

Line Interactive UPS
Inverter
Off Grid Solar Inverter

User's Manual

Preface

Thank you for choosing our Line interactive UPS, Inverter or Solar Inverter, which are safe, reliable and easy to use.

Please read this manual carefully, which includes a safe installation and operation description, as well as its electrical performance and associated protection functions, which will help you get the fullest service life. Observe all warnings and operating instructions in the manual and on the machine and keep this manual in a safe place.

The installation, operation and maintenance of this series of products should be carried out by trained technical personnel and the following requirements:

1> Make sure that the DC / AC voltage of the connected product complies with the nominal rated operating voltage of this product.

2> Make sure that the DC input of the product is connected to the positive and negative terminals of the battery and cannot be reversed.

3> Make sure that the cable between the product and the battery is as short as possible. Input and output wiring is correct and solid, and pay attention to avoid short circuit connection.

4> There is a high voltage inside the product. Do not open the case by non-electrical professionals.

Disclaimer: As the product and technology constantly updated, perfect, the contents of this information may not be fully consistent with the actual product, please understand. Please contact our company for information on product updates.



The car battery to provide big current to start the engine in short time, but not designed for continuous power consumption, not suitable for deep cycle discharge. If you want to use a continuous use of equipment for a long time, it is recommended that you install battery for deep discharge, such as AGM or GEL batteries.

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Chapter 1 Safety Precautions


1.1 Scope of Application


This user manual describes the assembly, installation, and operation and maintenance procedures of Line interactive UPS, Inverter & Solar Inverter installation, maintenance and troubleshooting.


Please read this manual carefully before installations and operations. Keep this USER MANUAL for future reference.

1.2 Safety Warning

 DANGER
Failure to comply will result in death or serious injury

 WARNING
Failure to comply may result in serious personal injury or damage to the equipment

 CAUTION
Failure to comply may result in minor or moderate injury

 NOTICE
Failure to comply may result in potential danger

1.3 Users

Only professionals who have read and fully understand all the safety rules contained in this manual may install, maintain and repair this equipment, and the operator must be aware that this is a high voltage device.

1.4 Safety Instructions

1.4.1 Please pay attention to the safety markings on this product, battery and instructions.

1.4.2 Before using this product, read all instructions and cautionary markings on this product, the batteries and all appropriate sections of this manual.

1.4.3 There are high temperature and high pressure inside the product, only qualified personnel can be installed, operated and maintained.

1.4.4 In the equipment installation, operation and maintenance, must comply with electrical safety regulations and related operating procedures, otherwise it may lead to personal injury or equipment damage. The safety precautions mentioned in the manual are intended only as a supplement to safety regulations.

1.4.5 DO NOT disassemble this product. 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.

1.4.6 To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turn off this product will not reduce this risk.

1.4.7 NEVER charge a frozen battery.

1.4.8 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.

1.4.9 NEVER cause AC output and DC input short circuit. DO NOT connect to the electricity power when DC input short circuit.

1.4.10 The manufacturer shall not be liable for any breach of the general safety requirements or violation of the design, production and use of equipment safety standards.

1.5 General Safety Precautions

Do not expose the Line interactive UPS, Inverter or Solar Inverter to water, fog, snow, dust, etc. Do not block or cover the ventilation ducts in order to reduce the risk. Do not install in a small space without ventilation, otherwise the power will overheat.

To avoid the occurrence of fire and electric shock, make sure that the electrical characteristics of all cables are good and that the wire diameter is appropriate; prohibit the use of damaged or wire diameter cables.

Due to the internal components of the power supply can cause discharge and ignition, please do not put the flammable or any items need to fire around the power supply.

1.6 Safety Precaution of Battery Operation

1.6.1 If the skin, clothing stained with acid batteries, immediately wash with soap and water. If the acid is splashed into the eyes, rinse immediately with cold water for at least 20 minutes and treat it in time.

1.6.2 Do not smoke or create an open fire near a battery or engine.

1.6.3 Do not place metal tools on the battery, sparks or short circuits can cause an explosion.

1.6.4 When operating lead-acid batteries do not wear rings, bracelets, necklaces, watches and other metal jewelry, and the battery short-circuit when the current can produce high heat, melting metal can produce serious burns.

Chapter 2 Symbols Description

2.1 Symbols Description



DANGER

- Dangerous due to electrical shock and high voltage.
- Do not touch the operation component of the Line interactive UPS, Inverter or Solar Inverter, it might result in burning or death.
- To prevent risk of electric shock during installation and maintenance, please make sure that all AC and DC terminals are plugged out
- Do not touch the surface of the Line interactive UPS, Inverter or Solar Inverter while the housing is wet, it might lead to electrical shock.
- Do not stay close to the Line interactive UPS, Inverter or Solar Inverter while there are severe weather conditions including storm, lighting, etc.
- Before opening the housing, the Line interactive UPS, Inverter or Solar Inverter must be disconnected from the grid and PV generator, you must wait at least five minutes to let the energy storage capacitors fully discharged after disconnecting from power source.



WARNING

- The installation, service, recycling and disposal of the Line interactive UPS, Inverter or Solar Inverter must be performed by qualified personnel only in compliance with national and local standards and regulations.
- Any unauthorized actions including modification of product functionality of any form may cause lethal hazard to the operator, third parties, the units or their property. Manufacturer is not responsible for the loss and these warranty claims.
- Be sure that the PV generator and solar inverter are well grounded in order to protect properties and persons.



CAUTION







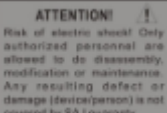
- The Line interactive UPS, Inverter or Solar Inverter will become hot during operation, please do not touch the heat sink or peripheral surface during or shortly after operation.
- Risk of damage due to improper modifications.
- Do not modify or tamper with the Line interactive UPS, Inverter or Solar Inverter and other components of the system.



NOTICE

- This is off grid equipment, it cannot feedback AC power to public utility.
- Do not connect the AC output of the Line interactive UPS, Inverter or Solar Inverter directly to the public grid.

2.2 Marking Instructions

	<p>Dangerous electrical voltage</p> <p>This device is directly connected to public grid, thus all work to the Line interactive UPS, Inverter or Solar Inverter shall only be carried out by qualified personnel.</p>
	<p>DANGER to life due to high electrical voltage!</p> <p>There might be residual currents in Line interactive UPS, Inverter or Solar Inverter because of large capacitors. Wait 5 minutes before you remove the front lid.</p>
	<p>Danger of hot surface</p> <p>The components inside the Line interactive UPS, Inverter or Solar Inverter will release a lot of heat during operation. Do not touch metal plate housing during operating.</p>
	<p>Fault alarm</p> <p>Please go to Chapter 6 “ common fault analysis” to solve the problem</p>
	<p>This device SHALL NOT be disposed of in residential waste</p> <p>Please go to Chapter 7 “ Recycling” for proper treatments</p>
	<p>CE Mark</p> <p>Equipment with the CE mark fulfills the basic requirements of the Guideline Governing Low-Voltage and Electro-magnetic Compatibility</p>
	<p>No unauthorized perforations or modifications</p> <p>Any unauthorized perforations or modifications are strictly forbidden, if any defect or damage (device/person) is occurred, the manufacturer shall not take any responsibility for it.</p>

Chapter 3 Production Information

3.1 Production Introduction

Line interactive UPS, Inverter or Solar Inverter can simultaneously meet the sine wave inverter, multi-stage smart battery charging and power switching three functions, can simplify the system configuration, and reduce system wiring. A small size with a strong ability, a high degree of intelligence. Which can supply power to the AC load and supply the AC load at the same time when there is a utility or alternator power supply. It can output the electric energy stored in the battery into a sine wave AC power supply without any bypass AC to ensure the load not power down. And can be based on the use of power distribution system and configuration to provide different programs, charge current adjustment and load management, widely used in vehicles, ships, solar independent systems or backup power and other occasions.

3. 2 Features

3. 2. 1 Line interactive UPS, Inverter or Solar Inverter function

3.2.1.1 Pure sine wave output: Frequency stabilized and voltage stabilized, small ripple wave, make sure all precision equipment and IT equipment are working stable (Distortion<3%)

3.2.1.2 Powerful loading ability: Low frequency designed, suitable for all types of inductive load, such as refrigerators, air conditioners, power tools, etc.

3.2.1.3 Low static power consumption: Line interactive UPS, Inverter or Solar Inverter provide two modes of operation, normal operation and energy saving mode. In the energy saving mode, the system time to detect the load power, when it is less than 5%, start intermittent output; when the load power is greater than 10%, to return to normal mode of operation. In this function, can reduce the static power consumption of 70%, thus maximizing the use of battery energy, to avoid waste.

3. 2. 2 Charging function

Multi-stage charging: smart chip control of the three-stage battery charge management function, can quickly fill the battery, and effectively extend the battery life.

Charging current optional: the user according to their own configuration of the battery AH, select the corresponding charge current (from 20% -100% in five steps adjustable).

Charging voltage optional: for a variety of battery charging: lead acid batteries, GEL batteries

3. 2. 3 Switch function

Line interactive UPS, Inverter or Solar Inverter integrates fast switch, when the mains input and meet the Line interactive UPS, Inverter or Solar Inverter operating voltage and load power requirements, the device will automatically switch to the mains power supply mode, through the bypass to supply the power to load and charge the battery at the same time

3. 2. 4 Remote control function (Optional accessories)

Telemetry: Provides machine status LED indication and switch control, can be installed in the console, user-friendly operation (can provide three sets of dry contact signal).

Remote monitoring: provides RS232 communication protocol and USB, 485, SNMP, can be used to set the alarm device, automatically start the generator or turn on / off part of the load.

3. 2. 5 Multi-operation Mode is Available for Solar Inverter

This series of solar inverter with 4 working modes for users to choose freely.

	Name	Description
Mode 1	Normal mode	PV always charge, always keep the output
Mode 2	Bypass mode	When the Sun was there, off the AC charging; If no Sun, turn to AC charging, always keep the output
Mode 3	Solar Mode	If the sun was there, turn off AC, Solar charging, inverter output, when battery capacity discharged to 50% connect to AC (AC & solar are charging together, AC stabilized output); If the sun was not there, AC charging and output; solar & AC Interrupted, inverter output. If no load, closed output
Mode 4	Energy saving mode	If the sun was there, turn off AC charging, if no sun then turn to AC charging. Always keep the output. If no load, closed output

3. 2. 6 Product Protection

This product equipped with a series of comprehensive hardware and software protection to ensure its stable integrated reliability.

Overload protection: When the charge or inverter overload, the machine will enter the protection state, hardware protection and software protection.

Hardware protection: When the hardware protection, over current protection (Over current protection) to jump, press the over current protection (Over current protection) button, the machine can re-work.

Software protection: Access to software protection, through software control will automatically shut down the machine, and automatically restart after 6s; in three repeated automatic shutdown, the machine will not automatically restart, this time, the user needs to manually boot.

Over temperature protection: When the machine internal temperature is too high, the machine will enter the over-temperature protection state.

Short circuit protection: When the machine is shorted circuit, the system will shut down and need to be started manually.

Battery Low Voltage Protection: To avoid excessive battery discharge, the machine will automatically shut down the system.

3. 2. 6 Hybrid Solar Power System Architecture

The following illustration shows basic application for the inverter. It also includes following devices to have a complete running system:

- Generator or Electric Grid
- PV modules

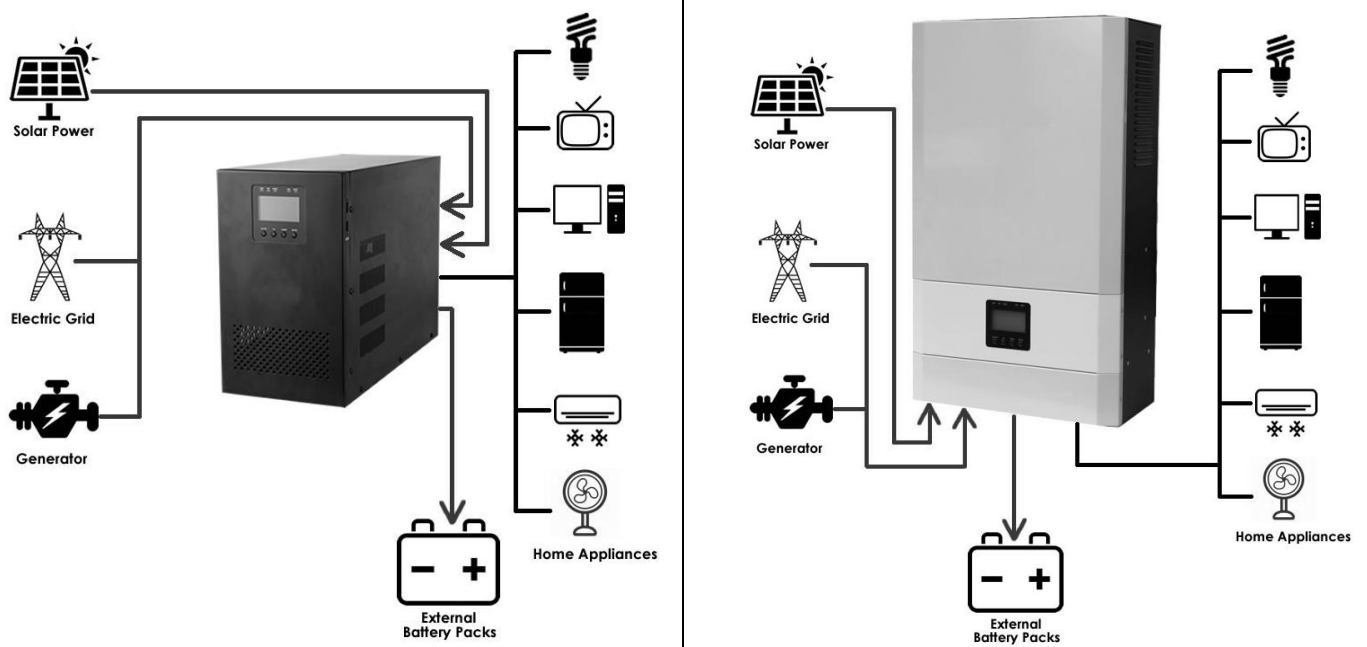


Figure 1 Hybrid Solar Power System

3.3 Product Overview

Line Interactive UPS / Inverter / Solar Inverter (Tower type)

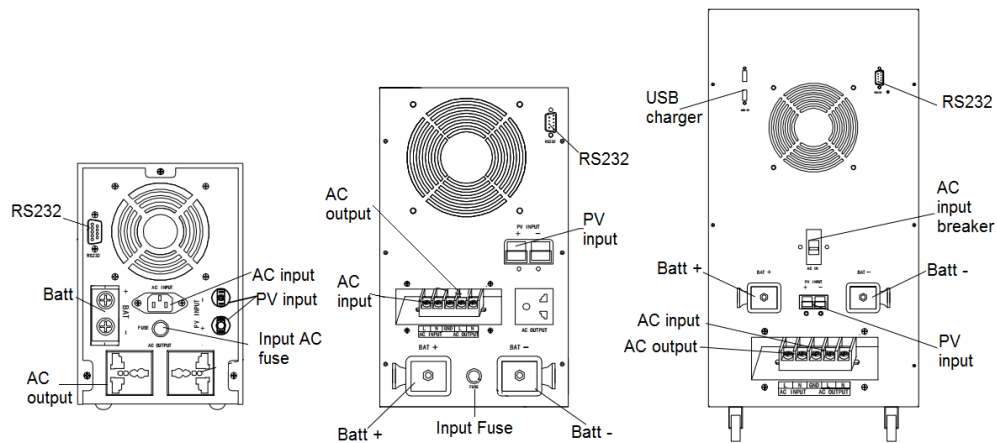
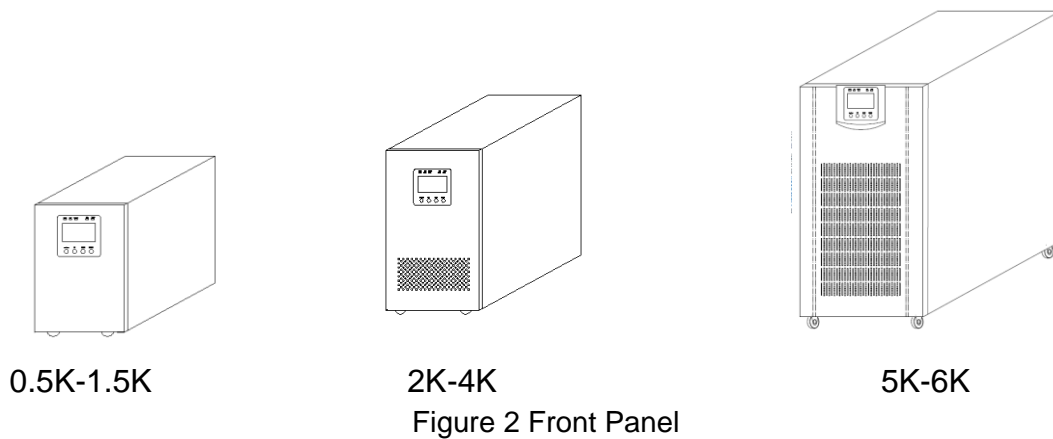
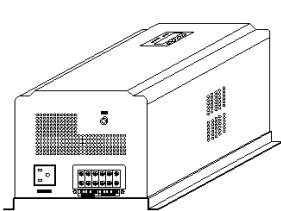
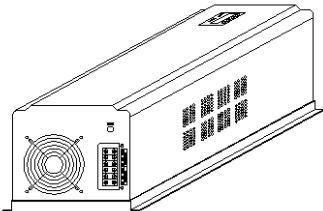


Figure 3 Rear Panel

Inverter (Long strip type)

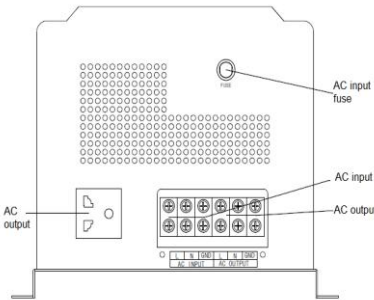


1K-3K

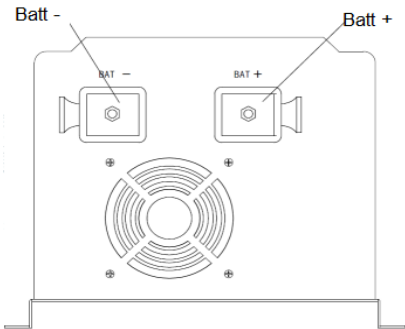


4K-6K

Figure 4 Front Panel

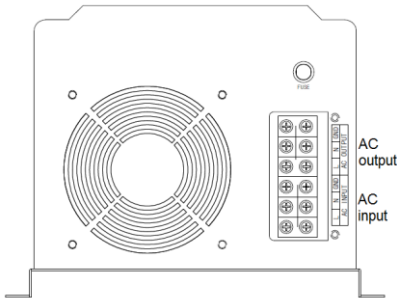


1-3K left

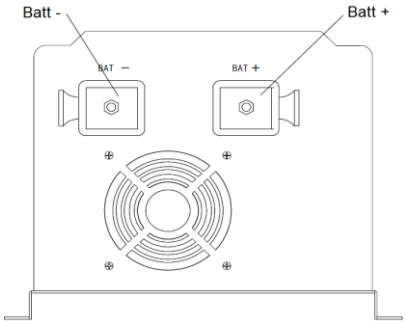


1-3K right

Figure 5 1-3KW Left and Right side



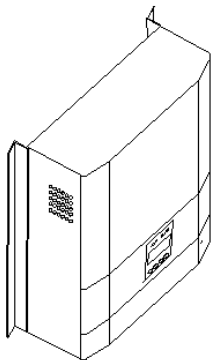
4-6K left



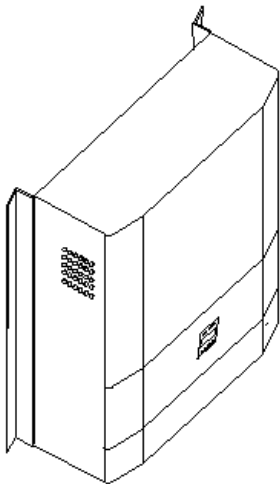
4-6K right

Figure 6 4-6KW Left and Right side

Solar Inverter (Wall mounted type)

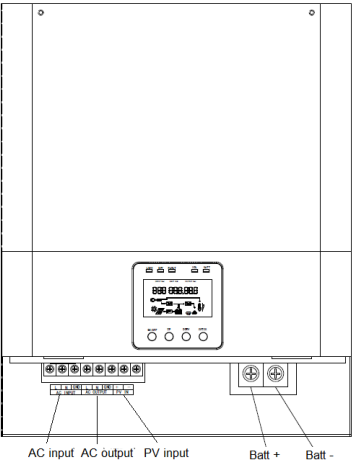


0.5K-2K

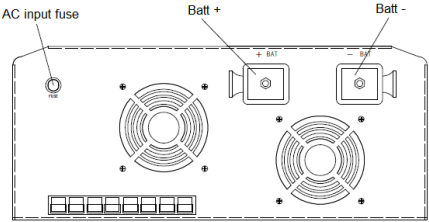
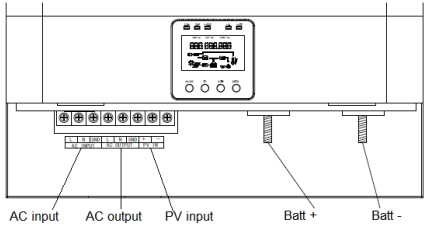


3K-6K

Figure 7 Front Panel



0.5-2K



3-6K

Figure 8 Terminal Connect

3.4 Specification

3.4.1 Inverter/Solar Inverter (Tower type)

Capacity(W)		0.5K	1K	1.5K	2K	3K	4K	5K	6K
AC Input	Voltage Range	100/110/120/127/220/230VAC (+25%,-36%)							
	Frequency	50/60 Hz±2.5Hz							
PV Input	Rating Voltage	18V/36V			36V/72V			72V	
	Charging Current	20A (optional increasing)			60A(optional increasing)				
Output	Rated Power(W)	500	1000	1500	2000	3000	4000	5000	6000
	Instantaneous Power (W)	1500	3000	4500	6000	9000	12000	15000	18000
	Wave Form	Pure Sine Wave							
	Battery Efficiency	81%			83%		85%		
	AC Efficiency	93%							
	Output Voltage	220V/110V±5%（AC mode ±10%）							
	Frequency	50Hz/60Hz±0.5Hz（AC mode ±2.5Hz）							
	Transfer Time	4ms/8ms Optional							
	USB	DC 5V/1A*1 + 5V/2A*1 (DC USB Charger Optional)							
Connector	Input / Output	Input power Cable, 2 pcs output sockets			Input & Output Terminals, 1 pc output socket			Terminals	
Battery	Voltage	12V/24V			24V/48V				
	Charging	4--20A adjustable			8--40A adjustable				
Working Mode	Normal Mode	PV always charge, always keep the output							
	Bypass Mode	When the Sun was there, off the AC charging; If no Sun, turn to AC charging, always keep the output							
	Solar Mode	If the sun was there, turn off AC, Solar charging, inverter output, when battery capacity discharged to 50% connect to AC (AC & solar are charging together, AC stabilized output); If the sun was not there, AC charging and output; solar & AC Interrupted, inverter output. If no load, closed output.							
	Energy Saving Mode	If the sun was there, turn off AC charging, if no sun then turn to AC charging. Always keep the output. If no load, turn off output							
Display	Method	LCD+LED							
	Content	Input / Output voltage, Battery voltage, Battery Capacity, Load Capacity, Working mode, Frequency, PV status & Specification, PV Cumulative power generation							
Protection	Battery Reversal	Optional							
	Output Short Circuit	AC mode: Jump fuse ; Inverter mode: Shut down							
	Overload	Full load 100%, UPS/Inverter alarm, Overload 120%, UPS/Inverter shut down output in 10s, once the load back to normal, Inverter recover output							
	High AC Voltage	Turn off AC, Turn to Inverter mode automatically							
	Low DC Voltage	Inverter shut down automatically, once the AC recover, inverter turn on and charge automatically. PV waiting for charging at any time							
	Over Temp.	Power off							
Working Environment	Humidity	15～93%（No condensation）							
	Temperature	-10℃-50℃							
	Altitude	≤3000m							
Communication		USB, RS232,485, SNMP (Optional)							
Dimension: D*W*H (mm)		381*142*209			472*190*330			535*280*525	

3.4.2 Inverter (Long strip type)

Capacity(W)		1K	1.5K	2K	3K	4K	5K	6K
Input voltage	Voltage Range	100/110/120/127/220/230VAC (+25%,-36%)						
	Frequency	50/60 Hz±2.5Hz						
Output	Rated Power (W)	1000W	1500W	2000W	3000W	4000W	5000W	6000W
	Instantaneous Power (W)	3000W	4500W	6000W	9000W	12000W	15000W	18000W
	Wave Form	Pure Sine Wave						
	Battery Efficiency	81%		83%		85%		
	AC Efficiency	93%						
	Output Voltage	220V/110V±5%（AC mode ±10%）						
	Output Frequency	50Hz/60Hz±0.5Hz（AC mode ±2.5Hz）						
	Transfer Time	4ms/8ms Optional						
Connector	Output	1 output socket, Input & Output Terminals					Input & Output Terminals	
Battery	Voltage	24V		24V/48V			48V	
	Charging	5--25A adjustable		12--60A adjustable				
Working Mode	Normal Mode	Inverter mode						
	Energy Saving Mode	Always keep the output. If no load, turn off output						
Display	Method	LCD+LED						
	Content	Input / Output voltage, Battery voltage, Battery Capacity, Load Capacity, Working mode, Frequency						
Protection	Battery Reversal	Optional						
	Output Short Circuit	AC mode: Jump fuse ; Inverter mode: Shut down						
	Overload	Full load 100%, UPS/Inverter alarm, Overload 120%, UPS/Inverter shut down output in 10s, once the load back to normal, Inverter recover output						
	High AC Voltage	Turn off AC, Turn to Inverter mode automatically						
	Low DC Voltage	Inverter shut down automatically, once the AC recover, inverter turn on and charge automatically.						
	Over Temp.	Power off						
Working Environment	Humidity	15~93%（No condensation）						
	Temperature	-10°C-50°C						
	Altitude	≤3000m						
Dimension: D*W*H (mm)		455*266*206				640*266*256		

3.4.3 Solar Inverter (Wall mounted type)

Capacity(W)		0.5K	1K	1.5K	2K	3K	4K	5K	6K
AC Input	Voltage Range	100/110/120/127/220/230VAC (+25%,-36%)							
	Frequency	50/60 Hz±2.5Hz							
PV input	Rating Voltage	18V/36V			36V/72V			72V	
	Charging Current	Standard 20A (Optional accessories)			Standard 60A (Optional accessories)				
Output	Rated Power(W)	500	1000	1500	2000	3000	4000	5000	6000
	Instantaneous Power (W)	1500	3000	4500	6000	9000	12000	15000	18000
	Wave Form	Pure Sine Wave							
	Battery Efficiency	81%			83%		85%		
	AC Efficiency	93%							
	Output Voltage	220V/110V±5%（AC mode ±10%）							
	Frequency	50Hz/60Hz±0.5Hz（AC mode ±2.5Hz）							
	Transfer time	4ms/8ms Optional							
	USB	DC 5V/1A*1 + 5V/2A*1 (DC USB Charger Optional)							
Battery	Voltage	12V/24V			24V/48V			48V	
	Charging	4--20A adjustable			8--40A adjustable				
Working Mode	Normal Mode	PV always charge, always keep the output							
	Bypass Mode	When the Sun was there, off the AC charging; If no Sun, turn to AC charging, always keep the output							
	Solar Mode	If the sun was there, turn off AC, Solar charging, inverter output, when battery capacity discharged to 50% connect to AC (AC & solar are charging together, AC stabilized output); If the sun was not there, AC charging and output; solar & AC Interrupted, inverter output. If no load, closed output.							
	Energy Saving Mode	If the sun was there, turn off AC charging, if no sun then turn to AC charging. Always keep the output. If no load, turn off output							
Display	Method	LCD+LED							
	Content	Input / Output voltage, Battery voltage, Battery Capacity, Load Capacity, Working mode, Frequency, PV status & Specification, PV Cumulative power generation							
Protection	Battery Reversal	Optional							
	Output Short Circuit	AC mode: Jump fuse ; Inverter mode: Shut down							
	Overload	Full load 100%, UPS/Inverter alarm, Overload 120%, Inverter shut down output in 10s, once the load back to normal, UPS/Inverter recover output							
	High AC Voltage	Turn off AC, Turn to Inverter mode automatically							
	Low DC Voltage	Inverter shut down automatically, once the AC recover, inverter turn on and charge automatically. PV waiting for charging at any time							
	Over Temp.	Power off							
Working Environment	Humidity	15~93%（No condensation）							
	Temperature	-10℃-50℃							
	Altitude	≤3000m							
Dimension: D*W*H (mm)		278*428*135mm				358*605*190mm			

3.4.4 Line Interactive UPS

Capacity(VA)		0.5K	1K	1.5K	2K	2.5K	3K	4K	5K	6.5K	8K	10K
AC Input	Voltage Range	100/110/120/127/220/230VAC (+25%,-36%)										
	Frequency	50/60 Hz±2.5Hz										
Output	Rated Power(W)	300	500	1000	1200	1500	2000	2400	3000	4000	5000	6000
	Instantaneous Power (W)	900	1500	3000	3600	4500	6000	7200	9000	12000	15000	18000
	Wave Form	Pure Sine Wave										
	Battery Efficiency	81%					83%			85%		
	AC Efficiency	93%										
	Output Voltage	220V/110V±5%（AC mode ±10%）										
	Frequency	50Hz/60Hz±0.5Hz（AC mode ±2.5Hz）										
	Transfer Time	4ms/8ms Optional										
	USB	DC 5V/1A*1 + 5V/2A*1 (DC USB Charger Optional)										
Connector	Input / Output	Input power Cable, 2 pcs output sockets					Terminals, 1 pc output socket				Terminals	
	Battery	Terminals										
Battery	Voltage	12V/24V					24V/48V				48V	
	Charging	4--20A adjustable					8--40A adjustable					
Working mode	Normal Mode	Inverter mode										
	Energy Saving Mode	Always keep the output. If no load, turn off output										
Display	Method	LCD+LED										
	Content	Input / Output voltage, Battery voltage, Battery Capacity, Load Capacity, Working mode, Frequency										
Protection	Battery Reversal	Optional										
	Output Short Circuit	AC mode: Jump fuse ; Inverter mode: Shut down										
	Overload	Full load 100%, UPS/Inverter alarm, Overload 120%, UPS shut down output in 10s, once the load back to normal, UPS/Inverter recover output										
	High AC Voltage	Turn off AC, Turn to Inverter mode automatically										
	Low DC Voltage	UPS shut down automatically, once the AC recover, UPS turn on and charge automatically.										
	Over Temp.	Power off										
Working Environment	Humidity	15～93%（No condensation）										
	Temperature	-10℃-50℃										
	Altitude	≤3000m										
Communication		USB, RS232,485, SNMP (Optional)										
Dimension: D*W*H (mm)		381*142*209					472*190*330				535*280*525	
Packing: D*W*H (mm)		500*480*335(2pcs/carton)					602*320*460				665*410*655	
Weight	N.W.(KGS/PC)	7.00	7.14	11.96	12.00	12.91	21.11	25.50	27.78	32.25	38.61	50.42
	G.W.(KGS/PC)	7.54	7.94	12.76	12.80	13.71	23.61	27.30	30.28	33.55	42.61	54.42

Chapter 4 Installation information

4.1 Safety instructions



DANGER

- Dangerous to life due to potential fire or electricity shock.
- Do not install the Line interactive UPS, Inverter or Solar Inverter near any inflammable or explosive items
- The Line interactive UPS, Inverter or Solar Inverter will be directly connected with HIGH VOLTAGE power generation device; The installation must be performed by qualified personnel only in compliance with national and local standards and regulations.



WARNING

- This equipment is suit for the pollution degree II.
- Inappropriate or the harmonized installation environment may jeopardize the life span of the Line interactive UPS, Inverter or Solar Inverter.
- Installation directly exposed under intensive sunlight is not recommended
- The installation site must have good ventilation condition.

4.2 Pre-installation Check

4.2.1 Check the package

Although Line interactive UPS, Inverter or Solar Inverter have surpassed stringent testing and are checked before they leave the factory, It is possible that the Line interactive UPS, Inverter or Solar Inverter may suffer damages during transportation. Please check the package for any obvious signs of damage and if such evidence is present, do not open the package and contact your dealer as soon as possible.

4.2.2 Installation environment

☞ Line interactive UPS, Inverter or Solar Inverter in the cold environment directly into the indoor and other warm environment, the internal may be condensation. At this point, be sure to wait until completely dry before they can be installed. To this end, after moving to the installation site, please put at least 2 hours, so that UPS to adapt to the environment, then install.

☞ The Line interactive UPS, Inverter or Solar Inverter never be installed in the vicinity of water or moisture.

☞ The Line interactive UPS, Inverter or Solar Inverter must not be installed in the sun or near the place where the heater equipment.

☞ Never block or shield the ventilation holes on the Line interactive UPS, Inverter or Solar Inverter housing.

4.2.3 Installation Position

☞ Because overheating can lead to reduced power. It is not recommended that the inverter be installed in a strong sunlight position. The installation site has an ambient temperature range of -25 ° C to + 60 ° C (-13 ° F to 140 ° F).

☞ Please make sure the installation place is ventilated, Air does not flow will affect the internal electronic components work performance, shorten the inverter life.

☞ Please make sure the installation place is ventilated, if several devices are installed in the same area, give the equipment a suitable air circulation condition.

4.3 Wire Configuration

Users choose their own, and make connection terminals, in order to protect the safety of electricity, cable selection should be greater than the data listed in the table below

4.3.1 Battery Connection Cable

Capacity (W)	12VDC	24 VDC	48 VDC
300	6mm ²	4 mm ²	
500	10 mm ²	6 mm ²	
1000	16 mm ²	10 mm ²	
1500		16 mm ²	10 mm ²
2000		16 mm ²	10 mm ²
3000		25 mm ²	16 mm ²
4000		35 mm ²	25 mm ²
5000		50 mm ²	35 mm ²
6000		50 mm ²	35 mm ²

4.3.2 AC Power Cable

Capacity (W)	110VAC	220 VAC
300	0.75 mm ²	0.5 mm ²
500	1 mm ²	0.75 mm ²
1000	1 mm ²	0.75 mm ²
1500	2.5 mm ²	1 mm ²
2000	4 mm ²	2.5 mm ²
3000	6 mm ²	2.5 mm ²
4000	10 mm ²	4 mm ²
5000	10mm ²	6 mm ²
6000	16 mm ²	6 mm ²

4.4 Installation Guide



Make sure Line interactive UPS, Inverter or Solar Inverter is off mode, it is forbidden to operate with electricity.

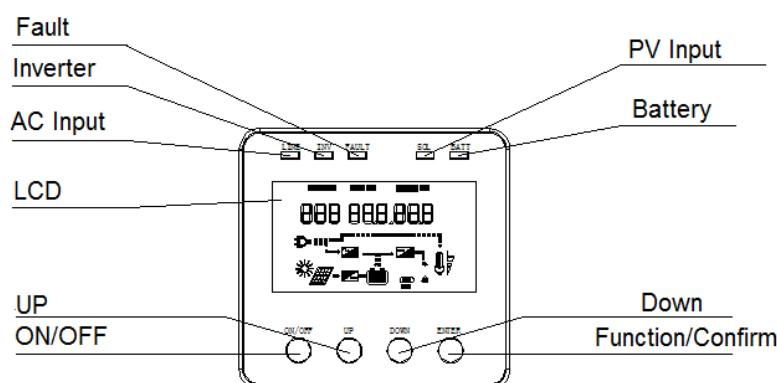


The Line interactive UPS, Inverter or Solar Inverter should be installed as close as possible to the battery, and make sure the installation is flat, dry and well ventilated.



Avoid damage to the system due to wiring errors or Line interactive UPS, Inverter or Solar Inverter fault. If you want to use another switch control system circuit, make sure that all switches are capable of withstanding the total energy of the system. The cable and fuse which do not meet the specification and stand will affect the normal work of the Line interactive UPS, Inverter or Solar Inverter.

4.4.1 LCD display




4.4.2 LED Indicator

Item	Color	Description
Line light	Green	AC normal "Bright", AC abnormal "OFF".
Inverter light	Yellow	Line interactive UPS, Inverter or Solar Inverter is working "bright", Line interactive UPS, Inverter or Solar Inverter is not working "OFF".
Fault light	Red	Line interactive UPS, Inverter or Solar Inverter is working normal "OFF", Line interactive UPS, Inverter or Solar Inverter is fault "Bright, Buzzer is long alarm.
PV light	Green	Solar inverter connect with solar panel "Bright", Solar inverter disconnect with solar panel "OFF".
Battery light	Green	Line interactive UPS, Inverter or Solar Inverter connect to battery "Bright", Line interactive UPS, Inverter or Solar Inverter disconnect with battery "OFF".

4.4.3 Function Keys

Function Keys	Description
ON/OFF	Power ON/OFF
UP	To previous selection
DOWN	To next selection
ENTER	To confirm the selection in setting mode or enter setting mode










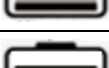


4.4.4 LCD Display Icons

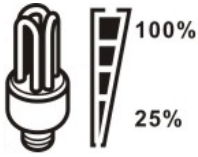











Icon	Function description
INPUT Vac	Indicates the AC input voltage.
BATT Vdc	Indicates the battery voltage.
OUTPUT Vac	Indicates the output voltage.
INPUT Hz	Indicates the AC input frequency.
BATT %	Indicates the battery capacity.
OUTPUT %	Indicates output loading.
PV-Vdc	Indicates PV input voltage.
PV-Adc	Indicates PV current.
PV-KW	Indicates PV output power.
PVEP KWh	Indicates PV total power generation.
	Indicates battery level by 0-24%, 25-49%, 50-74% and 75-100% in battery mode and charging status in line mode.

In AC mode, it will present battery charging status.

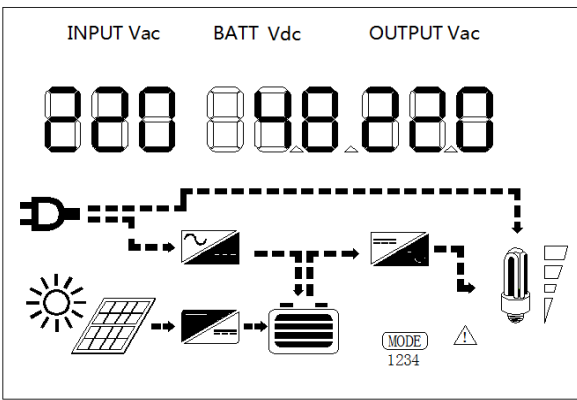
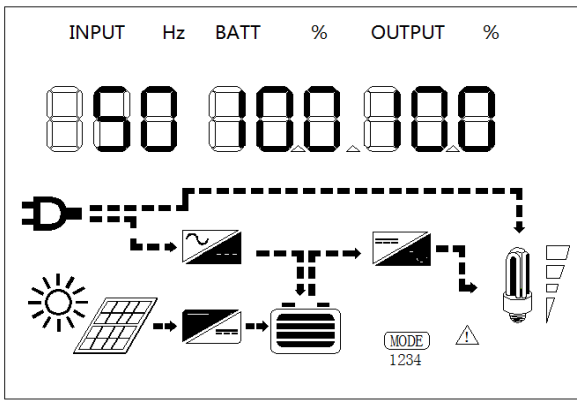
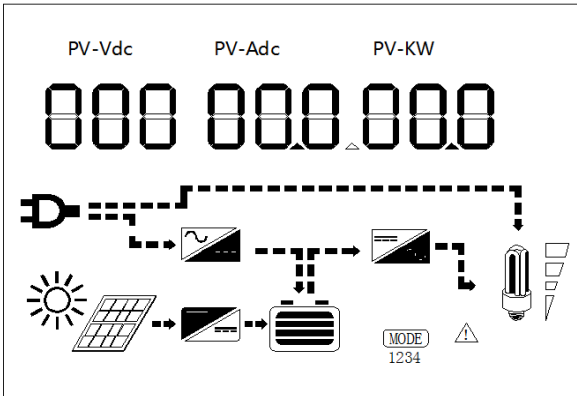
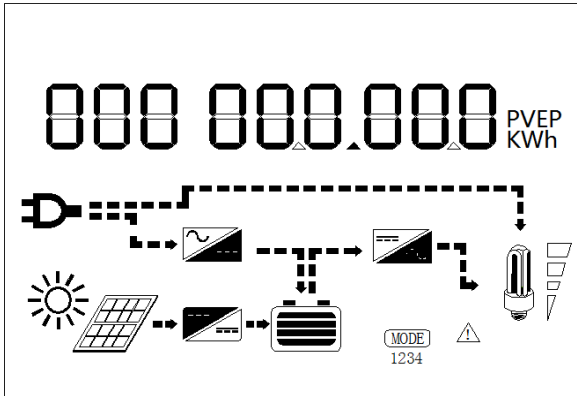
Status	Battery voltage	LCD Display
Constant	<2V/cell	4 bars will flash in turns.
Current mode /	2 ~ 2.083V/cell	Bottom bar will be on and other three bars will flash in turns.
Constant	2.083 ~ 2.167V/cell	Bottom two bars will be on and other two bars will flash in turns.
Voltage mode	> 2.167 V/cell	Bottom three bars will be on and the top bar will flash.
Floating mode. Batteries are fully charged.		4 bars will be on.

In battery mode, it will present battery capacity.

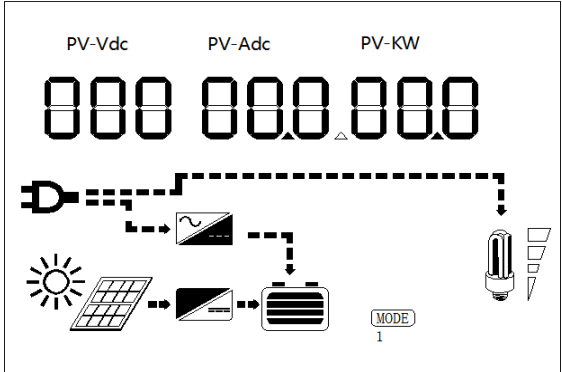
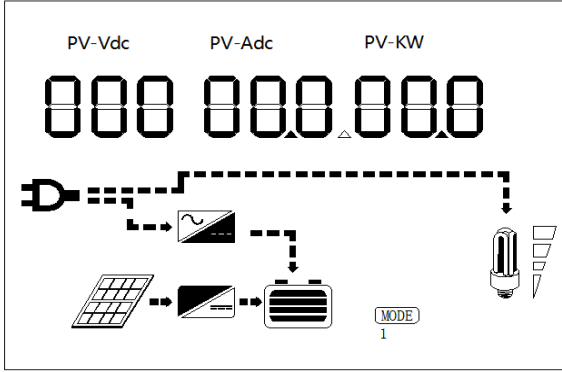
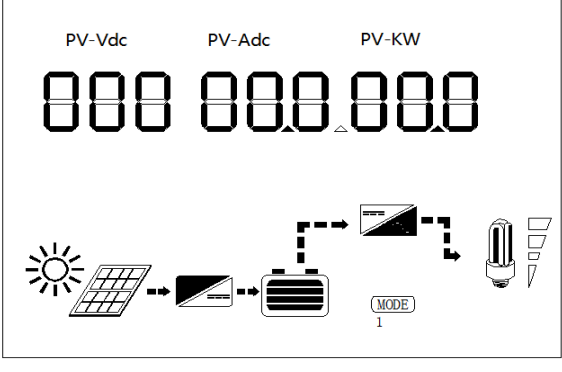
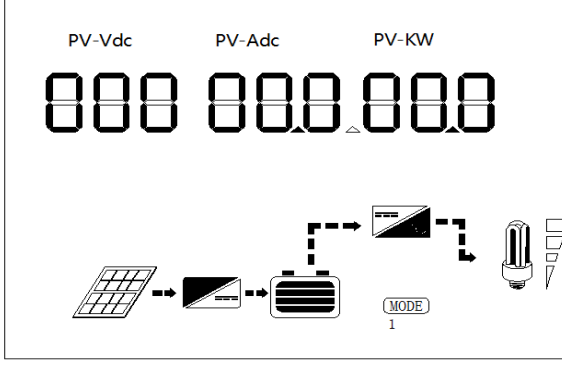
Load Percentage	Battery Voltage	LCD Display
Load >50%	< 1.717V/cell	
	1.717V/cell ~ 1.8V/cell	
	1.8 ~ 1.883V/cell	
	> 1.883 V/cell	
50%> Load > 20%	< 1.817V/cell	
	1.817V/cell ~ 1.9V/cell	
	1.9 ~ 1.983V/cell	
	> 1.983 V/cell	
Load < 20%	< 1.867V/cell	
	1.867V/cell ~ 1.95V/cell	
	1.95 ~ 2.033V/cell	
	> 2.033 V/cell	

	Indicates the load level by 0-24%, 25-50%, 50-74% and 75-100%.			
	0%~25%	25%~50%	50%~75%	75%~100%
				
	Indicates unit connects to the mains.			
	Indicates unit connects to the PV panel.			
	Indicates unit working under sunshine.			
	Indicates the utility charger circuit is working.			
	Indicates the DC/AC inverter circuit is working.			
	Indicates working mode number.			
	Indicates unit alarm is disabled.			

4.4.4 LCD Display Information

Input voltage/Battery voltage/Output voltage (Default)	Input frequency/Battery capacity/Output capacity
	
PV voltage/PV current/PV power	PV Power generation
	

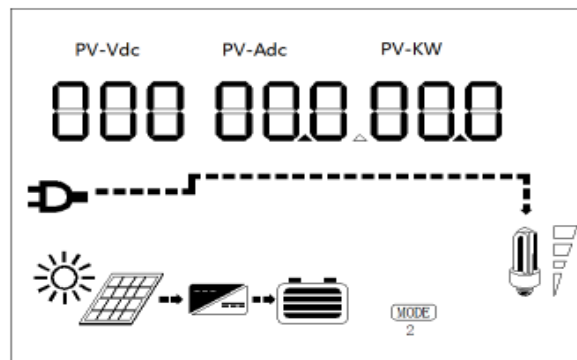
4.4.5 Operating Mode Description

Operation mode	Description	LCD display
Normal mode	PV always charging, always keep the output.(if no PV connecting, it is normal inverter or line interactive UPS mode)	<p>AC normal, Sunny</p> 
		<p>AC normal, Sunless</p> 
		<p>AC abnormal, Sunny</p> 
		<p>AC abnormal, Sunless</p> 

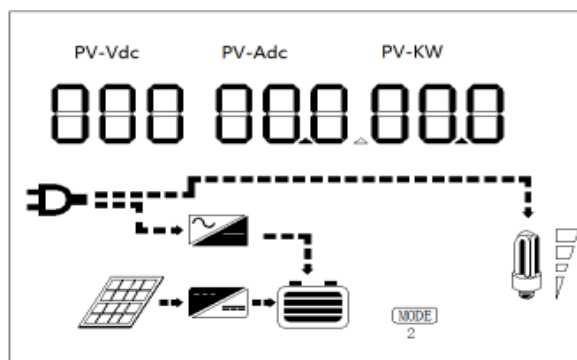
Bypass mode

When the Sun was there, turn off the AC charging; if no Sun, turn to AC charging, and always keep the output. (If no PV connecting, No display)

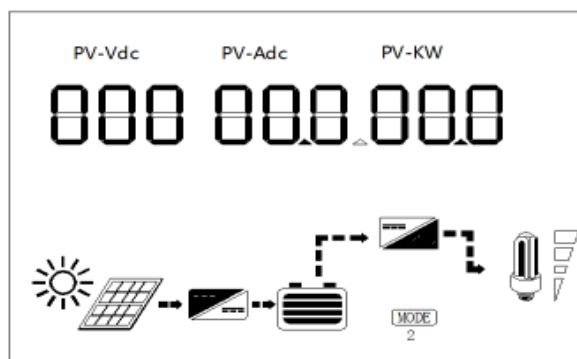
AC normal, Sunny



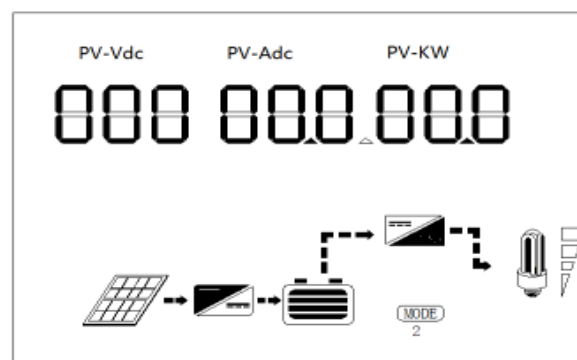
AC Normal, Sunless



AC abnormal, Sunny



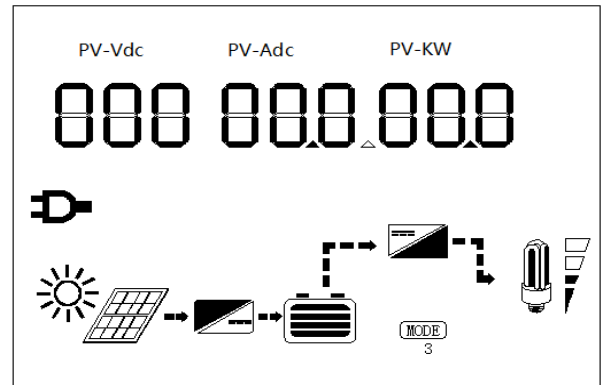
AC abnormal, Sunless



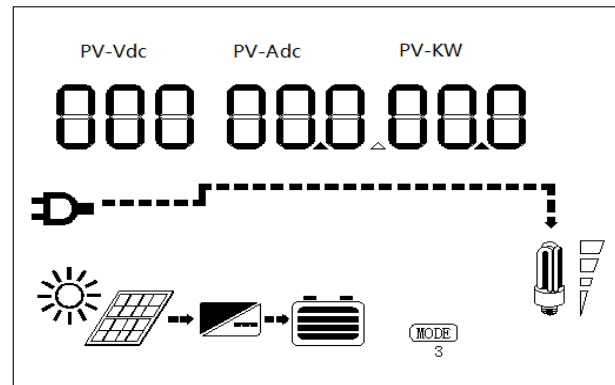
Solar Mode

If the sun was there, turn off AC, Solar charging, inverter output. (If no PV connecting, No display)

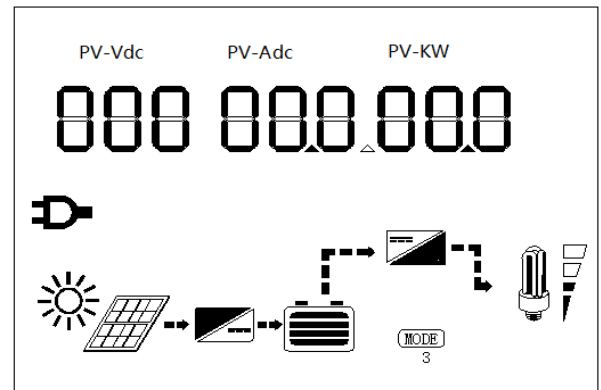
AC normal, Sunny, Battery normal, Inverter mode (load>10%)



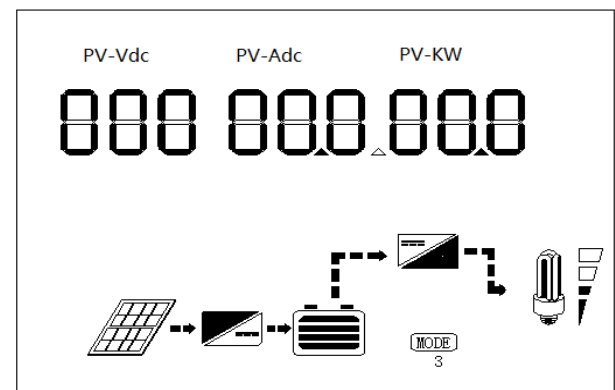
AC normal, Sunny, Battery capacity discharge to 50%, turn to AC mode (load>10%)



AC normal, Sunny, Battery Capacity reach to 90%, turn to inverter mode (load>10%)



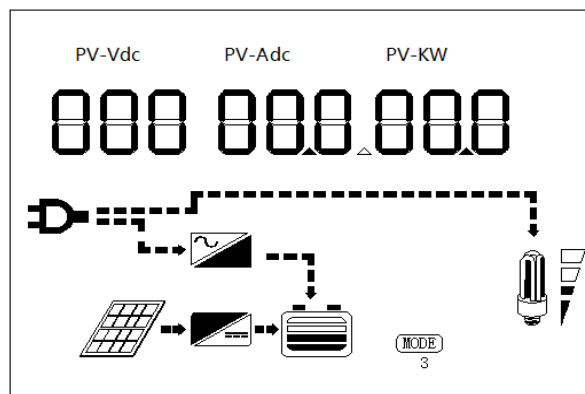
AC abnormal, Sunless, turn to inverter mode (load>10%), once battery capacity discharge to 0% then power off



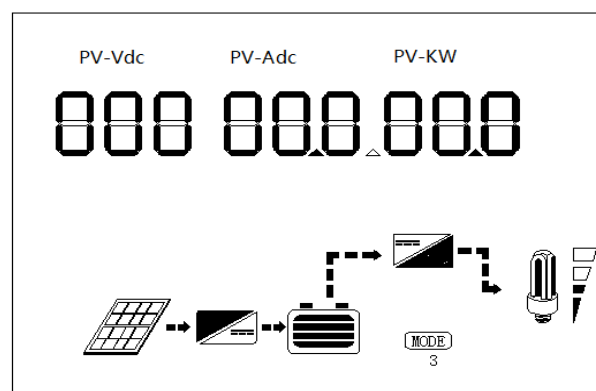
Energy saving mode

If the sun was there, turn off AC charging, if no sun then turn to AC charging. Always keep the output. If no load, turn off output

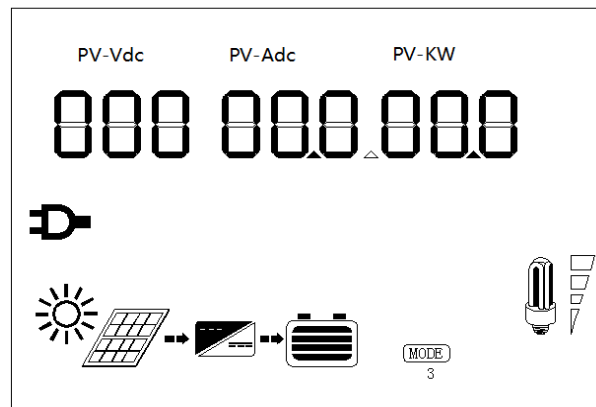
AC normal, Sunless or Night (load>10%)



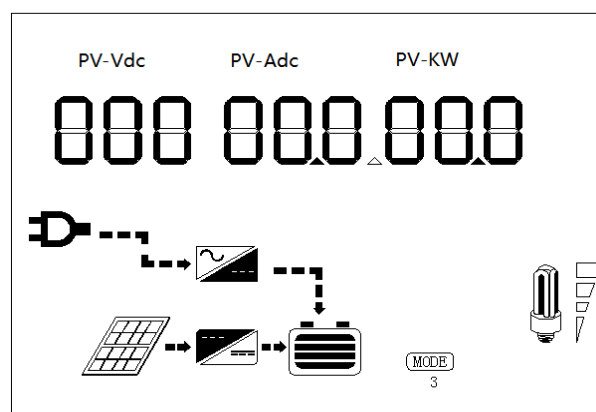
AC abnormal, Sunless or Night, turn to Inverter Moe (load>10%), battery capacity Discharge to 0%, then power off



AC normal, Sunny, Load>10%



AC normal, Sunless, Load<10%

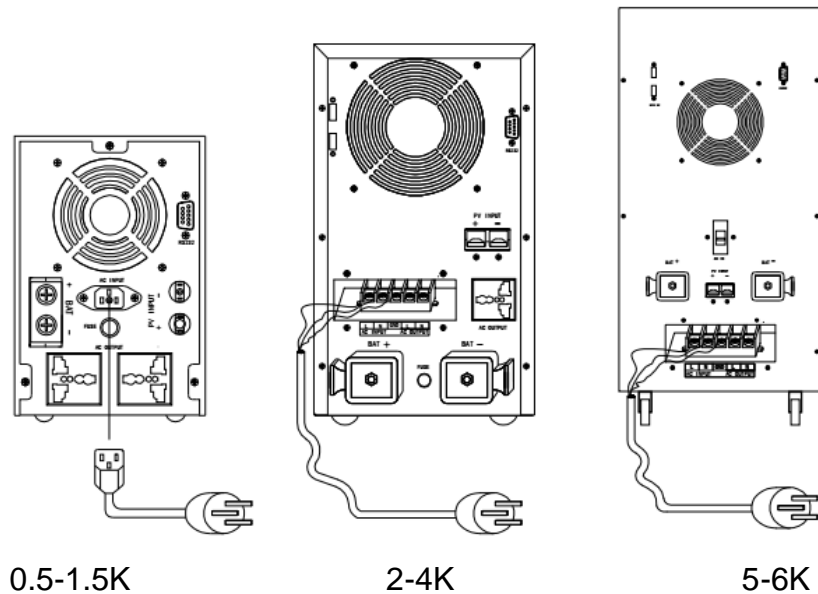


4.4.6 Connection

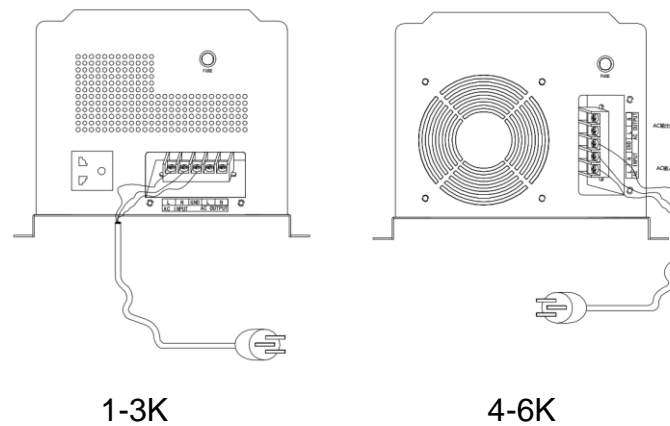
4.4.6.1 Input connection

Line Interactive UPS / Inverter / Solar Inverter small capacity model, the input plug must be Two-pole three-wire grounding type plug, and avoid using extension cord. Big capacity model should connect to terminals. Make sure that the input voltage is consistent with the product specifications.

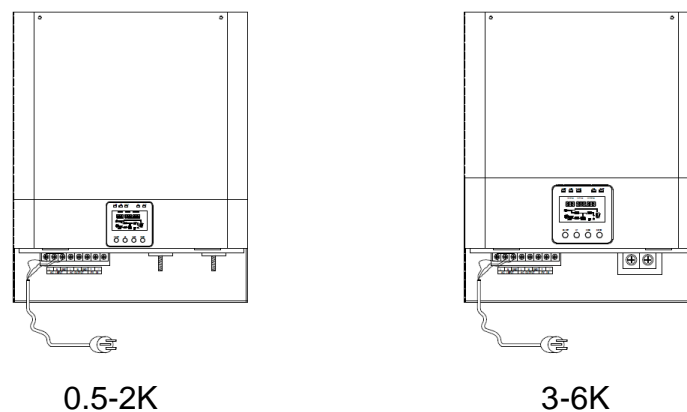
4.4.6.1-1 Line Interactive UPS / Inverter / Solar Inverter (Tower type)



4.4.6.1-2 Inverter (Long strip type)

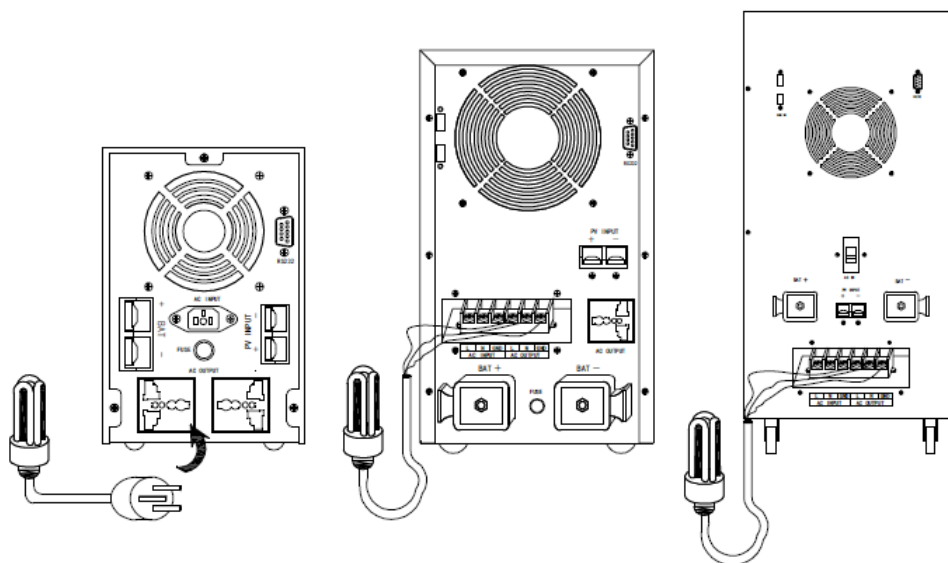


4.4.6.1-3 Solar Inverter (Wall mounted type)



4.4.6.2 Output connection

4.4.6.2-1 Line Interactive UPS / Inverter / Solar Inverter (Tower type)

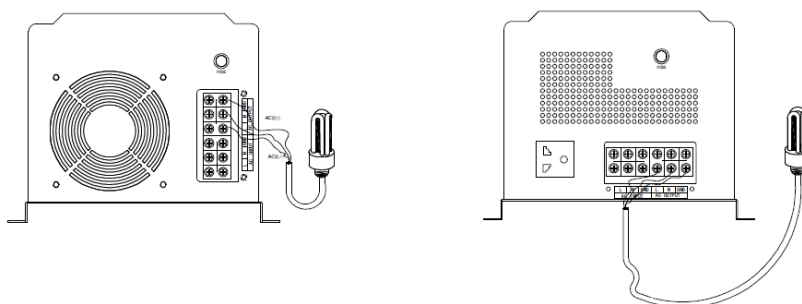


0.5-1.5K

2-4K

5-6K

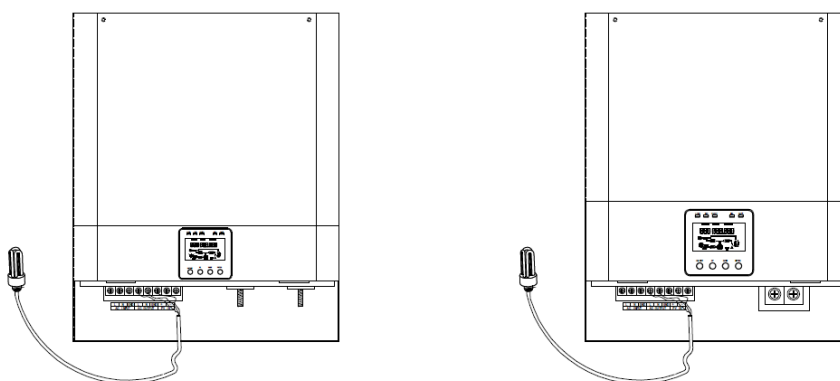
4.4.6.2-2 Inverter (Long strip type)



1-3K

4-6K

4.4.6.2-3 Solar Inverter (Wall mounted type)



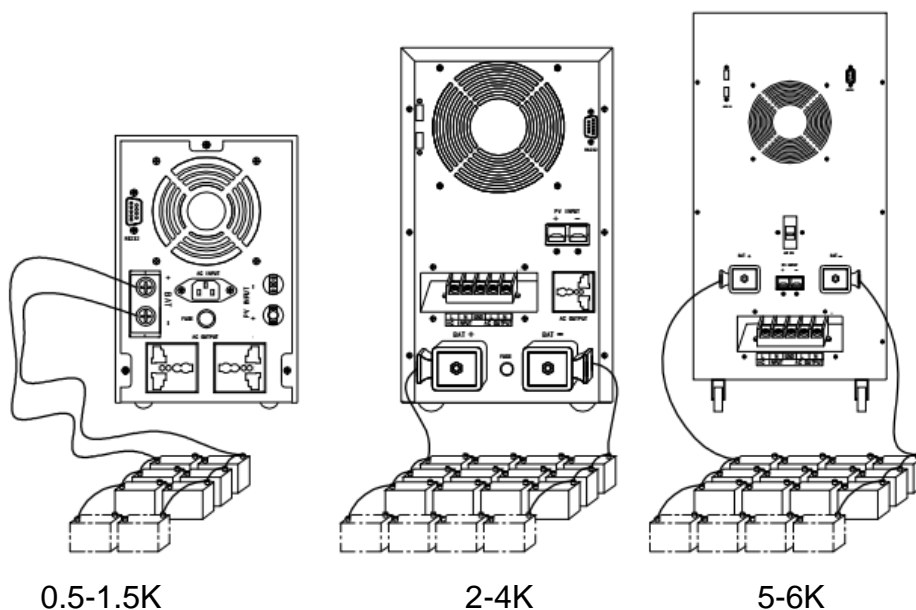
1-1.5K

2-6K

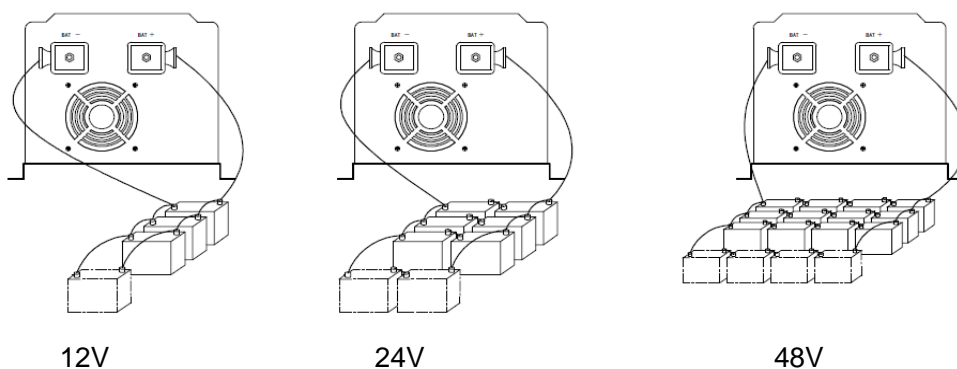
4.4.6.3 Battery Connection

Line Interactive UPS / Inverter / Solar Inverter use connectors, terminals connect to battery and Inverter. Make sure that the input voltage is consistent with the product specifications.

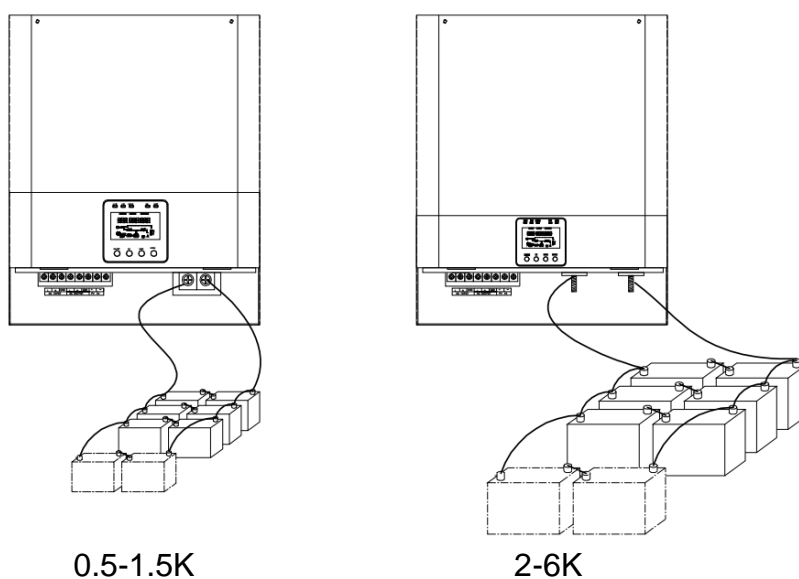
4.4.6.3-1 Line Interactive UPS / Inverter / Solar Inverter (Tower type)



4.4.6.3-2 Inverter (Long strip type)



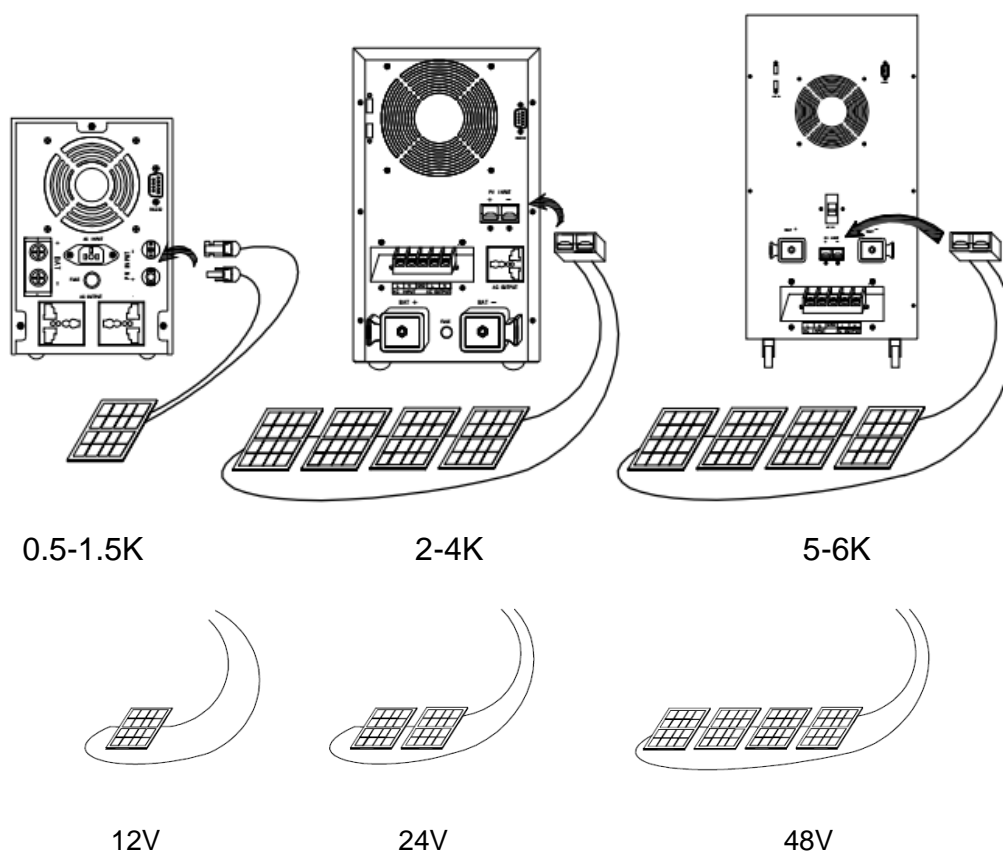
4.4.6.3-3 Solar Inverter (wall mounted type)



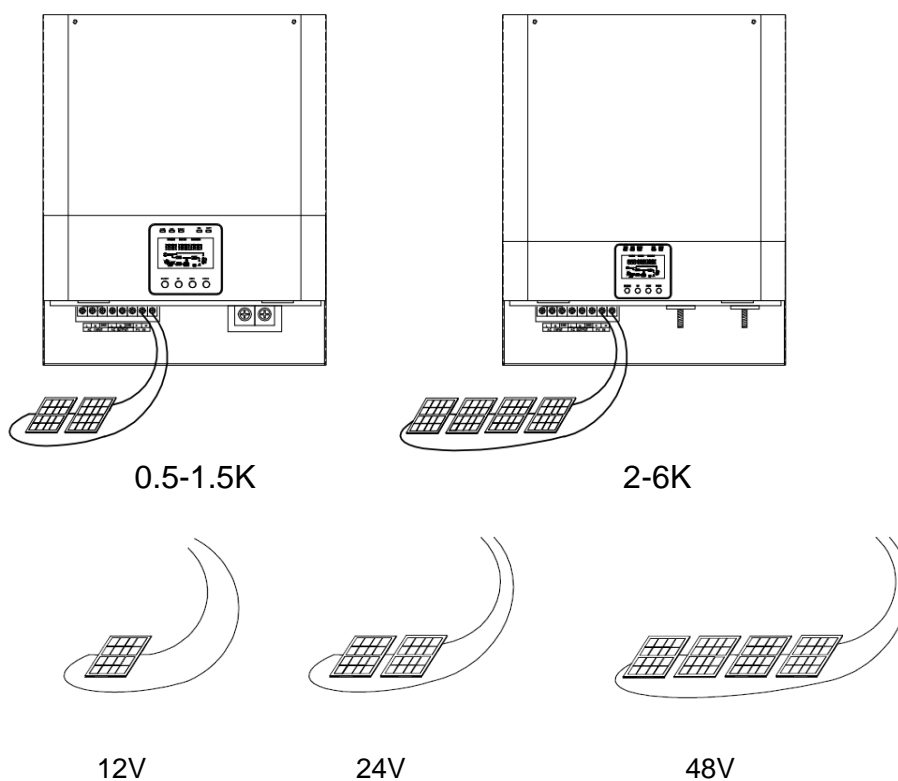
4.4.6.4 Solar panel connection

Solar inverter use MC4 connectors connect to solar panel. Make sure that the input voltage is consistent with the product specifications.

4.4.6.4-1 Solar Inverter (Tower type)



4.4.6.4-2 Solar Inverter (wall mounted type)



Chapter 5 Instructions and Operating Methods

5.1 Instruction for Use

After the installation of the system, start-up the Line Interactive UPS / Inverter / Solar Inverter must connecting with AC input to match the local power frequency, otherwise the Line Interactive UPS / Inverter / Solar Inverter will work according to the origin of power frequency. The Line Interactive UPS / Inverter / Solar Inverter always records the power frequency before the power outage, The next start-up if no electricity input, according to the last record to work; if connecting with electricity, the frequency is based on the current frequency of electricity to work.

5.2 Operation Guide

5.2.1 The 1st start-up

- ❶ Make sure all switches are “OFF”, Check if each input voltage match the rated input voltage identified by the rear panel of the machine. Please change, if you find that it do not meet the item, otherwise it will damage the system.
- ❷ Switch on battery switch, PV input switch, AC input switch in sequence ⚠ the sequence can be skipped, but cannot be violated.
- ❸ The system start-up automatically, enter the self-test mode: LCD display on, the corresponding LED lights also according to the provisions of the light. Once the buzzer click, the AC input LED light is bright, the system into the normal working operation
- ❹ After confirming that the output is normal, switch on load switch to supply power. During the loading process to ensure that the load is less than the rated load capacity of the system, that is, the fault light will not bright and the buzzer will not overload alarm.


5.2.2 Power off

After turn off the load, press button “ON” last for 5s, All LED indicated lights are off, at this moment Line Interactive UPS / Inverter / Solar Inverter off.





5.2.3 Daily operation

- ❶ Daily start-up only need to operate button “ON “on the Line Interactive UPS / Inverter / Solar Inverter can be.
- ❷ Turn off the load then press “OFF” button to power off Line Interactive UPS / Inverter / Solar Inverter. Please follow the first start-up procedures, if the Line Interactive UPS / Inverter / Solar Inverter no start-up for a long time.

5.2.4 System Setting Programs

Program	Description	Operation	Selectable Option
P0	Exit setting mode	Press “Enter” button last for 5s enter setting mode: Upper left corner of Display show “ESC”, “PO” is flashing	

At this moment, press “Enter” button twice to exit, or it will automatically exit if there is not any function in 10s. Press “UP” and “Down” buttons, it display P1, P2, P3, P4 in sequence, corresponding to the work mode adjustment, charging voltage adjustment, charging current adjustment, the buzzer adjustment of four states respectively.

P1	Working mode adjustment	When “P1” is flashing, press “Enter” button to enter “work mode adjustment state”, Press “UP”、“Down” to display 1、2、3、4 corresponding to scheduled working mode in sequence; Press “Enter” button to enter that mode, the corresponding number appears on the display.	
P2	Charging voltage adjustment	When “P2” is flashing, press “Enter” button to enter “Charging voltage adjustment state”, Press “UP”, “Down” button to display different digital corresponding to charging voltage in sequence, press “Enter” button to confirm AC charging voltage. Float charging voltage: floating voltage is set to three type, a single battery 13.6V, 13.8V, and 14V, corresponding to different batteries, average charging voltage increased by 0.3V respectively.	
P3	Charging current adjustment	When “P3” is flashing, press “Enter” button to enter the "charge current adjustment state", Press “UP”、“Down” button to display 20、40、60、80、100 corresponding to max charging current of 20%、40%、60%、80%、100% charging current in sequence, press “Enter” button to confirm AC charging current.	
P4	Buzzer adjustment	When “P4” is flashing, press “Enter” button to enter the "Buzzer Adjustment Status", Press “UP”、“Down” button to change the buzzer working state; Press “Enter” button to confirm. The silence flag display appears on the display.	

Special Note:

Shut down the Line Interactive UPS / Inverter / Solar Inverter After adjusted all parameters completely, cut off AC、DC voltage for 10 seconds, and then start-up Line Interactive UPS / Inverter / Solar Inverter. Adjustment is over if the Line Interactive UPS / Inverter / Solar Inverter start-up normally, and working in new set mode and parameters.

Chapter 6 Common Fault Analysis

- 1、When the fault LED is bright, please check ambient temperature, load capacity corresponding to panel indicate light
 - 2、Check if the connection cables are damage, each connectors are in correct connection
 - 3、If Line Interactive UPS / Inverter / Solar Inverter cannot start-up by “ON” button, Check DC input voltage if within the start-up voltage range.
 - 4、if connect with external generator power supply still no charging and AC bypass output, please check the output frequency and voltage of generator is consistent with the Line Interactive UPS / Inverter / Solar Inverter rated frequency and voltage.
- If the above checks are completed, the fault still cannot be resolved, please contact the seller.

Attached list UPS/Inverter common faults and solutions

Fault	Causes	Solutions
AC normal, AC input LED light is off, Inverter is working under battery mode	AC input cable lost or not in good connection	Check all input power cable and solve it
	AC input fuse jump	Change the fuse (or press the restorable fuse)
AC cut, Line Interactive UPS / Inverter / Solar Inverter backup time is not enough	Maybe the battery not full charge	Charge the battery at least 5 hours, then check the capacity of battery. If stil low battery, please contact your seller
	Battery damage	Contact the seller and change the battery
Buzzer long alarm, fault LED light is bright	Over temperature protection	Reduce the load, check the system ventilation holes are blocked or not
	Output short circuit or wrong connection	Check AC input line
	Output overload	Reduce the load

Chapter 7 Recycling

The Line Interactive UPS / Inverter / Solar Inverter cannot be treated as household waste. When the life of the Line Interactive UPS / Inverter / Solar Inverter reaches its limit, it is not required to be sent back to the dealer or to manufacturer, but must be recycled to the special waste electrical recycling station in the area.

Chapter 8 Warranty Service

Referring to the terms on the warranty card.