User Manual

All-in-one solar charge inverter

SUNON3.6

V1.2

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: **SUNON3.6**
- 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

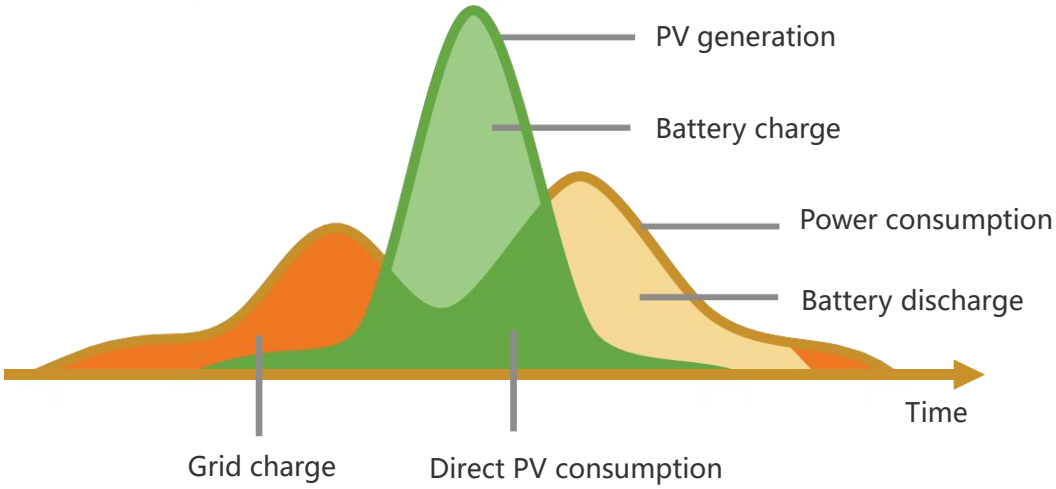
⚠ DANGER

- 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

SUNON3.6 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

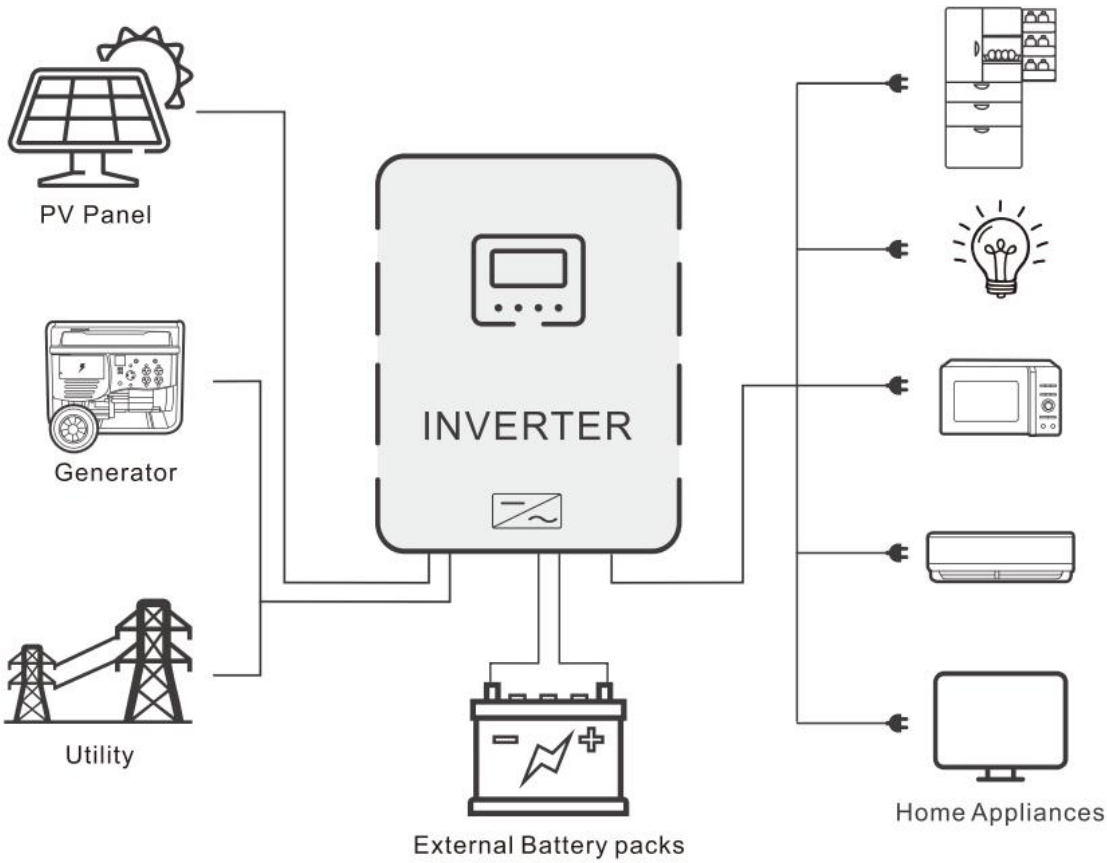
- Support the connection of various types of energy storage batteries such as lead-acid battery and lithium-ion battery
- Have the dual activation function during lithium-ion battery sleep, that is, access to Grid/PV power can activate the lithium-ion battery
- Support split-phase/single-phase pure sine 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
- MPPT efficiency can reach 99.9%, with a maximum single-channel current of 27A, 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 USB, RS485 communication

2.3 System connection diagram

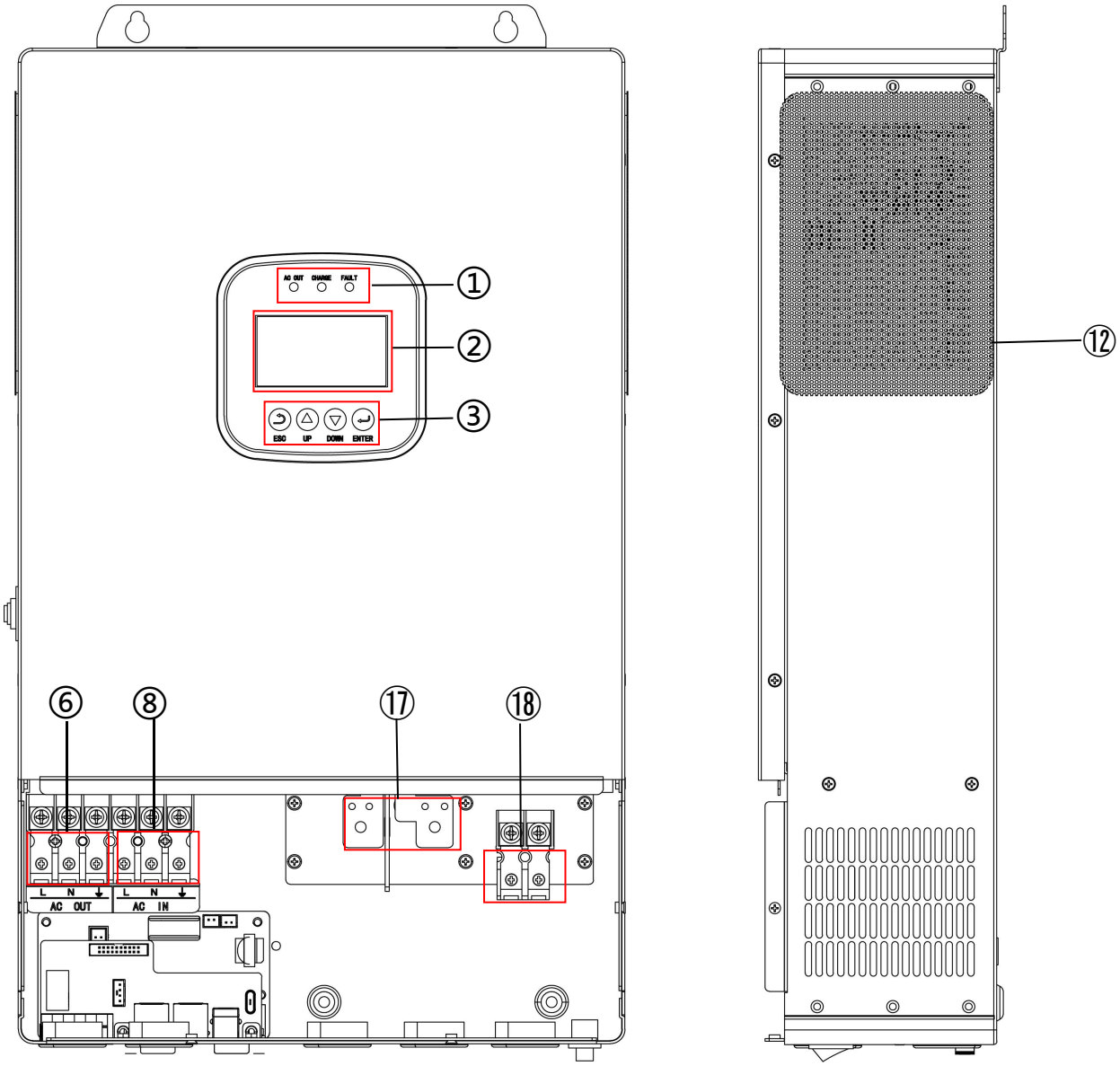
The following figure shows the system application scenario of the product. A complete system consists of the following parts:

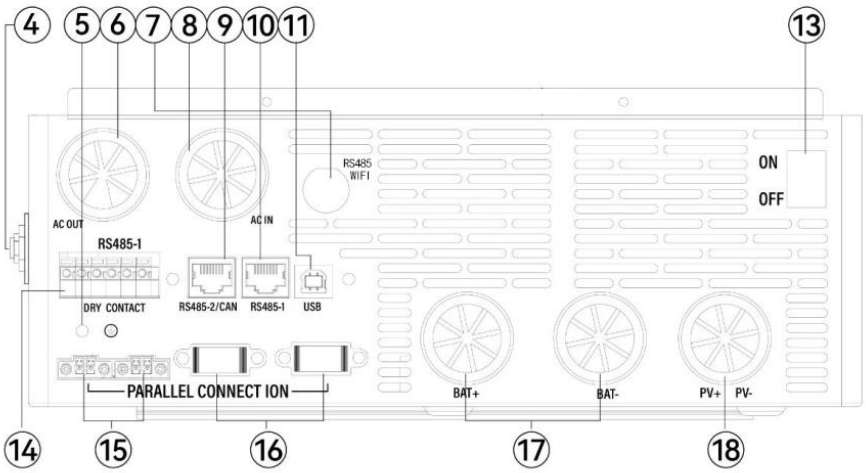
1. **PV module:** It converts solar energy into DC to charge batteries or into AC to supply power to loads.
2. **Grid or generator:** Connected to AC input, it can charge batteries while supplying power to loads. When the battery and PV module supply power to the load, the system can generally operate 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

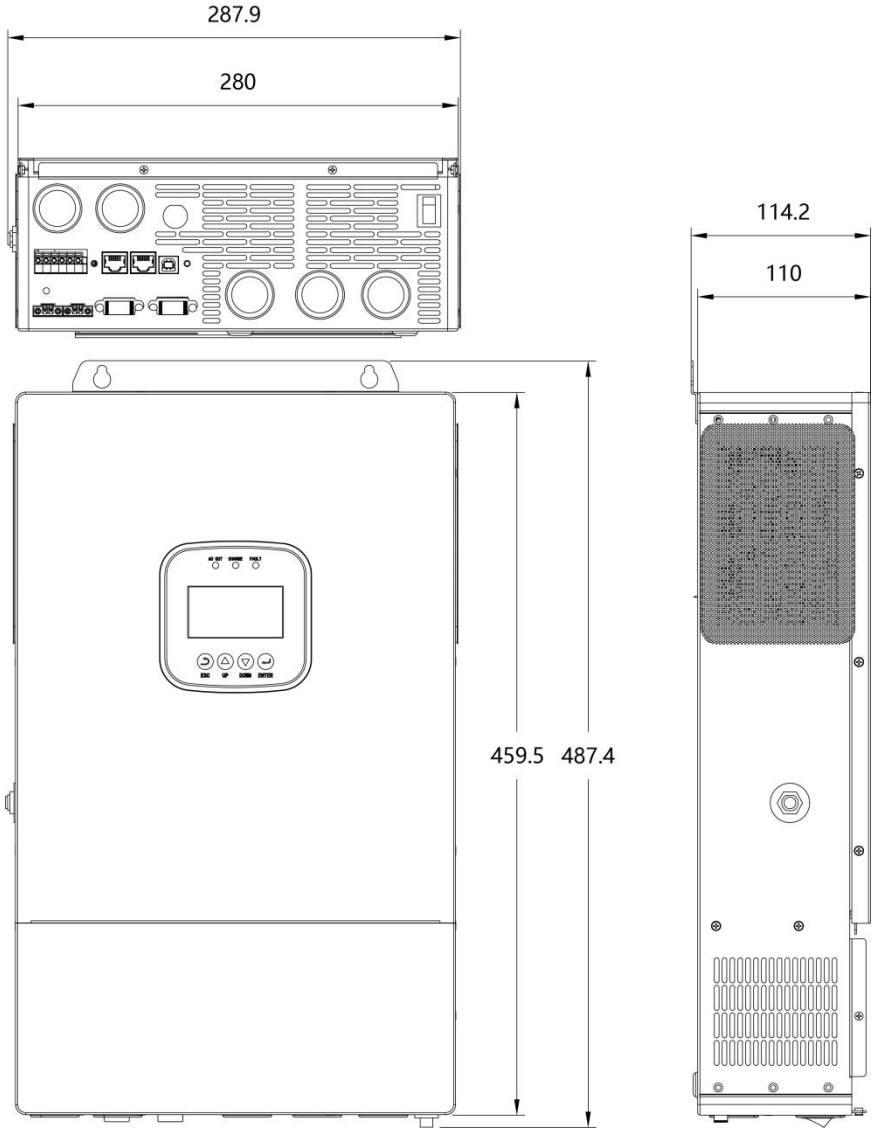




1	Indicator light	7	RS485 WIFI	13	ON/OFF rocker switch
2	LCD screen	8	AC input	14	Dry contact port
3	Touch the key lightly	9	BMS（RS485-2/CAN communication port	15	Current sharing port (parallel module only)
4	AC input overload protector reset button	10	RS485-1 communication port	16	Parallel communication port (parallel module only)
5	Grounding screw hold	11	USB communication port (Inverter debugging port)	17	Battery input
6	AC output	12	insect-proof net	18	PV input

Dimension

Unit：mm

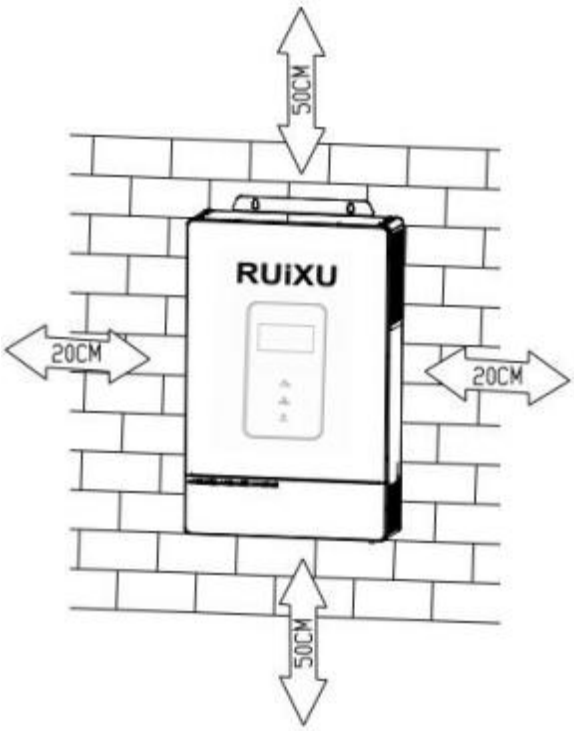


3. Installation

3.1 Installation location

SUNON3.6 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

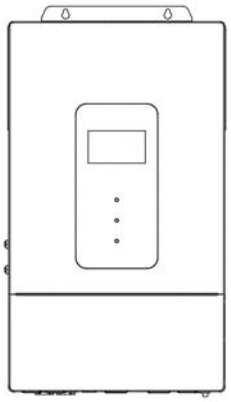
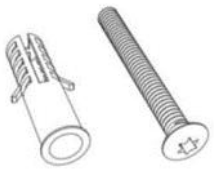
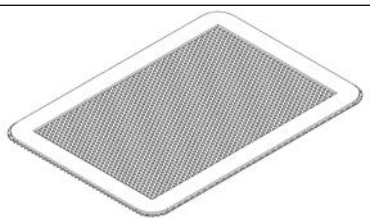
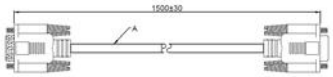
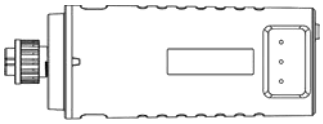
- Do not install the inverter near highly flammable materials
- Do not install the inverter in potentially explosive areas
- Do not install the inverter and lead-acid battery in enclosed spaces

⚠ CAUTION

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

3.2 Packing list

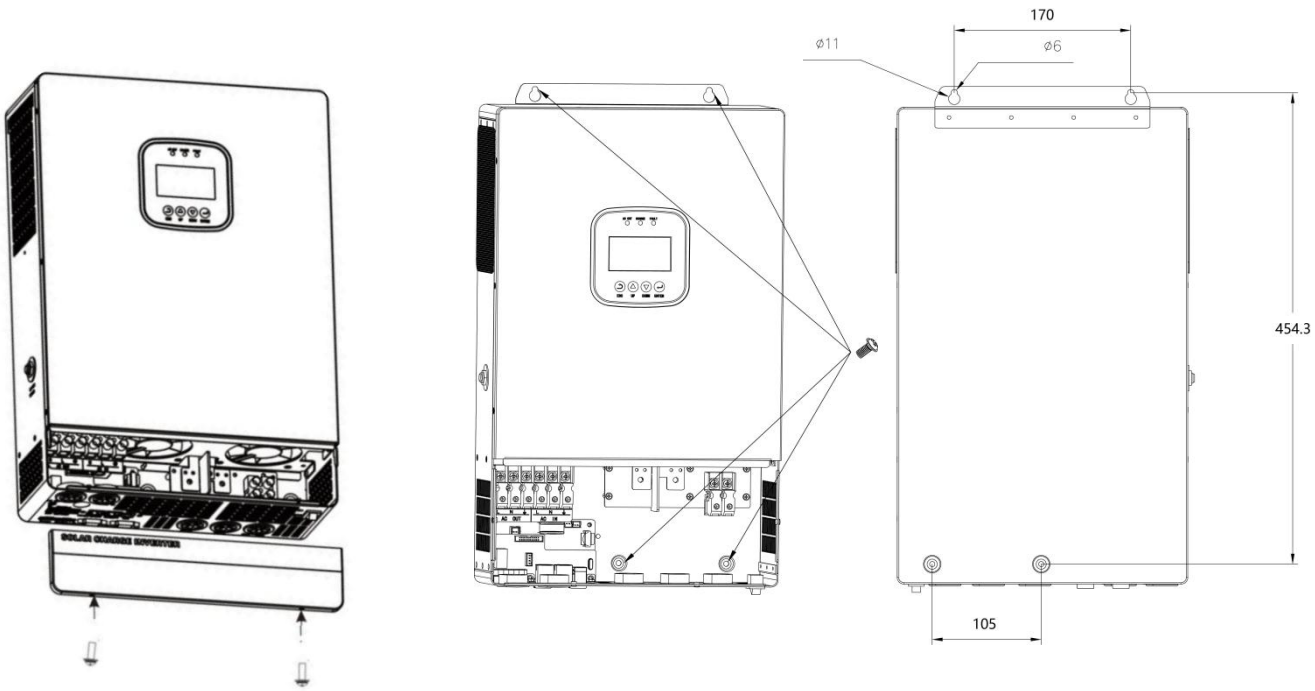
Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items in the package:

No.	Picture	Description	Quantity
1		Inverter	1
2		M4*30 self-tapping screws + M6*40 expansion anchors	2
3		M5 Fixing Screw	2
4		Copper lug SC35-6	2
5		Dust-proof net	2
6		Parallel communication cable	1
7		Current sharing cable	1
8		RS-485 WiFi model	1

9		RS-485 WiFi model Connection Cable	1
10		User Manual	1
11		The warranty card	1
12		Quality Certificate	1
13		Outgoing inspection report	1

3.3 Inverter installation

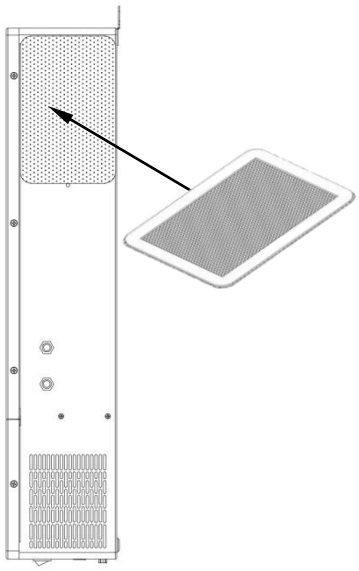
Before installation, please remove the terminal cover by unscrewing the four screws as shown below.



Install the unit by screwing four screws. It’ s recommended to use M4 or M5 screws.

NOTICE

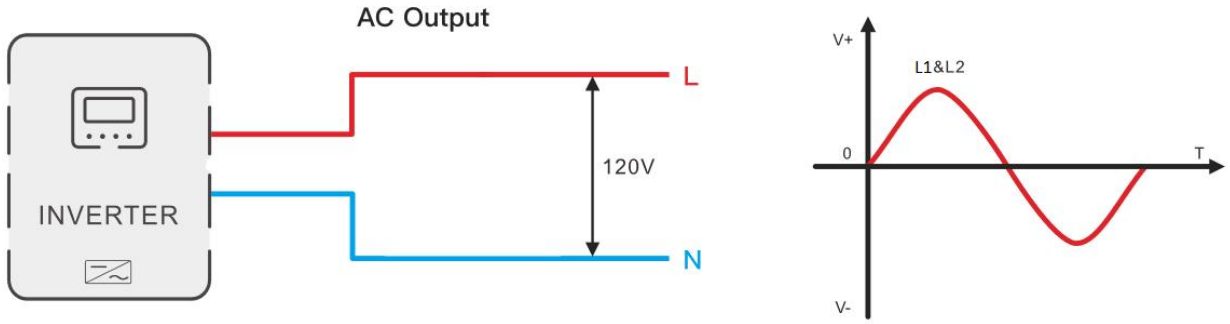
When using the inverter in areas with poor air quality, the dust proof net is easily blocked by air particles. Please regularly remove and clean it to avoid affecting the air flow rate inside the inverter; otherwise it may cause inverter overheating (22/23 fault), and affect power supply and the service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



4. Wiring

4.1 Wiring mode (depends on the output mode)

- **Single-phase mode**



Item	Description
Applicable model	SUNON3.6 U model
AC output phase voltage (L-N)	100 VAC–120 VAC, 120 VAC (default)

Note: Multiple inverters can be connected in parallel to obtain split - phase and three - phase outputs. For details, refer to the section on parallel connection.

4.2 Cable and circuit breaker model

- **PV INPUT**

Inverter Model	Cable Size	Maximum Input Current	Circuit Breaker Model	Torque Value
SUNON3.6	6.6mm2/9AWG	27A	2P-32A	1.2-1.6Nm
Note: If only one string of PV is selected, then you can refer to the following parameters.				
	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
SUNON3.6	Single-phase mode	L N	40A	8.3mm2/8AWG	2P-40A	1.2-1.6Nm

- **Battery**

Inverter Model	Cable Size	Maximum Current	Circuit Breaker Model	Torque value
SUNON3.6	20mm2/4AWG	85A	2P-100A	2-3Nm

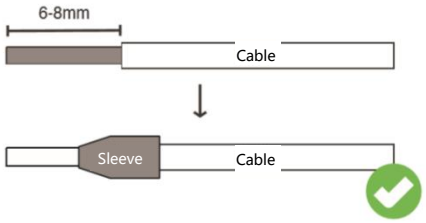
- **AC output**

Inverter Model	Output Mode	Diagram	Maximum Current	Cable Size	Circuit Breaker Model	Torque Value
SUNON3.6	Single-phase	L N	40A	8.3mm2/8AWG	2P-40A	1.2-1.6Nm

NOTICE

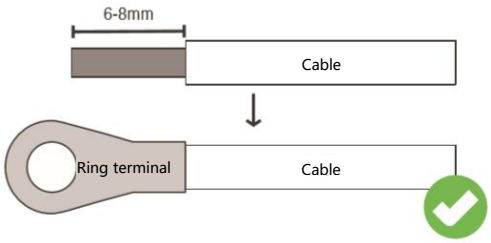
- **PV input, AC input, and AC output terminals**

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



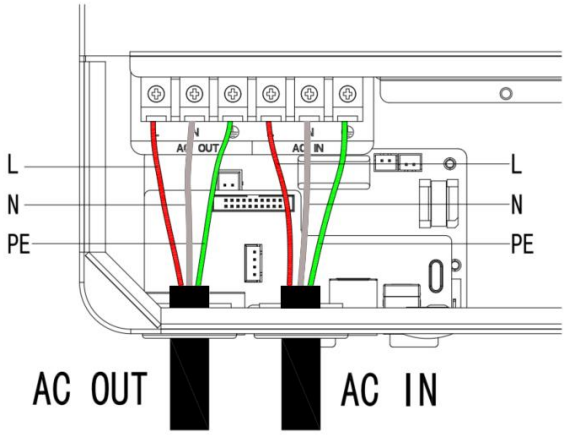
The cable size is for reference only. If the distance between the PV array and the inverter or between the inverter and the battery is long, using thicker cables will reduce voltage drop and improve system performance.

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

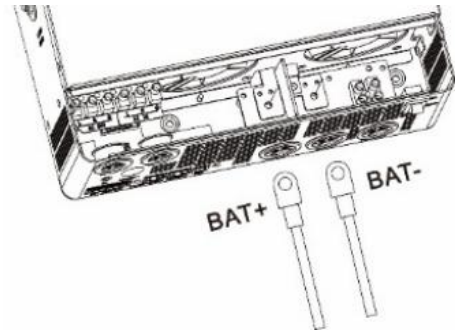


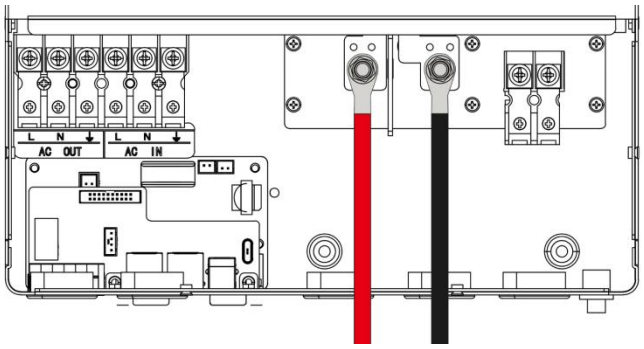
⚠ DANGER

- 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.



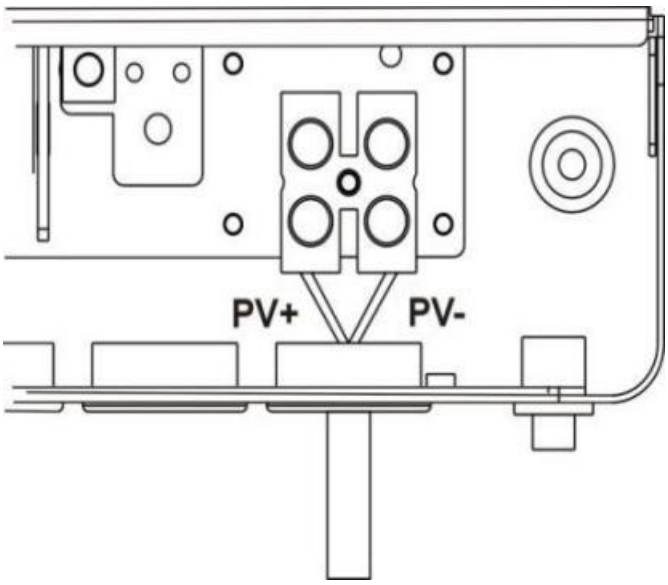


⚠ DANGER

- 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 PV modules according to the cable position and sequence shown in the following figure.

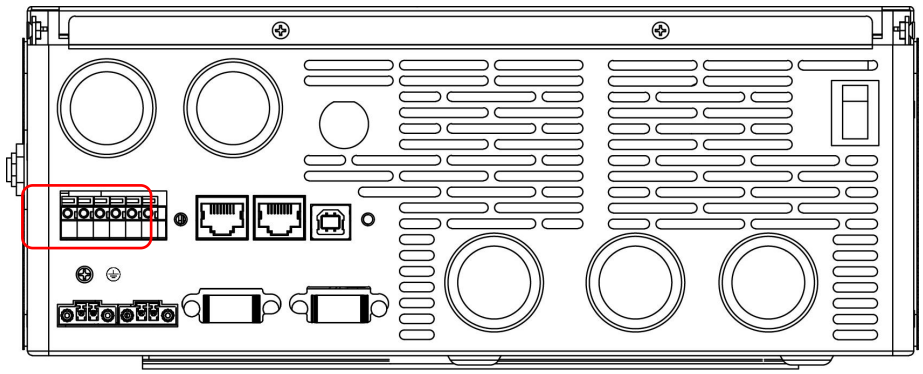


⚠ DANGER

- 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 SUNON3.6, this value is **300 V**); otherwise the inverter may be damaged.

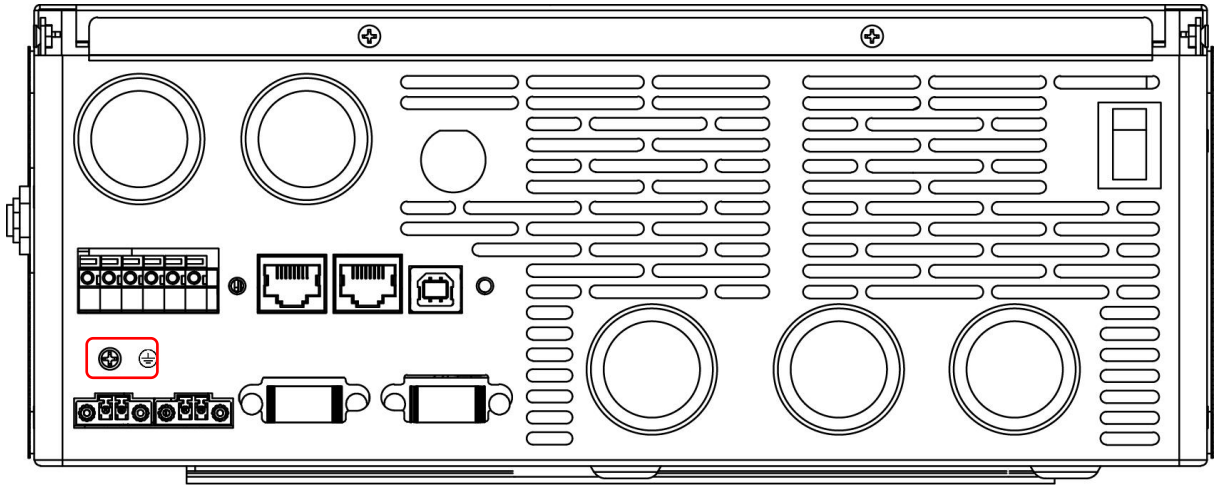
4.6 Dry contact wiring

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.

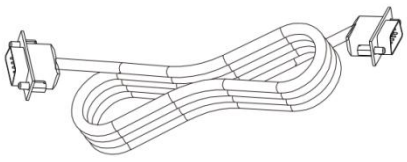
4.9 Parallel wiring

4.9.1 Parallel operation

1. Maximum six inverters can be used for parallel operation.

2. When using the parallel operation function, the following connecting cables (package accessories) shall be firmly and reliably connected:

Parallel communication cable*1



Current sharing 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.

2. **Battery wiring**

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

3. **AC OUT wiring:**

Parallel connection in single phase: Ensure L-to-L, 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.

Parallel connection in split phase: Ensure N-to-N and PE-to-PE connection for all inverters. The **L** lines of all inverters connected to the same phase need to be connected together. But **L** lines of different phases cannot be joined together. Other connection precautions are the same as parallel connection in single phase.

4. **AC IN wiring:**

Parallel connection in single phase: Ensure L-to-L, 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. 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.

Parallel connection in split phase: Ensure N-to-N and PE-to-PE connection for all inverters. The **L** lines of all inverters connected to the same phase need to be connected together. But **L** lines of different phases cannot be joined together. Other connection precautions are the same as parallel connection in single phase.

5. **Communication wiring:**

Parallel connection in single or split phase: Our company's parallel communication cable is a DB15 standard computer cable with shielding function. Ensure the "one-in-one-out" rule when connecting each inverter, that is, connect the male connector (out) of this inverter with the female connector (in) of the inverter to be paralleled. Do not connect the male connector of the inverter to its female connector. In addition, make sure to tighten the parallel communication cable of each inverter with self-contained end screws of DB15 to avoid the abnormal operation or damage of the system output caused by the falling off or poor contact of the parallel communication line.

6. **Wiring of current sharing cable：**

Parallel connection in single phase: Our company's current sharing cable is a twisted connection line. Ensure the "one-in-one-out" rule when connecting each inverter, that is, connect the current

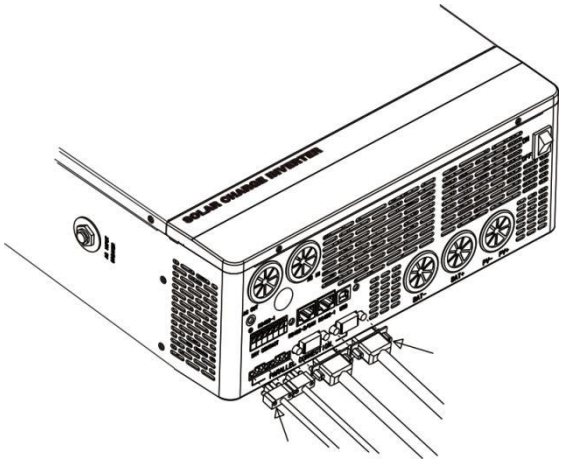
sharing line of the inverter with the current sharing green port of the inverter to be paralleled (choose one port from the two, and there is no mandatory sequence requirement). The current sharing ports of the inverter cannot be connected to each other. In addition, make sure that the red and black current sharing connection lines of each inverter are not manually exchanged, and make sure to tighten the lines with self-contained screws to avoid the abnormal operation or damage of the system output caused by abnormal parallel current sharing detection.

Parallel connection in split phase: The current sharing cables of all inverters connected to the same phase need to be connected together. But the current sharing cables of different phases cannot be joined together. Other connection precautions are the same as parallel connection in single phase.

7. 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.
8. 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.

4.9.3Wiring diagram for parallel connection

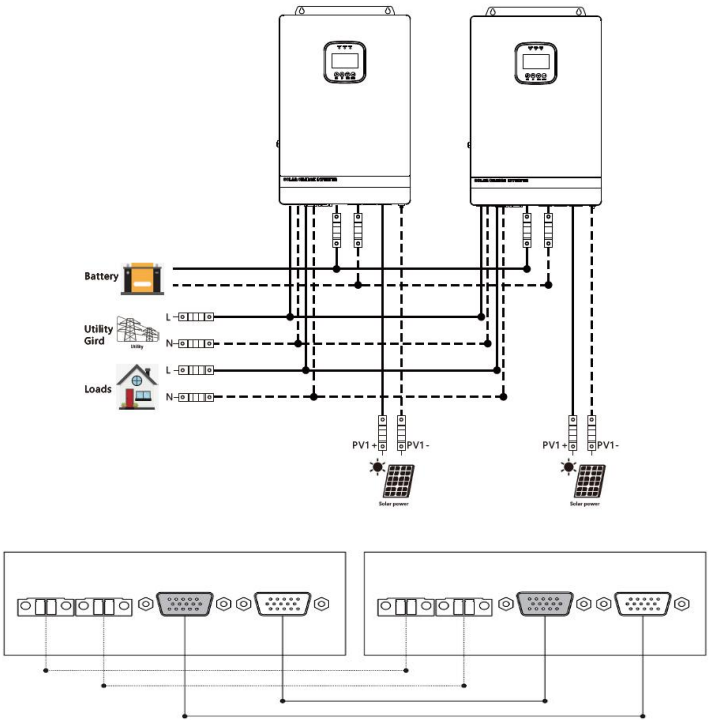
The communication cable of parallel solar storage inverter is to be locked with screws after connecting. See the diagram below:



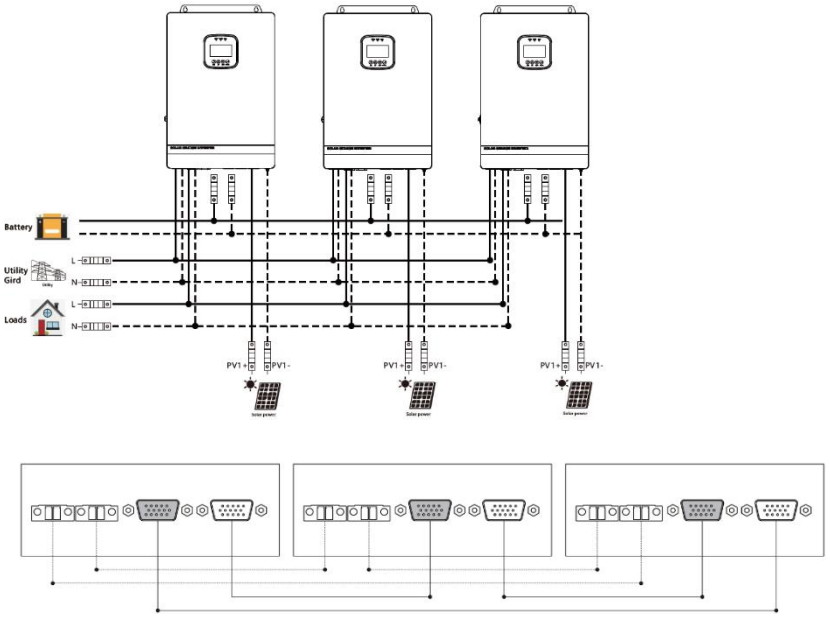
- In case of parallel operation with multiple inverters, the schematic diagram of parallel connection is as follows：

Parallel connection in single phase：

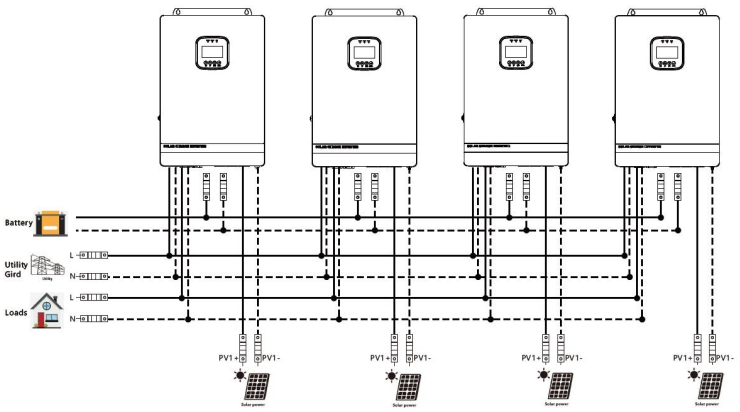
a) **Two all-in-one solar charger inverters of the system connected in parallel：**

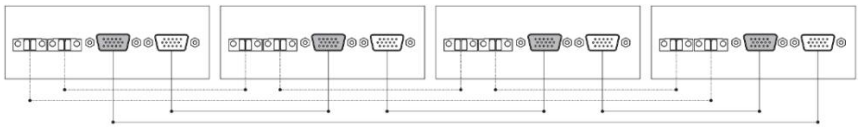


b) Three all-in-one solar charger inverters of the system connected in parallel:

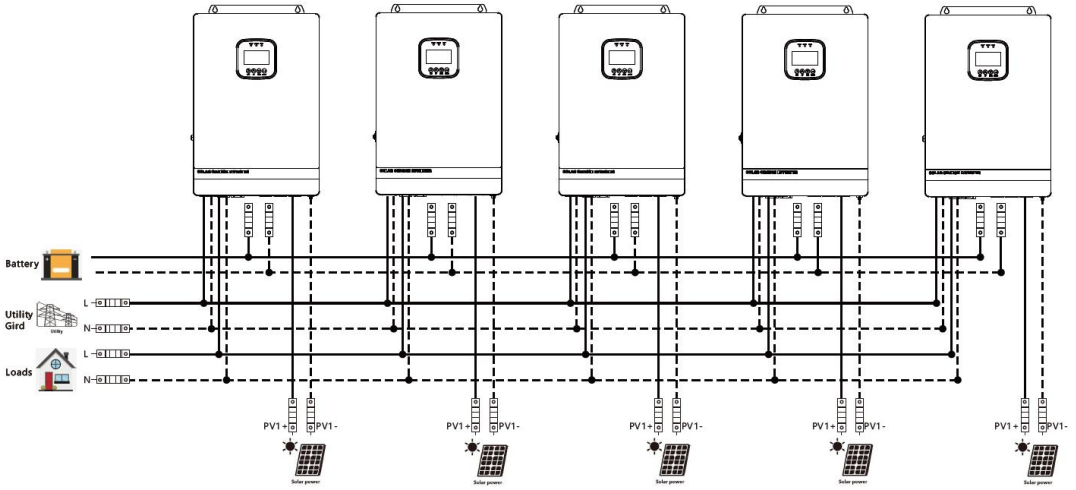


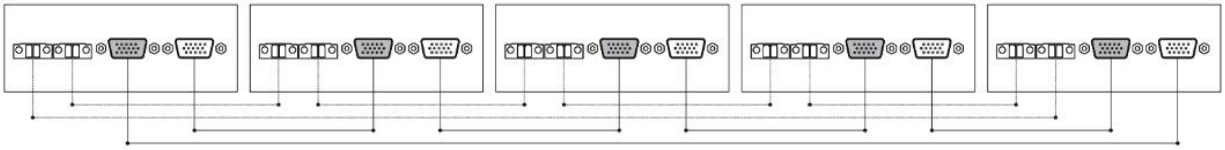
c) Four all-in-one solar charger inverters of the system connected in parallel:



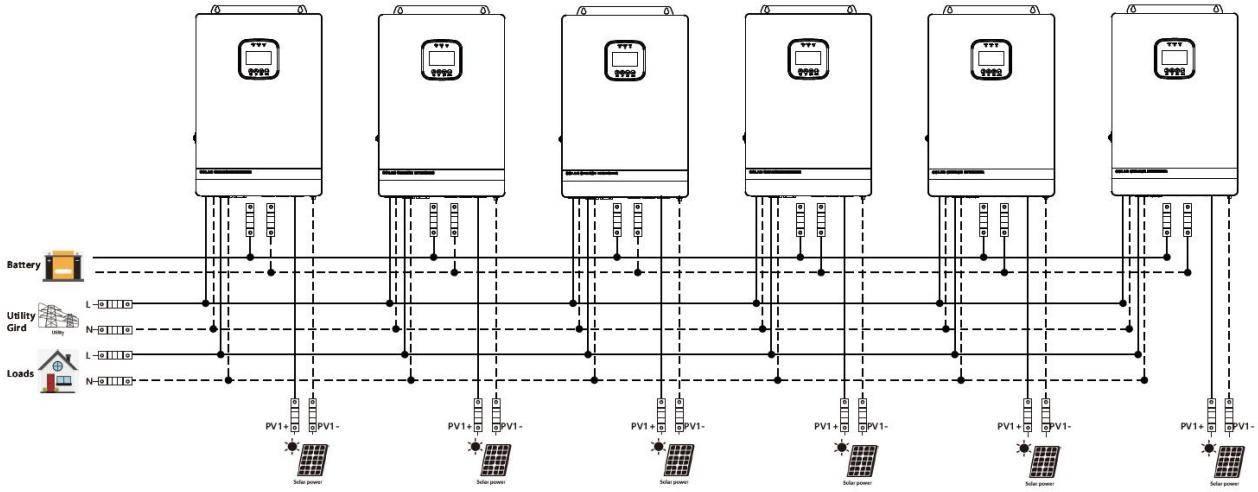


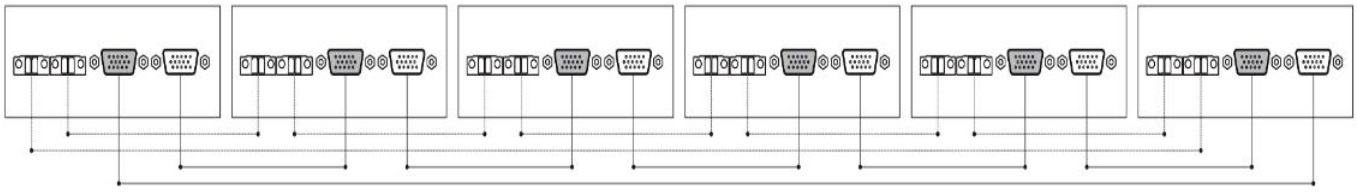
d) Five all-in-one solar charger inverters of the system connected in parallel:





e) Six all-in-one solar charger inverters of the system connected in parallel:

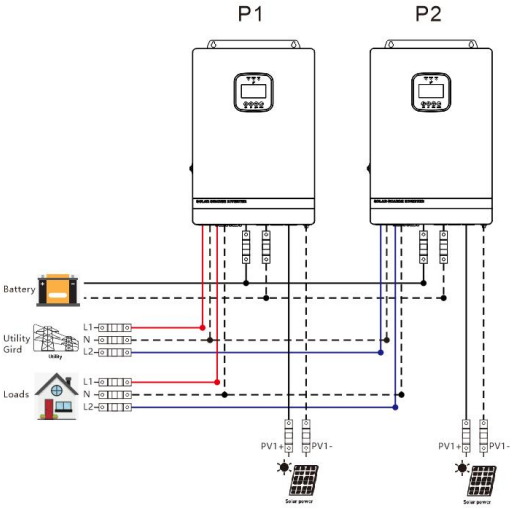


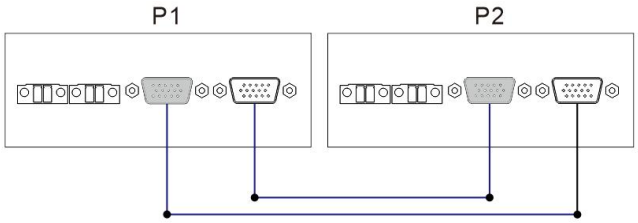


Parallel Operation in split phase:

a） Two all-in-one solar charger inverters of the system connected in two phase:

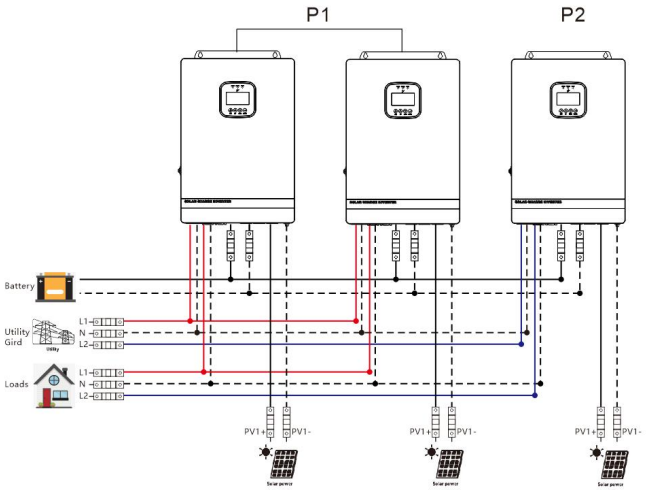
1+1 system:

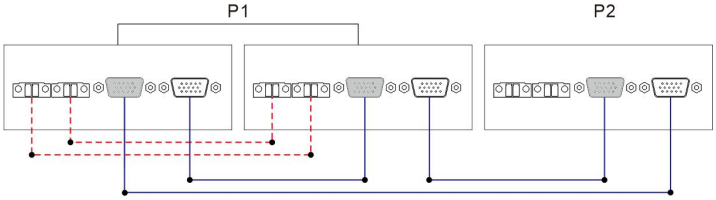




b） Three all-in-one solar charger inverters of the system connected in two phase:

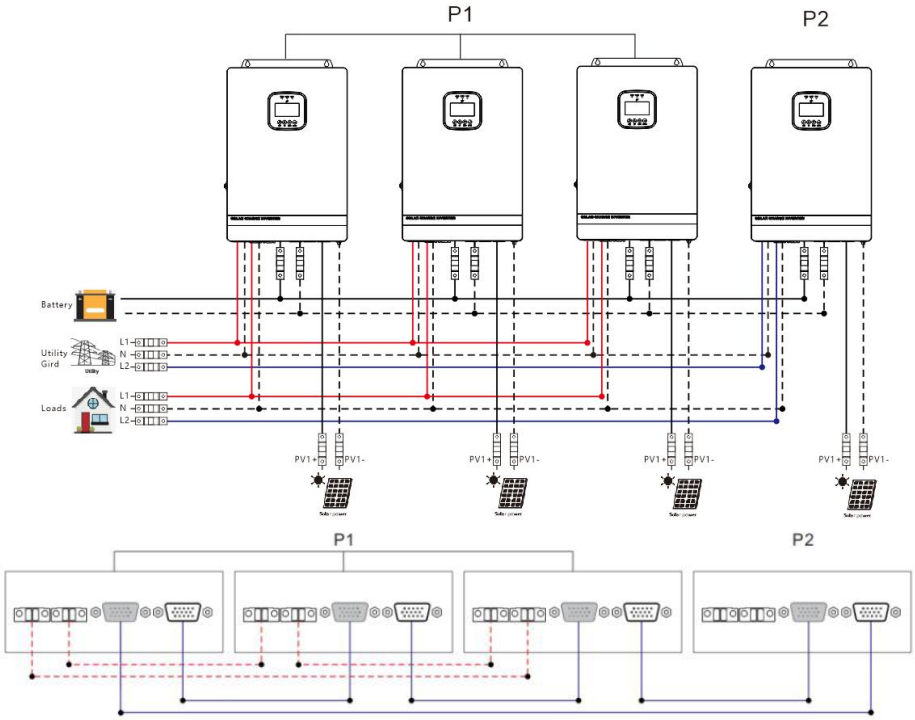
2+1 system：



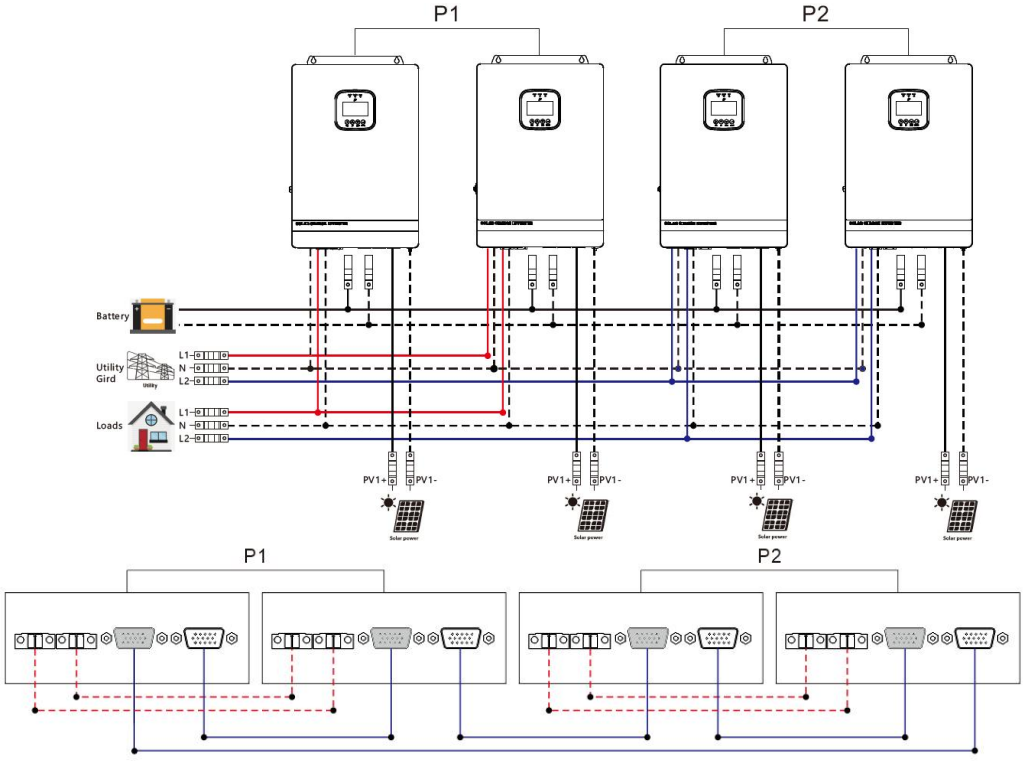


c） Four all-in-one solar charger inverters of the system connected in two phase：

3+1 system：

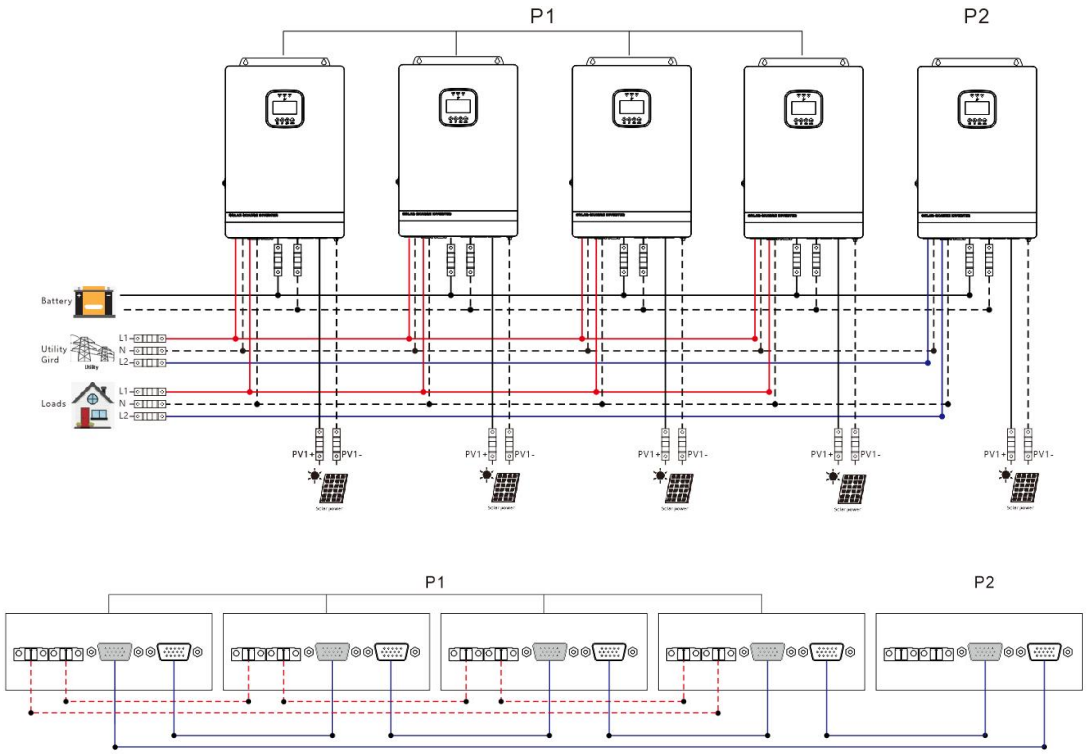


2+2 system:

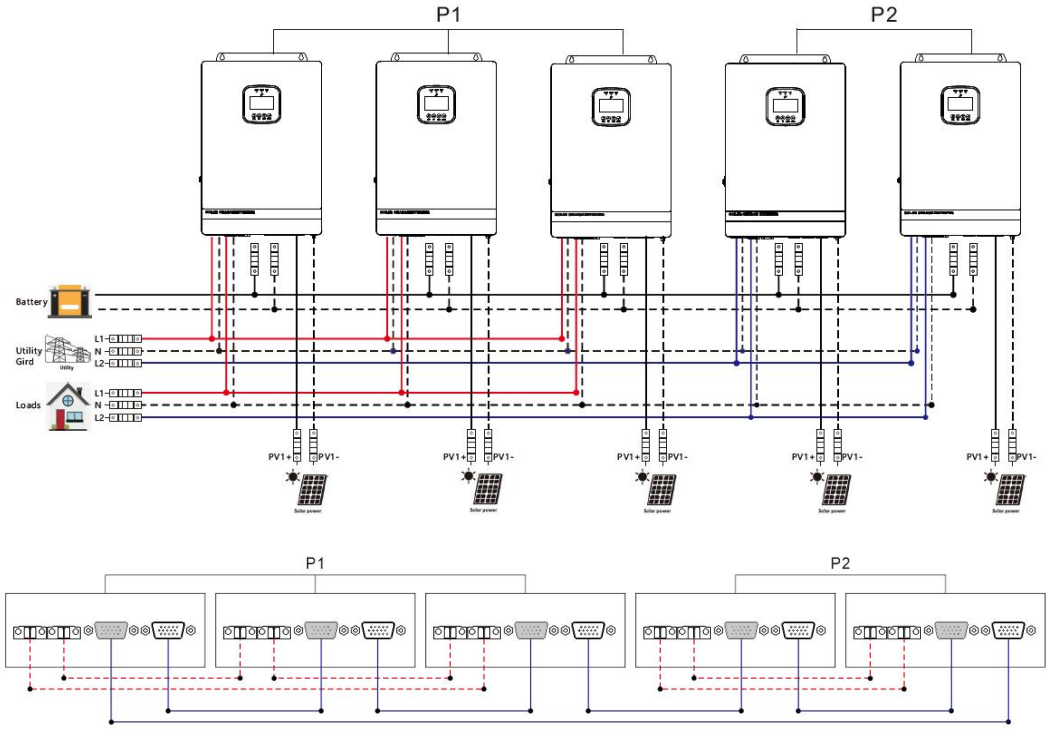


d) Five all-in-one solar charger inverters of the system connected in two phase:

4+1 system:

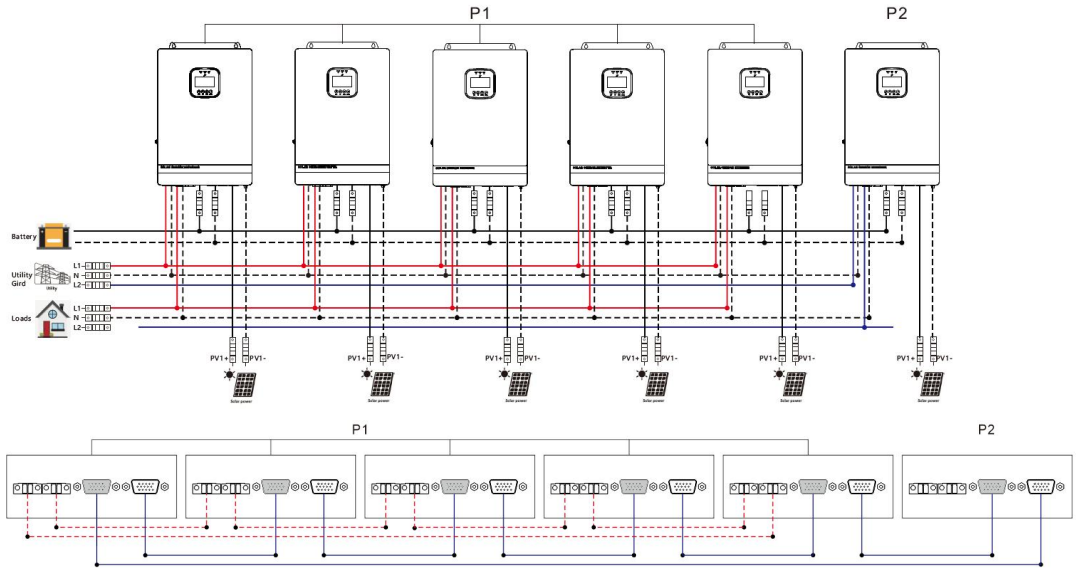


3+2 system:

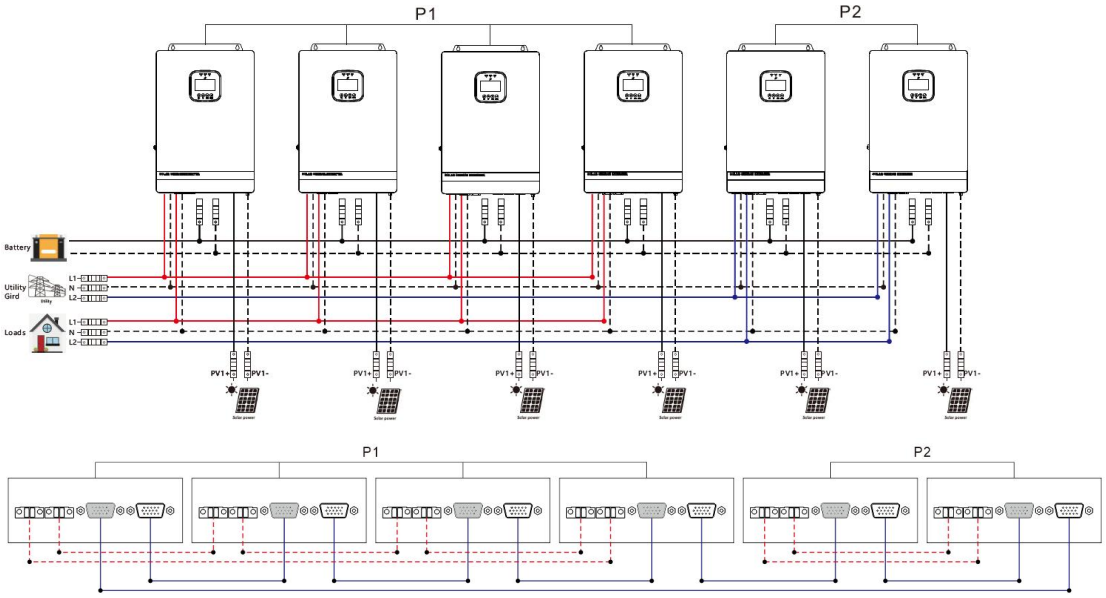


e) Six all-in-one solar charger inverters of the system connected in two phase:

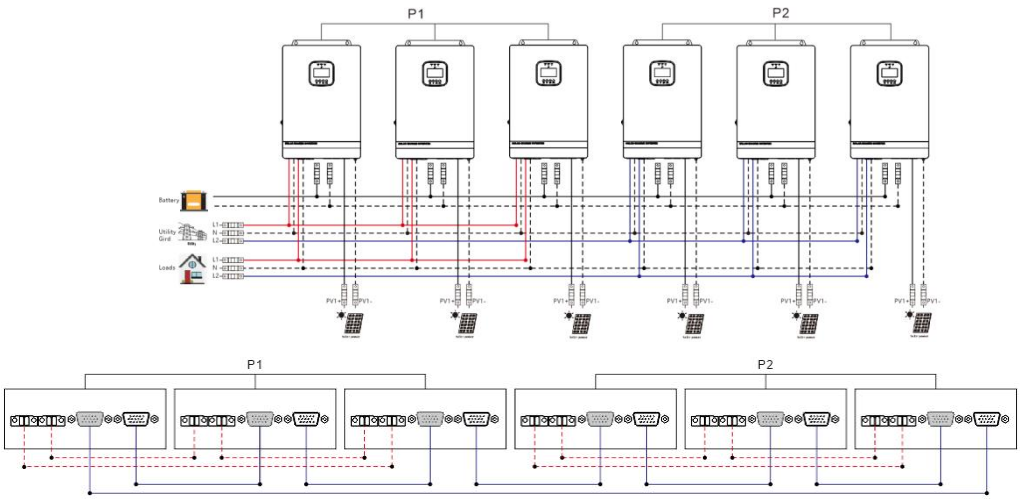
5+1 system:



4+2 system:



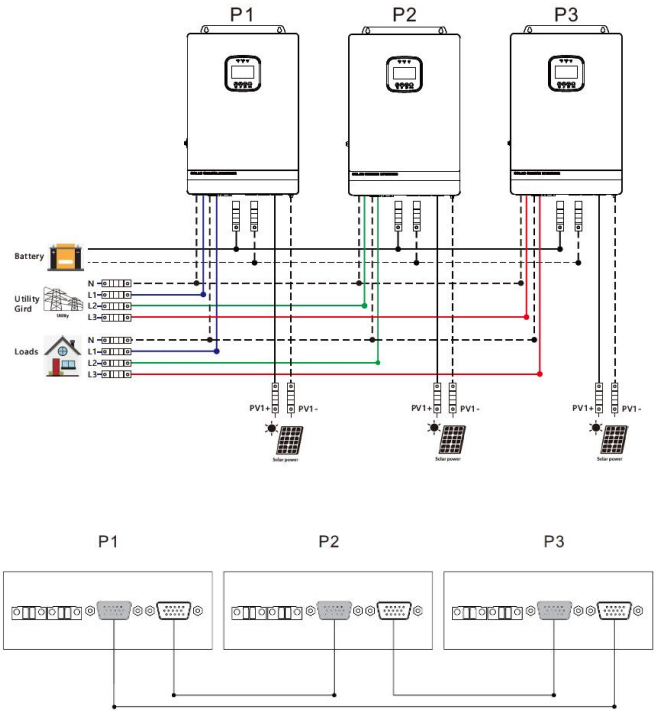
3+3 system:



Parallel Operation in three phase:

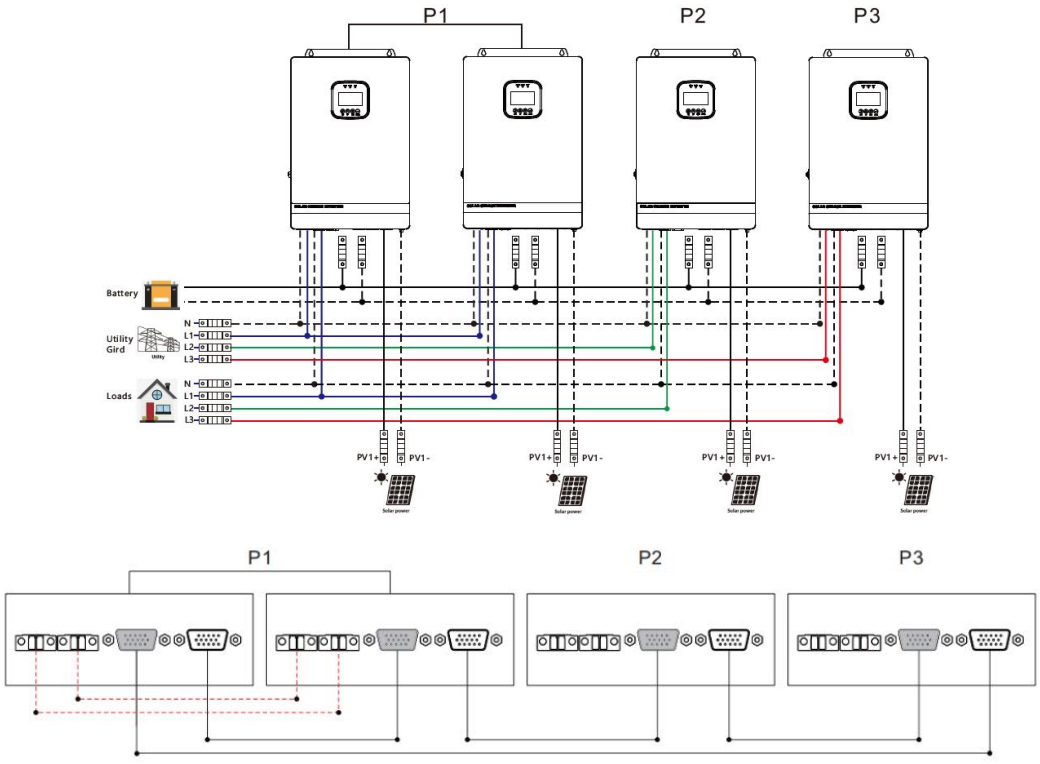
a） Three all-in-one solar charger inverters of the system connected in three phase:

1+1+1 system:



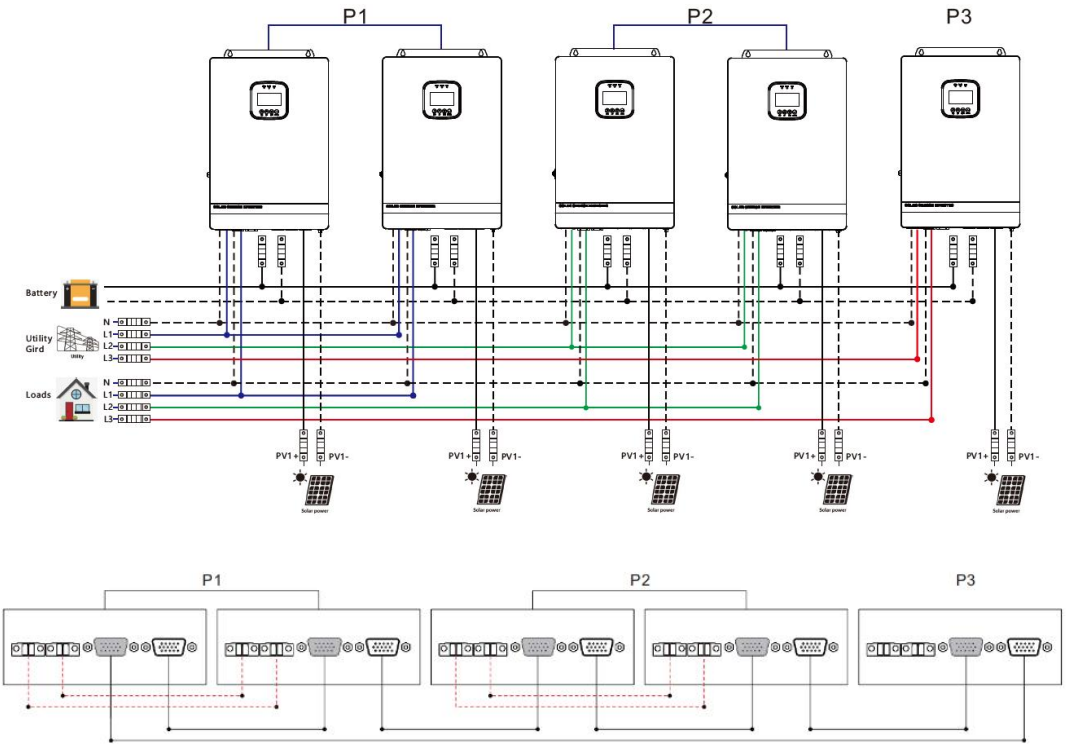
b） Four all-in-one solar charger inverters of the system connected in three phase:

2+1+1 system：

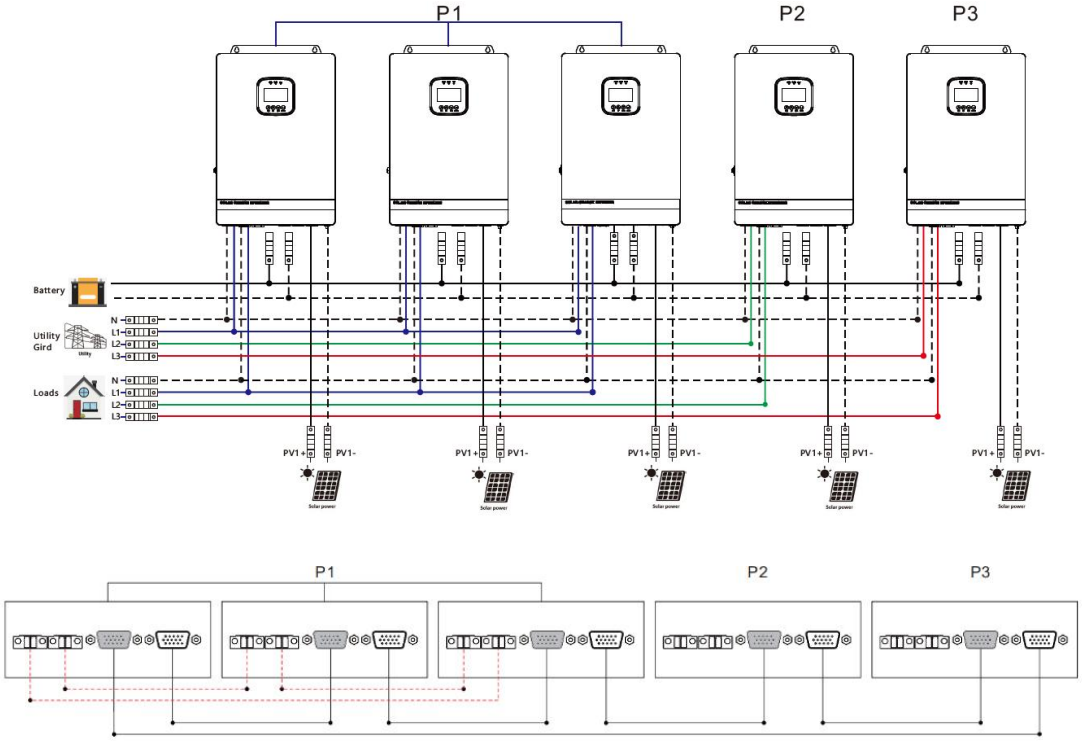


c） Five all-in-one solar charger inverters of the system connected in three phase：

2+2+1 system：

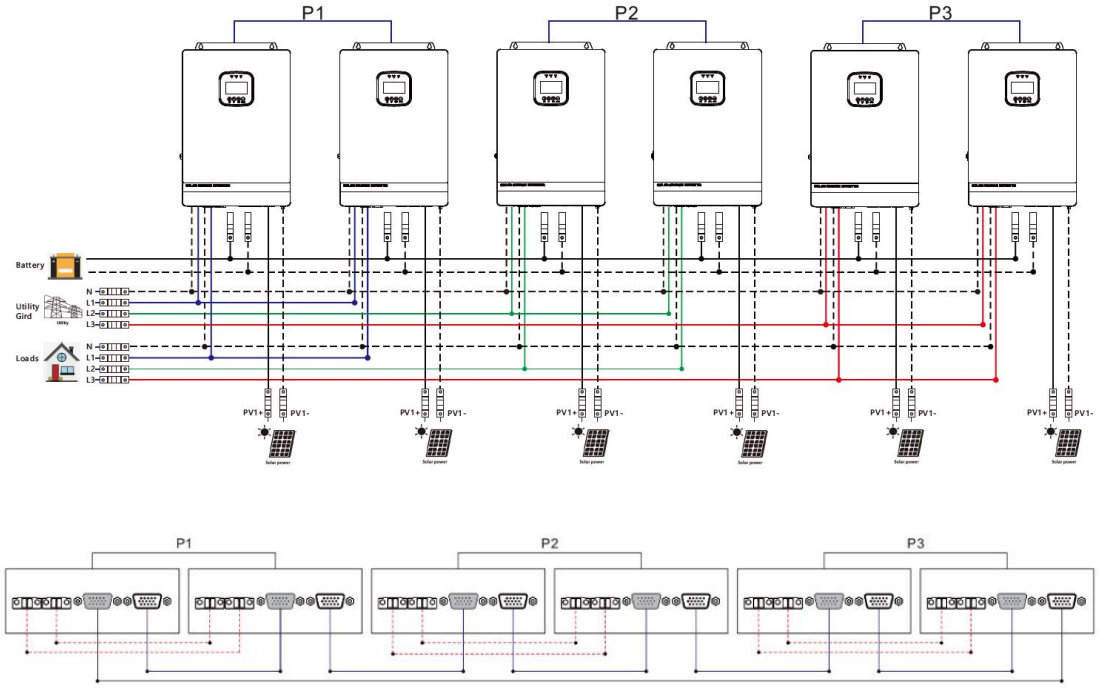


3+1+1 system：



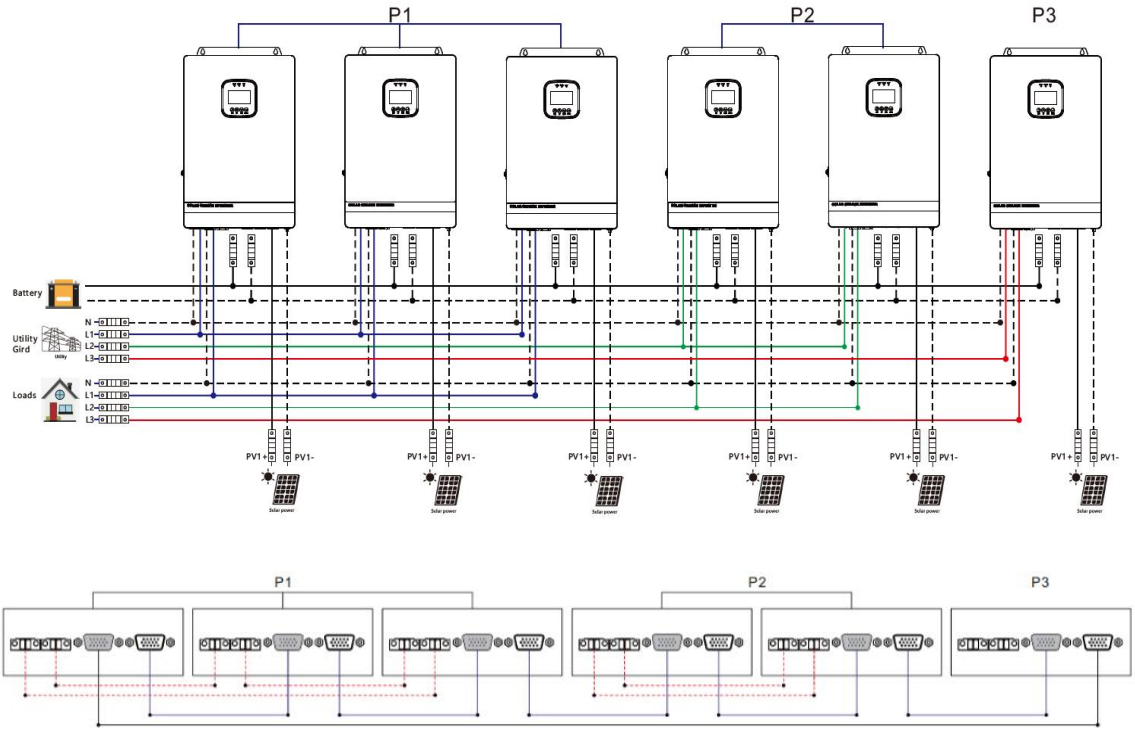
d） Six all-in-one solar charger inverters of the system connected in three phase:

2+2+2 system：


P1
P2
P3
Battery
Utility Gird
Loads
N
L1
L2
L3
PV1+
PV1-

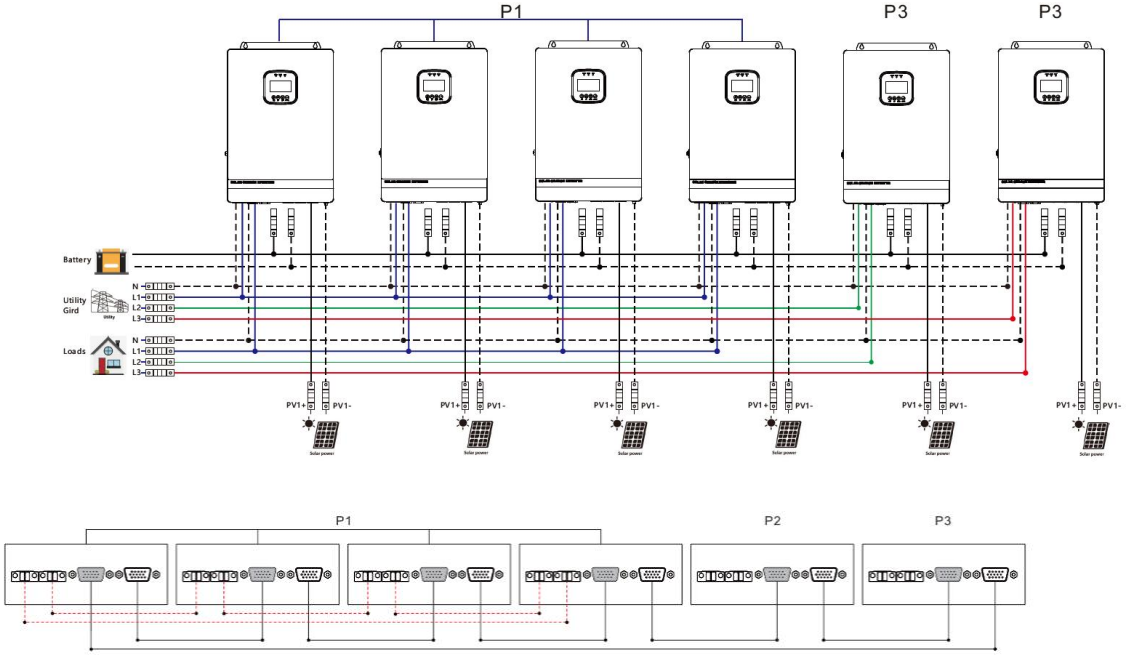
P1
P2
P3

3+2+1 system:


P1
P2
P3
Battery
Utility Gird
Loads
N
L1
L2
L3
PV1+
PV1-

P1
P2
P3

4+1+1 system:

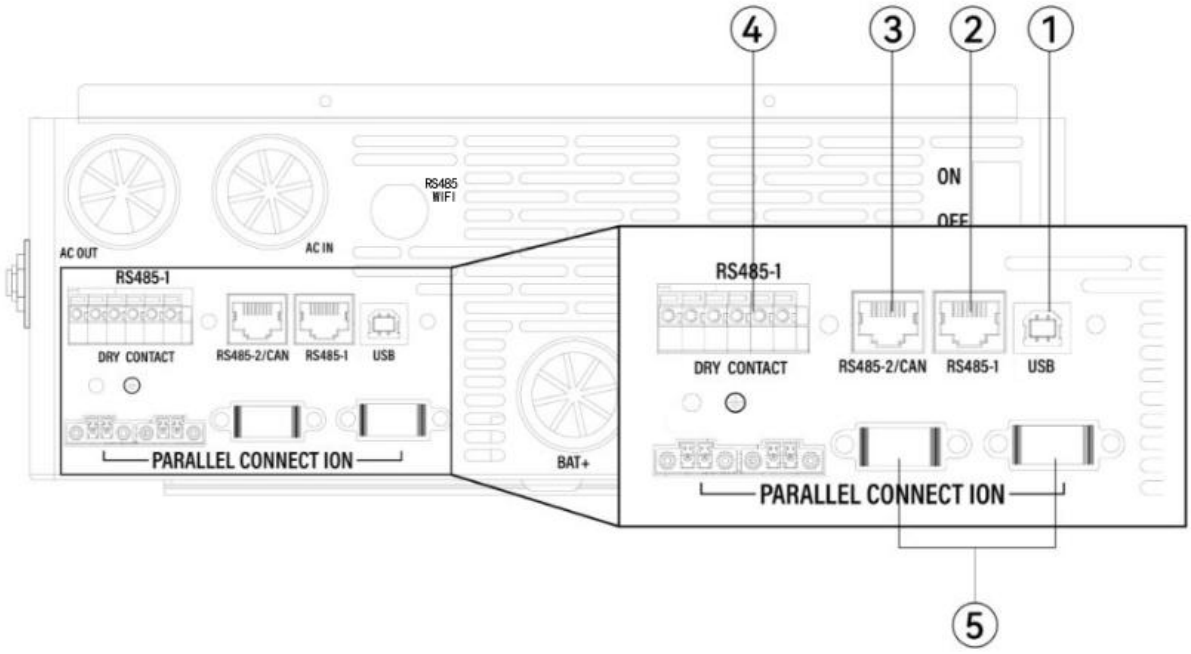


Note:

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 s hall be properly wired according to the requirements of the electrical load equipment to avoid damage to the load equipment.
4. Settings [02] need to be set consistently or only for the master. When the inverter is running, the voltage set by the master shall prevail, and the master will force the rewrite of the other slave inverters to keep the same set. Only can be set in the standby mode.
5. When using parallel function, the [31] setting items need to be set accordingly.
6. When setting the phase sequence [02] [31] on the screen, turn on one inverter for setting and turn off the others. Set one by one. Finally, power off and start up again.
7. After the system runs, measure the output voltage correctly, and then connect the load setting.

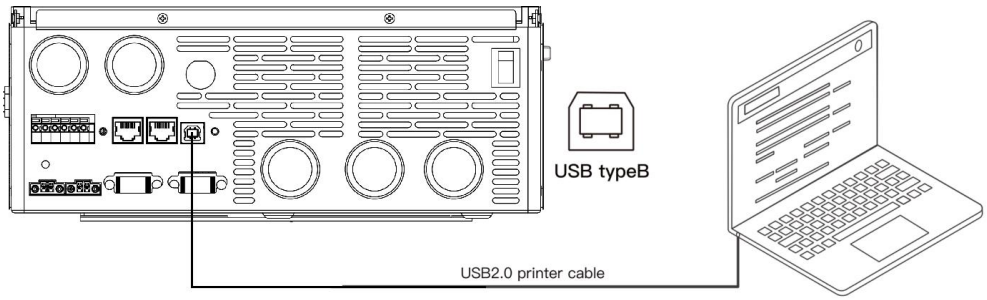
5.Communication

5.1 Overview



1	USB-B port	4	Dry contact port
2	RS485-1 port	5	Parallel communication port
3	RS485-2 port		

5.2 USB communication port

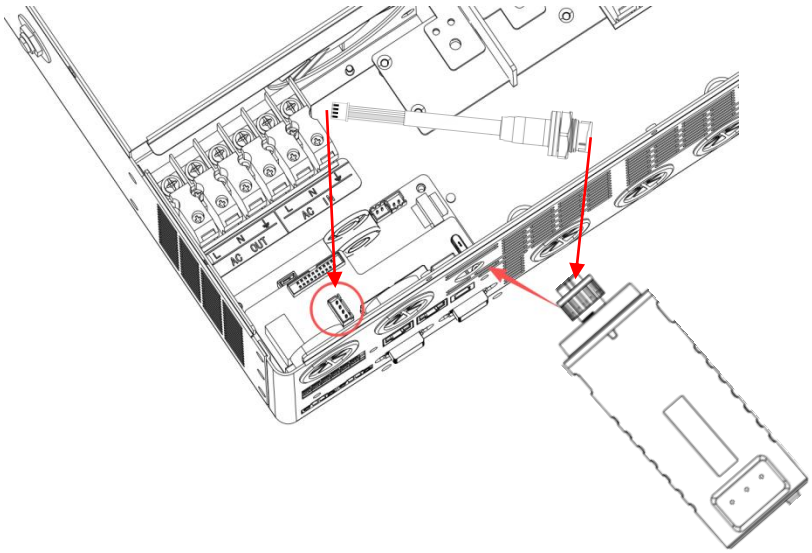


When necessary, users can use software to read and modify inverter parameters and upgrade the inverter's firmware via the port. When connecting to a computer, it is recommended to disconnect the connections between the inverter and the WiFi communication module, as well as the communication connection 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.

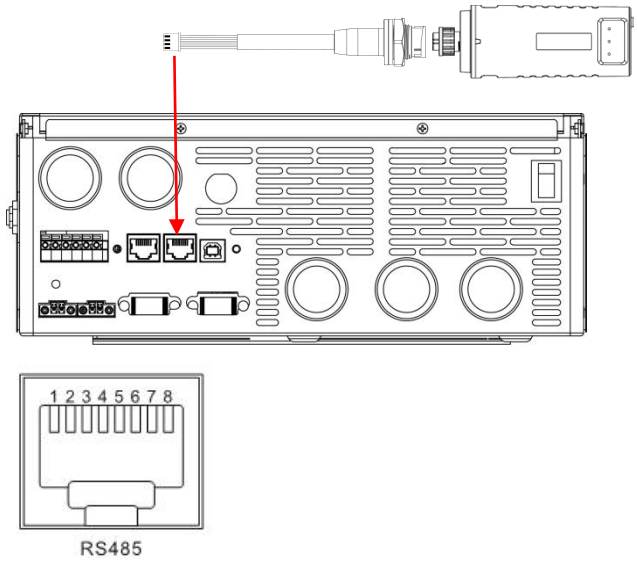
5.3 WIFI port

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.

1)Access the communication from the inside (default solution)



2) Through the RS485 - 1 communication port (a communication adapter cable needs to be separately configured).



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

Note:PIN3 and PIN6 of RS485 - 1 provide 5V power supply for the module.

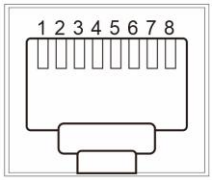
5.4 RS485-2/CAN (BMS) communication port

The RS485-2/CAN port is used to connect to the BMS of the Li-ion battery.

NOTICE

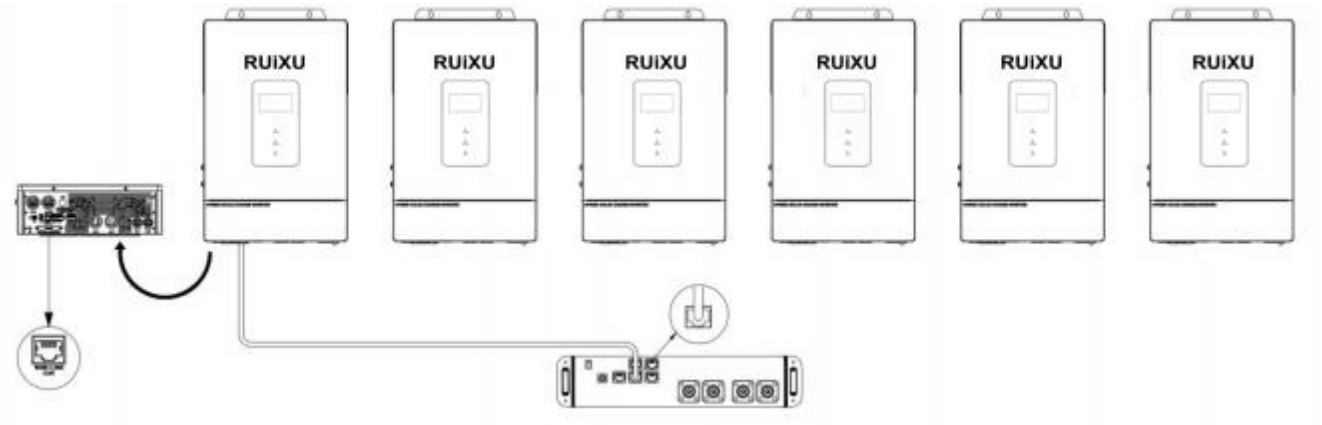
If you need the communication between the inverter and the BMS of the Li-ion battery, please contact us to understand the communication protocol, or upgrade the inverter to the corresponding software program.
Be careful not to connect the BMS communication cable to the RS485 - 1 communication port, as this may damage the BMS.

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



RS485/CAN

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.



5.5 Dry contact port

N-NO-NC function:

Working principle: This dry node can control the ON/OFF of the diesel generator.

1) Normally, NC-N point is connected and the NO-N point is disconnected;

2）When the battery voltage reaches the low voltage disconnection point, the relay coil is energized,

the NO-N point is connected while NC-N point is disconnected. At this point, NO-N point can drive resistive loads specifications: 125VAC/1A, 230VAC/1A or 30VDC/1A.

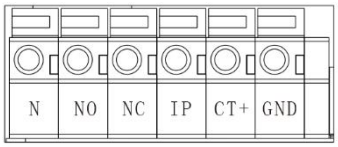
IP-GND function:

Optional function, not standard function;

Working principle: This dry node can control the AC output power ON/OFF of the inverter.

1) IP-GND is disconnected→ AC output ON;

2) IP-GND is connected→ AC output OFF;



(CT+)-GND function:

Optional function, not standard function;

Working principle: By sampling the input line current, self-use function is realized. But need to use our configuration of CT sensors;

5.6 Parallel communication function

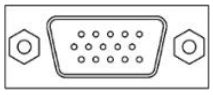
a) This port is used for parallel communication, through which the parallel modules can communicate with each other.

b) Each inverter has two DB15 ports, one for the male connector and the other for the female connector.

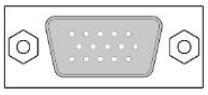
c) When connecting, make sure to connect the male connector of the inverter with the female connector of the inverter to be paralleled, or connect the female connector of the inverter to the male connector of the inverter to be paralleled.

d) Do not connect the male connector of the inverter to its female connector.

Female connector



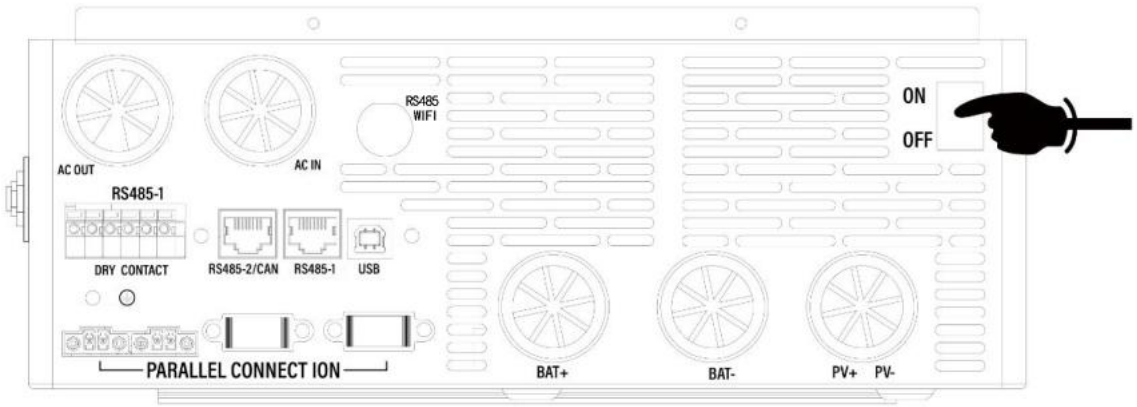
Male connector



6. Operation

6.1. Power ON/OFF

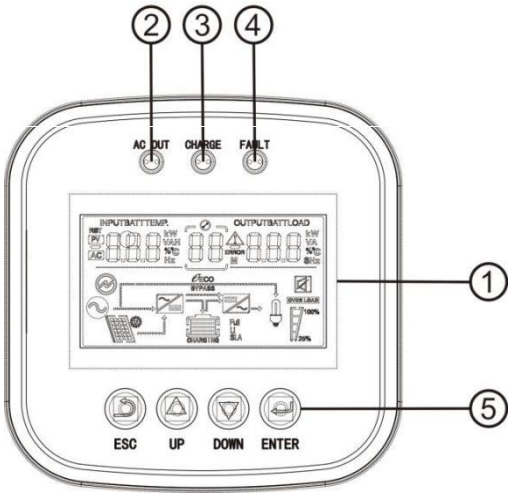
Once the unit has been properly installed and the batteries are connected well, simply press On/Off switch (located on the bottom of the case) to turn on the unit.



6.2. 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, four function keys and a LCD display, indicating the operating status and input/output power information.

1. LCD display
2. Status indicator
3. Charging indicator
4. Fault indicator
5. Function buttons



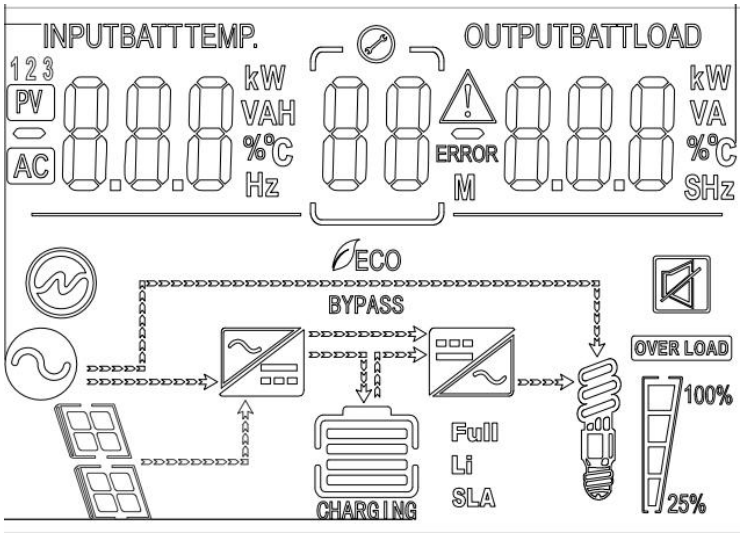
Indicators introduction:

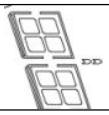
Indicators	Colors	Description
AC OUT	Green	Steady on: grid output
		Flash: Inverter output
CHARGE	Yellow	Flash: Fast charging
		Steady on: Floating charge
FAULT	Red	Flash : Fault state

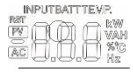
Operation buttons introduction:

Function buttons	Description
ESC	To exit setting mode
UP	Previous choice
DOWN	Next choice
ENTER	To confirm the selection in setting mode or enter setting mode

LCD screen introduction:



Icons	Functions	Icons	Functions
	Indicates that the AC input terminal has been connected to the grid		Indicates that the inverter circuit is working
	Indicates that the AC input mode in APL mode (wide voltage range)	BYPASS	Indicates that the machine is in the grid Bypass mode
	Indicates that the PV input terminal has been connected to the solar panel	OVER LOAD	Indicates that the AC output is in an overload state
	Indicates that the machine has been connected to the battery: indicates that the remaining battery is 0%~24%; indicates that the remaining battery is 25%~49%; indicates that the remaining battery is 50%~74%;  indicates that the remaining battery is 75%~100%.		Indicates the percentage of AC output loads:  indicates that the load percentage is 0%~24%;  indicates that the load percentage is 25%~49%,  indicates that the load percentage is 50%~74%,  indicates that the load percentage is ≥75%

Li	Indicates that the battery type of the machine is a lithium battery		Indicates that the buzzer is not enabled
SLA	Indicates that the current battery type of the machine is a lead-acid battery		Indicates that the machine has an alarm
CHARGING	Indicates that the battery is in charging state	ERROR	Indicates that the machine is in a fault condition
	Indicates that the AC/PV charging circuit is working		Indicates that the machine is in setup mode
	Indicates that the AC output terminal has an AC voltage output		The parameters displayed in the middle of the screen: 1. In the non-setup mode, the alarm or fault code is displayed. 2. In the setup mode, the currently set parameter item code is displayed.
M	In parallel operation, this icon indicates that this inverter is the host, which is only valid in parallel mode.		
Parameters display on the left side of the screen: input parameters			
AC	Indicates AC input		
PV	Indicates PV input		
123	Indicates the PV1 /PV 2 input		
	Display battery voltage, battery charge total current, grid charge power, AC input voltage, AC input frequency, PV input voltage, internal heat sink temperature, software version		
Parameters display on the right side of the screen: Output parameters			
	Indicates output voltage, output current, output active power, output apparent power, battery discharge current, software version; in setup mode, displays the set parameters under the currently set parameter item code		
Arrow display			
①	Indicates the grid supplying power to the load	④	Indicates the charging circuit charging the battery terminal
②	Indicates grid supplying power to the charging circuit	⑤	Indicates the battery terminal supplying power to the inverter circuit
③	Indicates PV module supplying power to the charging circuit	⑥	The arrow is not displayed
⑦	Indicates the inverter circuit supplying power to the load		

Real-time data viewing method

On the LCD main screen, press the "UP" and "DOWN" buttons to scroll through the real-time data of the machine.

page number	The left side of the screen parameter	In the middle of the screen parameters	The right side of the screen parameter
0	cell /battery voltage	Fault code	output voltage
1	Battery voltage collected by the BMS (Display only after BMS communication is normal)		Battery capacity rate acquired by BMS (Display only after BMS communication is normal)
2	battery current		power of battery [cell]
3	AC output		AC output active power
4	AC output frequency		The AC output sees the power
5	AC input current on		AC input voltage
6	AC incoming frequency		AC input depends power
7	The PV1 input voltage		PV1 input power
8	PV2 input voltage		PV2 input power
9	PV heat sink temperature		The PV is input to the total power
10	Inverter heat sink temperature		busbar voltage
11	Program larger version		Program version
12	Battery rated voltage		Output rated power
13	PV rated voltage		PV rated charging current
14	Machine ID No		Inverter in parallel machine mode

6.3 Setup parameters description

Buttons operation instructions: Press the "SET" button to enter the setup menu and exit the setup menu. After entering the setup menu, the parameter number **[00]** will flash. At this point, press the "UP" and "DOWN" buttons to select the code of parameter item to be set. Then, press the "ENT" button to enter the parameter editing mode, and the value of the parameter is flashing. Adjust the value of the parameter with the "UP" and "DOWN" buttons. Finally, press the "ENT" button to complete the parameter editing and return to the parameter selection state.

Note: in parallel mode, all machines will synchronize the setting parameters of the host (the machine with "M" 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 item.	Parameter name	Settings	Description
00	Exit setting menu	[00] ESC	Exit the setup menu
01	Output source priority	[01] PV	PV priority mode, switching to the grid when the PV fails or the battery is lower than the set value of parameter **[16].**
		[01] GID **default**	grid priority mode, switching to inverter only when the grid fails.
		[01] BAT	Battery priority mode. Switch to grid power only when the battery is under voltage or lower than the setting value of parameter **[16]**; Switch to battery discharge only when the battery is fully charged or higher than the setting value of parameter **[17]**.
		[01] HBR	Hybrid mode, you can set this mode through the **[33]** setting item.
02	AC output voltage setting	[02]120V	Allow to set to 100Vac/105Vac/110Vac/120Vac, default 120V. AC output power = rated power*(Vset/120)
03	Output Frequency	[03] 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.
		[03] 60.0HZ	
04	AC Input Voltage Range	[04] UPS **default**	Narrow grid input voltage range of 120Vac machine: 90~140Vac; Frequency range： 47~ 55Hz (50Hz);57Hz ~ 65Hz (60Hz);
		[04] APL	Narrow grid input voltage range of 120Vac machine: 90~140Vac; Frequency range： 47~ 55Hz (50Hz);57Hz ~ 65Hz (60Hz);
		[04] GEN	Diesel generators input, need to set this mode, at this time: Narrow Ac input voltage range of 120Vac machine: 90~140Vac Frequency range：40~ 70Hz
05	Power saving mode	[05] DIS **default**	Power saving mode disabled.

Parameter item.	Parameter name	Settings	Description
		[05] ENA	After the power saving mode is enabled, if the load is null or less than 25W, the inverter output is turned off after a delay for a certain period of time. When the load is more than 50W, the inverter automatic restart.
06	Charger source priority	[06] OSO	PV priority charging; only when the PV charging fails, the grid charging is started.
		[06] OUO	grid priority charging; only when the grid charging fails, the PV charging is started.
		[06] SNU **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. Note: Only when the grid bypass output is loaded, the PV charging and the grid charging can work at the same time. When the inverter works, only the PV charging can be started.
		[06] NUC	Only PV charging, with the grid charging not activated.
07	Max total charging current	[07] 80A **default**	Maximum total charging current setting. 3.6KW models setting range:0~80A; 6.5KW models setting range:0~150A;
08	Max PV charger current	[08] 80A **default**	Max PV charger current. 3.6KW models setting range:0~80A; 6.5KW models setting range:0~150A;
09	Max AC charger current	[09] 40A **default(36M)**	Setting range: 0~40A;
		[09] 60A **default(65M)**	Setting range: 0~120A;
10	Battery fully charging current setting	[10] 3A **default**	When the battery type is lead-acid, when the battery voltage is 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 is greater than or equal to the constant voltage charging value and the charging current is less than the set value, the battery is considered to be fully charged and the charging is stopped.

Parameter item.	Parameter name	Settings	Description
11	Battery Type	[11] USE	User-defined; all battery parameters can be set.
		[11] SLd	Sealed lead-acid battery; constant-voltage charge voltage: 57.6V, floating charge voltage: 55.2V.
		[11] FLd	Vented lead-acid battery; constant-voltage charge voltage: 58.4V, floating charge voltage: 55.2V.
		[11] GEL	Colloidal lead-acid battery; constant-voltage charge voltage: 56.8V, floating charge voltage: 55.2V.
		[11] LF14/LF15/LF16 **default**	Lithium iron phosphate battery LF14/LF15/LF16, corresponding to 14strings ,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; for 14 strings, default constant-voltage charge voltage is 49.2V; allow adjustable.
		[11] N13/N14	Ternary lithium battery; which is adjustable. The default constant voltage charging voltage of N13 is 53.2V, and the default constant voltage charging voltage of N14 series is 57.6V.
12	Battery boost charge voltage	[12] 56.8V **default**	Boost charge voltage setting; the setting range is 48V~58.8V, with step of 0.1V; it is valid for user-defined battery and lithium battery.
13	Battery floating charge voltage	[13] 56.8V **default**	Floating charge voltage, setting range: 48V~58.8V, step: 0.1V.
14	Battery boost charge time	[14] 120 **default**	Boost charge maximum time setting, which means the maximum charging time to reach the set voltage of parameter **[12]** during constant-voltage charging. The setting range is 5min~900min, with a step of 5 minutes. It is valid for user-defined battery and lithium battery.
15	Battery recharge recovery point	[15] 53.6V **default**	After the battery is fully charged, the inverter stops charging, and restarts charging when the battery voltage is lower than the voltage value.
16	Battery Power to Utility Setpoint	[16]49.2V **default**	When the parameter **[01]** =Bat, the battery voltage is lower than the set value, and the output is switched from the inverter to the grid. Setting range: 38V~57.2V.
17	Utility to Battery Power Setpoint	[17] 57.6V **default**	When the parameter **[01]** =Bat, the battery voltage is higher than the set

Parameter item.	Parameter name	Settings	Description
			value, and the output is switched from the grid to the inverter. Setting range: 48V~60V.
18	Battery under voltage alarm	[18] 49.6V **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 39V~56V, with a step of 0.1V.
19	Battery over discharge voltage (delay off)	[19] 48.8V **default**	Over-discharge voltage; when the battery voltage is lower than this judgment point, delay the time set by parameter **[22]** and turn off inverter output. Setting range is 38V~56V, with a step of 0.1V.
20	Battery over discharge voltage (immediately)	[20] 46.4V **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 38V~48.8V, with a step of 0.1V. It is valid for user-defined battery and lithium battery.
21	Battery voltage recovery point after over discharge protection (02 fault)	[21] 52.8V **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.
22	Battery over discharge delay time	[22] 30S **default**	Over-discharge delay time; when the battery voltage is lower than the parameter **[19]**, 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 5S.
23	RS485-2 /CAN communication	[23] DIS **default**	RS485-2 Disable the BMS communication. However, our PC and remote monitoring protocol can continue to be used.
		[23] RS485	RS485-2 port for BMS communication.
24	BMS protocol Settings	When the setting Program **[23]** is RS485, the corresponding lithium battery manufacturer brand needs to be selected for communication	
		PLN=PYLONTECH,PL3=PYLONTECH-3, PCE=PACE, GXU=GOTION, DAQ, AOG=ALLGRAND, OLT=OLITER, XWD=SUNWODA, CFE, MIT=FOXESS, VOL=Voltronic	
25	SOC discharge alarm (Optional when BMS is enabled)	[25] 15% **default**	After the BMS of the setting item **[23]** is enabled, the machine will alarm 07 if the battery capacity rate is lower than this value, and the alarm will be cleared if the battery capacity rate is higher than 5% of this value.

Parameter item.	Parameter name	Settings	Description
26	SOC switching grid (optional when BMS is enabled)	[26] 10% **default**	After the BMS of the setting item **[23]** is enabled, the machine will switch to the grid when the battery capacity rate is lower than this value and the grid power is available.
27	SOC switching inverter (optional when BMS is enabled)	[27] 100% **default**	After the BMS of the setting item **[23]** is enabled, 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.
28	SOC discharge cut off (optional when BMS is enabled)	[28] 5% **default**	After the BMS of the setting item **[23]** is enabled, if the battery capacity rate is lower than this value, the machine will report 08 fault and cut off the power supply or output.
29	SOC charging cut off (optional when BMS is enabled)	[29] 100% **default**	After the BMS of the setting item **[23]** is enabled, when the battery capacity rate 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.
30	Buzzer alarm	[30] DIS **default**	Alarm beep is enabled when the status of the main input source changes or the inverter fails.
		[30] ENA	Buzzer is silent
31	AC output mode **(can be set in the standby mode only**)	[31] SIG **default**	When single inverter is used, the default is SIG mode.
		[31] PAL	In parallel operation with single phase. Please refer to **8.3** Wiring Diagram.
		[31]2P0/2P1/2P2	In split phase operation with two phase. Please refer to **8.4** Wiring Diagram.
		When the parameter [02] setting item=120 All connected P1-phase inverters are set to "2P0": 1) If all connected P2-phase inverters are set to "2P1", AC out put line voltage difference is 120 degrees (L1-L2), line voltage is 120* 1.732=208Vac; Phase voltage is 120Vac (L1-N; L2-N). 2) If all connected P2-phase inverters are set to "2P2", AC out put line voltage difference is 180 degrees (L1-L2), line voltage is 120* 2= 240Vac; Phase voltage is 120Vac (L1-N; L2-N).	
		[31] 3P1/3P2/3P3	In split phase operation with three phase. Please refer to **8.4** Wiring Diagram.
		All connected P1-phase inverters are set to "**3P1**"; All connected P2-phase inverters are set to "**3P2**";	

Parameter item.	Parameter name	Settings	Description
		All connected P3-phase inverters are set to "**3P3**"; **When the parameter [02] setting item=120:** AC output line voltage difference is 120 degrees (P1-P2/P1-P3/P2-P3), each line voltage is 120*1.732= 208Vac; Each phase voltage is 120Vac (L1-N; L2-N; L3-N).	
32	RS485 ID setting	[32] 1 **default**	Parallel mode needs to be set in 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.
33	Mixed mode (available for some models, Hybrid mode available)	[33] LOD	● Inverter power generation energy only to the load (generation power < Load power). ● Note: mixed load, grid and photovoltaic are loaded together, photovoltaic is not enough to supplement the grid.
		● [33] CT	● Anti-backflow, self-use according to the load power, do not input current to the grid.
34	N-PE connection switchover is enabled	[34] DIS **default**	Do not automatically connect the N wire to the PE wire under any working conditions.
		[34] ENA	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.
35	Automatic battery activation	[35] DIS	When the battery is dormant or not connected, the PV or grid does not automatically activate the battery to turn on the battery output.
		[35] ENA **default**	When the battery is dormant or not connected, the PV or grid automatically activates the battery to turn on the battery output.
38	Mixed network priority enabling (Hybrid mode can be set)	[38] DIS **default**	The energy of PV supplies power to the load, and the excess energy goes to the grid.
		[38] ENA	The energy of the PV is preferentially transmitted to the power grid, and the excess energy is resupplied to the load.
40	Battery pack connection setting	[40] DIS **default**	Parallel use of all battery packs.
		[40] ENA	Battery pack not connected in parallel. Each battery is connected to each inverter.

Parameter item.	Parameter name	Settings	Description
62	Overload auto-restart is enabled	[62] DIS	Overload automatic restart is prohibited. If overload shutdown output occurs, the machine will no longer start on.
		[62] ENA **default**	Enable overload automatic restart. If overload shutdown output occurs, the machine will restart the output after a delay of 3 minutes. After a total of 5 times in 30 minutes, the startup system is no longer resumed
63	CT host Settings （Hybrid mode can be set）	[63] DIS **default**	
		[63] ENA	Anti-backflow host
65	Charging Logic Setting （Optional when BMS is enabled）	[65]LNU **default**	BMS+inverter,The maximum charging current of the battery is limited according to the descending logic of the machine.
		[65]BMS	BMS only,The maximum charging current of the battery is limited according to the current limit value of BMS.
		[65]SET	Manual setup,The maximum charging current of the battery is limited according to the set value of item [07].

6.4 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[35]" 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.

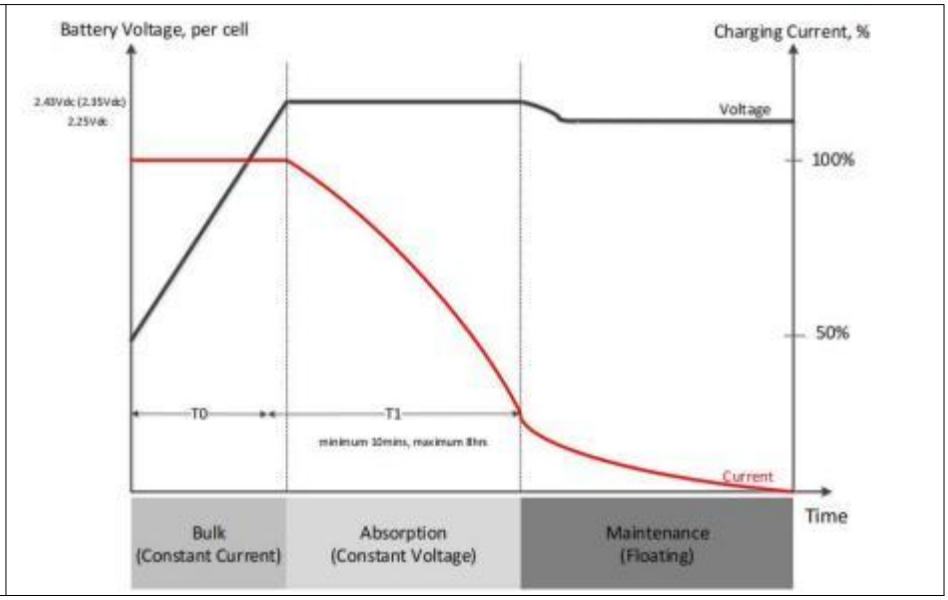
For lead-acid batteries and a small number of lithium-ion batteries without inverter communication capability, charge-discharge limits need to be set directly on the inverter.

6.4.1 Battery Settings Without Communication Function

On the settings page, set parameter item [23] to "DIS" to disable the communication between the inverter and the battery. Then, according to the actual battery in use, select the appropriate battery type in parameter item [11]. 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 can be further adjusted and modified as needed. If "User - defined" is selected, 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	Sealed lead acid battery	Colloidal lead acid battery	Vented lead acid battery	NCM lithium battery,14 cells	Lithium iron phosphate battery ,16 cells	Lithium iron phosphate battery ,15 cells
	User	SLD	GEL	FLD	N14	LF16 default	LF15
Overvoltage disconnection voltage	36～60V (Adjustable)	60V	60V	60V	60V	60V	60V
Battery recharged recovery point(setup item 15)	52V (Adjustable)	52V (Adjustable)	52V (Adjustable)	52V (Adjustable)	54.8V (Adjustable)	53.6V (Adjustable)	50.4V (Adjustable)
Boost charge voltage	36～60V (adjustable)	57.6V	56.8V	58.4V	57.6V (Adjustable)	56.8V (Adjustable)	53.2V (Adjustable)
Floating charge voltage	36～60V (adjustable)	55.2V	55.2V	55.2V	57.6V (Adjustable)	56.8V (Adjustable)	53.2V (Adjustable)
Undervoltage alarm voltage(01 fault)	36～60V (adjustable)	44V	44V	44V	46.8V (Adjustable)	49.6V (Adjustable)	46.4V (Adjustable)
Undervoltage alarm voltage recovery point(01 fault)	Undervoltage alarm voltage+0.8V						
over discharge voltage(delay off,02 fault)	36～60V (Adjustable)	42V	42V	42V	42V (Adjustable)	48.8V (Adjustable)	45.6V (Adjustable)
Battery voltage recovery point after over discharge protection (02 fault)	52V (Adjustable)	52V (Adjustable)	52V (Adjustable)	52V (Adjustable)	49.6V (Adjustable)	52.8V (Adjustable)	49.6V (Adjustable)
Battery over discharge voltage (immediately off)	36～60V	40V	40V	40V	39.2V	46.4V	43.6V
Over-discharge delay time	1～30s (Adjustable)	5s	5s	5s	30s (Adjustable)	30s (Adjustable)	30s (Adjustable)
Boost charge time	10～600 min (Adjustable)	120 minutes	120 minutes	120 minutes	120 min (Adjustable)	120 min (Adjustable)	120 min (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.

Charging Curve	

6.4.2 Battery Settings for Communication-enabled Batteries

1. Communication Setup

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

Parameter item [23]:Set to "RS**485 "**, matching your battery's communication method.

Parameter item [24]:In the "**BMS protocol settings**" 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 **Parameter item [65]**"**Charging Logic Setting**"menu.

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

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

LNU:The maximum charging current will be the lower of the two values provided by the BMS and the inverter.

3. Key SOC (State of Charge) Parameters

Charge Cut-off SOC (**Parameter item [29]**):

Default:100%.

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

Discharge Cut-off SOC (**Parameter item [28]**):

Default value: 5%. The inverter determines the state of charge (SOC) at which discharge is cut off. When in communication with the BMS, the inverter will cut off the discharge according to the higher value between this set value and the set value of the BMS.

4. alarm

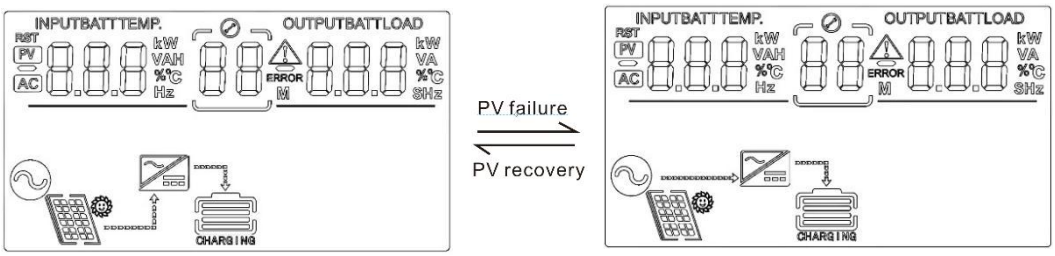
Low Battery alarm:A warning is issued (via LED and a mutable buzzer).

alarm Threshold:Adjusted via **Parameter item [25]**"**SOC discharging alarm**", typically set about 5% higher than the "SOC discharge off" value.

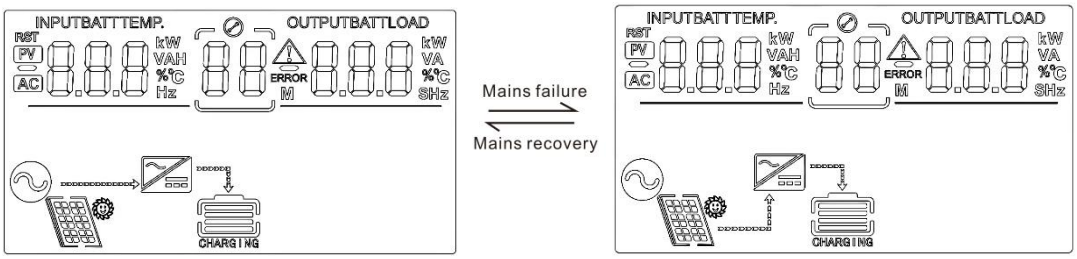
6.5 Operating Mode Description

6.5.1 Charging mode

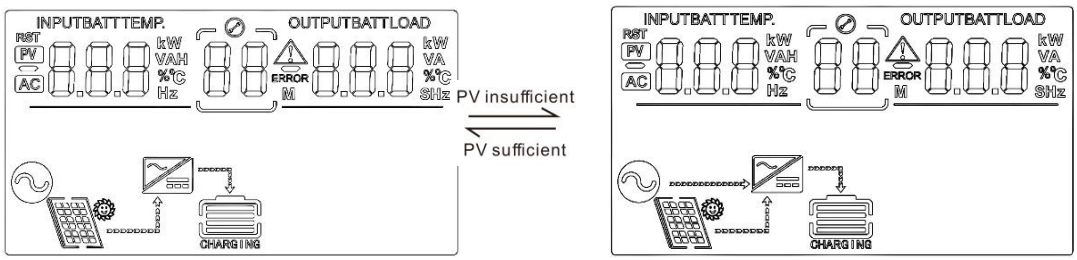
1) **PV priority**: PV module will charge the battery preferentially, and the battery is charged by the grid only when the PV system fails. During the day, solar energy is fully used to charge, while at night, it converts to the grid. This can maintain battery level, and is ideal for areas where the grid is relatively stable and electricity price is relatively high.



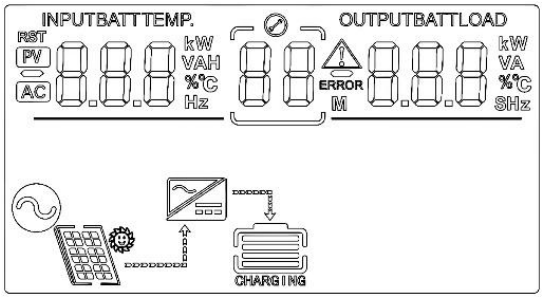
2) **grid priority:** The grid supply is preferentially used to charge the battery. Only when the grid fails, the PV charging can be activated.



3) **Hybrid charging:** PV and grid hybrid charging. PV MPPT charging is a priority, and when PV energy is insufficient, the grid supply supplements. When the PV energy is sufficient again, the grid stops charging. This is the fastest charging mode, suitable for the areas where power grid is unstable, providing sufficient backup power supply at any time.



4) **Only Solar Only Solar:** Only PV charging, without grid charging. This is the most energy-efficient way in which battery is charged only by solar panels, and is usually used in areas with good lighting conditions.

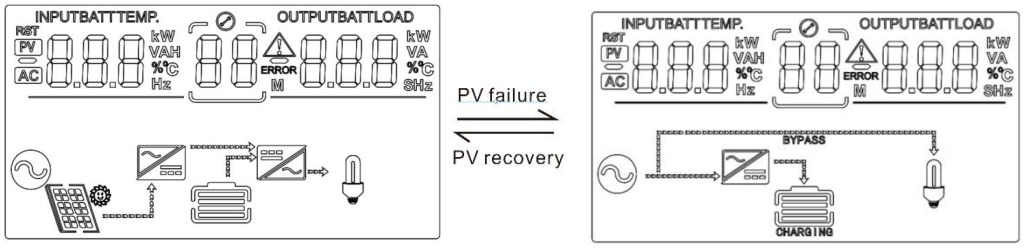


6.5.2 Output mode

1）PV priority mode：

PV and batteries power the load，switch to grid supply when the PV charging fails. This mode maximizes the use of solar energy while maintaining battery power, suitable for use in the areas with relatively stable grid.

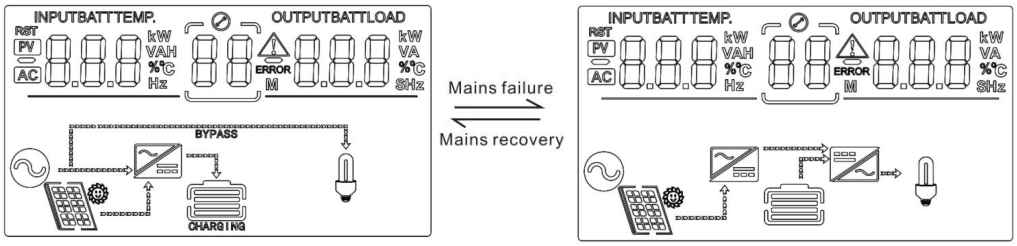
Power supply priority：Solar→Battery→Utility.



2）grid priority 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.

Power supply priority：Utility→Solar→Battery.

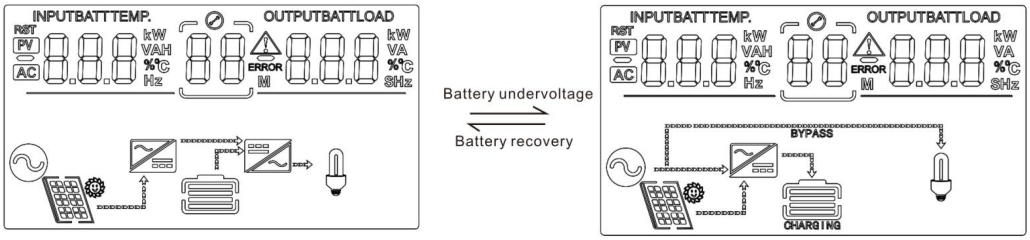


3）Battery priority mode：

Switch to grid supply only when the battery discharge undervoltage is lower than the set point (item 16). When the charging battery is higher than the set point of (17 setting item), switch to the battery discharge mode. This can cycle the battery charge and discharge. This

mode maximizes the use of DC power and is used in the area with stable grid. Switching does not affect PV charging.

Power supply priority：Solar→Battery→Utility.



4) Hybrid model:

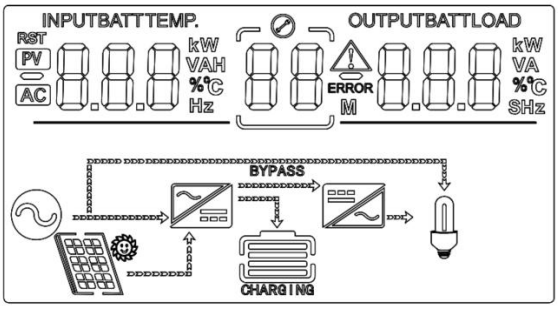
LOD：Inverter power generation energy only to the load (generation power < Load power).

Note: mixed load, grid and PV are loaded together, photovoltaic is not enough to supplement the grid.

CT: Hybrid inverter will not only provide power to the backup load connected but also give power to the home load connected. If PV power and battery power is insufficient, it will take grid energy as supplement. The hybrid inverter will not sell power to grid. In this mode, a CT is needed.

The external CT will detect power flowing back to the grid and will reduce the power of the inverter only to supply the local load, charge battery and home load.

Note: photovoltaic power generation is sufficient load power, excess grid-connected power generation



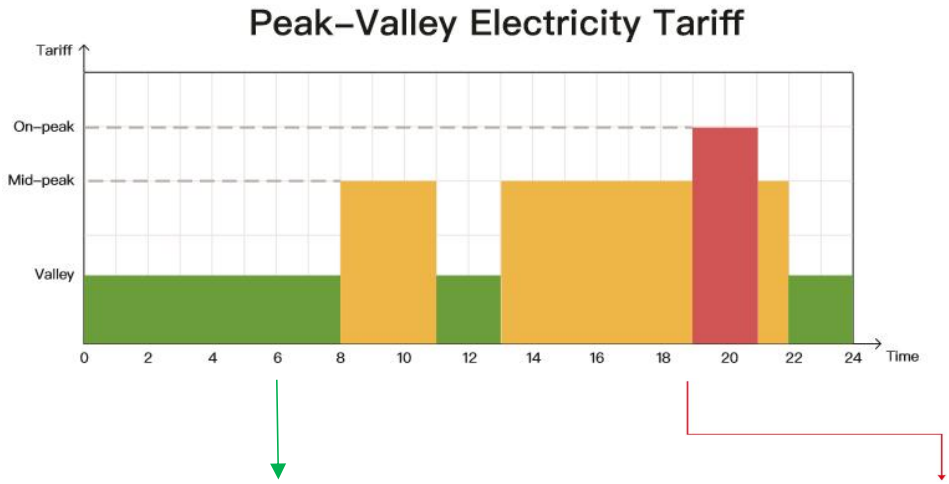
6.5.3 Timed charge/discharge function

SUNON3.6 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 grid and PV power. When grid 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(**It can only be operated via the APP for now**).

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 grid 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 grid to ensure stable operation of the load.

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 **[18]**, the battery is in the undervoltage state.
【02】	Battery under voltage protection	Yes	When the battery voltage is 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 over circuit	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 software sampling protection	Yes	Internal battery boost, boost bus voltage overvoltage software protection, turn off AC output and charge.
【15】	Bus over voltage hardware sampling protection	Yes	Internal battery boost, boost bus voltage overvoltage hardware protection, turn off AC output output and charge.
【16】	Bus under voltage protection	Yes	Internal battery boost, boost bus voltage undervoltage 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】	The PV current software is overcurrent	-	-
【20】	PV over current protection	No	Solar charging overcurrent hardware protection, turn off solar charging.
【21】	The Pv insulation impedance is low	-	-
【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	Yes	If the temperature of the heat sink is

	overheated. Procedure		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.
【26】	The AC output relay is short-circuit	Yes	AC output relay short circuit protection, turn off the inverter output and all charging functions.
【27】	Fan failure	Yes	If the fan is blocked or fails, disable the inverter output and charging functions.
【28】	EPROM hitch	-	-
【29】	SPI Communication failure	-	-
【30】	Type detection error	Yes	The model is not set before delivery, and the model identification is wrong.
【31】	The busbar soft start failed	-	-
【32】	The leakage current is abnormal	-	-
【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.
【49】	BMS communication error	No	Check whether the communication line is connected correctly and whether **[11]** 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; ● 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; 2.Re-power up to resume load output.
【18】	PV overvoltage	Use a multi meter 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.
【49】	A BMS communication error	Check whether the BMS communication line and the inverter communication ports are correctly connected

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 280V (230V model), 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 170V (230V model /UPS mode) or 90V (APL mode), the grid charging will be stopped and switched to the inverter mode.
5	Battery over voltage protection	When the battery voltage reaches the over voltage 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 protection	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	Synchronization 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:

NOTICE

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	SUNON3.6
Parallel mode	
Permitted parallel number	NO/1~6
AC mode	
Rated input voltage	120Vac±5%
Input voltage range	(90Vac-140Vac)±2%
Frequency	50Hz/60Hz (Auto detection)
Frequency Range	47±0.3Hz~55±0.3Hz (50Hz); 57±0.3Hz~65±0.3Hz (60Hz);
Overload/short circuit protection	Circuit breaker
Efficiency	>95%
Conversion time (bypass and inverter)	10ms (typical)
AC reverse protection	Yes
Maximum bypass overload current	40A
Inverter mode	
Output voltage waveform	Pure sine wave
Rated output power (VA)	3600
Rated output power (W)	3600
Power factor	1
Rated output voltage (Vac)	120Vac
Output voltage error	±5%
Output frequency range (Hz)	50Hz±0.3Hz/60Hz±0.3Hz
Maximum Efficiency	>91%
Overload protection	(102% < load <110%) ±10%: report error and turn off the output after 5 minutes; (110% < load < 125%) ± 10%: report error and turn off the output after 10 seconds; Load >125% ±10%: report error and turn off the output after 5 seconds;
Peak power	7200VA
Loaded motor capability	2HP
Output short circuit protection	Circuit breaker
Bypass circuit breaker specification	40A
Rated battery input voltage	48V (Minimum starting voltage 44V)
Battery voltage range	40.0Vdc~60Vdc±0.6Vdc (Undervoltage alarm/shutdown voltage/overvoltage alarm /overvoltage recovery... settable on LCD screen)
Power saving mode self-consumption	Load≤50W

AC charging	
Battery type	Lead acid or lithium battery
Maximum charge current(can be set)	40A
Charge current error	±5Adc
Charge voltage range	40 –60Vdc
Short circuit protection	Circuit breaker and blown fuse
Circuit breaker specifications	40A
PV charging	
Maximum PV open circuit voltage	300Vdc
PV operating voltage range	120-300Vdc
MPPT voltage range	90-260Vdc
Battery voltage range	40-60Vdc
Maximum PV input power	4500W
Maximum PV input current	27A
PV charging current range (can be set)	0-80A
Charging short circuit protection	Blown fuse
Wiring protection	Reverse polarity protection
Hybrid charging Max charger current specifications (AC charger+PV charger)	
Max charger current(can be set)	0-80A
Certified specifications	
Certification	CE(IEC62109-1,2)/ UL 1741
EMC certification level	EN61000, C2/FCC 15 class B
Operating temperature range	-10°C to 55°C
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(/WiFi/GPRS)/ Dry node control
Size (L*W*D)	460*280*110mm
Weight (kg)	7.8