

Product Model
ECG-LVM12K-SP



HYBRID SOLAR INVERTER

User Manual

Important Safety Instructions

Please save these instructions for future use!

- 1、 Before using the unit, read all instructions and cautionary marking on the unit, the batteries and all appropriate sections of this manual. The company has the right not to quality assurance, if not according to the instructions of this manual for installation and cause equipment damage.
- 2、 Please be clear which kind of battery system you want, lithium battery system or lead-acid battery system, if you choose the wrong system, energy storage system can't work normally.
- 3、 Do not disassemble the unit. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
- 4、 All the operation and connection must be performed by a professional electrical or mechanical engineer. All the electrical installation must comply with the local electrical safety standards. Be sure to comply with all local requirements and regulations for the installation of this inverter.
- 5、 **CAUTION**-To reduce risk of injury, charge only deep-cycle lead-acid type rechargeable batteries and lithium batteries. Other types of batteries may burst, causing personal injury and damage.
- 6、 To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk. All the operation and connection must be performed by a professional electrical or mechanical engineer. All the electrical installation must comply with the local electrical safety standards. Be sure to comply with all local requirements and regulations for the installation of this inverter.
- 7、 For optimum operation of this inverter, please follow required spec to select appropriate cable size. It's very important to correctly operate this inverter.
- 8、 **GROUNDING INSTRUCTIONS** -This inverter should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this inverter.
- 9、 **NEVER** cause AC output and DC input short circuited. Do NOT connect to the mains when DC input short circuits.
10. Do not install the inverter in harsh environments such as moist, oily, flammable or explosive, or heavily dusty areas.
11. **Warning!!** Only qualified maintenance personnel can repair this equipment. If the fault persists

after troubleshooting according to the troubleshooting table, take this inverter/charger back to your local dealer or service center for repair.

12. Do not reverse polarity of the battery input; otherwise, the device may be damaged or unpredictable risks may occur.
13. Make sure the inverter is completely assembled, before the operation. Do NOT open the terminal cover while the inverter is working.
14. When turning the circuit breakers for various interfaces of the inverter ON and OFF, please strictly follow the specified sequence.
15. Necessary to confirm that the inverter AC output power is the only input device for load, and it is forbidden to use it in parallel with other input AC power to avoid damage.
16. Recommended to attach proper fuse or circuit breaker to the outside of the inverter.

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1 Information on This Manual

This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installations and operations. Please keep this manual for future use.

1.1 Scope

This manual provides safety and installation guidance as well as information about tools and wiring.

1.2 Target Group

This document is intended for qualified persons and end users. Tasks that do not require any particular qualification can also be performed by end users. Qualified persons must have the following skills:

1. Knowledge of how an inverter works and was operated.
2. Training in how to deal with the dangers and risks associated with installing and using electrical devices and installations.
3. Training in the installation and commissioning of electrical devices and installations.
4. Knowledge of the applicable standards and directives.
5. Knowledge of and compliance with this document and all safety information.

2 Product Introduction

2.1 Product Description

Energy storage hybrid inverter through the connection and overall control of photovoltaic, energy storage battery, grid and load, for home, commercial and industrial users to provide stable, safe and clean electric energy, to meet the energy needs of different scenarios.

2.2 Product Features

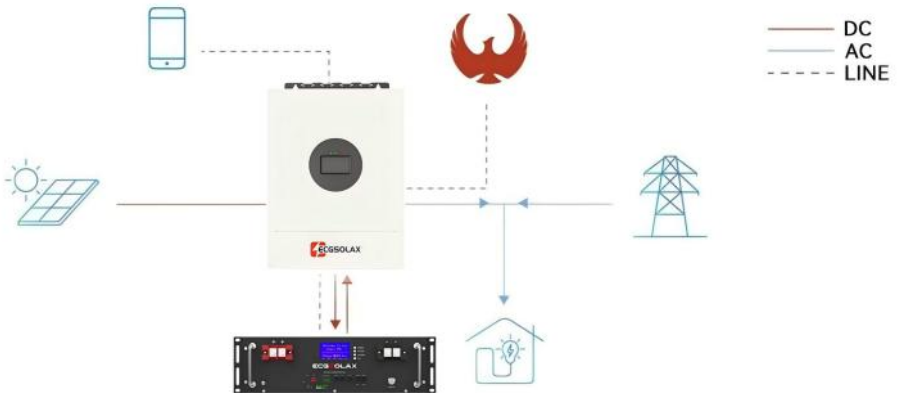
- Supports multiple types of energy storage batteries such as lead-acid batteries and lithium-ion batteries
- Support single-phase and split-phase pure sine wave output
- Support each phase voltage adjustment in the range of 100~130Vac
- Support two photovoltaic inputs, with the function of tracking the maximum power charging/carrying capacity of two MPPT simultaneously. The MPPT efficiency is up to 99.9%, and the maximum current of a single channel is 22A
- Has two output modes of mains bypass and inverter output, with uninterrupted power supply function
- There are 4 charging modes: PV only, Mains priority, PV priority and mains/PV hybrid charging
- Support for timed battery charging and timed battery discharge
- Energy saving mode function of single machine to reduce no-load energy loss
- With a variety of protection functions, fully protect the safety of photovoltaic panels, batteries, loads and the controller itself.
- Capacitive smart touch large screen, menu operation, intuitive and convenient parameter setting.
- Support 256 event records; Supports 512 days of historical data storage.
- Built-in Bluetooth and WIFI interface, providing native cloud platform access ability, automatic time after connection.

2.3 System Connection Diagram

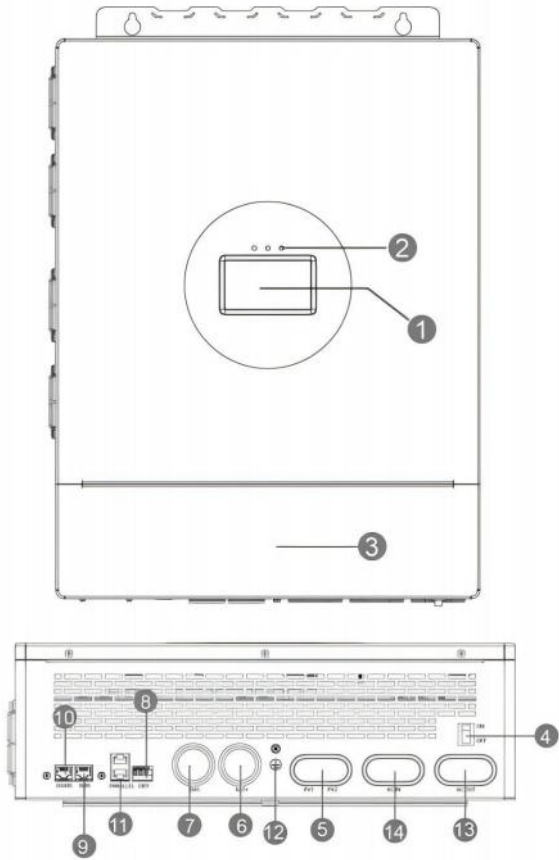
The following diagram shows the system application scenario of the product. A complete system consists of the following parts:

1. **Photovoltaic modules:** Convert light energy into direct current energy, which can be used to charge the battery through an inverter, or direct inverter to alternating current, which supplies power to the load.
2. **Mains or generator:** Connected to an AC input, which can charge the battery while supplying the load. The system can also generally operate without mains or generator while the battery and photovoltaic modules power the load.
3. **Battery:** The role of the battery is to guarantee the normal power supply of the system load in case of insufficient photovoltaic and no mains power.
4. **Loads:** A variety of home and office loads can be connected, including refrigerators, lamps, TVs, fans, air conditioners and other AC loads.
5. **Inverters:** Energy conversion devices for the entire system.

Actual application scenario diagram:



3 Product Overview



1	Capacitive touchscreen	6	Battery port (positive)	11	Parallel communication port
2	LED indicator	7	Battery port (negative)	12	Grounding screws
3	Terminal protective cover	8	Dry contacts points	13	AC output port
4	ON/OFF boat type switch	9	BMS port	14	AC input port
5	Photovoltaic input (1/1)	10	RS485 port		

4 Installation

4.1 Unpacking and Inspection

Before installation, please inspect the unit. Be sure that nothing inside the package is damaged.

You should have received the following items in the package:

- The unit x 1
- User manual x 1
- Ring terminal x 2
- Parallel cable x 1
- Spare screws x 4
- Plastic Expansion Screws x 1
- Stainless Steel Expansion Screws x 2

4.2 Select the Mounting Location

This product is for indoor use only (protection level IP20), users are required to consider the following factors before choosing an installation location:

- Choose a solid wall to install the inverter on.
- Install the inverter at eye level.
- Ensure adequate clearance around the inverter: a minimum of 200mm on both sides and 500mm at the top.
- The ambient temperature must be maintained between -10°C and $+55^{\circ}\text{C}$ (14 to 131°F). Avoid direct sunlight, moisture, and dust to ensure optimal operation.



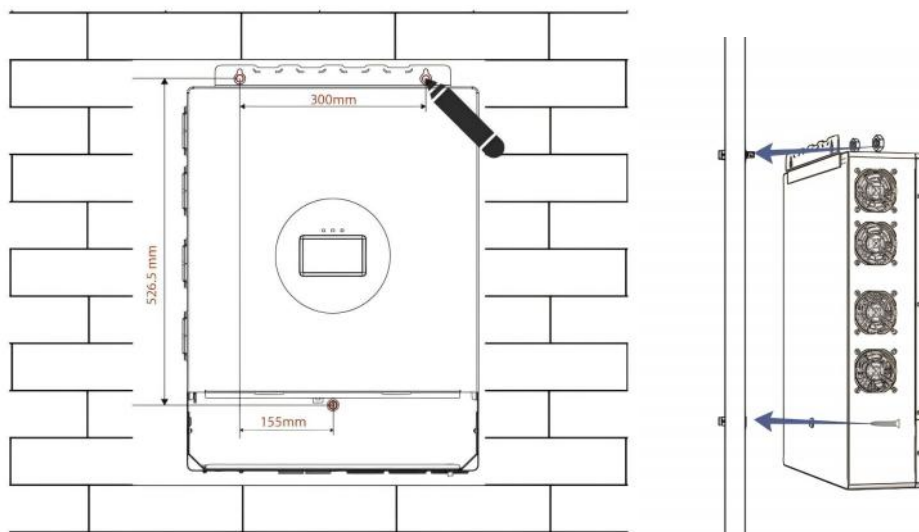
DANGER

- The inverter should not be installed in proximity to highly flammable substances.
- The inverter should not be installed in potential explosive areas.
- The inverter and lead-acid batteries should not be installed in an enclosed space.

WARNING

- The inverter must not be installed in an area exposed to direct sunlight.
- Do not install or utilize the inverter in a humid environment.

4.3 Install the Inverter

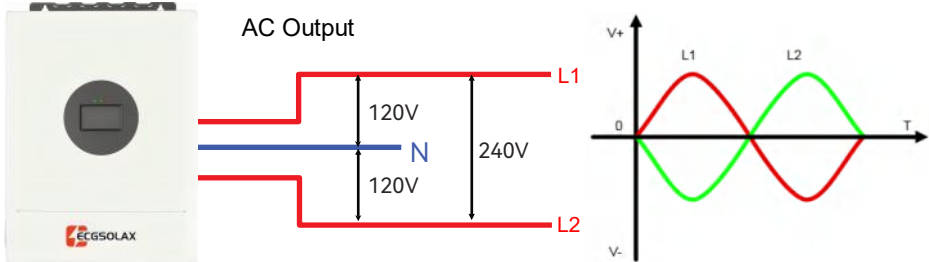


NOTICE

- When operating the equipment in areas with poor air quality, dust particles may clog the air filter. Please regularly remove and clean the air filter to ensure proper internal airflow within the inverter. Failure to do so may cause the inverter to overheat, trigger overtemperature protection, disrupt power supply operation, and shorten the inverter's service life.

5 Wiring

5.1 Split-phase Mode (default)



Items	Description
Applicable model	ECG-LVM12K-SP
Ac output phase voltage (L-N)	100 ~ 130Vac, 120Vac default
Ac output line voltage (L-L)	200 ~ 260Vac, 240Vac default

NOTICE

- Users can change the output voltage through the settings menu.
- The output voltage can be set within the range of 100V to 130V.

5.2 Cable and Circuit Breaker Selection

● Photovoltaic Input

Model	Wire Diameter	Max. Input Current	Circuit Breaker Specifications
ECG-LVM12K-SP	6mm ² / 10 AWG	22A	2P-32A

● AC Input

Model	Output Mode	Max. Input Current	Wire Diameter	Circuit Breaker Specifications
ECG-LVM12K-SP	Split Phase	63A (L1/L2/N)	16mm ² / 6AWG (L1/L2/N)	3P-63A
	Single Phase	63A (L1/N)	16mm ² / 6AWG (L1/N)	2P-63A

● Battery

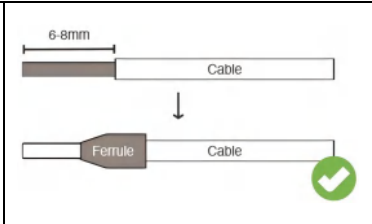
Model	Wire Diameter	Max. Charging Current	Circuit Breaker Specifications
ECG-LVM12K-SP	70mm ² / 2/0AWG	200A	2P-250A

● AC Output

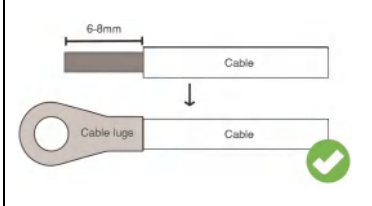
Model	Output Mode	Max. Output Current	Wire Diameter	Circuit Breaker Specifications
ECG-LVM12K-SP	Split Phase	63A (L1/L2/N)	16mm ² / 6 AWG (L1/L2/N)	3P-63A
	Single Phase	63A (L1/N)	16mm ² / 6AWG (L1/N)	2P-63A

NOTICE
● PV INPUT, AC INPUT, AC OUTPUT

1. Use a stripper to remove the 6~8mm insulation of the cable.
2. Fixing a ferrule at the end of the cable. (ferrule needs to be prepared by the user)


● BATTERY

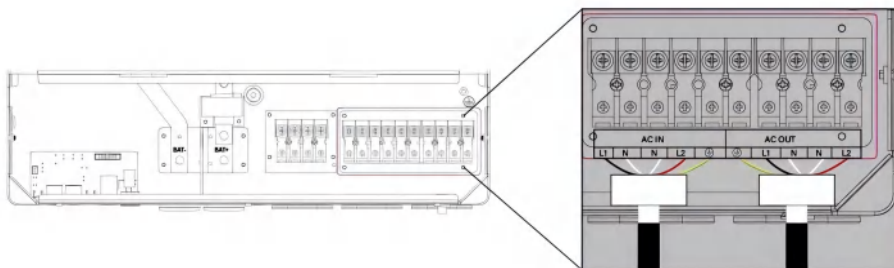
1. Use a stripper to remove the 6~8mm insulation of the cable
2. Fixing cable lugs that supply with the box at the end of the cable.



The wire diameter is for reference only. If the distance between the PV array and the inverter or between the inverter and the battery is long, using a thicker wire will reduce the voltage drop and improve the performance of the system.

5.3 AC Input and Output Cables

Connect the live wire, neutral wire, and ground wire according to the position and sequence of the cables shown in the following figure.

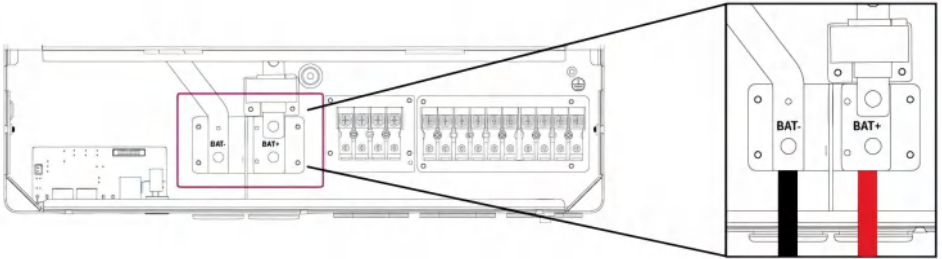


DANGER

- The system allows only one grounding point between Neutral and Earth.
- Reversed L/N wiring may cause faults or damage.
- Incorrect connection between the grid input and load output may result in faults or damage.
- Do not leave any interface unconnected or improperly connected.
- Before connecting AC inputs and outputs, the circuit breaker must be disconnected to avoid the danger of electric shock and no live operation.
- Check that the cable used is sufficient to meet the requirements, too thin, poor-quality cables can be a serious safety hazard.

5.4 Battery Wiring

Connect the battery's positive and negative cables in the cable position and order shown in the image below.

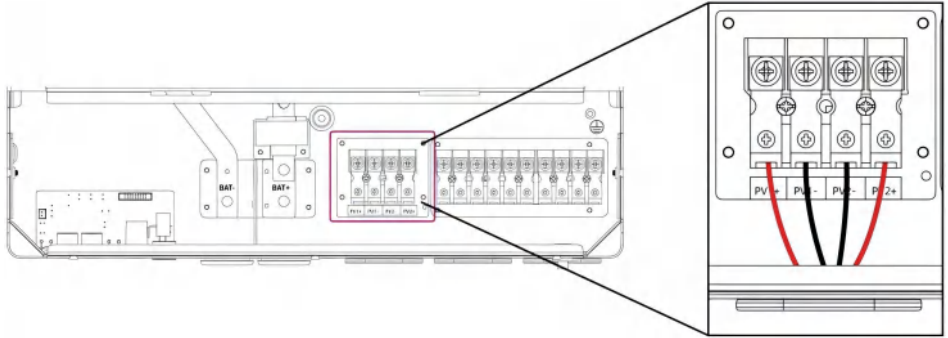


DANGER

- The lithium-ion battery must communicate with the inverter successfully.
- Before connecting the battery, ensure the circuit breaker is turned off to eliminate the risk of electric shock. Never operate the system while it is powered.
- Verify that the battery's positive and negative terminals are correctly connected. Reversed polarity may cause permanent damage to the inverter.
- Confirm that the cables used meet the required specifications. Using undersized or poor-quality cables poses significant safety hazards.

5.5 Photovoltaic Wiring

Connect the positive and negative wires of the two photovoltaics according to the cable position and sequence shown in the following figure.

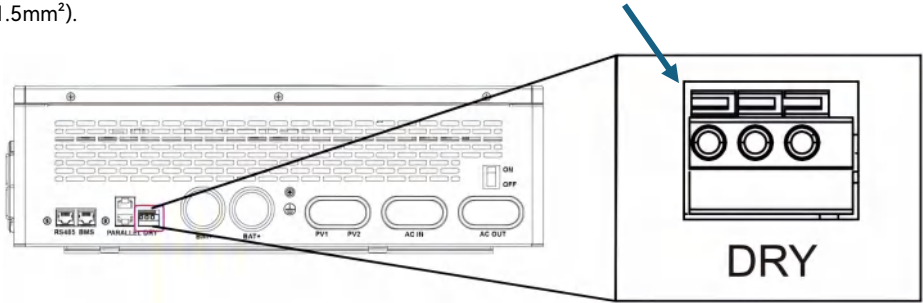


DANGER

- 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 (500V), otherwise the inverter may be damaged.
- Measure the PV voltage first (ensure it is below the inverter's maximum PV input voltage) before turning on the PV breaker.
- For the same MPPT channel, all PV modules must have the same orientation, tilt angle, and specifications.
- Each MPPT channel must have the same number of PV modules.
- PV ports and PV arrays must be used independently. Under no circumstances may PV arrays or PV ports be shared.

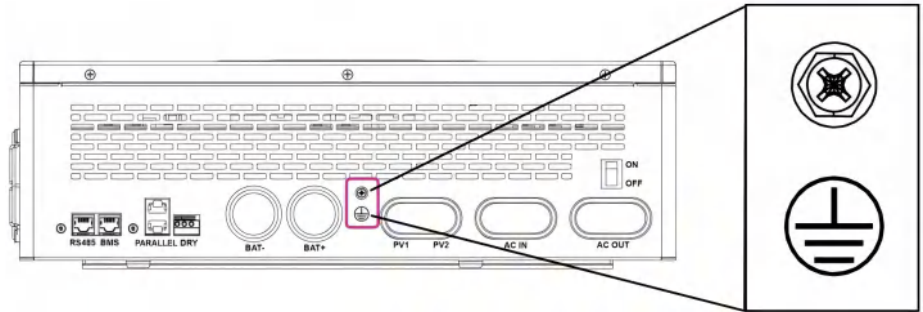
5.6 Dry Contact Cable

Use a small screwdriver to push the arrow back in the direction it is pointing, then insert the communication cable into the dry junction port. (The section of the communication wire is 0.2 to 1.5mm²).



5.7 Grounding

Ensure that the ground terminal is securely connected to the ground busbar.



NOTICE

- The ground cable should be no less than 4mm² in diameter and as close to the ground point as possible.

5.8 Final Installation

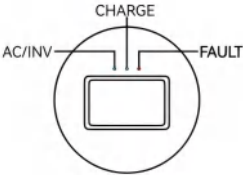
After confirming that all wiring is secure and each wire is connected to the correct terminal, restore the terminal protective cover to its original position.

5.9 Start the Inverter

- Step 1. Close the circuit breaker of the battery.
- Step 2. Press the boat-shaped switch at the bottom of the inverter. The screen and indicator lights will 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 increasing power.

6 Operation

6.1 LED Indication



Indicator Light	Colors	Description
AC/INV	green	Steady on: Mains bypass output
		Blinking: Inverter output
CHARGE	green	Steady on: Charging is complete
		Blinking: Charging is underway
FAULT	red	Blinking: A fault occurs

6.2 LCD Display and Operation

6.2.1 Home Page

➤ Time and Status Bar



No.	Descriptions
1	Displays the current time on the device.
2	When the device operates in standalone mode, this icon is not displayed. In parallel mode, the icon displays “M” when the device is in master status and “S” when in slave status.
3	Equipment failure: This icon appears gray under normal operation and red when a fault occurs.

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)

➤ PV Data



No.	Descriptions
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.

➤ **Grid Data**



No.	Descriptions
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 devices 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.

➤ **Battery Data**



No.	Descriptions
1	Long press for about 1s to enter the detailed data interface.
2	Real-time voltage.
3	Percentage of battery capacity.
4	When this text is displayed, it means that the battery is full.

➤ **Load Data**



No.	Descriptions
1	Long press for about 1s to enter the load detailed data interface.
2	If the device is a single-phase, this data shows the real-time load current. If the device is a split-phase, this data shows the real-time current of load L1.
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 not shown. If the device is a split-phase, this data shows the real-time voltage of load L2.
6	This icon appears when the device is operating under overload conditions.

➤ Operating Status and Main Menu



No.	Descriptions
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.

Press and hold the inverter icon in the center of the screen to enable the manual shutdown function. Once shut down, the inverter will stop output, and “MANUAL OFF” will be displayed in the Device State section. To restore output, press and hold the inverter icon again.

6.2.2 Real-time Monitoring

➤ PV Data Interface

Back		Solar	
Today:00.0 KWH		Total:12.0 KWH	
	Voltage	Current	Power
PV1	11V	0	0
PV2	12V	0	0
PV Power:00.0 W			

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.

➤ Grid Data Interface

The grid data displayed may vary depending on the equipment model.

Back		Grid		
Today:00.0 KWH		Total:0.0 KWH		
	Voltage	Current	Active Power	Apparent Power
L1	00.0V	00.0A	00.0W	00.0W
L2	00.0V	00.0A	00.0W	00.0W
Freq:00.0Hz				

For split-phase systems, the interface will display the following information: the voltage and current of L1 and L2, as well as the active power and apparent power for each phase.

For single-phase systems, the corresponding interface will be displayed.

Back		Grid	
Today:00.0 KWH		Total:0.0 KWH	
Voltage	Current	Active Power	Apparent Power
00.0V	00.0A	00.0W	00.0W
Freq:00.0Hz			

The top section of the interface shows the daily and total grid-connected energy.

➤ **Battery Data Interface**

Back		Battery	
SOC	Voltage	Current	Battery State
100%	00.0V	00.0A	Be charge
FULL			

The battery interface displays the following data: battery capacity, voltage, current, and charge status.

When “FULL” is shown, it indicates that the battery is fully charged.

➤ Load Data Interface

The load-side data, similar to the grid-side data, varies depending on the inverter model.

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

For split-phase inverters, the corresponding interface displays:

Current, active power, and apparent power for load L1 and L2, respectively, as well as the overall load rate.

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

For single-phase inverters, the corresponding interface displays:

Load current, active power, apparent power, and load rate.

Daily and total load energy consumption (shown at the top of the interface)

6.2.3 Data 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

➤ Real-Time Data Interface



Tap “<” or “>” to turn pages. The dots at the bottom of the screen indicate the current page. When the user enters this interface, it opens on the page last viewed.

The interface is divided into 6 pages, displaying the following:

Page	Information	Interface Display Content
1	Equipment	Equipment status, total charging power, load state, grid frequency, inverter frequency.
2	Alarm	Fault information 1, Fault information 2, Fault information 3, Fault information 4.
3	Current	parallel load average current, PV charging current, mains charging current.
4	Temperature	PV radiator temperature, inverter radiator temperature, battery radiator temperature.
5	Voltage	Total bus voltage, positive bus voltage, negative bus voltage.
6	Communication status	Bluetooth status, WIFI status, cloud platform connectivity status, RS485-1 communication status, RS485-2 communication status, BMS communication status.

➤ Statistical Data Interface

Back Statistical data		
< >		
Device	Today	Total
Charge ampere hours	0AH	0AH
Discharge ampere hours	0AH	0AH
Inverter work time	0Min	0Min
Bypass work time	0Min	0Min
Charge capacity	0AH	0AH
Electricity consumption	0.0KWh	0.0KWh

The interface is divided into 2 pages, showing the following:

Page	No.	Parameter Name
1	1	The ampere-hours charged to the battery during the day and the total accumulated ampere-hours charged.
	2	The ampere-hours discharged from the battery during the day and the total accumulated ampere-hours discharged.
	3	The inverter’s operating time for the day and its total accumulated operating time.
	4	The bypass operating time for the day and its total accumulated operating time.
	5	The amount of energy charged during the day and the total accumulated charged energy.
	6	The amount of energy consumed during the day and the total accumulated consumed energy.
2	7	The time when the inverter was last powered on.
	8	The time when the most recent battery equalization was performed.
	9	Total accumulated operating days of the inverter.
	10	The number of fault records stored by the inverter.
	11	The number of historical data entries recorded.

➤ Historical Data Interface

Back		Historical data	
[K]	[←]	512/512	[→] [X]
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

No.	Parameter Name
1	Battery ampere-hour charging capacity for the day
2	Battery discharge ampere-hour count for the day
3	Inverter operating hours on the day
4	Bypass working hours on the day
5	Load day electricity consumption
6	Time
7	Daily PV power generation
8	Daily grid-connected electricity generation
9	Electricity charged from the grid on the same day
10	Power consumption from the utility grid on the day of load

If a large volume of historical data is present, you can tap the current page number, use the on-screen keyboard to enter the desired record number, and jump directly to that record.

➤ Event Log Interface



The above shows the Event Log interface, which can be navigated by swiping up or down. Similar to the historical data interface, users can select and enter a specific record to view its details.

No.	Parameter Name	No.	Parameter Name
1	Error code		
2	Time	3	PV2 voltage
4	PV1 voltage	5	Total bus voltage
6	Battery voltage	7	Battery current
8	Total charging power	9	Battery SOC
10	Grid voltage	11	Grid current
12	Inverter voltage	13	Inverter current
14	Load current	15	Load rate
16	Load active power	17	Mains charging current
18	Grid frequency	19	Inverter frequency
20	PV heat dissipation plate temp.	21	Battery charge status
22	Temp. of the heat sink of inverters	23	PV charging current
24	Temperature of Battery	25	Total solar panel power
26	Load apparent power		
27	Average current of parallel load		
28	Device status		

➤ Control Function

Back	Control
Immediate equalization charge	>
Time setting	>
Clear events	>
Clear statistics	>
Clear historical records	>
Restore factory settings	>
Reset	>

The control functions are listed in the table above. After selecting an arrow (“>”), all functions—except “Set Time,” which opens an external time-setting interface—can be executed by selecting Confirm.

No.	Parameter Name
1	Charge immediately and evenly
2	Set-up time (Set the correct time zone; otherwise, time synchronization and scheduling may be affected at the next startup.)
3	Clear event records
4	Clear statistics
5	Clear historical data
6	Factory data reset
7	Reset

6.2.4 Device Information



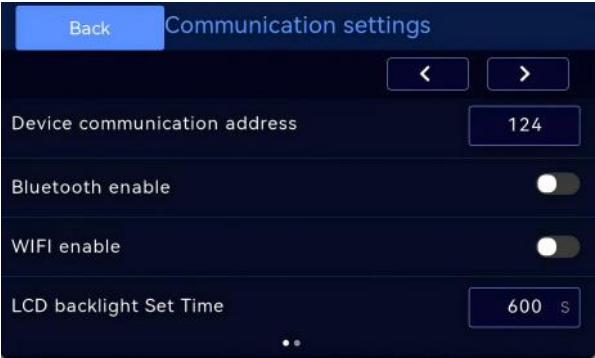
Display Text	Description
Hardware Version	Current machine hardware version number.
Software Version	Displays the current firmware version of the device. (To check whether the current device is the latest version, ensure that the device is in the manual shutdown state and connected to Wi-Fi, then tap Check update. If not, the user can update to the latest version.)
UI Version	Displays the current UI version of the device. (To check whether the current device is the latest version, ensure that the device is in the manual shutdown state and connected to Wi-Fi, then tap Check update. If not, the user can update to the latest version.)
Equipment SN	The current machine's SN code.
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. Currently, Chinese, English, German, Romanian, Russian and Spanish are supported.

6.2.5 Setting Interface



Icon	Description
	Opens the communication data settings interface.
	Opens the charging and discharging time settings interface.
	Opens the battery parameter settings interface.
	Opens the system parameter settings interface.

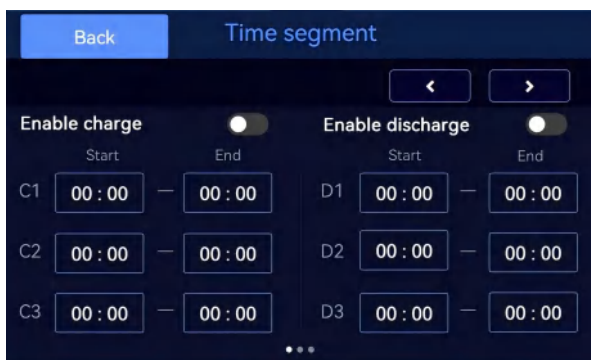
➤ Communication Setting Interface



In the parameter settings, selecting the input box displays the on-screen keyboard for data entry, while selecting the switch icon toggles the function on or off.

Page	No.	Parameter Name
1	1	Device communication address
	2	Bluetooth switch
	3	WIFI switch
	4	LCD Backlight Duration
2	5	RS485-1 parameter settings
	6	RS485-2 parameter settings

➤ Time-Slot Charging and Discharging Settings



In the Time-Segment Charge/Discharge Settings interface, the time parameters for each charge and discharge segment can only be set when the corresponding function is enabled. If the function is not enabled, the configured time-segment parameters will not take effect. Users can tap the “>” button on the interface to enter the multi-segment settings page and complete the configuration of the start time and end time for each charge and discharge segment.

No.	Parameter Name	No.	Parameter Name
1	Time-Segmented Charging – Enable	1	Time-Segmented Discharging – Enable
2	Start/End Time – Charging Stage 1	2	Start/End Time – Discharging Stage 1
3	Start/End Time – Charging Stage 2	3	Start/End Time – Discharging Stage 2
4	Start/End Time – Charging Stage 3	4	Start/End Time – Discharging Stage 3
5	Start/End Time – Charging Stage 4	5	Start/End Time – Discharging Stage 4
6	Start/End Time – Charging Stage 5	6	Start/End Time – Discharging Stage 5
7	Start/End Time – Charging Stage 6	7	Start/End Time – Discharging Stage 6
8	Start/End Time – Charging Stage 7	8	Start/End Time – Discharging Stage 7
9	Start/End Time – Charging Stage 8	9	Start/End Time – Discharging Stage 8
10	Start/End Time – Charging Stage 9	10	Start/End Time – Discharging Stage 9

➤ **Battery Settings**

When “Setting Parameters” or “Type Parameters” is highlighted in green, it indicates that the interface is in editable mode, and parameters can be configured via drop-down lists or input fields.



■ **Setting Parameters**

Page	Setting Item	Option	Description
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 to 5 mV, adjustable in 0.1 mV increments, to be configured according to the battery specifications.
2	Switch to 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 to 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	In inverter-priority mode, when the battery voltage is less than or equal to this value, the load will be transferred to mains power.
	Mains switching inverter voltage	36~68V	In inverter-priority mode, when the battery voltage is greater than or equal to this value, the load will be supplied by the inverter.
3	Maximum allowed charge current	0~ 240A	It can be input in the range of 0 ~ 240A, 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%.
4	Equalize the charge timeout	5~900 min	Can be input in the range of 5~900 min, step 1 min, only when the battery type is flooded lead-acid battery and sealed lead-acid battery.
	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.
	Discharge cut-off SOC	0~ 100%	It can be input in the range of 0 ~ 100%, and the step is 1%.

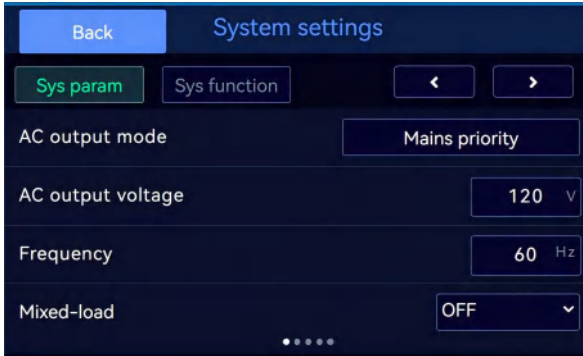
■ Type Parameters

Page	Setting Item	Option	Description
1	Overvoltage threshold	36~68V	It can be input in the range of 36 ~ 68V with a step of 0.1 V.
	Equalization the charging 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 flooded lead-acid battery and sealed lead-acid battery.
	Boost charging 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 types.
	Floating charging 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.
2	Boost charging 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 voltage	36~68V	When the battery voltage is lower than this voltage, the device will give an undervoltage alarm and output without

3			shutdown. It can be input within the range of 36 ~ 68V with a step of 0.1V. It is valid for lithium battery types.
	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.
	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 charging time	0~300 min	Can be input in the range of 0~ 300 min, step 1min, only when the battery type is flooded lead-acid battery and sealed lead-acid battery.
	Boost charging time	0~300 min	Refers to the continuous charging time when the voltage reaches the parameter " Boost 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 types of lithium battery.
4	Equalizing charging intervals	0	Set to 0 to be off.
		1~300D(days)	It can be input in the range of 1 to 300 days, step by 1 day, and is only valid when the battery type is flooded lead-acid battery, sealed lead-acid battery.

➤ System Settings



■ System parameter

Page	Setting Item	Option	Description
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.)
		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.

		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.
	AC output voltage	100V~130V	It can be input in the range of 100~130V 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 Selected Models Only)	OFF	Disabled
		Mixed Load	When enabled, the system automatically switches to Grid Priority mode, and this setting cannot be changed. In this mode, both utility (grid) power and photovoltaic (PV) power supply the loads simultaneously
2	Parallel mode	Single	Defines the inverter to operate independently.
		Single-phase master	Defines this inverter as the master unit in a single-phase parallel system.
		Three-phase master	Defines this inverter as the master unit in a three-phase parallel system.
		Two-phase 208V master	Defines this inverter as the master unit in a split-phase parallel system.
		Slave	Defines this inverter as a slave unit.

	Parallel phase	A Phase	Defines the grid phase to which this inverter is connected in a parallel system. Please configure according to the actual wiring to ensure system balance and synchronization. For Three-Phase Parallel Systems: If the inverter's output terminals L1 and L2 are connected to the grid phases L1 and L2, set this unit to Phase A. If the inverter's output terminals L1 and L2 are connected to the grid phases L2 and L3, set this unit to Phase B. If the inverter's output terminals L1 and L2 are connected to the grid phases L3 and L1, set this unit to Phase C. For Single-Phase or Split-Phase Systems: If the system is configured for single-phase or split-phase output, all inverters should be uniformly set to Phase A.
		B Phase	
		C Phase	
3	Battery charging mode	Hybrid	Both photovoltaic and mains power simultaneously charge the battery, with photovoltaic charging taking priority. When photovoltaic power is insufficient, mains power will provide supplementary charging. This dual charging mode can only be

			activated in bypass mode, and photovoltaic charging must be initiated during inverter operation. This configuration is exclusively available in off-grid mode, automatically switching to hybrid mode under hybrid grid-connected configurations.
		Mains priority	Mains power priority charging: solar charging is used only when mains power is unavailable.
		PV priority	Photovoltaic priority charging is only activated when photovoltaic is invalid.
		Photovoltaic only	Only photovoltaic charging is allowed, and mains charging is not started.
	Charge current limit	SET	Maximum battery charging current is limited according to the inverter battery charging current setting value.
		BMS	Maximum battery charging current is limited by the current limit value of the BMS.
		INV	Maximum battery charging current is limited by the machine's derating logic.
	Mains charging current limit	0 ~ 100A	It can be input in the range of 0 ~ 100A and step 1A.
4	BMS protocol	0	This item is set to Pylon by default.

5	PV output priority	Charge priority	In this mode, charging the battery takes priority.
		Load priority	In this mode, supplying power to the load takes priority.
	BMS Communication Fault Shutdown	Enable	When enabled, the inverter will automatically shut down its output if communication with the BMS fails.
	AC input mode	APL	The input voltage range is 90 ~ 140V.
		UPS	The input voltage range is 90 ~ 140V.
		240V/120V	Phase difference of 180 degrees. For standard applications. Select this option when the split-phase inverter is operating in split-phase output mode.
		208V/120V	Phase difference of 120 degrees. Select this option when two split-phase inverters are operating in parallel to provide three-phase output.
	Grid type	0V/120V	Phase difference of 120 degrees. Select this option when the split-phase inverter operates in single-phase mode with full single-phase output power.

■ System function

Page	Setting Item	Option	
1	NPE ground shorting function	Enable	
		Disable	
	Energy saving mode	Enable	If the Energy-Saving mode is enabled and the output power remains below 50 W for five consecutive minutes, the inverter will enter Energy-Saving mode by shutting down the AC output. After 30 minutes, the inverter will automatically restart the AC output and continue monitoring the output power. To exit Energy-Saving mode within this 30-minute period, there are two options: 1. Disable the Energy-Saving function; 2. Power the inverter off and on again.
			Disable
	Automatic restart after overload	Enable	
		Disable	
2	Buzzer alarm	Enable	
		Disable	
	Mode shift alerted	Enable	
		Disable	
	Overload bypass function	Enable	
		Disable	

6.3 Fault Information

Fault Codes	Description	Fault Codes	Description
1	Battery voltage low	29	Battery SOC is below the alarm value (Takes effect after successful BMS communication)

2	Battery over current software	30	Battery SOC is below the discharge cutoff set value (Takes effect after successful BMS communication)
3	Battery no connect	31	Low battery shutdown (Takes effect 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	48	Leakage current protection

	protection		
21	Fan fault	49	PV insulation protection
22	Memory fault	58	BMS communication failure (Takes effect after successful BMS communication)
23	Model setting error	59	BMS Error (Takes effect after successful BMS communication)
24	Positive and negative bus voltages are unbalanced	60	BMS low temperature alarm (Takes effect after successful BMS communication)
25	Bus short circuit	61	BMS over temperature alarm (Takes effect after successful BMS communication)
26	Inverter AC output is fed back to bypass AC output	62	BMS overcurrent alarm (Takes effect after successful BMS communication)
27	Mains input phase error	63	BMS undervoltage alarm (Takes effect after successful BMS communication)
28	Bus voltage low protection	64	BMS overvoltage alarm (Takes effect after successful BMS communication)

Notes:

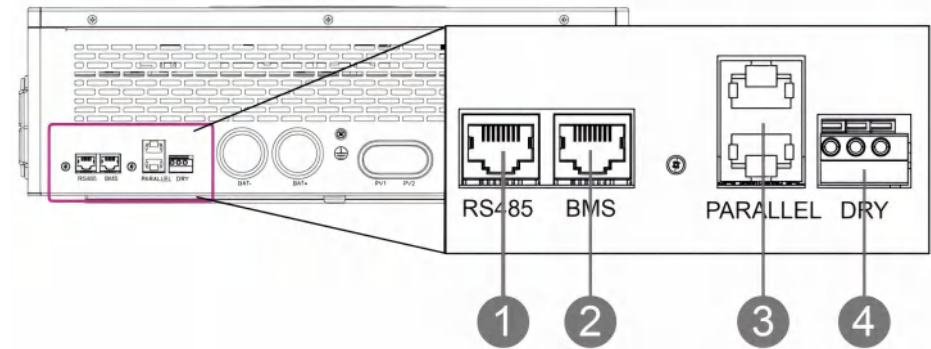
- 1) OTA Update: The device cannot perform OTA update when it is in the following states: Mains Operation, Inverter Operation, Inverter-to-Mains Switching, Mains-to-Inverter Switching, PV Charging Only, or Fault.
- 2) Solution: For UI version 1.3.0.7 and above, long-press the large icon on the main interface to manually shut down the device before proceeding with the update.
- 3) When Setting Charging Current: The set value of mains charging current must always be less than the set value of maximum charging current.
- 4) In Fault State: When modifying parameters in general settings, a secondary confirmation is required.
- 5) 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.
- 6) 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.

- 7) 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 Communication

7.1 Overview



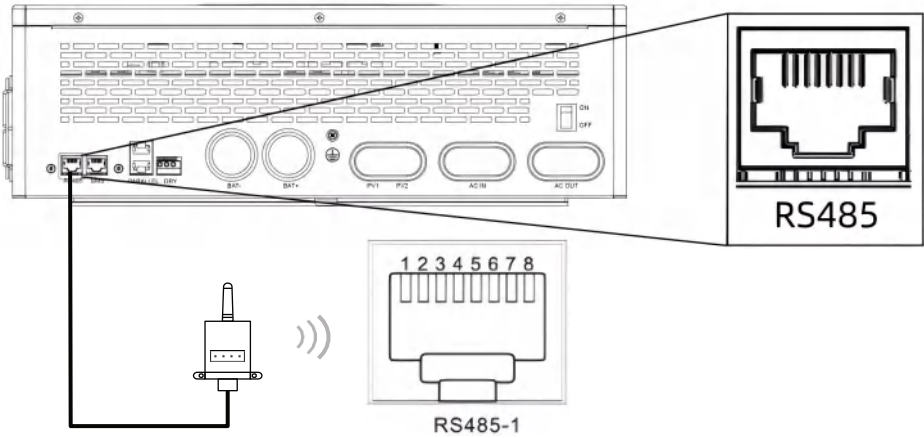
1	RS485 port	2	BMS port
3	Parallel communication port	4	Dry contact port

NOTICE

- The RS485 and BMS communication ports cannot be used simultaneously.

7.2 RS485-1 Port

Port RS485-1 is a data expansion port.

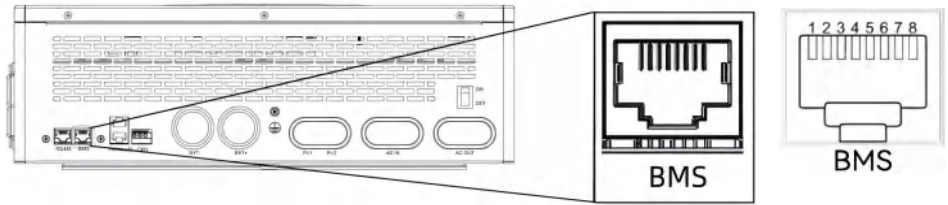


RJ45	Definition
Pin 1	5V
Pin 2	GND
Pin 3	/
Pin 4	/
Pin 5	/
Pin 6	/
Pin 7	RS485-A
Pin 8	RS485-B

7.3 BMS Port

The BMS port is used to connect BMS to 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 correctly connected and the protocol matches, communication is successful, and the battery icon in the upper-right corner of the inverter display will be illuminated, as shown in the figure.

If the communication cable is not connected, connected incorrectly, the communication protocol does not match, or the cable is unplugged after connection, communication fails, and the communication status icon in the upper-right corner will be illuminated, as shown in the figure.



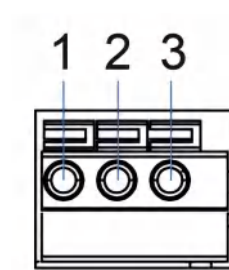
NOTICE

- If the inverter needs to communicate with a lithium-ion battery BMS, please contact us to obtain the communication protocol or upgrade the inverter firmware accordingly.
- If using a standard RJ45 network cable, check the pin configuration. In most cases, pins 1 and 2 must be disconnected for proper operation.

7.4 Dry Contact Port

The dry contact ports serve two primary functions:

Remote generator start/stop control



Features	Description
Remote generator start/stop control	When the battery voltage reaches the undervoltage alarm level or the voltage threshold for switching the battery to utility power, Pin 2 to Pin 1 is in a normally open state, and Pin 3 to Pin 1 is in a normally closed state. When the battery voltage reaches the threshold for switching from utility power back to the battery, or when the battery is fully charged, Pin 2 to Pin 1 is in a normally closed state, and Pin 3 to Pin 1 is in a normally open state. (The outputs of Pins 1/2/3 are 125 V / 1 A, 230 V / 1 A, and 30 V / 1 A.)

NOTICE

- If you need to use the remote start/stop function of a generator with dry contacts, make sure that the generator has an ATS and supports remote start/stop.

7.5 Bluetooth

The inverter has a built-in Bluetooth module, which can be connected to the EnerWise APP (EnerWise APP can be downloaded from the website or contact us to obtain the installation package.)



iOS



Android

7.6 WIFI

To connect to EnerwiseCloud Platform, set up the network via the APP.

Note: When entering the Wi-Fi name in the APP, use only letters and numbers (name < 32 characters). Do not include Chinese characters or special symbols.

For the password, use only letters and numbers ($8 \leq \text{length} < 16$ characters). Chinese characters and special symbols are not allowed.

8 Protection Function

8.1 Protective Features

No	Protective features	Instructions
1	PV Current Limiting Protection	When the charging current or power of the configured PV array exceeds the rated current or power of the inverter, it will be charged at the rated current or power.
2	PV Overvoltage Protection	If the PV voltage exceeds the maximum allowed by the hardware, the machine will report a fault and stop the PV boost to output a sinusoidal AC wave.
3	Night Anti-Backflow Protection	At night, because the battery voltage is higher than the voltage of the photovoltaic module, it will prevent the battery from discharging to the photovoltaic 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 voltage is lower than 90Vac, the mains charging will be stopped and the inverter output will be switched.
6	Battery Overvoltage Protection	When the battery voltage reaches the over-voltage disconnect voltage point, the PV and the mains will automatically stop charging the battery to prevent the battery from being damaged by overcharging.
7	Battery Undervoltage Protection	When the battery voltage reaches the low voltage disconnect voltage point, the battery will automatically stop discharging to prevent the battery from being damaged by excessive discharge.
8	Battery Overcurrent Protection	After the battery current exceeds the range allowed by the hardware, 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 output end of the load, the output AC voltage will be turned off immediately, and the output will be output again after 1 minute. If the output load is still in a short circuit state after 3 attempts, the short circuit fault of the load must be eliminated first and then manually powered on again to restore the normal output.
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 the overload protection, the inverter will resume output after 3 minutes, and 5 consecutive overloads will shut down the output until the inverter restarts. (102% < load < 110%) $\pm 10\%$: error, output turns off after 5 minutes.
12	AC Backfeed Protection	Prevent the battery inverter AC from backflow to the bypass AC input.
13	Bypass Overcurrent Protection	Software detection.
14	Bypass wiring Error Protection	When the phase of the bypass input differs from that of the inverter's split-phase output, the inverter will block the bypass switchover to prevent load power failure or short circuit during the transition.

9 Product Maintenance

9.1 Troubleshooting

Trouble Codes	Meaning	Reasons	Solutions
/	The screen is not displaying	No power input, or device switch is not turned on.	Check whether the battery circuit breaker or PV circuit breaker is closed. 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.	1. Check that the battery is reliably connected; 2. Check that the battery's circuit breaker is closed; 3. Make sure the BMS of the lithium-ion battery can communicate normally.
04	Battery undervoltage stops discharging	The battery voltage is lower than the value set in Over Discharge Voltage.	1. Manual reset: Turn off the power and restart 2. Automatic reset: Charge the battery so that the battery voltage is higher than the value set in the parameter "Overcharge Return Voltage"
06	Battery charge overvoltage protection	The battery is overvoltage.	Manually turn off the power and restart it. Check whether the battery voltage exceeds the limit. If so, discharge the battery until the voltage is below the over

			voltage of the battery.
13	Bypass over load protection	The bypass output power or output current is overloaded for a certain period of time.	Reduce the load power and restart the device. Refer to item 11 in Protection Features for more details.
14	Inverter over load protection	The output power or output current of the inverter is overloaded within a certain period.	
19	PV radiator over-temperature protection	The temperature of the photovoltaic radiator exceeds 80°C for 3s.	When the temperature of the radiator cools below the over-temperature recovery temperature, normal charging and discharging are resumed.
20	Inverter radiator over-temperature protection	The temperature of the inverter heat sink exceeds 80° C for 3s.	
21	Fan failure	The hardware has detected a fan failure.	After shutting down the system, manually start the fan and check for any foreign objects obstructing it.
26	Inverter AC output is feedback to bypass AC output	The AC output relay is stuck.	Restart manually, if the fault occurs again after restarting, you will need to contact after-sales service to repair the machine.
27	Mains input phase error	Phase mismatch detected between AC input and output.	Ensure that the AC input phase configuration matches the AC output phase configuration. For example, if the output is configured for split-phase operation, the input must also be in split-phase mode.

9.2 Maintenance

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

1. Ensure that airflow around the inverter is not obstructed, and remove any dirt or debris from the radiator.
2. Inspect all exposed wiring for damage caused by sun exposure, friction with surrounding objects, dry rot, or insect or rodent activity. Repair or replace any damaged wiring as necessary.
3. Verify that the display and instructions are consistent with the actual operation of the equipment. Pay attention to any faults or incorrect displays, and take corrective action if necessary.
4. Check all terminals for signs of corrosion, insulation damage, high temperature, or burning/discoloration, and tighten the terminal screws.
5. Check for dirt, nesting insects, and corrosion. Clean the insect netting regularly as needed.
6. If the lightning arrester has failed, replace it promptly to prevent lightning damage to the inverter or other user equipment.

DANGER

- Prior to any inspection or operation, it is essential to disconnect the inverter from all power sources and ensure that internal capacitors are fully discharged to prevent the risk of electric shock.

The following causes of machine issues are not covered under the standard warranty:

1. The product is beyond the warranty period (except for extended warranty services agreed upon by both parties);
2. Failures or damages resulting from failure to follow the product instructions or installation and maintenance requirements, or caused by operating, storing, or using the product in an environment that does not meet the specified conditions — such as improper installation distance, inadequate ventilation, or failure to use waterproof caps correctly;
3. Unauthorized disassembly, repair, or modification of the product;
4. Products obtained through unauthorized channels;
5. Failures or damages caused by unforeseeable circumstances, human factors, or force majeure events, such as storms, floods, lightning strikes, overvoltage, insect infestation, or fire;

6. Unauthorized design changes, modifications, or part replacements;
7. Intentional damage, defacement, permanent markings, or theft;
8. Normal wear and tear;
9. Failure to use the product in accordance with applicable safety standards (e.g., VDE standards);
10. Any other failures or damages not caused by product quality issues;
11. Damage incurred during transportation (including scratches on the casing caused by movement of the packaged product during transit);
12. Rust or corrosion of the enclosure due to exposure to harsh environmental conditions.

10 Specifications

Model Number	ECG-LVM12K-SP
Inverter Output	
Rated Output Power	12000 W
Max. Peak Power	24000 W
Rated Output Voltage	100V-130V/200V-260V (single/split phase)
Rated Frequency	50/60Hz
Output Waveform	Pure sine wave
Switching Time	10ms (typical value)
Battery	
Battery Type	Lithium-ion battery/lead-acid battery
Rated Battery Voltage	48Vdc
Voltage Range	40~60Vdc
Max. PV Charging Current	200A
Max. Mains/ Generator Charging Current	100A
Max. Hybrid Charging Current	200A
PV Input	
MPPT Way Number	2
Max. Input Power	9000 W + 9000 W
Max. Input Current	22A+22A
Max. Open Circuit Voltage	500Vdc+500Vdc
MPPT Operating Voltage Range	125~425Vdc
Mains/Generator Input	
Input Voltage Range	90~140Vac
Input Frequency Range	50/60Hz
Bypass Overload Current	63A
Efficiency	
MPPT Tracks Efficiency	99.9%
Max. Efficiency of Battery Inverter	92%

General	
Dimensions (W*H*D)	470*620*147mm
Weight	25.5kg
Level of Protection	IP20, for indoor use only
Ambient Temperature	-10 to 55°C, >45°C derated
Noise	<60dB
Cooling Method	Smart cooling
Warranty Time	2 years
Communication	
Built-in Interface	RS485/ CAN / Dry contact
Communication Module	WIFI/Bluetooth/4G
Certified	
Safety Standards	UL STD.1741, FCC SDOC Part 15B

11 Parallel Installation and Wiring

11.1 Introduction

- Before parallel operation, ensure that the inverter software is updated to the latest version.
- A maximum of six inverters can be connected in parallel.
- When using the parallel function, ensure that the parallel communication cables are correctly and securely connected.
- Recommended cable specifications for parallel connection:
 - RJ45 connector (8-pin modular plug)
 - Length: 2 meters
 - Cat-6 shielded twisted-pair cable (with ferrite bead shielding)

The following diagram illustrates the connection cable:

Parallel communication line*1:



11.2 Wiring Guidelines for Parallel Systems

1. PV wiring:

When connecting multiple inverters in parallel, each inverter must be connected to a separate PV array or PV source. A single PV source must not be shared by multiple inverters, and within one inverter, PV1 and PV2 must not be connected to the same PV source.

2. Battery cable connection:

In both split-phase and three-phase parallel configurations, all inverters must be connected to the same battery system. Connect BAT+ to BAT+ and BAT- to BAT- across all units. Before powering on the system, ensure that the wiring is correct, and that cable length and diameter are consistent, to avoid abnormal output operation in the parallel system.

3. AC OUT connection:

a. Split-Phase Parallel Wiring

When connecting in split-phase parallel mode, connect all inverters' L1 terminals together, all L2 terminals together, N to N, and PE to PE. Ensure all connections are correct and that wiring length and conductor size are consistent before powering on, to prevent incorrect wiring that could cause abnormal operation of the parallel system.

b. Three-Phase Parallel Wiring

For three-phase parallel systems, connect all inverters' N to N and PE to PE. Inverters assigned to the same phase must have their L lines connected together. Do not connect L lines between different phases. All other precautions are the same as for split-phase connections.

4. AC IN connection:

For split-phase parallel systems, connect N to N and PE to PE. L1 terminals of all inverters must be connected to the L1 phase, and L2 terminals must be connected to the L2 phase. Ensure all connections are correct before powering on, and that wiring lengths and wire gauges are uniform to prevent abnormal operation of the parallel system.

Do not connect multiple AC input sources simultaneously, as this may damage the inverters or other connected equipment. AC input sources must maintain consistent and unique configurations. For three-phase parallel systems, connect N to N and PE to PE. L lines of inverters in the same phase must be connected together. Do not connect L lines from different phases.

5. Parallel communication cable wiring:

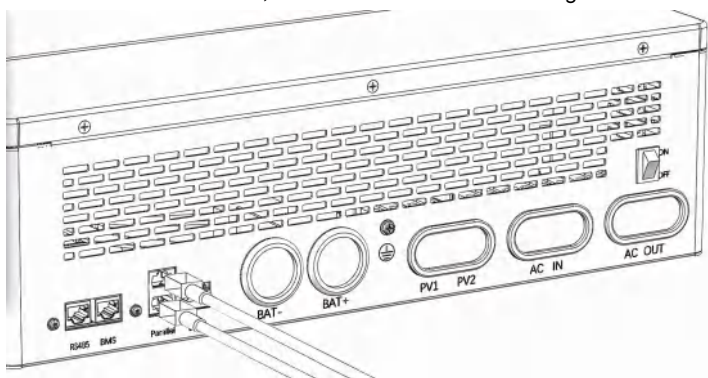
Communication cables should be connected according to the split-phase or three-phase parallel configuration. Each inverter must follow a one-in-one-out daisy-chain connection: the male connector (OUT) of one device must be connected to the female connector (IN) of the next. Reversing this order is not allowed.

All communication cables must be securely fastened with screws to prevent loosening or poor contact, which could lead to system malfunctions or equipment damage.

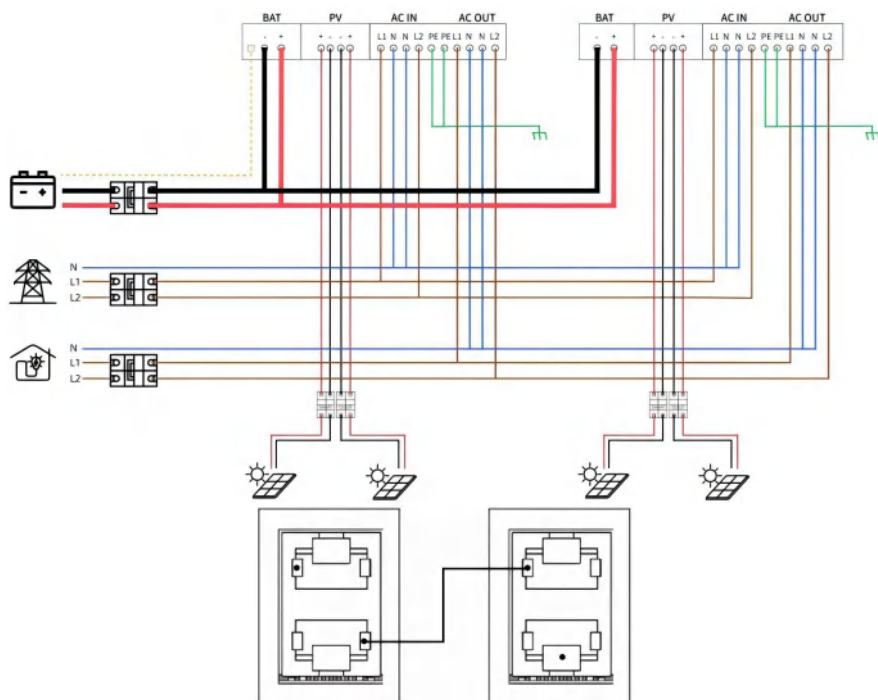
Reminder: Set the parallel communication pins of the first and last inverters to the ON position, and set the inverters between them to the OFF position. The two switches in the "ON" position correspond to address 1. The switches in the "OFF" position correspond to their respective addresses.

11.3 Split-Phase Parallel Connection Diagram

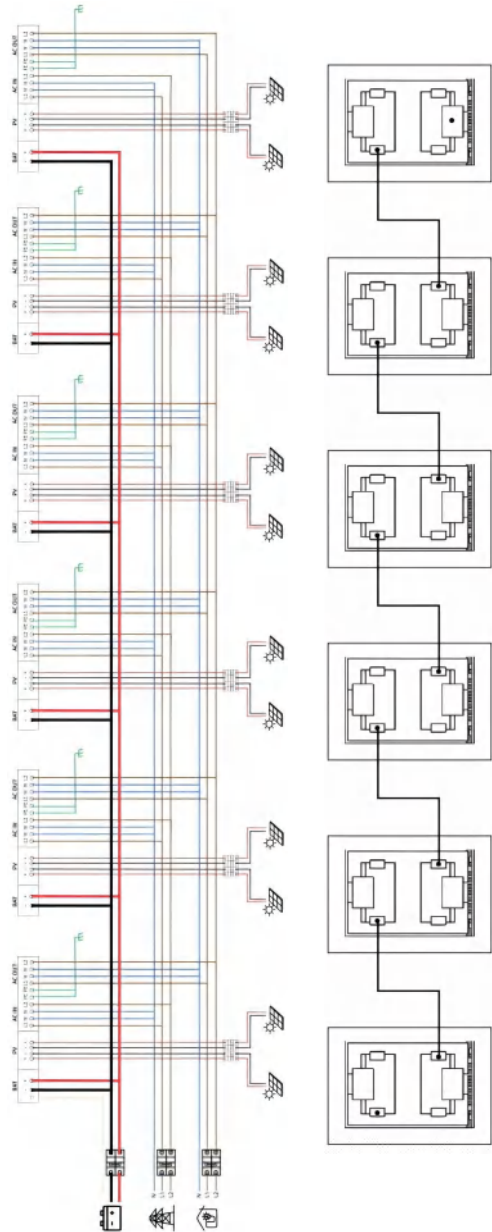
1. The inverter parallel communication line and equal current detection line need to be connected and locked with screws, as shown in the schematic diagram:



2. Parallel connection of multiple units
 - 1) Two inverters connected in parallel

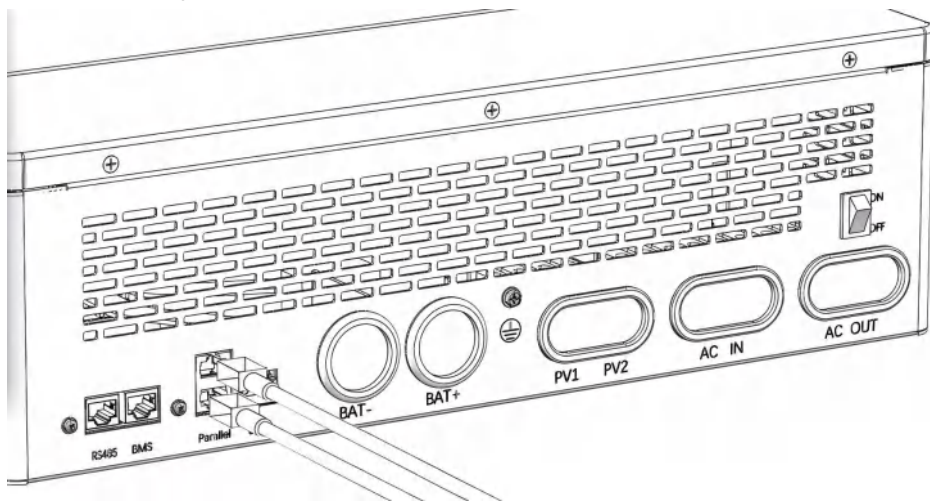


2) Six inverters connected in parallel



11.4 Three-Phase Parallel Connection Diagram

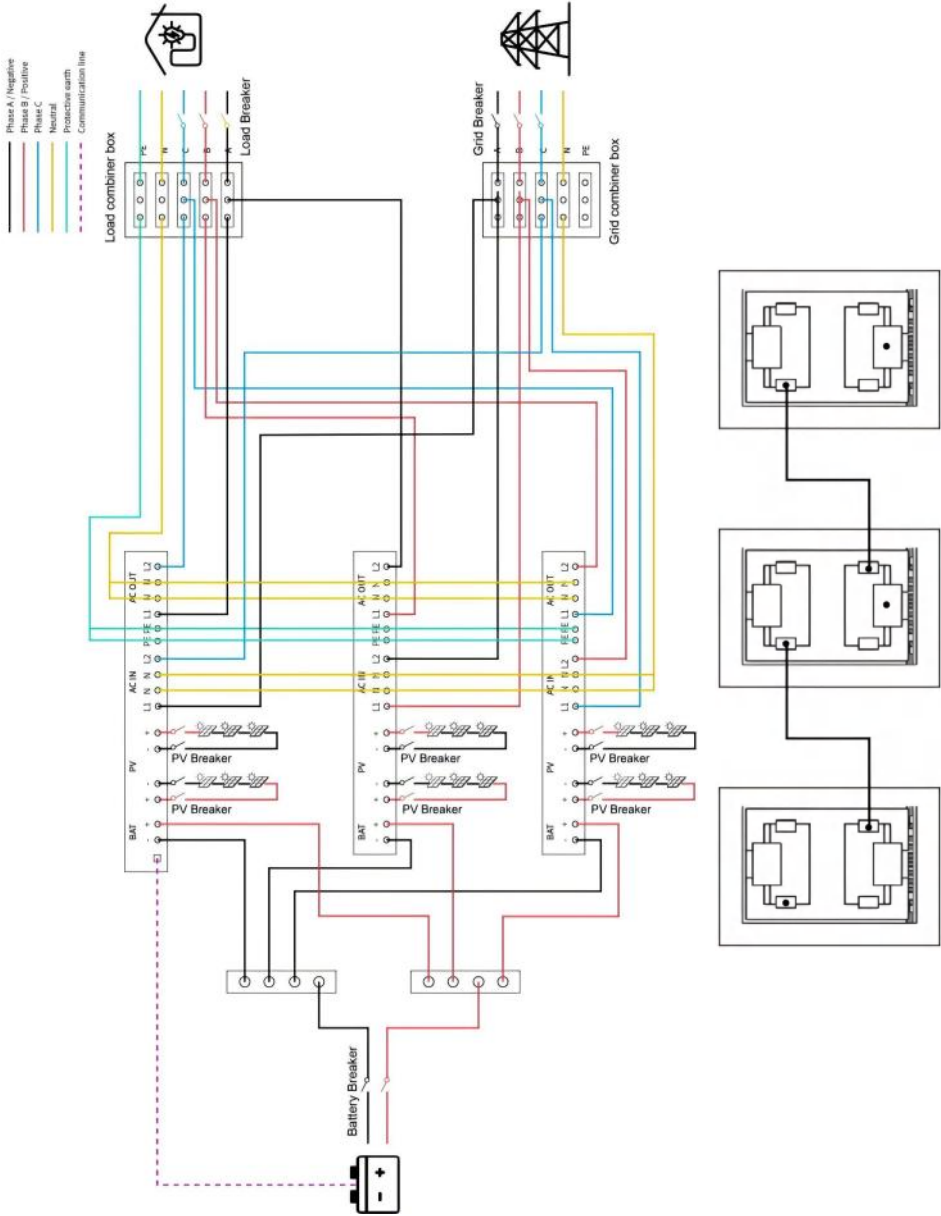
The communication line of the inverter should be connected and locked with screws, as shown in the schematic diagram:



NOTICE

- The PV input ports must always be used independently.
- Always read the user manual and follow the instructions before performing parallel operation.

Three-Phase Parallel Operation



Attention:

- 1) Before powering on and lighting up the screen, verify that all wiring is correct according to the wiring diagram above to avoid system faults.
- 2) Ensure all connections are firmly secured to prevent disconnection or poor contact, which may cause abnormal system behavior.
- 3) When connecting the AC output to the load, ensure correct wiring according to the electrical load requirements to avoid damage.
- 4) The AC output voltage must be set consistently across all units, or configured only on the master. In parallel mode, the master unit's voltage setting will override those of the slave units to ensure consistency. This parameter can only be configured in standby mode.
- 5) By default, the inverter operates in standalone mode. If parallel or three-phase mode is required, configure the AC output mode via the LCD screen. The setting procedure is as follows:
 - Power on one unit at a time while keeping the others off.
 - Configure the AC output mode based on the system's actual operation requirements.
 - After setting up the unit, turn it off and proceed with the next unit in the same way.
 - Once all units are configured, power them on simultaneously to enter normal operation.
- 6) After system startup, verify that the output voltage is correct before connecting the load.

