

# User Manual

3.6KW/5.6KW  
SOLAR INVERTER / CHARGER



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# 1.About This Manual

## 1.1 Purpose

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

## 1.2 Scope

This manual provides safety and installation guidelines as well as information on tools and wiring.

## 1.3 Safety Instructions

**⚠ WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.**

- 1.Before using the unit, read all instructions and cautionary markings on the unit, the batteries and all appropriate sections of this manual.
- 2.**Caution** – To reduce risk of injury, charge only deep-cycle lead acid type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage.
- 3.Do not disassemble the unit. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
- 4.To reduce risk of electric shock, disconnect all wiring before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
- 5.**Caution**– Only qualified personnel can install this device with battery.
- 6.never charge a frozen battery.
- 7.For optimum operation of this inverter/charger, please follow required spec to select appropriate cable size. It's very important to correctly operate this inverter/charger.
- 8.Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion.
- 9.Please strictly follow installation procedure when you want to disconnect AC or DC terminals. Please refer to INSTALLATION section of this manual for the details.
- 10.Fuses are provided as over-current protection for the battery supply.
- 11.GROUNDING INSTRUCTIONS -This inverter/charger should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this inverter.
- 12.NEVER cause AC output and DC input short circuited. Don't connect to the mains when DC input short circuits.
- 13.**Warning!!** Only qualified service persons are able to service this device. If errors still persist after following troubleshooting table, please send this inverter/charger back to local dealer or service center for maintenance.
14. **Warning:** Because this inverter is non-isolated, only three types of PV modules are acceptable: single crystalline, poly crystalline with class A-rated and CIGS modules. To avoid any malfunction, do not connect any PV modules with possible current leakage to the inverter. For example, grounded PV modules will cause current leakage to the inverter. When using CIGS modules, please be sure NO grounding.
- 15.**Caution:** It's required to use PV junction box with surge protection. Otherwise, it will cause damage on inverter when lightning occurs on PV modules.

## 2.Introduction

This is a multi-function inverter, combining functions of inverter, solar charger and battery charger to offer uninterruptible power support in a single package. The comprehensive LCD display offers user-configurable and easy-accessible button operations such as battery charging current, AC or solar charging priority, and acceptable input voltage based on different applications.

### 2.1 Features

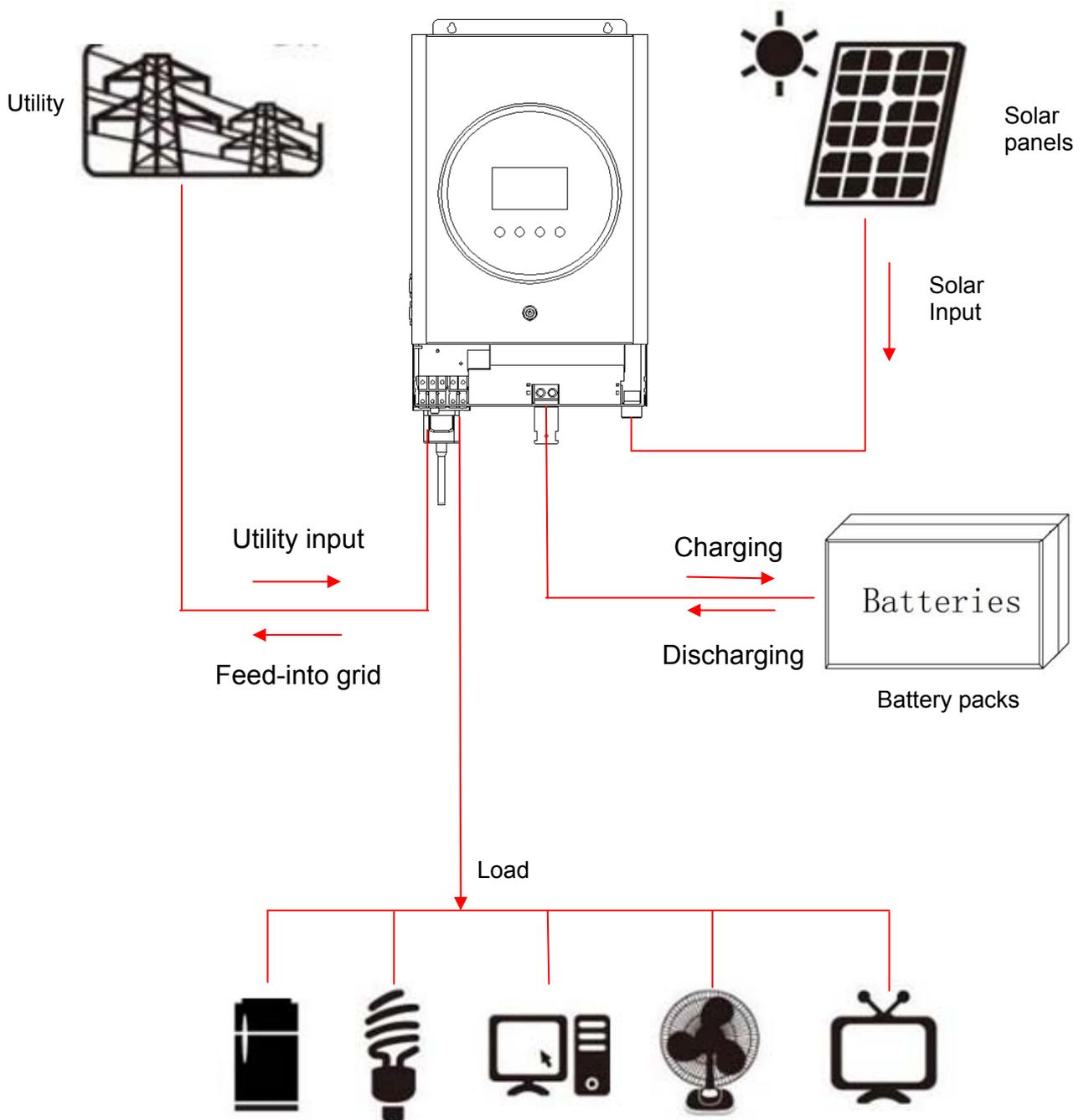
- 1.On/off grid inverter
- 2.Pure sine wave inverter
- 3.Customizable status LED ring with RGB lights
- 4.Built-in Wi-Fi or External WIFI for mobile monitoring (APP is required)
- 5.Reserved communication ports for BMS (RS485, CAN)
- 6.Configurable input voltage ranges for home appliances and personal computers via LCD control panel
- 7.Configurable battery charging current based on applications via LCD control panel
- 8.Compatible to utility mains or generator power
- 9.Parallel operation with up to 6 units

## 2.2 Basic System Architecture

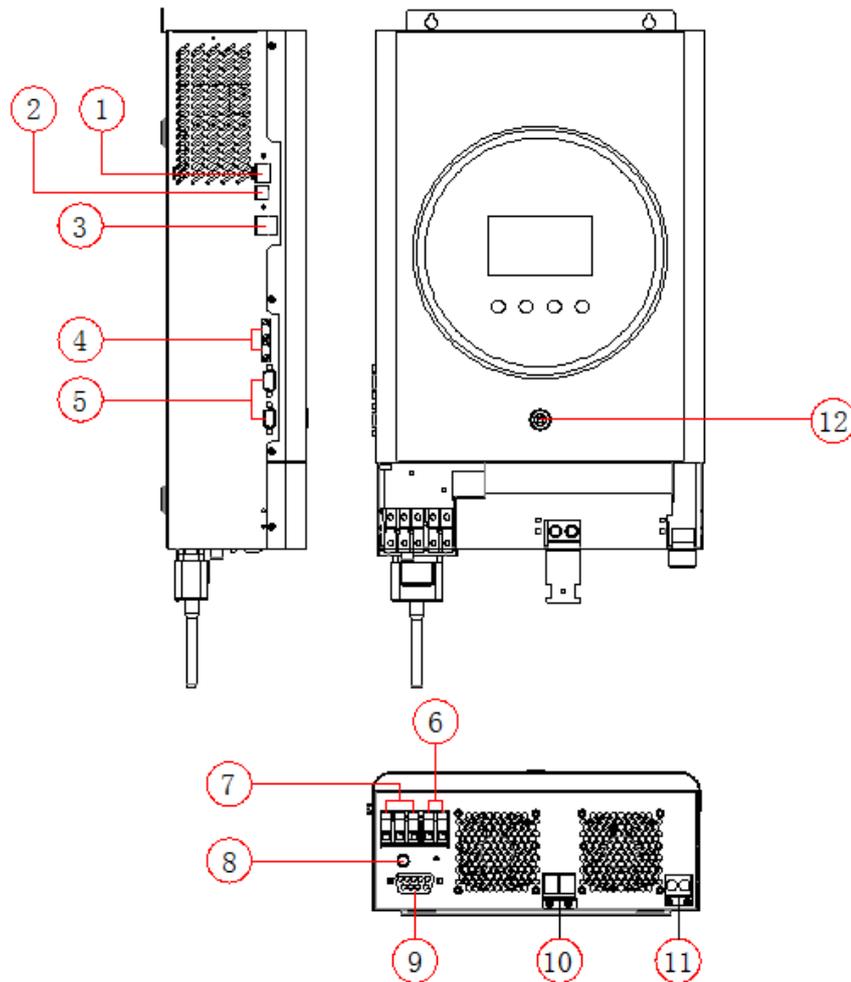
The following illustration shows basic application for this unit. It also required the following devices to have a complete running system:

- Generator or Utility mains.
- PV modules

Consult with your system integrator for other possible system architectures depending on your requirements. This inverter can power various appliances in home or office environment, including motor-type appliances such as tube light, fan, refrigerator and air conditioners.



## 2.3 Product Overview



1. RS-232/RS485/CAN communication port
2. USB communication port
3. Dry contact
4. Current sharing port
5. Parallel port
6. AC output terminal
7. AC input terminal
8. AC input breaker
9. External WIFI port (Built-in WIFI, no need)
10. Battery input terminal
11. PV input terminal
12. Power on/off switch

**Note 1:** Please insert the WIFI Dongle if you choose external WIFI. Built-in WIFI is optional, please scan the WIFI PN code on the solar inverter directly and login account.

**Note 2:** RS232, RS485, CAN communication share the same port, so it can't be used at the same time.

**Communication port definition:**

RS232	1:RXD , 2:TXD,8:GND
RS485	6:485-B ,7.485-A
CAN	3: CAN-H,5: CAN-L



RJ45 PORT

### 3.Installation

#### 3.1 Unpacking and Inspection

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

The inverter x1

User manual x 1

RS232 Communication cable x 1

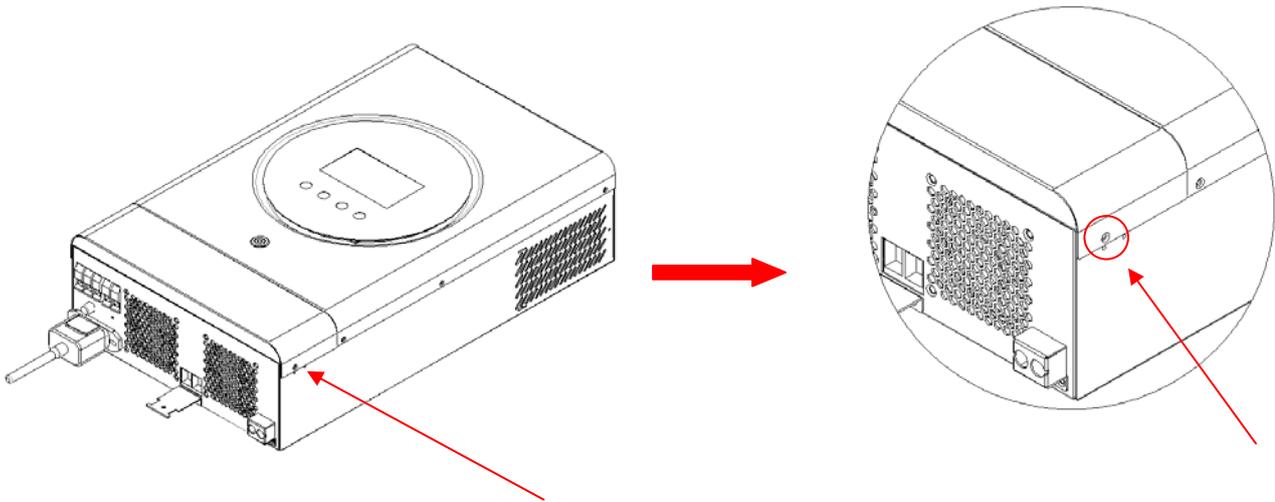
USB Communication cable x 1

Parallel communication cable x 1(No parallel machine, No need)

Current sharing cable x 1 (No parallel machine, No need)

#### 3.2 Preparation

Before connecting all wirings, please take off bottom cover by removing two screws. When removing the bottom cover, be carefully to remove one cable as shown below.

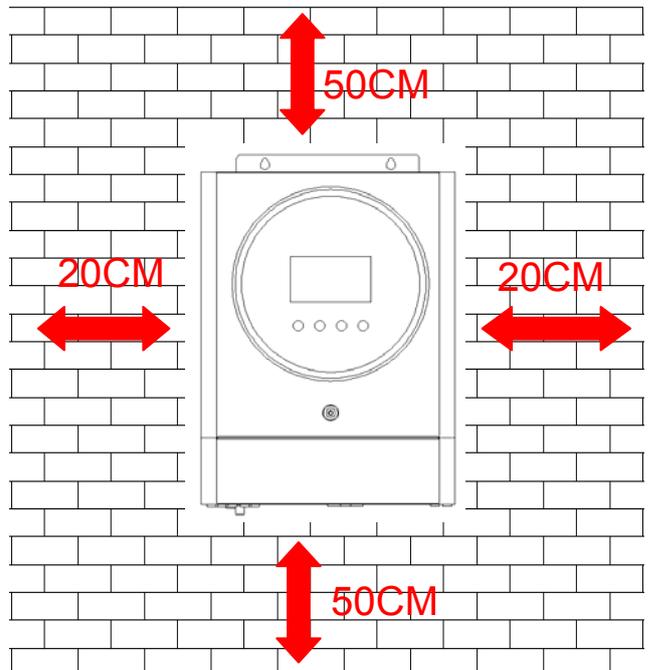


#### 3.3 Mounting The Unit

Consider the followings before selecting your placements:

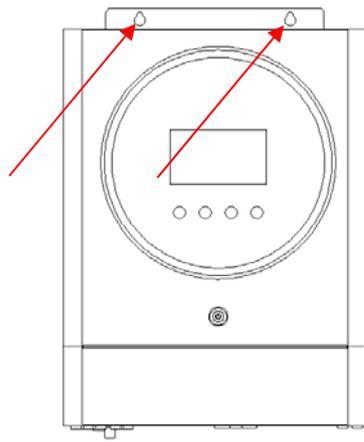
- 1.Do not mount the inverter on flammable construction materials.
- 2.Mount on a solid surface
- 3.Install the inverter at eye level in order to allow easy LCD display readout.
- 4.For proper air circulation and heat dissipation, allow a clearance of approx. 20 cm to the side and approx. 50cm above and below the unit.
- 5.The ambient temperature should be between 0°C And 55°C to ensure optimal operation.
- 6.The recommended orientation is to adhered to the wall vertically.

Be sure to keep other objects and surfaces as shown in the diagram to guarantee sufficient heat dissipation and to have enough space for wiring.



**NOTE:SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY.**

Install the unit by screwing three screws. It's recommended to use M4 or M5 screws.



### 3.4 Battery Connection

**CAUTION:** For safety operation and regulation compliance, it's requested to install a separate DC over-current protector or disconnection device between battery and the inverter. It may not be necessary to have a disconnection device in some applications; however, it's still recommended to have over-current protection installed. Please refer to typical amperage as required.

**WARNING!** All wiring must be performed by a qualified personnel.

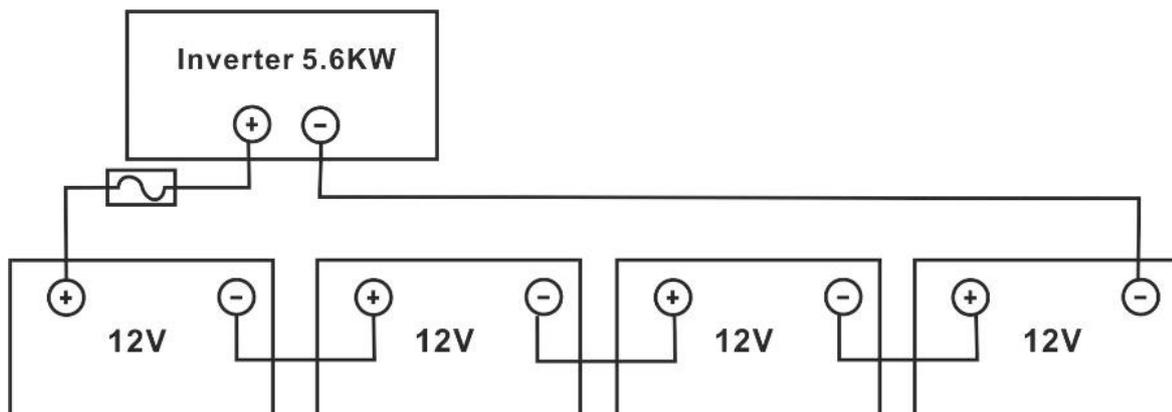
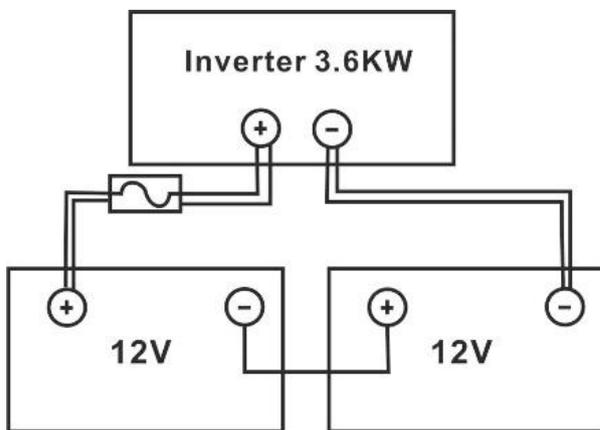
**WARNING!** It's very important for system safety and efficient operation to use appropriate cable for battery connection. To reduce risk of injury, please use the proper recommended cable .

**Recommended battery cable :**

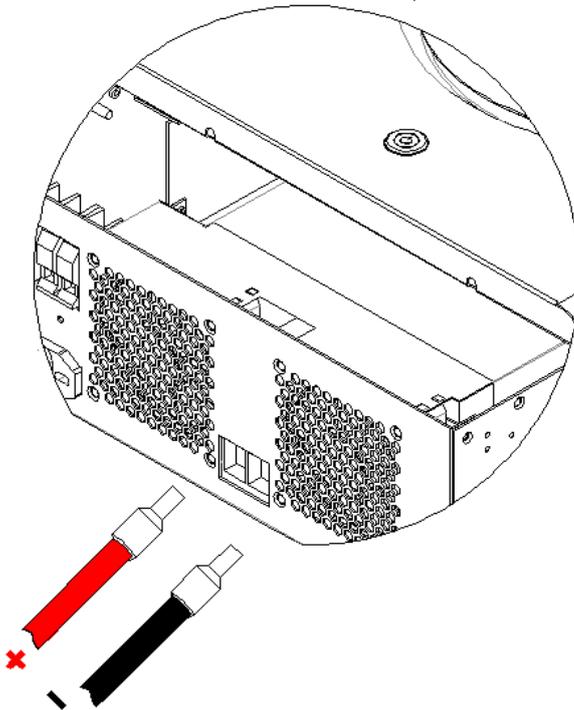
Model	Max. discharge current	Battery capacity	Wire size(AWG)	Wire size(mm <sup>2</sup> )
3.6KW24V	171A	200AH	1*3AWG or 2*4AWG	1*35 or 2*25
5.6KW48V	133A	200AH	1*3AWG	1*35

Please follow below steps to implement battery connection:

1. 3.6KW model supports 24VDC system and 5.6KW model supports 48VDC system. Connect all battery packs as below chart. It is recommended connecting minimum of 100Ah capacity battery for 3.6KW model and 200Ah capacity battery for 5.6KW model.



2. Prepare four battery wires for 3.6KW model and two or four battery wires for 5.6KW model depending on cable size (refer to recommended cable size table). Apply ring terminals to your battery wires and secure it to the battery terminal block with the bolts properly tightened. Refer to battery cable size for torque value. Make sure polarity at both the battery and the inverter is correctly connected and ring terminals are secured to the battery terminals



**WARNING:** Shock Hazard

Installation must be performed with care due to high battery voltage in series.

**CAUTION!!** Do not place anything between the flat part of the inverter terminal and the ring terminal. Otherwise, overheating may occur.

**CAUTION!!** Do not apply anti-oxidant substance on the terminals before terminals are connected tightly.

**CAUTION!!** Before making the final DC connection or closing DC breaker/disconnect or, be sure positive (+) must be connected to positive (+) and negative (-) must be connected to negative (-).

### 3.5 AC Input/output Connection

**CAUTION!!** Before connecting to AC input power source, please install a separate AC breaker between inverter and AC input power source. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of AC input. The recommended spec of AC breaker is 32A for 3.6KW and 63A for 5.6KW.

**CAUTION!!** There are two terminal blocks with "IN" and "OUT" markings. Please do NOT mis-connect input and output connectors.

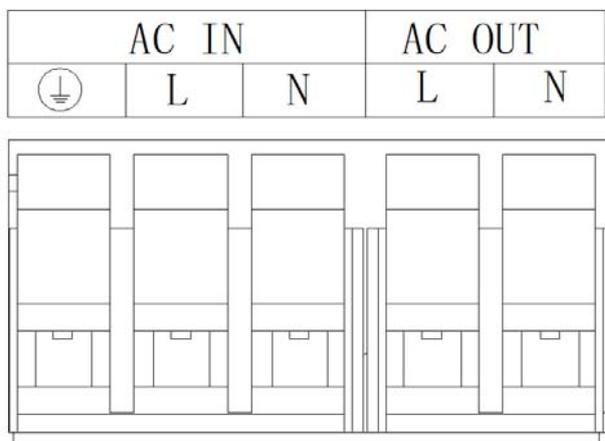
**CAUTION!!** High touch current, earth connection essential before connection supply.

**WARNING!** All wiring must be performed by a qualified personnel.

**WARNING!** It's very important for system safety and efficient operation to use appropriate cable for AC input connection. To reduce risk of injury, please use the proper recommended cable size as below.

### Suggested cable requirement for AC wires

Model	Gauge	Cable (mm <sup>2</sup> )	Torque Value
3.6KW	10 AWG	6	1.2 Nm
5.6KW			



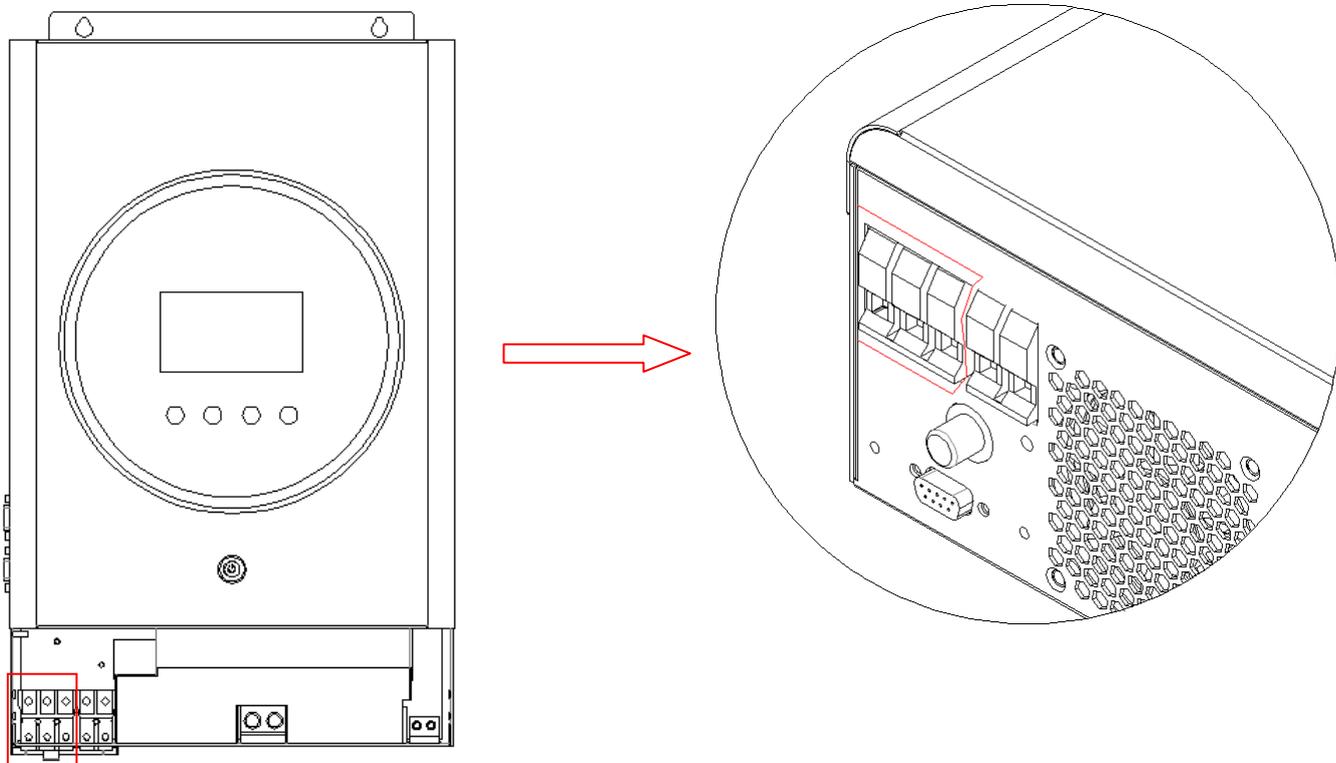
Please follow below steps to implement AC input/output connection:

1. Before making AC input/output connection, be sure to open DC protector or disconnected first.
2. Remove insulation sleeves for about 10mm for the five screw terminals.
3. Insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws.

Be sure to connect PE protective conductor (⏚) first.

→ ⏚ **Ground (yellow-green)**

**L**→**LINE (brown or black)** **N**→**Neutral (blue)**



**⚠ WARNING:**

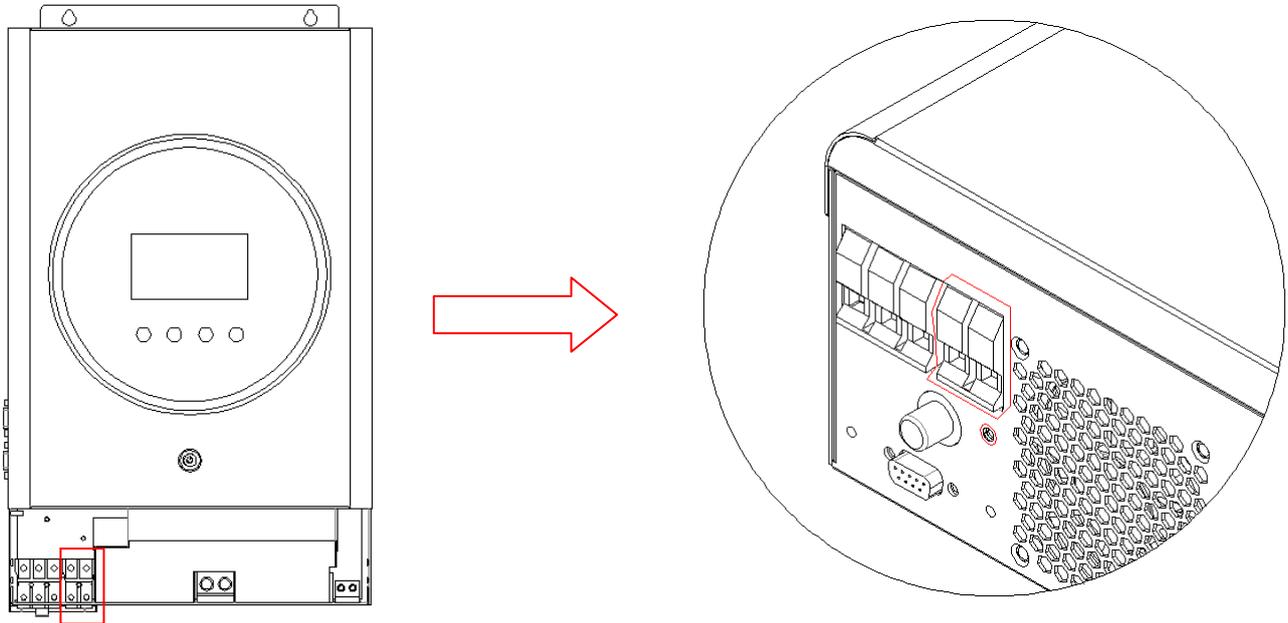
Be sure that AC power source is disconnected before attempting to hardwire it to the unit.

4. Then, insert AC output wires according to polarities indicated on terminal block and tighten terminal screws. Be sure to connect PE protective conductor (⊕) first.

→ ⊕ **Ground (yellow-green)**

**L**→**LINE (brown or black)** **N**→**Neutral (blue)**

5. Make sure the wires are securely connected.



**CAUTION:** Appliances such as air conditioner requires at least 2~3 minutes to restart because it's required to have enough time to balance refrigerant gas inside of circuits. If a power shortage occurs and recovers in a short time, it will cause damage to your connected appliances. To prevent this kind of damage, please check manufacturer of air conditioner if it's equipped with time-delay function before installation. Otherwise, this inverter/charger will be trigger overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

### 3.6 PV Connection

**CAUTION:** Before connecting the PV module, install a 40A1000VDC circuit breaker between each inverter and the pv module.

**WARNING!** It's very important for system safety and efficient operation to use appropriate cable for PV module connection. To reduce risk of injury, please use the proper recommended cable size shown below.

Model	Wire Size	Cable (mm <sup>2</sup> )	Torque value ( max )
3.6KW/5.6KW	1 x 12AWG	4	1.2 Nm

**WARNING:** Because this inverter is non-isolated, are accepted: single crystalline, poly crystalline with class A-rated and CIGS modules. To avoid any malfunctions, do not connect any PV modules with possible current leakage to the inverter. For example, grounded PV modules will cause current leakage to the inverter. When using CIGS modules, please be sure NO grounding connection.

**CAUTION:** It's requested to use PV junction box with surge protection. Otherwise, it will cause damage on inverter when lightning occurs on PV modules.

PV Module Selection:

When selecting proper PV modules, please be sure to consider the following parameters:

1. Open circuit Voltage (Voc) of PV modules not to exceeds maximum PV array open circuit voltage of the inverter.
2. Open circuit Voltage (Voc) of PV modules should be higher than the start-up voltage.

INVERTER MODEL	3.6KW	5.6KW
Max. PV Array Power	5500W	
Max. PV Array Open Circuit Voltage	450Vdc	
PV Array MPPT Voltage Range	120Vdc~450Vdc	
Start-up Voltage	150Vdc +/- 10Vdc	

Take the 250Wp PV module as an example. After considering above two parameters, the recommended module configurations are listed in the table below.

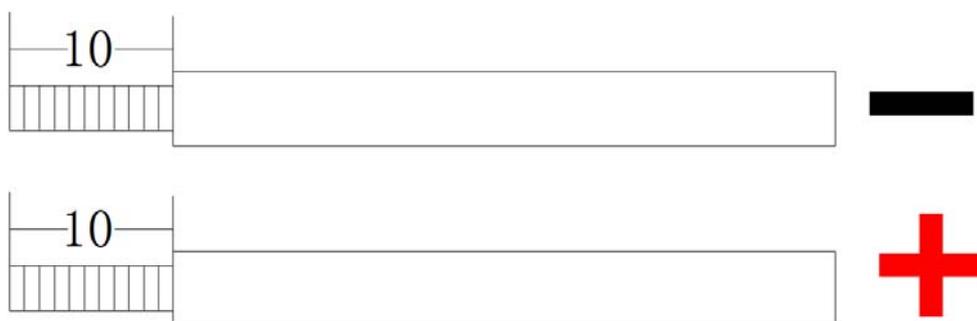
Solar Panel Spec. (reference)	Solar input	Q'ty of panels	Total input power
	Min. in series: 5 pcs, max. in series: 12 pcs.		
- 250Wp	6 pcs in series	6 pcs	1500W
- Vmp: 30.0Vdc	8 pcs in series	8 pcs	2000W
- Imp: 8.3A	12 pcs in series	12 pcs	3000W
- Voc: 36.0Vdc	8 pieces in series and 2 sets in parallel	16 pcs	4000W
- Isc: 8.4A	9 pieces in series and 2 sets in parallel	18 pcs	4500W
- Cells: 60	10 pieces in series and 2 sets in parallel	20 pcs	5000W
	11 pieces in series and 2 sets in parallel	22 pcs	5500W

### PV Module Wire Connection

Please take the following to implement PV module connection:

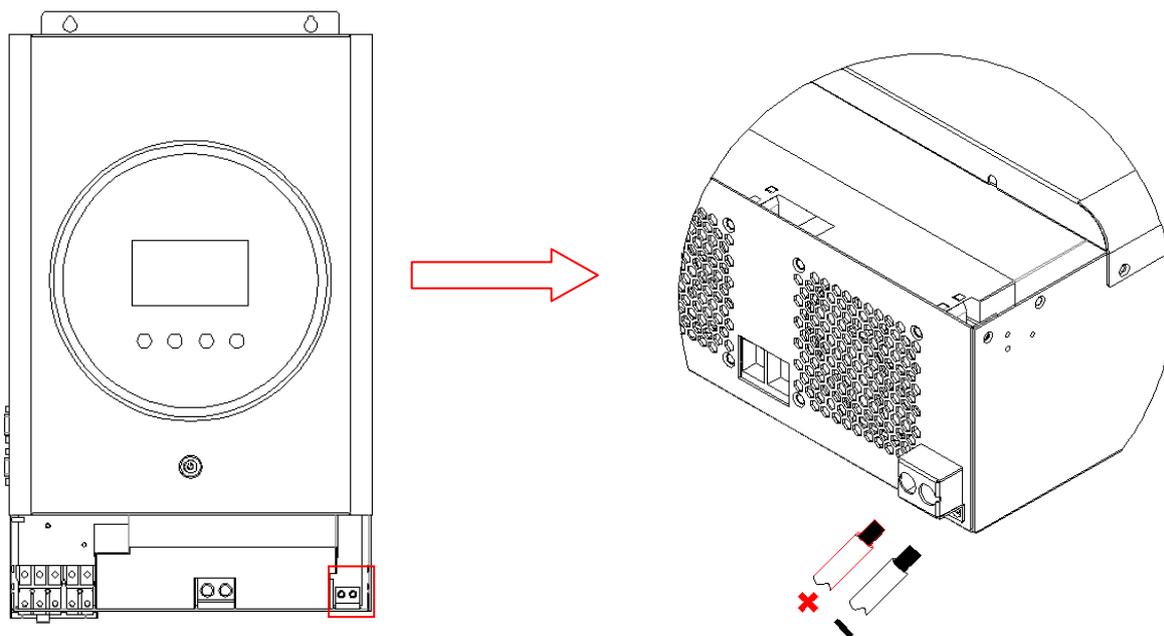
1. Remove insulation sleeve for about 5 mm on your positive and negative wires.
2. We recommend using bootlace ferrules on the wires for optimal performance.
3. Check polarities of wire connections from PV modules to PV input screw terminals. Connect your wires as illustrated below.

Recommended tool: 4mm blade screwdriver



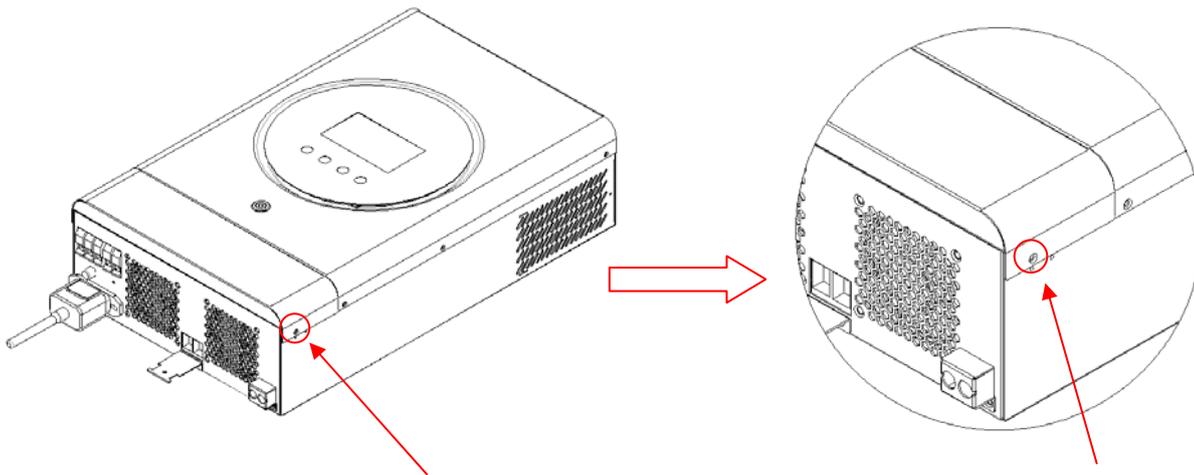
3. Check polarities of wire connections from PV modules to PV input screw terminals. Connect your wires as illustrated below.

Recommended tool: 4mm blade screwdriver



### 3.7 Final Assembly

After connecting all wirings, re-connect one cable and then put bottom cover back by screwing two screws as shown below.



### 3.8 RS232/USB Communication Connection

Please download software “Solar Power” from the official website. When the inverter is connected to the computer, the following interface will be displayed.

**Note:** The following dates are for reference only.

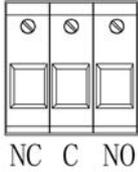


### 3.9 Wi-Fi Connection (Optional)

- 1.The device has its own standard WIFI port, if users need to monitor the status and information of the device through WIFI, they must connect to the WIFI collector.
- 2.Users can download "SmartEss" WIFI monitoring software from the app store on their phone.
- 3.Inverters come equipped with factory-integrated Wi-Fi capability which makes it very easy to integrate into a home network (Wi-Fi Dongle is Optional)This makes it ideal for local monitoring via the inverter's own wireless home network or for online monitoring platforms.

### 3.10 Dry Contact Signal

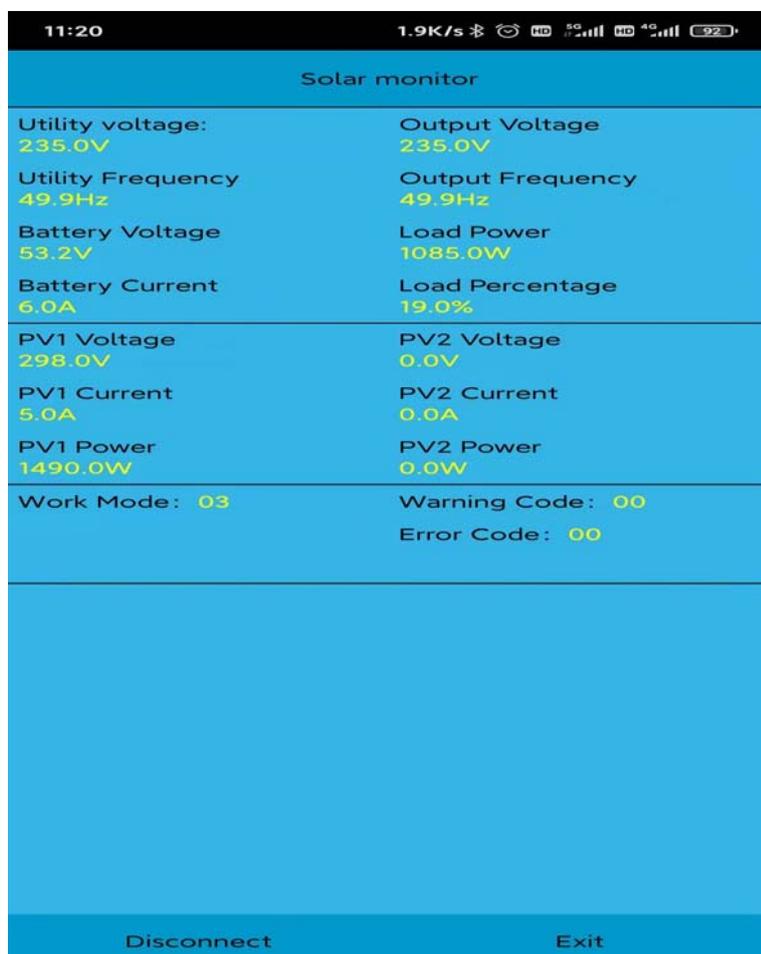
There is one dry contact (3A/250VAC) available on the rear panel. It could be used to deliver signal to external device when battery voltage reaches warning level.

Unit Status	Condition		
		NC & C	C & NO
Power Off	Unit is off and no output is powered	Open	Close
Power On	Battery voltage <Setting the voltage in program 12	Close	Open
	Battery voltage >Setting the voltage in program 13	Open	Close

### 3.11 Bluetooth Communication (Optional)

This unit is equipped with a Bluetooth transmitter. Download "RevoMonitor" APP from the company website. Once the APP is download, you may connect "RevoMonitor" APP to your inverter with the pairing password "1234". The communication distance is roughly 6 ~ 7 meters.

- Note:1.the following date are for reference only.  
2.Bluetooth APP only supports Android phone users.



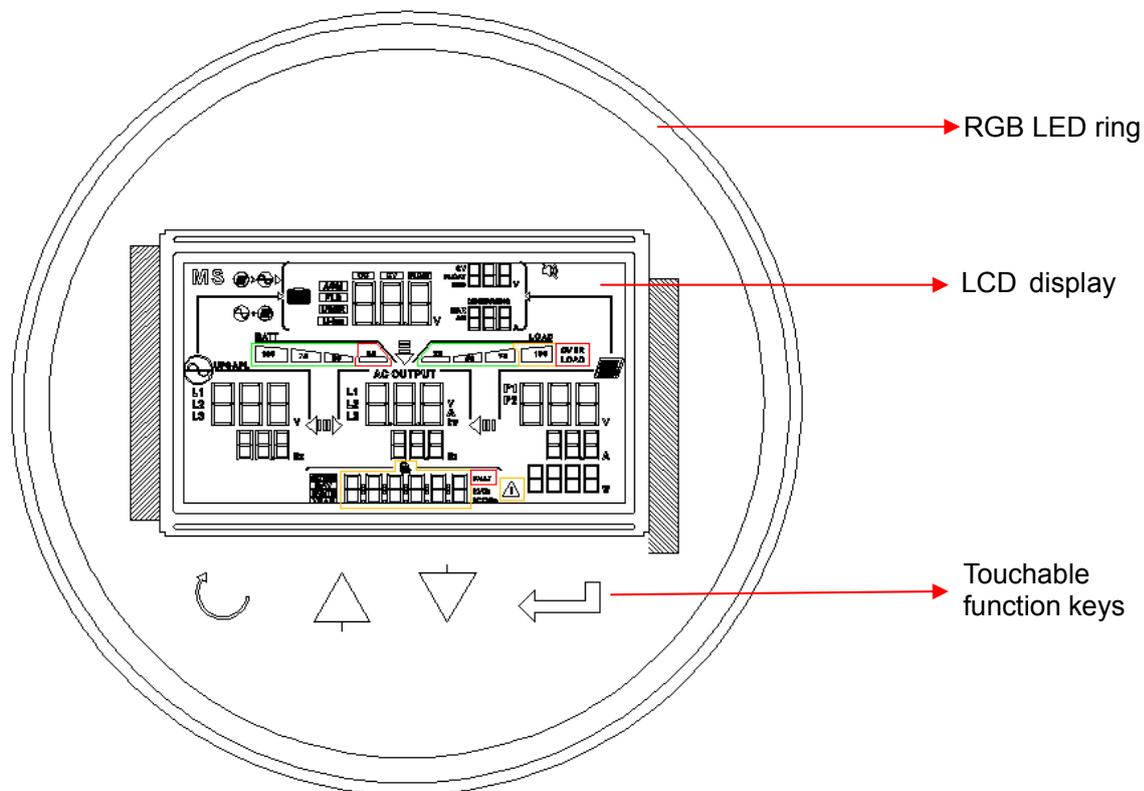
## 4.Operation

### 4.1 Power ON/OFF

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

### 4.2 Operation And Display Panel

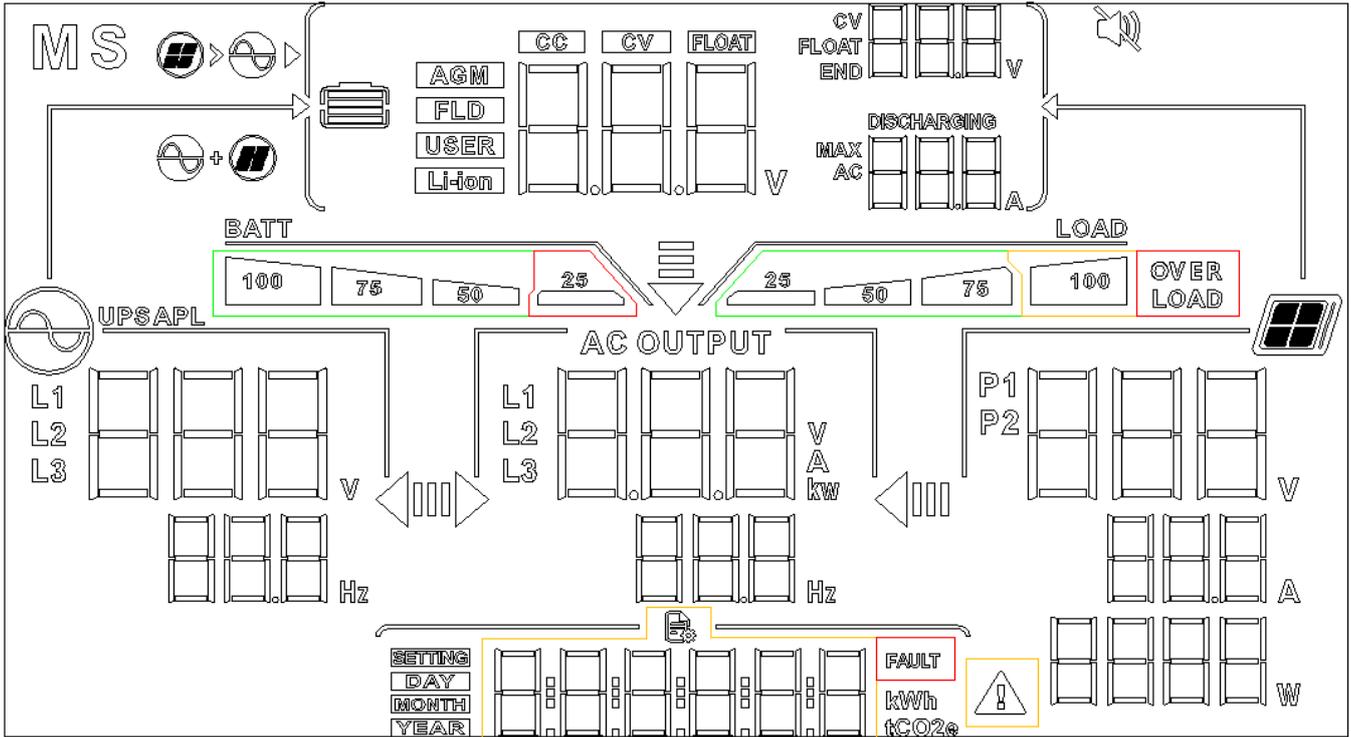
The operation LCD panel, shown in the chart below, includes one RGB LED ring, four touchable function keys and a LCD display to indicate the operating status and input/output power information.

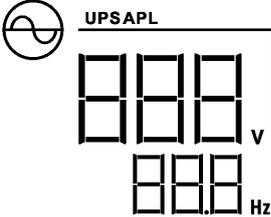
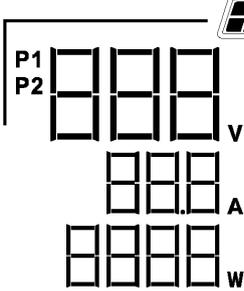
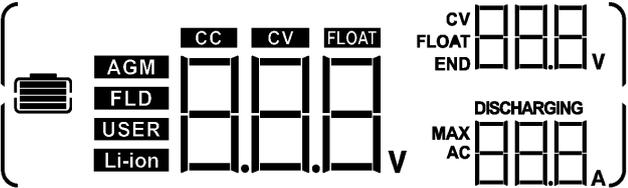


Touchable Function Keys

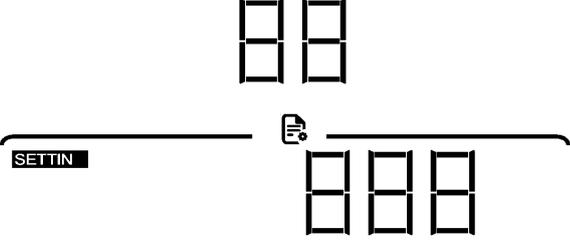
Function Key		Description
	ESC	To exit the setting
	Up	To last selection
	Down	To next selection
	Enter	To confirm/enter the selection in setting mode

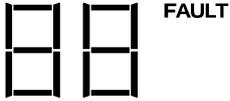
### 4.3 LCD Display Icons



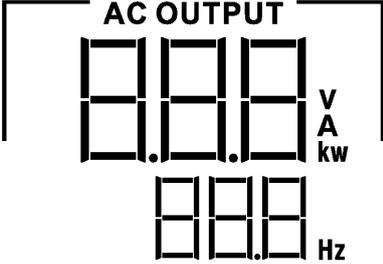
Icon	Function Description
	<p>Indicates the AC input voltage and frequency.</p>
	<p>Indicates the PV voltage, current and power.</p>
	<p>Indicates the battery voltage, charging stage, configured battery parameters, charging or discharging current.</p>

Configuration Program and Fault Information

	<p>Indicates the setting programs.</p>
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	<p>Indicates the warning and fault codes. Warning: flashing with warning code</p>  <p>Fault: lighting with fault code.</p> 
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Output Information

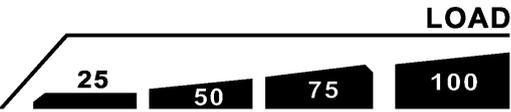
	<p>Indicates the output voltage, load in VA, and load in Watt and output frequency.</p>
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Battery Information

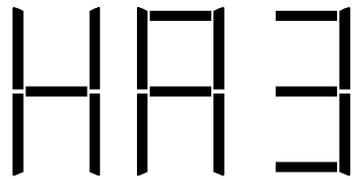
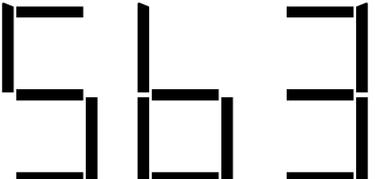
<p><b>BATT</b></p> 	<ol style="list-style-type: none"> <li>1. Indicates battery level by 1-25%, 26-49%, 51-75% and 76-100% in battery mode and charging status in line mode.</li> <li>2. When battery is charging, it will present battery charging status.</li> <li>3. Floating mode. Batteries are fully charged. 4 bars will be on.</li> </ol>
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Load Information

<p><b>OVER LOAD</b></p>	<p>Indicates overload.</p>
-----------------------------	----------------------------

	<p>Indicates the load level by 0-25%, 26-50%, 51-75% and 76-100%.</p>
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	<p>Indicates setting program 01 "Output source priority" is selected as "Utility first".</p>
	<p>Indicates setting program 01 "Output source priority" is selected as "Solar first".</p>
	<p>Indicates setting program 01 "Output source priority" is selected as "SBU".</p>
<p>AC Input Voltage Range Setting Display</p>	
<p><b>APL</b></p>	<p>The acceptable AC input voltage range will be within 90-280VAC.</p>
<p><b>UPS</b></p>	<p>The acceptable AC input voltage range will be within 170-280VAC.</p>
<p>Operation Status Information</p>	
	<p>Indicates unit connects to the mains.</p>
	<p>Indicates unit connects to the PV panel.</p>
<p><b>AGM</b></p> <p><b>FLD</b></p> <p><b>USER</b></p> <p><b>Li-ion</b></p>	<p>Indicates battery type.</p>

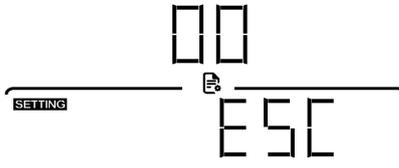
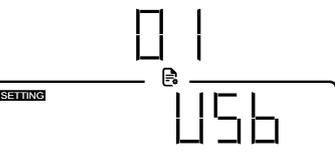
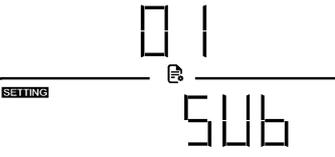
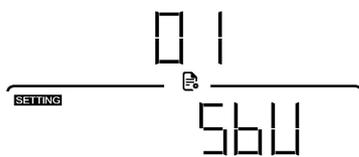
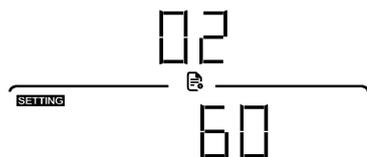
	Date: Year, Month ,Day
	Power generation
	Indicates unit alarm is disabled.
	<p>“H”: Master unit .  “2”: there are two parallel machines in single phase</p>
	<p>“S”: Slave unit.  “2”:there are two parallel machines in single phase</p>
	<p>“H”: Master unit  “A”: A-phase  “3”:there are three parallel machines in three phase</p>
	<p>“S”: Slave unit  “B”: B-phase  “3”:there are three parallel machines in three phase</p>
	<p>“S”: Slave unit  “C”: C-phase  “3”:there are three parallel machines in three phase</p>
	Feed back into the grid

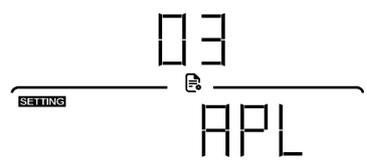
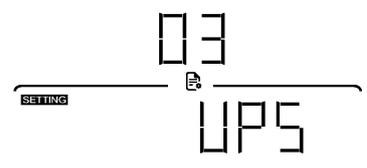
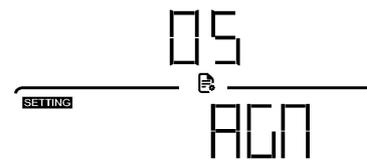
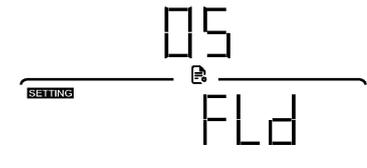
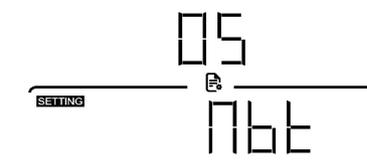
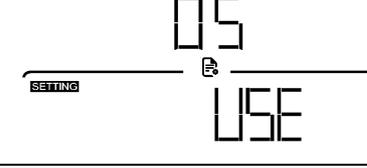
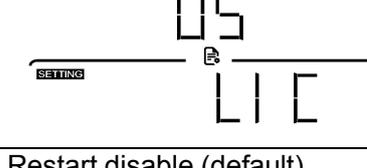
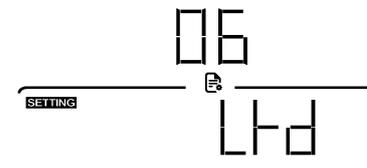
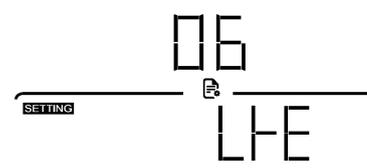
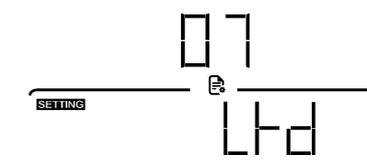
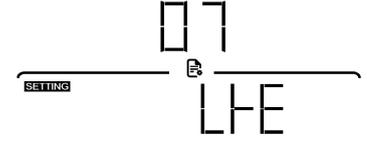
## 4.4 LCD Setting

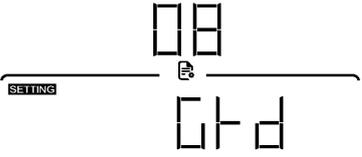
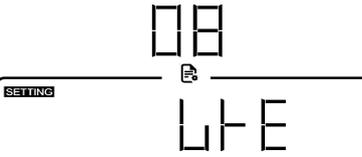
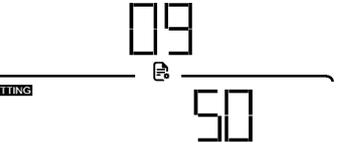
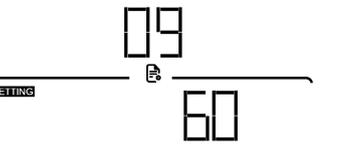
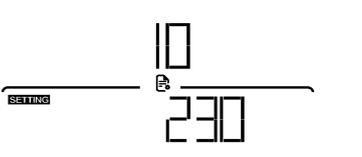
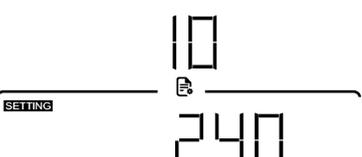
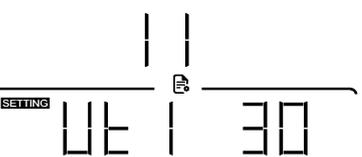
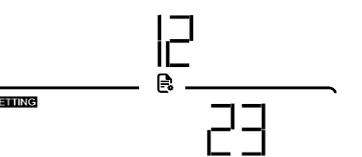
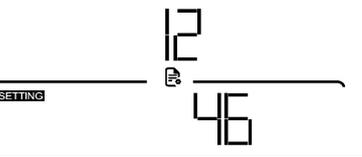
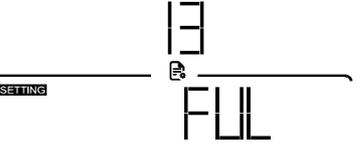
After pressing and holding ENTER button for 3 seconds, the unit will enter setting mode. Press “UP” or “DOWN” button to select setting programs. And then, press “ENTER” button to confirm the selection or ESC button to exit.

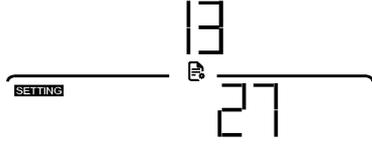
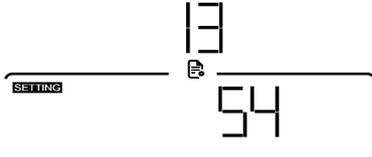
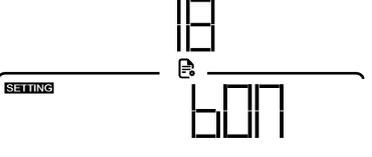
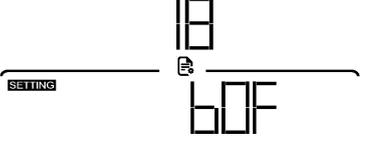
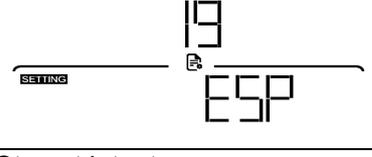
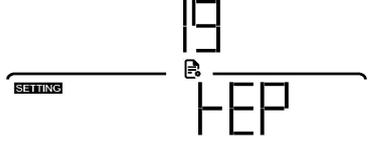
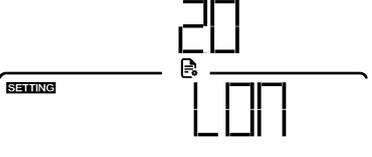
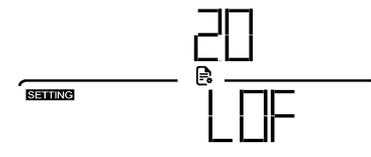
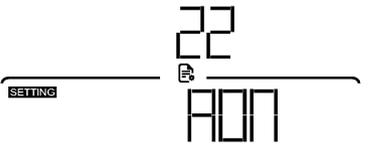
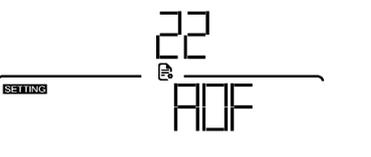
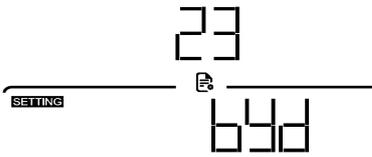
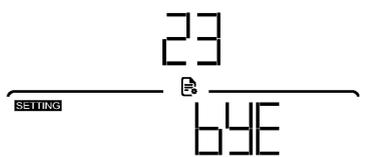
**Note: All settings must be modified in battery mode and must be rebooted to be valid.**

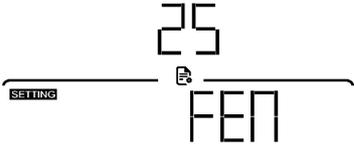
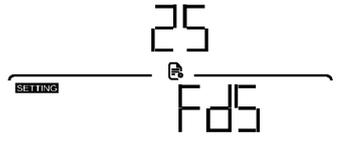
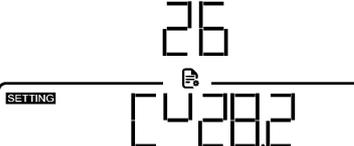
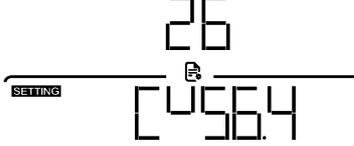
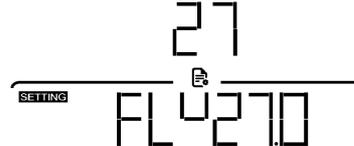
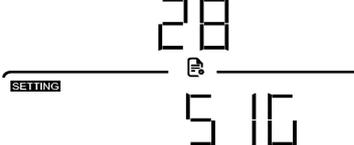
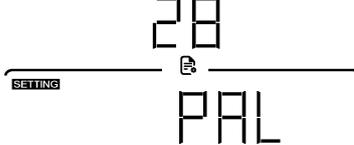
### Setting Programs:

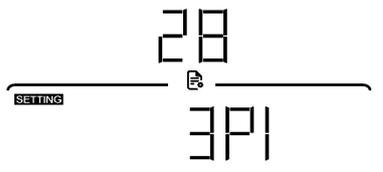
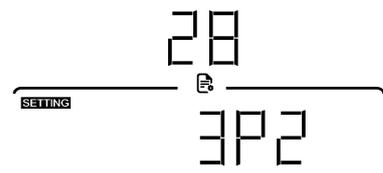
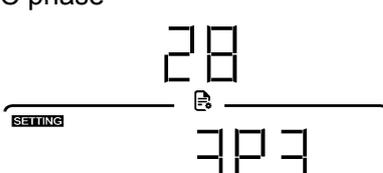
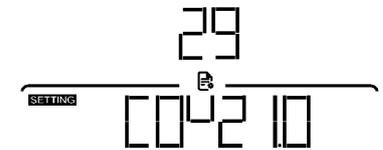
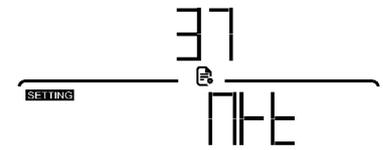
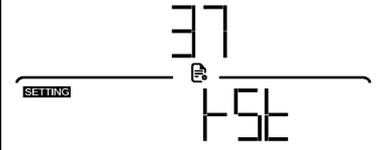
Program	Description	Selection Option	
00	Exit setting mode	Escape 	
01	Output source priority: To configure load power source priority	Utility first (default)	 <p>Utility will provide power to the loads as first priority. solar and battery energy will provide power to the loads only when utility power is not available</p>
		Solar first	 <p>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.</p>
		Battery priority	 <p>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. utility provides power to the loads only when battery voltage drops to either low- level warning voltage or the setting point in program 12.</p>
02	Maximum charging current: (Max. charging current = utility charging current + solar charging current)	60A (default)	 <p>Setting range is from 10A to 100A. Increment of each click is 10A.</p>

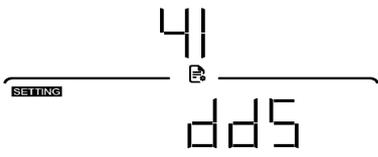
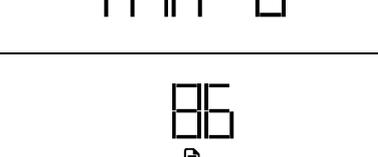
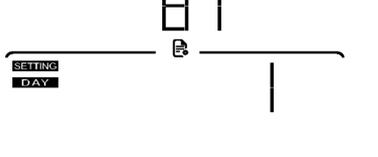
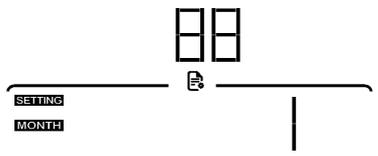
03	AC input voltage range	Appliances (default) 	If selected, acceptable AC input voltage range will be within 90-280VAC.
		UPS 	If selected, acceptable AC input voltage range will be within 170-280VAC.
05	Battery type	AGM (default) 	Flooded 
		No battery 	
		User-Defined 	If "User-Defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 26, 27 and 29.
		3 <sup>rd</sup> party Lithium battery 	If selected "LIC -LI5", programs of 02, 26, 27 and 29 will be automatically set up. No need for further setting. Please contact the battery supplier for installation procedure.
06	Auto restart when overload occurs	Restart disable (default) 	Restart enable 
07	Auto restart when over temperature occurs	Restart disable (default) 	Restart enable 

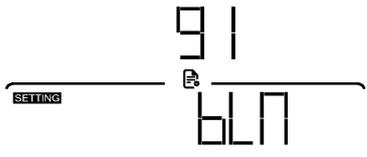
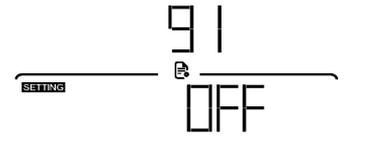
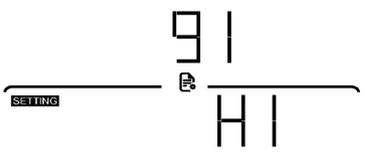
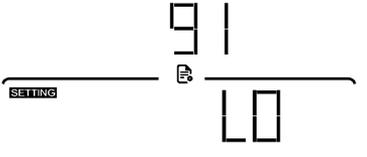
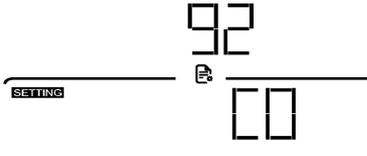
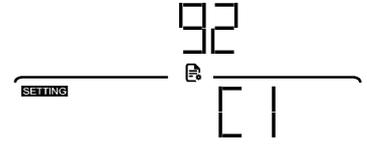
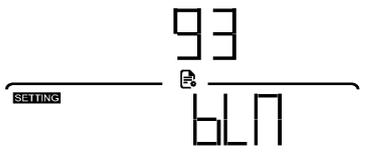
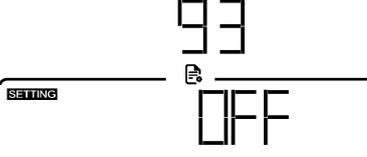
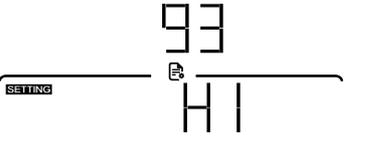
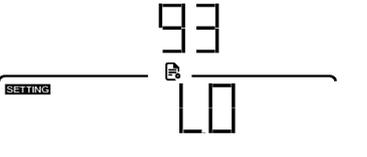
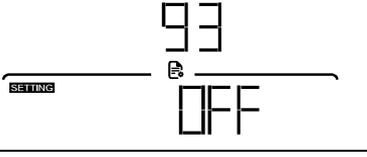
08	Feed back into the grid	Disable (default) 	Enable 
09	Output frequency	50Hz (default) 	60Hz 
10	Output voltage	220V 	230V (default) 
		240V 	
11	Maximum utility charging current Note: If setting value in program 02 is smaller than that in program in 11, the inverter will apply charging current from program 02 for utility charger.	30A (default) 	Setting range is 2A, then from 10A to 80A. Increment of each click is 10A.
12	Setting voltage point back to utility source when selecting "SBU" (SBU priority) in program 01	23V model (default) 	Setting range is from 22V to 25V. Increment of each click is 1V.
		46V model (default) 	Setting range is from 44V to 51V. Increment of each click is 1V.
13	Setting voltage point back to battery mode when selecting "SBU" (SBU priority) in program 01.	Battery fully charged 	

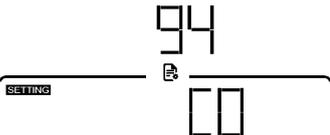
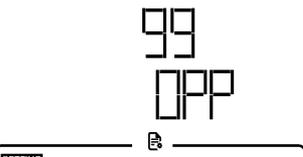
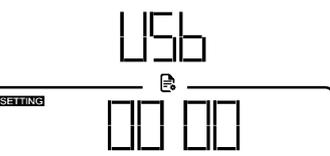
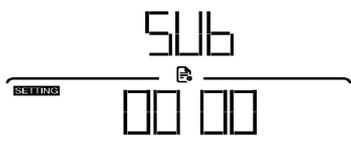
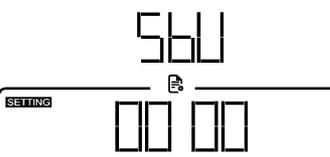
13	Setting voltage point back to battery mode when selecting "SBU" (SBU priority) in program 01.	24V model 	27V (default) Setting range is from 24V to 29V. Increment of each click is 1V.
		48V model 	54V (default) Setting range is from 48V to 58V. Increment of each click is 1V.
18	Alarm control	Alarm on (default) 	Alarm off 
19	Auto return to default display screen	Return to default display screen (default) 	If selected, no matter how users switch display screen, it will automatically return to default display screen after no button is pressed for 1 minute.
		Stay at latest screen 	If selected, the display screen will stay at latest screen user finally switches.
20	Backlight control	Backlight on(default) 	Backlight off 
22	Beeps while primary source is interrupted	Alarm on (default) 	Alarm off 
23	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.	Bypass disable (default) 	Bypass enable 

25	Record Fault code	Record enable (default) 	Record disable 
26	Bulk charging voltage (C.V voltage)	Available options for 24V model: 28.2V (default) 	If user-defined is selected in program 5, this program can be set up. Setting range is from 24.0V to 30.5V. Increment of each click is 0.1V.
		Available options for 48V model: 56.4V (default) 	If user-defined is selected in program 5, this program can be set up. Setting range is from 48.0V to 61.0V. Increment of each click is 0.1V.
27	Floating charging voltage	Available options for 24V model: 27.0V (default) 	If user-defined is selected in program 5, this program can be set up. Setting range is from 24.0V to 30.5V. Increment of each click is 0.1V.
		Available options for 48V model: 54.0V (default) 	If user-defined is selected in program 5, this program can be set up. Setting range is from 48.0V to 61.0V. Increment of each click is 0.1V.
28	Single and Parallel setting	default 	Single enable
		single-phase parallel 	single-phase parallel enable

28	Single and Parallel setting	A phase 	A-phase parallel enable
		B phase 	B-phase parallel enable
		C phase 	C-phase parallel enable
		Please note: 1.when three-phase parallel,make sure that A-phase is the host; 2.after the parallel parameters are modified,the device must be restarted to be effective. 3. All inverters must share the same battery pack when paralleling 4. This setting is only available when the inverter is in standby mode (Switch off).	
29	Low DC cut-off voltage	Available options for 24V model: 21.0V (default) 	If user-defined is selected in program 5, this program can be set up. Setting range is from 21.0V to 24.0V. Increment of each click is 0.1V. Low DC cut-off voltage will be fixed to setting value no matter what percentage of load is connected.
		Available options for 48V model: 42.0V (default) 	If user-defined is selected in program 5, this program can be set up. Setting range is from 42.0V to 48.0V. Increment of each click is 0.1V. Low DC cut-off voltage will be fixed to setting value no matter what percentage of load is connected.
37	Reset all stored data for PV generated power and output load energy	Not reset(Default) 	Reset 

41	Discharge limited current		discharge current limited disable
			<p>setting range :10A to 200A          setting increase or decrease of 10A.          NOTE:1. if you work in “SUB mode” or “SBU mode”, when the loads is greater than the current limiting point, it will automatically switch to utility mode.          2.if it only works in battery mode, when the load is greater than the current limiting point ,the inverter will shut down immediately.</p>
85	Time setting – Minute		For minute setting, the range is from 0 to 59.
86	Time setting – Hour		For hour setting, the range is from 0 to 23.
87	Time setting– Day		For day setting, the range is from 1 to 31.
88	Time setting– Month		For month setting, the range is from 1 to 12.
89	Time setting – Year		For year setting, the range is from 17 to 99.

91	On/Off control for surround RGB LED	Enabled (default) 	Disable 
	Surround RGB brightness	Brightness of RGB LED: high 	Brightness of RGB LED: low 
		Brightness of RGB LED: normal 	
92	Surround RGB LED effect	Default: Cycling 	The cycle of seven kinds of color.
		Solid on 	“ [ 1 ” to “ [ 7 ” can be used in one of the colors
93	On/Off control for LOGO RGB LED	Default: enabled 	Disabled 
	LOGO RGB brightness	High 	Low 
		Normal 	

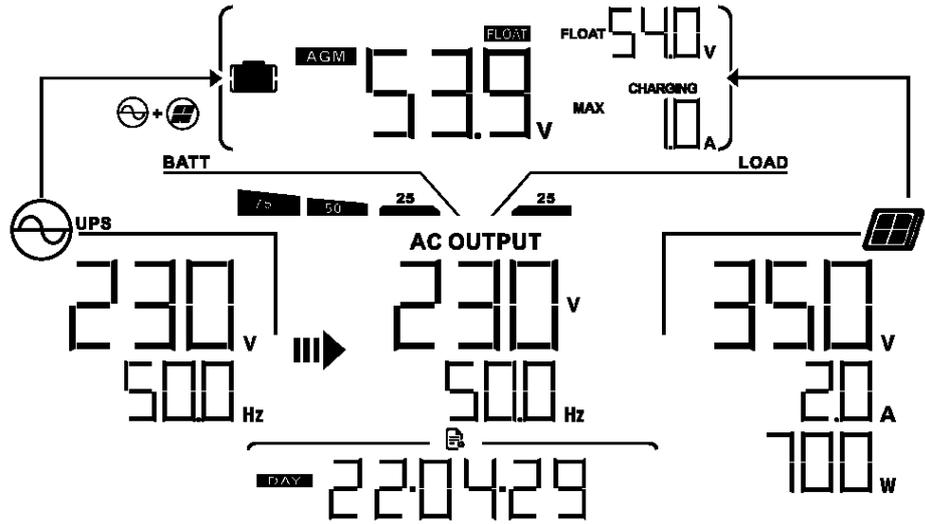
94	LOGO RGB LED effect	Default: Cycling 	The cycle of seven kinds of color.
		Solid on 	“[1]” to “[7]” can be used in one of the colors
99	Timer Setting for Output source Priority 	Once access this program, it will show “OPP” in LCD. Press “←” button to select timer setting for output source priority. There are three timers to set up. Press “▲” or “▼” button to select specific timer option. Then, press “←” to confirm timer option. Press “▲” or “▼” button to adjust starting time first and the setting range is from 00 to 23. Increment of each click is one hour. Press “←” to confirm starting time setting. Next, the cursor will jump to right column to set up end time. Once end time is set completely, press “←” to confirm all setting.	
		Utility first timer 	Solar first timer 
		SBU priority timer 	

## 4.5 LCD Display

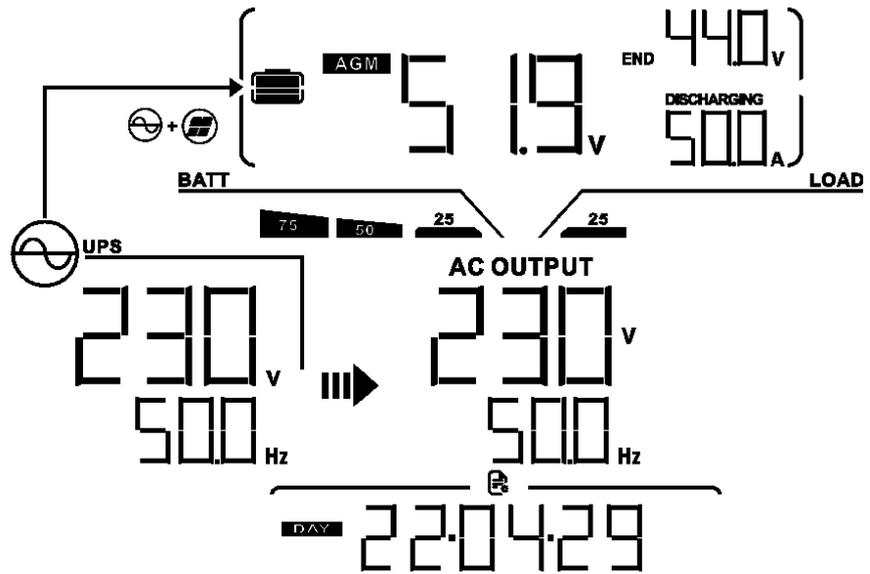
The LCD display information will be switched in turn by pressing the “▲” or “▼” button. The selectable information is switched as the following table in order.

Selectable information	Default LCD display
Utility voltage=230Vac Utility frequency=50.0Hz Output voltage=230Vac Frequency=50.0Hz	<p>The diagram shows a circuit with a utility input (UPS) and a battery (BATT) connected to an AC output. The battery is labeled 'AGM' and 'CC'. The LCD display shows:           <ul style="list-style-type: none"> <li>Utility voltage: 230 V, Frequency: 50.0 Hz</li> <li>AC Output: 230 V, 50.0 Hz</li> <li>Battery voltage: 56.4 V (CV), 50.0 V (AGM)</li> <li>Charging status: CHARGING, MAX AC 200 A</li> <li>Day: 22.04.29</li> </ul>           The battery level is indicated by a bar graph with segments labeled 7.5, 50, 25, and 25.         </p>
PV voltage=350Vdc PV current=2.0A PV power=700W	<p>The diagram shows a circuit with a utility input (UPS), a battery (BATT), and a PV panel. The battery is labeled 'AGM' and 'CC'. The LCD display shows:           <ul style="list-style-type: none"> <li>Utility voltage: 230 V, Frequency: 50.0 Hz</li> <li>AC Output: 230 V, 50.0 Hz</li> <li>Battery voltage: 56.4 V (CV), 50.0 V (AGM)</li> <li>Charging status: CHARGING, MAX AC 200 A</li> <li>PV Input: 350 V, 2.0 A, 700 W</li> <li>Day: 22.04.29</li> </ul>           The battery level is indicated by a bar graph with segments labeled 7.5, 50, 25, and 25.         </p>
Battery voltage=50.0Vdc Bulk charging voltage=56.4Vdc Charging current=20.0A	<p>The diagram shows a circuit with a utility input (UPS), a battery (BATT), and a PV panel. The battery is labeled 'AGM' and 'CC'. The LCD display shows:           <ul style="list-style-type: none"> <li>Utility voltage: 230 V, Frequency: 50.0 Hz</li> <li>AC Output: 230 V, 50.0 Hz</li> <li>Battery voltage: 56.4 V (CV), 50.0 V (AGM)</li> <li>Charging status: DISCHARGING, MAX AC 200 A</li> <li>PV Input: 350 V, 2.0 A, 700 W</li> <li>Day: 22.04.29</li> </ul>           The battery level is indicated by a bar graph with segments labeled 7.5, 50, 25, and 25.         </p>

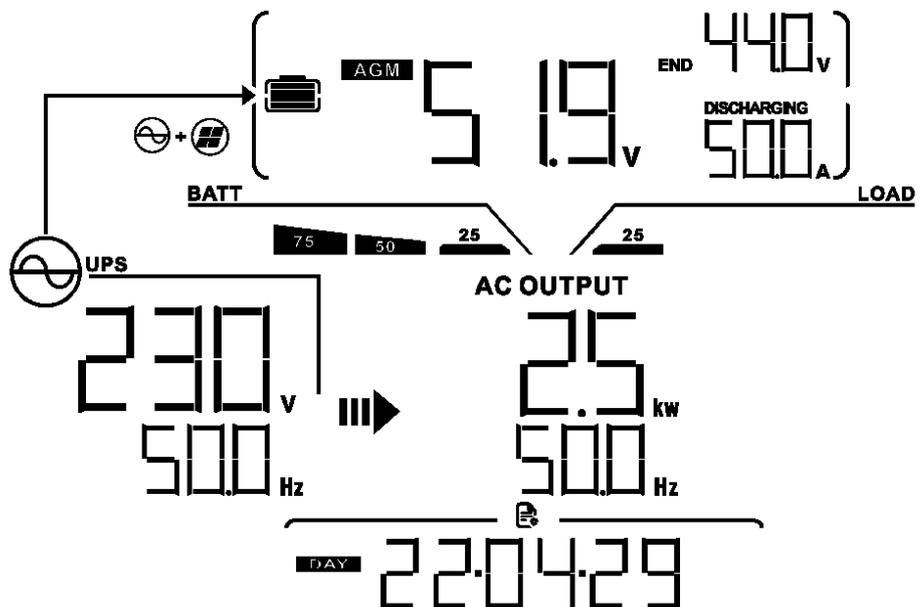
Floating charging  
voltage=54.0  
Charging current=1.0A



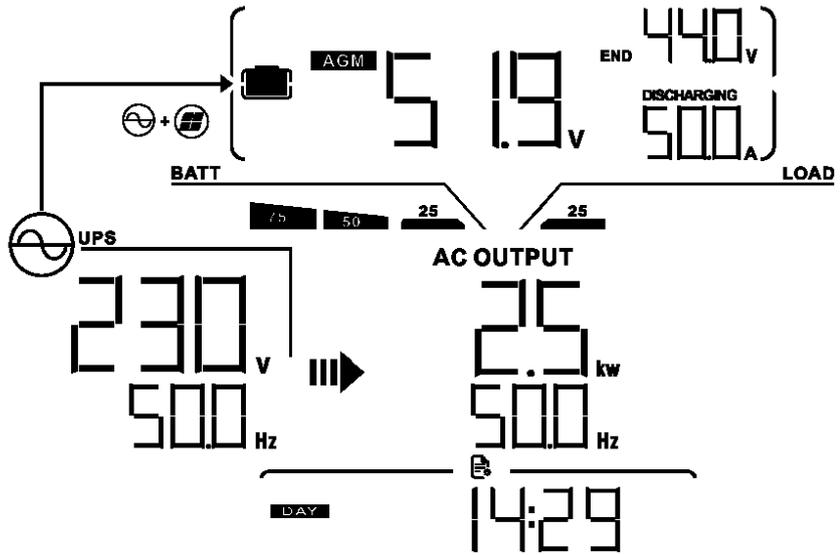
Low DC cut-off  
voltage=44.0V,  
Discharging current=50.0A  
Output voltage=230V  
Output frequency=50Hz



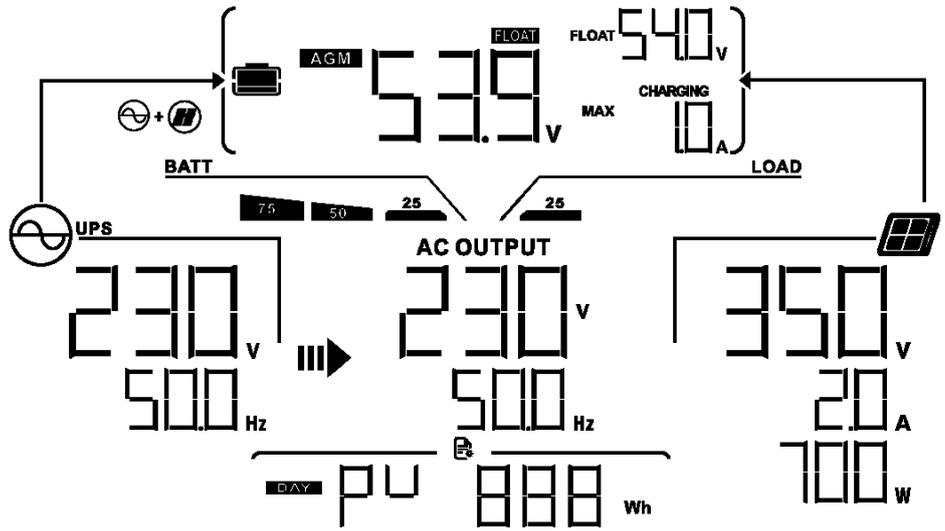
Load in Watt=2.5kW,  
Output frequency=50Hz  
Real date April 29, 2022.



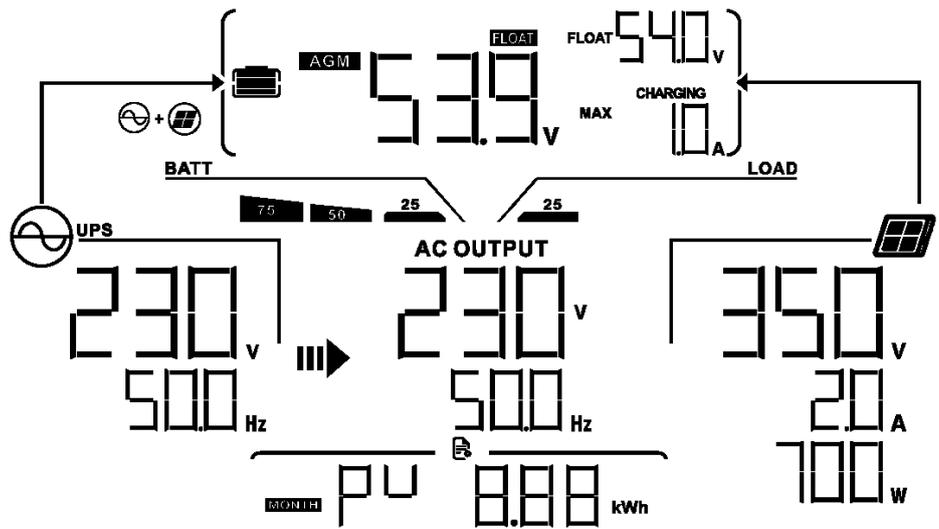
Real time 14:29.



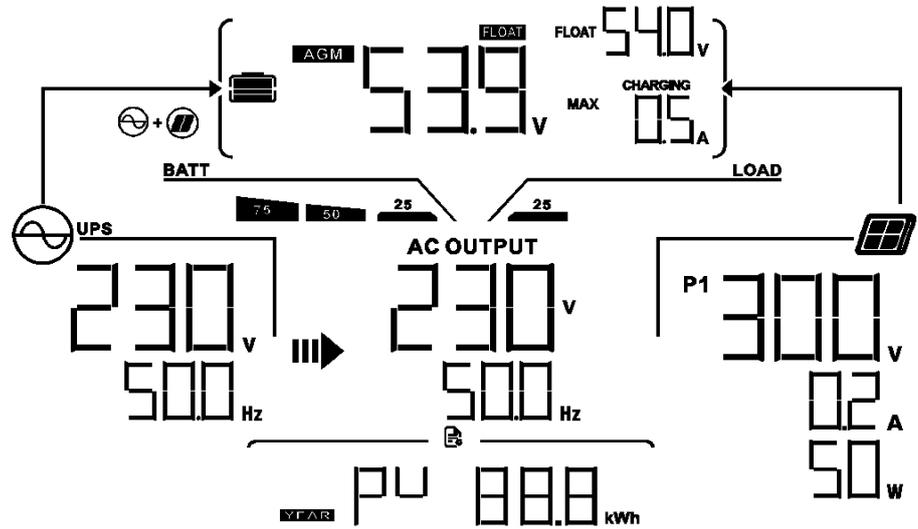
PV energy generation today =888Wh.



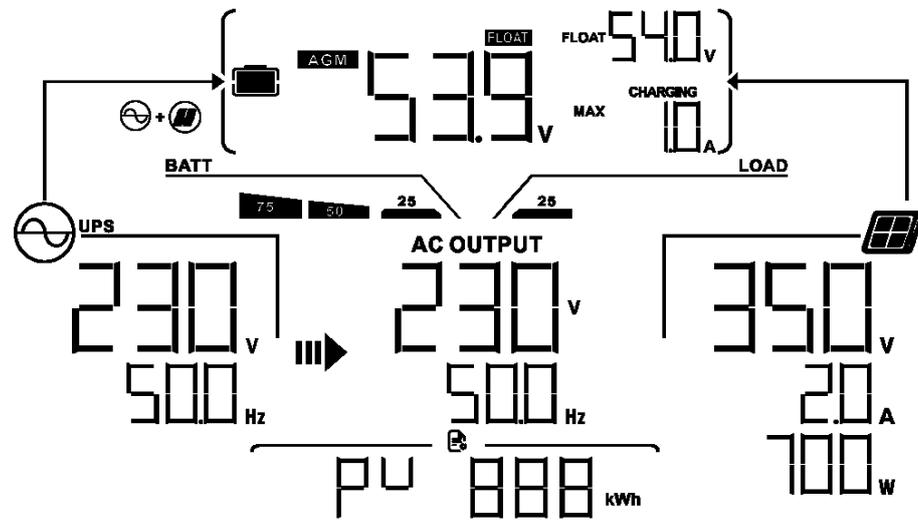
PV energy generation this month =8.88kWh.



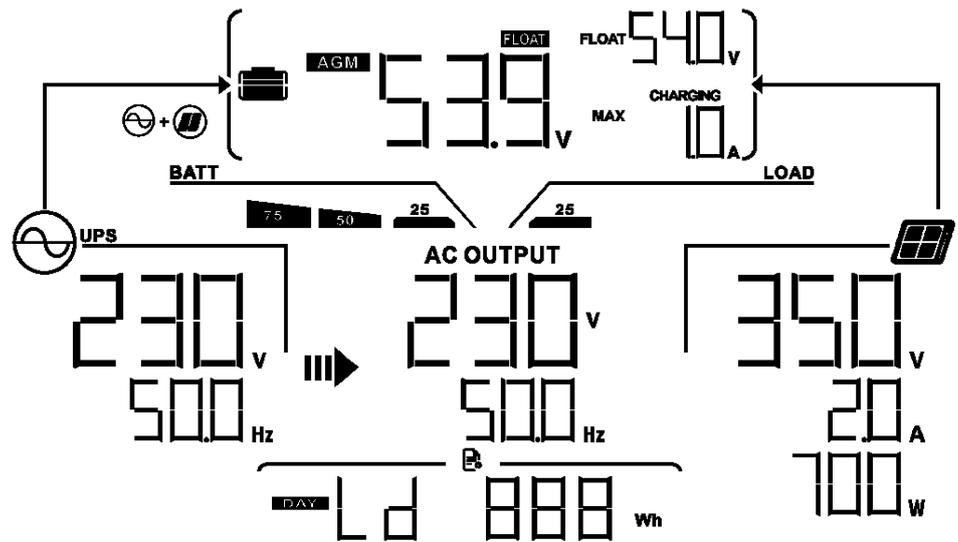
PV energy generation this year =88.8kWh.



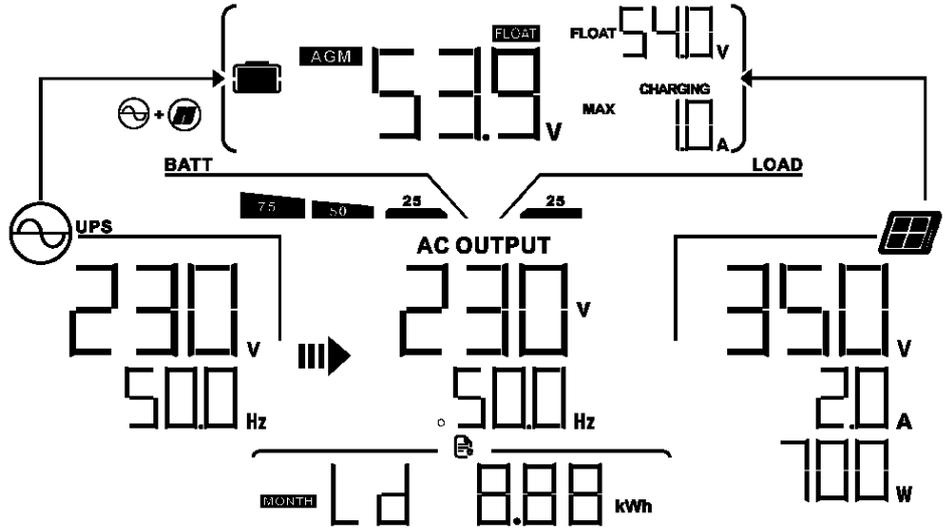
Total PV energy generation



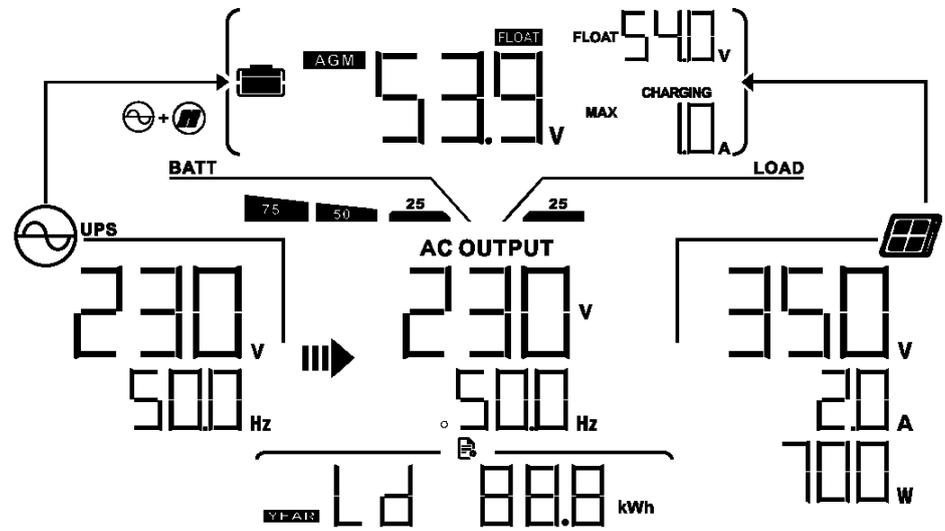
Load output energy today =888Wh.



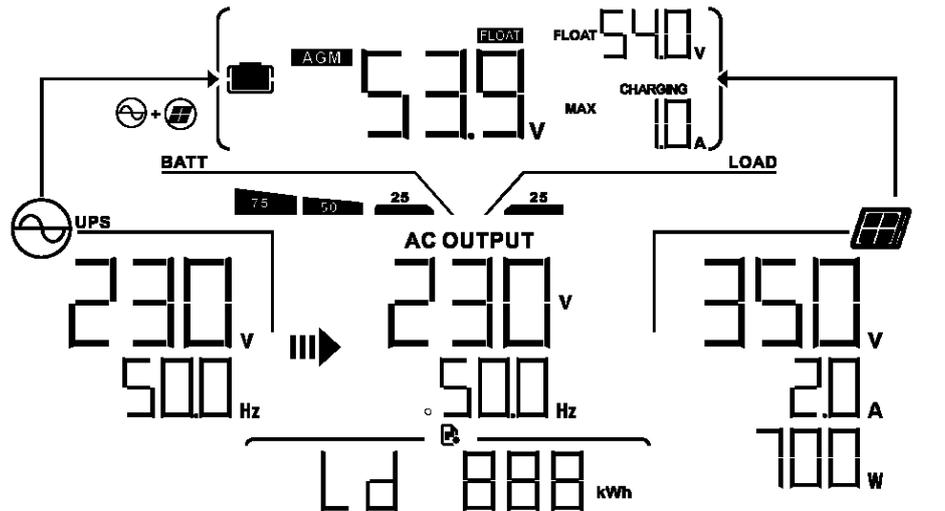
Load output energy this month=8.88 kWh



Load output energy this year =88.8 kWh.

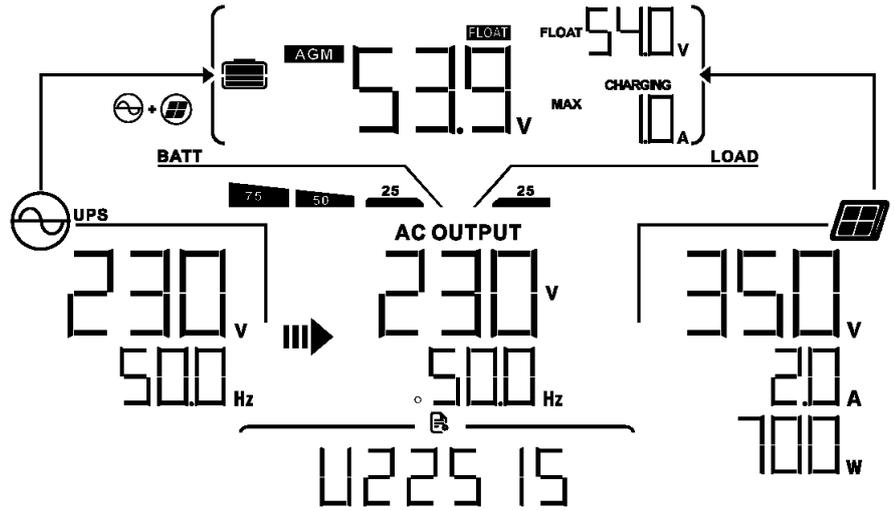


Total load output energy



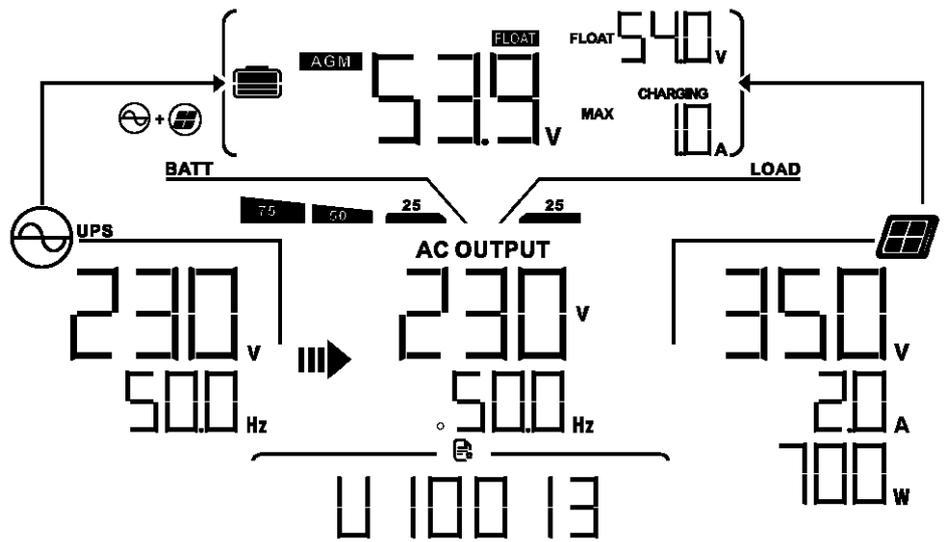
version:25-1.5

Display control board  
software version



Version:00-1.3

Inverter control board  
software version



## 5.Parallel Installation Guide

### 5.1 Parallel Operation Cable

1.Recommended battery cable and terminal size: (please refer 3.4 section)

Recommended battery cable :

Model	Max. discharge current	Battery capacity	Wire size(AWG)	Wire size(mm <sup>2</sup> )
3.6KW24V	171A	200AH	1*3AWG or 2*4AWG	1*35 or 2*25
5.6KW48V	133A	200AH	1*3AWG	1*35

**WARNING:** Be sure the length of all battery cables is the same. Otherwise, there will be voltage difference between inverter and battery to cause parallel inverters not working.

2. Recommended breaker specification of battery for each inverter:

Model	1 unit*X
3.6KW	200A32Vdc
5.6KW	150A63Vdc

**NOTE:** If you want to use only one breaker at the battery side for the whole system, the rating of the breaker, should be X times current of 1 unit. "X" indicates the number of inverters connected in parallel.

3. Recommended AC input cable size for each inverter

Model	Gauge	Torque Value
3.6KW/5.6KW	10 AWG	1.0~ 1.2Nm

4. Recommended AC input circuit breaker configuration

**Note 1:** You can choose 3.6K devices and install a 32A circuit breaker on the input front of each device. 5.6K devices have a 63A circuit breaker installed at the input front end of each device.

**Note 2:** Regarding three-phase system, you can use 4-pole breaker directly and the rating of the breaker should be compatible with the phase current limitation from the phase with maximum units.

**WARNING:** Regarding AC input and output, please also follow the same principle. should be compatible with the phase current limitation from the phase with maximum units.

5. Recommended PV input configuration

**CAUTION:** Before connecting the PV module, install a 40A1000VDC circuit breaker between each inverter and the PV module.

### 5.2 Matters Needing Attention In Single-phase Parallel Operation

1. Parallel operation in single phase with up to 6 units.

2. **WARNING:** It's required to connect battery for parallel operation, it is forbidden to use parallel without batteries

3. **WARNING:** It is forbidden for inverter to share the same solar panel group.

4. **WARNING:** Make sure all cables are of the same length, Otherwise, there will be voltage difference between inverter and battery to cause parallel inverters not working.

5. Set the parameters of each inverter separately (working mode, single - phase parallel function).

**Warning:** When working in parallel, the working mode of each inverter must be the same working mode, output frequency.

6. After setting the parameters, turn on each inverter in turn.

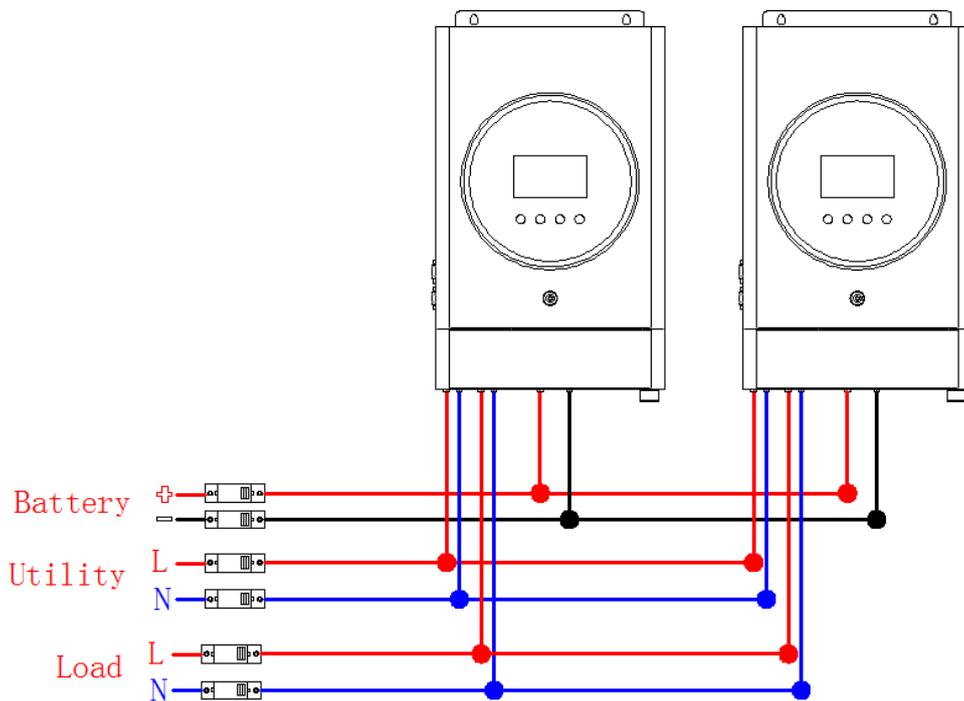
7. **WARNING:** When running in parallel, all inverters must share the battery pack.

## 5.3 Single-phase Parallel Operation Cable Connection

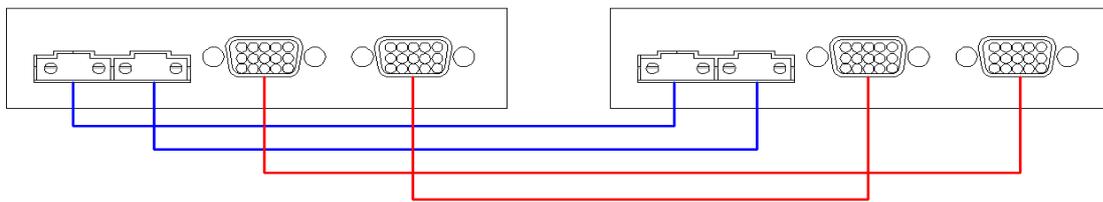
### 1. Two inverters in parallel :

Power Connection:

**NOTE:** The following picture only for your reference. It is subject to actual goods to be received.



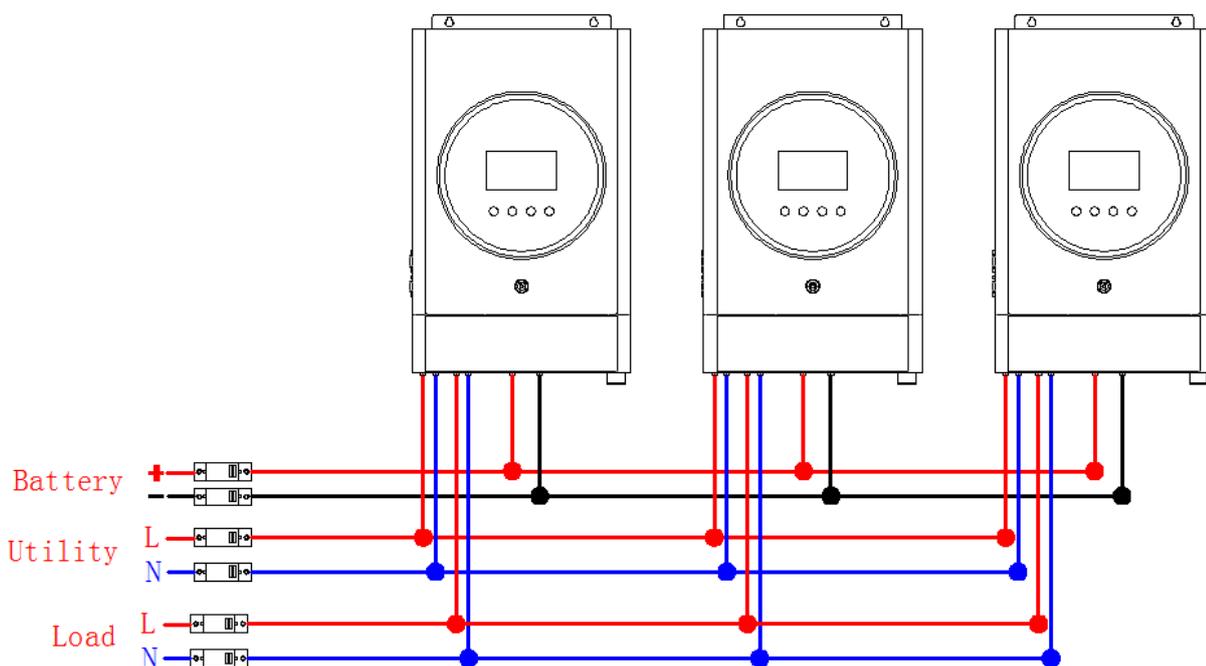
Communication Connection:



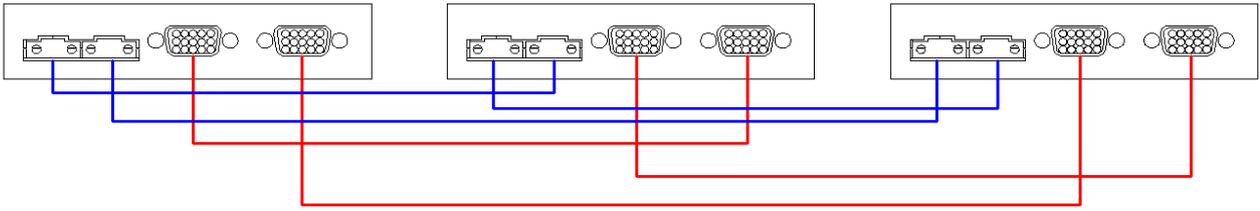
### 2. Three inverters in parallel :

Power Connection:

**NOTE:** The following picture only for your reference. It is subject to actual goods to be received.



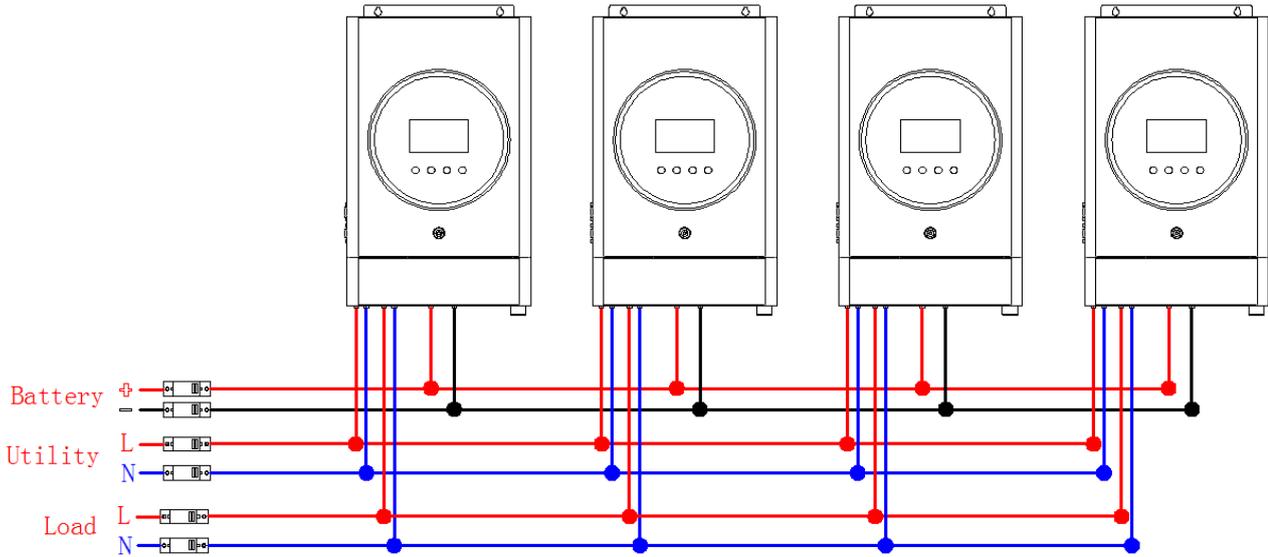
Communication Connection:



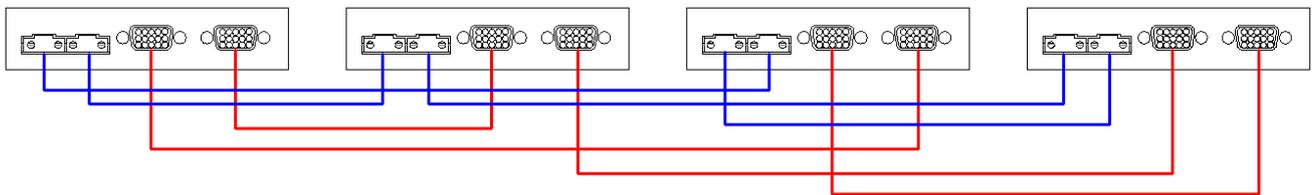
### 3. Four inverters in parallel :

Power Connection:

**NOTE:** The following picture only for your reference. It is subject to actual goods to be received.



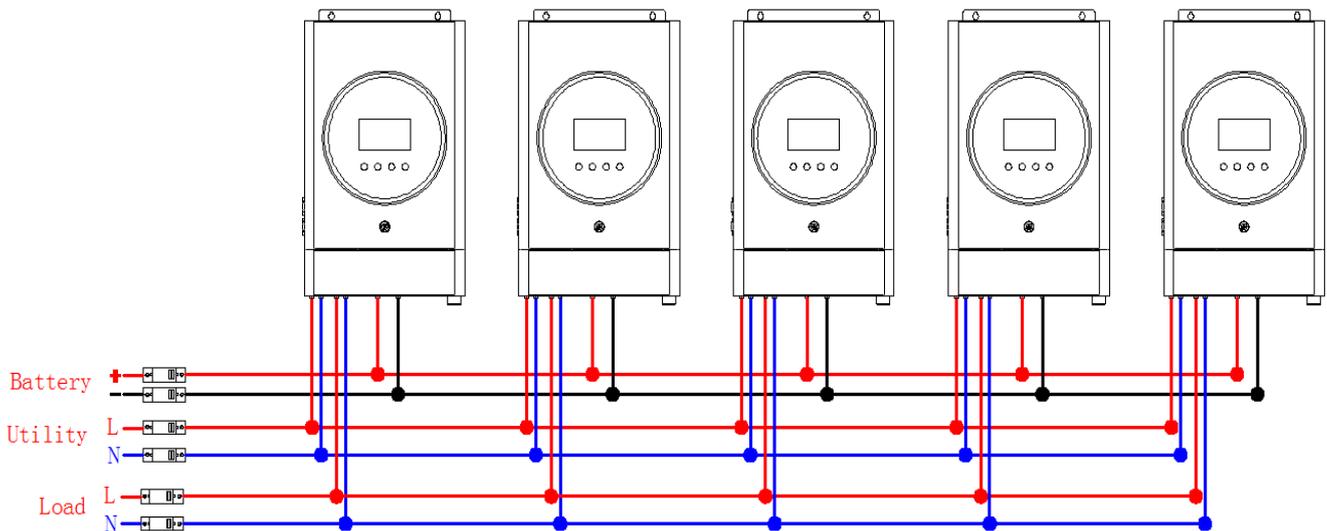
Communication Connection:



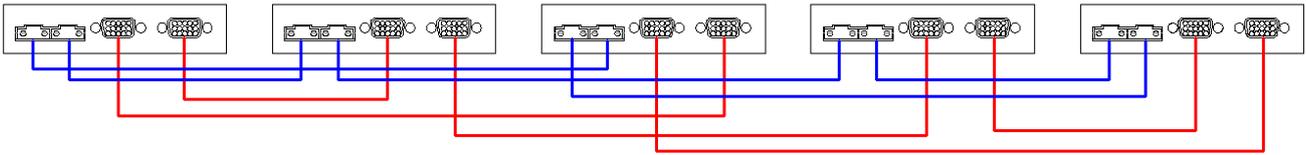
### 4. Five inverters in parallel :

Power Connection:

**NOTE:** The following picture only for your reference. It is subject to actual goods to be received.



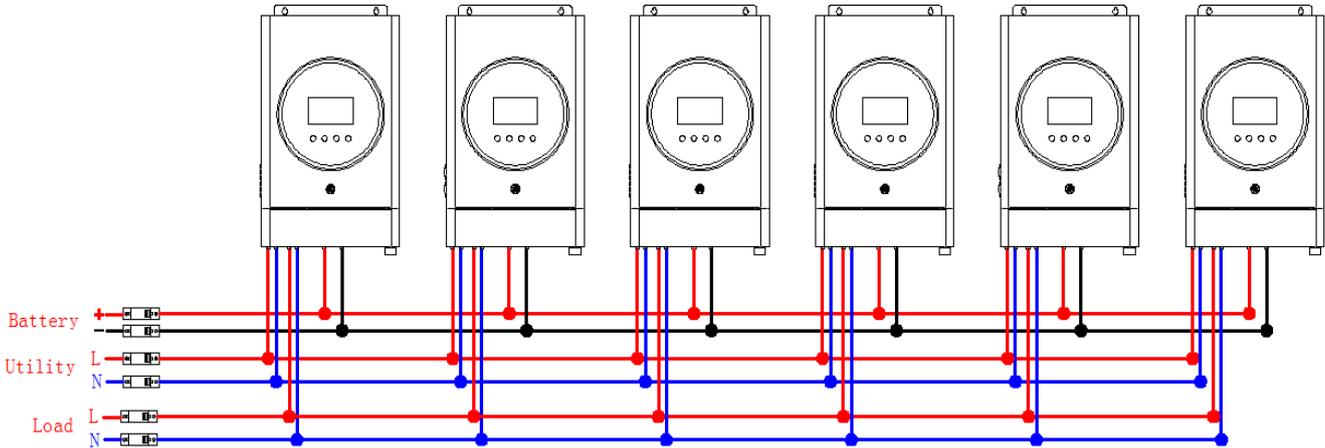
Communication Connection:



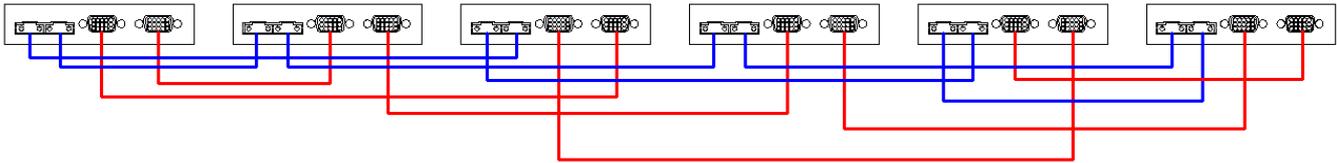
### 5. Six inverters in parallel :

Power Connection:

**NOTE:** The following picture only for your reference. It is subject to actual goods to be received.



Communication Connection:



## 5.4 Matters Needing Attention In Three-phase Parallel Operation

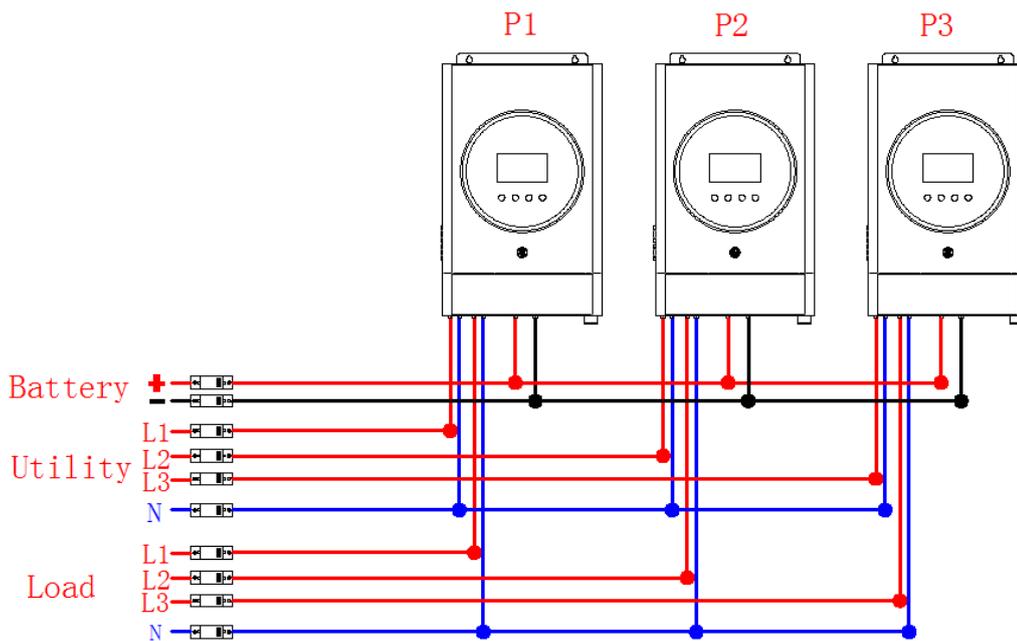
1. Parallel operation in Three phase with up to 6 units.
2. **WARNING:** It's required to connect battery for parallel operation, it is forbidden to use parallel without batteries
3. **WARNING:** It is forbidden for inverter to share the same solar panel group.
4. **WARNING:** Make sure all cables are of the same length, Otherwise, there will be voltage difference between inverter and battery to cause parallel inverters not working.
5. Set the parameters of each inverter independently (working mode, three-phase parallel function and set A/B/C phase sequence).  
**WARNING:** When working in parallel, the working mode of each inverter must be the same working mode, output frequency.
6. After setting the parameters, turn on each inverter in turn.
7. **WARNING:** When running in parallel, all inverters must share the battery pack.
8. **WARNING:** Do not connect the current sharing cable between the inverters which are in different phase. Otherwise ,it may damage inverters .

## 5.5 Three-phase Parallel Operation Cable Connection

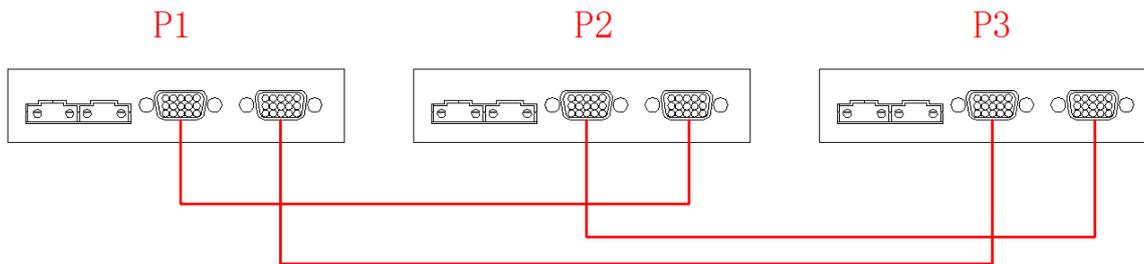
### 1. One inverters in each phase:

Power Connection:

**NOTE:** The following picture only for your reference. It is subject to actual goods to be received.



Communication Connection:

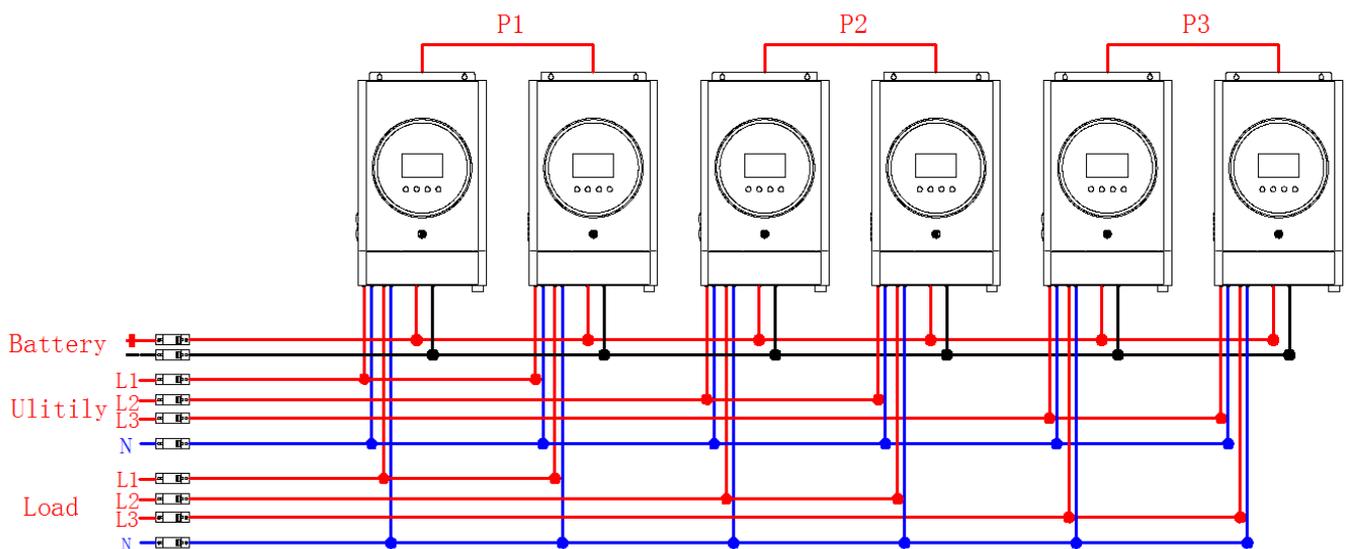


**NOTE:** P1: A-phase, P2: B-phase, P3: C-phase.

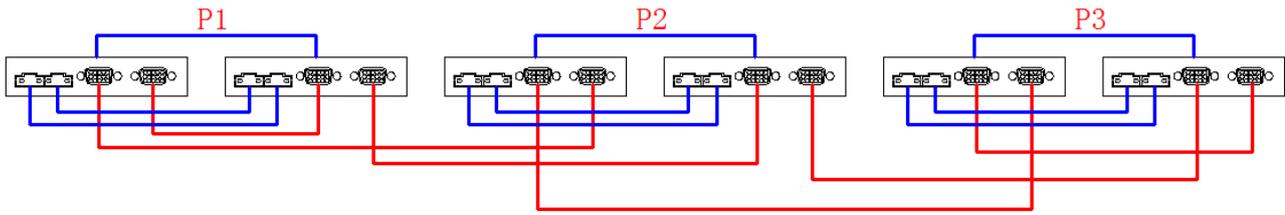
### 2. Two inverters in each phase:

Power Connection:

**NOTE:** The following picture only for your reference. It is subject to actual goods to be received.



Communication Connection:

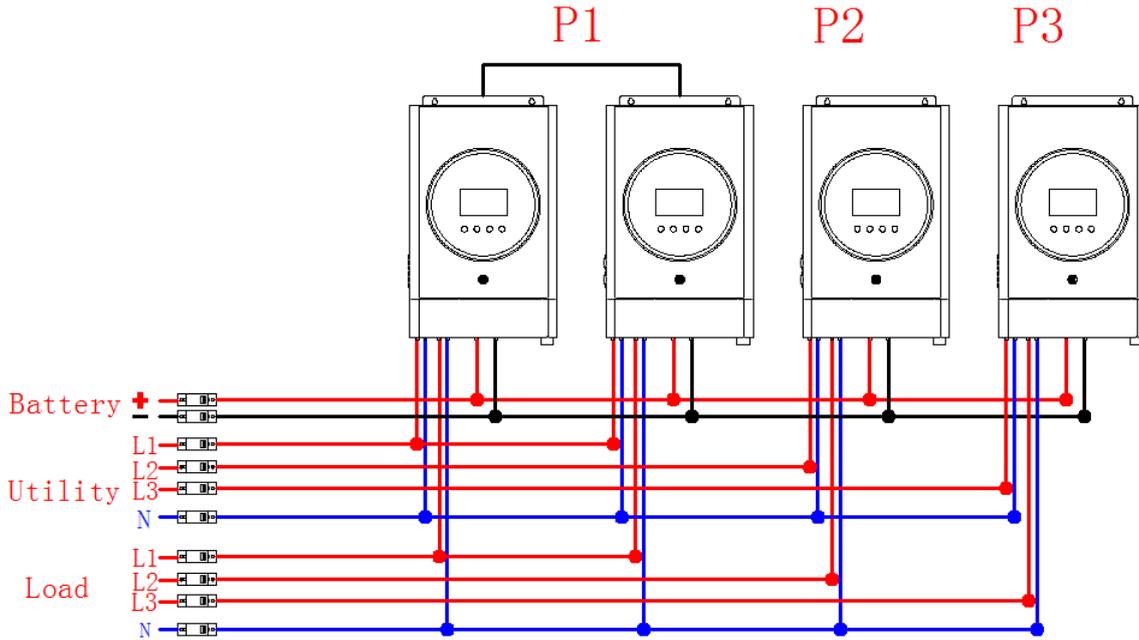


NOTE:P1: A-phase, P2: B-phase, P3: C-phase.

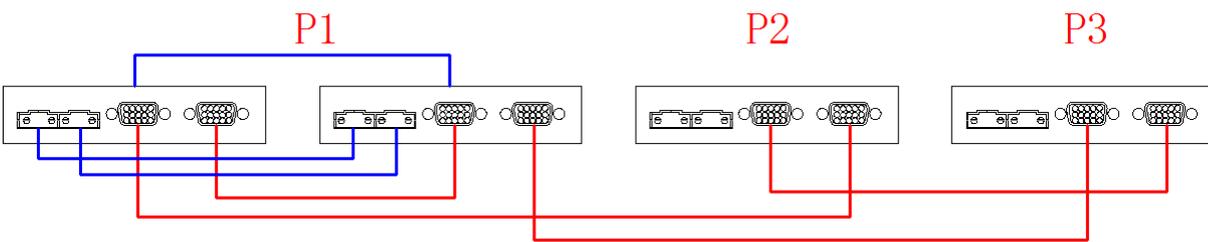
**3. Two inverters in one phase, one inverters in second phase and one inverter for the third phase:**

Power Connection:

**NOTE:** The following picture only for your reference. It is subject to actual goods to be received.



Communication Connection:

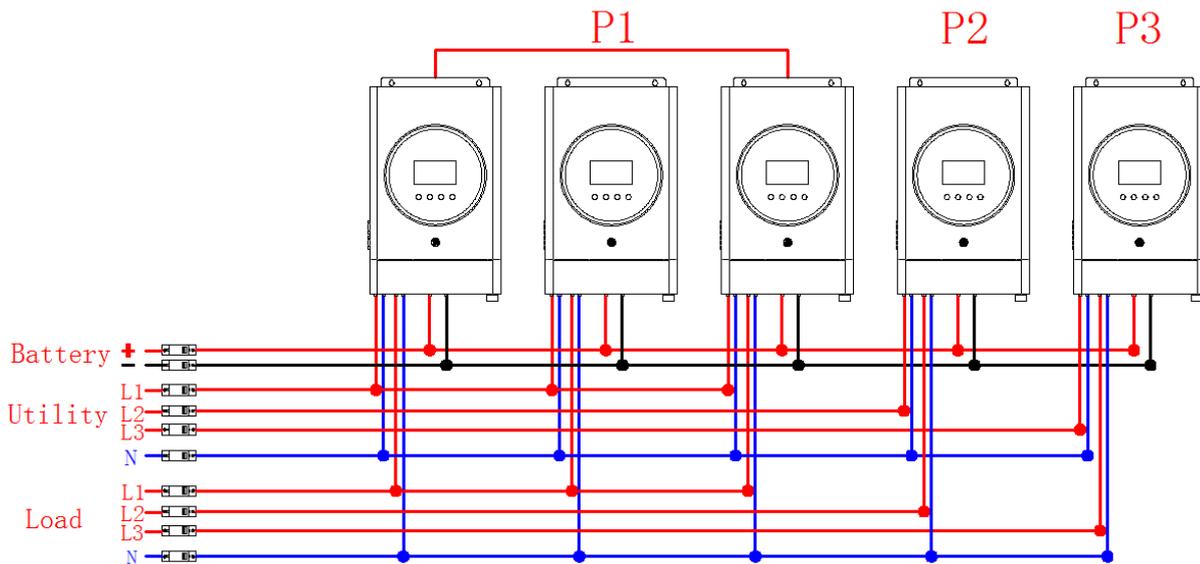


NOTE:P1: A-phase, P2: B-phase, P3: C-phase.

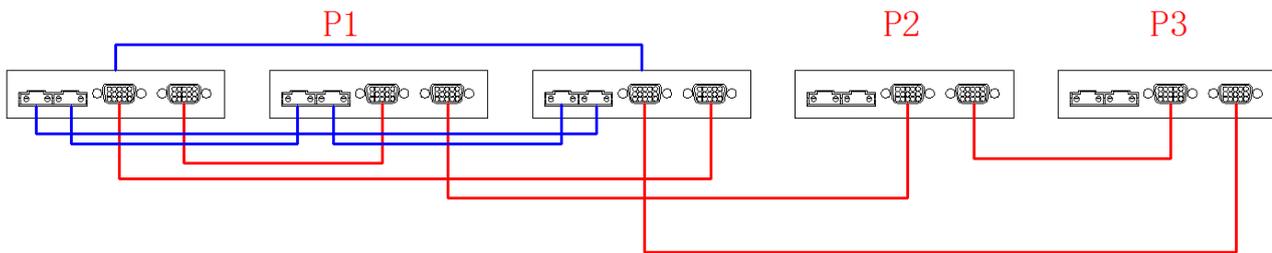
**4. Three inverters in one phase, one inverters in second phase and one inverter for the third phase:**

Power Connection:

**NOTE:** The following picture only for your reference. It is subject to actual goods to be received.



Communication Connection:

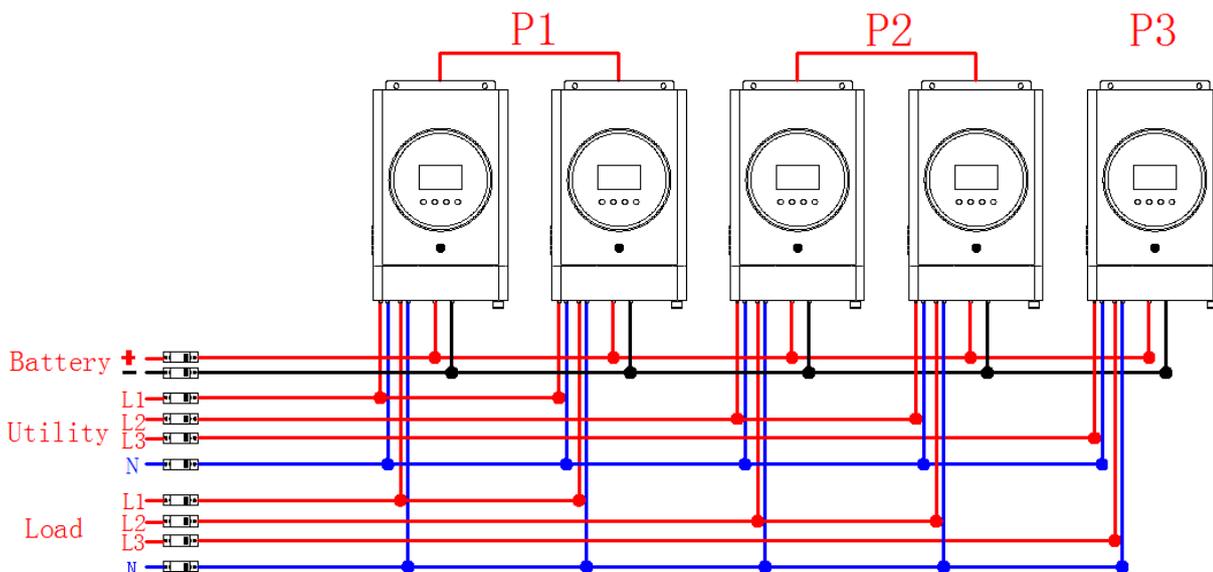


NOTE: P1: A-phase, P2: B-phase, P3: C-phase.

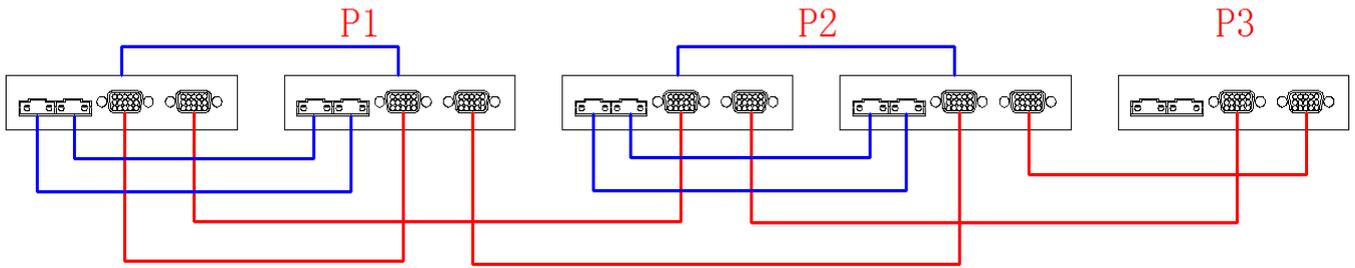
**5. Two inverters in one phase, two inverters in second phase and one inverter for the third phase:**

Power Connection:

NOTE: The following picture only for your reference. It is subject to actual goods to be received.



Communication Connection:

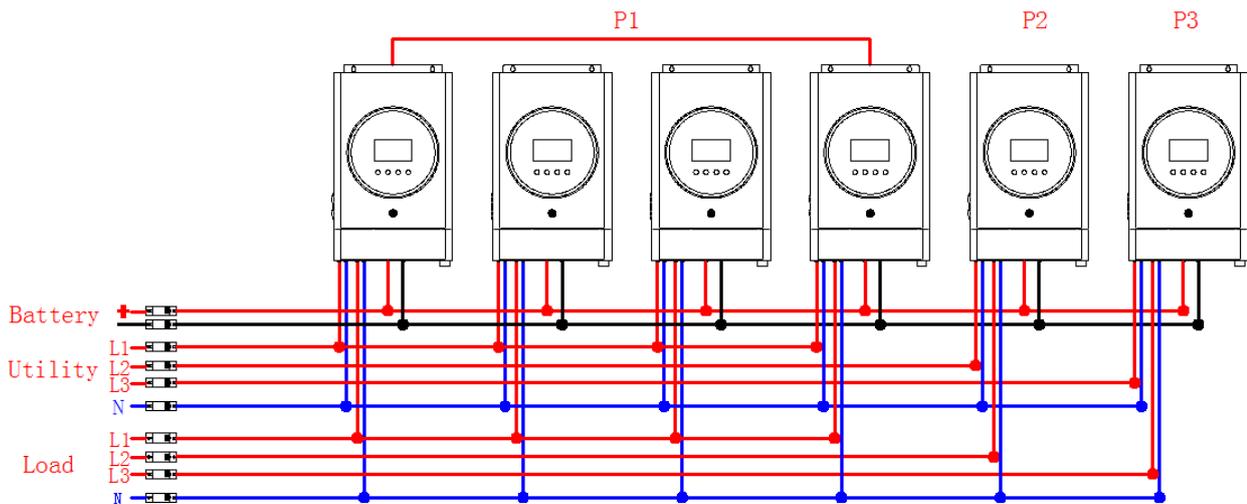


NOTE:P1: A-phase, P2: B-phase, P3: C-phase.

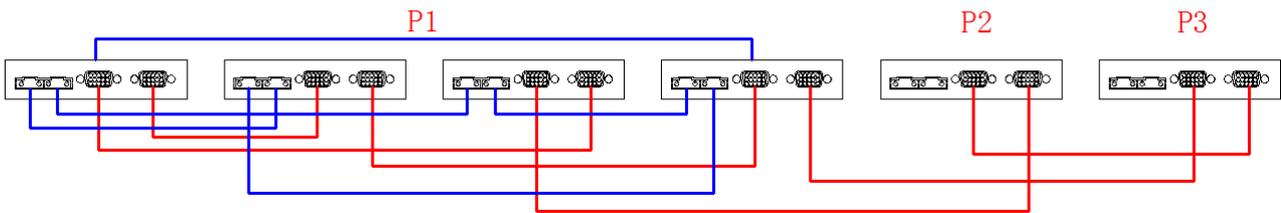
**6.Four inverters in one phase, one inverters in second phase and one inverter for the third phase:**

Power Connection:

**NOTE:** The following picture only for your reference. It is subject to actual goods to be received.



Communication Connection:

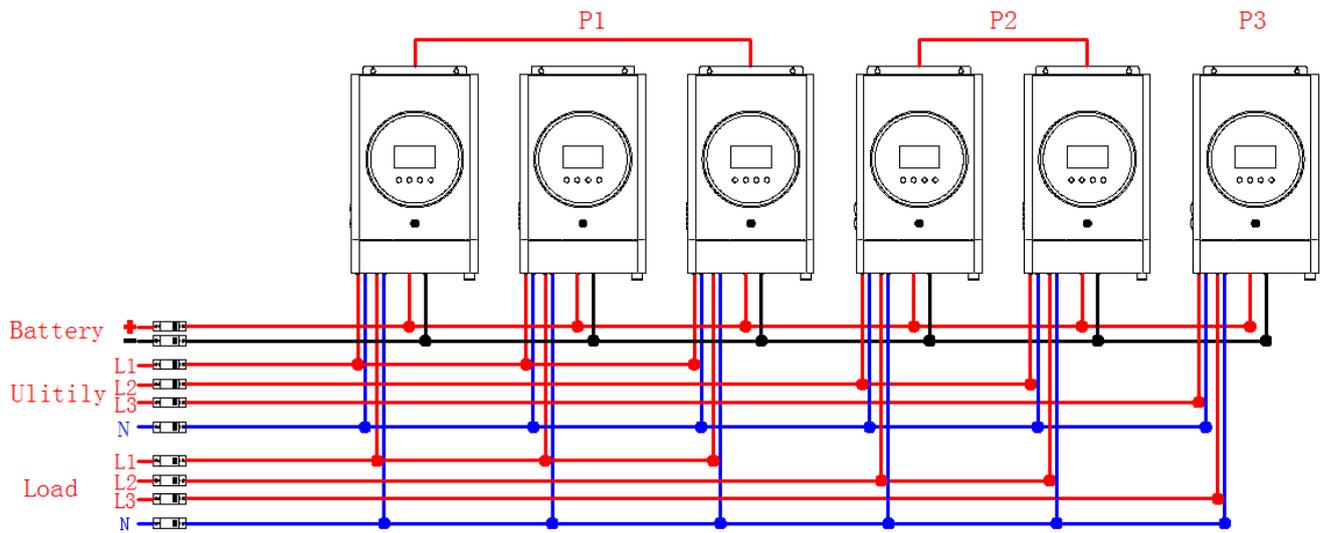


NOTE:P1: A-phase, P2: B-phase, P3: C-phase.

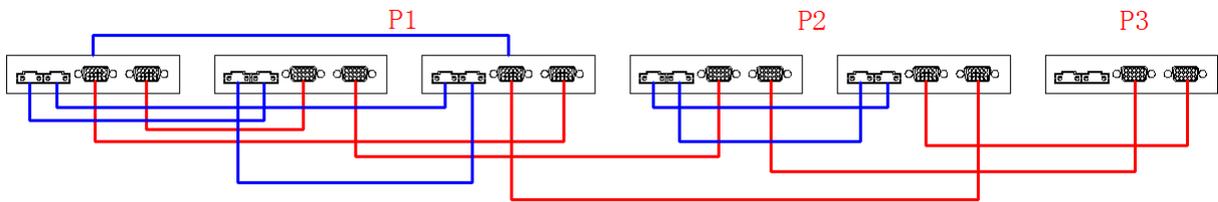
**7.Three inverters in one phase, two inverters in second phase and one inverter for the third phase:**

Power Connection:

**NOTE:** The following picture only for your reference. It is subject to actual goods to be received.



Communication Connection:



NOTE:P1: A-phase, P2: B-phase, P3: C-phase.

## 6. Faults Code

Fault Code	Fault Event
01	Fan is locked
02	Over temperature
03	Battery voltage is too high
04	Battery voltage is too low
05	Output short circuited.
06	Output voltage is too high.
07	Overload time out
08	Bus voltage is too high
09	Bus soft start failed
52	Bus voltage is too low
53	Inverter soft start failed
55	Over DC voltage in AC output
57	Current sensor failed
58	Output voltage is too low

## 7. Warning Code

Warning Code	Warning Event
01	Fan is locked
02	Over temperature
03	Battery is over-charged
04	Low battery
07	Overload
10	Output power derating
08	Discharge over current
15	PV energy is low
16	High AC input (>280VAC) during BUS soft start
21	PV low voltage
22	PV over voltage
24	PV over temperature

## 8. Parallel Faults Code

Fault Code	Fault Event
60	Power feedback protection
71	Firmware version inconsistent
72	Current sharing fault
73	Output voltage different
80	CAN fault
81	Host loss
82	Synchronization loss
83	Battery voltage detected different
84	AC input voltage and frequency detected different
85	AC output current unbalance
86	AC output mode setting is different

## 9. Trouble Shooting

Problem	LCD/LED/Buzzer	Possible cause	What to do
Unit shuts down automatically during start up process	LCD/LED and buzzer will be active then complete off	The battery voltage is too low	1.Re-charge battery. 2. Replace battery
No response after power on	No indication	1.The battery voltage is too low. 2. Internal fuse tripped	1.Contact repair center for replacing the fuse. 2. Re-charge battery. 3. Replace battery.
Mains exist but the unit works in battery mode	Input voltage is displayed as '0' on the LCD and green LED is flashing	Input protector is triggered	Check if AC breaker is turned on and AC wiring is connected well.
	LED is flashing	Insufficient quality of AC power(grid or generator )	1. Check if AC wires are too thin and/or too long. 2. Check if generator (if applied) is working well or if input voltage range setting is correct.
When the unit is turned on, internal relay is switched on and off repeatedly	LCD display and LED flashing	Set "Solar First" as the priority of output source.	Change output source priority to utility first.
Buzzer beeps continuously and red LED is on	warn code 01	Fan fault	Replace the fan
	Fault code 02	Internal temperature of inverter component is over 85°C	Check whether the environment around the equipment well ventilated
	Fault code 03	The battery voltage is too high	Check if spec and quantity of batteries meet requirements
		battery is over charged	Return to repair center
	Fault code 04	The battery voltage is too low	1.The battery is dead, please charge the battery immediately 2.Check the battery if damage
	Fault code 05	Output short circuited	1.Check that the output cable is connected 2.Return to the maintenance center
	Fault code 06/58	Output abnormal (Inverter voltage range 180-260VAC)	Return to the maintenance center
	Fault code 07	Overload error , the inverter is overload 110% and overload time reaches the upper limit	Reduce load

Buzzer beeps continuously and red LED is on	Fault code 08/09/12/53/57	Internal fault of inverter	Return to the maintenance center
	Fault code 10	Over current or surge	Remove abnormal load or check PV input
	Fault code 11	The configuration of the solar panel is higher than the PV input voltage required by the inverter	Remove the excess solar panels
	Warn code 08	Battery discharge over current	Please check whether the discharge current of Item 41 is lower than the discharge current of the inverter
	Fault code 52/55	Internal fault of inverter	Return to the maintenance center
	Fault code 60	Power feedback protection	1.Restart the inverter. 2.Check if L/N cables are not connected reversely in all inverters. 3.For parallel system in single phase ,make sure the sharing are connected in all inverters. for supporting three-phase system, make sure the sharing cables are connected in the inverters in the same phase. and disconnected in the inverters in different phase.
	Fault code 71	Firmware version inconsistent	1.Update all inverter firmware to the same version 2.If the problem remains ,please contact your installer.
	Fault code 72	The output current of each inverter is different	1.check if sharing cables are connected well and restart the inverter. 2.if the problem remains ,please contact your installer.
	Fault code 73	AC output voltage setting is different	Check whether the output voltage of each inverter are set the same

Buzzer beeps continuously and red LED is on	Fault code 80	CAN data loss	1.Check if communication cables are connected well and restart the inverter 2. If the problem remains, please contact your installer.
	Fault code 81	Host data loss(only for three-phase parallel)	
	Fault code 82	Synchronization data loss	
	Fault code 83	The battery voltage of each inverter is not the same.	1.Make sure all inverters share same groups of batteries together. 2. Remove all loads and disconnect AC input and PV input. Then, check battery voltage of all inverters. If the values from all inverters are close, please check if all battery cables are the same length and same material type. Otherwise, please contact your installer to provide SOP to calibrate battery voltage of each inverter. 3.If the problem still remains, please contact your installer.
	Fault code 84	AC input voltage and frequency detected different	Check whether the input voltage and frequency of each inverter are set the same
	Fault code 85	AC output current unbalance	1.Restart the inverter 2.Remove some excessive loads and re-check load information from LCD of inverters. If the values are different, please check if AC input and output cables are in the same length and material type.
	Fault code 86	AC output mode setting is different.	1.Check whether it is set to parallel mode 2. Return to the maintenance center

## 10. Specifications

### Table 1 Line Mode Specifications

MODEL	3.6KW	5.6KW
Input Voltage Waveform	Sinusoidal (utility or generator)	
Nominal Input Voltage	230Vac	
Low Loss Voltage	170Vac $\pm$ 7V (narrow range); 90Vac $\pm$ 7V (wide range)	
Low Loss Return Voltage	180Vac $\pm$ 7V (narrow range); 100Vac $\pm$ 7V (wide range)	
High Loss Voltage	280Vac $\pm$ 7V	
High Loss Return Voltage	270Vac $\pm$ 7V	
Max AC Input Voltage	300Vac	
Nominal Input Frequency	50Hz / 60Hz (Auto detection)	
Low Loss Frequency	40 $\pm$ 1Hz	
Low Loss Return Frequency	42 $\pm$ 1Hz	
High Loss Frequency	65 $\pm$ 1Hz	
High Loss Return Frequency	63 $\pm$ 1Hz	
Output Short Circuit Protection	Circuit Breaker	
Max. Efficiency (Line Mode)	>95% ( Rated R load, battery full charged )	
Transfer Time	10ms typical (narrow range); 20ms typical (wide range)	
Output power derating: When AC input voltage drops to 170V, the output power will be derated.	<p>Output Power</p> <p>Rated Power</p> <p>50% Power</p> <p>90V 170V 280V Input Voltage</p>	

**Table 2 Inverter Mode Specifications**

MODEL	3.6KW	5.6KW
Rated Output Power	3600W	5600W
Output Voltage Waveform	Pure Sine Wave	
Output Voltage Range	230Vac±5%	
Output Frequency	50Hz	
Max. Peak Efficiency	93%	
Overload Protection	5s@≥150% load; 10s@110%~150% load	
Surge Capacity	2* rated power for 5 seconds	
Nominal DC Input Voltage	24Vdc	48Vdc
Cold Start Voltage	23.0Vdc	46.0Vdc
Low DC Warning Voltage		
@ load < 50%	23.0Vdc	46.0Vdc
@ load ≥ 50%	22.0Vdc	44.0Vdc
Low DC Warning Return Voltage		
@ load < 50%	23.5Vdc	47.0Vdc
@ load ≥ 50%	23.0Vdc	46.0Vdc
Low DC Cut-off Voltage		
@ load < 50%	21.5Vdc	43.0Vdc
@ load ≥ 50%	21.0Vdc	42.0Vdc
High DC Cut-off Voltage	31Vdc	62Vdc

**Table 3 Charge Mode Specifications**

INVERTER MODEL		3.6KW	5.6KW
Charging Algorithm		3-Step	
Utility Charging Mode			
AC Max. Charging Current		2/10/20/30/40/50/60/70A/80Amp (@VI/P =230Vac)	
Bulk Charging Voltage	Flooded Battery	29.2VDC	58.4VDC
	AGM / Gel Battery	28.2VDC	56.4VDC
Floating Charging Voltage		27.0VDC	54.0VDC
Charging Curve			
Solar input			
Model		3.6KW	5.6KW
PV Input Max. Power		5500W	
Max. charging current(Solar+AC)		100A	
Nominal PV Voltage		360Vdc	
Start-up Voltage		150Vdc +/- 10Vdc	
PV Array MPPT Voltage Range		120-450VDC	
Max. PV Array Open Circuit Voltage		450Vdc	
PV Max input current		18A	

**Table 4 General Specifications**

MODEL	3.6KW	5.6KW
Operating Temperature Range	-10°C to 50°C	
Storage temperature	-15°C~ 60°C	
Humidity	5% to 95% Relative Humidity (Non-condensing)	
Dimension (L*W*H), mm	500x 302 x 133	
Net Weight, kg	10	12
Gross weight, kg	12	14

# 11. Installation Dimension Drawing

Unit: mm

