

# UPS

Uninterruptible Power System

Line Interactive (Network) UPS

425VA/ 525VA/ 625VA/ 825VA/1000VA

■ USER'S MANUAL ■

## Important Safety Instructions

### IMPORTANT SAFETY INSTRUCTIONS

#### SAVE THESE INSTRUCTIONS

- **WARNING (SAVE THESE INSTRUCTIONS):** This manual contains important instructions that should be followed during installation and maintenance of the UPS and batteries.
- **WARNING (CONTROLLED ENVIRONMENT):** These units are intended for installation in a temperature controlled, indoor area free of conductive environment.
- **CAUTION:** Risk of electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.
- **CAUTION:** Do not dispose of batteries in a fire, the battery may explode.
- **CAUTION:** Do not open or mutilate the battery, released electrolyte is harmful to the skin and eyes. It may be toxic.
- **CAUTION:** A battery can present a risk of electric shock and high short circuit current. The following precaution should be observed when working on batteries  
Remove watches, rings or other metal objects.  
Use tools with insulated handles.  
Wear rubber gloves and boots.  
Do not lay tools or metal parts on top of batteries.  
Disconnect charging source prior to connecting or disconnecting battery terminals.
- Servicing of batteries should be performed or supervised by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from batteries.
- When replacing battery, replace with same type.
- Do not connect any additional batteries by yourself.
- Symbol for On/Off is displayed and defined.
- **CAUTION:** To reduce the risk of fire, connect only to a circuit provided with 20 amperes maximum branch circuit overcurrent protection in accordance with the National Electrical Code, ANSI/NFPA 70.

## Table of contents

<b>Important Safety Instructions</b> .....	<b>I</b>
<b>Table of contents</b> .....	<b>II</b>
<b>Introduction</b> .....	<b>IV</b>
Please read and save this manual .....	IV
Please save or recycle the packaging materials.....	IV
Intelligent microprocessor control .....	IV
Advanced battery management.....	IV
Advanced monitoring software.....	IV
<b>1. Presentation</b> .....	<b>5</b>
Front Panel.....	5
Rear Panel.....	6
<b>2. Installation</b> .....	<b>8</b>
2.1 Placement: .....	8
2.2 Connect Computer Interface (optional): .....	8
2.3 Connect to Utility: .....	8
2.4 Charge the battery:.....	8
2.5 Connect the loads:.....	8
<b>3. Operation</b> .....	<b>9</b>
3.1 Switch on with “Green Mode” Function.....	9
3.2 Switch on with “Disabled Green Mode” Function.....	9
3.3 Switch off.....	9
3.4 Silence: .....	9
3.5 Self-test function.....	9
<b>4. Alarm</b> .....	<b>10</b>
4.1 “BACKUP” (slow alarm) .....	10
4.2 “LOW BATTERY” (rapid alarm) .....	10

4.3 “OVER LOAD” (continuous alarm).....	10
<b>5. Software installation and Interface Port</b> .....	<b>11</b>
5.1 Power Monitoring Software.....	11
5.2 Installing software.....	11
5.3 Connecting interface cable.....	12
5.4 The characteristics of software UPSMON .....	13
<b>6. Maintenance and storage</b> .....	<b>14</b>
6.1 Maintenance.....	14
6.2 Storage conditions.....	14
6.3 To extend the storage .....	14
<b>Appendix A Troubleshooting</b> .....	<b>17</b>
<b>Appendix B Specifications</b> .....	<b>18</b>

# SAVE THESE INSTRUCTIONS

### Please read and save this manual

Thank you for selecting this uninterruptible power system (UPS). It provides you with a perfect protection for connected equipment. The manual is a guide to install and use the UPS. It includes important safety instructions for operation and correct installation of the UPS. If you should have any problems with the UPS, please refer to this manual before calling customer service.

### Please save or recycle the packaging materials

The UPS's shipping materials are designed with great care to provide protection within delivery. These materials are invaluable if you ever have to return the UPS for service. Damage happened during transit is not covered under the warranty.

### Intelligent microprocessor control

The product is an advanced line-interactive UPS based on microprocessor control. This means that it operates with the newest technology, high performance and powerful function.

The line-interactive UPS is an intelligent protector and provides pure, reliable AC power to the critical loads - protecting them from utility power blackout, swells, sags, surges and interference. The loads could include sensitively medical instruments, computers, telecommunication systems, and industrially automatic equipment. Under power normal condition, the line-interactive design enables the system to adjust and filter power fluctuations continuously and automatically. In the event of power failure, it can provide immediately back-up power from the batteries without any interruption. Complete transference will be achieved within 4m seconds, with no interruption.

Beside this, when the utility power is connected, the charger would work automatically even under power switch is OFF. Furthermore, in order to save the battery energy, UPS can be set to turn it off under backup mode if none of the connected loads is operating.

### Advanced battery management

The visual and audible indications of the UPS present the battery's status including capacity degree and battery condition. Self-test function let UPS detect a weak battery before it is put into service. The UPS normally perform a self-test at power up and manual self-test condition. Self-test function can be conducted manually with the ON/TEST switch at any time.

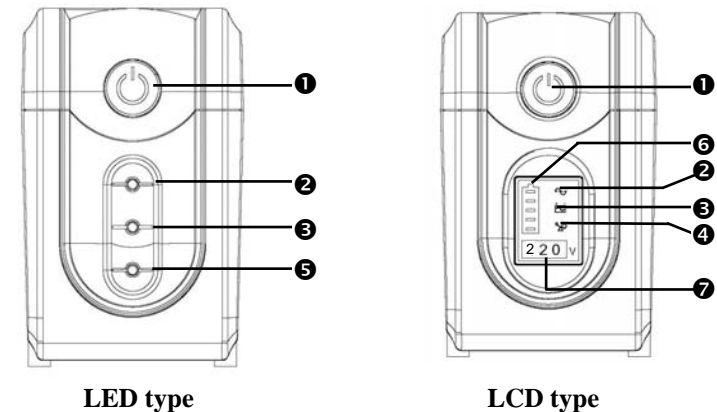
### Advanced monitoring software

The line-interactive UPS and UPSMON series monitoring software (optional kits) make your computer operate intelligently and provide you with the ability of perfect protection of your critical devices. The software is available for most operation systems and is supplied with a communication cable that connects to the UPS.

The UPS is a line interactive uninterruptible power system (UPS). When utility input is normal, the UPS would provide surge protection and energy to charge the internal battery. If the utility input is abnormal, the UPS can supply AC power to the loads immediately.

- (1). Utilizes microprocessor based controls, it will minimize the dependency on hardware. Beside this, it maximizes system flexibility and optimizes the assurance of reliability.
- (2). Automatic frequency selection to match with utility power.
- (3). High-grade battery charger to prolong battery's life and fully charge the battery.
- (4). With actual overload protection both in line and battery mode.

### Front Panel



#### ① “ON/OFF/TEST/SILENCE” button

No matter the UPS plugged in or not. Press the “ON/OFF/TEST/SILENCE” button till the beep stop to turn on or to turn off the UPS. When UPS is working under AC mode, it also activates the UPS's self-test by press the bottom less than 1 second.

In back up mode, press the bottom about 1 second to activate the UPS's silence function.

#### ② “LINE mode” indicator (Green)

The indicator will illuminate when the utility input is normal.

#### ③ “BACKUP mode” indicator (Yellow)

The indicator illuminates when the power is supplied from the battery.

#### ④ “OVER LOAD” indicator (Red)

The indicator illuminates when the connected loads exceed the maximum rated capacity.

### 5 “Battery Fault” indicator (Red)

The indicator illuminates two statuses of the UPS: When this Red LED is steady illuminated, it indicates that the battery needs to be replaced or the charger of UPS is fail to function. When this Red LED flashes rapidly, it indicates the UPS is over loaded.

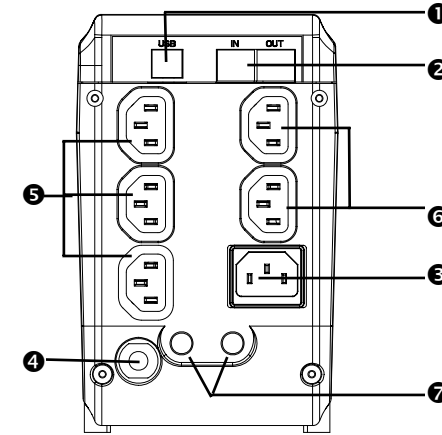
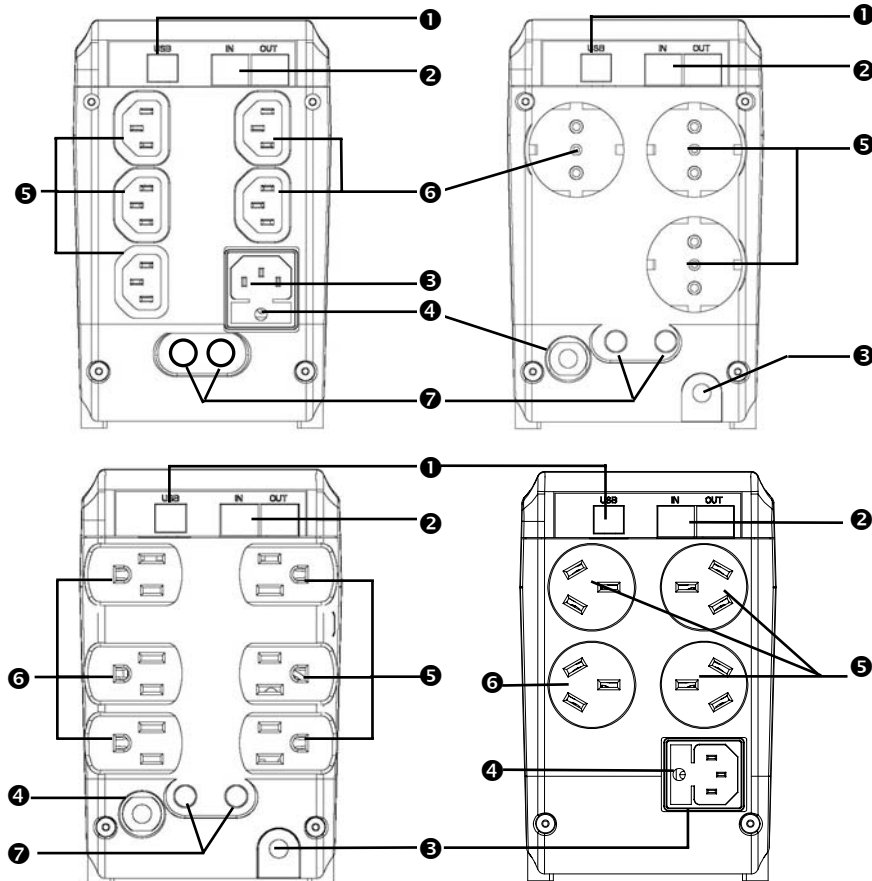
### 6 “Battery level” bar

It indicates the battery capacity and battery status. When the battery capacity is low, it becomes dim, when the battery needs to be replaced or the charger of UPS is fail to function, indicators on all the bar flash.

### 7 “Output Voltage”

This digital indicates present output voltage.

### Rear Panel



### 1 Remote Port

Provide USB to support NOVELL, LINUX, UNIX, WINDOWS and other operating systems.

### 2 TEL/ Modem protection

Telecom transfer ports provide users to extend the applications.

**Caution:** To reduce the risk of fire, use only No. 26AWG or larger telecommunication line cord.

### 3 AC Input Power Receptacle

The input power cord needs to connect the rear inlet socket of the UPS and plug into a socket on the wall. Please notice the voltage of utility power should match with the UPS. For example, the rating voltage of UPS is 110V/(220V), the input utility power should be the same as 110V/(220V).

### 4 Input Circuit Breaker/Fuse

It trips when the connected loads exceed the protected receptacle’s capacity.

### 5 UPS & Surge Protected Outlets

When utility power is normal, the UPS outlets are powered by utility power with AVR function. Any higher or lower utility power would be rectified by AVR function. When utility power is fail, the UPS outlets are powered from battery.

### 6 Convenience Outlet (S)

CONVENIENCE outlets protect the loads from spike.

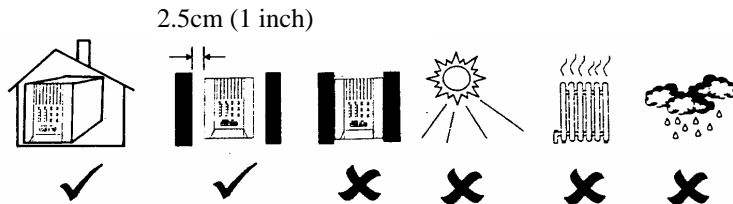
### 7 Coaxial Surge Suppression Port (Option)

## 2. Installation

Inspect the UPS upon receipt. The packaging is recyclable; keep it for reuse or be disposed of properly.

### 2.1 Placement:

Install the UPS in a protected area with adequate flowing air and free of excessive dust. Do not operate the UPS where the temperature and humidity is out of the specified limits.



### 2.2 Connect Computer Interface (optional):

UPSMON series software (or other power management software) and an interface kits can be used with this UPS. Use only kits supplied or approved by the manufacturer. If used, connect the computer interface port and the REMOTE port of the UPS using the bonding cable.

Note: Computer interface connection is optional. The UPS works properly without a computer interface connection.

**CAUTION:** Use only factory supplied or authorized UPS monitoring cable!

### 2.3 Connect to Utility:

The input power cord needs to connect the rear inlet socket of the UPS and plug into a socket on the wall. Please notice the voltage of utility power should match with the UPS. For example, the rating voltage of UPS is 110V/(220V), the input utility power should be the same as 110V/(220V).

### 2.4 Charge the battery:

The UPS charges its battery whenever it is connected to utility power. For best results, charge the battery for 24 hours in the initial use.

### 2.5 Connect the loads:

The employed equipment's power cords (such as computer) are plugged into the sockets on the rear panel.

**CAUTION:** Never connect a laser printer or plotter to the "UPS outlets". A laser printer or plotter periodically draws significantly more power than when its idle status, and may overload the UPS.

## 3. Operation

### 3.1 Switch on with "Green Mode" Function

When utility input is connected to the UPS, press "ON" button and keep pressing until the "Bi" beep stops to turn on the UPS. After that, connect the electrical cords of the equipments that will be used (such as desktop computer and CRT monitor) to the rear panel of UPS. In order to save the power, it will also automatically enable the "Green mode" - No Load (or Light load) shut-down function under backup mode (about 4 minutes later).

**ATTENTION:** At backup mode, UPS can be automatically shut-down if none of the connected loads is operating. (Green mode; No Load shut down function) Once the utility power is normal again, the unit can be waked up by itself.

**CAUTION:** Never connect a laser printer or plotter to the UPS. A laser printer or plotter periodically draws significantly more power than its idle status, and may overload the UPS.

### 3.2 Switch on with "Disabled Green Mode" Function

When utility input is connected to the UPS, press "ON" button and keep pressing until the "Bi.Bi-Bi" beeps stopped to turn on the UPS. After that, connect the electrical cords of the equipments that will be used (such as Notebook computer and LCD monitor) to the rear panel of UPS. If the load is lighter than 30W, please also refer this function to avoid any inconvenience cause by "Green Mode" function.

### 3.3 Switch off

Press the "OFF" button at "LINE" or "BACKUP" modes and keep pressing more than 3 second to turn off the UPS.

**ATTENTION:** UPS can automatically charge itself under "OFF" mode. (Advanced Battery Management Technology)

### 3.4 Silence:

When UPS is under "BACKUP" mode, press the "SILENCE" button about 1 second to silence the audible alarm. The function is disabled when UPS is under condition of "LOW BATTERY" or "OVERLOAD"

### 3.5 Self-test function

Press the "TEST" button at "LINE" mode about 0.5 second, UPS will perform self-test procedure automatically.

**ATTENTION:** No load shut-down function can be disabled by pressing button until bi-bi beep to turn on the UPS.

## 4. Alarm

### 4.1 “BACKUP” (slow alarm)

When the UPS is working under “BACKUP” mode, the UPS would emit audible alarm. The alarm stops when the UPS is return to “LINE” mode operation.

**ATTENTION:** The alarm of “BACKUP” is going to beep every 2 seconds.  
( Slow-speed beep).

**ATTENTION:** The UPS provides mute function for the warning. When the beeping sound occurs, press "ON" to stop it; and press "ON" again to resume the sound.

### 4.2 “LOW BATTERY” (rapid alarm)

In the “BACKUP” mode, when the energy of battery becomes to lower level. ( about 20% ~ 30%) The UPS beeps rapidly until the UPS shuts down from battery exhaustion or returns to “LINE” mode operation.

**ATTENTION:** The alarm of the batteries caused by low voltage beeps every 0.5 second.

**ATTENTION:** The rapid alarm under “LOW BATTERY” condition cannot be muted.

### 4.3 “OVER LOAD” (continuous alarm)

When the UPS is working under overload condition (the connected loads exceed the maximum rated capacity), the UPS will emit continuous alarm to warn an overload condition. In order to protect the unit and the loads, the UPS will be automatic turn off. Please disconnect nonessential devices from UPS to eliminate the overload alarm.

## 5. Software installation and Interface Port

### 5.1 Power Monitoring Software

The UPSMON series software (or other power monitoring software) is applied standard interface to perform monitoring functions, and then provides an orderly shutdown of a computer in the event of power failure. Moreover, UPSMON displays all the diagnostic symptoms on monitor, such as Voltage, Frequency, Battery level and so on. The software is available for Windows 98, Windows Me, Windows 2000, Windows XP, Windows NT 4.0 or later, Novell Netware, Linux, and others. Call your dealer for more information on computer OS compatible solutions.

### 5.2 Installing software

To perform monitoring functions, you must install UPSMON series software accompanied with the UPS. Please do the following steps to complete installation of UPSMON series software.

1. Insert the UPSMON CD into your CD-ROM drive. The installation program should start automatically and installation menu appear as shown in Fig 5.1. Please select the operating system applied for your computer and then click on it. (For example if your operating system is Windows 98, please click select item **Windows 98/ ME/ 2000/ XP**.)

*Note : If the installation program doesn't start automatically, select Start → Programs → Windows Explorer (for Windows 98) and then double-click on the setup icon (in your CD-ROM drive as shown in picture 5.2).*

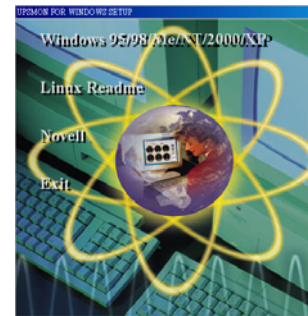


Fig 5.1

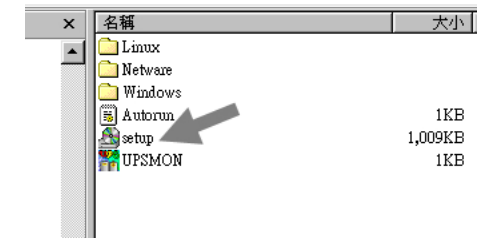


Fig5.2

- A windows labeled **Welcome** appears, please read and follow instruction written in the window and click “Next”. (see Fig 5.3)

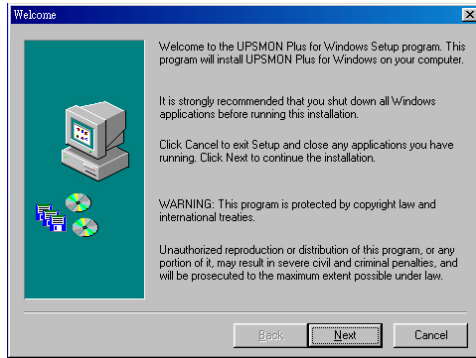


Fig 5.3

- Select a location for installing program. Please read and follow instruction written in the window and click **Next**. (see Fig 5.4)

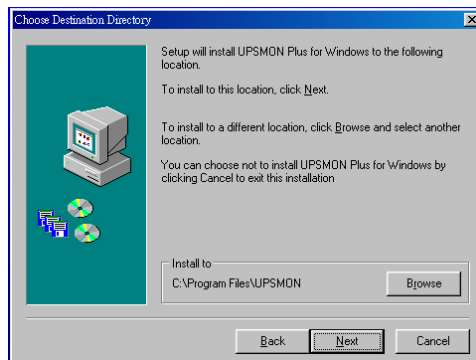


Fig 5.4

- Please read and follow instructions appearing in the window to complete installation of the software.

### 5.3 Connecting interface cable

A series of interface kits is available for operation systems that provide UPS monitoring. Each interface kit includes the special interface cable required to convert status signals from the UPS into signals which individual operating system recognizes.

The interface cable at UPS side must be connected to REMOTE PORT, at computer side can be either **COM 1, COM 2, COM 3, COM 4** or **USB** port.

**CAUTION:** Use only the factory supplied or authorized UPS monitoring cable!

### 5.4 The characteristics of software UPSMON

The communication port on the back of the UPS may be connected to host computer. Through utilizing UPSMON software, the computer is allowed to monitor the status of the UPS and controlling the operation condition of the UPS in some cases. These major functions normally include some or all of the following:

- To broadcast a warning message when power fails.
- To close and save any open files before the battery is exhausted.
- To turn-off the UPS.

Some computers are equipped with a special connector to link with the communication port. In addition, special plug-in cord may be needed. Some computers may need special UPS monitoring software. Contact your dealer for the details on the various interface Kits.

### 5.5 How to Use Software “UPSMON”


After you have completed installation of the software UPSMON, you can launch the software by clicking on the icon  on the Control Strip on your desktop (see Fig 5.5)



Fig 5.5

Then main menu of UPSMON appears as shown in Fig 5.6

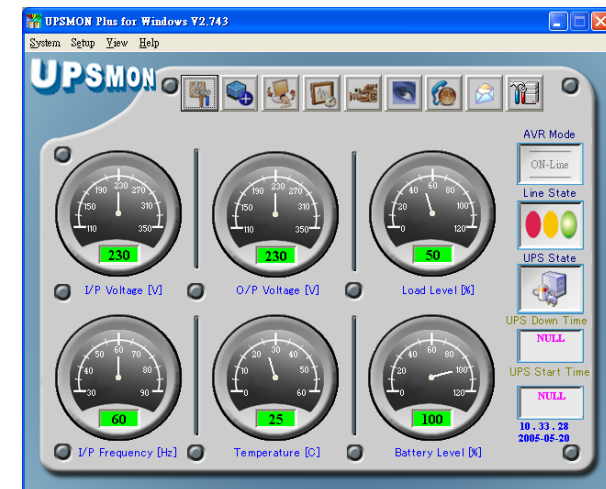


Fig 5.6

The main menu contains tools and further feature for monitoring UPS operation and controlling UPS. For details on each tool and function of UPSMON, please click on **Help** button on main menu of UPSMON.

**ATTENTION:** UPSMON software and interface port function just available for model name with “P” affix. The standard USB cable (or pin to pin D-SUB 9 pin cable) can be connected between UPS REMOTE PORT and computer USB port (or COM port) for the UPSMON series software.

## 6. Maintenance and storage

### 6.1 Maintenance

- 6.1.1. Keep the unit clean and vacuum the ventilation intake periodically.
- 6.1.2. Wipe with soft loose and damp cloth.
- 6.1.3. Check for loose and bad connections monthly.
- 6.1.4. Never leave the unit on an uneven surface.
- 6.1.5. Position the unit to allow at least 10 cm clearance between the rear panel and the wall. Keep the ventilation intake open.
- 6.1.6. Avoid direct sunlight, rain and high humidity.
- 6.1.7. Stay away from fire and extremely hot location.
- 6.1.8. Do not stack materials on top of the unit.
- 6.1.9. The unit should not be exposed to corrosive air.
- 6.1.10 The normal operating temperature is 0-30°C.

### 6.2 Storage conditions

Store the UPS covered and upright in a cool and dry location, with its battery fully charged. Before storing, charge the UPS for at least 6 hours. Remove any accessories in the accessory slot and disconnect any cables connected to the computer interface port to avoid unnecessary draining the battery.

### 6.3 To extend the storage

- 6.3.1. During the environment where the ambient temperature is -15 to +30 °C (+5 to +86 °F), charge the UPS’s battery every 6 months.
- 6.3.2. During the environment where the ambient temperature is +30 to +45 °C (+86 to +113 °F), charge the UPS’s battery every 3 months.

## 7. Battery Replacement Procedure (For Hot Swap models only)

The Batteries inside this UPS should last from between 2 to 3 years. If you suspect that the batteries are weak, allow the UPS to charge the batteries for 24 hours and then test the backup time. If the UPS still does not provide adequate backup time, follow the procedures below to replace the batteries. Please read section 7.1 before proceeding the procedure in sections 7.2

*Notice: Please note that only Hot Swap models of UPS mentioned on this manual are with this function of battery replacement.*

### 7.1 Warning

Servicing of batteries should always be performed or supervised by personnel knowledgeable of batteries and required precautions. Please read the following cautions before replacing the batteries. Keep unknowledgeable (i.e., unauthorized) personnel away from the batteries.

**CAUTION:** Except for the battery, the unit contains no user serviceable parts. Repairs should be performed only by factory trained service personnel.

**CAUTION:** A battery can present a risk of electrical shock and high short-circuit current. The following precautions should be observed when working on batteries:

- (1) Remove watches, rings, or other metal objects.
- (2) Use tools with insulated handles.

**CAUTION:** Do not dispose of batteries in a fire. The batteries may explode.

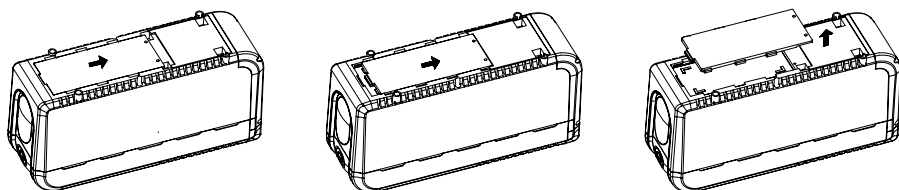
**CAUTION:** Do not open or mutilate batteries. They contain an electrolyte which is toxic and harmful to the skin and eyes.

**CAUTION:** When replacing batteries, use the same number and type of batteries.

## 7.2 Battery Replacement Procedure

Changing the batteries in your UPS is a safe and easy procedure. Since the battery is not isolated from the AC input, you must power off your UPS and unplug the power cord before proceeding the following procedure.

1. Remove the two screws on the battery cover.
2. Pull and open the cover as the following illustrations. Gently pull out the battery.
3. Disconnect the two wires connecting the battery to the UPS.
4. Connect the wires to the new battery, making sure that the red wire is connected to the red battery terminal and the black wire is connected to the black battery terminal.
5. Push the new battery into place.
6. Close the cover, and replace the screws back to the cover.



## Appendix A Troubleshooting

PROBLEM	POSSIBLE CAUSE	Solutions
<ul style="list-style-type: none"> <li>● UPS can't be turned on</li> <li>● No lights on, no warning sounds</li> </ul>	Time of pressing the button is too short	Keep pressing the button over 2 seconds
	The UPS output has short circuit or the UPS is overloaded.	Turn off UPS and remove all equipment to make sure there are no problems on it or any internal short circuit. Keep pressing button over 2 seconds
"BACKUP mode" Indicator is lit even if the utility power is present	The utility power voltage is out of range	No solution because mode of operation is correct
	Poor connection to the input utility power	Check the connection between the UPS input outlet and utility power
	Fuse melted or circuit breaker tripped	Replace fuse or reset circuit breaker (you can find a spare fuse for UPS at inlet of UPS).
The battery's indicator is lit & Buzzer keeps beeping	The UPS is overloaded	Remove less needed equipment
Available time of the batteries is too short.	Battery not fully charged	Keep UPS "ON" for over 24 hours to recharge the batteries
	The UPS is overloaded	Remove less needed equipment
	Batteries are near the end of its service life	Contact the dealer or service center for replacing batteries
	The charger is out of order	Contact the dealer or service center for help
The backup time is about 4min. when the load is light.	Green Mode function active.	The load is lighter than 30W, please disable the Green Mode function. (See section 3.2)

## Appendix B Specifications

Model		425VA	525VA	625VA	825VA	1000VA
Input	Capacity	255W	315W	375W	495W	550W
	Voltage	100V, 110V, 115V, 120V/ 220V, 230V, 240V				
	Frequency	50 or 60Hz +/-10% (auto sensing)				
Output	Voltage (on battery)	Simulated square wave output at nominal +/-5%				
	Frequency (on battery)	50 or 60Hz +/-1%				
	Voltage Regulation (AVR)	AVR automatically increase output voltage 15% while nominal -9% to -25% utility voltage be connected. AVR automatically decrease output voltage 13% while nominal +9% to +25% utility voltage be connected.				
	Transfer time	4 milliseconds (Typical)				
Protection and filtering	Surge Protection	420Joules(2x0V) / 225Joules(1x0V) , 8/20us				
	Unit Input	Fuse or Circuit breaker for overload & short circuit protection				
	10 Base-T Cable Port	Network (UTP, RJ-45) compatible jacks				
	Overload protection	UPS automatic shutdown if overload exceeds 110% of nominal at 60 seconds and 130% at 3 seconds.				
	Short Circuit	UPS output cut off immediately or input open protection				
Battery	Type	Sealed, Maintenance-free lead acid				
	Typical Recharge Time	6 hours (to 90% of full capacity)				
	Protection	Auto discharge protection				
	Back-up Time (a PC with 15" monitor)	≅ 15 minutes	≅ 20 minutes	≅ 25 minutes	≅ 30 minutes	≅ 35 minutes
Physical	Net Weight Kg (lbs)	5.8	6.0	6.3	6.4	6.5
	Dimension (mm) W x D x H	105 x 334 x 168				
Alarm	Battery Back-Up	Slow beeping sound (about 0.47Hz)				
	Battery Low	Rapid beeping sound (about 1.824Hz)				
	Overload	Continue beeping sound				
Interface	RS232 or USB Interface	Detect battery, Schedule UPS On/Off, AC input/ output power status display				
Environment	Operation	3,500m max, Humidity: 0%-95%(without condensation formation), Temperature: 0-30°C				
	Audible noise	<40dBA (1 meter from surface)				
	Storage condition	15000 meters max. elevation				

2005, 07, V01