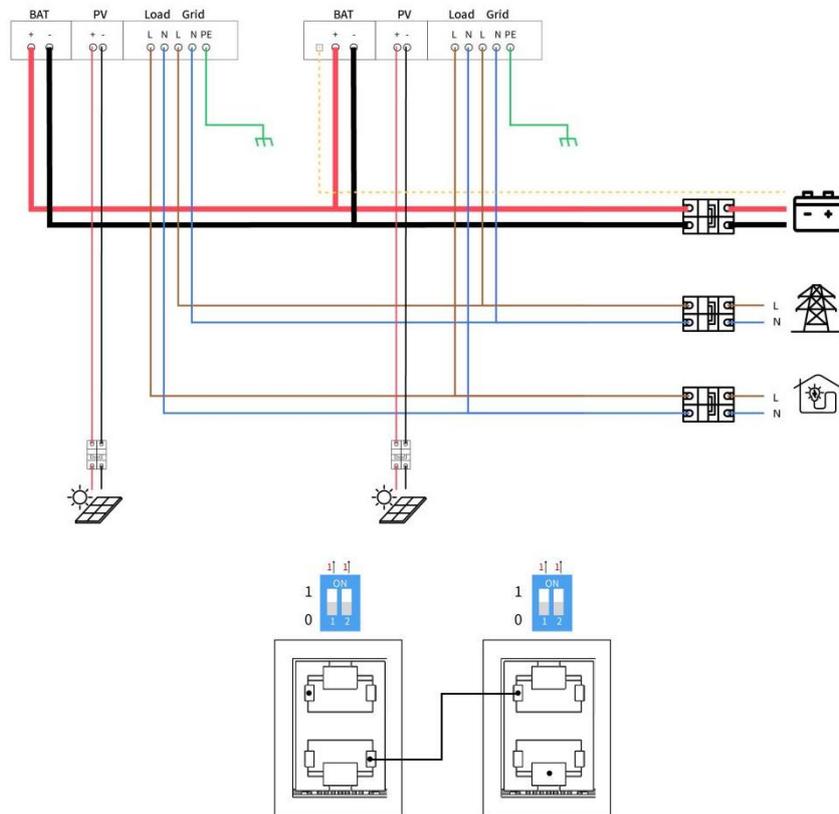
### 3.4.3 Schematic Diagram for Single - phase Parallel Connection Guidance

The communication cables for inverter parallel operation shall be securely connected. See the diagram below.

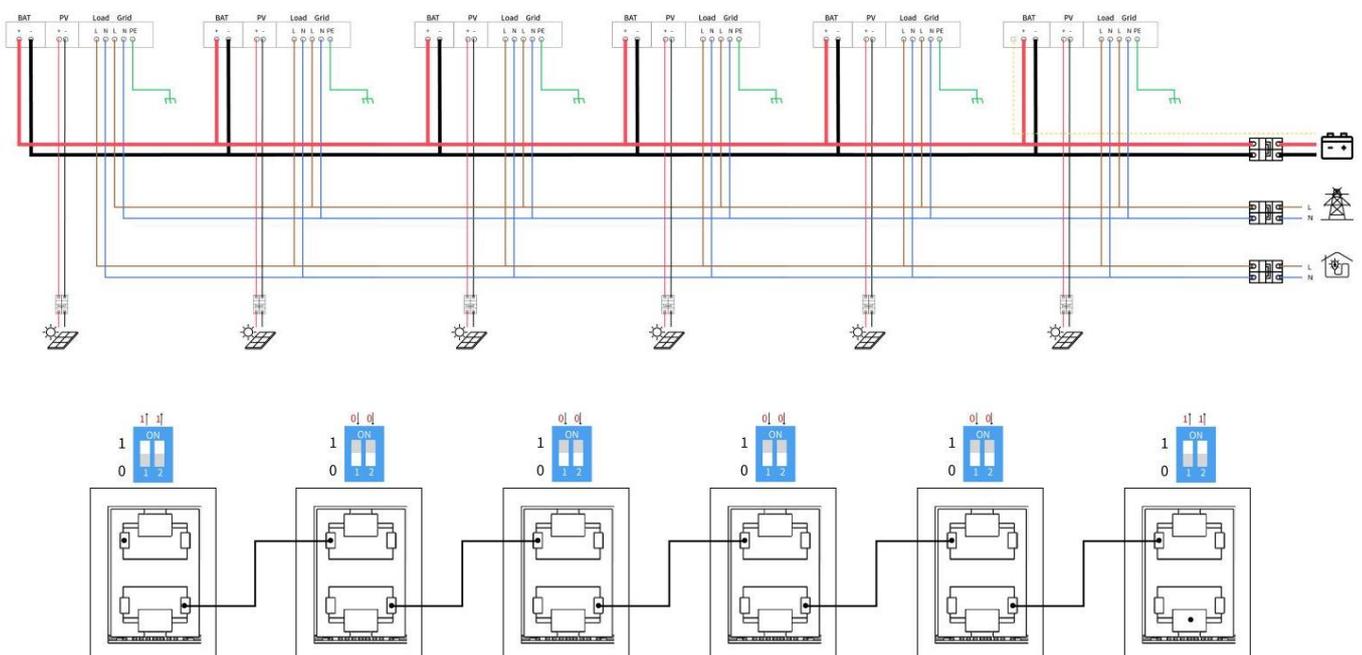


When multiple units are connected in parallel, the schematic diagram for parallel connection guidance is as follows:

**a) Parallel Connection of Two Inverters in the System:**

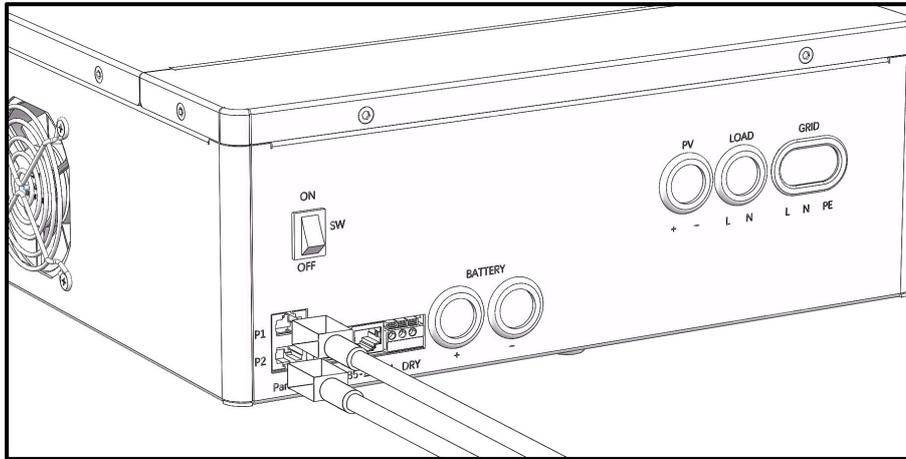


**b) Parallel Connection of Six Inverters in the System:**



### 3.4.4 Schematic Diagram for Three - phase Parallel Connection Guidance

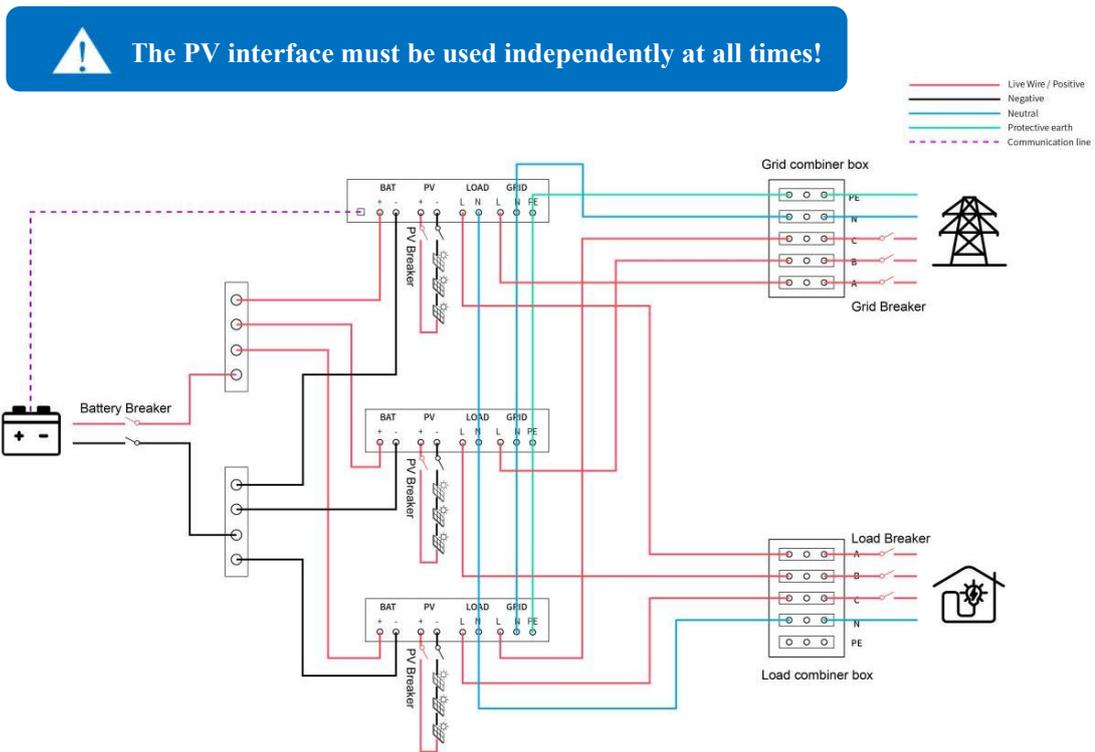
The communication cables for inverter parallel operation shall be securely connected. See the diagram below.



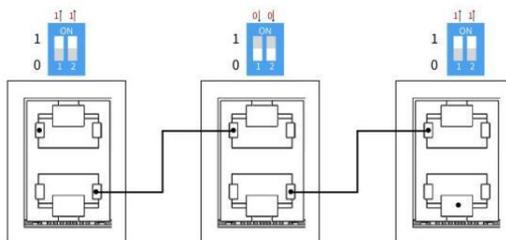
### Three - phase parallel connection

Three devices constitute a three-phase separation system

1+1+1 system



**Before paralleling, be sure to read the instruction manual carefully and operate in accordance with the guidelines!**



## Note:

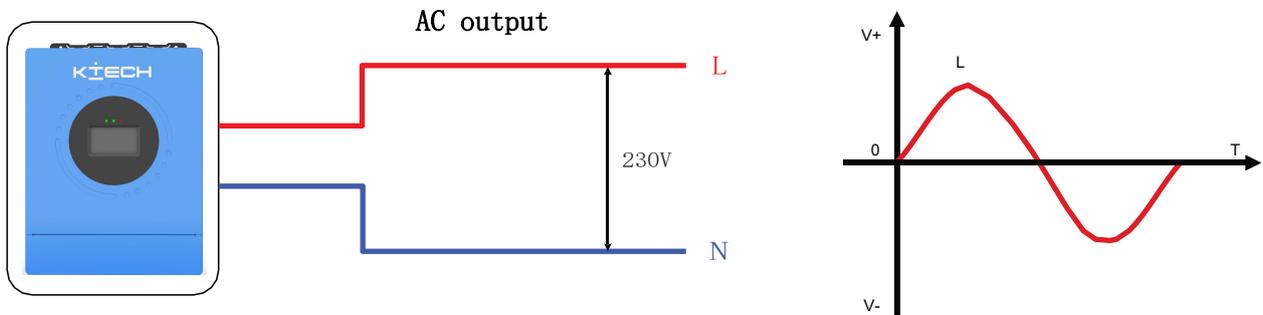
- 1) Before powering on and lighting up the screen, check whether the wiring is correct according to the above wiring diagram to avoid system problems.
- 2) All connections should be fixed and strong to avoid system failure caused by wire loss.
- 3) When the AC output is connected to the load, the wiring should be correct according to the requirements of the electrical load equipment to avoid damage to the load equipment.
- 4) The communication output voltage must be set to a consistent value, or only the host can be configured. When operating in parallel mode, the voltage set by the host shall prevail, and the host shall forcibly rewrite the remaining slaves to keep them consistent. This option can only be set in standby mode.
- 5) Machine factory defaults to stand-alone mode, if you use a weaver or three-phase function, need to set the weaver mode through the screen. The setting method is:

Each time the power is turned on, one machine is turned on and the rest are turned off. Then, the parallel mode and phase are set according to the on-site system operation mode. For single-phase parallel units, set up the single-phase parallel unit main unit, slave unit, and slave unit in sequence. Three-phase parallel units are set in sequence as three-phase parallel main unit, slave unit, and slave unit, and the phases are set in sequence as A phase, B phase, and C phase. After the machine is successfully set up, turn off the machine switch, wait for the machine to be powered on, and then set the other machines in sequence until all machines are set up. At the same time, all machines should be powered on again and enter the working state.

- 6) After the system is running, the measurement output voltage is correct, and then the load is connected to set.

## 4. Wiring

### 4.1 Single - phase Mode

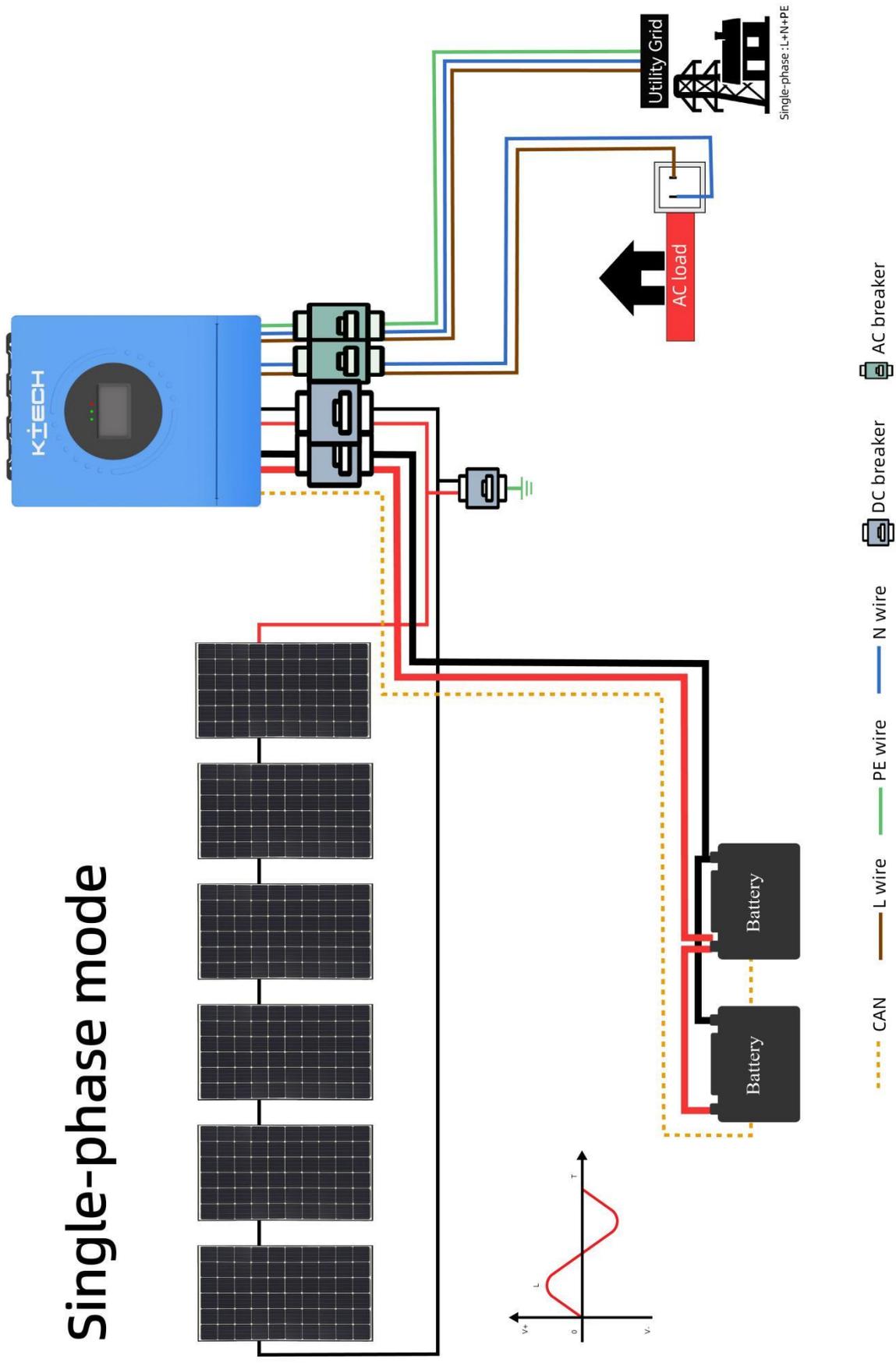


Item	Description
Applicable Models	CT-5KC5L1EF/CT-6KC5L1EF
AC Output Phase Voltage (L - N)	200~260V, 230V default

#### NOTICE

- Users can change the output voltage through the setting menu.
- The output voltage can be set within the range of 200V to 260V

# Single-phase mode



## 4.2 Cable and Circuit Breaker Selection

### ● Photovoltaic input

Model	Wire Diameter	Maximum Input Current	Circuit Breaker Specification
KE-5KC5L1EF	4mm <sup>2</sup> / 8 AWG	27A	2P-32A
KE-6KC5L1EF	4mm <sup>2</sup> / 8 AWG	27A	2P-32A

### ● AC Input

Model	Output Mode	Maximum Current	Wire Diameter	Circuit Breaker Specification
KE-5KC5L1EF	Single-phase	63A (L/N)	25mm <sup>2</sup> /4 AWG (L/N)	2P-63A
KE-6KC5L1EF	Single-phase	63A (L/N)	25mm <sup>2</sup> /4 AWG (L/N)	2P-63A

### ● Battery

Model	Wire Diameter	Maximum Current	Circuit Breaker Specification
KE-5KC5L1EF	50mm <sup>2</sup> / 2/0 AWG	120A	2P-125A
KE-6KC5L1EF	50mm <sup>2</sup> / 2/0 AWG	120A	2P-125A

### ● AC Output

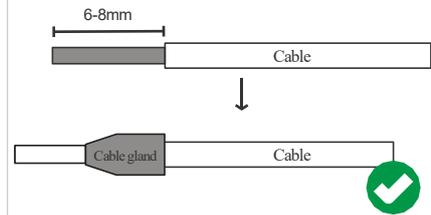
Model	Output Mode	Maximum Current	Wire Diameter	Circuit Breaker Specification
KE-5KC5L1EF	Single-phase	63A (L/N)	25mm <sup>2</sup> /4 AWG (L/N)	2P-63A
KE-6KC5L1EF	Single-phase	63A (L/N)	25mm <sup>2</sup> /4 AWG (L/N)	2P-63A



## NOTICE

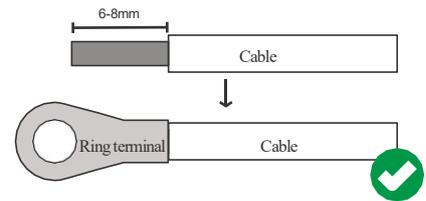
- For the photovoltaic input, AC input, and AC output terminals.

1. Use a wire stripper to remove 6 - 8mm of the insulation layer of the cable.
2. Fix a cable gland at the end of the cable (the cable gland needs to be prepared by the user).



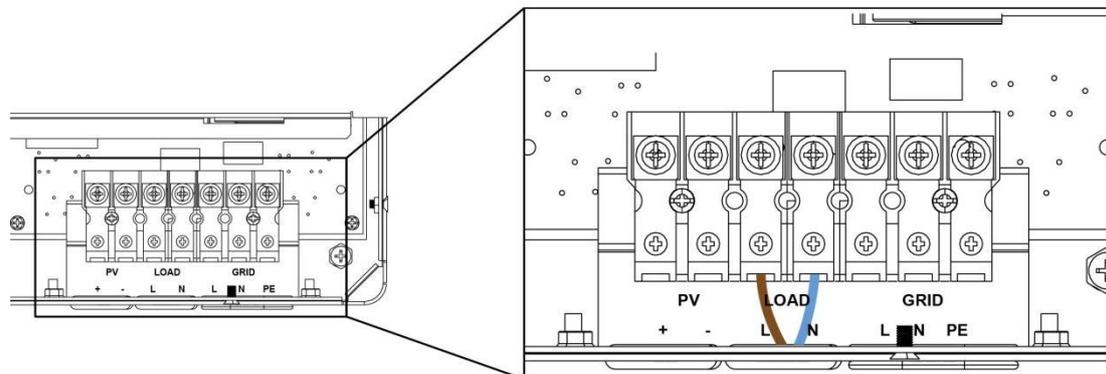
- Battery Terminal

1. Use a wire stripper to remove 6 - 8mm of the insulation layer of the cable.
2. Fix the ring terminal (provided with the box) at the end of the cable.

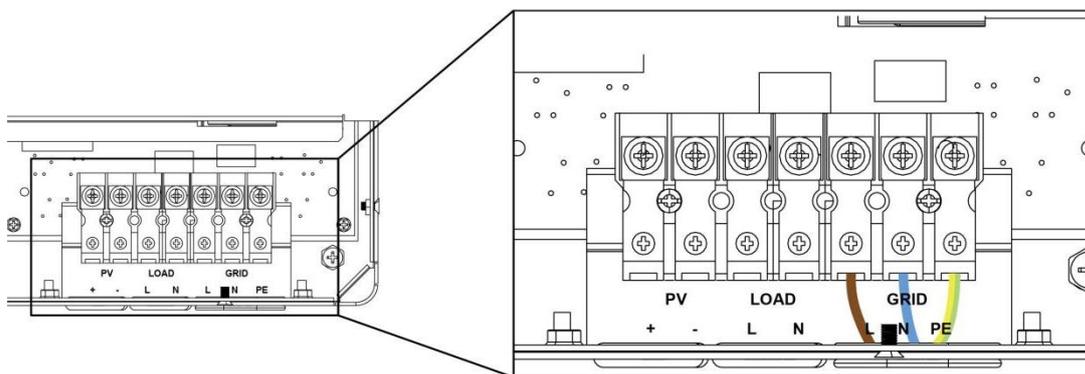


## 4.3 AC Input and Output Wiring

Connect the live wire, neutral wire, and ground wire according to the cable position and sequence shown in the figure below.



### AC Output



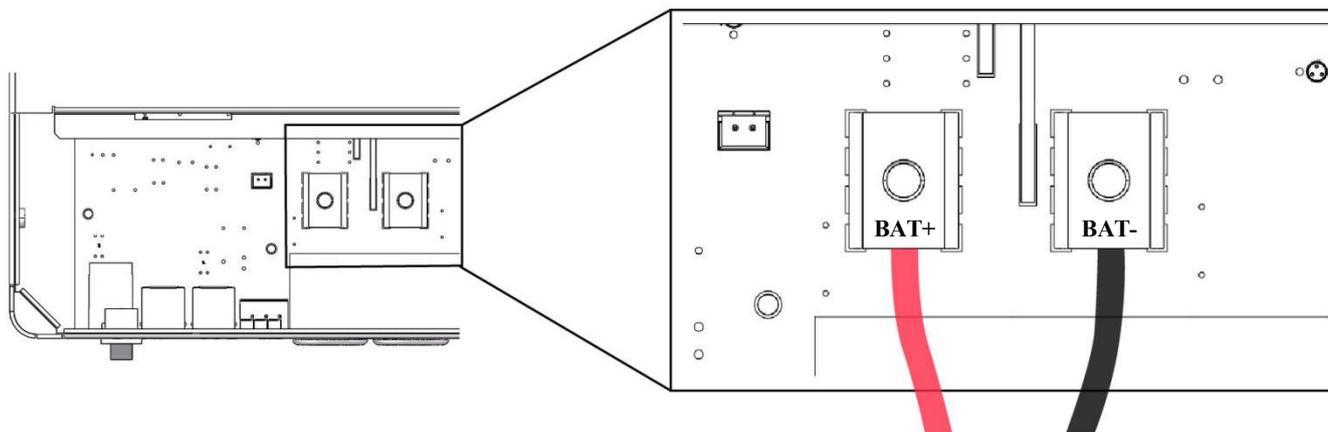
### AC Input

#### 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.

## 4.4 Battery Wiring

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

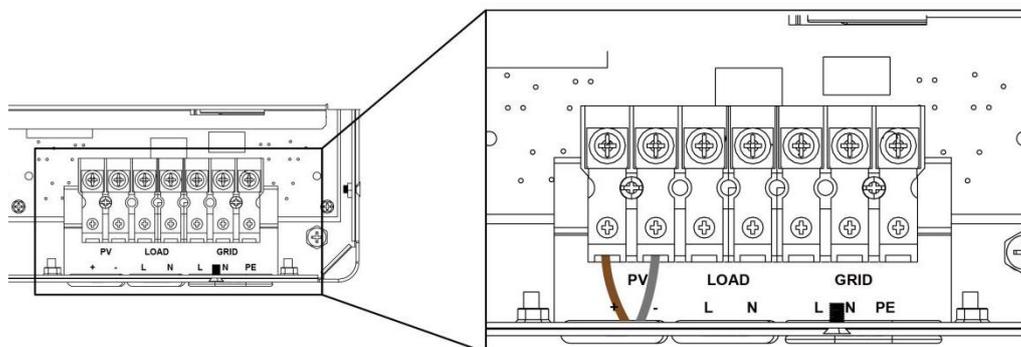


### DANGER

- 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 risk of electric shock. Do not operate with power on.
- Make sure that the positive and negative terminals of the battery are connected correctly. Do not reverse them, otherwise the inverter may be damaged.
- Check whether the cable used is sufficient to meet the requirements, too thin, poor quality cable will have serious safety risks.

## 4.5 Photovoltaic Wiring

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

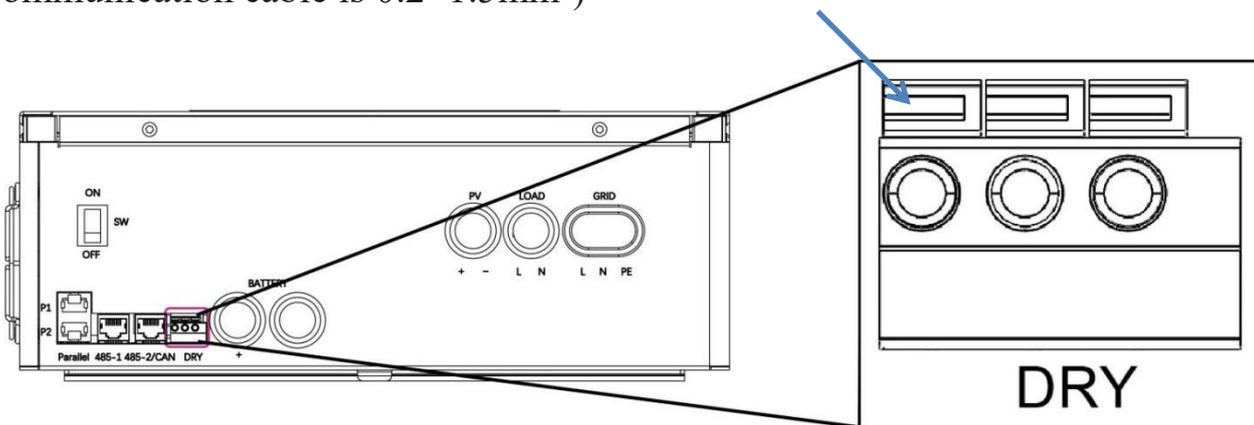


## DANGER

- 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  $\leq$  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.

## 4.6 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<sup>2</sup>)



## 4.7 Final Installation

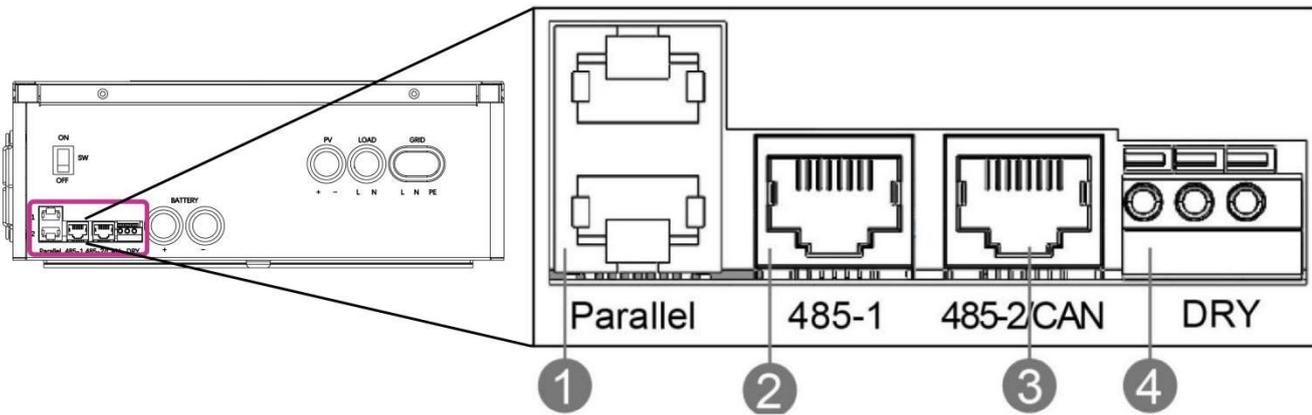
After ensuring that the wiring is reliable and the wire sequence is correct, restore the terminal protection cover to its original position.

## 4.8 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.

# 5.Communication

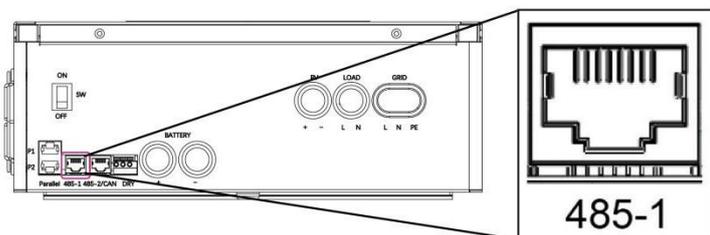
## 5.1 Overview



<b>1</b>	Parallel Port	<b>2</b>	RS485-1Port	<b>3</b>	CAN/RS485-2 Port	<b>4</b>	Dry Contact
----------	---------------	----------	-------------	----------	------------------	----------	-------------

## 5.2 RS485-1 Port

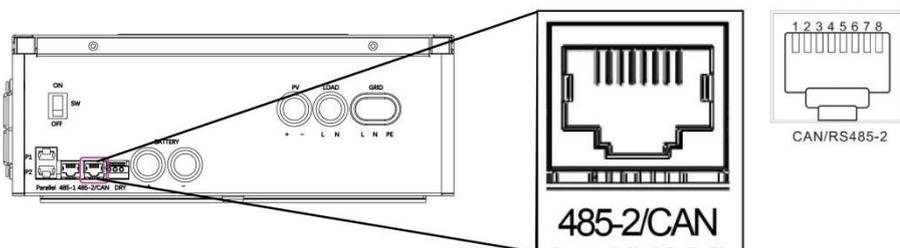
Port RS485-1 is a data expansion port.



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

## 5.3 CAN/RS485-2 Port

The CAN/RS485-2 port can be used to connect to the BMS (Battery Management System) of lithium-ion batteries.

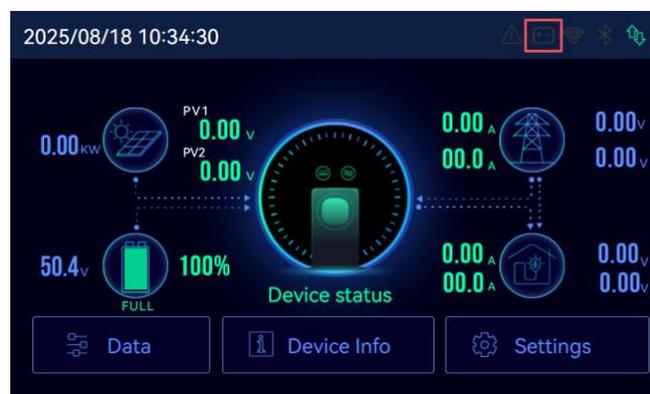


RJ45	Definition
Pin 1	5V
Pin 2	GND
Pin 3	/
Pin 4	CANH
Pin 5	CANL
Pin 6	/
Pin 7	RS485-A
Pin 8	RS485-B

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:



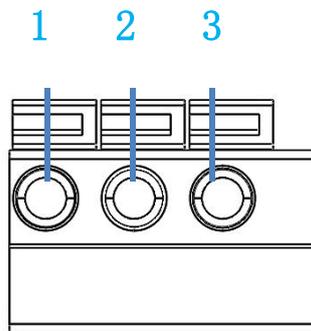
### NOTICE

If you need the inverter to communicate with the lithium battery BMS, please contact us to learn about the communication protocol or upgrade the inverter to the corresponding software program.

If you use a common RJ45 network cable, please check the pin definition. Pins 1 and 2 typically need to be cut off for normal operation.

## 5.4 Dry Contact Port

### Dry Contact Signal



Function	Description
Generator Remote Start/Stop	<p>When the battery voltage reaches the undervoltage alarm level or the voltage point for battery-to-mains switching, Pin 2 to Pin 1 is in normally open (NO) state, and Pin 3 to Pin 1 is in normally closed (NC) state.</p> <p>When the battery voltage reaches the voltage point for mains-to-battery switching or the battery is fully charged, Pin 2 to Pin 1 is in normally closed (NC) state, and Pin 3 to Pin 1 is in normally open (NO) state. (Pins 1/2/3 output 125V/1A, 230V/1A, 30V/1A respectively)</p>



### 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.

## 5.5 Bluetooth

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



**IOS**



**Android**



**Chinese Android**

## 5.6 WIFI

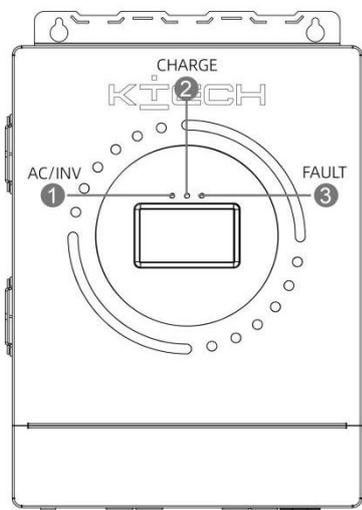
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After configuring the internet connection in the App, the device can connect to the Xiaoai Assistant/Wisehome cloud platform.

**Please note:** When setting the Wi-Fi name in the App, use only English letters and numbers (name must be less than 32 characters). Chinese characters and special symbols are not allowed. The password must also consist of English letters and numbers (8–16 characters in length). Chinese characters and special symbols should not be included.

# 6.Interface Operation (Based on UI version 1.3.0.12)

## 6.1 LED Indication



Pilot lamp	Pigment	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

### (1)Home Page

#### Correspond to the Sequence in the Diagram

- ① Display the current time on the device.
- ② This icon will not be displayed when the device is operating as a single unit; it only appears when the device is in parallel mode.If the device is the master unit, the "M" icon will be shown;If the device is the slave unit, the "S" icon will be shown.
- ③ Equipment failure: gray when the equipment is not faulty, red when the equipment is faulty.
- ④ Battery BMS communication connection status,when connected to the battery and BMS communication is normal, the icon is green, not connected is gray.
- ⑤ WIFI, connection status, when the device is connected to 2.4G-WIFI, it is green, and gray when not connected.
- ⑥ Bluetooth connection status. When the APP connects to the device through Bluetooth, the icon is green and gray when not connected.
- ⑦ Equipment communication status: green when the equipment is normal, otherwise gray (Note: When the equipment is gray, contact the staff for processing).



Long press the large icon in the middle of the inverter to set whether to manually shut down the machine. After the machine stops, if you need to continue running, long press this icon in the prompt box to confirm.

### Correspond to the Sequence in the Diagram

- ① Long press this icon for about 1s to enter the detailed PV data interface.
- ② Real-time PV total power.
- ③ Real-time voltage of PV1.
- ④ If the device supports two PV channels, this data shows the real-time voltage of PV2. If the device only supports one PV channel, this data is not available.



- ① Long press for about 1s to enter the detailed data interface of the power grid.
- ② If the equipment is single-phase, this data is not available, If the device is a split phase, the data shows the real-time current of the grid L1.
- ③ If the device is single-phase, this data shows the grid current. If the device is a split-phase, the data will show the real-time Current of the grid L2.
- ④ If the device is single-phase, this data shows the grid frequency. If the device is a split-phase, the data shows the real-time voltage of the grid L1.
- ⑤ If the device is single-phase, this data shows the grid voltage. If the device is a split-phase, the data shows the real-time voltage of the grid L2.



- ① Long press this icon for about 1s to enter the detailed battery data interface.
- ② Real-time voltage.
- ③ Percentage of battery capacity.
- ④ When this text is displayed, it means that the battery is full.

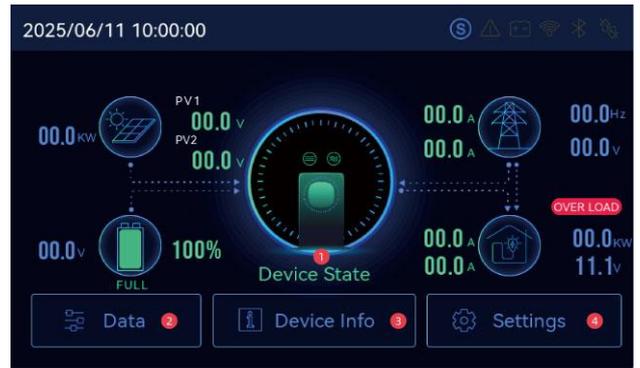


- ① Long press for about 1s to enter the load detailed data interface.
- ② If the device is a single camera, this data shows the real-time load current. If the device is a split-phase, this data shows the real-time load L1 current.
- ③ If the device is a single-phase, this data is not displayed. If the device is a split-phase, this data shows the real-time current of load L2.
- ④ If the device is a single-phase, this data shows the real time power of load. If the device is a split-phase, this data shows the real-time voltage of load L1.
- ⑤ If the device is a single phase, this data is real-time voltage of load. If the device is a split-phase, this data shows the real-time voltage of load L2.
- ⑥ When the device is a split-phase, this icon will be displayed.



### Correspond to the Sequence in the Diagram

- ① The running status of the device
- ② Click this icon to enter the viewable data menu interface
- ③ Click this icon to enter the device information interface
- ④ Click this icon to enter the device Settings data menu interface



### (2) PV Data Interface

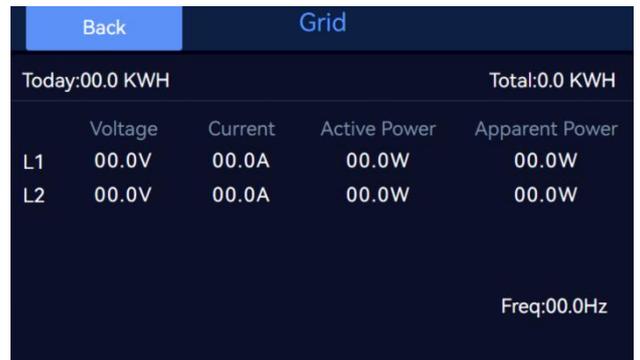
In this interface, the upper part shows the daily PV solar panel's PV power generation and total power generation, while the lower part shows the PV voltage, current and power respectively.



### (3) Grid Data Interface

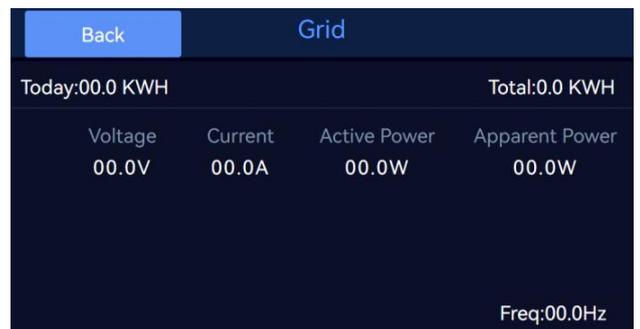
The data of the power grid will vary according to the equipment model. If it is a split-phase inverter, the right interface will be displayed:

The data shown are the voltage, current, active power and apparent power of L1 and L2 respectively.



If it is a single phase, the right interface will be displayed:

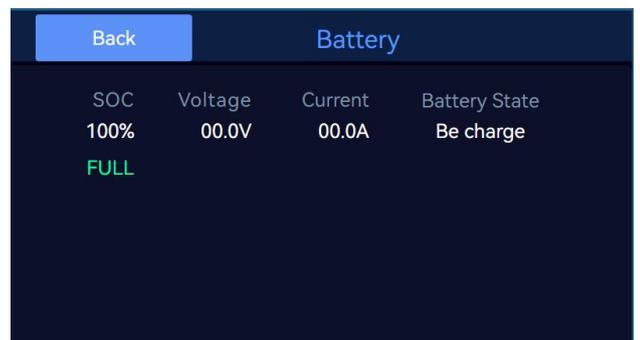
Above the interface are the daily and total grid-connected electricity of the power grid.



### (4) Battery Data Interface

The data displayed on the battery interface are:

Battery capacity, voltage, current and battery charging status. When "FULL" is displayed, it means the battery is full.



## (5) Load Data Interface

The data on the load side, like the grid, varies by model

**If it is a split-phase inverter, the right side of the interface will be displayed:**

The data shown are the current, active power, apparent power and load of the loads L1 and L2.

Back		Load		
Today:00.0 KWH		Total:0.0 KWH		
	Current	Active Power	Apparent Power	Load Rate
L1	00.0A	00.0W	00.0W	0.00%
L2	00.0A	00.0W	00.0W	0.00%
				Freq:00.0Hz

**If it is a single-phase inverter, the interface on the right is displayed:**

The data shown here are the current, active power, apparent power and load rate of the load. The data above are the daily electricity consumption and total electricity consumption of the load.

Back		Load		
Today:00.0 KWH		Total:0.0 KWH		
	Current	Active Power	Apparent Power	Load Rate
	00.0A	00.0W	00.0W	0.00%
				Freq:00.0Hz

## (6) Equipment Information Interface

Display text	Description
Hardware-version	Current machine hardware version number
Software version	Current software version of the device (To check whether the device is running the latest version, ensure that the device is in the <b>manual shutdown state</b> . After the device has been connected to Wi-Fi, tap the Check for Updates option on the side panel. If an update is available, the user may choose to update the current version.)
Display the screen UI version	Current display UI version of the device (To check whether the device is running the latest version, ensure that the device is in the <b>manual shutdown state</b> . After the device has been connected to Wi-Fi, tap the Check for Updates option on the side panel. If an update is available, the user may choose to update the current version.)
Equipment SN	The current machine's SN number
Maximum support voltage of battery	The maximum supported battery voltage of the current machine
Language	After clicking, users can choose the language setting of UI on the interface.

Back		Device information	
Hardware version	0.0.0.0		
Software version	0.0.0.0	<a href="#">Check update</a>	
UI version	0.0.0.0	<a href="#">Check update</a>	
Device SN	02123456789000000000		
Max supported battery voltage	48V		
Language	<a href="#">English</a>		

## (7) Read Only Category Menu and Control Interface

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



## (8) Real-Time Data Interface

Click "<" and ">" to flip pages. The circle below the interface represents which page you are currently on,  
When the user enters the interface, the last page is displayed.



The interface is divided into six pages, displaying the following:

### Page 1 (Equipment)

Parameter name: Equipment status, total charging power, load state, grid frequency, inverter frequency

### Page 2 (Fault)

Parameter name: Fault information 1, Fault information 2, Fault information 3, Fault information 4

### Page 3 (Current)

Parameter name: parallel load average current, PV charging current, mains charging current

### Page 4 (Temperature)

Parameter name: PV radiator temperature, inverter radiator temperature, battery radiator temperature

### Page 5 (Voltage)

Parameter name: total bus voltage, positive bus voltage, parent bus voltage (It depends on the machine. Some models have high and low busbars, while others have high and low busbars plus main, positive and negative terminals)

### Page 6 (Communication status)

Parameter name: Bluetooth status, WIFI status, cloud platform link status, RS485-1 communication status, RS485-2 communication status, BMS communication status

## (9) Statistical Data Interface

The interface is divided into two pages, and the content displayed is as follows:

	Order number	Parameter name
Page 1	1	Charging ampere-hours capacity
	2	Discharging ampere-hours capacity
	3	Inverter working time
	4	Bypass working time
	5	Charging capacity
	6	Electricity consumption
Page 2	7	Boot time
	8	Last balanced charge time
	9	Total operation days
	10	Error recording
	11	Historical data

Back		Statistical data	
		<	>
Boot time		2025-03-04 00:00:00	
Last balanced charge time		2025-03-04 00:00:00	
Total operation days		30Days	
Error recording		200	
Historical data		100	

## (10) Historical Data Interface

Order number	Parameter name
1	Battery charging ampere-hours capacity
2	Battery discharging ampere-hours capacity
3	Inverter working time
4	Bypass working time
5	Load power consumption
6	Time
7	PV power generation
8	Grid-connected power
9	Load consumes utility power
10	Amount of electricity charged today

Back		Historical data	
		K	512/512
		<	>
Battery charge AH	300Ah	Battery discharge AH	30Ah
Inverter work time	00	Bypass work time	20h
Load usage	00	Time	2025-03-05 08:00:00
PV power generation	00	Grid-connected power	00
Load consumes utility power			00
Amount of electricity charged today			00

If there is a large amount of historical data, you can click the current page number and use the interface keyboard to input the number of items you want to view, and then jump to that item.

## (11) Event Log Interface

The following is the Event Log Interface. Users can swipe the screen up and down to view the content. Similar to historical data, users can select and enter a specific record to jump directly to it. (The figure below only displays partial parameters.)

Order number	Parameter name
1	Error code
2	Time
3	PV1 voltage
4	Battery voltage
5	Total charge power
6	Grid voltage
7	Inverter voltage
8	Load current
9	Load active power
10	Grid frequency
11	PV radiator temp
12	Inverter radiator temp
13	Battery radiator temp
14	Load apparent power
15	Load apparent power
16	Device status

The screenshot shows a mobile application interface titled "Event data". At the top, there is a "Back" button and a "256/256" indicator. Below the title bar, there are navigation arrows and a list of parameters. The parameters and their values are as follows:

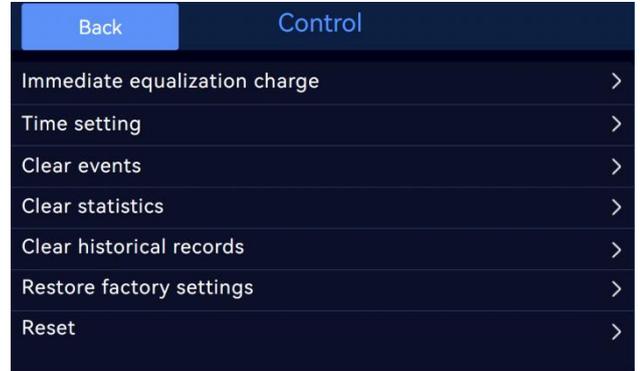
Parameter name	Value
Error code	
Time	
PV1 voltage	0
Battery voltage	0
Total charge power	0
Grid voltage	0
Inverter voltage	0
Total bus voltage	0
Battery current	0
Battery SOC	0
Grid current	0
Inverter current	0

Order number	Parameter name
17	Total bus voltage
18	Battery current
19	Battery SOC
20	Grid current
21	Inverter current
22	Load rate
23	Mains charge current
24	Inverter frequency
25	BAT charge status
26	PV charge current
27	PV total KWH

## (12) Control Function

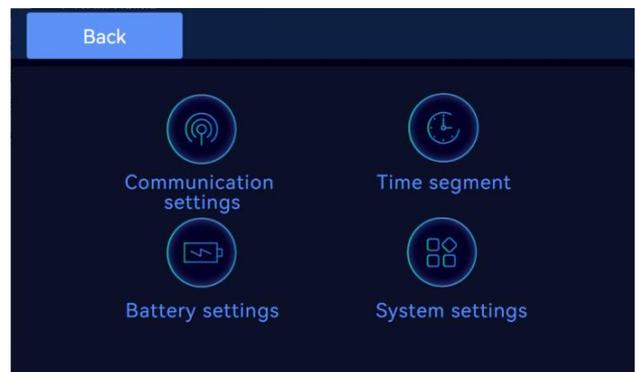
The control functions are listed in the table below. When the user clicks the ">" arrow, all functions will be executed immediately upon confirmation, except for the "Set Time" function, which will redirect to a separate interface for configuration.

	Order number	Parameter name
Page 1	1	Charge immediately and evenly
	2	Time Settings (When setting the time, pay attention to the time zone setting, as it will affect the synchronization time and time-sharing function of the next startup)
	3	Clear event records
	4	Clear statistics
Page 2	5	Clear historical data
	6	Factory data reset
	7	Reset



## (13) Setting Class Parameters

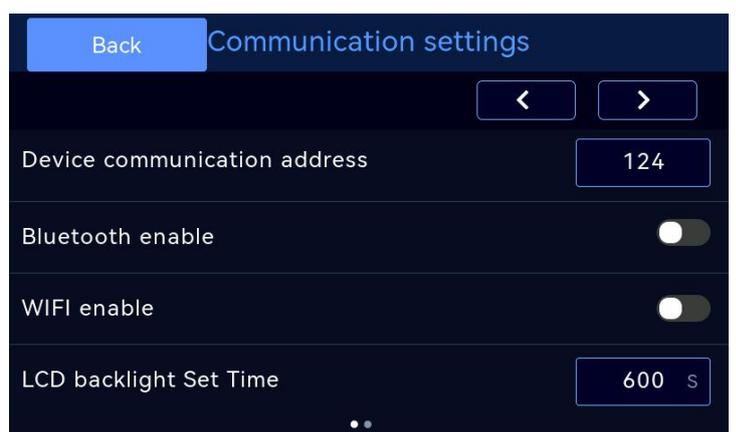
Icon	Description
	After clicking, enter the communication data setting interface
	After clicking, enter the interface of time setting for charging and discharging
	After clicking, enter the battery parameter setting interface
	After clicking, enter the system parameter setting interface



## (14) Communication Data Setting Interface

In the setting parameters, clicking the input box can display the keyboard to input data, and clicking the switch icon can open or close.

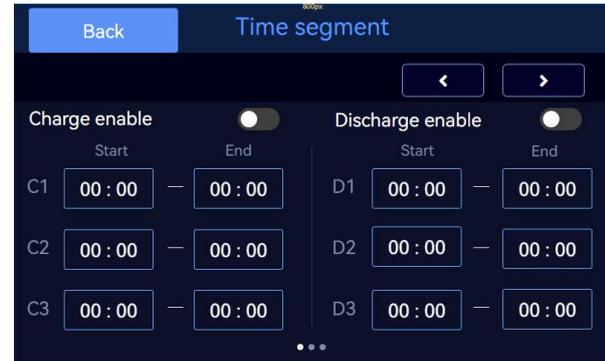
	Order number	Parameter name
Page 1	1	Device address
	2	Bluetooth enabled
	3	WIFI enabled
	4	LCD backlight time
Page 2	1	RS485-1 parameter Settings
	2	RS485-2 parameter Settings



## (15) Periodic Charge and Discharge Settings

In the time-segmented charging/discharging setting interface, the time parameters of each charging and discharging period shall only be configured on the premise that the corresponding enable function is activated. If the enable function is not turned on, the configured period parameters will not take effect. Users can click the ">" button on the interface to enter the multi-period setting page, where they can complete the configuration of the start time and end time for each charging and discharging period.

		Order number	Parameter name
Charge	Page 1	1	Time - segmented charging enable
		2	Setting of start and end time for charging stage 1
		3	Setting of start and end time for charging stage 2
		4	Setting of start and end time for charging stage 3
	Page 2	5	Setting of start and end time for charging stage 4
		6	Setting of start and end time for charging stage 5
		7	Setting of start and end time for charging stage 6
		8	Setting of start and end time for charging stage 7
	Page 3	9	Setting of start and end time for charging stage 8
		10	Setting of start and end time for charging stage 9
Discharge	Page 1	1	Periodic discharge enable
		2	Setting of start and end time for discharging stage 1
		3	Setting of start and end time for discharging stage 2
		4	Setting of start and end time for discharging stage 3
	Page 2	5	Setting of start and end time for discharging stage 4
		6	Setting of start and end time for discharging stage 5
		7	Setting of start and end time for discharging stage 6
		8	Setting of start and end time for discharging stage 7
	Page 3	9	Setting of start and end time for discharging stage 8
		10	Setting of start and end time for discharging stage 9



## (16) Battery Parameter Settings

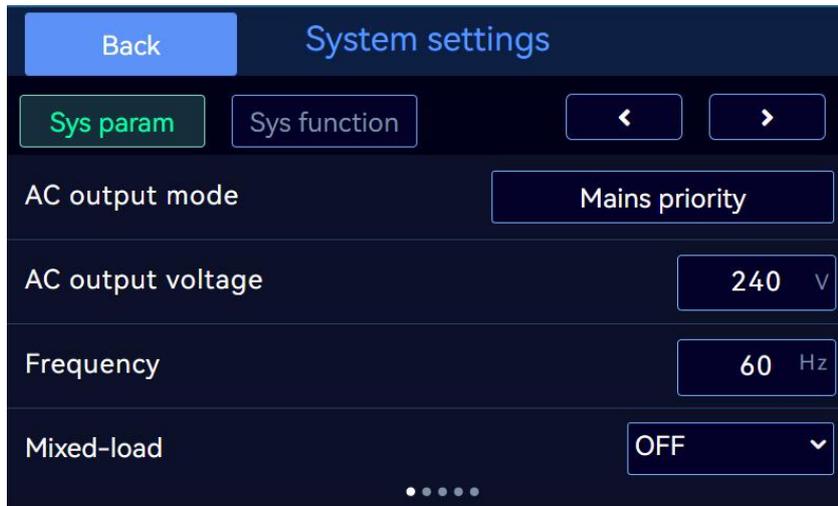
When "Setting Parameters" or "Type Parameters" is displayed in green, it indicates that the interface is in place, and each parameter can be set through drop-down options and input boxes.



	Page	Main options	Option 2	Description
Setting Parameter	Page 1	Battery type	Lead - acid	Lead - acid battery
			Lithium	Lithium battery
		Battery system voltage	48V	The voltage of the battery system is fixed at 48V and cannot be changed
		Nominal battery capacity	1~9999AH	It can be input in the range of 1~9999AH, and step by 1 AH
		Temperature compensation	-(3~5)mV/°C/2V	Setting range-(3-5) mV, step 0.1mV, users can set according to the battery parameters, 0: No compensation
	Page 2	Switch mains SOC capacity	0~100%	It can be input in the range of 0~100%, 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.
		Switch battery SOC capacity	1~100%	It can be input in the range of 1 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.
		Inverter switching mains voltage	36~68V	It can be input in the range of 36~68V with a step of 0.1 V.
		Mains switching inverter voltage	36~68V	It can be input in the range of 36~68V with a step of 0.1 V.
	Page 3	Maximum allowed charge current	0~120A	It can be input in the range of 0~120A, step by 1A, and set to 0 to prohibit the system from charging and discharging
		Stop charge current	0~10A	It can be input in the range of 0~10A and step 1A
		Stop charge SOC	0~100%	It can be input in the range of 0~100%, and the step is 1%
		Equalize the charge timeout	5~900 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.
	Page 4	Activation current of lithium battery	0~20A	It can be input in the range of 0~20A with a step of 0.1 A.

		Charging activation method	OFF	Do not activate (lead-acid batteries only)
			PULSE(Default)	Adopt intermittent control (except for lead-acid batteries)
		Discharge cut-off SOC	0~100%	It can be input in the range of 0~100%, and the step is 1%
		SOC low alarm	0~100%	It can be input in the range of 0~100%, and the step is 1%. An alarm will be given when the set SOC capacity is reached
<b>Type param</b>	Page 1	Overvoltage threshold	36~68V	It can be input in the range of 36~68V with a step of 0.1 V
		Equalizing charge voltage	36~68V	It can be input in the range of 36~68V with a step of 0.1 V and is only valid when the battery type is open lead-acid battery, sealed lead-acid battery.
		Boost charge voltage	36~68V	It can be input in the range of 36~68V with a step of 0.1 V and is valid for lithium battery type.
		Float charge voltage	36~68V	It can be input in the range of 36~68V with a step of 0.1 V. This parameter cannot be set after successful BMS communication
	Page 2	Boost charge recovery voltage	36~68V	It can be input in the range of 36~68V with a step of 0.1 V
		Battery over-discharge recovery voltage	36~68V	When the battery pack voltage drops below the "over-discharge protection voltage" during discharge triggering, the inverter resets 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	When the battery voltage is lower than this voltage, the device will give an under-voltage 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	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.
	Page 3	Discharge limit voltage	36~68V	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	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	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	Refers to the continuous charging time when the voltage reaches the parameter "Increase charging voltage" 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 type of lithium battery.
	Page 4	Equalizing charging interval	0	Set to 0 to be off
			1~300D(days)	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, sealed lead-acid battery.

## (17) System Settings



	Page	Main options	Option 2	Description
System Parameter	Page 1	AC output mode	Mains priority	In the case of mains power priority, the mains power prioritizes supplying power to the load and battery, while the battery only supplies power to the load when mains power is unavailable. (For example, when the time discharge function is used, the battery can discharge.) <b>Priority: Mains power &gt; Photovoltaic &gt; Battery</b>
			Inverter priority	Inverter priority: Switch to mains power with load only when the battery voltage falls below the set value of parameter [Battery-to-utility voltage point]. When the battery voltage exceeds the set value of parameter [Utility-to-Battery voltage point] or is fully charged, switch back to inverter with load from mains power Inverter first . <b>Priority: Photovoltaic &gt; Battery &gt; Mains power</b>
			PV priority	PV priority: When the photovoltaic is not available, or the battery voltage is lower than the set value of [battery to mains voltage point], it switches to mains power. <b>Priority: Photovoltaic &gt; Mains power &gt; Battery</b>
		AC output voltage	200~260V	It can be input in the range of 200~260V with a step of 1V
		Frequency	45~ 65Hz	It can be input in the range of 45~65Hz and step 1 Hz
		Mixed-load ( applicable to select Models only )	OFF	Disable
			Mix load	After activation, it automatically switches to grid power priority mode, and this setting cannot be changed. In this mode, both grid power and photovoltaic power simultaneously power the load.
	Page 2	Parallel mode	Single	Users can select the corresponding parameter Settings according to different parallel operation requirements, and the default single machine mode is selected.
			Single-phase master	
			Slave	
	Three-phase master			
	Split-phase 2*208Host (only displayed on the split-phase)			

		Parallel phase	Phase A		
			Phase B		
			Phase C		
	Page 3	Battery charge mode	Hybrid	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.	
			Mains priority	Mains power priority charging, only light activated when mains power is invalid	
			PV priority	Photovoltaic priority charging is only activated when photovoltaic is invalid	
			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	It can be input in the range of 0~100A and step 1A		
	Page 4	BMS protocol	PYLON	This item is set to Pylon by default	
		PV output priority	Charge priority	In this mode, the PV output charges the battery first	
			Load priority	In this mode, the PV output gives power to the load first	
	BMS communication fault shutdown	Enable	When this parameter is enabled, the inverter output will be shut down if BMS communication fails.		
	Page 5	AC input mode	APL	When the output voltage is 220/230V, the input voltage range is 90~280V	
			UPS	When the output voltage is 220/230V, the input voltage range is 170~280V	
		Grid type (only displayed on the split-phase inverter)	240/120	Regular application,select this option for the phase-splitter output of the phase-splitting machine.	
			208/120	Select this option when two phase-splitting machines are operated in parallel for three-phase output.	
			0/120	Select this option for the phase-splitting machine in single-phase mode with full single-phase power output.	
System function	Page 1	NPE ground shorting function	Enable		
			Disable		
	Energy saving mode	Enable	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			
		Disable			
	Automatic restart after over-temperature	Enable			
		Disable			

	Page 2	Buzzer alarm	Enable
			Disable
		Mode shift alerted	Enable
			Disable
		Overload bypass function	Enable
			Disable

## (18) The Fault Information Is as Follows:

Fault code	Description	Fault code	Description
1	Battery voltage low	29	Battery SOC is below the alarm value(Effective after successful BMS communication)
2	Battery over current software	30	Battery SOC is below the discharge cutoff set value(Effective after successful BMS communication)
3	Battery no connect	31	Low battery shutdown(Effective after successful BMS communication)
4	Battery undervoltage stops discharging	32	Parallel control CAN communication failure
5	Battery overcurrent hardware protection	33	Parallel CAN communication failure
6	Battery charge overvoltage protection	34	Parallel communication address setting error
7	Bus overvoltage hardware protection	35	Parallel current sharing fault
8	Bus overvoltage software protection	36	Parallel mode, battery voltage difference is large
9	PV overvoltage protection	37	the mains input source is inconsistent
10	PV Boost overcurrent software protection	38	Parallel mode, hardware sync signal failure
11	PV Boost overcurrent hardware protection	39	Abnormal DC component of inverter voltage
12	SPI communication error	40	Parallel program versions are inconsistent
13	Bypass overload protection	41	Parallel wiring fault
14	Inverter overload protection	42	Serial number is not set at the factory
15	Inverter overcurrent hardware protection	43	Parallel mode setting error
16	Slave chip request shutdown fault	44	Battery voltage is lower than discharge limit voltage
17	Inverter short circuit protection	45	Battery radiator over-temperature protection
18	Bus soft start fault	46	Overload warning
19	PV radiator over-temperature protection	47	Battery discharge current overcurrent
20	Inverter radiator over-temperature protection	48	Leakage current protection
21	Fan fault	49	PV insulation protection
22	Memory fault	58	BMS communication failure
23	Model setting error	59	BMS Error
24	Positive and negative bus voltages are unbalanced	60	BMS low temperature alarm(Effective after successful BMS communication)
25	Bus short circuit	61	BMS over temperature alarm(Effective after successful BMS communication)
26	Inverter AC output is fed back to bypass AC output	62	BMS overcurrent alarm(Effective after successful BMS communication)

27	Mains input phase error	63	BMS undervoltage alarm(Effective after successful BMS communication)
28	Bus voltage low protection	64	BMS overvoltage alarm(Effective after successful BMS communication)

## 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) US Standard Split-Phase Inverter Parallel Operation Timing: If the parallel operation mode is Three-Phase Master Unit / 2\*208 Master Unit, the grid type must be set to 2\*208.

5) 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.

6) 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].

# 7. Protection Functions

## 7.1 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 back flowing 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 undervoltage 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°C 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 80°C 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

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**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.

**Product issues caused by the following circumstances are not covered under the KTECH's standard warranty:**

1. The product is beyond the warranty period (except where both parties have separately signed an extended warranty service agreement);
2. Failures or damages caused by non-compliance with the operating requirements specified in the product manual or relevant installation and maintenance guidelines, or by improper use, storage, or operation in an environment not specified for the product. Examples include improper installation distance, inadequate ventilation, and incorrect use of waterproof caps;
3. Unauthorized from KTECH's disassembly, repair, or modification of the product;
4. Products obtained through unauthorized channels by KTECH;
5. Failures and damages caused by unforeseeable factors, human factors, force majeure, or other reasons, such as stormy weather, floods, lightning, overvoltage, pest infestations, and fires;
6. Unauthorized modifications, design changes, or replacement of parts;
7. Intentional damage, defacement, making indelible marks, theft, etc.;
8. Natural wear and tear and aging;
9. Use not in compliance with correct safety regulations (such as VDE standards, etc.);
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. Rust and corrosion on the machine casing caused by harsh environments.