

User & Installation Manual

Rackmount & Tower Convertible UPS

PHOENIX *SURTC* Series

1 kVA~20 kVA

tsinepower

Please strictly follow the warnings, safety precautions and operation instructions in the manual. Do not start using the ups before reading this manual. Keep the manual close to the ups during the lifetime.

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1. Introduction

1.1 System and Model No. Explanations














PHOENIX SU RTC Series model comes in standard rackmount & tower convertible design. It is an advanced true on-line sine wave Uninterrupted Power Supply (UPS) which can provide reliable, excellent AC power, ranging from computer and telecommunication systems to industrial automation & control systems. Since its on-line design, different from off-line UPS. The UPS is constantly regulating and filtering out the input voltage. When the mains power fails, the UPS switches to battery mode and uses the power stored inside the battery cells to supply back-up power without any interruption. During overload, general faults or inverter failure conditions, the UPS will automatically transfer to the bypass. The system can back to inverter condition automatically when the overload situation ends.

This manual is for the following models :

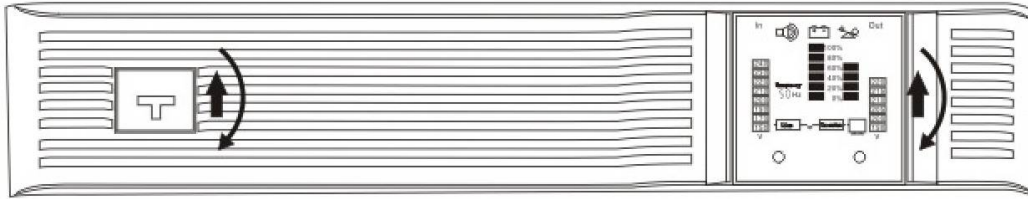
- 1) **PHOENIX SU RTC**, 1 kVA/ 24 or 36Vdc, internal/ external battery set, with output power factor of 0.8 or 0.9, with high runtime kit (depending on the user' s choice)
- 2) **PHOENIX SU RTC**, 2 kVA/ 48, 72 or 96Vdc, internal/ external battery set, with output power factor of 0.8 or 0.9, with high runtime kit (depending on the user' s choice)
- 3) **PHOENIX SU RTC**, 3 kVA/ 72 or 96Vdc, internal/ external battery set, with output power factor of 0.8 or 0.9, with high runtime kit (depending on the user' s choice)
- 4) **PHOENIX SU RTC**, 6 kVA/ 192 or 240Vdc, internal/ external battery set, with output power factor of 0.8 or 0.9, with high runtime kit (depending on the user' s choice)
- 5) **PHOENIX SU RTC**, 10 kVA/ 192 or 240Vdc, internal/ external battery set, with output power factor of 0.8 or 0.9, with high runtime kit (depending on the user' s choice)
- 6) **PHOENIX SU RTC**, 15 kVA/ 192 or 240Vdc, internal/ external battery set, with output power factor of 0.8 or 0.9, with high runtime kit (depending on the user' s choice)
- 7) **PHOENIX SU RTC**, 20 kVA/ 192 or 240Vdc, internal/ external battery set, with output power factor of 0.8 or 0.9, with high runtime kit (depending on the user' s choice)

1.2 Symbols Used in The Manual

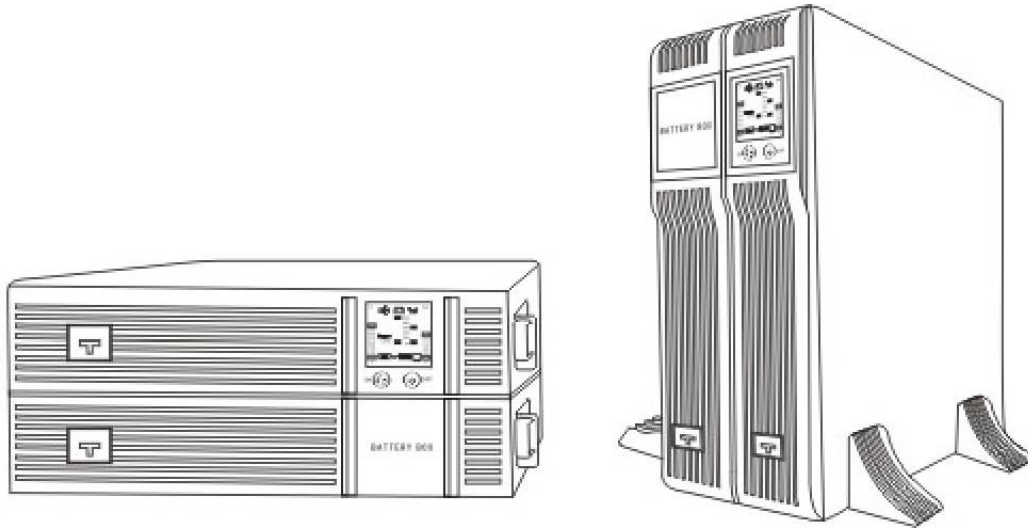
The following symbols are used in the manual and on the UPS panels to point out information or operation that needs special attention.

| Symbol and Description | | | |
|---|----------------------|---|---|
| Symbol | Description | Symbol | Description |
|  | Attention |  | Protective ground |
|  | High-voltage danger |  | Alarm Elimination |
|  | Power on |  | Overload |
|  | Power off |  | Battery checking |
|  | Standby or Power off |  | Recycled |
|  | Alternating current |  | Do not put this equipment with other materials together |
|  | Direct current | | |

1.3

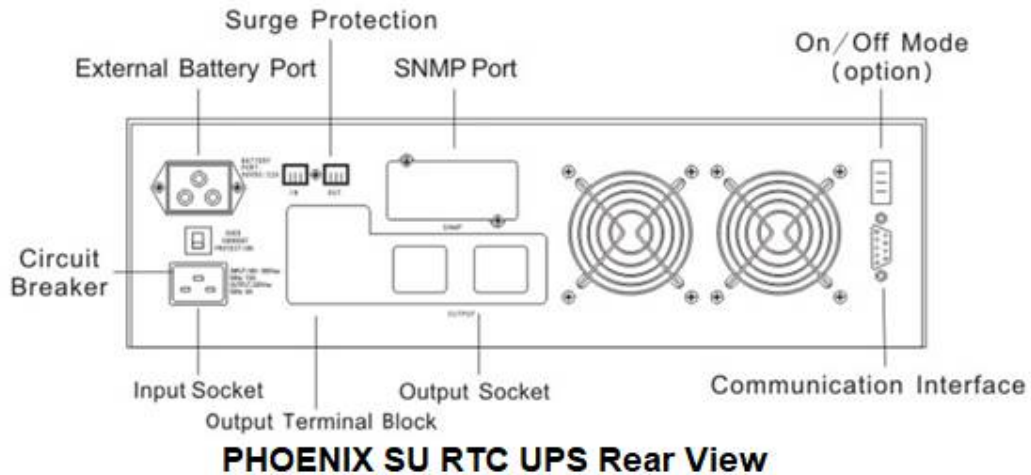


PHOENIX SU RTC UPS LCD Front Panel

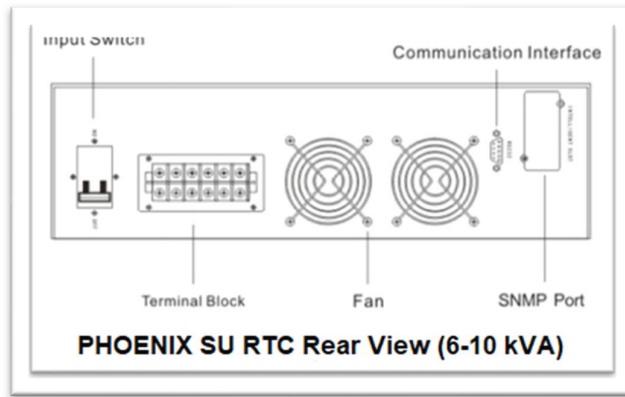


Note:

The UPS comes in standard rackmount & tower convertible design, standard 19” (inches) and 2U height, when the user wants to use the ups as in the tower form factor, please pull out the LCD/LED display and brand part rotating 90° clockwise and then put in as above pictures.



PHOENIX SU RTC UPS Rear View



1.4 Product Specification and Performance

■ General Specification

| | | | | | | | | | | | | | | |
|--------------------|-------|------|-------|-------|-------|-------|-------|-------|--------|------|--------|---------|--------|-------|
| Model Name | | | | | | | | | | | | | | |
| Rated Power | 1 kVA | | 2 kVA | | 3 kVA | | 6 kVA | | 10 kVA | | 15 kVA | | 20 kVA | |
| Rated Active Power | 800W | 900W | 1600W | 1800W | 2400W | 2700W | 4800W | 5400W | 8 kW | 9 kW | 12 kW | 13.5 kW | 16 kW | 18 kW |

INPUT

| | | | | | | | | | | | | | | |
|-------------------------------|---------------------------------|-----|-------|-----|-----|-----|---------------------------------|--|--|--|--|--|--|--|
| Input Voltage & Voltage Range | 220/ 230/ 240Vac, 120~300Vac | | | | | | 220/ 230/ 240Vac, 176~300Vac | | | | * 380/ 400/ 415Vac, 176~300Vac 220/ 230/ 240Vac, 176~300Vac | | | |
| Input Current | 5A | 10A | 15.1A | 32A | 50A | 75A | 100A | | | | | | | |
| Input Frequency & Range | 50/ 60 Hz ± 4 Hz | | | | | | | | | | | | | |
| Power Factor | Better than 0.99 | | | | | | | | | | | | | |

OUTPUT

| | | | | | | | | | | | | | | |
|--------------------------------|---|------|-----|-----|-------|-------|-----|--------------------|-----|-----|-----|-----|-----|-----|
| Output Voltage & Voltage Range | 220/ 230/ 240Vac, < 1% | | | | | | | | | | | | | |
| Output Current | 4.5A | 4.5A | 9A | 9A | 13.6A | 13.6A | 27A | 27A | 45A | 45A | 68A | 68A | 90A | 90A |
| Output Frequency & Range | 50/ 60Hz (adopt itself to mains frequency); < 0.1% (Battery Operation) | | | | | | | | | | | | | |
| Power Factor | 0.8 | 0.9 | 0.8 | 0.9 | 0.8 | 0.9 | 0.8 | 0.9 | 0.8 | 0.9 | 0.8 | 0.9 | 0.8 | 0.9 |
| THDv | < 3% (Linear Load) | | | | | | | < 2% (Linear Load) | | | | | | |
| Crest Factor | 3:1 | | | | | | | | | | | | | |
| Overload Capacity | 105%~130%, to bypass after 1min; >130%, to bypass after 1s, no output after 1 min. | | | | | | | | | | | | | |

BATTERY

| | | | | | | | | | | | | | | |
|-----------------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| Battery Voltage | 24Vdc | 24Vdc | 48Vdc | 48Vdc | 72Vdc | 72Vdc | 192Vdc | 192Vdc | 192Vdc | 192Vdc | 192Vdc | 192Vdc | 192Vdc | 192Vdc |
| | 36Vdc | 36Vdc | 72Vdc | 72Vdc | 96Vdc | 96Vdc | 240Vdc | 240Vdc | 240Vdc | 240Vdc | 240Vdc | 240Vdc | 240Vdc | 240Vdc |
| Max. DC Current | 40A | 40A | 40A | 40A | 40A | 40A | 40A | 40A | 56A | 84A | 84A | 56A | 112A | 112A |
| | 25A | 25A | 25A | 25A | 30A | 30A | 32A | 32A | 45A | 45A | 67A | 67A | 90A | 90A |

| PHYSICAL | | | | | | | |
|-------------------------------|------------|----|----|------------|----|--|--|
| Dimensions (W*D*H) [in mm] | 430x480x88 | | | 430x680x88 | | | |
| Weight [in kg] | 9 | 11 | 12 | 18 | 19 | | |

* These ratings can operate with 3 Phase Input or Single Phase Input Automatically

■ Battery Cabinet Specification

| Model | Specification | Dimension WxLxH (mm) | Weight (kg) |
|----------------------|---------------|----------------------|-------------|
| 72V battery cabinet | L2V7AHx6 | 430x480x88 | 18 |
| 96V battery cabinet | 12V7AHx8 | 430x480x88 | 22 |
| 192V battery cabinet | 12V7AHx16 | 430x680x88 | 42 |

Note: 12V9AH battery is optional

■ Operation Environment

| Environment Temperature | Environment Humidity | Altitude | Storage Temperature |
|-------------------------|----------------------|----------|---------------------|
| 0~40 °C | <95% | < 1000m | 0~40 °C |

Power derating occurs when the UPS operates above 1000m, the derating factors are shown as below:

| Altitude(m) | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 |
|--------------------|------|------|------|------|------|------|------|------|------|
| Fall rating factor | 100% | 95% | 91% | 86% | 82% | 78% | 74% | 70% | 67% |

2. Installation

2.1 Unpacking and Inspection

- 1) Open the ups package and check the accessories, which should include user & installation manual, power cord, monitoring software CD/ communication cable, charging cable except 1 kVA, accessories for mounting.
- 2) Check if the ups damaged in the transport. If you find damage and/ or missing parts, please don't use the UPS, and inform the local dealer.

2.2 Before Installing The UPS

- 1) UPS should be placed in a place where ventilation is provided and away from liquids, water, humidity, combustible gas, corrosives, direct sunlight or heat sources.
- 2) Make sure the front and rear sides and fans of the UPS which cools down the heat inside during the operation are open and have enough space for ease of heat dissipation.
- 3) The environment temperature should be between 0°C to 40°C. For the best performance and best lifetime & battery maintenance, the preferred environment temperature should be kept between 18°C to 20°C.
- 4) When the UPS box is opened in low temperatures, the water inside the air in the ups may condense, so please install and operate the machine after the outer and inner of the machine are complete dry to avoid electric shock.

Attention:

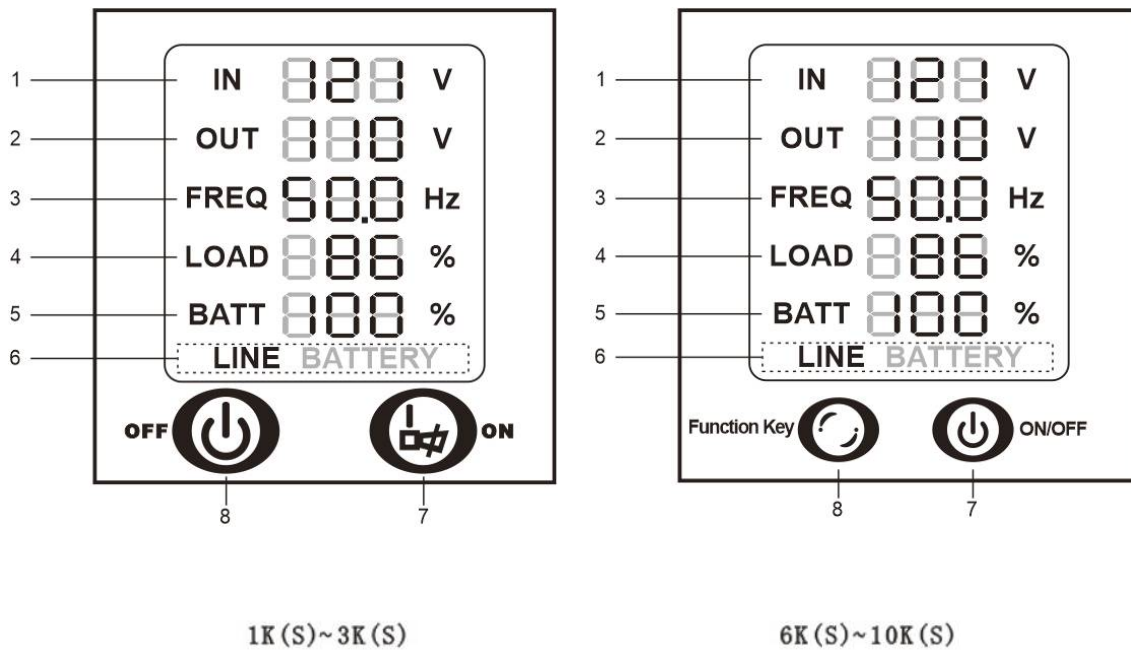
1. *When connecting the load to UPS, please shut down all the connected loads firstly and and connect, then start up the loads one by one.*
2. *Connect UPS to the socket with the over current protection device.*
3. *The power sockets should be connected to ground.*
4. *The ups has hazardous voltage inside and at output terminals if it connected to the mains. To shut the ups down completely, disconnect the input power from from the ups for max. safety.*
5. *For any of the battery options for the ups, please connect the ups to mains and turn it ON for 8 to 24 hours to charge the battery set connected to it before use. This is for ultimate use and performance of the UPS and battery sets.*
6. *If the load is a load with high starting current such as laser printers, air conditioners or blowers, make sure the UPS rating you purchase is according to the startup power of the load.*

2.3 External Battery Installation

- 1) Please connect battery strings correctly according to the different UPS ratings and DC Inputs shown on the product label. It is shown on Chapter "Introduction" and "Technical Specifications".
- 2) One end of the charging cable is for connecting UPS and the other end are three wires to connect battery pile. Please follow the installation procedure.
 - a) Connect the pile in series to make sure the right battery voltage.
 - b) The charging cable connects the batteries first, (no connecting to UPS, it is dangerous) the white wiring with red tab connects battery anode '+', black wiring connects battery cathode '-', and the yellow wiring connects Ground.
- 3) Don't connect UPS to the load, connect the power cable and provide main to the UPS, making UPS running in bypass mode.
- 4) Connect the charging cable socket to the UPS battery and the UPS starts to provide supply to battery.

3. Operation

3.1 LCD Display



Power Switch: Press key 'ON' continuously to turn on UPS, Press key 'OFF' continuously to turn off UPS.

1. **Input voltage**
2. **Output voltage**
3. **Main frequency**
4. **Load percentage**
5. **Battery capacity percentage**
6. **Running mode**
7. **Power on /Alarm eliminating (1~3K), On/off (6~10K)**
8. **Power off key (1~3K), Function Key (6~10K)**

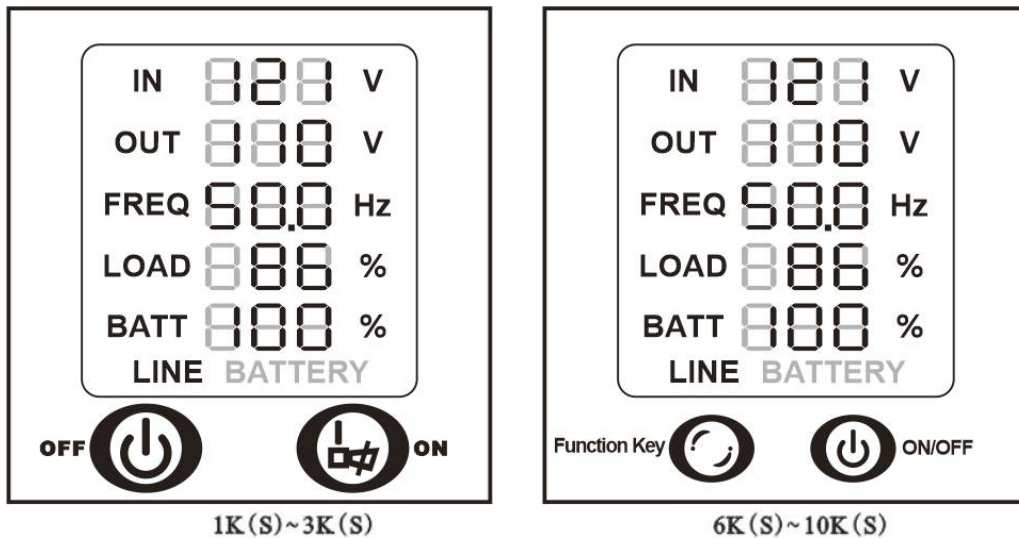
3.2 Operation

- 1) Switch on, UPS startup
 - a) Ensure connecting external battery correctly, and make the input switch at 'ON', the fans will start running and the UPS will charge the batteries.
 - b) Keep pressing the startup button over one second to startup the UPS and inverter.
 - c) UPS startup and have a self-test first then it is running in the online mode.
- 2) Switch off, UPS startup by DC
No main input, keep pressing the startup button over one second to startup the UPS
- 3) UPS shutdown in main mode
 - a) Keep pressing shutdown button over one second to shut down UPS.
 - b) UPS have a self-test when shutting and is running in bypass mode.
 - c) After the above shutdown, UPS can still provide output supply, if users want to make the UPS without output, just need to switch off.
- 4) UPS shutdown in battery mode
 - a) Keep pressing the shutdown button over one second to shutdown UPS.
 - b) UPS will have a self-test when shutting and there is no display in front panel, UPS will not provide power supply then.

3.3 Operations Modes

1) Main Mode

The utility voltage and frequency will show on the screen.



◆ Main Mode

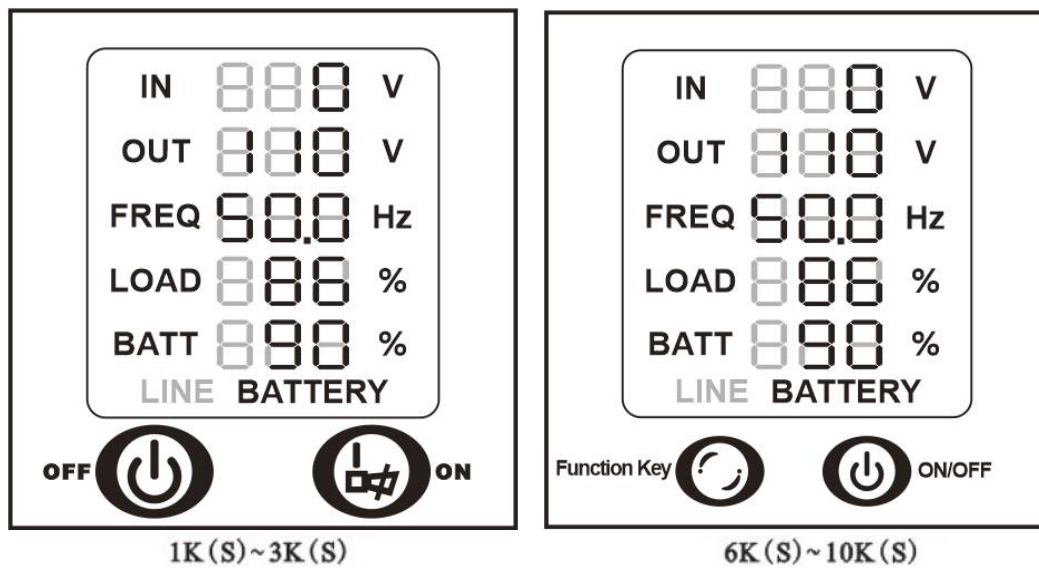
Attention:

If connect to generator, please follow the below procedure:

1. Startup the generator and connect it to UPS after it runs stably (make sure the UPS without load), then startup the UPS according to the startup procedure, and then connect load.
2. Generator capability is subject to the twice of UPS capability.

2) Battery Mode

- a) Running in battery mode, the buzzer beeps once every four seconds, if keep pressing startup button over one second, the buzzer will not beep, and then keep pressing startup button over one second, alarm resumes.
- b) When the battery capacity decreases, the showed capacity will be down accordingly. When the battery voltage decreases to the early warning electric potential, the buzzer will beep once every second to remind the user that the battery capacity is short and UPS is going to shutdown automatically, please speed up load operation and deduct load.
- c) Users can check the backup function through not connecting to utility.

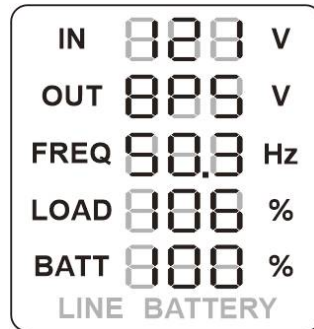


◆ Battery Mode

3) Bypass Mode

Running in bypass mode. the utility indicator and bypass indicator will light, the number of lighten load capacity indicator will change according to the connected load capacity, The buzzer beeps once every 2 minutes.

- a) If the utility indicator flashes, it indicates the utility voltage or frequency is beyond normal range.
- b) Other display is the same as that of main mode.
- c) Running in bypass mode, UPS don't have backup function. It's the electric power system that supplies power to load after filtering.
- d) Note: 1~3KVA bypass is optional function, 6~10KVA bypass is standard equipped function.



1K(S)~10K(S)LCD Display

◆Bypass Mode

4) Abnormal Mode

The UPS is running in abnormal mode when the malfunction indicator lights. To see how to deal with it, please refer to chapter 6.

5) Internet Communication

This series UPS equip with Intelligent slot. Webpower card is optional, which can realize remote monitor. RS232 provides computer communication interface to monitor input power and UPS even controls the UPS.

Communication Interface Explanation

- a) RS232 or USB port on the rear panel is an interface for serial communication between the computer and UPS.

The transmission and data format of RS232 include:

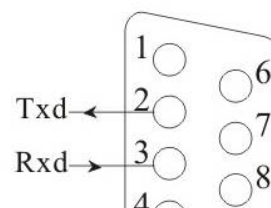
Band rate: 2400 bps

Length of character: 8 bits

Stop bit:1 bit

Parity bit: None

RS232 Communication interface



DB-9 PIN Explanation:

| Pin | Function | I/O |
|-----|----------|--------|
| 3 | Rxd | Input |
| 2 | Txd | Output |
| 5 | GND | Ground |

RS232 Communication interface

- b) Just need to install AS400 card(optional), can achieve UPS monitor function as the monitor management for the power.

Pin Explanation:

PIN1 Close: UPS Failure

PIN2 Close: Summary Alarm

PIN3 Ground

PIN4: Remote Shutdown(input)

PIN5: Common

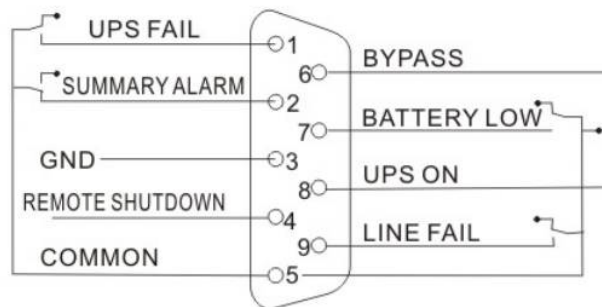
PIN6 Closed: Bypass Active Open: UPSON

PIN7 Closed: Battery low

PIN8 Closed: UPSON

Open: bypass

PIN9 Closed: Utility Failure



As400 Communication interface

4. Battery Maintenance

- 1. Keep the battery charged always to get the design lifetime as max.*
- 2. If you do not plan to use the UPS for a long time, please charge it every four or six months.*
- 3. Normally, the battery life is three to five years, if you find anything abnormal, please replace the battery earlier by an authorized professional service.*
- 4. Battery needs special expertise and knowledge for replacements.*
- 5. Normally, battery should charge and discharge once every four to six months, and the charging time is not less than 12 hours.*
- 6. In high temperature area, the battery should charge and discharge once every two months, the charging time is not less than 12 hours.*

5. Safety Precautions

1. *Although UPS doesn't connect to the main, the output voltage may be 220V because of the battery, unintended touches to the ON button or charges in the DC bus and capacitors.*
2. *If need to replace the charging cable or power cable, please purchase the original parts & accessories from the closes TSINE Electronics Industries reseller. Using parts and accessories which are not certified by TSINE may cause over heating, fire or other problems and damages.*
3. *Don't throw the battery to fire, or it will explode and may cause people get hurt.*
4. *Don't open or damage the battery, the electrolyte includes acid which is poisonous and corrosive, inhale or being exposed to the vapour of the electrolyte may result in burns and bad for people's health.*
5. *Avoid the short circuit of battery anode and cathode.*
6. *Don't open the UPS cover by yourself, because you may get an electric shock.*
7. *Before touching the battery, please check if there is voltage. Don't connect to the blower and electric heater, etc. appliances to ensure the machine safety.*

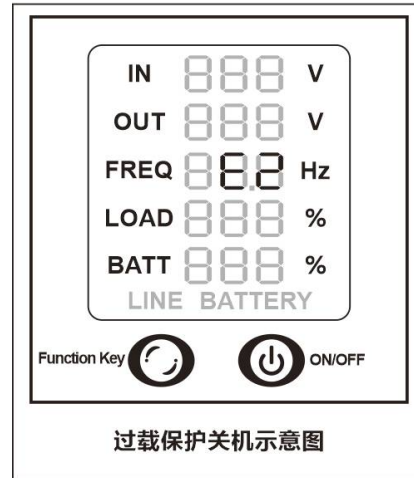
6. Display Code

1-3 kVA LCD DISPLAY CODE

- E0 Normal shutdown
- E1 Sudden load protection
- E2 Over load
- E3 Low battery voltage
- E4 High charging voltage
- E5 Abnormal inverter
- E6 Poor line contact during startup
- E7 Output short-circuit

6-10 kVA LCD DISPLAY CODE

- E0 Normal shutdown
- E1 EPO (optional)
- E2 Over load
- E3 Low battery voltage
- E4 High charging voltage
- E5 Abnormal inverter
- E6 Temperature control overheat
- E7 Output short-circuit



When you need maintenance service, please provide the following information,

- Model of the UPS and the serial number.
- The date of failure
- A clear video about the fault with serial number of the device in the same video.

TSINE ELEKTRONİK SANAYİ ve TİCARET LİMİTED ŞİRKETİ
Fatih Sultan Mehmet Cad. No: 172-3, Darica, KOCAELI, TURKEY
P: +90 216 365 7049
F: +90 216 313 2970

www.tsinepower.com
info@tsinepower.com
support@tsinepower.com

tsinepower