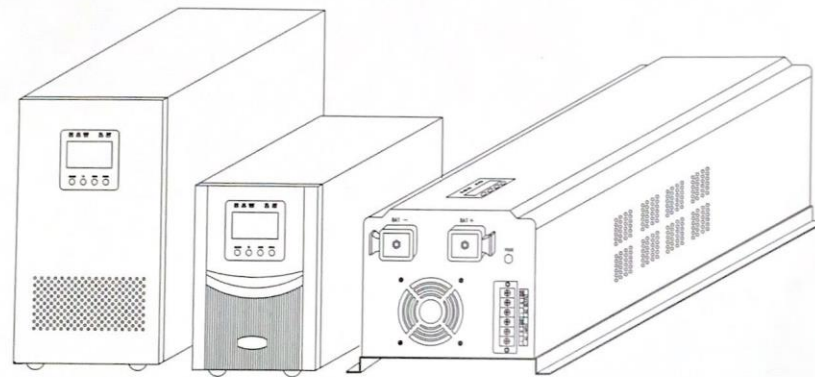




LINE INTERACTIVE UPS
& INVERTER

USER'S MANUAL



Version 3.3

Preface

Thank you for choosing our Line interactive UPS or 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 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 with manual will result in death or serious injury |

| |
|--|
|  WARNING |
| Failure to comply with manual may result in serious personal injury or damage to the equipment |

| |
|--|
|  CAUTION |
| Failure to comply with manual may result in minor or moderate injury |

| |
|---|
|  NOTICE |
| Failure to comply with manual may result in potential danger |

1.3 Users

Only professionals who have read and fully understood 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 install, operate and maintain this product

1.4.4 During the process of the 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 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 or 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 firing around the power supply.

1.6 Safety Precaution of Battery Operation

1.6.1 If the skin, clothing stained with acid batteries, washing it immediately 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 ignite 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 when the battery short-circuit, the current can produce high heat to melt metal, leading to serious burns.


Chapter 2 Symbols Description

2.1 Symbols Description







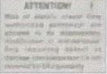
|  DANGER |
|---|
| <p>Dangerous due to electrical shock and high voltage.</p> <ul style="list-style-type: none"> Do not touch the operation component of the Line interactive UPS or Inverter, it might result in burning or death. To prevent risk of electric shock during installation and maintenance, please make sure that all AC and DC terminals are plugged out Do not touch the surface of the Line interactive UPS or Inverter while the housing is wet, it might lead to electrical shock. Do not stay close to the Line interactive UPS or Inverter while there are severe weather conditions including storm, lighting, etc. <p>Before opening the housing, the Line interactive UPS or Inverter must be disconnected from the grid, you must wait at least five minutes to let the energy storage capacitors fully discharge after disconnecting from power source.</p> |

|  WARNING |
|---|
| <p>The installation, service, recycling and disposal of the Line interactive UPS or Inverter must be performed by qualified personnel only in compliance with national and local standards and regulations.</p> <ul style="list-style-type: none"> 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 Line interactive UPS and inverter are well grounded in order to protect properties and persons. |

|  CAUTION |
|---|
| <ul style="list-style-type: none"> The Line interactive UPS or 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 or Inverter and other components of the system. |

|  NOTICE |
|--|
| <ul style="list-style-type: none"> This is off grid equipment, it cannot offer AC power to public utility. Do not connect the AC output of the Line interactive UPS or 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 or 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 or 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 or Inverter will release a lot of heat during operation. Do not touch metal plate housing during operating.</p> |
|  | <p>Fault alarm</p> <p>Please read Chapter 6 "common fault analysis" to solve the problem</p> |
|  | <p>This device SHALL NOT be disposed of in residential waste</p> <p>Please read 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 Electronic-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 or Inverter can simultaneously meet the sine wave inverter, multi-stage smart battery charging and power switching three functions, simplifying the system configuration, and reducing system wiring. A small size with strong load capacity, a high degree of intelligence. It 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. When there is no bypass alternating current, it can output the electrical energy stored in the battery into sine wave alternating current to supply the equipment with electricity and ensure the load does not lose power based on the use of power distribution system and configuration, it can provide different solutions, adjusting charging current and load management, which is widely used in vehicles, ships, solar independent systems or backup power and other occasions.

3.2 Features

3.2.1 Line interactive UPS or Inverter functions

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

3.2.1.2 Powerful loading ability: Low frequency design, is 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 or 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 3%, start intermittent output, when the load power is greater than 4%, 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: regarding to their own configuration of the battery AH, the users select the corresponding charge current (from 0% -100% in 20 steps adjustable).

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

3.2.3 Switch function

The machine integrates a fast switching switch. When there is mains input and meets the requirements of online interactive UPS or inverter, series working voltage and load power demand, inverter The online interactive UPS series will automatically switch to the mains supply mode, supply power to the load through the bypass, and simultaneously charge the battery. At this time, the inverter is turned off, and the AC output voltage is consistent with the input voltage. When there is no mains input or the mains input does not meet the load demand, the inverter, and online interactive UPS series will be fast. Switch to the inverter working state, and take the battery from the battery to the AC output to ensure that the load does not lose power; when the utility power recovers or re-satisfies the load power demand, the inverter, online interactive machine The series will switch back to the mains supply status.

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).

Communication function: RS232 and USB, 485, SNMP card remote control, which can be used to set the alarm device, automatically starting the generator or turning on / off part of the load.

3.2.5 Inverter & Line Interactive UPS working mode

| Mode | Name | Description |
|--------|---|---|
| Mode 1 | Regular Mode | The system always keeps output. When there is electricity power, the AC charging function is always maintained. If no AC, battery will discharge in inverter mode, and it will not shut down until it reaches low battery voltage. Once the AC recovers, it will auto restart |
| Mode 4 | Solar Energy Priority, Energy saving mode | The system always keeps output. When the load is less than 3%, the inverter Enters the standby mode within 5 seconds, and turns on the inverter automatically every 6 seconds, every 3 seconds to loop checks whether there is a load. It does not enter the standby mode in the AC mode. |

3.2.6 Product Protection

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

| | |
|---------------------------------|---|
| Power Amplifier Over Current | This system is equipped with the detection of the working current of power amplifier tube. When the detection current over large, the system will automatically enters current limiting working mode, meanwhile it display the fault code E01 |
| Output Short Circuit Protection | When the machine is shorted circuit, the system will shut down and display fault code: E02. After removed the fault, it need to be started manually. |
| Overload Protection | When the charge or inverter overload, the machine will enter the protection state, and display fault code: E03, including hardware protection and software protection. |
| Over Temperature Protection | When the machine internal temperature is too high, the machine will enter the over-temperature protection state, and display fault code: E04. |
| Battery Over Voltage Protection | In order to avoid the wrong way battery connection or the controller and charger fault caused system damage, when the system detects that battery voltage is over high, it will automatically shut down and display fault code: E05 |
| Low Battery Voltage Protection | To avoid excessive battery discharge, the machine will automatically shut down the system and display fault code E06 |
| Phase Reverse Protection | When the system detects internal phase error, it will alarm and display fault code: E07 |
| Low Output Voltage Protection | When the system detects that the output voltage of system is over low, the inverter will automatically shut down and display fault code: E08 |
| Hardware Protection | When entering the hardware protection, the over current protector jumps off and needs to press the over current protector button before the machine can work again |
| Software Protection | When entering the software protection, the machine will shut down automatically through the software control. At this time, the user needs to start the machine manually. |

3.4 Specifications

3.4.1 Long Strp Home Inverter

| Capacity(KW) | | 1 | 1.5 | 2 | 3 | 4 | 5 | 6 |
|----------------------|--------------------------|---|--------------------------|--------------------------------------|-------------|----|-----|----|
| Input voltage | Voltage Range | 100/110/120/127/220/230/240VAC (+25%,-36%) | | 100/110/120/127/220/230/240VAC(±25%) | | | | |
| | Frequency | 50/60 Hz±2.5Hz | | | | | | |
| Output | Rated Power (KW) | 1 | 1.5 | 2 | 3 | 4 | 5 | 6 |
| | Instantaneous Power (KW) | 3 | 4.5 | 6 | 9 | 12 | 15 | 18 |
| | Wave Form | Pure Sine Wave | | | | | | |
| | Battery Efficiency | 81% | | 83% | | | 85% | |
| | AC Efficiency | 93% | | | | | | |
| | Output Voltage | 100/110/120/127/220/230/240VAC ±5% (AC mode ±10%) | | | | | | |
| | Output 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 & Output Terminals | | | | | |
| Battery | Voltage | 24V | | 24V/48V | | | 48V | |
| | Charging | 0-25A adjustable by 5% | | 0-60A adjustable by 5% | | | | |
| Working Mode | Mode 1 | Regular Mode | | | | | | |
| | Mode 4 | Solar Energy Priority, Energy saving mode | | | | | | |
| 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 | The load exceeds 105%. The buzzer sounds an alarm and does not shut down; the load exceeds 110%, and the protection is turned off for 60 seconds; the load exceeds 130%, the protection is turned off for 20 seconds; the load is over loaded by 200%, and the protection is turned off for 1 second. | | | | | | |
| | High AC Voltage | Turn off AC, Turn to Inverter mode automatically | | | | | | |
| | Low DC Voltage | Inverter shut down automatically, once the AC recover, Inverter start up 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*235*150 | | | 550*295*205 | | | |

3.4.2 Tower Home Inverter

| Capacity(KW) | | 0.3 | 0.5 | 1 | 1.2 | 1.5 | 2 | 3 | 4 | 5 | 6 | 8 | 10 |
|----------------------|--------------------------|---|-----|-----|--|-----|--------------------------------------|-----|-------------|----|-----|----|----|
| AC Input | Voltage Range | 100/110/120/127/220/230/240 VAC (+25%,-36%) | | | | | 100/110/120/127/220/230/240VAC(±25%) | | | | | | |
| | Frequency | 50/60 Hz±2.5Hz | | | | | | | | | | | |
| Output | Rated Power(KW) | 0.3 | 0.5 | 1 | 1.2 | 1.5 | 2 | 3 | 4 | 5 | 6 | 8 | 10 |
| | Instantaneous Power (KW) | 0.9 | 1.5 | 3 | 3.6 | 4.5 | 6 | 9 | 12 | 15 | 18 | 24 | 30 |
| | Wave Form | Pure Sine Wave | | | | | | | | | | | |
| | Battery Efficiency | 81% | | | 83% | | | 85% | | | | | |
| | AC Efficiency | 93% | | | | | | | | | | | |
| | Output Voltage | 100/110/120/127/220/230/240VAC±5% (AC mode ±10%) | | | | | | | | | | | |
| | Frequency | 50Hz/60Hz±0.5Hz (AC mode ±2.5Hz) | | | | | | | | | | | |
| | Transfer Time | 4ms/8ms Optional | | | | | | | | | | | |
| | USB (Optional) | DC 5V/1A*1 + 5V/2A*1 (DC USB Charger Optional) | | | | | | | | | | | |
| Connector | Input / Output | Input power Cable, 2 pcs output sockets | | | Input & Output Terminals, 2 pc output socket | | Terminals | | | | | | |
| Battery | Voltage | 12/24V | | 24V | | | 24V/48V | | 48V | | 96V | | |
| | Charging | 0-20A adjustable by 5% | | | 0-40A adjustable by 5% | | | | | | | | |
| Working Mode | Mode 1 | Regular Mode | | | | | | | | | | | |
| | Mode 4 | Solar Energy Priority, Energy saving mode | | | | | | | | | | | |
| 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 | The load exceeds 105%. The buzzer sounds an alarm and does not shut down; the load exceeds 110%, and the protection is turned off for 60 seconds; the load exceeds 130%, the protection is turned off for 20 seconds; the load is over loaded by 200%, and the protection is turned off for 1 second. | | | | | | | | | | | |
| | High AC Voltage | Turn off AC input, Turn to Inverter mode automatically | | | | | | | | | | | |
| | Low DC Voltage | Inverter shut down automatically, once the AC recover, Inverter start up and charge automatically. PV waiting for charging at any time | | | | | | | | | | | |
| | Over Temp | Power off | | | | | | | | | | | |
| Working Environment | Humidity | 15-93% (No condensation) | | | | | | | | | | | |
| | Temperature | -10°C-50°C | | | | | | | | | | | |
| | Altitude | ≤3000m | | | | | | | | | | | |
| Communication | | USB, RS232, 485, SNMP (Optional) | | | | | | | | | | | |
| Dimension D*W*H (mm) | | 381*145*210 | | | 472*190*330 | | | | 535*280*580 | | | | |

3.4.3 Line Interactive UPS

| Capacity(KVA/COSφ=0.6) | | 0.5 | 1 | 1.5 | 2 | 2.5 | 3 | 4 | 5 | 6.5 | 8 | 10 | 12 | 15 | |
|------------------------|--|---|---|-----|-----|-------------|--------------------------------------|-----|----|-------------|----|-----|---|----|--|
| AC Input | Voltage Range | 100/110/120/127/220/230/240VAC(+25%,-36%) | | | | | 100/110/120/127/220/230/240VAC(±25%) | | | | | | | | |
| | Frequency | 50/60Hz±2.5Hz | | | | | | | | | | | | | |
| Output | Rated Power(KVA) | 0.5 | 1 | 1.5 | 2 | 2.5 | 3 | 4 | 5 | 6.5 | 8 | 10 | 12 | 15 | |
| | Instantaneous Power (KVA) | 1.5 | 3 | 4.5 | 6 | 7.5 | 9 | 12 | 15 | 19.5 | 24 | 30 | 42 | 45 | |
| | Wave Form | Pure Sine Wave | | | | | | | | | | | | | |
| | Battery Efficiency | 81% | | | 83% | | | 85% | | | | | | | |
| | AC Efficiency | 93% | | | | | | | | | | | | | |
| | Output Voltage | 100/110/120/127/220/230/240VAC ±5% (AC mode ±10%) | | | | | | | | | | | 100/110/120/127/220/230/240VAC ±5% (AC mode ±25%) | | |
| | 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, 2 pc output socket | | | Terminals | | | | | |
| | Voltage | 12V/24V | | 24V | | | 24V/48V | | | 48V | | 96V | | | |
| Battery | Charging | 0-20A adjustable adjustable by 5% | | | | | 0-40A adjustable adjustable by 5% | | | | | | | | |
| Working mode | Mode 1 | Regular Mode | | | | | | | | | | | | | |
| | Mode 4 | Solar Energy Priority, Energy saving mode | | | | | | | | | | | | | |
| 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 | The load exceeds 105%. The buzzer sounds an alarm and does not shut down; the load exceeds 110%, and the protection is turned off for 60 seconds; the load exceeds 130%, the protection is turned off for 20 seconds; the load is over loaded by 200%, and the protection is turned off for 1 second; | | | | | | | | | | | | | |
| | High AC Voltage | Turn off AC, Turn to Inverter mode automatically | | | | | | | | | | | | | |
| | Low DC Voltage | UPS shut down automatically, once the AC recover, UPS start up and charge automatically | | | | | | | | | | | | | |
| | Over Temp | Power off | | | | | | | | | | | | | |
| Working Environment | Humidity | 15~93% (No condensation) | | | | | | | | | | | | | |
| | Temperature | -10℃-50℃ | | | | | | | | | | | | | |
| | Altitude | ≤3000m | | | | | | | | | | | | | |
| Communication | RS232 (Standard), USB, RS485, SNMP (Optional) | | | | | | | | | | | | | | |
| Dimension D*W*H (mm) | 385*145*210 | | | | | 472*190*330 | | | | 540*280*580 | | | | | |

Chapter 4 Installation information

4.1 Safety instructions

DANGER

- Dangerous to life due to potential fire or electricity shock.
- The installation of the Line interactive UPS or Inverter should not get close to any inflammable or explosive items
- The Line interactive UPS or 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 suitable for the pollution degree II.
- Inappropriate or the harmonized installation environment may jeopardize the life span of the Line interactive UPS or 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 or Inverter have passed stringent testing and have been checked before they leave the factory, it is possible that the Line interactive UPS or 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 or 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 can adapt to the environment, then install.

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

☞ The Line interactive UPS or Inverter must not be installed under the sun or near the place where there is heater equipment.

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

4.2.3 Installation Position

Because overheating can lead to power reduction. 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 $+60^{\circ}\text{C}$ (-13°F to 140°F). When the temperature rises by 5°C , the load should be reduced by 10%.

Please make sure the installation place is ventilated, because the condition of air flowing will affect the internal electronic components' working performance, shortening the inverter life.

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

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 | 96VDC |
|--------------|--------------------|--------------------|--------------------|--------------------|
| 300 | 6mm ² | 4 mm ² | - | - |
| 500 | 10 mm ² | 6 mm ² | - | - |
| 1000 | 16 mm ² | 10 mm ² | - | - |
| 1200 | - | 10 mm ² | 6 mm ² | - |
| 1500 | - | 16 mm ² | 10 mm ² | - |
| 2000 | - | 25 mm ² | 10 mm ² | - |
| 3000 | - | 35 mm ² | 16 mm ² | - |
| 4000 | - | 50 mm ² | 25 mm ² | - |
| 5000 | - | - | 35 mm ² | - |
| 6000 | - | - | 35 mm ² | - |
| 8000 | - | - | - | 25 mm ² |
| 10000 | - | - | - | 35mm 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 | 0.5 mm ² |
| 1000 | 1 mm ² | 0.75 mm ² |
| 1200 | 2.5 mm ² | 1.5 mm ² |
| 1500 | 2.5 mm ² | 1.5 mm ² |
| 2000 | 4 mm ² | 2.5 mm ² /14AWG |
| 3000 | 6 mm ² | 2.5 mm ² /12AWG |
| 4000 | 10 mm ² | 4 mm ² |
| 5000 | 10mm ² | 4 mm ² |
| 6000 | 16 mm ² | 6 mm ² |
| 8000 | 16 mm ² | 10 mm ² |
| 10000 | 25 mm ² | 10 mm ² |

4.4 Installation Guide



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

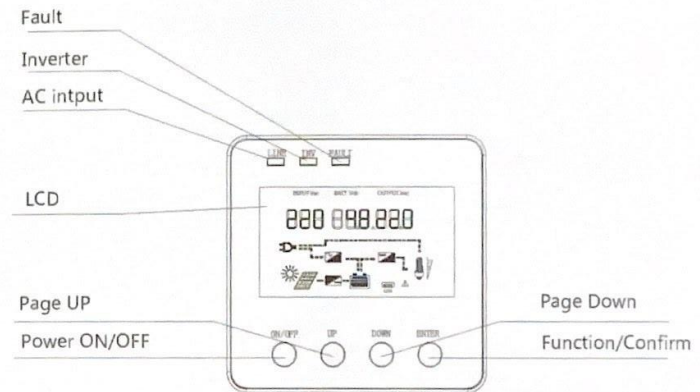


The Line interactive UPS or Inverter should be installed as close as possible to the battery, and make sure the installation is flat, dry and well ventilated.



Avoid damage to the system due to wiring errors or Line interactive UPS or Inverter Inverter fault. If you want to use another switch control system circuit, making 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 standard will affect the normal work of the Line interactive UPS or Inverter

4.4.1 LCD display



4.4.2 LED Indicator

| indicator light | Color | Description |
|-----------------|--------|--|
| Line light | Green | AC is normal "Bright", and _AC abnormal "OFF". |
| Inverter light | Yellow | Line interactive UPS or Inverter is working "bright", and Line interactive UPS or Inverter is not working "OFF". |
| Fault light | Red | Line interactive UPS or Inverter are working normal "OFF", Line interactive UPS or Inverter are fault "Bright, Buzzer is long alarm. |

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 |
| | 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 ~ 2.1V/cell | Bottom bar will be on and other three bars will flash in turns. |
| | Constant 2.1 ~ 2.2V/cell | Bottom two bars will be on and other two bars will flash in turns. |
| Voltage mode | > 2.2 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% | < 1.7V/cell | |
| | 1.7V/cell ~ 1.8V/cell | |
| | 1.8 ~ 1.9V/cell | |
| | > 1.9 V/cell | |
| 50%> Load > 20% | < 1.8V/cell | |
| | 1.8V/cell ~ 1.9V/cell | |
| | 1.9 ~ 2.0V/cell | |
| | > 2.0 V/cell | |
| Load < 20% | < 1.9V/cell | |
| | 1.8V/cell ~ 1.9V/cell | |
| | 1.9 ~ 2.0V/cell | |
| | > 2.0 V/cell | |

| Indicates the load level by 0-24%, 25-50%, 51-74% and 75-100%. | | | | |
|--|--------|---------|---------|----------|
| | 0%~24% | 25%~50% | 51%~74% | 75%~100% |
| | | | | |
| | | | | |

| | |
|--|---|
| | Indicates unit connects to the mains. |
| | Indicates the utility charger circuit is working. |
| | Indicates the DC/AC inverter circuit is working. |
| | Indicates working mode number. |
| | Indicates unit alarm is disabled. |

4.4.5 LCD Display Information

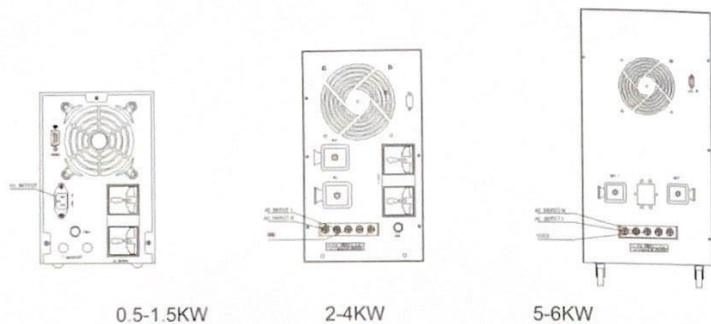
| Input voltage/Battery voltage/Output voltage | Input frequency/Battery capacity/Output capacity |
|--|---|
| <p>INPUT Vac BATT Vdc OUTPUT Vac</p> <p>220 48.220</p> | <p>INPUT Hz BATT % OUTPUT %</p> <p>50 800.800</p> |

4.4.6 Connection

4.4.6.1 Input connection

Line Interactive UPS / 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.

4.4.7.1-1 Line Interactive UPS / Inverter

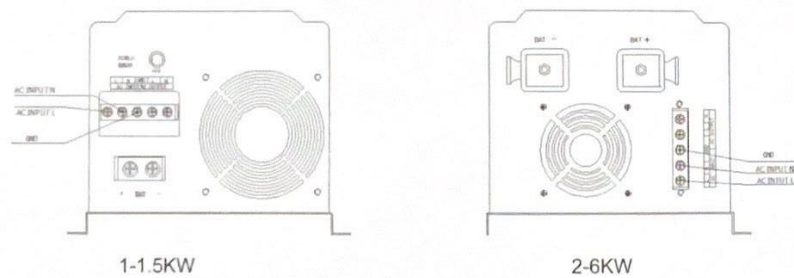


0.5-1.5KW

2-4KW

5-6KW

4.4.7.1-2 Home Inverter

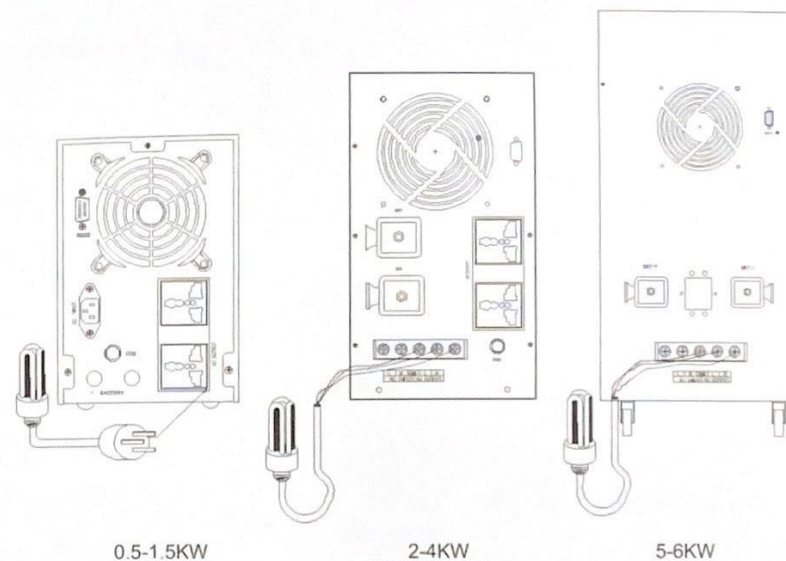


1-1.5KW

2-6KW

4.4.7.2 Output connection

4.4.7.2-1 Line Interactive UPS / Inverter

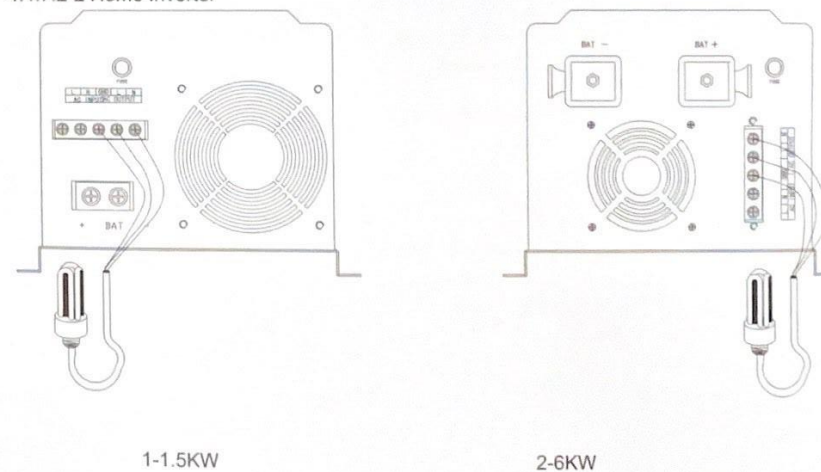


0.5-1.5KW

2-4KW

5-6KW

4.4.7.2-2 Home Inverter



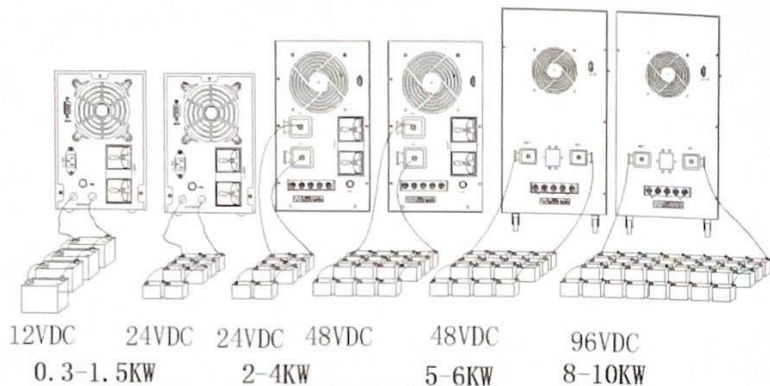
1-1.5KW

2-6KW

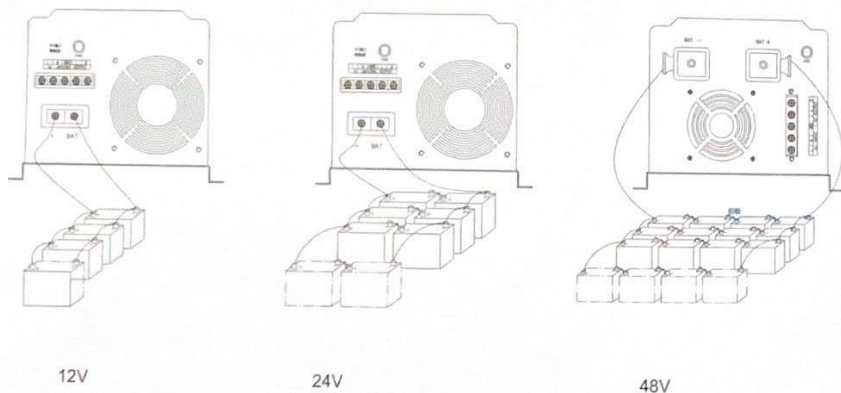
4.4.7.3 Battery Connection

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

4.4.7.3-1 Line Interactive UPS / Inverter



4.4.7.3-2 Home Inverter



Chapter 5 Instructions and Operating Methods

5.1 Instruction for Use

After the installation of the system, the start-up of Line Interactive UPS / Inverter must connect with AC input to match the local power frequency, otherwise the Line Interactive UPS / Inverter will work in accordance with the origin of power frequency. The Line Interactive UPS / Inverter always records the power frequency before the power outage. The next start-up if no electricity input, depends on 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", and check it 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, AC input switch in sequence Δ 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 follow the provisions of the light. Once the buzzer click, the AC input LED light is bright, and the system turn to the normal working operation
- ❹ After confirming that the output is normal, switch on load switch to supply power. During the loading process you should 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 turning off the load, press button "ON" last for 5s, and all LED indicated lights are off, At this moment Line Interactive UPS / Inverter off.

5.2.3 Daily operation

- ❶ Daily start-up only needs to press button "ON" on the Line Interactive UPS / Inverter can be.
- ❷ Turn off the load then press "OFF" button to power off Line Interactive UPS / Inverter. Please follow the first start-up procedures, if the Line Interactive UPS / Inverter are not used 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 | ESC PO |
| 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, then it displays 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. | | | |
| | | When "P1" is flashing, press "Enter" button to enter "work mode adjustment state", Press "UP", "Down" to display 1, | |

| | | | |
|----|-----------------------------|--|------------|
| P1 | Working mode adjustment | 2、3、4 corresponding to scheduled working mode in sequence; Press "Enter" button to enter that mode, the corresponding number appears on the display. | ESC 020000 |
| 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. Floating charge voltage adjustment range: 13V—15VDC; Each press of the up and down keys adjusts 0.1 VDC; Strong charging voltage = floating charging voltage +0.7 VDC; Normal switching point: DC voltage reaches to "floating charging voltage +0.4Vdc", it will turn to floating charge in 10mins. Fast switching point: DC voltage reaches to "floating charging voltage +0.6Vdc", it will turn to floating charge in 30s | ESC 02038 |
| P3 | Charging current adjustment | When "P3" is flashing, press "Enter" button to enter the "charge current adjustment state", Press "UP", "Down" button to adjust charging current from 5% to 100%, each time adjust 5% of the max charging current, press "Enter" button to confirm AC charging current. | ESC 023020 |
| 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. | ESC 024000 |

Special Note:

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

Chapter 6 Common Fault Analysis

1. When the fault LED is on, please check ambient temperature, load capacity corresponding to panel indicate light
 2. Check if the connection cables are damage, each connectors are in correct condition
 3. If Line Interactive UPS / Inverter cannot start-up by "ON" button, Check DC input voltage if it is within the start-up voltage range.
 4. If there is no charging and ac bypass output when the external generator is powered, please check the output frequency and voltage of generator is consistent with the Line Interactive UPS / 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 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 it is still 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 | Reducing the load, checking the system ventilation holes are blocked or not |
| | Output short circuit or wrong connection | Check AC input line |
| | Output overload | Reduce the load |
| Machine is out of working, Shutting down with buzzer alarm. At this moment, The fault code is shown on the "output voltage" position on LCD display. | E00 | No fault |
| | E01 | Mosfet over current |
| | E02 | Output short circuit |
| | E03 | Overload |
| | E04 | Over temperature |
| | E05 | Over DC voltage |
| | E06 | Low DC voltage |
| | E07 | Power cable wrong connection |
| E08 | Low output voltage protection | |