

USER MANUAL

HYBRID SOLAR INVERTER

15KW-30KW



FOR SOLAR OFF-GRID SYSTEM

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Chapter 1 Safety Precautions

Operational Safety

1. Please read "Safety Precautions" carefully before using this product to ensure correct and safe use. Please keep this manual in a safe place.
2. When operating, please pay attention to all warning signs and operate as required.
3. Do not use the device in direct sunlight, rain or moisture environment.
4. This equipment cannot be installed near heat source areas, or near electric heaters, furnaces, etc.
5. When placing the inverter, keep a safe distance around it, ensure ventilation and heat dissipation and product maintenance. Please refer to this manual when installing.
6. When cleaning, use a dry, non-conductive item to wipe.
7. In the event of a fire, please use a dry power fire extinguisher for fire fighting. Do not use liquid fire extinguishers.
8. Please consider the position-to-machine and battery pack load-bearing capacity before installation.
9. Before using the device, please ensure that the load power matches the rated power of the inverter and the battery specifications.

Prohibited Matter

1. There is high voltage inside the power supply equipment, not the company or a technician who is not authorized by the company, Do not open the lid without authorization, otherwise there is a danger of electric shock and loss of warranty.
2. Before applying to the following load equipment, please discuss with the dealer in advance; its application, setup, management and maintenance must have special considerations and design:
 - A. Precision industrial, scientific and medical instruments and equipment;
 - B. Elevators and other equipment that may endanger personal safety;
 - C. Starting a load device with a large current and generating negative work;
3. Do not place the battery in a fire to avoid explosion.

Electrical Safety

1. Before powering up, please confirm that it is properly grounded and check the correctness of the distribution line and battery polarity.
2. The battery protection device must be equipped with an overcurrent protection circuit breaker of the rated specification.
3. When the inverter needs to be moved or re-wired, it must be ensured that the inverter is completely shut down and the input breaker and battery switch are disconnected, otherwise the output may still be charged and there is a danger of electric shock.
4. Before connecting the inverter, the client must install a four-pole overcurrent protection device with rated value in the power distribution system to disconnect all input lines to prevent electric shock.

Battery Safety

1. The life of the battery is shortened as the ambient temperature increases. Regular battery replacement ensures that the inverter is working properly and that sufficient backup time is guaranteed.
2. Battery replacement and maintenance should only be carried out by authorized personnel with battery expertise. The same type and model of battery must be used and must be the same quantity.
3. There is a danger of electric shock and short current in the battery. To avoid electric shock and injury, please observe the following warnings when replacing the battery:
 - A. Do not wear watches, rings or similar metal objects;
 - B. Use insulated tools;
 - C. Wear rubber shoes and gloves;
 - D. Do not place metal tools or similar metal parts on the battery;
 - E. Disconnect the load connected to the battery before removing the battery connection terminal.
4. It is strictly forbidden to expose the battery to fire to avoid explosion and endanger personal safety.
5. Non-professionals should not open or damage the battery, because the electrolyte in the battery contains dangerous substances such as strong acid, which can cause damage to the skin and eyes. If you accidentally come into contact with the electrolyte, immediately wash it with plenty of water and go to the hospital for examination.
6. Do not short-circuit the positive and negative terminals of the battery. Over-current protection must be installed in the battery box to prevent fire or electric shock.

Use And Maintenance

1. The use environment and storage methods have an impact on the service life and reliability of this product. Therefore, please be careful not to use it in the following working environments:
 - A. High, low temperature and humidity places that exceed the technical specifications (temperature 0-55 °C, relative humidity 0-95%, No condensation);
 - B. Locations that are subject to vibration and are subject to collision;
 - C. Locations with metallic dust, corrosive substances, salt and flammable gases.
2. If not used for a long time, the inverter (without battery) must be stored in a dry environment with a storage temperature range of 0-55 °C. Before the inverter is turned on, the ambient temperature must be warmed to above 0 °C for more than 2 hours.
3. Please keep the inlet and exhaust holes open. Poor ventilation of the inlet and exhaust holes can cause the temperature inside the inverter to rise, shortening the life of components in the machine, which will affect the life of the machine.
4. When the battery is not used for a long time, the battery needs to be charged once if it has not been charged for three consecutive months.


Chapter 2 Installation

Unpacking Inspection

1. Open the Package ,it should be include:

- 1) One unit Inverter
- 2) Communication Wire(optional)
- 3) External display (optional)
- 4) User manual

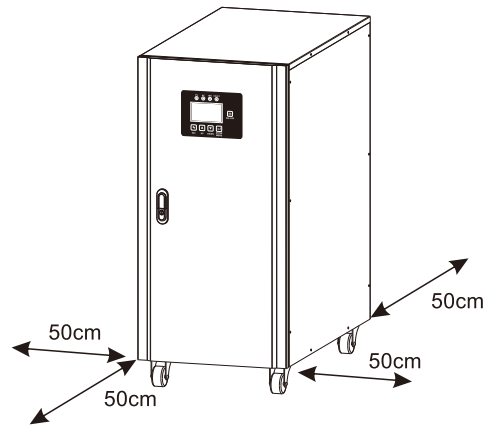
2. Before opening the inverter package, please check if the inverter is damaged during transportation. If it is found damaged or missing parts, do not turn it on. Contact the carrier or dealer immediately.


 **Recycling:** The packaging material is reusable, please keep the packaging material for future use.

Installation Requirements

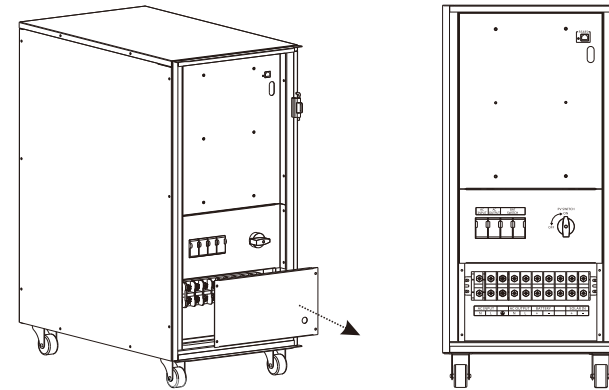
1.Installation of the inverter must be performed by personnel with electrical safety knowledge.

- No objects can be placed on the top of the inverter.
- The installation location must match the size of the inverter.
- Do not install the inverter on a building constructed of flammable or heat-resistant materials.
- Install the inverter in a head-up orientation for easy inspection of the LCD display and maintenance work.
- It is not recommended to expose the inverter directly to strong sunlight.
- The humidity of the installation environment should be between 0 and 95% (non-condensing).
- The ambient temperature around the inverter should be between 0 °C and 55 °C.
- Sufficient space for maintenance must be prepared directly in front of and above the equipment,as shown:



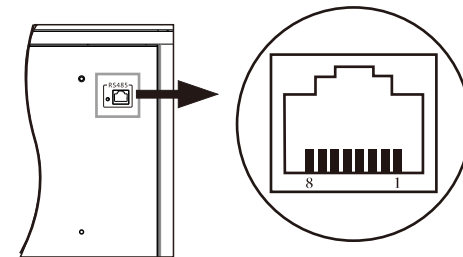
 It is only suitable for installation on the ground or other non-combustible surfaces.

Product Overview



Cable Connection

Device side - female connector



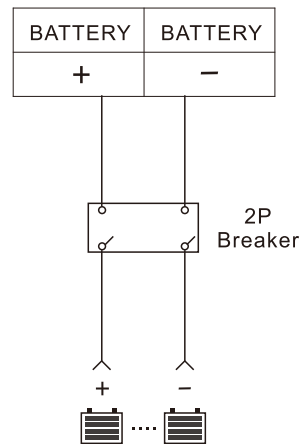
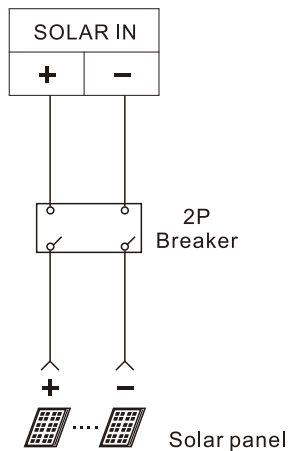
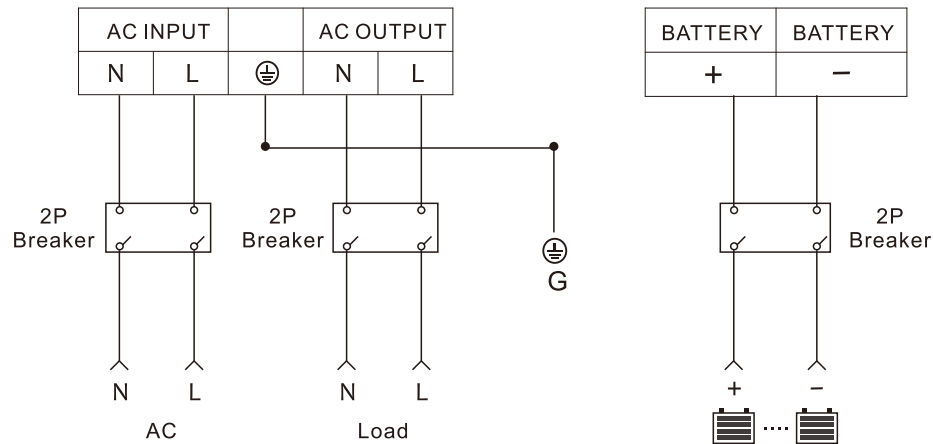
Pin on Rj45	Name	Description
1	A	Generator terminal 0
2	B	Generator terminal 1
8	GND	Signal and optional Power Supply common

Inverter Circuit Diagram

The machine with relatively high power is connected to the mains input and load output through the terminal block. The load output is output in addition to the terminal block mode.

Caveat! ! Please do not connect the output line to the "AC" terminal, and do not connect the AC to the "load" terminal.

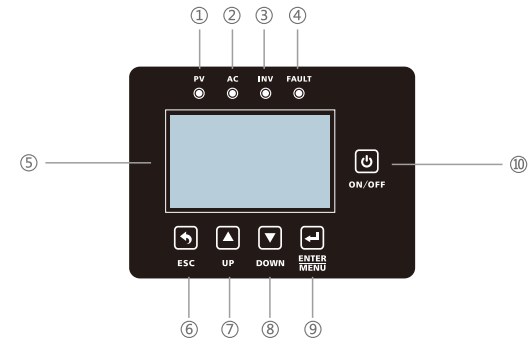
1.AC input and output load connection



Chapter 3 Operating

Screen Control Function

LCD screen is an interface used for man-machine interaction, which can be used for visual operation through LCD screen, which provides a friendly interface for functions such as turn on, turn off, state display, fault alarm, parameter setting, and so on. After installation, the user can complete all operations through the LCD screen. The LCD screen includes three parts: status indicator, LCD display screen, and navigation key. The following table describes the status indicator and the navigation button respectively.



• Indicator status

Identification	Indicator light name	Status
①	PV	PV Normal
②	AC	AC Normal
③	Inverter	Battery inverter power supply
④	Fault/Warning	Warning/work abnormal

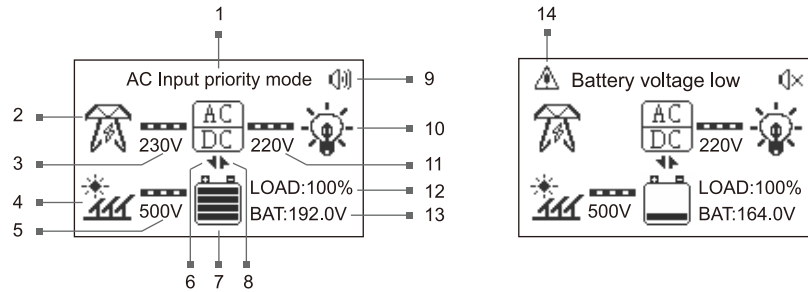
• LCD Display—⑤ : Detailed display information

• Navigation keys: selection, opening, obtaining information, modifying system parameters, etc.

Identification	Navigation keys	Function
⑥	Return	Return to the previous interface menu or exit the settings interface (do not save the settings)
⑦	UP	Page turning; switching options; adding settings value
⑧	Down	Page turning; switching options; minus setting values
⑨	Confirm	Press and hold for 5 seconds to enter the setting interface; short press to confirm save or set to enter the setting submenu
⑩	Turn On/Off	Turn on or turn off the inverter

Main Interface Description

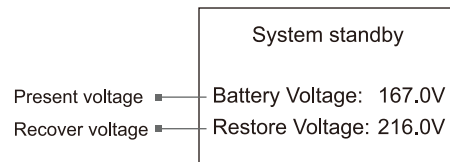
The main interface description is as shown.



NO.	Description	NO.	Description
1	System Mode	8	Battery Inverter
2	AC	9	Alarm Status
3	AC Input Voltage	10	Load
4	PV	11	Output Voltage
5	PV Input Voltage	12	Load Capacity
6	AC Charging	13	Battery Voltage
7	Battery	14	Fault Info

System Standby

In the unattended mode, the battery voltage will be too low to enter the system standby.



Main Interface

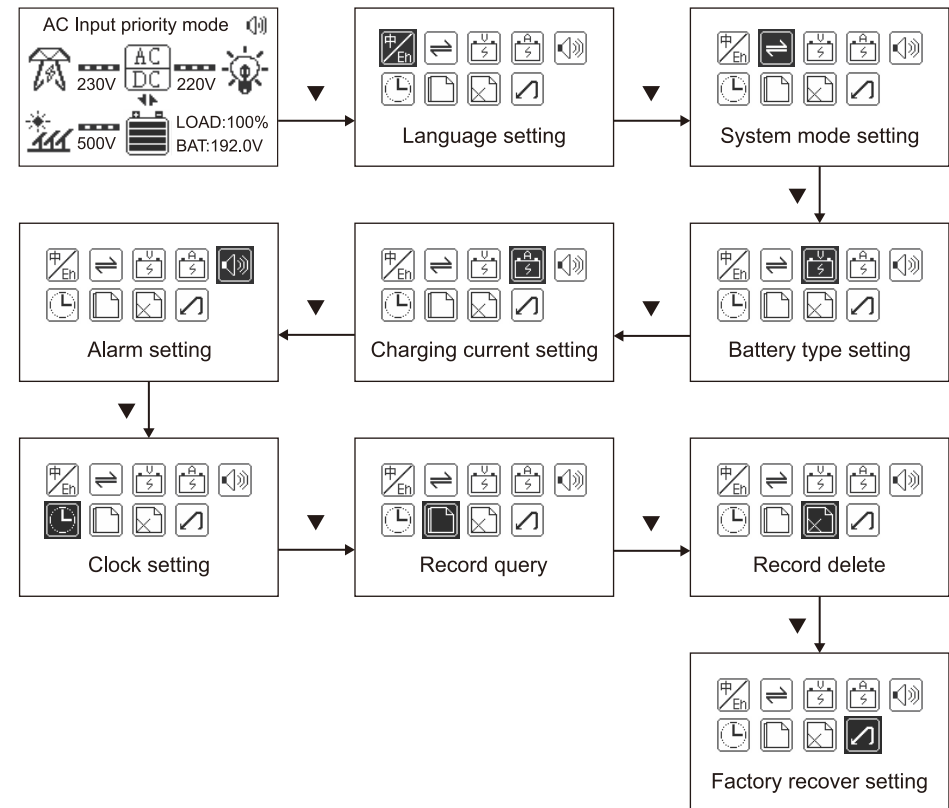
In the default main interface, press the "UP" or "DOWN" button to scroll through the pages. Under the main page, long press the back and down keys to restore the factory settings.

Icon	Parameter Interface	LCD display
①	AC Input Parameter	<div style="border: 1px dashed black; padding: 5px;"> <p style="text-align: center;">AC Input parameter</p> <p>Voltage: 222V</p> <p>Freq: 50Hz</p> <p>Status: AC input normal</p> </div>
②	PV Parameter	<div style="border: 1px dashed black; padding: 5px;"> <p style="text-align: center;">PV Parameter</p> <p>PV Voltage: 500V</p> <p>PV Current: 100A</p> <p>PV Status: PV loss</p> </div>
③	Energy Parameter	<div style="border: 1px dashed black; padding: 5px;"> <p style="text-align: center;">Energy Parameter</p> <p>Daily Energy: 744Wh</p> <p>Total Energy: 4.859KWh</p> </div>
④	Daily Energy MAX:00.00Wh(Recorded the highest power generation value for a day)	<div style="border: 1px dashed black; padding: 5px;"> <p style="text-align: center;">Daily Energy MAX: 53</p> </div>

Icon	Parameter Interface	LCD display
⑤	Battery Parameter	<div style="border: 1px dashed black; padding: 5px;"> <p style="text-align: center;">Battery parameter</p> <p>Battery Voltage: 218.4V Battery Capacity 100% Charging Voltage : 219.2V</p> </div>
⑥	Output Parameter	<div style="border: 1px dashed black; padding: 5px;"> <p style="text-align: center;">Output Parameter</p> <p>Voltage: 222V Freq: 50Hz Status: Output off</p> </div>
⑦	System Information	<div style="border: 1px dashed black; padding: 5px;"> <p style="text-align: center;">System Information</p> <p>2021-06-19 08:57:00 Hardware Version: 1.00 Software Version: 1.00</p> </div>

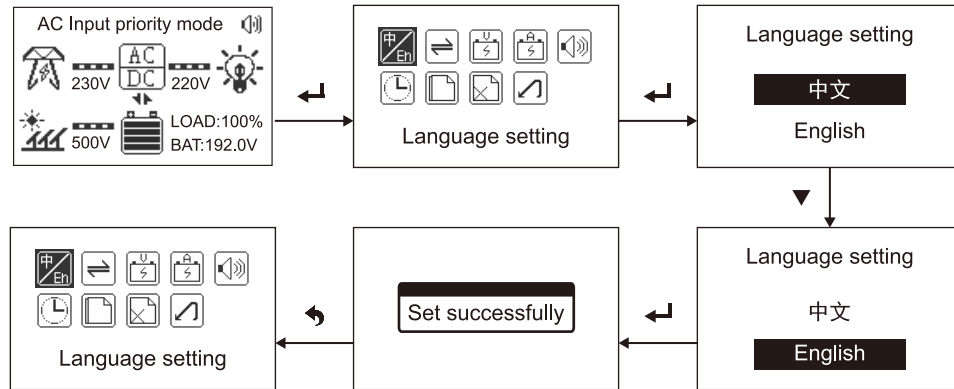
Mode Introduction

In the default main interface, long press the “ENTER” for 5 seconds to enter the setup menu, press “DOWN” to scroll through the submenus. Set to battery priority mode, the default charge is off, you need to charge to the current settings page.



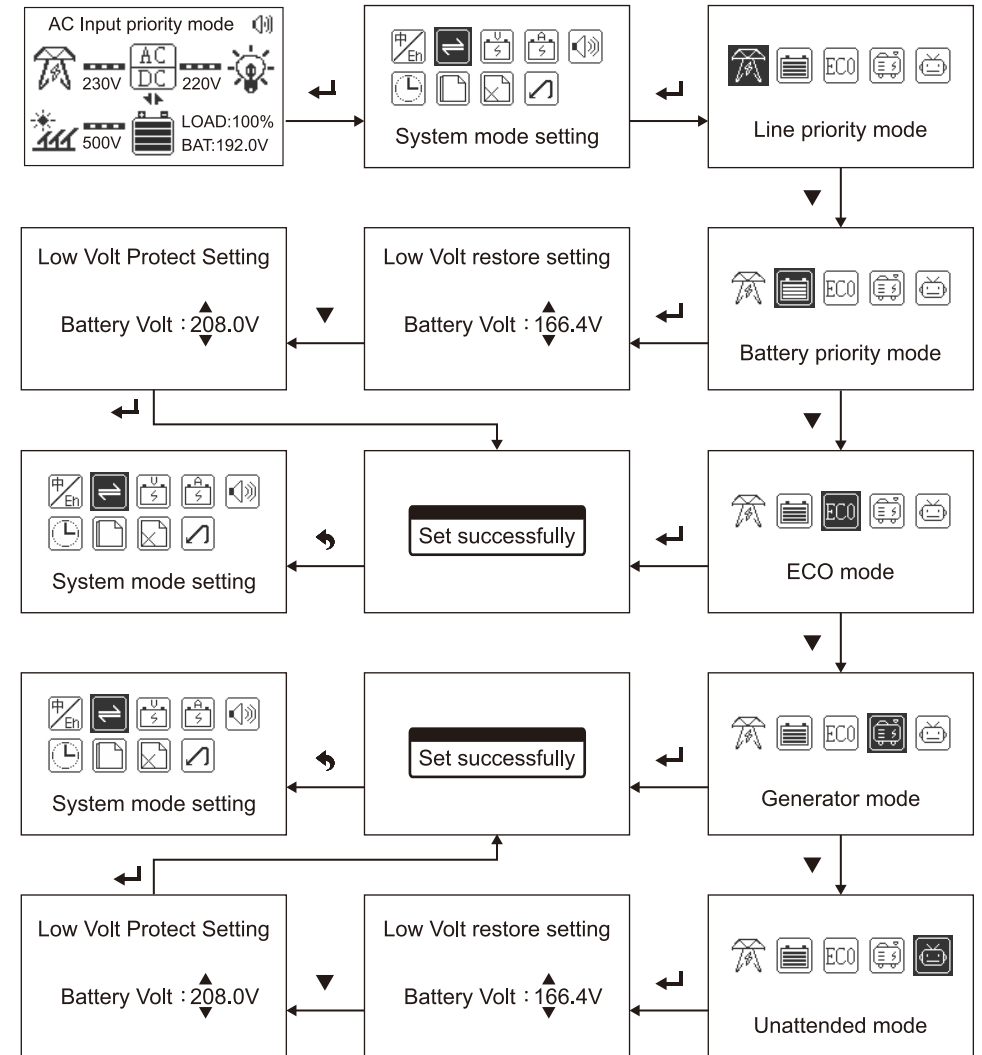
Language Setting

In the default main interface, long press the "ENTER" for 5 seconds to enter the setup menu, press "DOWN" to select the language setting and press the "ENTER" to confirm, press the "ESC" to return to the menu or wait after the pop-up is successful. 2 seconds automatically returns to the menu.



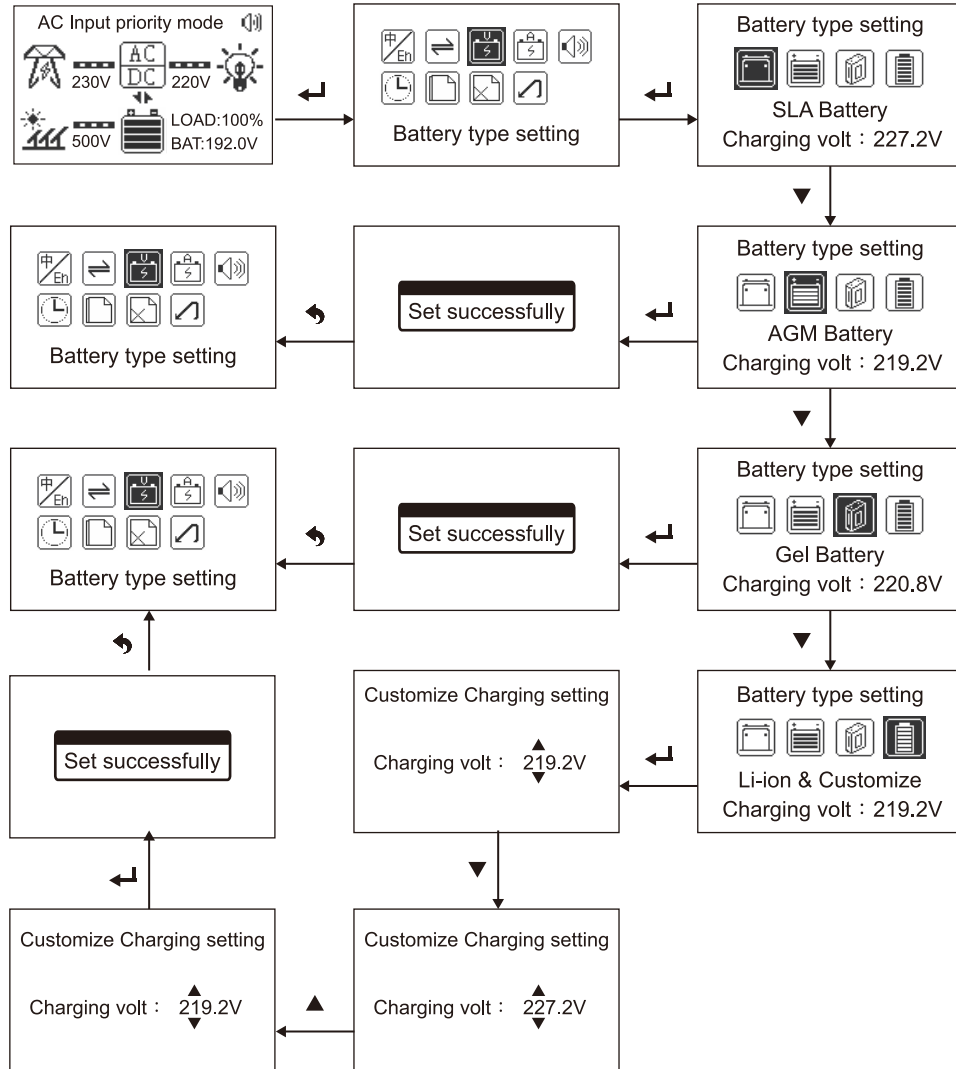
System Mode Setting

In the default main interface, long press the "ENTER" for 5 seconds to enter the setup menu, press the "DOWN" to select the system mode setting and press the "ENTER" to confirm, enter the mode selection press "DOWN" to select the option, pop-up settings After success, press the "ESC" to return to the menu or wait for 2 seconds to automatically return to the menu.



Battery Type Setting

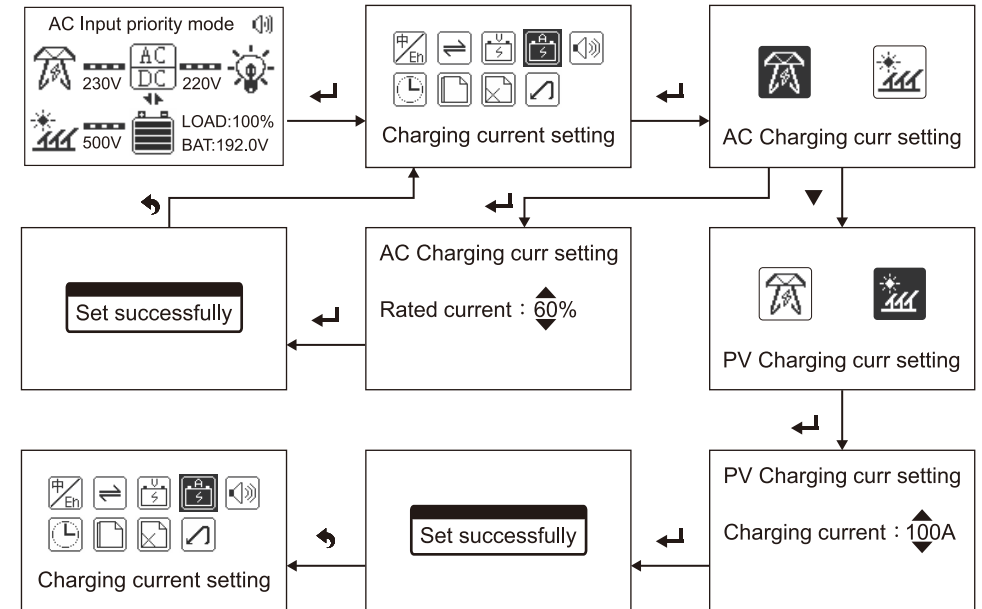
In the default main interface, the long press "ENTER" 5 seconds into the settings menu, press "DOWN" to select battery type settings and then press "ENTER" confirmation, enter mode select press "DOWN" selection option, Press "ESC" to return to menu or wait for 2 seconds to automatically return to menu.



System Mode Setting

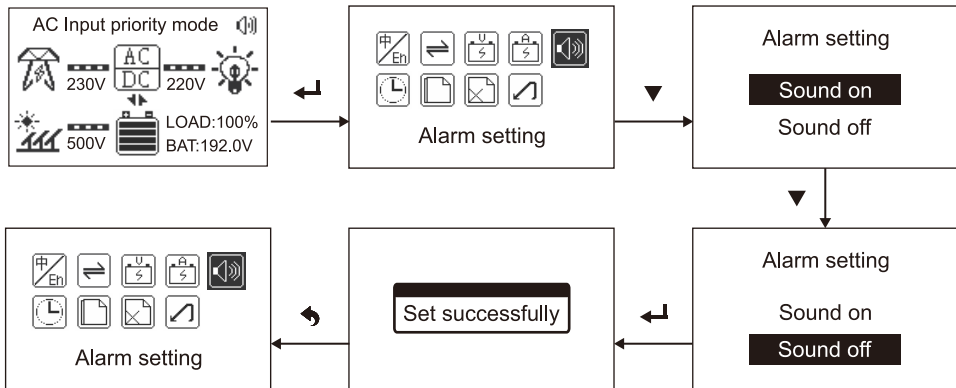
In the default main interface, long press the "ENTER" for five seconds to enter the setup menu, press the "DOWN" to select the charging current setting and press the "ENTER" to confirm, press the "DOWN" to modify the value, confirm the value and press to "ENTER", press the "ESC" to return to the menu after the pop-up setting is successful or wait for 2 seconds to automatically return to the menu.

(Note: setting the value to 0% will turn off the charging function)



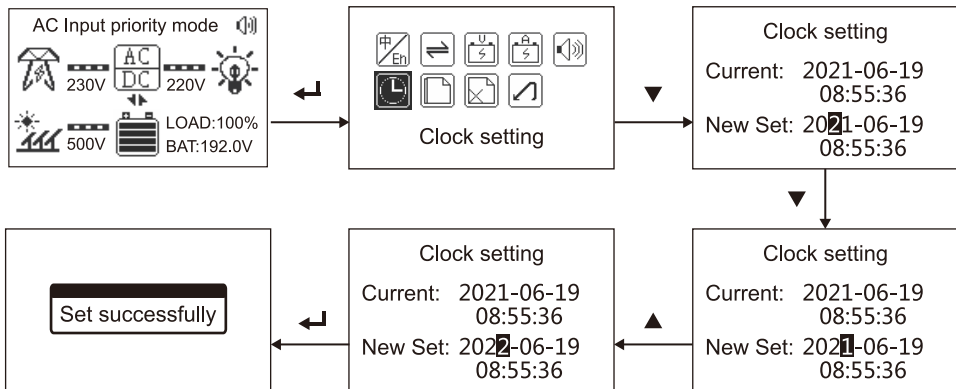
Alarm Setting

In the default main interface, long press the "ENTER" for five seconds to enter the setup menu, press the "DOWN" to select the alarm tone setting and press the "ENTER" to confirm, press the "ESC" to return to the menu or Wait 2 seconds to automatically return to the menu.



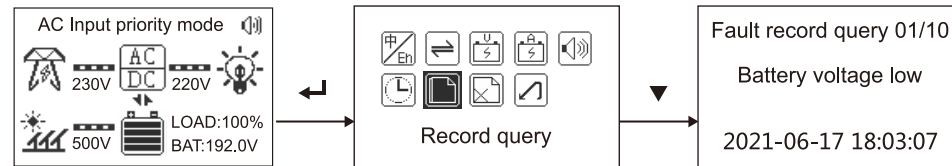
Clock Setting

In the default main interface, long press the "ENTER" for five seconds to enter the setup menu, press the "DOWN" to select the clock setting and press the "ENTER" to confirm, press the "ESC" to return to the menu or Wait 2 seconds to automatically return to the menu.



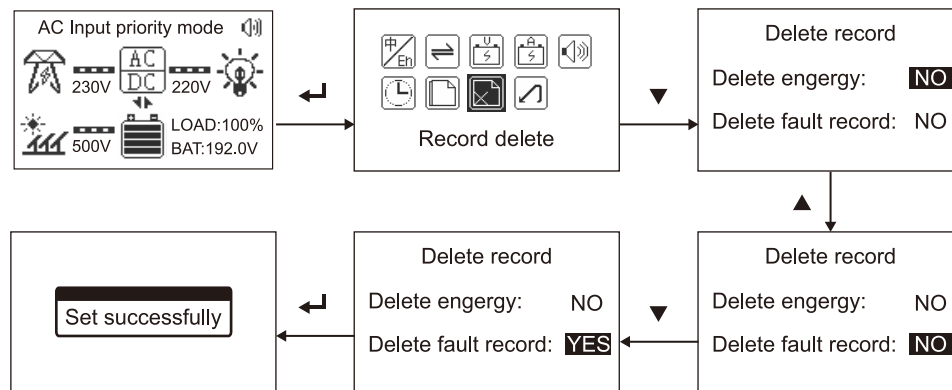
Record Query

In the default main interface, the long press "ENTER" 5 seconds into the settings menu, press "DOWN" to select record query and then press "ENTER" confirmation, Press "ESC" to return to menu or wait for 2 seconds to automatically return to menu.



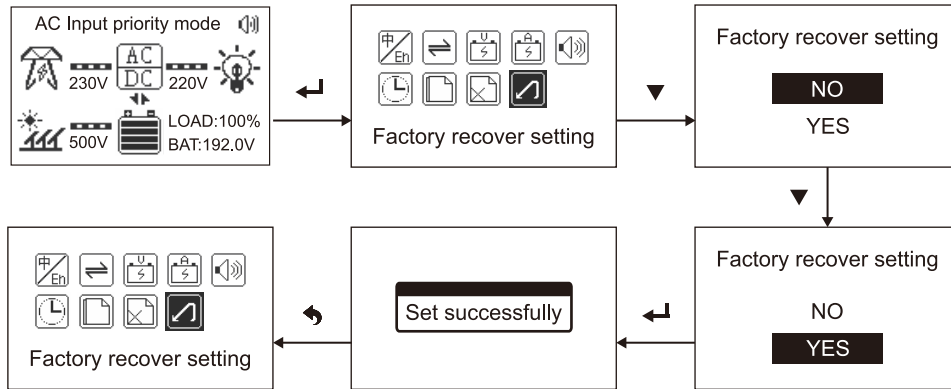
Record Delete

In the default main interface, the long press "ENTER" 5 seconds into the settings menu, press "DOWN" to select record query and then press "ENTER" confirmation, Press "ESC" to return to menu or wait for 2 seconds to automatically return to menu.



Factory Recover Setting

In the default main interface, long press the "ENTER" for five seconds to enter the setup menu, press the "DOWN" to select the factory recover setting and press the "ENTER" to confirm, press the "ESC" to return to the menu or Wait 2 seconds to automatically return to the menu.



Chapter 4 Trouble Shooting

When the inverter is not working properly, we recommend the following solutions to eliminate common faults. The table below helps the technician understand the problem and take action.

Problem	LCD/LED/Buzzer	Explanation / Possible cause	What to do
Unit shuts down automatically	No indication or buzzer beeps continuously and red LED is on	The battery voltage is too low	1. Re-charge battery. 2. Replace battery.
Fan stop or slow running	No indication	Fan intelligent speed regulation or fan fault	1. A rise in temperature or load capacity will increase the running speed. 2. Replace the fan.
Output turns on for 1 second and then stops, repeating	ECO mode	This mode shuts off output when the load is less than 5%	1.The load > 5% will run continuously. 2.Change mode settings.
No response after power on	No indication	1. The battery voltage is far too low. 2. Battery polarity is connected reversed.	1. Check if batteries and the wiring are connected well. 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	Input protector is tripped	Check if AC breaker is tripped and AC wiring is connected well.
	Input voltage is displayed in the normal range on the LCD	Insufficient quality of AC power. (Shore or Generator)	1. Check if AC wires are too thin and/or too long. 2. Check if generator (if applied) is working well or The input frequency is unstable or out of range.
	Green LED is lighten	Set "Battery priority mode" as the system mode	System mode is not set to "Battery priority mode".
Buzzer beeps continuously and red LED is on	Over current	Over current or surge	Reduce the connected load ,Restart the unit, if the error happens again, please return to repair center.
	Output short	Output Short or surge	

Problem	LCD/LED/Buzzer	Explanation / Possible cause	What to do
Buzzer beeps continuously and red LED is on	Over load	Over load error. The inverter is over load 110% and time is up	Reduce the connected load by switching off some equipment.
	Over temperature	Internal temperature of inverter component is over 80°C	Check whether the air flow of the unit is blocked or whether the ambient temperature is too high.
	Battery volt. high	Battery is over-charged. The battery voltage is too high	1. Check the setting of charger. 2. Check if spec and battery quantity of requirements.
	Battery voltage low	The battery voltage is too low	1. Re-charge battery. 2. Replace battery. 3. Check if spec and battery.
	Output voltage low	Output abnormal	1. Reduce the connected load. 2. Return to repair center.

Chapter 5 Protection And Cleaning

Check The Heat Dissipation

Check the environment around the inverter to eliminate the clogging of the vents. Cleaning the device will improve the heat dissipation of the inverter.

Cleaning The Inverter

Turn off the AC circuit breaker, DC switch, and wait until the inverter is turned off. You can wipe the inverter with non-conductive items. Do not use water or any cleaning agent (such as solvent or abrasive).

Check Connection

Regularly check the cable and switch for damage or abnormal heat; if there is any damage to the cable and DC switch, please contact a professional staff for inspection.

Chapter 6 Disassembly

Disassemble The Inverter

- Let the inverter be powered off.
- Remove all cables connected to the inverter.
- Unscrew all cable connectors.
- Carefully remove the inverter.

Inverter Packaging

Whenever possible, replace the inverter with the original box and fasten it with the bag. If you can't find the original box, you can also use a box of the same size to ensure that it is the right size and can withstand the weight of the inverter.

Inverter Processing



Do not dispose of the obsolete inverter or its accessories as domestic waste. The disposal methods of discarded electrical and electronic products refer to the regulations on the management of waste electrical and electronic recycling.

Chapter 7 Technical Data Sheet

Model		15KW	20KW	30KW
Capacity	Rated Power	15KW	20KW	30KW
	Peak Power	45KW	60KW	90KW
Input	Battery Voltage	192V / 220V / 240V		
	DC Input Voltage	192V:168-240VDC / 220V:192-275VDC / 240V:210-300VDC		
	AC Input Voltage	170-275VAC		
	AC Input Frequency	50Hz / 60Hz±5Hz		
Protection	Battery High Voltage Warning	192V: > 240VDC / 220V: > 275VDC / 240V: > 300VDC		
	Battery High Voltage Protection	192V: > 256VDC / 220V: > 293VDC / 240V: > 320VDC		
	Battery Low Voltage Warning	192V: < 168VDC / 220V: < 192VDC / 240V: < 210VDC		
	Low Voltage Battery Shutdown	192V: < 163VDC / 220V: < 187VDC / 240V: < 204VDC		
	Overload, High Temperature, Short Circuit Protection	Automatic Shut-down		
Output	Effectiveness	≥90%		
	Output Voltage	(Inverter Mode) 220VAC±3%		
	Output Frequency	(Inverter Mode) 50Hz / 60Hz±0.5Hz		
	Output Waveform	Pure Sine Wave		
Other	Switchover Time	≤5ms		
	Display	LCD		
	Cooling System	Forced Air Cooling, Intelligent Speed Regulation		
	Operating Mode	AC Input Priority Mode / Battery Priority Mode / ECO Mode / Generator Mode / Unattended Mode		
	Communication	RS-485		
AC Charging	Type Of Battery	SLA Battery / AGM Battery / Lithium Battery		
	AC Charging Current	15A		
Working Environment	Temperature	0~55℃		
	Humidity	0~95%(No Condensation)		
Exterior	Product Size(mm)	683x383x831		683x383x891
	N. W. (Kg)	129	136	161

• Product specifications are subject to change without notice.

MPPT Specifications

Model	15KW	20KW	30KW
Charging Mode	Constant Current/Floating Charge/MPPT		
Overall Unit Efficiency	192V/220V/240V ≥96.5%		
Photovoltaic Module Utilization	192V/220V/240V ≤99%		
Solar Input Open Circuit Voltage	≤650V		
Solar Input Operating Voltage	≤550V		
Maximum Charging Current	100A/120A		

Solar Panel Configuration Requirements

Open Circuit Voltage 43V:

Rated Voltage (V)	Rated Current (A)	PV Module Load Voltage (Recommended Value)	Open Circuit Voltage 43V				
			Max. Input Voltage(V)	Optimal Number Of Series	Max. Number Of Series	Minimum Number Of Series	Number Of Parallel Groups
192V	100A	250V~550V	650V	8	12	1	Configured According To Power Consumption
192V	120A	250V~550V	650V	8	12	1	
220V	100A	270V~550V	650V	8	12	1	
220V	120A	270V~550V	650V	8	12	1	
240V	100A	300V~550V	650V	8	12	1	
240V	120A	300V~550V	650V	8	12	1	

Open Circuit Voltage 36V:

Rated Voltage (V)	Rated Current (A)	PV Module Load Voltage (Recommended Value)	Open Circuit Voltage 36V				
			Max. Input Voltage(V)	Optimal Number Of Series	Max. Number Of Series	Minimum Number Of Series	Number Of Parallel Groups
192V	100A	250V~550V	650V	10	15	1	Configured According To Power Consumption
192V	120A	250V~550V	650V	10	15	1	
220V	100A	270V~550V	650V	10	15	1	
220V	120A	270V~550V	650V	10	15	1	
240V	100A	300V~550V	650V	10	15	1	
240V	120A	300V~550V	650V	10	15	1	