# User Manual


## All-in-one solar charge inverter

**SUNON7.2**

V1.0

# Contents

# 1. Safety

## 1.1 About this Manual

- This Manual contains important information, guiding principles, operation, and maintenance of the product, and applies to the model: **SUNON7.2**
- Users must follow the instructions in this Manual during installation, use and maintenance

## 1.2 Symbols and description

| Symbol | Description |
|---|---|
| ⚠ DANGER | Dangerous situations that will lead to death or serious injury when ignored |
| ⚠ WARING | Dangerous situations that may lead to death or serious injury when ignored |
| ⚠ CAUTION | Dangerous situations that may lead to mild or moderate injury when ignored |
| ⓘ NOTICE | Operation tips |

## 1.3 Safety matters

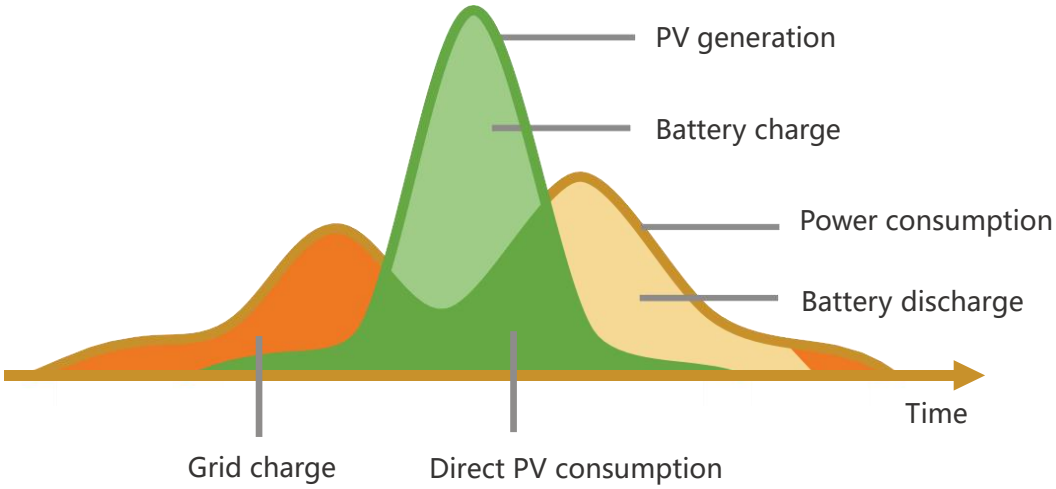
⚠ DANGER

- This chapter contains important safety matters. Please read and keep this Manual for future reference.
- Please make sure to comply with local requirements and regulations when installing the inverter.
- Be careful of high voltage. Before and during installation, please turn off the switch of each power supply to avoid electric shock.
- In order to achieve optimal operation of the inverter, please select the appropriate cable size and necessary protective devices according to regulations.
- Do not connect or disconnect any connections when the inverter is working.
- Do not open the terminal cover when the inverter is working.

# 2. About the Product

## 2.1 Description

SUNON7.2 is a new type of solar storage inverter that integrates PV storage, Grid charge, and energy storage and outputs sinusoidal AC. Equipped with DSP control and advanced control algorithm, it has high response speed and good reliability, and applies to industrial scenarios.




## 2.2 Features

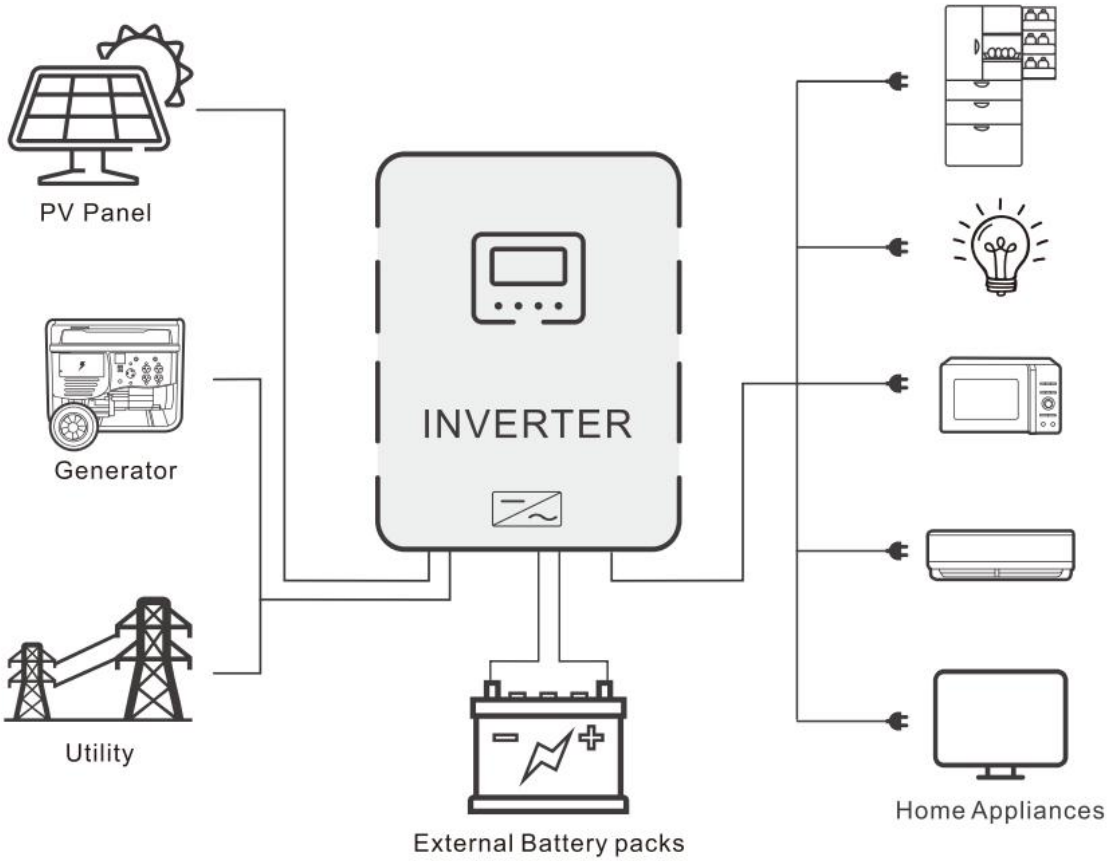
- Support the connection of various types of energy storage batteries such as lead-acid battery and lithium-ion battery
- Have the dual activation function during lithium-ion battery sleep, that is, access to Grid/PV power can activate the lithium-ion battery
- Support split-phase/single-phase pure sine wave output
- Support adjusting the voltage of each phase within the range of 100 VAC, 105 VAC, 110 VAC, 115VAC,120 VAC and 127 VAC
- Support two-channel PV input and have the function of simultaneous two-channel maximum power point tracking (MPPT) for charging/carrying capacity
- Support two-channel MPPT, with an efficiency of up to 99.9% and a maximum single-channel current of 16 A, perfectly fitting high-power modules
- Provide 2 charge modes: only PV and grid + PV
- Have the timed charge and discharge function, that is, users can set the charge and discharge time according to the time-of-use price to save electricity costs
- Have the energy-saving mode, reducing no-load energy losses
- Provide two output modes: Grid bypass output and inverter output, achieving uninterrupted power supply
- Support LCD display of dynamic flowchart, updating system data and operating status at any time
- Provide 360° protection, including short circuit protection, over current protection, over voltage and under voltage protection, and overload protection
- Support CAN, USB, RS485 communication

## 2.3 System connection diagram

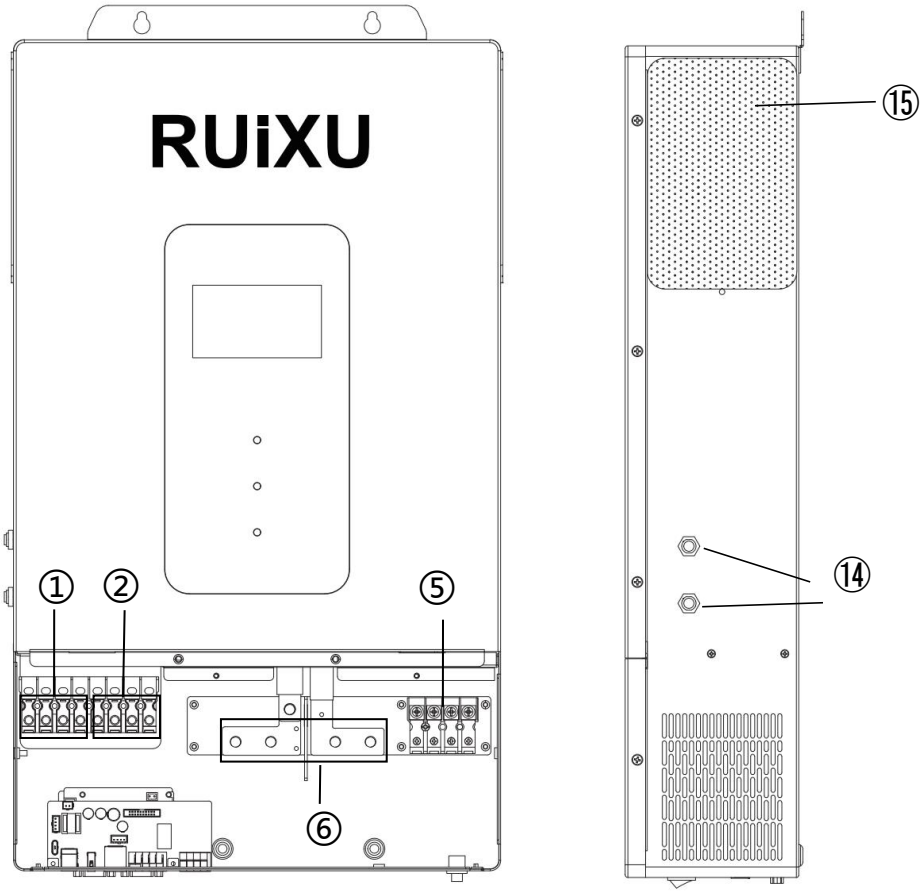
The following figure shows the system application scenario of the product. A complete system consists of the following parts:

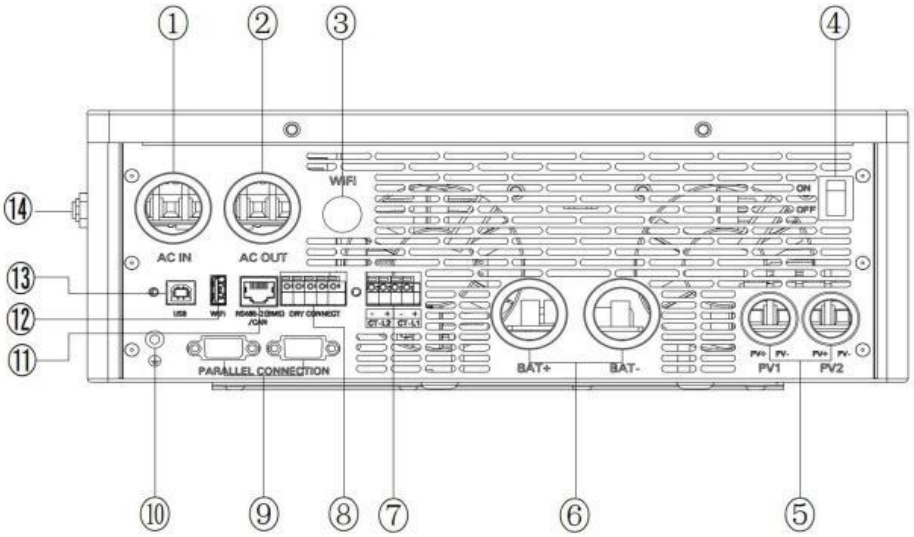
1. **PV module:** It converts solar energy into DC to charge batteries or into AC to supply power to loads.
2. **Grid or generator:** Connected to AC input, it can charge batteries while supplying power to loads. When the battery and PV module supply power to the load, the system can generally operate without Grid or generator.
3. **Battery:** The function of a battery is to ensure normal power supply for the system load when there is insufficient PV power and no Grid.
4. **Household load:** It can connect various household and office loads, including refrigerators, lighting fixtures, TVs, fans, air conditioners, and other AC loads.
5. **Inverter:** It is the energy conversion device of the entire system.

- **The actual application scenario determines the specific system wiring mode**



## 2.4 Product overview

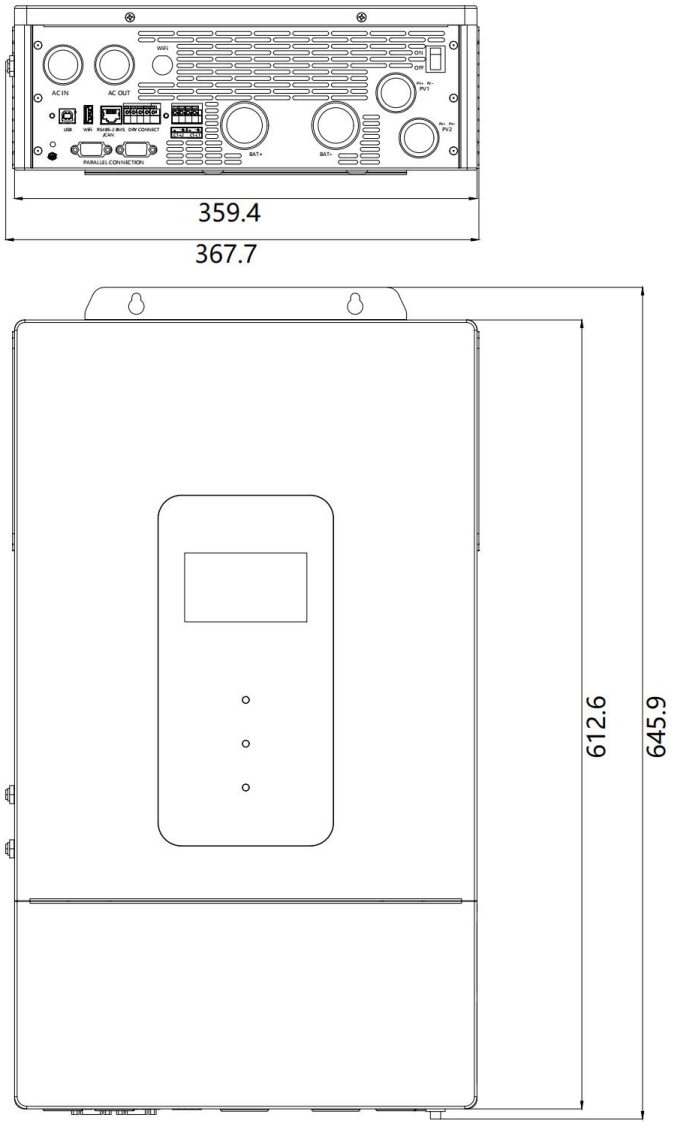


| | | | | | |
|---|---|---|---|---|---|
| 1 | AC input | 6 | Battery input | 11 | BMSRS（485-2/CAN communication port |
| 2 | AC output | 7 | CT dry contact | 12 | USB-WiFi （ optional） |
| 3 | RS485-Wi Fi | 8 | Dry contact | 13 | USB communication port （Inverter debugging port） |
| 4 | ON/OFF rocker switch | 9 | Parallel communication port | 14 | AC input overload protector reset button |
| 5 | PV input | 10 | Grounding screw | 15 | insect-proof net |

## Dimension

Unit：mm

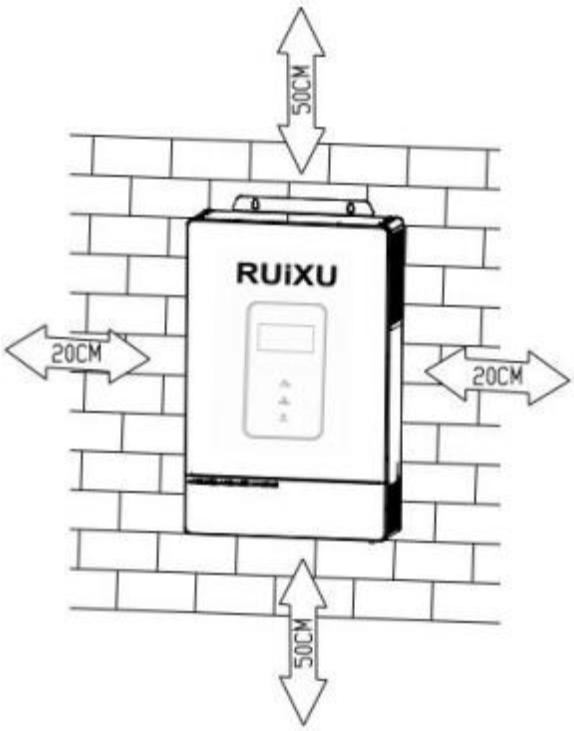


# 3. Installation

## 3.1 Installation location

SUNON7.2 is only for indoor use **(protection level: IP20).** Before selecting the installation location, users should consider the following factors:

- A solid wall
- Installation height: flush with the line of sight
- Sufficient heat dissipation space
- Ambient temperature: -10°C–55°C (14°F–131°F), to ensure optimal operation




**⚠ DANGER**

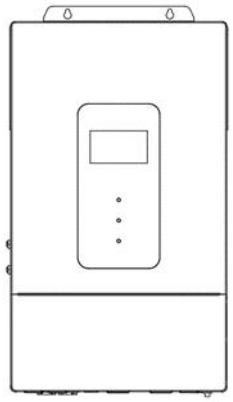
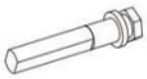
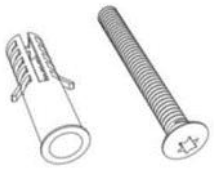
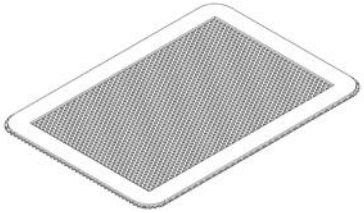
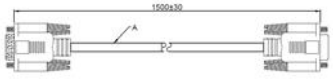
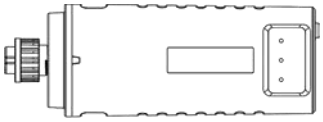
- Do not install the inverter near highly flammable materials
- Do not install the inverter in potentially explosive areas
- Do not install the inverter and lead-acid battery in enclosed spaces

**⚠ CAUTION**

- Do not install the inverter in direct sunlight
- Do not install or use the inverter in damp environments

## 3.2 Packing list

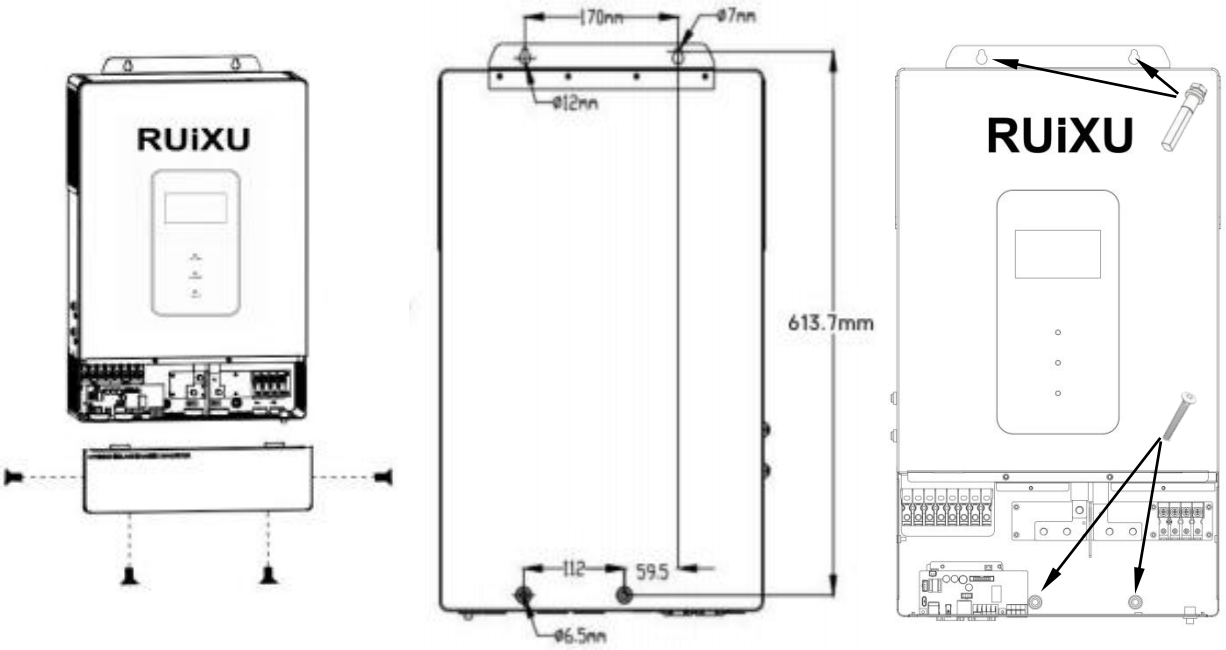
Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items in the package:

| No. | Picture | Description | Quantity |
|---|---|---|---|
| 1 |  | Inverter | 1 |
| 2 |  | M6*60mm Expansion screw | 2 |
| 3 |  | M5*40 self-tapping screws + M8*40 expansion anchors | 2 |
| 4 |  | M8 Hex flange nut | 4 |
| 5 |  | Copper lug SC50-8 | 4 |
| 6 |  | Dust-proof net | 2 |
| 7 |  | Parallel communication cable | 1 |
| 8 |  | RS-485 WiFi model<br>(Including Connection Cable) | 1 |

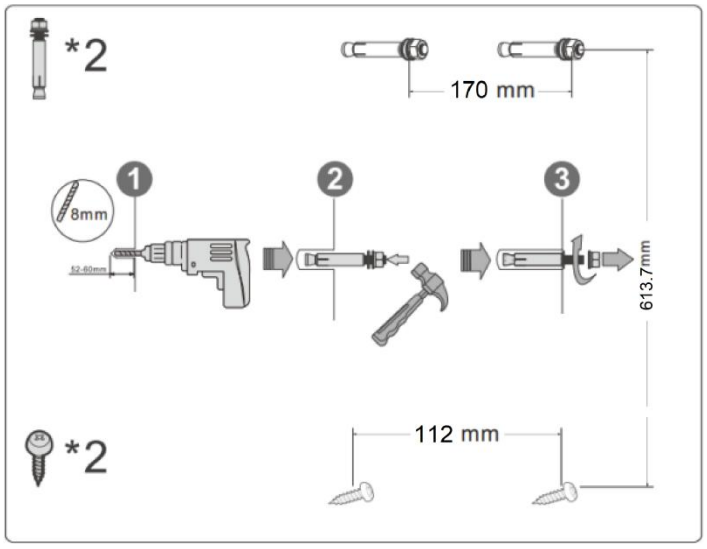
| | | | |
|---|---|---|---|
| 9 |  | User Manual | 1 |
| 10 |  | The warranty card | 1 |
| 11 |  | Quality Certificate | 1 |
| 12 |  | Outgoing inspection report | 1 |

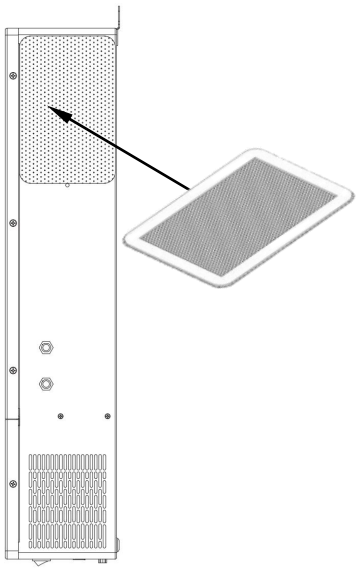
## 3.3 Inverter installation

Before installation, please remove the terminal cover by unscrewing the four screws as shown below.




Use an electric drill to drill 4 installation holes of specified sizes on the wall. Insert 2 expansion screws in the upper part. Hang the inverter on the expansion screws, and then fix the inverter with 2 M5 screws in the lower part.



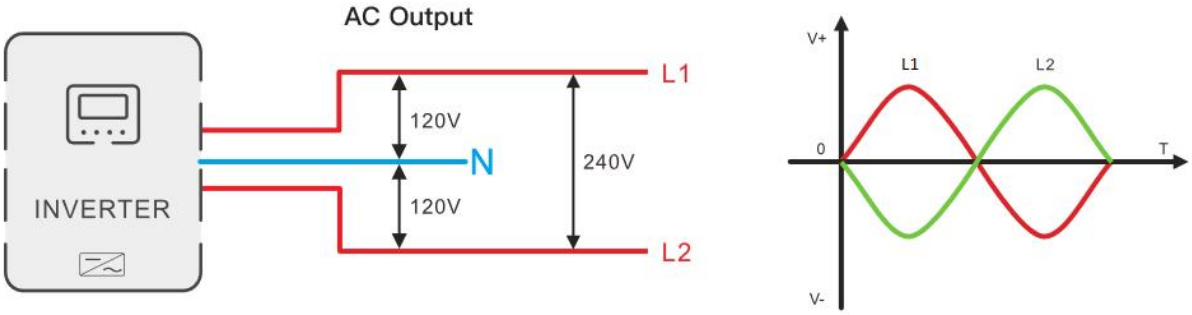
**NOTICE**

- When using the inverter in areas with poor air quality, the dust proof net is easily blocked by air particles. Please regularly remove and clean it to avoid affecting the air flow rate inside the inverter; otherwise it may cause inverter overheating (22/23 fault), and affect power supply and the service life of the inverter

# 4. Wiring

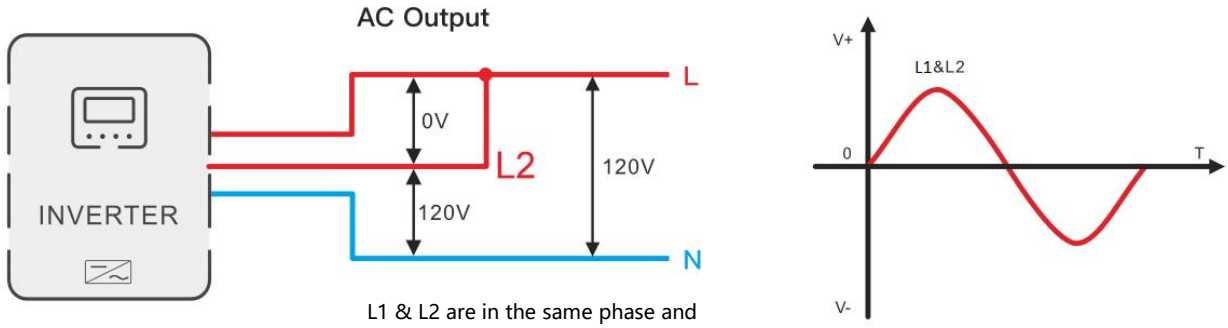
## 4.1 Wiring mode (depends on the output mode)

- **Split-phase mode (default)**



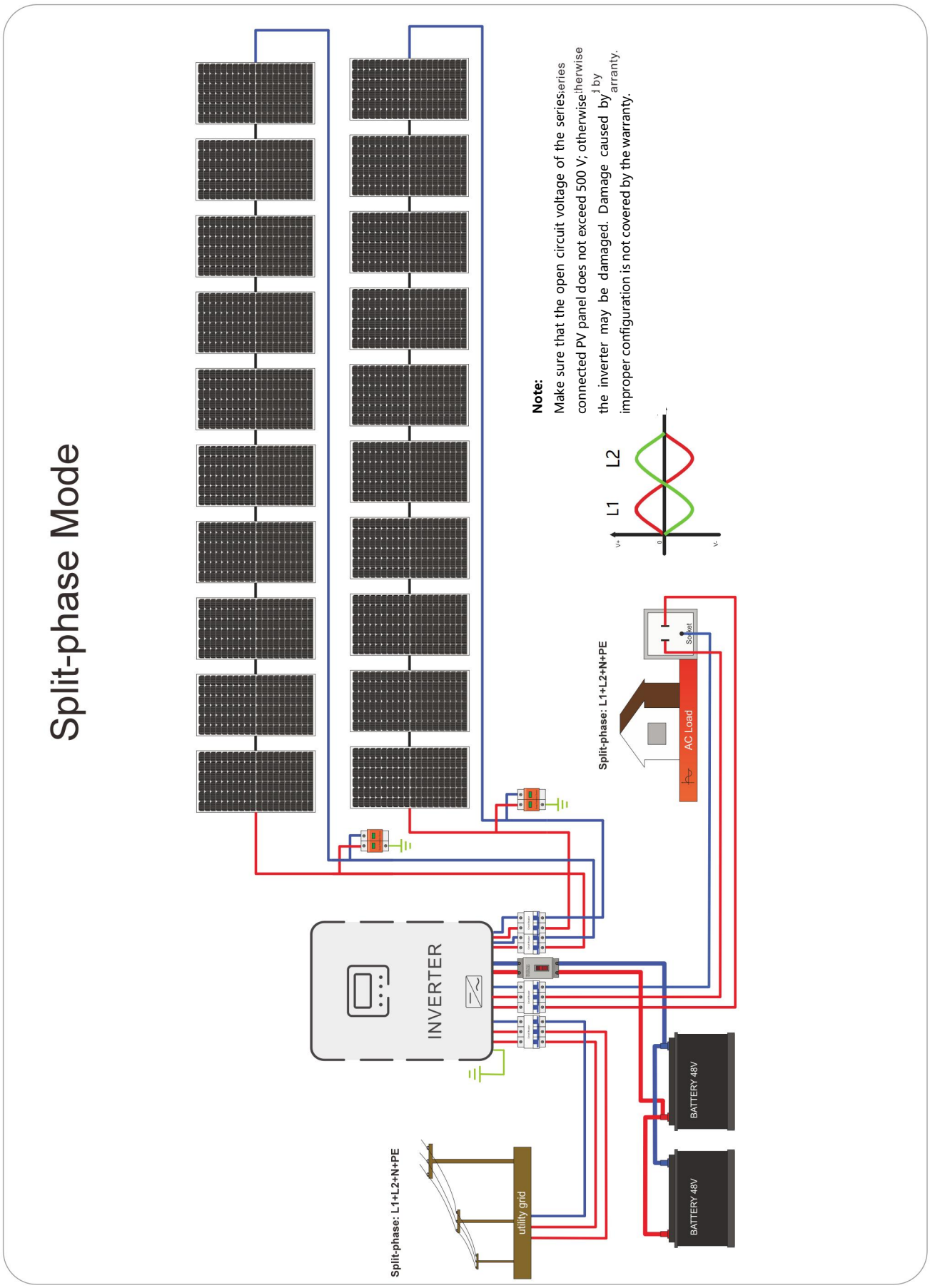

| Item | Description |
|---|---|
| Applicable model | SUNON7.2 model |
| AC output phase voltage (L-N) | 100 VAC–120 VAC, 120 VAC (default) |
| AC output line voltage (L-L) | 200 VAC–240 VAC, 240 VAC (default) |

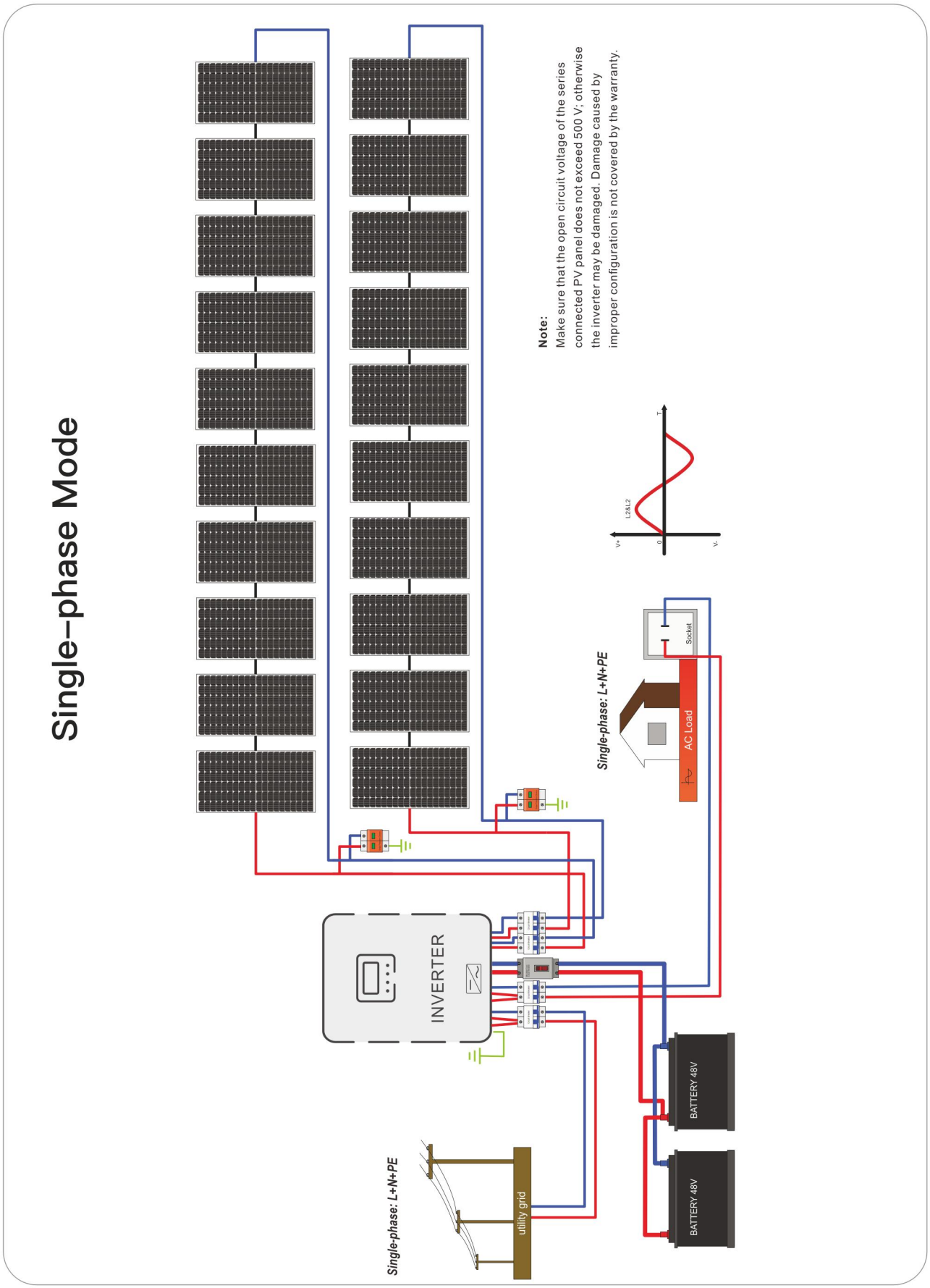
- **Single-phase mode**




L1 & L2 are in the same phase and can be used in parallel

| Item | Description |
|---|---|
| Applicable model | SUNON7.2 U model |
| AC output phase voltage (L-N) | 100 VAC–120 VAC, 120 VAC (default) |


Split-phase Mode
Note:
Make sure that the open circuit voltage of the series connected PV panel does not exceed 500 V; otherwise the inverter may be damaged. Damage caused by improper configuration is not covered by the warranty.
L1
L2
INVERTER
AC Load
Split-phase: L1+L2+N+PE
Split-phase: L1+L2+N+PE
utility grid
BATTERY 48V
BATTERY 48V

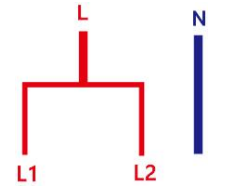

Single-phase Mode
Note:
Make sure that the open circuit voltage of the series connected PV panel does not exceed 500 V; otherwise the inverter may be damaged. Damage caused by improper configuration is not covered by the warranty.
L2&L2
V+
0
V-
INVERTER
Single-phase: L+N+PE
AC Load
Socket
Single-phase: L+N+PE
utility grid
BATTERY 48V
BATTERY 48V

## 4.2 Cable and circuit breaker model

- **PV INPUT**

| Inverter Model | Cable Size | Maximum Input Current | Circuit Breaker Model | Torque Value |
|---|---|---|---|---|
| SUNON7.2 | 3.31mm2/12AWG | 16A | 2P-25A | 1.2-1.6Nm |

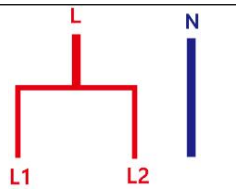
- **AC INPUT**

| Inverter Model | Output Mode | Diagram | Maximum Current | Cable Size | Circuit Breaker Model | Torque Value |
|---|---|---|---|---|---|---|
| SUNON7.2 | Split-phase mode |  | 50A (L1/L2/N) | 5.26mm2/10 AWG (L1\L2\N) | 3P-63A | 1.2-1.6Nm |
| | Single-phase mode |  L1 and L2 in same phase | 50A (L1/L2) 100 A (N) | 5.26mm2/10 AWG (L1/L2) 16.8 $mm^2$/5 AWG (N) | 2P-125A | 1.2-1.6Nm |

- **Battery**

| Inverter Model | Cable Size | Maximum Current | Circuit Breaker Model | Torque value |
|---|---|---|---|---|
| SUNON7.2 | 33.6mm2 /2AWG | 160A | 2P-200A | 2-3Nm |

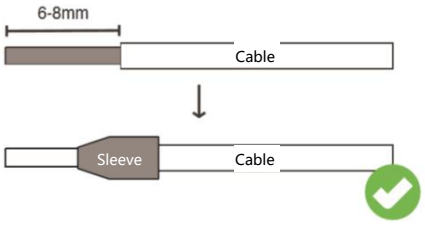
- **AC output**

| Inverter Model | Output Mode | Diagram | Maximum Current | Cable Size | Circuit Breaker Model | Torque Value |
|---|---|---|---|---|---|---|
| SUNON7.2 | Split-phase mode |  | 30A (L1/L2/N) | 5.26mm2/10 AWG (L1\L2\N) | 3P-40A | 1.2-1.6Nm |
| | Single-phase mode |  L1 and L2 in same phase | 30A (L1/L2) 60 A (N) | 5.26mm2/10 AWG (L1/L2) 16.8 $mm^2$/5 AWG (N) | 2P-80A | 1.2-1.6Nm |

**NOTICE**

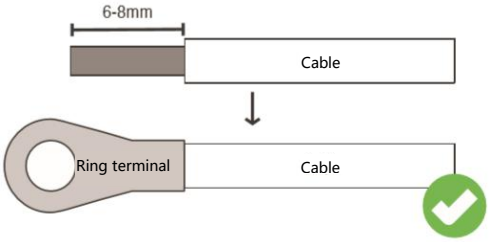
- **PV input, AC input, and AC output terminals**

1. Use a wire stripper to strip off 6 mm–8 mm long insulation layer of the cable.
2. Fix a sleeve at the end of the cable (the sleeve is to be prepared by the user)




- **Battery terminal**

1. Use a wire stripper to strip off 6 mm–8 mm long insulation layer of the cable.
2. Fix a ring terminal (attached) at the end of the cable



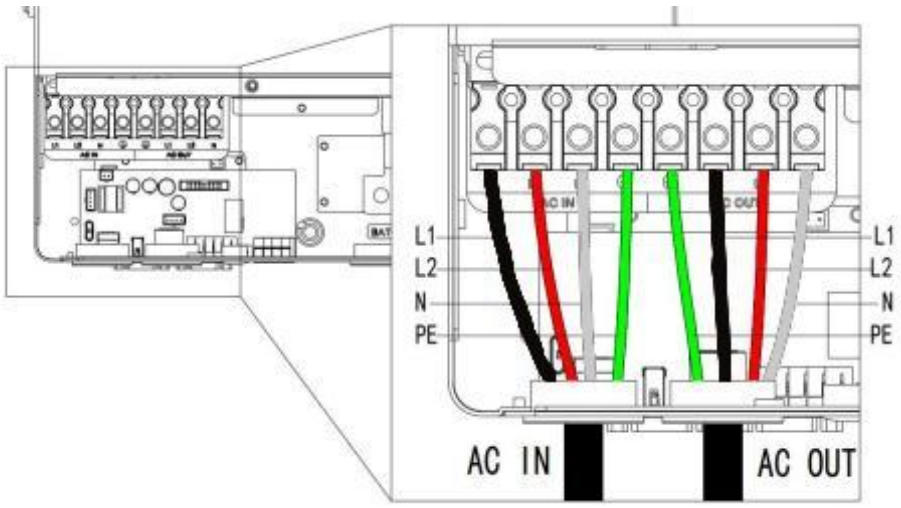

The cable size is for reference only. If the distance between the PV array and the inverter or between the inverter and the battery is long, using thicker cables will reduce voltage drop and improve system performance.

## 4.3 GRID and LOAD wiring

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

AC IN ---->GRID

AC OUT---->LOAD

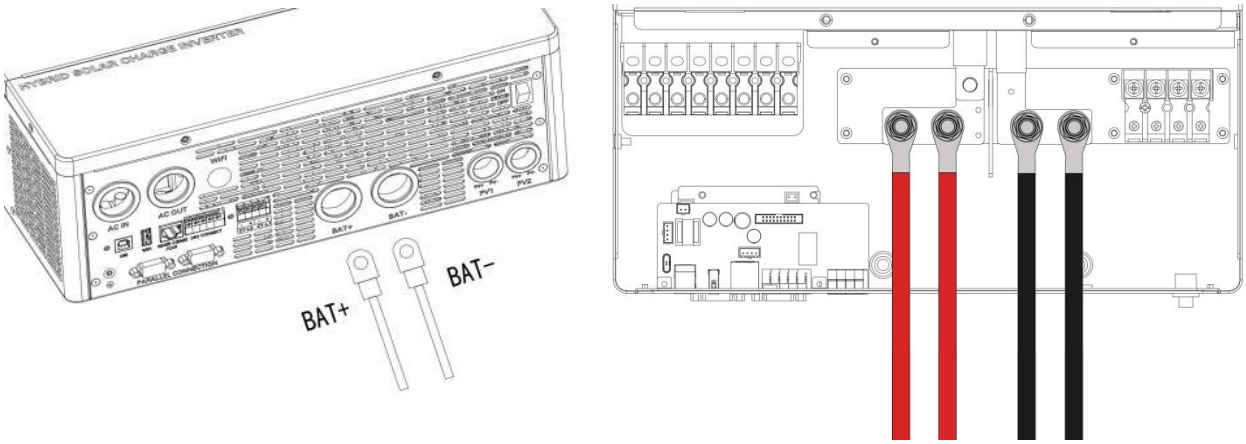


**⚠ DANGER**

- Before connecting AC input and output, be sure to disconnect the circuit breaker to avoid the risk of electric shock. Do not conduct live operation.
- Please check whether the cables used are sufficient to meet the requirements. Cables that are too thin or of poor quality may pose serious safety hazards.

## 4.4 Battery wiring

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

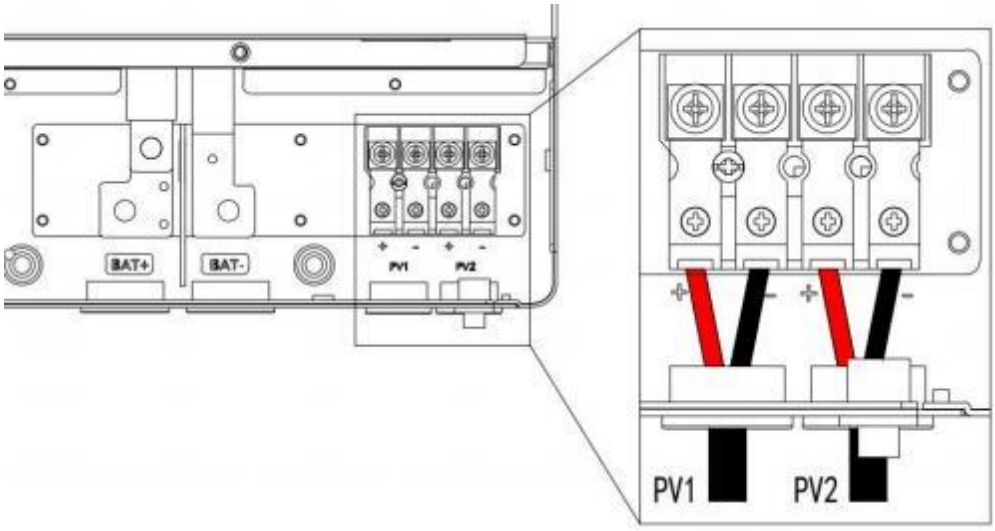



**⚠ DANGER**

- Before connecting the battery, be sure to disconnect the circuit breaker to avoid the risk of electric shock. Do not conduct live operation.
- Please check the positive and negative terminals of the battery for correct connection and no reverse connection; otherwise it may damage the inverter.
- Please check whether the cables used are sufficient to meet the requirements. Cables that are too thin or of poor quality may pose serious safety hazards.

## 4.5 PV wiring

Connect the positive and negative terminals of the two-channel PV modules according to the cable position and sequence shown in the following figure.

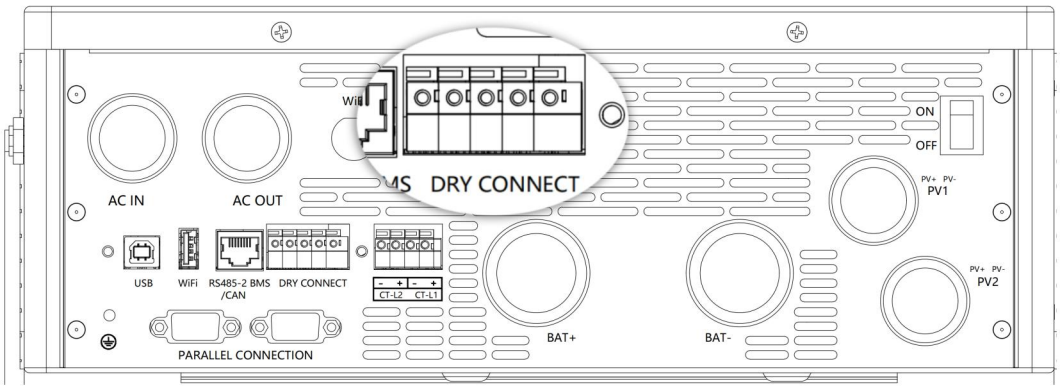



**⚠ DANGER**

- Before connecting PV modules, be sure to disconnect the circuit breaker to avoid the risk of electric shock. Do not conduct live operation.
- Please make sure that the open circuit voltage of the series connected PV modules does not exceed the maximum open circuit voltage of the inverter (in SUNON7.2, this value is 500 V); otherwise the inverter may be damaged.

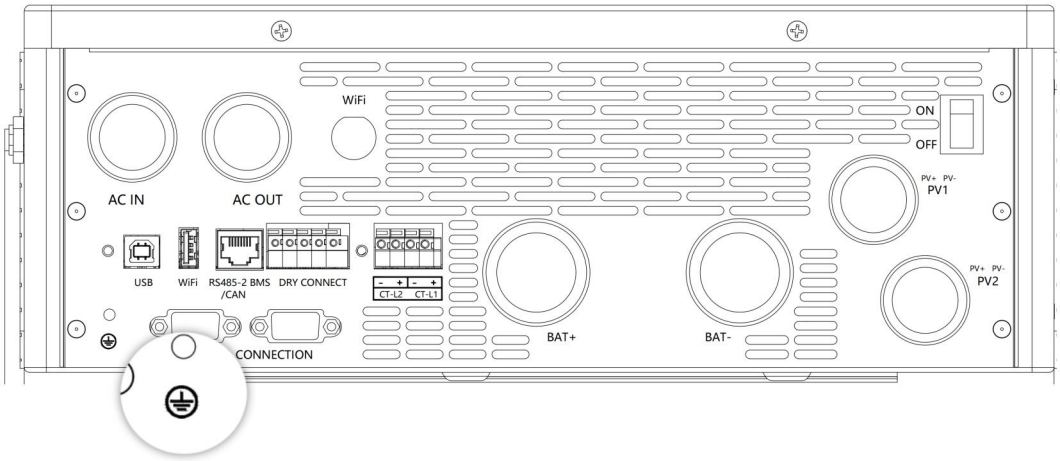
## 4.6 Dry contact wiring

Use a small-sized screwdriver to push back in the direction indicated by the arrow, and then insert the communication cable into the dry contact port. (Communication cable section: 0.2 $mm^2$–1.5 $mm^2$)




## 4.7 Grounding

Please ensure that the grounding terminal is reliably connected to the grounding busbar.




> ⓘ ***NOTICE***
>
> - The grounding cable size shall not be less than 4 mm² and shall be as close as possible to the grounding point

## 4.8 Inverter start

After confirming reliable wiring and correct wiring sequence, restore the terminal cover to its original position

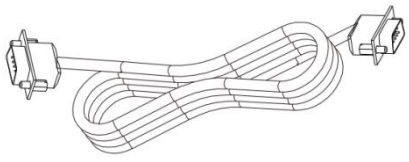
- Step 1: Close the battery circuit breaker.
- Step 2: Press the rocker switch at the bottom of the inverter, and the screen and indicator light up, indicating that the inverter has been activated.
- Step 3: Close the circuit breakers of PV, AC input and AC output in turn.
- Step 4: Start the load one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

## 4.9 Parallel wiring

### 4.9.1 Parallel operation

1. The parallel operation supports up to six solar storage inverters.
2. When using the parallel function, it is necessary to connect the parallel communication cable in a correct and reliable manner. See the figure blow for the communication cable (packaging accessory):

**Parallel communication cable*1**



## 4.9.2 Cautions for parallel connection

**Warning:**

1. **PV wiring:**

In parallel connection, the PV array of each inverter must be independent, and the PV array of PV1 and PV2 for one inverter must also be independent.

2. **Battery wiring**

**Parallel connection of batteries (It is necessary to set "Battery connected independently" to "Disable" in the setting interface.)**: Ensure that all inverters are connected to the same battery, with BAT + connected to BAT + , BAT - connected to BAT -, and that the connection is correct with the same wiring length and line diameter before power on and start-up, so as to avoid the abnormal operation of parallel system output caused by wrong connection.

**Separate connection of batteries (It is necessary to set "Battery connected independently" to "Enable" in the setting interface.)**: Ensure that each inverter was connected to the each battery, with BAT + connected to BAT + , BAT - connected to BAT -, and that the connection is correct with the same wiring length and line diameter before power on and start-up, so as to avoid the abnormal operation of parallel system output caused by wrong connection.

3. **AC OUT wiring:**

**Parallel connection in split phase:** Ensure L1-to-L1, L2-to-L2, N-to-N and PE-to-PE connection for all inverters, and that the connection is correct with the same wiring length and line diameter before power on and start-up, so as to avoid the abnormal operation of parallel system output caused by wrong connection. For specific wiring, please refer to 4.1 Wiring Diagram.

**Parallel connection in single phase:** Ensure N-to-N and PE-to-PE connection for all all-in-one solar charger inverters. The L(L1 and L2) lines of all inverters connected to the same phase need to be connected together. Other connection precautions are the same as parallel connection in single phase. For specific wiring, please refer to 4.1 Wiring Diagram.

4. **AC IN wiring:**

**Parallel connection in split phase**: Ensure L1-to-L1, L2-to-L2, N-to-NandPE-to-PE connection for all inverters, and that the connection is correct with the same wiring length and line diameter before power on and start-up, so as to avoid the abnormal operation of parallel system output caused by wrong connection. Meanwhile, it is not allowed to have multiple different AC source inputs to avoid damage to the external equipment of the inverter. The consistency and uniqueness of AC source input shall be ensured.For specific wiring, please refer to 4.1 Wiring Diagram.

**Parallel connection in single phase:** Ensure N-to-N and PE-to-PE connection for all all-in-one solar charger inverters. The L(L1 and L2) lines of all inverters connected to the same phase need to be connected together. Other connection precautions are the same as parallel connection in single phase. Other connection precautions are the same as parallel connection in s single phase. For specific wiring, please refer to 4.1 Wiring Diagram.

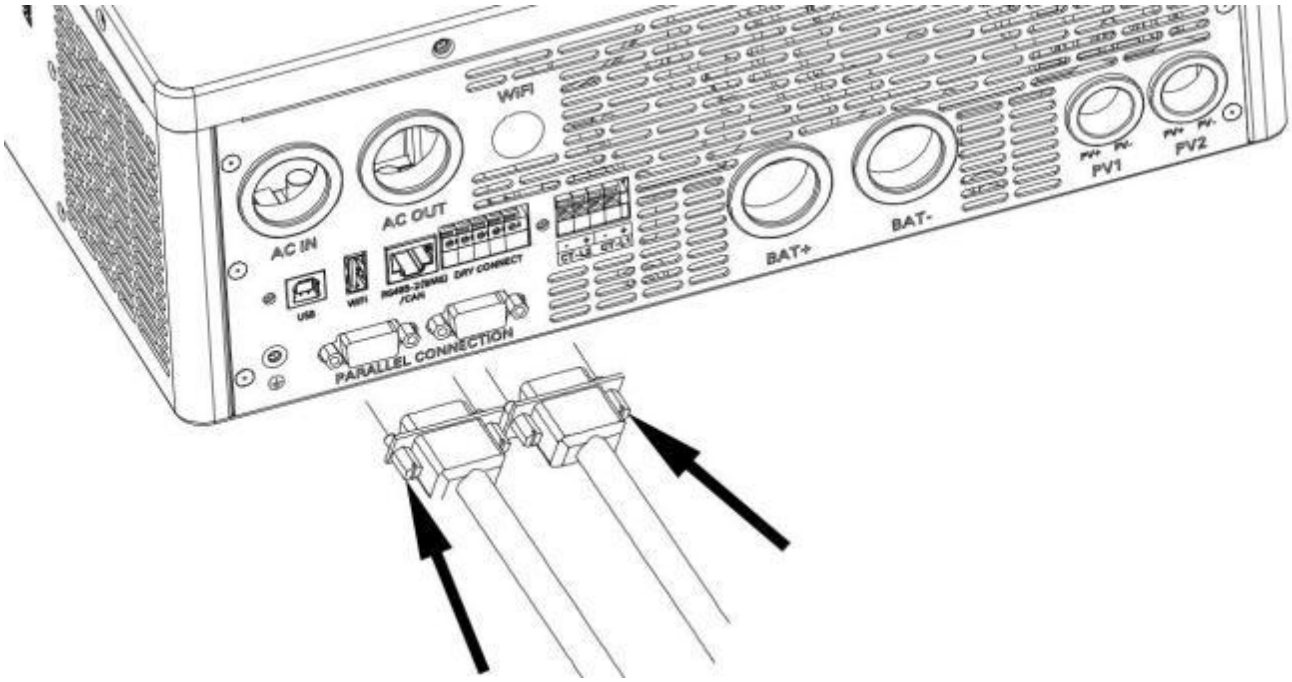
5. **Communication wiring:**

Our company's communication cable for parallel operation is a DB15 standard computer cable with shielding function, and it is used for single-phase or three-phase parallel connection. Each inverter shall be connected with one out and one in, that is, the male connector (out) of the inverter is to be connected to the female connector (in) of the parallel inverter, not the one of the inverter. In addition, DB15 terminal screws will be used to tighten the communication cable of each parallel inverter to avoid falling off or poor contact of the communication cable, followed by abnormal operation or damage of the system output.

6. Before and after connecting the system, please carefully refer to the following system wiring diagrams to ensure that all wiring is correct and reliable before power on.
7. After the system is correctly wired, powered on, and in normal operation, if a new inverter needs to be connected, make sure to disconnect the battery input, PV input, AC input and AC output, and that all solar storage inverters are powered off before reconnecting into the system.

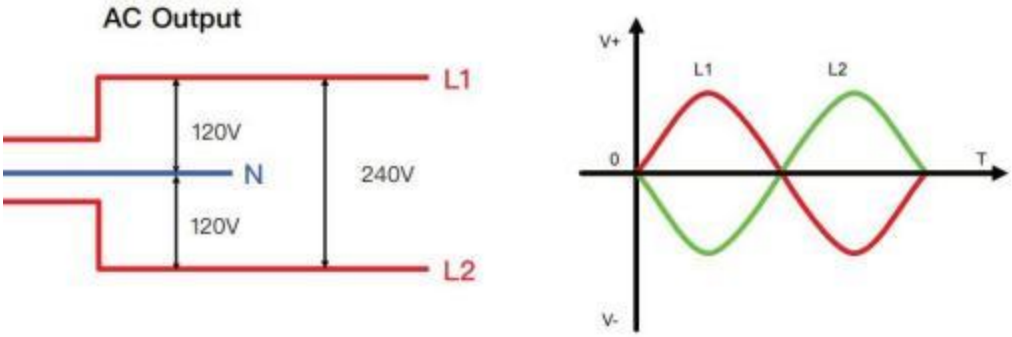
### 4.9.3 Wiring diagram for parallel connection

- The communication cable of parallel solar storage inverter is to be locked with screws after connecting. See the diagram below:

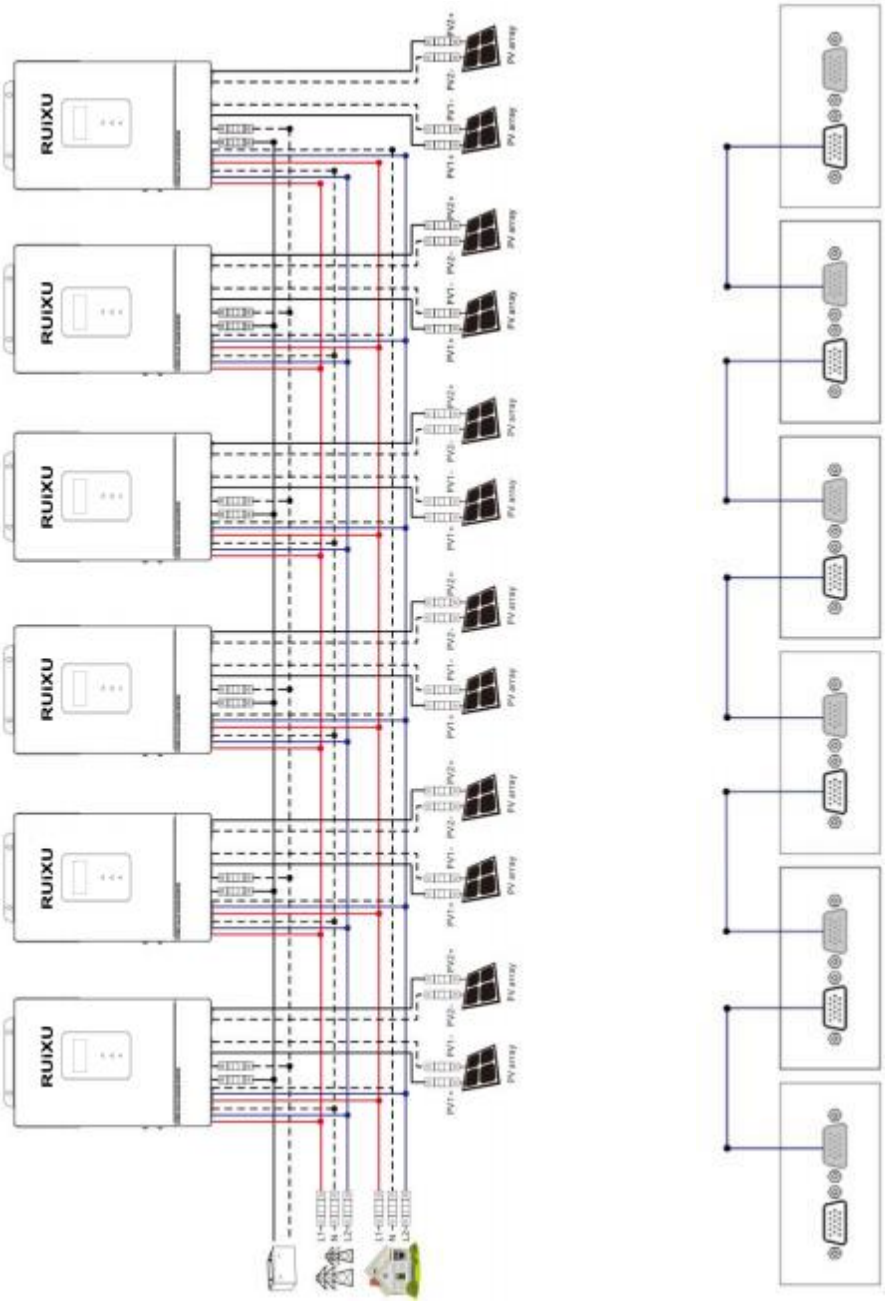



- In case of parallel operation with multiple inverters, the schematic diagram of parallel connection is as follows：

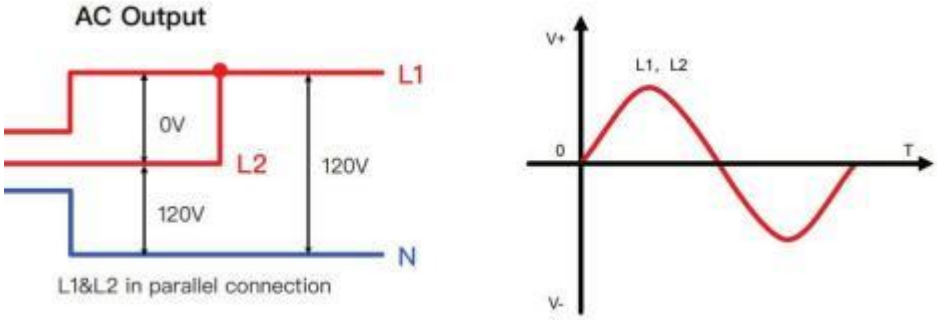
**Parallel connection in split phase**：



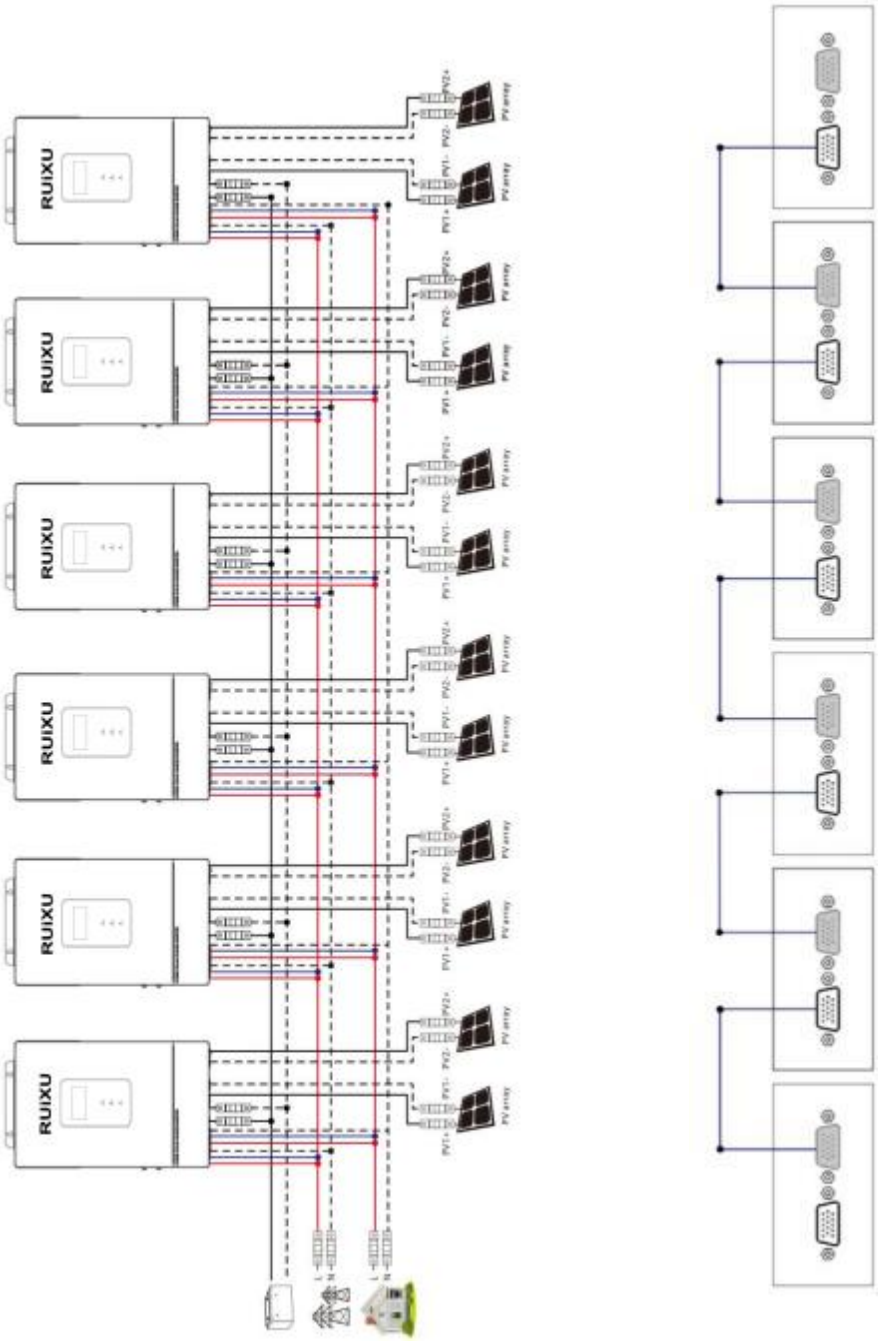

**a) six inverters of the system connected in split parallel:**



**Parallel Operation in single phase:**




**a） six inverters of the system connected in single phase:**



**Note:**

1) Before starting up and running, please check whether the connection was correct to avoid any abnormalities in the system.
2) All wiring must be fixed and reliable to avoid wire drop during use.
3) When the AC output is wired to the load, it shall be properly wired according to the requirements of the electrical load equipment to avoid damage to the load equipment.
4) Settings AC out voltage need to be set consistently or only for the host. When the machine is running, the voltage set by the host shall prevail, and the master will force the rewrite of the other slave machines to keep the same set. Only can be set in the standby mode.

| | | |
|---|---|---|
| AC output voltage setting | 120Vac **default** | Allow to set to 100Vac/105Vac/110Vac/120Vac/127Vac, default 120V. The rated output power will be reduced = (Power Rate)*(Vset/120) |

5) When parallel connection is required to form a 120V single - phase output, the "AC output phase setting" of the master inverter should be set to "Single phase". When parallel connection is required to form a 240V split - phase output, the "AC output phase setting" of the master inverter should be set to "Split 180".

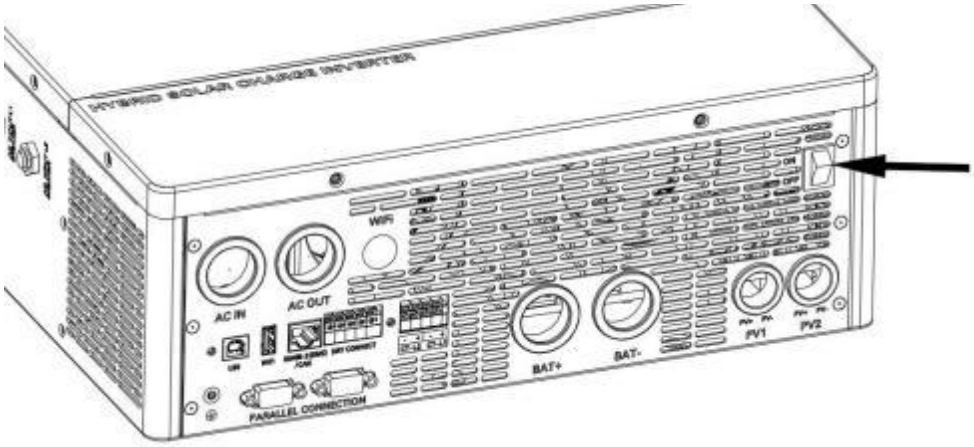
| | | |
|---|---|---|
| AC output phase setting<br><br>Set in the settings interface:<br>setting -><br>Grid setting -><br>AC output phase setting | Single phase | Stands for single-phase mode. The phase same of L1-L2 is 0 degree, L1/L2 in parallel connection. As AC output voltage setting was 120Vac, therefore L1-N/L2-N voltage was 120Vac, L1-L2 voltage was 0Vac. Setting allowed only when output is switched off. |
| | Split 120 | Stands for split-phase mode. The phase difference of L1-L2 is 120 degree, L1/L2 in split connection. As AC output voltage setting was 120Vac, therefore L1-N/L2-N voltage was 120Vac, L1-L2 voltage was 208Vac. Setting allowed only when output is switched off. |
| | Split 180 | Stands for split-phase mode. The phase difference of L1-L2 is 180 degree, L1/L2 in split connection. As AC output voltage setting was 120Vac, therefore L1-N/L2-N voltage was 120Vac, L1-L2 voltage was 240Vac. Setting allowed only when output is switched off. |

6) When the phase sequence is set on the screen, the setting one is turned on to set, and the other machines are turned off. One by one set. Finally, power off and start up again.
7) After the system runs, the output voltage is measured correctly, and then the load setting is connected.

# 5. Operation

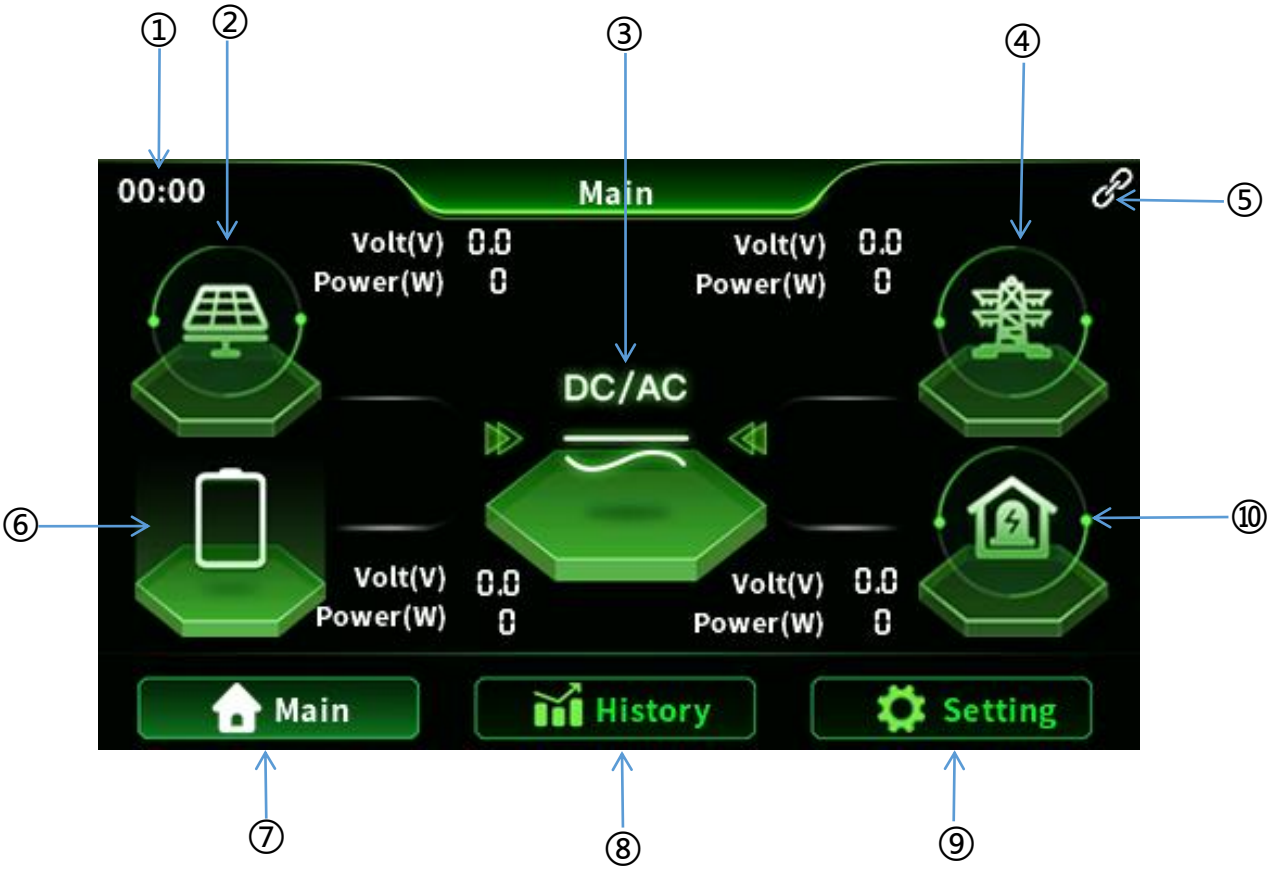
## 5.1. Power ON/OFF

Once the unit has been properly installed and the batteries are connected well, simply press On/Off switch (located on the bottom of the case) to turn on the unit.




## 5.2. Operation and Display Panel

The operation and display panel, shown in below chart, is on the front panel of the inverter. It includes three indicators and a LCD display, indicating the operating status and input/output power information.



| | | | |
|---|---|---|---|
| ① | Time | ⑥ | Battery parameters |
| ② | Photovoltaic (PV) parameters | ⑦ | Main |
| ③ | System information | ⑧ | Historical data |
| ④ | AC input parameters | ⑨ | Menu bar |
| ⑤ | Screen communication | ⑩ | AC output parameters |

**LCD screen setting menu :**


**Real-time data viewing method**

On the LCD main screen, press the screen to scroll through the real-time data of the machine.

## 5.3. Setup parameters description

Screen operation instructions : Press the "Setting" button to enter the setup menu; After entering the Settings menu, you can choose the options to be set and click to enter, then press" <" and " >" Select the value of the parameters to be set, and then press "Confirm" to upload the set parameters.

**Note: in parallel mode, all machines will synchronize the setting parameters of the master (the machine with "Main" is displayed on the display screen) before startup. After startup, the setting parameters of any machine will be synchronized to other machines in the system.**

| Parameter name | Settings | Description |
|---|---|---|
| **Battery setting** | | |
| Automatic battery activation | Disable | When the battery is dormant or not connected, the PV or grid does not automatically activate the battery to turn on the battery output. |
| | Enable **default** | When the battery is dormant or not connected, the PV or grid automatically activates the battery to turn on the battery output. |
| Battery type | USER | User-defined; all battery parameters can be set. |
| | SLD | Sealed lead-acid battery; constant-voltage charge voltage: 57.6V, floating charge voltage: 55.2V. |
| | FLD | Vented lead-acid battery; constant-voltage charge voltage: 58.4V, floating charge voltage: 55.2V. |
| | GEL | Colloidal lead-acid battery; constant-voltage charge voltage: 56.8V, floating charge voltage: 55.2V. |
| | LFP14/LFP15/LFP16 **default** | Lithium iron phosphate battery LFP15/LFP16, corresponding to 15 strings and 16 strings of lithium iron phosphate battery; for 16 strings, default constant-voltage charge voltage is 56.8V; for 15 strings, default constant-voltage charge voltage is 53.2V; Allow adjustable. |
| | NCM14 | Ternary lithium battery; which is adjustable. The default constant voltage charging voltage of NCM 14 series is 57.6V. |
| Battery pack rate AH | 200Ah default | Battery capacity |
| BMS select | OFF **default** | Turn off BMS communication function. |
| | 485-BMS | BMS communicates through RS485-2. |
| | CAN-BMS | BMS communicates through CAN. |
| BMS protocol Settings | RS485:Gotion,Dyness,Pace,PylonV3.5,Voltronic (default). CAN:UZ Pylon-CAN,EVI | When the BMS communication setting was on, the corresponding lithium battery manufacturer brand needs to be selected for communication. |
| Charging Strategy Options | BMS+inverter | The maximum charging current value is the smaller one between the charging current value limited by the BMS and the set value of the inverter. |
| | BMS only | The maximum charging current of the battery is limited according to the current limit value of BMS. |
| | Manual setup | The maximum charging current of the battery is limited according to the set value of inverter . |

| | | |
|---|---|---|
| SOC charging off(optional when BMS is enabled) | 100%default | After the BMS of t he setting item **BMS** is enabled, when the battery SOC is higher than this value, the inverter considers the battery to be full. If the battery priority mode is adopted at this time, the machine will switch the battery back from the grid. |
| SOC discharging alarm (Optional when BMS is enabled) | 15% **default** | After the BMS of t he setting item **BMS** is enabled, the machine will alarm 07 if the battery SOC is lower than this value, and the alarm will be cleared if the battery capacity rate is higher than 5% of this value. |
| SOC discharge off (optional when BMS is enabled) | 10% **default** | After the BMS of t he setting item **BMS** is enabled, if the battery SOC is lower than this value, the machine will report 08 fault and cut off the power supply or output. |
| SOC exit forced charging(optional when BMS is enabled) | 5% **default** | After the BMS of t he setting item **BMS** is enabled, when the inverter receives a forced charging command from BMS, it will force charging the battery. When the battery SOC is higher than this value, the inverter will exit the force charging mode and continue running the set current mode. |
| Cv Charge Volt | 57.6V **default** | C.V. charging voltage setting; the setting range is 48V~58.4V; it is valid for user-defined battery and lithium battery. |
| Float Charge Volt | 57.6V **default** | Floating charge voltage, setting range: 48V~58.4V. |
| CV charge Back Volt | 53V **default** | After the battery is fully charged, the inverter stops charging, and restarts charging when the battery voltage is lower than the voltage value. |
| Cv Charge Time | 120min **default** | C. V. charging maximum time setting, which means the maximum charging time to reach the set voltage of parameter "battery equalizing charge voltage" during constant-voltage charging. The setting range is 5min~900min, with a step of 1minutes. It is valid for user-defined battery and lithium battery. |
| Batt Low Alarm Volt | 47.2V **default** | Battery undervoltage alarm point; when the battery voltage is lower than the point, an undervoltage alarm is given (01 fault), and the output is not turned off; the setting range is 40V~52V, with a step of 0.1V. |
| Delay off dicharge | 46.4V **default** | Over-discharge voltage; when the battery voltage is lower than this judgment point, delay the time set by parameter "battery over discharge delay time" and turn off inverter output. Setting range is 40V~48V, with a step of 0.1V. |
| Off discharge delay time | 30s **default** | Over-discharge delay time; when the battery voltage is lower than the parameter **"battery over discharge voltage (delay off)" the inverter output will be turned off after the time set by this parameter is delayed. The setting range is 5S~ 120S, with a step of 1S.** |

| | | |
|---|---|---|
| Battery over discharge voltage (immediately off discharge) | 44.4V default | Battery discharge limit voltage; when the battery voltage is lower than the point, the output is turned off immediately (02 fault); the setting range is 40V~52V, with a step of 0.1V. It is valid for user-defined battery and lithium battery. |
| Over discharge recovery (02 fault) | 51.2V **default** | When the battery over discharge protection disconnects the inverter output, the battery voltage must be greater than this value to restore the inverter AC output. |
| Fully charging judgment current setting | 3A **default** | The battery type is lead-acid, when the battery voltage was greater than or equal to the floating charge value, and the charging current is less than the setting value, the battery is considered to be fully charged and the charging is stopped; If the battery type is lithium battery, when the battery voltage was greater than or equal to the constant voltage charging value and the charging current was less than the set value, the battery would be considered to be fully charged, the charging would be stop. |
| **Grid setting** | | |
| AC output phase voltage setting | 120Vac default | Allow to set to100Vac/105Vac/110Vac/120Vac/127Vac, default 120V. The rated output power will be reduced = (Power Rate)*(Vset/120) |
| AC output Frequency | 50.0HZ | Bypass self-adaptation; when the grid is connected, it automatically adapts to the grid frequency; when the grid is disconnected, the output frequency can be set through this menu. The default output frequency to 60Hz of the 120Vac. |
| | 60.0HZ | |
| AC Input Voltage Range | UPS **default** | Narrow grid input voltage range of 120Vac machine: 90~140Vac(Lower input voltage limit becomes 85V when system voltage is 100V / 105V); Frequency range：47~ 55Hz (50Hz);57Hz ~ 65Hz (60Hz); |
| | Generator | Diesel generators input, need to set this mode, at this time:Narrow Ac input voltage range of 120Vac machine: 90~140Vac<br>Frequency range：40~ 70Hz |
| AC output phase setting | Split 180 | Stands for split-phase mode. The phase difference of L1-L2 is 180 degree, L1/L2 in split connection. As AC output voltage setting was 120Vac, therefore L1-N/L2-N voltage was 120Vac, L1-L2 voltage was 240Vac. Setting allowed only when output is switched off. |
| | Split 120 P-seq | Stands for split-phase mode. The phase difference of L1-L2 is positive 120 degree, L1/L2 in split connection. As AC output voltage setting was 120Vac, therefore L1-N/L2-N voltage was 120Vac, L1-L2 voltage was 208Vac. Setting allowed only when output is switched off. |

| | | |
|---|---|---|
| | Same phase | Stands for single-phase mode. The phase same of L1-L2 is 0 degree, L1/L2 in parallel connection. As AC output voltage setting was 120Vac, therefore L1-N/L2-N voltage was 120Vac, L1-L2 voltage was 0Vac. Setting allowed only when output is switched off. |
| | Split 120 N-seq | Stands for split-phase mode. The phase difference of L1-L2 is negative 120 degree, L1/L2 in split connection. As AC output voltage setting was 120Vac, therefore L1-N/L2-N voltage was 120Vac, L1-L2 voltage was 208Vac. Setting allowed only when output is switched off. |
| N-PE connection | Disable **default** | Don’ t automatically connect the N wire to the PE wire under any working conditions. |
| | Enable | When there is no grid input off the grid, the neutral line automatically connects to the PE. When the bypass has grid input, the neutral line is automatically disconnected from the PE. |
| AC Overload Restart Enabled | Enable **default** | Enable automatic restart with heavy load. If the output is shut down due to overload, the machine will restart the output after a delay of 3 minutes. After 5 times in 30 minutes, the startup system will not be restored; |
| | Disable | Overload automatic restart is prohibited. If the machine stops output due to overload, it will not start again; |
| No Zero Line Charge Enable | Enable | At this time, the device can be charged using 230V grid power. It should be noted that the output end must not be connected to a 120V load; only a 230V load is allowed. |
| | Disable default | At this time, 230V grid electricity can not be connected; |
| **Parallel setting** | | |
| Parallel mode (can be set in the standby mode only) | Single **Default** | When single inverter is used, the default is SIG mode. |
| | PAL | In parallel operation with single phase. |
| Communication address | 1 **default** | Parallel mode needs to be set i n the range of 1-6, the ID cannot be repeated. When the power is first turned on, it will be automatically distributed; Single mode setting range 1-254. |
| Battery connected independently | Disable default | Parallel use of all battery packs. |
| | Enable | Battery pack not connected in parallel. Each battery is connected to each inverter. |

| Other setting | | |
|---|---|---|
| Factory Reset | Factory data reset **default** | Select the corresponding option and confirm, then restart the inverter (activate restart via "Restart control") to reset or clear settings/data.<br>"Factory data reset" → Reset inverter settings to factory defaults<br>"Clear statistics" → Clear statistical data<br>"Clear history data" → Clear setting logs and fault logs |
| Silent Mode | Enable **default** | The inverter buzzer is silent. |
| | Disable | When an alarm occurs in the inverter, the inverter buzzer will sound. |
| On/off control | ON | Turn on the inverter AC output. |
| | OFF | Turn off the inverter AC output. |
| Restart control | Restart | Restart the inverter. |
| Language | English default | Switching between Chinese / English/ español |
| Machine time Setting | 2000/1/1 0:00 | Time setting. |
| Screen Bright Times | 5min **default** | Can adjust the screen brightness time. |
| Screen Luminance | 10% **default** | Can adjust the screen brightness. |
| Screen Click Sound | Disable | The screen buzzer is silent. |
| | Enable **default** | The buzzer sounds when touching the screen. |
| **EMS setting** | | |
| AC Output Mode | Battery **default** | Solar energy provides power to the loads as first priority.If solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time. Switch to grid power if the battery is under voltage,or voltage/SOC meets the "Battery Power to grid" /"SOC switching grid " set point. Switch to battery discharge only if the battery is fully charged or voltage/SOC meets the "grid power to battery"/"SOC switching inverter " set point. |
| | grid | grid priority mode, switching to inverter only when the grid fails. |
| | Hybrid | Solar energy provides power to the loads as first priority.If solar energy is not sufficient to power all connected loads, Utility energy will supply power to the loads at the same time. switching to battery only when the grid fails. |

| | | |
|---|---|---|
| Battery Power to grid | 47.2V **default** | When the parameter **"AC Output Mode"** =Battery, the battery voltage is lower than the set value, and the output is switched from the inverter to the grid. Setting range: 44V~52V. |
| grid power to battery | 57.6V **default** | When the parameter "**AC Output Mode**" =Battery, the battery voltage is higher than the set value, and the output is switched from the grid to the inverter. Setting range: 48V~60V. |
| SOC switching grid (optional when BMS is enabled) | 5% default | After the BMS of t he setting item BMS is enabled, and the parameter "AC Output Mode" =Battery, the machine will switch to the grid when the battery capacity rate is lower than this value and the grid power is available. |
| SOC switching inverter (optional when BMS is enabled) | 100% default | After the BMS of t he setting item BMS is enabled, and the parameter "AC Output Mode" =Battery,it takes effect in battery priority mode. If the battery capacity rate is higher than this value, the machine will switch from the grid to the inverter mode. |
| Charger source priority | charge together default | PV and grid hybrid charging; PV charging is a priority, and when the PV energy is insufficient, the grid charging supplements. When the PV energy is sufficient, the grid charging stops. |
| | grid priority | grid priority charging; only when the grid charging fails, the PV charging is started. |
| | PV priority | PV priority charging; only when the PV charging fails, the grid charging is started. |
| | PV Only charging | Only PV charging, with the grid charging not activated. |
| Max total charging current | 60A **default** | Maximum total charging current setting. setting range:0~150A. |
| Max AC charger current | 60A **default** | setting range: 0~120A. |
| Power saving mode | Disable default | Power saving mode disabled. |
| | Enable | After the power saving mode is enabled, if the load per phase is null or less than 25W, the inverter output is turned off after a delay for a certain period of time. When the load of any phase is more than 50W, the inverter automatic restart. |

| | | |
|---|---|---|
| Timed charging | Disable default | Disable this function. |
| | Enable | Enable this function, grid charging the battery and carry load only in charging time slot which user set or the battery is under voltage. |
| | 0h 0min | 1st slot start charging; range: 00:00-23:59 |
| | 0h 0min | 1st slot end charging; range: 00:00-23:59 |
| | 0h 0min | 2st slot start charging; range: 00:00-23:59 |
| | 0h 0min | 2st slot end charging; range: 00:00-23:59 |
| | 0h 0min | 3st slot start charging; range: 00:00-23:59 |
| | 0h 0min | 3st slot end charging; range: 00:00-23:59 |
| Timed discharging | Disable default | Disable this function. |
| | Enable | Enable this function, battery discharging only in discharging time slot which user set or utility is not available. |
| | 0h 0min | 1st slot start discharging; range: 00:00-23:59 |
| | 0h 0min | 1st slot end discharging; range: 00:00-23:59 |
| | 0h 0min | 2st slot start discharging; range: 00:00-23:59 |
| | 0h 0min | 2st slot end discharging; range: 00:00-23:59 |
| | 0h 0min | 3st slot start discharging; range: 00:00-23:59 |
| | 0h 0min | 3st slot end discharging; range: 00:00-23:59 |

## 5.4 Battery setting

For lithium-ion batteries, if the battery enters protection mode, a pulse current is required to deactivate the protection. We need to set the parameter "**Automatic battery activation**" to Enabled; this allows the inverter to send pulse currents at regular intervals to ensure no lithium-ion batteries in protection mode are missed. For lead-acid batteries, this parameter can be set to Disabled.

Most lithium-ion batteries come with a communication function for inverters. The battery's BMS (Battery Management System) sends battery status information and charge-discharge limits (voltage and current) to the inverter, which adjusts the charging or discharging voltage and current accordingly.

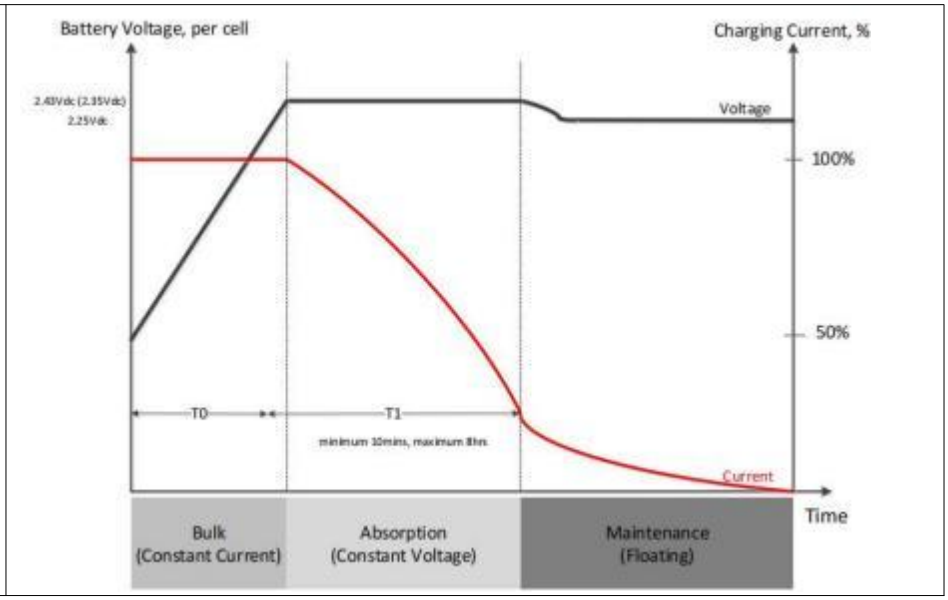
For lead-acid batteries and a small number of lithium-ion batteries without inverter communication capability, charge-discharge limits need to be set directly on the inverter.

### 5.4.1 Battery Settings Without Communication Function

Set "BMS select" to "OFF" to disable communication between the inverter and the battery. Then select the appropriate battery type in the "Battery type" menu according to the actual battery used. Once the battery type is selected, the relevant limit parameters will change accordingly. The table below shows the correspondence between battery types and parameters; some parameters are further adjustable and can be modified as needed. If you select "USER", all limit parameters can be customized. Generally, we recommend keeping the limit parameters at the recommended values in the table below after selecting the battery model.

| Battery Type parameter | User-defined (User) | Sealed lead acid battery (SLD) | Colloidal lead acid battery (GEL) | Vented lead acid battery (FLD) | NCM lithium battery (N14) | Lithium iron phosphate battery (LF16) | Lithium iron phosphate battery (LF15) |
|---|---|---|---|---|---|---|---|
| Cv (Boost ) Charge Volt | 40 ~60V (Adjustable) | 57.6V | 56.8V | 58.4V | 57.4V (Adjustable) | 57.6V (Adjustable) | 53.2V (Adjustable) |
| Float Charge Volt | 40 ~60V (Adjustable) | 55.2V | 55.2V | 55.2V | 57.4V (Adjustable) | 57.6V (Adjustable) | 53.2V (Adjustable) |
| CV charge Back Volt | 52V (Adjustable) | 52V (Adjustable) | 52V (Adjustable) | 52V (Adjustable) | 54.6V (Adjustable) | 53.0V (Adjustable) | 50.4V (Adjustable) |
| Cv Charge Time | 10 ~600min (Adjustable) | 120 min | 120 min | 120 min | 120 min | 120 min | 120 min |
| Batt Low Alarm Volt | 40 ~60V (Adjustable) | 44V | 44V | 44V | 47.6V (Adjustable) | 47.2V (Adjustable) | 46.4V (Adjustable) |
| Delay off dicharge | 40 ~60V (Adjustable) | 42V (Adjustable) | 42V (Adjustable) | 42V (Adjustable) | 44V (Adjustable) | 46.4 (Adjustable) | 45.6V (Adjustable) |
| Off discharge delay time | 1 ~30s (Adjustable) | 5s | 5s | 5s | 30s (Adjustable) | 30s (Adjustable) | 30s (Adjustable) |
| Battery over discharge voltage (immediately off discharge) | 40 ~60V (Adjustable) | 40V | 40V | 40V | 43.4V (Adjustable) | 44.4V (Adjustable) | 43.6V (Adjustable) |
| Over discharge recovery (02 fault) | 52V (Adjustable) | 52V (Adjustable) | 52V (Adjustable) | 52V (Adjustable) | 49.2V (Adjustable) | 51.2V (Adjustable) | 49.6V (Adjustable) |

In non-communication mode, the inverter charges the battery as shown in the figure below. When the current reaches a certain value (Fully charging judgment current), the inverter will deem the battery fully charged. The default value is 3A and can be adjusted as needed, but shall not be set lower than 2A.

| | |
|---|---|
| Lead acid Charging Curve |  |

### 5.4.2 Battery Settings for Communication-enabled Batteries

**1. Communication Setup**

Enable communication between the inverter and the battery by configuring these settings:

**BMS Select**:Set to "**485-BMS**"or "**CAN-BMS**", matching your battery's communication method.

**BMS Protocol**:In the "**BMS protocol setting**" menu, select the protocol specified by your battery manufacturer.

**2. Charging Current Control**

The charging current is managed by both the inverter setting and the BMS. Select the desired control mode in the "**Charging strategy options**"menu.

**BMS only**: The maximum charging current of the battery is limited according to the current limit value provided by the BMS.

**Manual setup**:The maximum charging current of the battery is limited according to the value set on the inverter.

**BMS+Inverter**:The maximum charging current will be the lowerof the two values provided by the BMS and the inverter.

**3. Key SOC (State of Charge) Parameters**

Charge Cut-off SOC ("**SOC charging off**"):

Default:100%.

Recommendation:Maintain the default 100% setting to allow the BMS to perform necessary SOC calibration.

Discharge Cut-off SOC ("**SOC discharge off**"):

Purpose:Defines the battery level that triggers BMS protection (discharge stop and forced charging)*.

Adjustment:A higher value can prevent forced charging but may reduce protection.

Exit Forced Charging SOC ("**SOC exit forced charging**"):

Purpose:Sets the SOC level at which the inverter stops the forced charging.

Use Case:For large-capacity systems, set a lower value to avoid charging to the BMS's preset high level.

> ***Note**: Forced charging is a BMS protection function to prevent battery damage from deep discharge. After the BMS sends a forced charging signal to the inverter, if the inverter is connected to the grid, it will use grid power to charge the battery until the battery's SOC recovers to the level where the BMS cancels the forced charging signal, or until the inverter's "SOC exit forced charging" value is reached.*

**4. alarm**

Low Battery alarm:A warning is issued (via LED and a mutable buzzer).

alarm Threshold:Adjusted via "**SOC discharging alarm**", typically set about 5% higher than the "SOC discharge off" value.

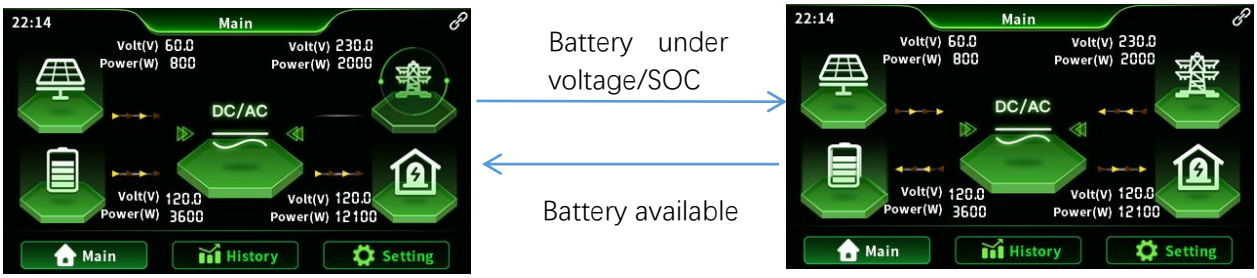
## 5.5 EMS setting

### 5.5.1 AC Output Mode

**1. Battery mode:**

Solar energy provides power to the loads as first priority.If solar energy is not sufficient to

power all connected loads, battery energy will supply power to the loads at the same time. Switch to grid power if the battery is under voltage,or voltage/SOC meets the "Battery Power to grid" /"SOC switching grid " set point. Switch to battery discharge only if the battery is fully charged or voltage/SOC meets the "grid power to battery"/"SOC switching inverter " set point.




**Battery Power to grid/SOC switching grid :** the inverter will switch to the grid (or grid+solar) when the battery voltage/SOC is lower than this value and the grid power is available.

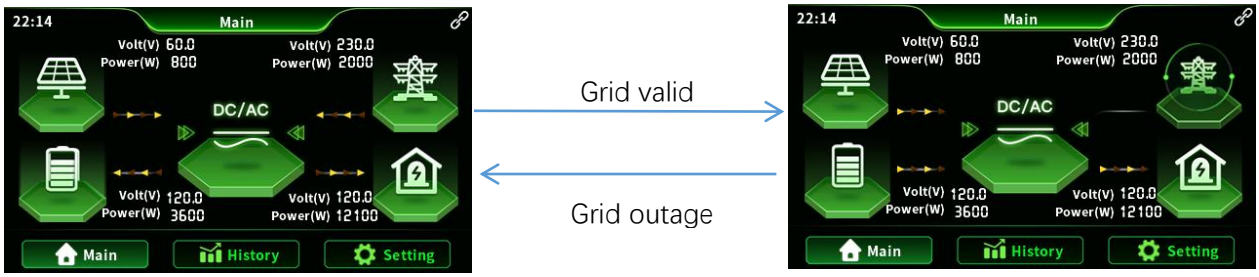
**grid power to battery/SOC switching inverter :** the battery voltage/SOC is higher than the set value, and the output is switched from the grid to the inverter(battery or battery+solar). This can cycle the battery charge and discharge. This mode maximizes the use of DC(PV or battery) power and is used in the area with stable grid. Switching does not affect PV charging. This is a highly cost-effective energy output mode (self-generation for self-use mode).

**2. grid mode:**

Switch to inverter only when the grid fails (when there was grid power, switch to grid power for charging and power supply).Then, the unit is equivalent to a backup UPS, suitable for areas with unstable grid. Switching does not affect PV charging.

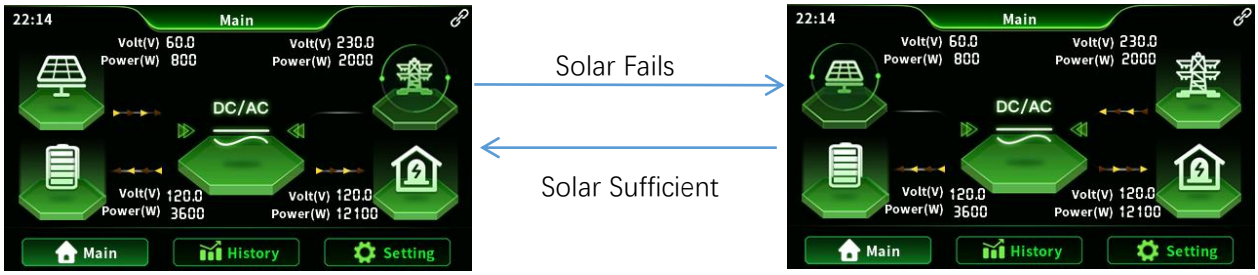
**3. Hybrid mode:**

Solar energy provides power to the loads as first priority.If solar energy is not sufficient to power all connected loads, Utility energy will supply power to the loads at the same time. switching to battery only when the grid fails. This is a backup power mode that can utilize PV.

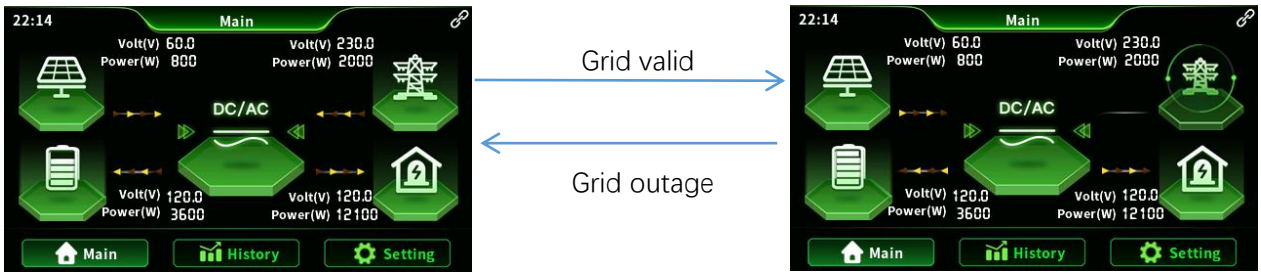



## 5.5.2 Charging mode

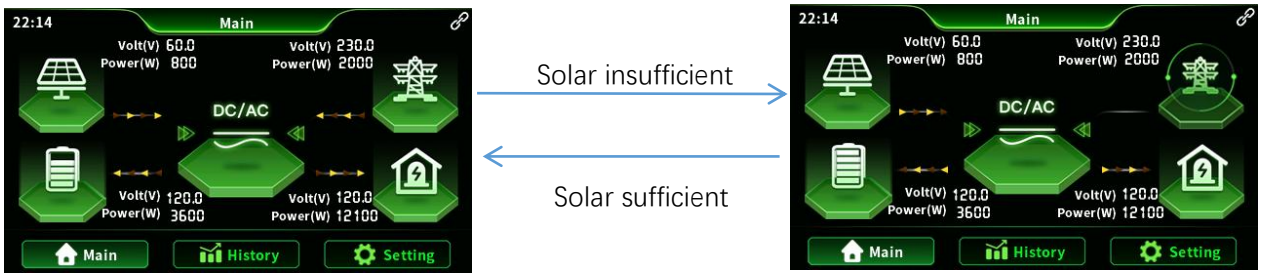
**1.PV priority**: PV priority charging; only when the PV charging fails, the grid charging is started.



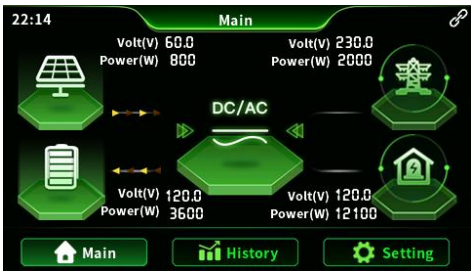

**2.grid priority:** grid priority charging; only when the grid charging fails, the PV charging is started




**3.charge together:** PV charging is a priority,and when the PV energy is insufficient, the grid charging supplements. When the PV energy is sufficient, the grid charging stops.




**4.Only Solar:** Only PV charging, without grid charging.



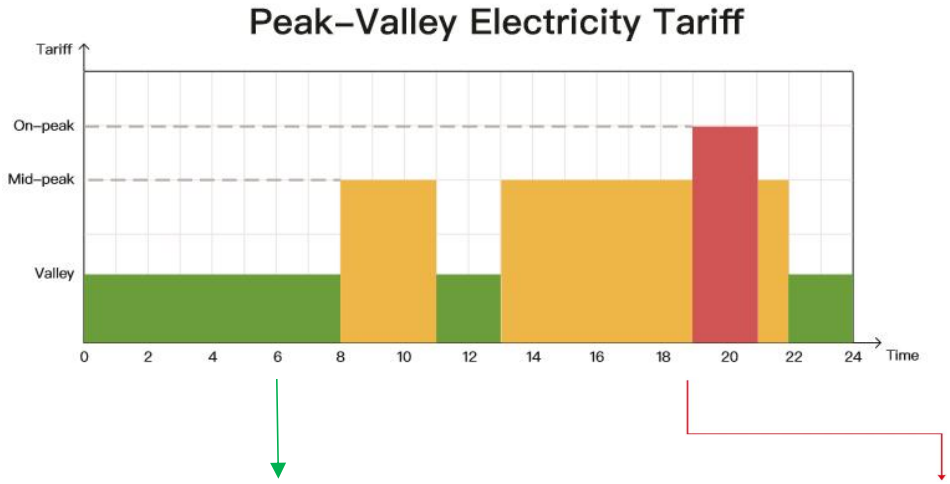
### 5.5.3 Timed charge/discharge function

SUNON7.2 has the timed power charge/discharge function. Users can set different charge and discharge periods according to the local time-of-use price, thus reasonably using mains and PV power. When mains is expensive, the battery inverter is used to supply power to the load; when mains is cheap, it can be used to supply power to and charge the load, thus helping users reduce electricity expenses to the full extent. Users can enable the timed charge/discharge function and set the charge/discharge time periods in the "**Timed charging**" and "**Timed discharge** "parameters.

The following is an example to help users understand the function:

Before using the function for the first time, please set the local time and date in parameters **Setting>Other>Machine time Setting**, and then you can set corresponding periods based on the local time-of-use price.

***NOTICE***




**Timed charge and loading function**

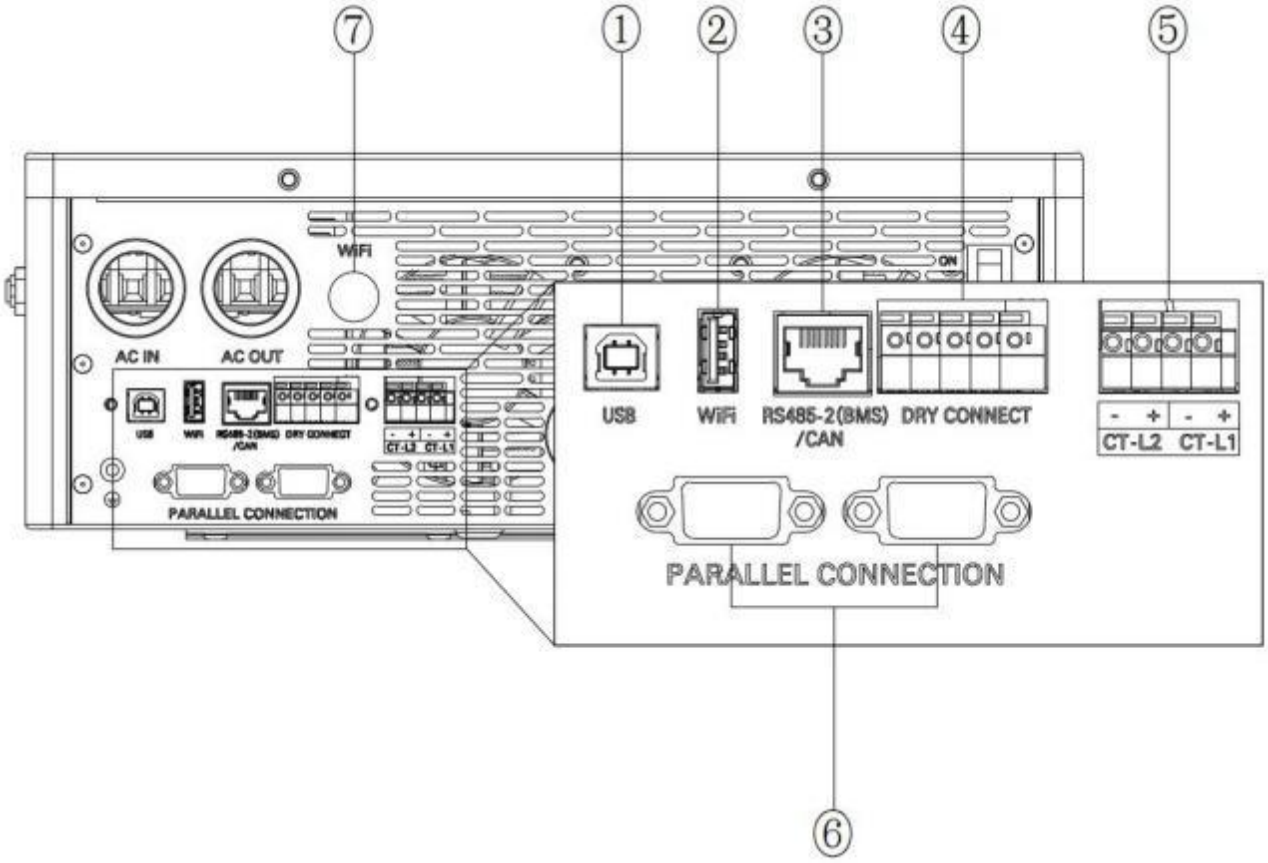

With 6 definable periods, users can freely set the mains charge/loading period in the range of 00:00–23:59. During the period set by the user, in case of PV energy output, it will be used first; in case of no PV energy output or lack of PV energy, mains will be used as a supplement.

**Timed battery discharge function**


With 6 definable periods, users can freely set the battery discharge period in the range of 00:00–23:59. During the period set by the user, the inverter will first use the battery inverter to load; if the battery power is insufficient, the inverter will automatically switch to mains to ensure stable operation of the load.

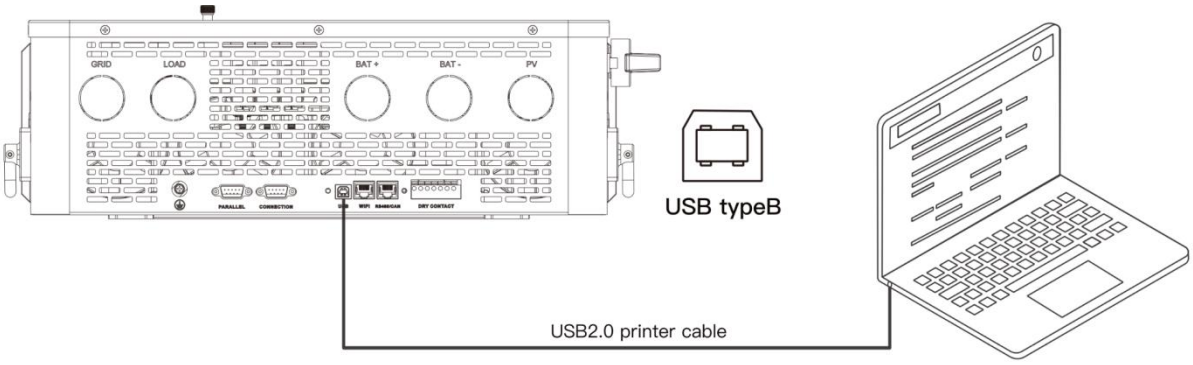
# 6. Communication

## 6.1 Overview




| | | | |
|---|---|---|---|
| 1 | USB communication port<br>(Inverter debugging port) | 5 | CT (Current Transformer) port<br>(No function in this model) |
| 2 | USB-WiFi (optional) | 6 | Parallel communication port |
| 3 | BMS communication<br>(RS485-2/CAN)port | 7 | RS485-WiFi |
| 4 | Dry contact port | | |

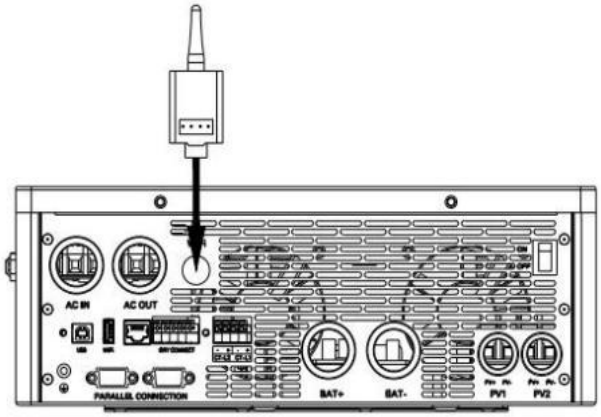
## 6.2 USB-B port

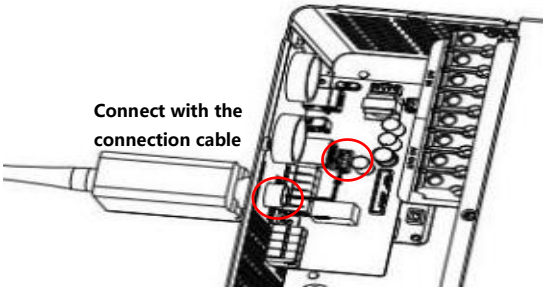



When necessary, users can use software to read and modify inverter parameters and upgrade the inverter's firmware via the port. When connecting to a computer, it is recommended to disconnect the connections between the inverter and the WiFi communication module, as well as the communication connection between the inverter and the battery, to avoid interference with the communication. To use this port, you should install the corresponding "USB to serial chip CH340T d river" in the computer.

## 6.3 WIFI port

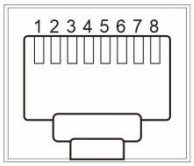
The WIFI port is used to connect to the Wi-Fi/GPRS data acquisition module, and then users can view the operation status and parameters of the inverter via the mobile APP.




## 6.4 RS485/CAN port

The RS485/CAN port is used to connect to the BMS of the Li-ion battery.

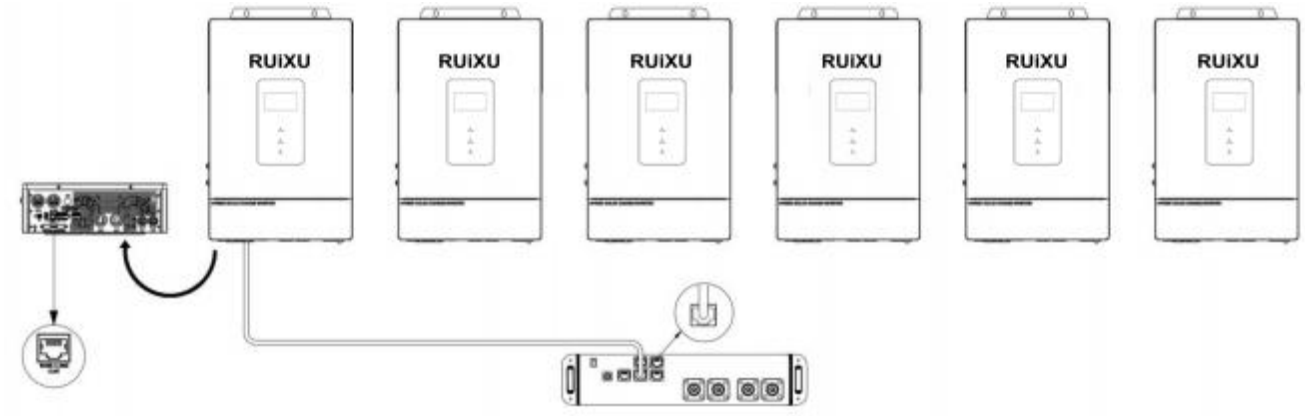


RS485/CAN

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

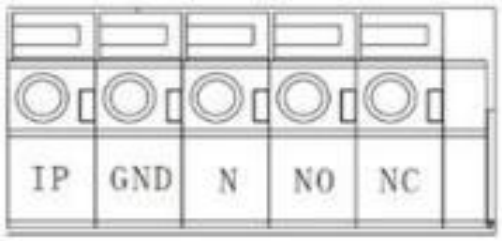
> ⓘ *NOTICE*
>
> If you need the communication between the inverter and the BMS of the Li-ion battery, please contact us to understand the communication protocol, or upgrade the inverter to the corresponding software program.

If need to use communicate with BMS in a parallel system, you should make sure to connect the BMS（master battery） communication cable between the battery and one inverter of the parallel system. It’s recommended to connect to the master inverter of the parallel system.



## 6.5 Dry contact port

**The dry contact port has 2 functions:**




**NOTICE**

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

| Function | Working Principle | Operating Status | Load Spec |
|---|---|---|---|
| N-NO-NC | Controls diesel generator ON/OFF | 1. Normal: NC-N closed, NO-N open<br>2. Low battery voltage: Relay energized, NO-N closed, NC-N open | NO - N conduction can drive resistive loads with the following specifications: 125VAC/1A, 230VAC/1A or 30VDC/1A. |
| IP-GND | Remote controls inverter AC output ON/OFF | 1. IP-GND open: AC output ON<br>2. IP-GND closed: AC output OFF | N/A |

# 7. Failure codes and countermeasures

## 7.1 Fault code

| Fault code | Fault name | Whether it affects the output or not | Description |
|---|---|---|---|
| 【01】 | Battery under voltage warning | No | If the battery voltage is lower than "battery under voltage alarm" setting, the battery was in the under voltage state. |
| 【02】 | Battery under voltage protection | Yes | When the battery voltage was low, turn off the output to stop the battery discharge protection. |
| 【03】 | Average battery discharge current over current protection | Yes | If the average battery discharge current exceeds the maximum input battery current for 1 minute, turn off the output to stop the battery discharge protection. |
| 【04】 | Instantaneous battery discharge over current protection | Yes | If the instantaneous value of the battery discharge current is greater than the maximum instantaneous value of the device, turn off the output to stop the battery discharge protection. |
| 【05】 | Battery not connected | Yes | Battery not connected warning. |
| 【06】 | Battery over voltage | Yes | When the selected battery type or set battery voltage is exceeded, turn off the output to stop the battery charging protection. |
| 【07】 | BMS low battery alarm | No | BMS alarm low battery ( Set BMS enablement to work) |
| 【08】 | BMS low battery protection | Yes | The BMS battery capacity rate is low. Disable the output to stop the battery discharge protection. (Set BMS enablement to work) |
| 【09】 | Bypass overload protection | Yes | If the grid is overloaded, turn off the AC output and stop the grid charging. |
| 【10】 | Battery output overload protection | Yes | If the battery discharge inverter is overloaded, turn off AC output and stop battery discharge protection. |
| 【11】 | Battery inverter output short circuit | Yes | If the AC output of the battery inverter discharge is short circuiting, turn off the AC output and stop the battery discharge protection. |
| 【12】 | The AC output of the battery inverter overcurrent | Yes | If the AC output of the battery inverter discharge is over circuit, turn off the AC output and stop the battery discharge protection. |

| | | | |
|---|---|---|---|
| 【13】 | The DC component of the battery inverter voltage is abnormal | Yes | If the DC component of the battery inverter voltage is abnormal, turn off the AC output and stop the battery discharge protection. |
| 【14】 | Bus over voltage hardware sampling protection | Yes | Internal battery boost, boost bus voltage over voltage hardware protection, turn off AC output and charge. |
| 【15】 | Bus over voltage software sampling protection | Yes | Internal battery boost, boost bus voltage over voltage software protection, turn off AC output output and charge. |
| 【16】 | Bus under voltage protection | Yes | Internal battery boost, boost bus voltage under voltage protection, turn off AC output output and charge. |
| 【17】 | Bus short circuit protection | Yes | Internal battery boost, boost bus voltage short-circuit protection, turn off AC output output and charge. |
| 【18】 | The PV input voltage is over voltage | Yes | The solar input voltage exceeds the maximum allowable input voltage protection. |
| 【19】 | PV Over Curr Sw | Yes | Solar charging over current software protection, turn off solar charging. |
| 【20】 | PV over curr Hw | No | Solar charging over current hardware protection, turn off solar charging. |
| 【21】 | PVIso Low | Yes | The PV insulation impedance is low, and the inverter is shutdown. |
| 【22】 | The PV heat sink is overheated. Procedure | No | If the temperature of the solar charging radiator is too high, turn off the solar charging. |
| 【23】 | The AC heat sink is overheated. Procedure | Yes | If the temperature of the heat sink is too high, turn off the AC charging or battery inverter discharge. |
| 【24】 | The temperature of the main transformer is overheated | Yes | If the internal main transformer temperature is too high, turn off the AC charging or battery inverter discharge. |
| 【25】 | Ac input relay short circuit | Yes | Ac input relay short-circuit protection prevents the inverter AC output from being pumped back into the bypass AC input,the inverter is turned off. |
| 【26】 | Output relay short | Yes | Output relay short circuit, |
| 【27】 | Fan failure | Yes | If the fan is blocked or fails, disable the inverter output and charging functions. |

| | | | |
|---|---|---|---|
| **【28】** | EEPROM | Yes | The program is not activated. |
| **【29】** | SPI Comm Err | Yes | Master chip and from the chip communication error. |
| **【30】** | Type detection error | Yes | The model is not set before delivery, and the model identification is wrong. |
| **【31】** | Bus Soft Start Fail | Yes | Inverter busbar soft start failed. |
| **【32】** | Leakage Curr Over | Yes | The leakage current sensor has a sampling exception. |
| **【33】** | Parallel control can communication is faulty | Yes | In parallel mode, CAN communication is lost, AC output and charging are turned off. |
| **【34】** | Parallel control can communication is faulty | Yes | In parallel mode, CAN communication is lost, AC output and charging are turned off. |
| **【35】** | Parallel mode is faulty | Yes | In parallel mode, the system has inconsistent machine parallel mode **[31]** Settings. |
| **【36】** | Parallel current sharing fault | Yes | In parallel mode, the AC output of the battery inverter differs greatly from the non-uniform current output of each machine. Turn off the AC output and charge. |
| **【37】** | Parallel ID setting error | Yes | In parallel mode, the RS485 addresses repeatedly conflict. The fault stops the AC output and charge. After the host automatically reallocates the address, the fault is cleared and the host enters the parallel. |
| **【38】** | Inconsistent Battery in parallel mode | Yes | In parallel mode, the battery voltage input of each machine varies greatly. |
| **【39】** | Inconsistent AC input source in parallel mode | Yes | Inconsistent AC input source in parallel mode |
| **【40】** | The parallel mode synchronization fails | Yes | Parallel mode, hardware synchronization signal reception failure, stop parallel and AC output. |
| **【41】** | Inconsistent system firmware version in parallel mode | Yes | If the program version is inconsistent in the parallel system, stop the parallel and AC output. |
| **【42】** | The parallel communication cable is faulty | Yes | The parallel communication line is faulty. Stop the parallel and AC output. |
| **【43】** | Serial number error | Yes | The serial number is not set before the factory, or the factory serial number is set repeatedly in the system. |

| | | | |
|---|---|---|---|
| 【44】 | Batt cap not enough | Yes | In the parallel system, one of the devices has a low battery voltage. |
| 【45】 | Aux dsp abnormal | Yes | Auxiliary DSP chip malfunction |
| 【46】 | Bus unbalance | Yes | In the split-phase inverter, the voltages of the positive bus and the negative bus are inconsistent. |
| 【47】 | ExtCT hosterr | No | In the parallel inverter system, Setting Item [63] is incorrectly configured. Only one inverter per phase can be designated as the external CT master. |
| 【48】 | Grid phase Err | No | Conduct a check on the phase of the utility power. |
| 【49】 | BMS communication error | No | Check whether the communication line is connected correctly and whether **BMS** is set to the corresponding lithium battery communication protocol |
| 【50】 | BMS other alarm | No | Check the BMS fault type and troubleshoot lithium battery problems |
| 【51】 | BMS battery over temperature alarm | No | BMS alarm lithium battery over temperature |
| 【52】 | BMS battery over current alarm | No | BMS alarm lithium battery over current |
| 【53】 | BMS battery over voltage alarm | No | BMS alarm lithium battery over voltage |
| 【54】 | BMS battery low voltage alarm | No | BMS alarm lithium battery low voltage |
| 【55】 | BMS battery low temperature alarm | No | BMS alarm lithium battery low temperature |

## 7.2 Trouble Shooting

| Fault code | Faults | Handling measures |
|---|---|---|
| / | No display on the screen | Check if the battery air switch or the PV air switch has been closed; if the switch is in the "ON" state; press any button on the screen to exit the screen sleep mode. |
| 【06】 | Rechargeable battery overvoltage protection | Measure if the battery voltage exceeds rated。If it exceeds, the battery needs to be discharged until the voltage is below the overvoltage recovery point of the battery. |
| 【01】【02】 | Battery under voltage protection | Charge the battery until it returns to the low voltage disconnection recovery voltage. |
| 【27】 | Fan failure | Check if the fan is not turning or blocked by foreign object. |
| 【22】【23】 | Heat sink over temperature protection | When the temperature of the device is cooled below the recovery temperature, normal charge and discharge control is resumed. |
| 【09】【 10】 | Bypass overload protection, inverter overload protection | 1. Reduce the use of power equipment;<br>2. Restart the unit to resume load output. |
| 【11】 | Inverter short circuit protection | 1.Check the load connection carefully and clear the short-circuit fault points;<br>2.Re-power up to resume load output. |
| 【18】 | PV overvoltage | Use a multimeter to check if the PV input voltage exceeds the maximum allowable input voltage rated. |
| 【05】 | Battery missed alarm | Check if the battery is not connected or if the battery circuit breaker is not closed. |
| 【40】【42】 | Parallel connection fault | Check whether the parallel line is not connected well, such as loose or wrong connection. |
| 【37】 | Parallel ID setting error | Check whether the setting of parallel ID number is repeated. |
| 【36】 | Parallel current sharing fault | Check whether the parallel current sharing line is not connected well, such as loose or wrong connection. |
| 【39】 | Inconsistent AC input source in parallel mode | Check if the grid input of the parallel machine is the same input interface. If two machines in the three-phase group mode report inconsistent grid input sources, you can try swapping the grid input wiring of any two machines to check if the fault is caused by inconsistent grid input phase sequence and set phase sequence |
| 【41】 | Inconsistent system firmware version in parallel mode | Check whether the software version of each inverter is consistent. |

**Note:** If you encounter a product fault that cannot be solved by the methods in the above table, please contact our after-sales service department for technical support, and do not disassemble the equipment yourself.

# 8. Protection Function and Product Maintenance

## 8.1 Protection Function

| No. | Protections | Description |
|---|---|---|
| 1 | PV current/ power limiting protection | When charging current or power of the PV array configured exceeds the PV rated, it will charge at the rated. |
| 2 | PV night reverse current protection | At night, the battery is prevented from discharging through the PV module because the battery voltage is greater than the voltage of PV module. |
| 3 | grid input over voltage protection | When the grid voltage exceeds 140V, the grid charging will be stopped and switched to the inverter mode. |
| 4 | grid input under voltage protection | When the grid voltage is lower than or 85V , the grid charging will be stopped and switched to the inverter mode. |
| 5 | Battery over voltage protection | When the battery voltage reaches the overvoltage disconnection point, the PV and the grid will be automatically stopped to charge the battery to prevent the battery from being overcharged and damaged. |
| 6 | Battery low voltage protection | When the battery voltage reaches the low voltage disconnection point, the battery discharging will be automatically stopped to prevent the battery from being over-discharged and damaged. |
| 7 | Load output short circuit protection | When a short circuit fault occurs at the load output terminal for more than 200 milliseconds, the AC output is immediately turned off. |
| 8 | Heat sink over temperature protection | When the internal temperature is too high, the all-in-one machine will stop charging and discharging; when the temperature returns to normal, charging and discharging will resume. |
| 9 | Overload protection | Output again 3 minutes after an overload protection, and turn the output off after 5 consecutive times of overload protection until the machine is re-powered. For the specific overload level and duration, refer to the technical parameters table in the manual. |
| 10 | PV reverse polarity protection | When the PV polarity is reversed, the machine will not be damaged. |
| 11 | AC reverse protection | Prevent battery inverter AC current from being reversely input to Bypass. |
| 12 | Bypass over current protection | Built-in AC input overcurrent protection circuit breaker. |

| | | |
|---|---|---|
| 13 | Battery input over current protection | When the discharge output current of the battery is greater than the maximum value and lasts for 1 minute, the AC input would switched to load. |
| 14 | Battery input protection | When the battery is reversely connected or the inverter is short-circuited, the battery input fuse in the inverter will blow out to prevent the battery from being damaged or causing a fire. |
| 15 | Charge short protection | When the external battery port is short-circuited in the PV or AC charging state, the inverter will protect and stop the output current. |
| 16 | CAN communication loss protection | In parallel operation, an alarm will be given when CAN communication is lost. |
| 17 | Parallel connection error protection | In parallel operation, the equipment will be protected when the parallel line is lost. |
| 18 | Parallel battery voltage difference | In parallel operation, the equipment will be protected when the battery connection is inconsistent and the battery voltage is greatly different from that detected by the host. |
| 19 | Parallel AC voltage difference protection | In parallel operation, the equipment will be protected when the AC IN input connection is inconsistent. |
| 20 | Parallel current sharing fault protection | In parallel operation, the running equipment will be protected when the load difference of each inverter is large due to improper connection of current sharing line or device damage. |
| 21 | Synchronizatio n signal fault protection | The equipment will be protected when there is a fault in the guidance signal between parallel buses, causing inconsistent behavior of each inverter. |

## 8.2 Maintenance

1. In order to maintain the best long-term performance, it is recommended to conduct the following checks twice a year.
2. Make sure that the airflow around the unit is not blocked and remove any dirt or debris from the heat sink.
3. Check that all exposed wires are damaged by exposure to sunlight, friction with other objects around them, dryness, bite by insects or rodents, etc., and the wires shall be repaired or replaced if necessary.
4. Verify for the consistency of indication and display with the operation of the device. Please pay attention to the display of any faults or errors, and take corrective actions if necessary.
5. Check all wiring terminals for corrosion, insulation damage, signs of high temperature or burning/discoloration, and tighten the screws.
6. Check for dirt, nesting insects and corrosion, and clean up as required.
7. If the arrester has failed, replace in time to prevent lightning damage to the unit or even

other equipment of the user.

**The company does not assume any liability for damage caused by:**

a)Improper use or use in improper site.

b)Open circuit voltage of the PV module exceeds the maximum allowable voltage rated.

c)Temperature in the operating environment exceeds the limited operating temperature range.

d)Disassemble and repair the all-in-one solar charge inverter without permission.

e)Force majeure: Damage that occurs in transportation or handling of the all-in-one solar charge inverter.

**DANGER**

**Danger of electric shock! When doing the above operations, make sure that all power supplies of the all-in-one machine have been disconnected, and all capacitors have been discharged, and then check or operate accordingly!**

# 9. Appendix

## 9.1. Recycling and disposal

This device should not be disposed as a residential waste. An inverter that has reached the end of its operation life is not required to be returned to your dealer;instead, it must be disposed by an approved collection and recycling facility in your area.

## 9.2. Warranty

Check the product warranty conditions and terms on the RUiXU website: http://www.ruixubattery.com

## 9.3. Contacting support

RUiXU Electronic

Address: Factory Blog. 1, No.6 Chuangye N. Rd, Hongqi Town,Jinwan District, Zhuhai, Guangdong, China, P.C. 519000

Website:http://www.ruixubattery.com

Technical Support & Service

Tel: +86 15019934220

Sales

E-mail:sales@ruixubattery.com

## 9.4. Trademark

RUiXU is the trademark of RUiXU Electronic

# 10. Parameter Table

| Models | SUNON7.2 | Settable |
|---|---|---|
| **Parallel mode** | | |
| Permitted parallel number | NO/1~6 | |
| **AC input** | | |
| Rated input voltage | 120(L1/N, L2/N)/240Vac(L1/L2) | Y |
| Input phase voltage range | (85Vac~ 140Vac)±2% | |
| Frequency | 50Hz/60Hz (Auto detection) | |
| Frequency Range | 47±0.3Hz~55±0.3Hz (50Hz); | Y |
| | 57±0.3Hz~65±0.3Hz (60Hz); | Y |
| Overload/short circuit protection | Circuit breaker | |
| Maximum efficiency of municipal electricity charging | >95% | |
| Conversion time (bypass and inverter) | 10ms (typical) | |
| AC reverse protection | Yes | |
| Maximum bypass phase overload current | 2pole, 50A/50A(L1/L2) | |
| **Inverter output** | | |
| Output voltage waveform | Pure sine wave | |
| Rated output power (VA) | Split phase:7200W | |
| | Single phase: 6000W | |
| Rated output power (W) | Split phase:7200W | |
| | Single phase: 6000W | |
| Power factor | 100% | |
| Rated output voltage (Vac) | 120Vac (L1/N, L2/N)/240Vac(L1/L2) | Y |
| Output voltage error | ±5% | |
| Output frequency range (Hz) | 50Hz±0.3Hz/60Hz±0.3Hz | Y |
| Maximum efficiency of inverter output | >93% | |
| Overload | (105% < load <110%) ±5%: report error and turn off the output after 5 minutes; | |
| protection | (110% < load < 125%) ± 5%: report error and turn off the output after 10 seconds; Load >125% ±5%: report error and turn off the output after 5 seconds; | |
| Peak power | Split phase: 10800VA | |
| | Single phase: 10800VA | |
| Loaded motor capability | 4HP | |
| Output short circuit protection | Continuous short circuit 200ms protect | |

| | | |
|---|---|---|
| Bypass circuit breaker phase specification | 2pole, 50A/50A(L1/L2) | |
| Power saving mode self-consumption | Load per phase is null or less than 25W enter power-saving mode | |
| **Battery** | | |
| Battery type | Lead acid and lithium battery | Y |
| Rated battery input voltage | 51.2V (Minimum starting voltage 44V) | |
| Battery voltage range | 40.0Vdc~58.6Vdc±0.6Vdc | |
| Max charger current(AC+PV) | 0-150A | Y |
| Max AC charge current | 120A | Y |
| Charge current error | ±5Adc | |
| Short circuit protection | Circuit breaker or blown fuse | |
| Circuit breaker phase specifications | 2pole, 50A/50A(L1/L2) | |
| **PV input** | | |
| Number of MPPT groups | 2 | |
| Maximum PV open circuit voltage | 500Vdc | |
| PV operating voltage range | 90Vdc~485Vdc | |
| MPPT voltage range | 90Vdc~450Vdc | |
| Battery voltage range | 40-58.6Vdc | |
| Maximum PV input power | 4500W+4500W | |
| Maximum PV input current | 16A+16A | |
| PV charge current(can be set) | 0-150A | |
| Charging short circuit protection | Blown fuse | |
| Wiring protection | Reverse polarity protection | |
| **Certified specifications** | | |
| Certification | UL 1741 | |
| EMC certification level | FCC part15, CLASS B | |
| Operating temperature range | -10°C to 55°C(>45°C derating) | |
| Storage temperature range | -25°C ~ 60°C | |
| Humidity range | 5% to 95% （ Conformal coating protection） | |
| Noise | ≤60dB | |
| Heat dissipation | Forced air cooling, variable speed of fan | |
| Communication interface | USB/RS485/CAN/WiFi/ Dry node control | |
| Size (L*W*D) | 613mm*360mm*128mm | |
| Weight (kg) | 16KG | |