

Rack-Tower Conversion Single Phase UPS









Electrical System for Continuity

Foreword

Manual instruction

Thanks for purchasing our UPS, it is safe and reliable, so few maintenance is required.

Read this manual carefully and completely. It includes instructions of safety installation and operation. They will help your UPS obtain the longest life and service. This manual accounts the internal working principle and the relative protection functions. This manual also contains information about the usage of the equipment.

Please obey the instructions and all the warning stated in the manual or on the machine. Don't operate the machine before finishing reading the safety and operation instructions.



RISK OF ELECTRIC SHOCK - Observe the warning associated with the risk of electric shock symbol.

CAUTION, need your attention



This symbol indicates that you should not discard the UPS or the UPS batteries in the trash. This product contains sealed, lead-acid batteries and must be disposed of properly. For more information, contact your local recycling/reuse or hazardous waste center

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IXI
XХ
୵୲୷ଡ଼୕ୣ୵

This symbol indicates that you should not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center

Made in P.R.C

CE

Note: Because of the continuous improvements, our products may differ somewhat from the contents included in this manual. You can contact local office to get the information when necessary.

Content

1.Summary.	5
1.1 Introduction	5
1.2 Functions and characteristics	5
2.Safety instruction	6
2.1 Safety instruction	6
2.2 Symbols indication	7
3.Product Introduction	7
3.1 The appearance of the product	7
3.2 The principle of the product	8
3.3 Model	9
4.Installation	9
4.1 Unpacking and inspection	9
4.2 Notes	9
4.3 UPS input connection	9
4.4 UPS output connection	10
4.5 Long backup external battery connection	10
4.6 Installation	11
5.Panel display, operation and running	13
5.1 Faceplate display illumination	13
5.2 Operation	16
5.3 Parameter setting	16
5.4 Parameters inquiring	22
5.5 Run mode	24
6.Maintenance	25
6.1 Battery maintenance	25
7. Troubleshooting and properties of product	26
7.1 LED indication and warning table	26
7.2 Troubleshooting	28
7.3 EMC standard/Safety standard	28
7.4 Product Performance	29
7.5 Communication interface	30

1. Summary

1.1 Introduction

UPS (uninterruptible power supply) is a kind of power supply equipment that provides uninterruptible, high quality and efficient and reliable AC power to the loads, it also has functions of protection and monitoring. The UPS plays a very important role in power supply of computer and its network, communication, finance, electricity, transportation, national defense, college, scientific research institutes and so on.

This series of 3KVA product is designed as advanced ON-LINE UPS that provide the multiple functions and good performance.

1.2 Functions and characteristics

1.Advanced IGBT modules are used in our UPS. The electronic components we used can work normally for more than 300,000 hours.

2.Digital control technology with high efficiency and the most reliable controller algorithm design are used to optimize the output parameters of the machine.

3.Self-diagnose before start. It can find potential problems of the UPS in time to avoid any losses.

4.Double conversion on-line topology which makes the output of the UPS a pure sine wave electricity with constant frequency and voltage, low noise and no interruption of the main power fluctuation. It provides more comprehensive and perfect protection for the users' equipments.

5.No transfer time for the output of the UPS when the main power fails or restores. It meets the high standard and high request of the precise instruments.

6. The bypass function. When UPS meets a fault, it can transfer to bypass with no interruption to supply power to loads and provide alarm.

7.Advanced voltage compensation technology. It makes the input voltage range from 115v to 295v which reduces the battery usage and enhances the adaptive ability against the bad main power variation.

8. The AC input frequency is 50Hz/60Hz. Advanced wide frequency input technology makes the input frequency range wider. When the output frequency is 50Hz, the range of the AC input frequency is 45Hz-55Hz, When the output frequency is 60Hz, the range of the AC input frequency is 55Hz-65Hz. The UPS has a good compatibility with generator. It is suitable for different types of single-phase generators.

9. The advanced PFC(power factor correction) technology on the input of the UPS makes the input power factor more than 0.98. It increases the power efficiency, removes the harmonic noise from UPS to utility, lowers the UPS operational cost. It's really an economic environmental protection power supply.

10.Intelligent function without surveillance. When main power is on blackout, the UPS will start battery mode to supply power to loads.

When battery voltage is low, UPS will protect itself and shut down automatically. When main power restores, UPS will detect main power to determine whether the voltage and frequency are normal. If normal, UPS will turn on automatically to supply power to loads; if abnormal, UPS will start charger to charge the battery. The UPS will not turn on to supply power to loads until the voltage and frequency of the main power restore normally.

11.Cold start function. When there is no main power, UPS can be started by battery pack. It can meet the users' emergency needs. The cold start function is quite strong. UPS can be cold started under the full load situation.

12.UPS protection function:

When the main power input/output voltage is too high or too low, overload, short-circuit, inverter temperature is too high, low voltage

and overcharge of battery, network surge and so on, UPS has a protection function.

13.Rack-Tower conversion LCD design. No matter what angel to watch the display, only press the key slightly can meet your perspective needs. The content displayed on the interface is rich. The capacity of the loads and the battery can be saw directly and the FLASH pictures and fan rotating icon can be displayed when charging. So it is easy to know it's operation. When UPS fails, it can show the fault code, the machine can be maintained as soon as possible by inquiring fault code table.

14. The UPS can communicate with the computer with intelligent UPS monitoring software through the RS232 interface. All the parameters clearly display on the communication interface. Computer can control multiple functions of the UPS directly.

15. Via internal or external SNMP adapter, UPS can go on internet and provide the latest information and power messages. You can monitor and manage the UPS status through all kinds of network management system.

16.Convenient USB communication. You can see the operation of the machine completely. Even if the RS232 interface is occupied or connected at the same time, it will automatically switch to USB connection.

17.ECO function can help you save electricity. When the input mains power is in a fixed range, the loads is supplied with power by mains power directly, the inverter is on waiting; when input mains power is abnormal, it transfers to inverter to supply power to loads at once.

18.In order to ensure the power of the important loads can last for a long time, you can plug the important loads into the second power down socket. When the battery voltage is below the predetermined value, only the first cut-off power socket is broken off, the second power down can keep on supplying power until the battery voltage reaches protect point and shut down.

19.Adopt international standard rack-mounted size. Whether you want to put it on the office desk or in the rack-mount as a system to manage, It can present your personal style with corresponding components.

2. Safety instruction

Abstract

This chapter mainly introduce the safety marks and notes of 3KVA series on-line UPS. Read this chapter carefully before operating on the equipment.

2.1 Safety instruction

There is dangerous voltage and high temperature inside the UPS. During the installation, operation and maintenance, please abide the local safety instructions and relative laws, otherwise, it will result in personal injury or equipment damage. Safety instructions in this manual act as a supplementary for the local safety instructions.

Our company will not assume the liability that caused by disobey of safety instructions. Please note the following:

- 1. Don't use the UPS when the actual load exceeds the rated load.
- There are high-capacity batteries in the standard type UPS. You mustn't open the enclosure or it will lead to electric shock. If it needs internal maintenance or battery replacement, please send it to the designated site.
- 3. Internal short-circuit of the UPS will cause electric shock or fire. So don't place the containers equipped with liquid on the top of the UPS so as not to cause danger of electric shock and so on.
- 4. Don't put the UPS in a place with high temperature or humidity as well as the corrosive gas, much dust.
- 5. Keep good air circulation between in-vent on front panel and out-vent on back panel.
- 6. Avoid direct sunlight or near heat-dispensed objects.
- 7. In case that the smoke appears on the UPS, please cut off the power as soon as possible and contact the dealer service site.

2.2 Symbols indication

The safety symbols cited in this manual are shown in table 1-1, which are used to inform readers of safety issues that should be obeyed when installation, operation and maintenance.

Safety Symbol	Indication
	Attention
	Static discharge sensitive
	Electric shock

There are three levers of safety grade: Dangerous, Warning and Attention. The remark is on the right side of the safety symbol, the detailed comments is behind, shown as following:



Dangerous

Indicate risk of serious injury or death or seriously damage the equipment



warning:

Indicate risk of serious injury or damage the equipment.



Indicate risk of injury or damage the equipment.

3. Product Introduction

3.1 The appearance of the product



Fig 1 Front Panel view



Fig 2 Rear Panel view

3.2 The principle of the product



Fig 3 UPS Principle Diagram

- 1. Input filter: Complete filtering the input AC utility power to provide the clean power for UPS.
- 2. AC/DC converter: Convert the filtered AC mains to DC and boost the DC for DC/AC inverter.
- 3. DC/DC booster: When the UPS works in battery mode, the circuit boosts the DC for DC/AC inverter.
- 4. DC/AC inverter: Convert the boosted DC to stable AC output.
- 5. Bypass: When overload or failure of inverting happen in the UPS, it transfers to bypass mode to supply power to loads.
- 6. Charger: Standard unit provides 1A; long backup unit provides 7A/14A.
- 7. Battery: Sealed Lead Acid Battery.
- 8. Output filter: Complete filtering the output of the UPS to provide the clean power for loads.

3.3 Model

UPS sort	MODEL	Remark
Standard unit	3KVAS	Internal 1A charger, 2 high-rate 9AH batteries
Long backup unit	ЗКVАН	★internal 6A/14A charger, external 72V battery

Notice: long backup unit can choose two chargers connected in parallel, the charger current is 12A.

4. Installation

4.1 Unpacking and inspection

- 1. Unpacking the UPS and check that whether it's damaged during the transportation. If damaged or some parts missing, don't start the machine and inform the carrier and franchiser.
- 2. Check the annex (please consult Appendix Table 1).
- 3. Check if the equipment is just what you wanted to purchase. You can affirm through inspecting the model number on back panel of the equipment.

4.2 Notes

- 1. Please place the UPS in a clean, stable environment, avoid the vibration, dust, too humidity, flammable gas and liquid, corrosive.
- 2. The ambient temperature around UPS should keep in a range of 0°C∼40°C. If UPS works above 40°C, it is required that the rated value of the largest load decreases 12% while the temperature increases the 5°C every time. The highest temperature cannot be more than 50°C when UPS works.
- 3. UPS should be placed in a sufficiently ventilated place.

4.3 UPS input connection

to connect the main to the UPS, do this using an appropriate cable to connect the input terminal indicated by the arrow in the picture 4 below:



Fig 4 Input Connection

4.4 UPS output connection

to connect the load to the UPS, do this using an appropriate cable to connect the output terminal indicated by the arrow in the picture 5 below:



Fig 5 output connection

4.5 Long backup external battery connection

to connect an external battery cabinet to the UPS, do this using the cable supplied to the connector indicated by the arrow in the picture 6 below:



Fig 6 battery connection

4.6 Installation







4.6.2 Cabinet installation bracket assembly

1) screw A, screw B, two M4 screws (symmetrical on both sides, a total of four)



Fig 8 Cabinet installation bracket assembly

2) cabinet installation bracket screw hole A, screw hole B are respectively corresponding to two screws (symmetrical on both sides, a total of four).



Fig 9 Cabinet installation bracket

Fig 10 Cabinet installation bracket assembly

3) screw the two M4 screws described as Fig 10 (symmetrical on both sides, a total of four).



Fig 11 Cabinet installation bracket assembly

4.6.3 Tower/Rack assembly



Fig 12 Tower—mounted assembly



Fig 13 Rack-mounted assembly



- ★ Before installing battery, make sure that UPS and breaker are all turned off. Remove all your metallic adornment such as finger ring, watch, and so on before connecting battery.
- ★ No anti-connection or short circuit between the battery anode and cathode forever. Red cable connect with battery anode "+" and black cable connect with cathode "-".
- ★ Please use the screwdriver with insulating handle. Do no lay the tools or metallic goods on the battery.

Motice:

- ★When using the external battery, It is best to use external battery cable which matches with the equipment.
- ★When connecting load to UPS, first turn off load and then connect the power cable and finally turn on load one-by-one.
- ★Inductance loads such as motor, fluorescent lamp, copy cat are strictly prohibited connecting to UPS to avoid damage.
- ★Plug UPS on the special socket with over-current protection, the power socket that used should be connected with ground wire.
- ★UPS is likely to have output voltage no matter whether the power input cable is plugged in mains input socket. If you wish UPS have no output, first break off the switch and then cancel the mains.
- ★When connect laser printer, select the capacity of UPS according to the UPS start power because the startup power is higher.

5. Panel display, operation and running

The operation is simple, operators only need to read the manual and follow the operation instructions listed in this manual without any special training.

5.1 Faceplate display illumination

5.1.1 Keys function



Fig 14 front panel keys instruction

J ON/OFF key (@+∞)

Press and hold this key for more than half a second to turn on or turn off the UPS.

Press and hold this key for more than 2 seconds to rotate LCD in any mode.

J SELF-TEST/MUTE key (@+∞)

Press and hold the key for more than 1 second in mains mode or economical mode: UPS runs the self-test function.

Press and hold the key for more than 1 second in battery mode: UPS runs the mute function.

J INQUIRING key <∞ or <∞</p>

Non-functional setting mode:

Press and hold the key for more than half a second (less than 2 seconds): Indicate the items of the LCD item section orderly.

Press and hold \bigcirc for more than 2 seconds: Circularly and orderly display the items every 2 seconds, when press and hold the key for some time again, it will turn to output status. Functional setting mode:

Press and hold the key for more than half a second (less than 2 seconds): Select the set option.

Function setting key

Non-functional setting mode:

Press and hold the key for more than 2 seconds: Function setting interface.

Functional setting mode:

Press and hold the key for more than half a second (less than 2 seconds): Affirm the set option.

5.1.2 The description of LED display lamp functions



Warning red LED is on: UPS is fault and has no output. For example: Overload beyond the allowed time, inverter fault, BUS fault, over temperature fault etc.

Bypass yellow LED is on: UPS is alarming. For example: Bypass mode supply power and etc.

Battery yellow LED is on: UPS is alarming. For example: Battery mode supply power and etc.

Inverter green LED is on: UPS is normally powered by mains or ECO mode or battery mode.

After starting the UPS, the four LEDs will light and go out one-by-one. It circulates several times until starting the UPS successful.

NOTE: As to the LED indication in different modes, please refer to the LED lamps/display panel and warning table.

5.1.3 LCD display functions

When UPS is tower-mounted, the LCD displays as following Fig A. Press and hold the ROTATE key for more than 1 second, the display will begin to rotate which matches with the rack-mounted configuration. LCD displays as following Fig.B.



LCD display comprises numerical value section, capacity graphics section, fan-status graphics section and charger-status graphics section.

Numerical value section—display the corresponding numerical value of inquiring items(output, load, temperature, input, battery), for example, as the graphics shows above, the output voltage is 220v, the output frequency is 50Hz.

Capacity graphics section—display the capacity of the battery and load. Every pane represents 20% capacity. As graphics showed above, the capacity of the battery is 80%-100%(5 panes), the load reaches 40%-60%(3 panes). When UPS is overload, the icon will flash, when capacity of battery is too low or disconnected, the icon will also flash.

Fan-status graphics section—display if the fan works normally. When the fan works normally, it will show the dynamic fan blades rotating; when the fan works abnormally, the icon will keep on flashing and alarm. Charger-status graphics section—display the status of the charger. When charger works normally, the corresponding icon will vary dynamically and orderly, just as Graphics (1);



(1)

when charger works abnormally, the icon will flash in a whole, as Graphics(2):



When UPS is in battery mode, the number of the icons of the charger-state section will vary according to the changeable capacity of the battery (pane). For example, there are five panes in Fig.A,(as the right picture of the Graphics(3) shows), so the corresponding number of icons is five rows(as the left picture of the Graphics(3) shows),, followed by this rule,





5.2 Operation

5.2.1 Start up operation

Turn on the UPS in line mode

- Once mains power is plugged in, the UPS will charge the battery, at the moment, LCD shows that the output voltage is 0, which means UPS has no output. If it is expected to have output of bypass, you can set the bps "ON" by LCD setting menu.
- Press and hold the ON/OFF key for more than half a second to start the UPS, then it will start the inverter.
- Once started, the UPS will perform a self-test function, LED will light and go out circularly and orderly. When self-test finishes, it will come to line mode, the corresponding LED lights, UPS is working in line mode.

Turn on the UPS by DC without mains power

- When mains power is disconnected, press and hold the ON/OFF key for more than half a second to start UPS.
- The operation of UPS in the process of start is almost the same as that when mains power is in. After finishing the self-test, the corresponding LED lights and UPS is working in battery mode.

5.2.2 Turn off operation

Turn off the UPS in line mode

- Press and hold the ON/OFF key for more than half a second to turn off the UPS and inverter.
- After UPS shutting down, LED go out and there is no output. If output is needed, you can set bps "ON" by LCD setting menu.

Turn off the UPS by DC without mains power

- Press and hold the ON/OFF key for more than half a second to turn off the UPS.
- When turning off the UPS, it will do self-testing firstly. LED light and go out circularly and orderly until there is no display on the panel.

5.2.3 UPS self-test/mute test operation.

- When UPS is in line mode, press and hold the self-test/mute key for more than 1 second, LED light and go out circularly and orderly. UPS comes to self-test mode and tests its status. It will exit automatically after finishing testing, LED resume.
- When UPS is in battery mode, press and hold the self-test/mute key for more than 1 second, the buzzer stops beeping. If you press and hold the self-test/mute key for one more second, it will restart to beep again.

5.3 Parameter setting

UPS has setting function. It can run the setting on any mode. After setting, it will become effective at once when meets some standards. The set information can be saved only when the battery connected and normally turning off the UPS.

The operation of setting is as following:

5.3.1 ECO mode setting (1)

- Enter the setting interface. Press and hold the function setting key for more than 2 seconds, then come to setting interface, the letters "ECO" will flash
- Enter the ECO setting interface. Press and hold the function setting key for more than half a second(less than 2 seconds), then come to setting interface of ECO, at this time, the letters "ECO" will light for a long time. The "ON"(or OFF) below the ECO will flash. Press and hold the inquiring key
 for more than half a second (less than 2 seconds) to determine whether the ECO function is used or not. If used, the corresponding word is "ON", if not, the word is "OFF". It can be determined by yourself.



- Confirm the ECO selecting interface. After selecting ON or OFF, press and hold the function setting key I for more than half a second (less than 2 seconds). Now, the ECO setting function is completed and the "ON" or "OFF" below the "ECO" will light without flash.
- Set the ECO tolerance range. Short press the scroll key I prese to be for more than half a second (shorter than 2 seconds) to select the voltage range in percentage. +5%,+10%,+15%,+25% (default is +25%), then short press function setting key I for more than half a second (shorter than 2 seconds) to confirm the selection, then to set the minus range.
- To set the minus range in the same way.
- Exit from the setting interface. Press and hold function setting key for more than 2 seconds, exit from the setting interface and turn to main interface.

5.3.2 Bypass mode setting (2)

• Enter the setting interface. Press and hold the function setting key I for more than 2 seconds, then come to setting interface, Press and hold the function setting key I for more than half a second (less than 2 seconds), select the function setting, choose the bypass output interface, at the moment, the letters "bPS" will flash



• Enter the Bypass output selecting interface. Press and hold the function setting key I for more than half a second(less than 2 seconds), then come to setting interface of bPS, at this time, the letters "bPS" will light for a long time. The "ON" below the bPS will flash. Press and hold the inquiring key I for more than half a second (less than 2 seconds) to determine whether the bPS function is used or not. If used, the corresponding word is "ON", if not, the word is "OFF". It can be determined by yourself.

- Confirm the Bypass output selecting interface. After selecting ON or OFF, press and hold the function setting key for more than half a second (less than 2 seconds), Now, the bPS setting function is completed and the "ON" or "OFF" below the "bPS" will light without flash.
- Set the BPS tolerance range. Short press the scroll key I provide the voltage of provide the voltage range in percentage.
 +5%,+10%,+15%,+25% (default is +25%), then short press function setting key I provide the voltage range in percentage.
- To set the minus range in the same way.
- Exit from the setting interface. Press and hold function setting key I for more than 2 seconds, exit from the setting interface and return to main interface.
- After setting bPS as ON, when mains power plugged in without turning on the UPS or no mains power plugged in, there is bypass output but no power down backup function.

5.3.3 Output voltage setting (3)

• Enter the setting interface. Press and hold the function setting key I for more than 2 seconds, then come to setting interface, Press and hold the inquiring key I for more than half a second(less than 2 seconds), select the function setting, choose output voltage setting interface, at the moment, the letters "OPU" will flash



- Enter the output voltage selecting interface. Press and hold the function setting key I for more than half a second (less than 2 seconds), then come to setting interface of output voltage OPU, at this time, the letters "OPU" will light for a long time. The numerical value below the OPU will flash. Press and hold the inquiring key I for more than half a second (less than 2 seconds), select the numerical value in accordance with "OPU" function. The provided voltages are 208V,220V, 230V, 240V you can choose anyone by yourself (The default is 220v).
- Confirm the output voltage selecting interface. After selecting numerical value, press and hold the function setting key is for more than half a second (less than 2 seconds). Now, the OPU setting function is completed and the numerical value below the "OPU" will light without flash.
- Exit from the setting interface. Press and hold function setting key I for more than 2 seconds) exit from the setting interface and return to main interface.

NOTE: When setting the output voltage, you'd better cut off the load of the UPS first.

5.3.4 Battery Pack (EBP) number and type setting (4)

• Enter the setting interface. Press and hold the function setting key 2 for more than 2 seconds, then come to setting interface, Press and hold the scroll key 2 for more than half a second (less than 2 seconds), select the function setting, choose battery setting interface, at the moment, the letters "bAt" will flash.



- Enter the battery setting interface. Press and hold the function setting key I for more than half a second(less than 2 seconds), then come to setting interface of battery, the letters "bAt" will stop flashing. The numerical value below the "bAt" will flash. Press and hold the scroll key I for more than half a second (less than 2 seconds), select the numerical value in accordance with the real connected battery packs.
- Confirm the battery packs setting interface.
- After selecting numerical value, press and hold the function setting key I for more than half a second (less than 2 seconds). Now, the battery packs setting is confirmed and the battery type value below will flash.
- set the battery type in the same way.
- Exit from the setting interface. Press and hold function setting key I for more than half a second (less than 2 seconds), exit from the setting interface and return to main interface.

5.3.5 Load segment setting (5)

It's show on the menu but not available for this model.

5.3.6 Automatic Battery Test mode setting (6)

- Enter the setting interface. Press and hold the function setting key I for more than 2 seconds, then come to setting interface, Press and hold the inquiring key I for more than half a second(less than 2 seconds), select the function setting, choose Automatic Battery Test setting interface, at the moment, the letters "Abt" will flash.
- Enter the "Abt" setting interface. Press and hold the function setting key for more than half a second(less than 2 seconds), then come to setting interface of "Abt", at this time, the letters "Abt" will light for a long time. The "ON"(or OFF) below the "Abt" will flash. Press and hold the inquiring key
 for more than half a second (less than 2 seconds) to determine whether the "Abt" function is used or not. If used, the corresponding word is "ON", if not, the word is "OFF". It can be determined by yourself.



• Confirm the "Abt" selecting interface. After selecting ON or OFF, press and hold the function setting key is for more than half a second (less than 2 seconds). Now, the "Abt" setting function is completed and the "ON" or "OFF" below the "Abt" will light without flash.

- Exit from the setting interface. Press and hold function setting key for more than half a second (less than 2 seconds), exit from the setting interface and return to main interface.
- When the ABT function is set to ON, the UPS will automatically do battery test every 30 days for 10 seconds if utility is available.
- If the battery test fails:
 - 1. The battery indicator on the LCD will flash. Battery voltage, battery capacity will show zero. When the UPS detect battery test fail, the buzzer will sound 6 consecutive short sounds.
 - 2. The battery indicator in Upsilon2000 will be red and battery capacity will show zero (if installed).
 - 3. Relay will have low battery alarm. (if installed Relay board)

5.3.7 Warning Code Display mode setting (7)

- Enter the setting interface. Press and hold the function setting key I for more than 2 seconds, then come to setting interface, Press and hold the inquiring key I for more than half a second(less than 2 seconds), select the function setting, choose Warning Code Display setting interface, at the moment, the letters "wc" will flash
- Enter the "wc" setting interface. Press and hold the function setting key I for more than half a second(less than 2 seconds), then come to setting interface of "wc", at this time, the letters "Abt" will light for a long time. The "ON"(or OFF) below the "wc" will flash. Press and hold the inquiring key I for more than half a second (less than 2 seconds) to determine whether the "wc" function is used or not. If used, the corresponding word is "ON", if not, the word is "OFF". It can be determined by yourself.



- Confirm the "wc" selecting interface. After selecting ON or OFF, press and hold the function setting key is for more than half a second (less than 2 seconds). Now, the "wc" setting function is completed and the "ON" or "OFF" below the "wc" will light without flash.
- Exit from the setting interface. Press and hold function setting key for more than half a second (less than 2 seconds), exit from the setting interface and return to main interface.
- If used, the corresponding word is "ON",2~5 seconds cycle Warning Code, please refer to Warning Code information Table in Appendix1.

5.3.8 EPO Input Polarity setting (8)

- Enter the setting interface. Press and hold the function setting key I for more than 2 seconds, then come to setting interface, Press and hold the scroll key I for more than half a second(less than 2 seconds), select the function setting, choose EPO Input polarity setting interface, the letters "EPO" will flash.
- Enter the EPO Input Polarity setting interface. Press and hold the function setting key I for more than half a second(less than 2 seconds), the letters "EPO" will stop flashing. The letters below the "EPO" will flash. Press and hold the scroll key I for more than half a second (less than 2 seconds), select the EPO input polarity, "+P"(open circuit execute EPO function) or "-P"(short circuit execute EPO function).



- Confirm the setting. After selecting EPO input polarity, press and hold the function setting key
- Exit from the setting interface. Press and hold function setting key *for* more than half a second (less than 2 seconds), exit from the setting interface and return to main interface.

5.3.9 (Battery) End of discharge setting (9)

- Enter the setting interface. Press and hold the function setting key I for more than 2 seconds, then come to setting interface ,short press the scroll key I for more than half a second (less than 2 seconds) to select Eod setting, the letters "Eod" will flash.
- Enter the Eod setting interface. Press and hold the function setting key for more than half a second(less than 2 seconds) at this time, the letters "Eod" will stop flashing.



- Set the Eod tolerance range. Short press the scroll key 💷 or 💬 for more than half a second (shorter than 2 seconds)to select the voltage range in percentage. 10.0V, 10.5V, 11.0V (default is 10.0V), then short press function setting key 💷 for more than half a second (shorter than 2 seconds)to confirm the selection, then to set the minus range.
- After the minus range is confirmed. Long press function setting key to for more than 2 seconds to exit setting menu.

5.3.10 Frequency Converter mode setting (10)

• Enter the setting interface. Press and hold the function setting key I for more than 2 seconds, then come to setting interface, Press and hold the scroll key I for more than half a second(less than 2 seconds), select the function setting, choose output frequency setting interface, the letters "OPF" will flash.



- Enter the output frequency of converter mode setting interface. Press and hold the function setting key *for* more than half a second(less than 2 seconds), the letters "OPF" will stop flashing. The letters below the "OPF" will flash. Press and hold the scroll key *for* more than half a second (less than 2 seconds), select the output frequency, "50Hz"(output fixed to 50Hz and active converter mode) or "60Hz"(output fixed to 60Hz and active converter mode) or "IPF"(inactive converter mode and active normal mode).
- Confirm the setting. After selecting converter mode output frequency, press and hold the function setting key I for more than half a second (less than 2 seconds). Now, the setting is confirmed.
- Exit from the setting interface. Press and hold function setting key I for more than half a second (less than 2 seconds), exit from the setting interface and return to main interface.

IPF:UPS output frequency with the same frequency as the mains input.

50.0Hz:UPS output frequency is fixed at 50.0Hz, independent of the mains input frequency

60.0Hz:UPS output frequency is fixed at 60.0Hz, independent of the mains input frequency.

5.4 Parameters inquiring

Press and hold the inquiring key I or I for more than half a second(less than 2 seconds) to inquire about items. The inquired items include input, battery, output, load, temperature. The displayed items on LCD screen are showed as following:

Output: Display the output voltage and output frequency of the UPS. As the following graphic shows, the output voltage is 220V, the output frequency is 50Hz.



Load: Display the numerical value of the active power (WATT) and apparent power (VA) of the load. For example, as the following graphics shows: the WATT of the load is 100W, VA is 100VA (when disconnect load, it is a normal phenomenon to show a small numerical value of WATT and VA).



Temperature: Display the temperature of the inverter in the UPS. As the following graphics shows: the temperature of the inverter is 37°C.

When the UPS in high temperature situation (over 85°C), the UPS will turn to bypass and alarm. At this situation, you should shut down the UPS and shut down the output.



Input: Display the voltage and frequency of the input. As the following graphics shows: the input voltage is 210V, input frequency is 49.8Hz.



Battery: Display the voltage and capacity of the battery (determined by type). As the following graphics shows: the battery voltage is 28V, the capacity of battery is 100% (the capacity of battery is approximately reckoned according to the battery voltage).



Press and hold the inquiring key \bigcirc for more than 2 seconds, LCD begins to display the items circularly and orderly which transfer to another every 2 seconds. Press and hold the key for some time again, it will return to output status.

5.5 Run mode

5.5.1 Bypass mode

LED indications on front panel in bypass mode are as following:



Bypass yellow LED is On, the buzzer beeps once every 2 minutes. The warning red LED is on when beeping. LCD displays are according to the exact load and battery capacity.

Turn to bypass mode under the following two conditions:

- Turn off the UPS in line mode while start the bypass output.
- Overload in line mode.

NOTE: When UPS is working in bypass mode, it has no back up function.

5.5.2 Line mode

LED indications on front panel in line mode are as following: the inverter green LED is On.



When input AC mains is in line with the working conditions, UPS will work in line mode.

5.5.3 Battery mode

LED indications on front panel in battery mode are as following: both the inverter green LED and battery yellow LED are on, the buzzer beeps once every 4 seconds. The warning red LED is on when beeping.



When the mains power down or instable, UPS will turn to battery mode at once. Continuously working on battery mode can last for 20 hours depending on the battery volume and the load. If battery discharge for 20 hours and the load is lower than 10% of rated power, the UPS will alarm for half an hour and then shutdown to protect the batteries.

5.5.4 ECO mode

LED indications on front panel on ECO mode are as following: both the inverter green LED and bypass yellow LED are on.



When the input mains meets the input range of the ECO mode and start the ECO function, the UPS will works on ECO mode. If input AC mains exceeds the range of ECO several times in a row in a minute but stays in inverting input range, UPS will work on inverting mode automatically.

5.5.5 Fault mode

LED indications on front panel in fault mode are as following:



Fault mode (LCD interface on which the fault code display)

When UPS has fault, the fault LED lights and the buzzer beeps. UPS will turn to fault mode when overload fault, inverting fault and over-temperature fault happen. UPS cuts off the output and LCD display fault codes. At the moment, you can press the mute key to make the buzzer stop beeping temporarily to wait for maintenance. You can also press the ON/OFF key to shut down the UPS when confirm that there is no serious fault.

NOTE: As for corresponding information of the fault code, please refer to Fault Code information Table in Appendix.

- ★ The following process must be performed if UPS is connected with generator:
- ★ First turn on generator, after it runs stably connect output power of generator to UPS input terminal, then turn on UPS. After UPS turned on, please connect load one-by-one.
- ★ It is recommended that the generator capacity is as twice as UPS rated capacity
- ★ You'd better not use the ECO mode when the quality of the input AC mains is not good.

6. Maintenance

Only minimum maintenance is required for this series of UPS. The battery is sealed lead acid maintenance free. It only needs to be kept charging to obtain the expected life. Whether it is started or not, the UPS would charge batteries once it is connected to mains and provide protection for over-charging and deep discharging.

6.1 Battery maintenance

- 1. It is recommended that the batteries are manually charged or discharged.
- once every three or four months if UPS has not been used for a long time or the power is long-term uninterruptible. The battery will be fully discharge to low-voltage protection shutdown. Then it needs to be fully charged once.
- 2. In high temperature area, batteries should be manually charged and discharged once every two months. The process is the same as that said above.
- 3. Under normal circumstances of using, the battery working life is three to five years. If you find that the battery do not act well such as obviously shortening of backup time, too much imbalance on battery voltage so on, the battery should be replaced as soon as possible, which must be performed by qualified personnel.
- 4. When replace battery, it is recommended to change battery all together instead of changing separately.

★Before replacing batteries, first please turn off the UPS and break off the mains. Remove your metallic adornment such as finger ring, watch and so on.

 \star When replace batteries, please use the screwdriver with insulating handle. Do not lay the tools or metallic goods on the battery.

★Never revert or short circuit between the battery anode and cathode.

7. Troubleshooting and performance of product

The following messages are the information that users would find on UPS when it meets some problems. Users can judge if the fault is caused by external factors and know how to deal with it by making full use of the information.

- a. Fault indicator on, indicates that the UPS has detected some fault.
- b. Buzzer beeps, indicates that UPS need to be paid attention to, if beeps for a long time, it means that there is something wrong with the machine.
- c. If you need help, contact our service department, the following messages should be provided for analysis:
 - ♦ UPS MODEL NO. and SERIAL NO.
 - Date of fault happened
 - Detailed description of the problem (include indicator statements on panel)

7.1 LED indication and warning table

Appendix1: Fault Codes

	FAULT CODES				
		Byp Mode	Line Mode	Bat Mode	BatTest Mode
	Bus Fault	62	05、25	01、21	40、41
AWARNING	Inv Fault	61、63	04	24	42
Battery voltage low 1	Over Heat	33	06	08	43
Overload warning 2 Battery disconnect 3	OP Short	١	16	02	44
Mains abnormal 4	Overload	١	03	09	45
Fan lock 5 Charger fail 6	Fan Fault	36	28	38	46
Battery over 7 Bypass mode 8	Charge Fault	07	07	1	١
Battery mode 9	BatOver	11	11	11	11

Indication NO Working status Warning Remarks Nor Bat Bps Fan 1 Line mode Normal voltage • None High/low voltage Once every protection, turn to ★ • four seconds battery mode 2 Battery mode Once every Normal voltage * four seconds Battery Voltage Once per * ★ • abnormal warning second 3 Bypass mode Main AC Normal Once every Eliminate after starting voltage in bypass * two minutes the UPS mode Main AC high Once every voltage warning in * four seconds bypass mode Main AC low Once every voltage warning in ★ four seconds bypass mode 4 Battery disconnect warning Once everv Affirm if the batterv Bypass mode . ★ four seconds switch is closed Once every Affirm if the battery Inverting mode • ★ four seconds switch is closed Affirm if the battery is Power up or start Six times connected well Output overload protection 5 Twice per Overload warning Remove the less • * in line mode, seconds important loads Remove the less Overload in line Long beeps important loads • . mode, protection Overload warning Twice per Remove the less • • ★ in battery mode second important loads Overload in Remove the less battery mode, Long beeps • • . important loads protection Overload warning Remove the less Once every 2 6 * in bypass mode seconds important loads Fan fault (fan icon Once every 2 Check if the fan is 7 * flash) seconds blocked by object. If display fault code and icon \triangle lights, contact for maintenance when you 8 Fault mode Long beeps • can't deal with it by vourself.

Appendix 2: The corresponding working status of indications

• indicator lights for a long time

★ indicator flashes

▲ the status of indicator depends on other conditions

Note: When UPS has fault, it is convenient for you to know the working status of UPS and the exact information about the fault promptly by referring to the two tables listed above.

7.2 Troubleshooting

When the fault occurs, firstly, perform troubleshooting by referring to the troubleshooting table. If the fault still exists, please contact the franchiser.

Fault	Cause	Solution
The "INPUT" letters on LCD display	The voltage or frequency of mains power exceeds UPS input range	UPS is working in battery mode, save disk and close the programs, make sure AC mains voltage and frequency is in the normal range
section hashes	Anti-connection of mains live and neutral	Re-connect the input power cable and make a correct connection
Battery capacity indicator flashes	Battery low voltage or battery disconnected	Check UPS battery, connect battery well, if battery damaged, replace it
Mains normal, but UPS has no input	UPS input breaker open circuit	Press the breaker for reset
	Battery not fully charged	Keep UPS connecting with mains power for more than 8 hours, recharge battery
Short back up time	UPS overload	Check the usage of loads, remove some redundant devices
	Battery aged	When replace battery, contact franchiser to get battery and relative assembly
	Short holding time	Press and hold the ON key for more than 1s to start UPS
UPS doesn't startup after pressing the ON key	UPS has no battery connected or battery voltage low and too many loads connected	Connect UPS battery well, if battery voltage low, please turn off UPS and take off some loads, then start UPS
	Fault occurs inside UPS	Contact supplier for servicing
The icon of charger status on LCD display flashes and buzzer beeps once per second	Charger doesn't work normally or battery aged	Contact supplier for servicing

7.3 EMC standard/Safety standard

• Our product are manufactured according to the following EMC international grade standard and has passed the CE authentication:

EMC / Safety standard number			
2014/35/UE IEC/EN 62040-1			
2014/30/UE	IEC/EN 62040-2		
	IEC/EN 62040-3		
	IEC/EN 60950-1		

7.4 Product Performance

7.4.1 Electric performance

MODEL			FLEXIBLE 3KVA
RATED CAPACITY		CITY	3000VA/2700W
	In	put	Single phase and earthing
	Voltag	e range	160-290VAC @ full load
	Freq	uency	46Hz-54Hz±0.5Hz@50HZ or 56Hz-64Hz±0.5Hz@60HZ
INFUI	Powe	r factor	≥0.98
	Current	harmonic	< 7% (100% linear load)
	Connection		1x Terminal P/N + Ground
	Outp	ut style	Single phase and earthing
	Rated	voltage	208/220/230/240VAC
	Powe	r factor	0.9
	Voltage	precision	±2%
		l ine mode	1. When input frequency is in the range, the output frequency is the same as that of input.
	Frequency	Line mode	2. When input frequency is out of the range, the output frequency of output is $(50/60\pm0.2)$ Hz
		Battery mode	(50/60 ± 0.2)Hz
	Cres	st ratio	3:1
OUTPUT	DUTPUT Transfer time	mains←→battery =0ms	
-			mains←→bypass <4ms
		Battery mode	108%±5% <load≤150%±5%>30s cut off output and warn</load≤150%±5%>
	Overload		150%±5% <load<200%±5%> 300ms cut off output and warn</load<200%±5%>
	capacity	Line mode	108%±5% <load≤150%±5% <math="">> 30s $$ transfer to bypass and warn</load≤150%±5%>
			150%±5% <load<200%±5%>300ms transfer to bypass and warn</load<200%±5%>
		mains	Full load ≥ 90%
	Efficiency	battery	Full load ≥ 85%
		ECO	Full load ≥ 94%
	Conr	nection	1x Terminal P/N + Ground
	Input batt	ery voltage	72VDC
BATTERY	Internal battery quantity		6
	Internal battery type		12V/9Ah sealed lead acid maintenance free battery (only refers to standard UPS)
	Backup time		Full load≥4min (only refers to standard UPS), As for long backup UPS, the backup time is determined by the capacity of battery.
	Charge current (A)		1

NOTE: The rated output voltage has been already provided. The function of setting the rated output voltage by LCD menu is an optional.

Work Environment

MODEL	FLEXIBLE 3KVA
Temperature	0°C~40°C
Relative	0 \sim 95% non-condensing
Altitude	<1500m when >1500m, lower the rated power for use
Store temperature	-25°C∼5°C

Mechanical Specification

MODEL	Dimension W*D*H (mm)	Net weight / Gross weight (Kg)
3KVA	440*520*131	26/28.8

7.5 Communication interface

7.5.1 RS232 communication interface

This UPS provides a standard DB9 communication interface on its rear panel, the definition of the pins is as following:



Pin	Definition
1、4、6、7、8、9	No use
2	Transmit
3	Receipt
5	GND

7.5.2 RS232 cable specifications

When connecting the UPS with PC by RS232 cable, it needs to use the standard RS232 cable, the detailed cable NO. are as following:

PIN 1 (hole) to computer serial port	PIN 2 (needle) to UPS serial port
2	2
3	3
5	5

7.5.3 Optional communication interface

- USB communication interface
 USB communication interface: Install the intelligent monitoring software UPSilon2000 which is equipped with the UPS. Then it can achieve the communication with monitoring device directly. When RS232 and USB are provided, only one of them will be chosen and USB is preferred.
- Intelligent slot

The following intelligent cards can be installed into the intelligent slot of the UPS: intelligent SNMP card and intelligent dry contact card. Support the hot plug and play. Any card of them can be used according to users' requirements.

- a) Intelligent SNMP card: When connecting to the internet by SNMP card, it communications with the monitoring computer to monitor power source of the UPS from far end.
- b) Intelligent dry contact card: Use the monitoring function of the dry contact interface system to monitor and manage the power source of the UPS.

NOTE:

Remove the cover before installing the optional accessories.

The operating instruction of the UPSilon can be acquired from the CD.

As for the operating instructions of the intelligent SNMP card and dry contact card, please refer to the relative special instructions.

WARRANTY

Dear Customer,

Thank you for purchasing a NAICON product. We hope that you be satisfied.

If the product fails in warranty period, please contact your dealer or call +39 02 950031 or go to www.naicon.com/elsist. Before contacting your dealer or authorized service network, we recommend that you read the operating and maintenance manual carefully.

With this warranty, NAICON warrants the product to be free from defective in materials or workmanship for 24 months on electronics and 12 months on batteries, as of the original delivery date.

If there are material or manufacturing defects during the warranty period, ELSIST affiliates, Authorized Service Centers or authorized resellers located in the UE region will repair or (at ELSIST discretion) replace the defective product or components under the terms and conditions below, without any charge for labor or spare parts costs. ELSIST reserves the right (in its sole discretion) to replace the components of defective products or low cost products with assembled parts or new or refurbished products.

Conditions.

1. This warranty will be valid only if the defective product is returned together with the sales invoice.

ELSIST reserves the right to refuse warranty service in the absence of such documents or if the information contained therein is incomplete or illegible.

2. This warranty does not cover the costs and / or any damages and / or defects resulting from any modifications or adjustments made to the product, without prior written permission from ELSIST, in order to adapt the product to local technical or safety standards in countries other than those for which the product was originally designed and manufactured.

3. This warranty will be void if the model or serial number indicated on the product has been modified, deleted, removed or otherwise illegible.

4. Are excluded from the warranty:

- Periodic maintenance and repair or replacement of parts subject to normal wear and tear.
- Any modification or modification to the product, without prior written permission from ELSIST to enhance performance than those described in the User and Maintenance Manual
- All costs of technical staff support and any transport from the customer's address to Assistance Center and vice versa as well as all the risks involved.
- Damages due to:

a. Improper use, including but not limited to: (a) the use of the product for any purpose other than the intended use or failure to observe the ELSIST instructions for correct use and maintenance of the product, (b) installation or use of the product not complying with the Technical or Safety standards in the country in which it is used.

b. Repairs by unauthorized personnel or by the Customer himself.

c. Accidental events, lightning, floods, fires, incorrect ventilation or other causes not attributable to ELSIST.

d. Defects of the equipment or equipment to which the product was connected.

5. This warranty does not affect the buyer's rights established by applicable national laws nor the Customer's rights to the reseller arising out of the sales contract.

Unless authorized by the manufacturer, reproduction of any part of this manual is prohibited. Our equipment, built with the utmost care and with selected components, is controlled by ELSIST Quality Services. However, if you notice any anomalies, please inform us by calling +39 02-950031 specifying serial number and model of the device, which are printed on the identification plate at the rear side of the UPS. ELSIST Assistance Service is also available to collect requests, comments, suggestions, if any.

In case of failure:

Contact our Customer Service Center at +39 02 95 0031, and verify the UPS malfunction.

If the products returned to NAICON were OPERATING or if they were delivered without our permission or for out-of-warranty products, they will be returned to the customer by charging a cost that will depend on the country where will be shipped.











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