APC 1000VA Tower Uninterruptible Power Supply User Manual

Contents

APC 1000VA Tower Uninterruptible Power Supply

Specifications

- Model: 750XL/1000XL
- Capacity: 1000VA/1500VA
- Input Voltage: 230VAC/120VAC/100VAC
- Output Voltage: 230VAC/120VAC
- Type: Tower Uninterruptible Power Supply
- Date: 990-1062A 11/01

Product Usage Instructions

Installation
Read the Safety Instruction sheet before installing the UPS.

Unpacking
The UPS is shipped with the battery disconnected.

Positioning the UPS
The UPS is heavy. Select a location sturdy enough to handle the weight. Do not operate the UPS where there is excessive dust or if the temperature and humidity are outside the specified limits.

Placement Guidelines

- Humidity Range: 0-95% Relative Humidity

- Clearance: 2.5cm (1in) around the UPS

Connecting Equipment and Power to the UPS

Smart-UPS Rear Panel Connections

1. Plug in the battery connector.
2. Connect equipment to the UPS. Note: Do not connect a laser printer to the UPS as it may overload the UPS.
3. Add any optional accessories to the Smart-Slot.
4. Plug the UPS into a two-pole, three-wire, grounded receptacle using the power cord.

Basic Connectors Information

- Use only APC-supplied or approved power management software and interface kits.
- Use APC-supplied cable for connecting to the Serial Port. Do not use a standard serial interface cable.
- External Battery Pack Connector on XL models supports up to ten external battery packs. Check **www.apc.com/support** for compatible models.
- TVSS Screw for connecting grounding cable on surge suppression devices.

Operation

Smart-UPS Front Panel Indicators

- Power On/Off
- Load
- Battery Charge
- Online AVR Trim

The online LED indicates utility power supply status. Other LEDs indicate various operational conditions like battery power, overload, and battery replacement.

Introduction

- American Power Conversion Corporation (APC) is the leading national and international manufacturer of state-of-the-art uninterruptible power supplies, redundant switches, power management software, and related equipment. APC products protect hardware, software, and data from power disturbances in business and government offices throughout the world.
- The APC Uninterruptible Power Supply (UPS) is designed to prevent blackouts, brownouts, sags, and surges from reaching your computer and other valuable electronic equipment. The UPS filters small utility line fluctuations and isolates your equipment from large disturbances by internally dis-connecting from the utility line. The UPS provides continuous power from its internal battery until the utility line returns to safe levels or the battery is discharged.

INSTALLATION

Read the Safety Instruction sheet before installing the UPS.

Unpacking

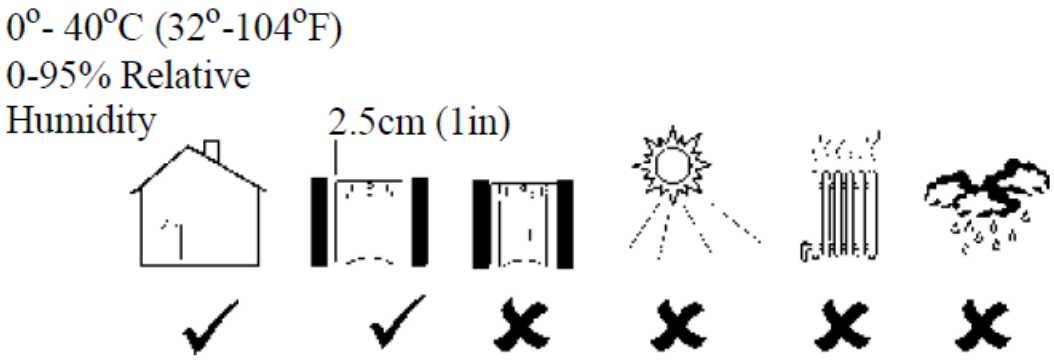
- Inspect the UPS upon receipt. APC designed robust packaging for your product. However, accidents and damage may occur during shipment. Notify the carrier and dealer if there is damage.
- The packaging is recyclable; save it for reuse or dispose of it properly.
- Check the package contents. The package contains the UPS, a literature kit containing one CD, one serial cable, one USB cable, product documentation and Safety Information.
- 230V models: Two IEC jumper cables are included and a utility connector plug is included for use on servers with permanently attached power cords.

The UPS is shipped with the battery disconnected.

Positioning the UPS

- The UPS is heavy. Select a location sturdy enough to handle the weight.
- Do not operate the UPS where there is excessive dust or the temperature and humidity are outside the specified limits.

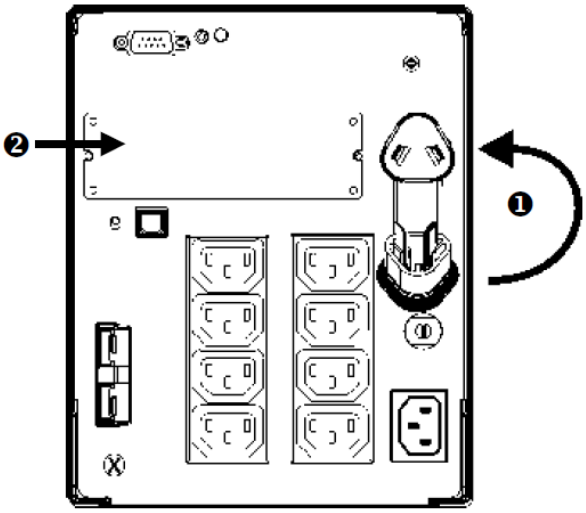
PLACEMENT



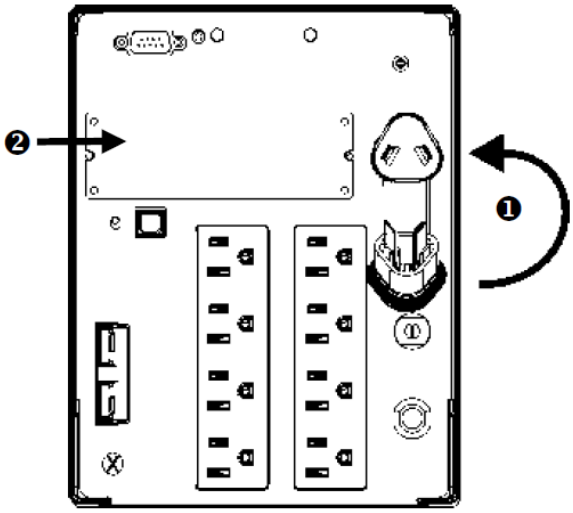
Connecting Equipment and Power to the UPS

SMART-UPS REAR PANEL

230V MODELS



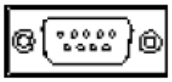
120V/100V MODELS



1. Plug in the battery connector 1 .
2. Connect equipment to the UPS. Note: Do not connect a laser printer to the UPS. A laser printer draws significantly more power than other types of equipment and may overload the UPS.
3. Add any optional accessories to the Smart-Slot 2 .
4. Using the power cord, plug the UPS into a two-pole, three-wire, grounded receptacle only. Avoid using extension cords.
    - 230V models: A utility connector plug is included for use on servers with permanently attached power cords.
    - 120V/100V models: The power cord is permanently attached to the rear panel of the UPS.
5. Turn on all connected equipment. To use the UPS as a master ON/OFF switch, be sure all connected equipment is switched ON. The equipment will not be powered until the UPS is turned on.
6. To power up the UPS press the 

button on the front panel.
    - The UPS charges its battery when it is connected to utility power. The battery charges to 90% capacity during the first three hours of normal operation. Do not expect full battery run capability during this initial charge period.
    - 120V Models: Check the site wiring fault LED located on the rear panel. It lights up if the UPS is plugged into an improperly wired utility power outlet. Refer to Troubleshooting in this manual.
7. For additional computer system security, install PowerChutePlus® UPS Power Management and Diagnostic Software.

BASIC CONNECTORS

Serial Port  **USB Port** 

Power management software and interface kits can be used with the UPS. Use only interface kits supplied or approved by APC.

- Use the APC supplied cable to connect to the Serial Port. DO NOT use a standard serial interface cable since it is incompatible with the UPS connector.

- Both Serial and USB Ports are provided. They cannot be used simultaneously.

External Battery Pack Connector
XL models: Use the battery pack connector to connect optional external battery pack(s). These units support up to ten external battery packs.
See the APC web site, **www.apc.com/support** for the correct external battery pack model number for your UPS.

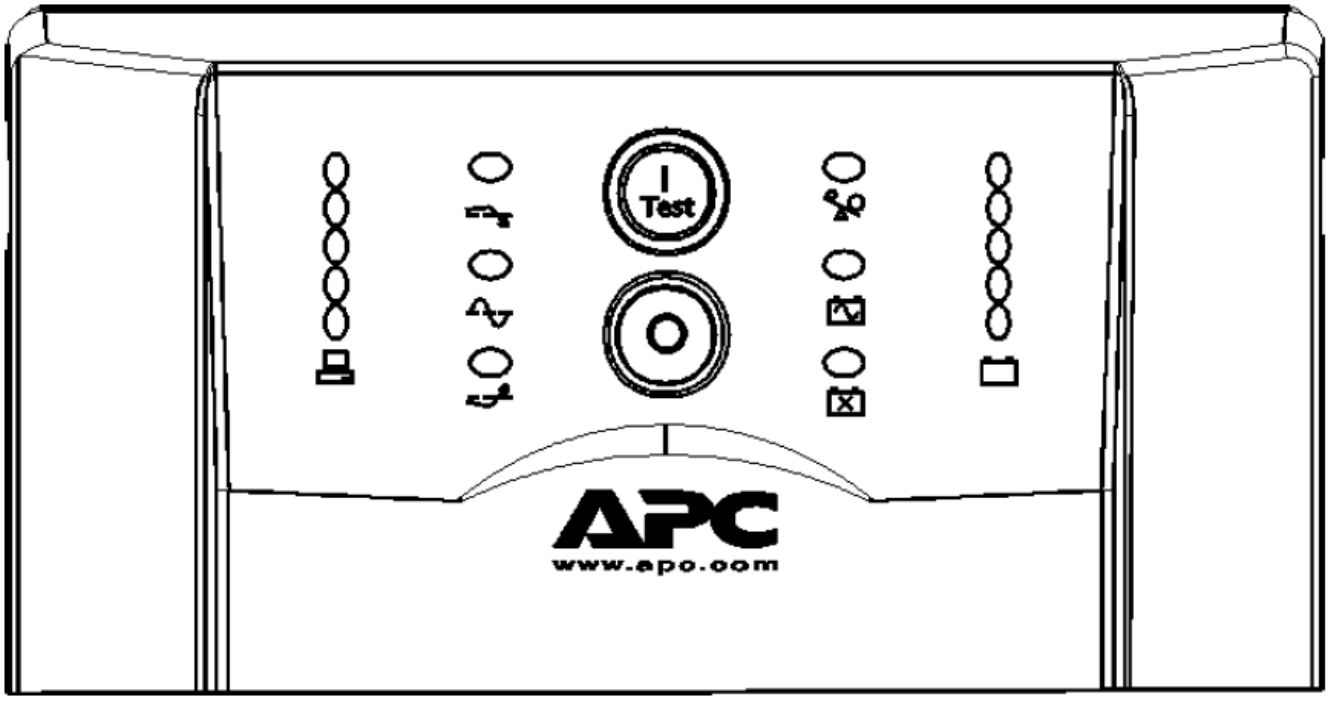
TVSS Screw
The UPS features a transient voltage surge-suppression (TVSS) screw for connecting the ground lead on surge suppression devices such as telephone and network line protectors.
When connecting grounding cable, disconnect the unit from the utility power outlet.

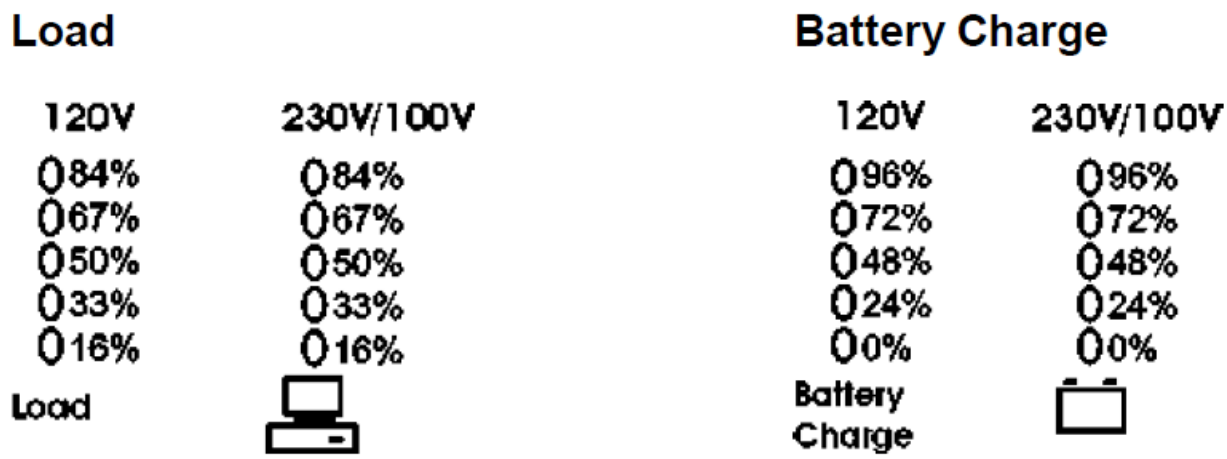
OPERATION

SMART-UPS FRONT PANEL

Power On

Power Off





Online

- The online LED illuminates when the UPS is supplying utility power to the connected equipment. If the LED is not lit, the UPS is either not turned ON, or is supplying battery power.

AVR Trim

- This LED illuminates to indicate the UPS is compensating for a high utility voltage.
- **AVR Boost** This LED illuminates to indicate the UPS is compensating for a low utility voltage.
- **On Battery** When the on battery power LED is lit the UPS is supplying battery power to the connected equipment. When on battery, the UPS sounds an alarm—four beeps every 30 seconds.
- **Overload** The LED illuminates and the UPS emits a sustained alarm tone when an overload condition occurs.
- **Replace Battery** Failure of a battery self-test causes the UPS to emit short beeps for one minute and the replace battery LED illuminates. Refer to Trou-bleshooting in this manual.
- **Battery Disconnected** The replace battery LED flashes and short beep is emitted every two seconds to indicate the battery is disconnected.
- **Automatic Self-Test** The UPS performs a self-test automatically when turned on, and every two weeks thereafter (by default).

  During the self-test, the UPS briefly operates the connected equipment on battery.

  If the UPS fails the self-test, the replace battery LED lights and immediately returns to online operation. The connected equipment is not affected by a failed test. Recharge the battery for 24 hours and perform another self-test. If it fails, the battery must be replaced.

- **Manual Self-Test** Press and hold 

the button for a few seconds to initiate the self- test.

On Battery Operation
The Smart-UPS switches to battery operation automatically if the utility power fails. While running on battery, an alarm beeps four times every 30 seconds.

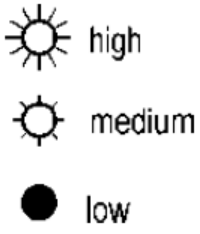
Press the 

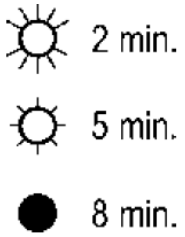
button (front panel) to silence the UPS alarm (for the current alarm only. If the utility power does not return, the UPS continues to supply power to the connected equipment until the battery is exhausted.
If PowerChute is not being used you must manually save your files and power down before the UPS turns off.

DETERMINING ON BATTERY RUN TIME
UPS battery life differs based on usage and environment. It is recommended that the battery/batteries be changed once every three years. See the APC web site, **www.apc.com**, for on battery run times.

USER CONFIGURABLE ITEMS

NOTE: SETTINGS ARE MADE THROUGH SUPPLIED POWERCHUTE SOFTWARE OR OPTIONAL SMART SLOT **ACCESSORY CARDS.**			
FUNCTION	***FACTORY DEFAULT***	***USER SELECTABLE CHOICES***	***DESCRIPTION***
Automatic Self-Test	Every 14 days (336 hours)	Every 7 days (168 hours), On Startup Only, No Self- Test	This function sets the interval at which the UPS will execute a self-test. Refer to your softw are manual for details.
UPS ID	UPS_IDEN	Up to eight characters to defin e the UPS	Use this field to uniquely ident ify the UPS, (ie. server name or location) for net-work mana gement purposes.
Date of Last Battery Repla cement	Manufacture Dat e	Date of Battery Replacement mm/dd/yy	Reset this date when you repl ace the battery module.
Minimum Capacity Before Return from Shut-down	0 percent	15, 30, 45, 50, 60, 75, 90 perc ent	The UPS will charge its batteri es to the specified percentage before return from a shutdown .

Voltage Sensitivity The UPS detects and reacts to line voltage distortions by transferring to battery operation to protect the connected equipment. Where power quality is poor, the UPS may frequently transfer to battery operation. If the connected equipment can operate normally under such conditions, reduce the sensitivity setting to conserve battery capacity and service life.		Brightly lit: UPS is set to *high* sensitivity (default). Dimly lit: UPS is set to *medium* sensitivity. Off: Low battery warning interval is about eight minutes.	To change the UPS sensitivity, press the voltage sensitivity button  (rear panel). Use a pointed object (such as a pen) to do so. You can change the sensitivity level through Power- Chute software.
Alarm Control	Enable	Mute, Disable	User can mute an ongoing alarm or disable all existing alarms permanently.
Shutdown Delay	90 seconds	0, 180, 270, 360, 450, 540, 630 seconds	Sets the interval between the time when the UPS receives a shutdown command and actual shutdown.

NOTE: SETTINGS ARE MADE THROUGH SUPPLIED POWERCHUTE SOFTWARE OR OPTIONAL SMART SLOT **ACCESSORY CARDS.**			
FUNCTION	***FACTORY DEFAULT***	***USER SELECTABLE CHOICES***	***DESCRIPTION***
Low Battery Warning. PowerChute interface software provides automatic, unattended shut- down when approximately two minutes (by default) of battery operated run time remains.		*Brightly lit*: Low battery warning interval is about two minutes. *Dimly lit*: Low battery warning interval is about five minutes. Off: Low battery warning interval is about eight minutes. Possible interval settings: 2, 5, 8, 11, 14, 17, 20, 23 minutes.	The low battery warning beeps are continuous when two minutes of run time remain. To change the warning interval default setting, press the *voltage sensitivity* button (use a pointed object such as a pen to do so), while pressing and holding the button (front panel).
Synchronized Turn-on Delay	0 seconds	60, 120, 180, 240, 300, 360, 420 seconds	The UPS will wait the specified time after the return of utility power before turn-on (to avoid branch circuit overload).

High Transfer Point	*230V models:* 253VAC *120V models:* 127VAC *100V models*: 108VAC	*230V models:* 257, 261, 265VAC *120V models:* 130, 133, 136VAC *100V models:* 110, 112, 114VAC	To avoid unnecessary battery usage, set the high transfer point higher if the utility voltage is chronically high and the connected equipment is known to work under this condition.
Low Transfer Point	*230V models:* 208VAC *120V models:* 106VAC *100V models*: 92 VAC	*230V models:* 196, 200, 204VAC *120V models:* 97, 100, 103VAC *100V models*: 86, 88, 90VAC	Set the low transfer point lower if the utility voltage is chronically low and the connected equipment can tolerate this condition.
Output Voltage	*230V models:* 230VAC	*230V models:* 220, 240VAC	*230V models* ONLY, allow the user to select the output voltage.

STORAGE, MAINTENANCE, AND TRANSPORTING

Storage
Store the UPS covered and positioned as for proper functioning, in a cool, dry location, with the batteries fully charged.

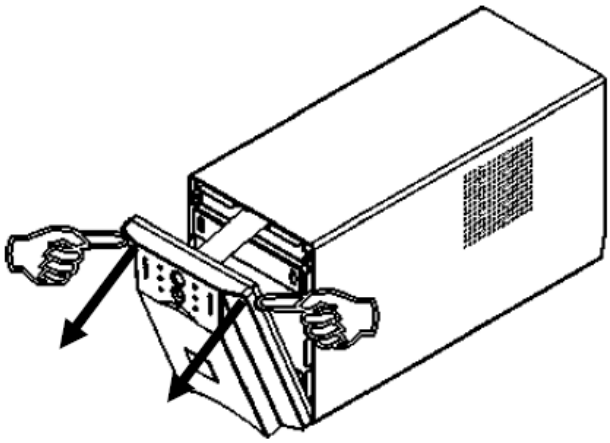
- At -15 to +30 °C (+5 to +86 °F), charge the UPS battery every six months.
- At +30 to +45 °C (+86 to +113 °F), charge the UPS battery every three months.

Replacing the Battery Module
This UPS has an easy to replace, hot-swappable battery module. Replacement is a safe procedure, isolated from electrical hazards. You may leave the UPS and connected equipment on for this proce-dure. See your dealer or contact APC at the web site, **www.apc.com/support** for information on replacement battery modules.

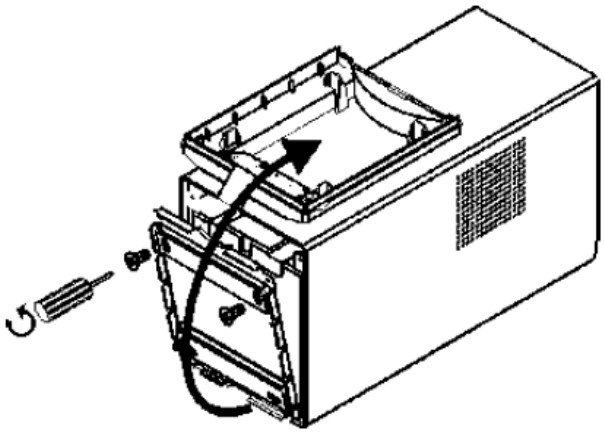
- Once the battery is disconnected, the connected equipment is not protected from power outages.
- Be careful during the following steps-the battery module is heavy.

REMOVING THE FRONT BEZEL AND BATTERY MODULE

Step 1



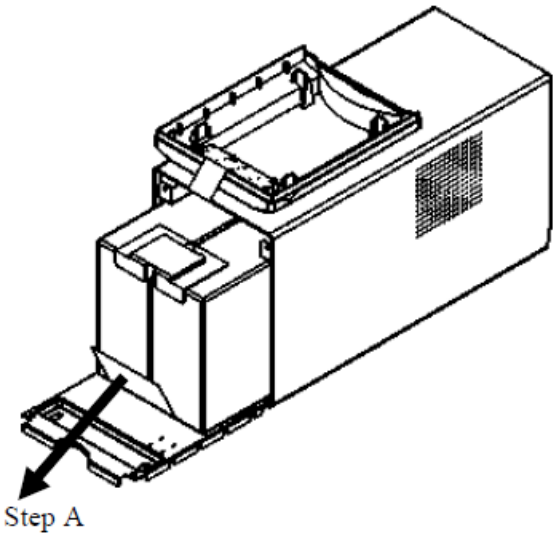
Step 2

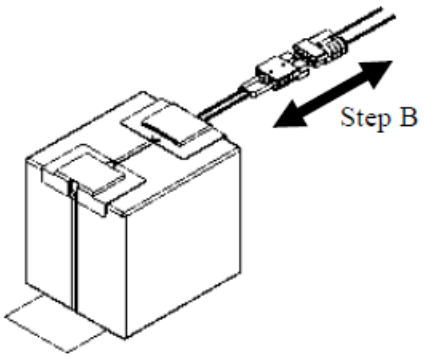


1500VA Model

Step 3

- Pull the battery module out of the compartment until the back of the module is flush with the outer edges of the UPS.
- Disconnect the battery connector.



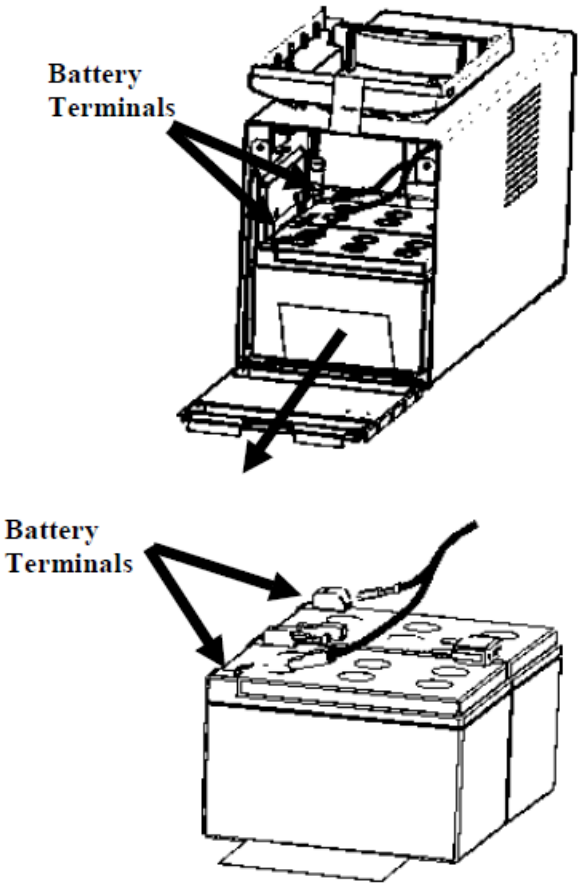


1000VA Model

Disconnect the battery cable terminals before removing the battery module from the UPS.

Note: The red cable connects to the red color-coded terminal; the black cable connects to the black color-coded terminal. This will be important during the battery replacement procedure.

Step 3



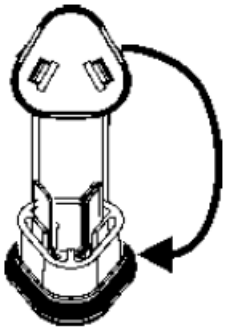
Be sure to deliver the spent battery to a recycling facility or ship it to APC in the replacement battery packing material.

REPLACING THE BATTERY MODULE
To replace the battery module, reverse the directions above for Removing the Front Bezel and Battery Module.

Disconnecting the Battery for Transport

- Always DISCONNECT THE BATTERY before shipping in compliance with U.S. Department of Transportation (DOT) regulations.
- The battery may remain in the UPS; it does not have to be removed.

1. Shut down and disconnect any equipment attached to the UPS.
2. Shut down and disconnect the UPS from the power supply.
3. Unplug the battery connector (rear panel).



For shipping instructions and to obtain appropriate packing materials contact APC at the web site, **www.apc.com/support/contact**.

TROUBLESHOOTING

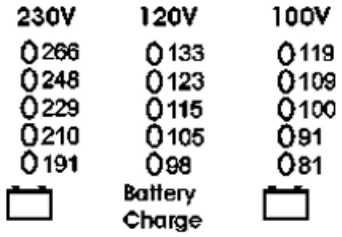
Use the chart below to solve minor Smart-UPS installation and operation problems. Refer to the APC web site, **www.apc.com**, for assistance with complex UPS problems.

PROBLEM AND POSSIBLE CAUSE	SOLUTION
UPS WILL NOT TURN ON	
Battery not connected properly. Test button not pushed. UPS not connected to utility power supply. Very low or no utility voltage.	Check that the battery connector (rear panel) is fully engaged. Press the Test button once to power the UPS and the connected equipment. Check that the power cable from the UPS to the utility power supply is securely connected at both ends. Check the utility power supply to the UPS by plugging in a table lamp. If the light is very dim, have the utility voltage checked. 
UPS WILL NOT TURN OFF	
Internal UPS fault.	Do not attempt to use the UPS. Unplug the UPS and have it serviced immediately.
UPS BEEPS OCCASIONALLY	
Normal UPS operation.	None. The UPS is protecting the connected equipment.
UPS DOES NOT PROVIDE EXPECTED BACKUP TIME	
The UPS battery is weak due to a recent outage or is near the end of its service life.	Charge the battery. Batteries require recharging after extended outages. They wear faster when put into service often or when operated at elevated temperatures. If the battery is near the end of its service life, consider replacing the battery even if the *replace battery* LED is not yet lit.
ALL LEDS ARE LIT AND THE UPS EMITS A CONSTANT BEEPING	
Internal UPS fault.	Do not attempt to use the UPS. Turn the UPS off and have it serviced immediately.
FRONT PANEL LEDS FLASH SEQUENTIALLY	
The UPS has been shut down remotely through software or an optional accessory card.	None. The UPS will restart automatically when utility power returns.
ALL LEDS ARE OFF AND THE UPS IS PLUGGED INTO A WALL OUTLET	
The UPS is shut down and the battery is discharged from an extended outage.	None. The UPS will return to normal operation when the power is restored and the battery has a sufficient charge.

PROBLEM AND POSSIBLE CAUSE	SOLUTION

THE OVERLOAD LED IS LIT AND THE UPS EMITS A SUSTAINED ALARM TONE	
The UPS is overloaded.	The connected equipment exceeds the specified “maximum load” as defined in Specifications at the APC web site, **www.apc.com.** The alarm remains on until the overload is removed. Disconnect nonessential equipment from the UPS to eliminate the overload. The UPS continues to supply power as long as it is online and the circuit breaker does not trip; the UPS will not provide power from batteries in the event of a utility voltage interruption. If a continuous overload occurs while the UPS is on battery, the unit turns off output in order to protect the UPS from possible damage.
THE REPLACE BATTERY LED IS LIT	
Replace Battery LED flashes and short beep is emitted every two seconds to indicate the battery is disconnected.	Check that the battery connectors are fully engaged.
Weak battery.	Allow the battery to recharge for 24 hours. Then, perform a self-test. If the problem persists after recharging, replace the battery.
Failure of a battery self-test.	The UPS emits short beeps for one minute and the *replace battery* LED illuminates. The UPS repeats the alarm every five hours. Perform the self- test procedure after the battery has charged for 24 hours to confirm the *replace battery* condition. The alarm stops and the LED clears if the battery passes the self-test.
THE SITE WIRING FAULT LED IS LIT	
The site wiring LED is  lit (rear panel). *120V models only.*	The UPS is plugged into an improperly wired utility power outlet. Wiring faults detected include missing ground, hot-neutral polarity reversal, and overloaded neutral circuit. Contact a qualified electrician to correct the building wiring.
THE INPUT CIRCUIT BREAKER TRIPS	
The plunger on the circuit breaker (located above the input cable connection)  pops out.	Reduce the load on the UPS by unplugging equipment and press the plunger in.
AVR BOOST OR AVR TRIM LEDS LIGHT	
AVR Boost or Trim LEDs light Your system is experiencing excessive periods of low r high voltage.	Have qualified service personnel check your facility for electrical problems. If the problem continues, contact the utility company for further assistance.

PROBLEM AND POSSIBLE CAUSE	*SOLUTION*
UTILITY CIRCUIT BREAKER TRIPS	
Utility circuit breaker trips during normal operation.	*100V models:* In order to operate at the full VA rating of the 1500VA product, the supplied 15 A plug must be replaced with a 20A plug. This change must be performed by qualified servic e personnel.
UPS OPERATES ON BATTERY ALTHOUGH NORMAL LINE VOLTAGE EXISTS	
UPS input circuit breaker tripped. Very high, low, or distorted line voltage. Inexpensive fuel power ed generators can distort the voltage.	Reduce the load on the UPS by unplugging eq uipment and resetting the circuit breaker (on t he back of UPS) by pressing the plunger in. Move the UPS to a different outlet on a differe nt circuit. Test the input voltage with the utility voltage display (see below). If acceptable to th e connected equipment, reduce the UPS sensi tivity.
BATTERY CHARGE AND BATTERY LOAD LEDS FLASH SIMULTANEOUSLY	
UPS has shutdown. The internal temperature of the UPS has exceeded the allowab le threshold for safe operation.	Check that the room temperature is within the specified limits for operation. Check that the UPS is properly installed allowi ng for adequate ventilation. Allow the UPS to cool down. Restart the UPS. If the problem continues contact APC at, **www .apc.com/supoport.**
DIAGNOSTIC UTILITY VOLTAGE FEATURE	

Utility Voltage  	The UPS has a diagnostic feature that displays the utility voltage. Plug the UPS into the normal utility power. Press and hold the Test button to view the utility voltage bar graph display. After a few seconds the five-LED, Battery Charge, , display on the right of the front panel shows the utility input voltage. Refer to the figure at left for the voltage reading (values are not listed on the UPS). The display indicates the voltage is between the displayed value on the list and the next higher value. Three LEDs light, indicating utility voltage within the normal range. If no LEDs are lit and the UPS is plugged into a working utility power outlet, the line voltage is extremely low. If all five LEDs are lit, the line voltage is extremely high and should be checked by an electrician.
	The UPS starts a self-test as part of this procedure. The self-test does not affect the voltage display.

Service

If the UPS requires service do not return it to the dealer. Instead, follow these steps:

1. Review the problems discussed in the Troubleshooting section of this manual to eliminate common problems.
2. If the problem persists, contact APC Customer Service through the APC web site, **www.apc.com/support**.
   Note the model number of the UPS, the serial number, and the date purchased. If you call APC Customer Service, a technician will ask you to describe the problem and try to solve it over the phone, if possible. If this is not possible, the technician will issue a Returned Material Authorization Number (RMA#).
   If the UPS is under warranty, repairs are free. If not, there is a repair charge.
3. Pack the UPS in its original packaging. If the original packing is not available, refer to the APC web site, **www.apc.com/support**, for information about obtaining a new set.
   Pack the UPS properly to avoid damage in transit. Never use Styrofoam beads for packaging. Damage sustained in transit is not covered under warranty.
   Always DISCONNECT THE BATTERY before shipping in compliance with U.S. Department of Transportation (DOT) regulations.
   The battery may remain in the UPS; it does not have to be removed.
4. Mark the RMA# on the outside of the package.
5. Return the UPS by insured, prepaid carrier to the address given to you by Customer Service.

Contacting APC
Refer to the information provided at the APC Internet site, **http://www.apc.com/support.**

REGULATORY AND WARRANTY INFORMATION

Regulatory Agency Approvals and Radio Frequency Warnings

230V MODELS

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take corrective actions.

120V MODELS

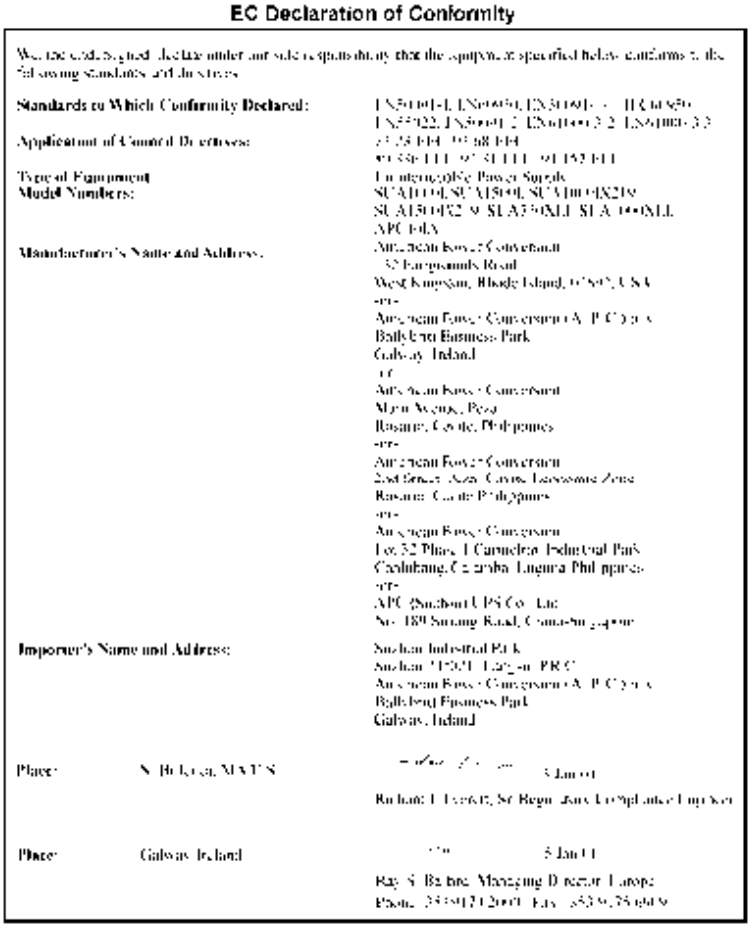
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Shielded signal cables must be used with this product to ensure compliance with the Class A FCC limits.

Declaration of Conformity

CE 2001

EC Declaration of Conformity



Limited Warranty

- American Power Conversion (APC) warrants its products to be free from defects in materials and workmanship for a period of two years from the date of purchase. Its obligation under this warranty is limited to repairing or replacing, at its own sole option, any such defective products. To obtain service under warranty you must obtain a Returned Material Authorization (RMA) number from customer support. Products must be returned with transportation charges prepaid and must be accompanied by a brief description of the problem encountered and proof of date and place of purchase. This warranty does not apply to equipment that has been damaged by accident, negligence, or misapplication or has been altered or modified in any way. This warranty applies only to the original purchaser who must have properly registered the product within 10 days of purchase.
- EXCEPT AS PROVIDED HEREIN, AMERICAN POWER CONVERSION MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Some states do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser.
- EXCEPT AS PROVIDED ABOVE, IN NO EVENT WILL APC BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF THIS PRODUCT, EVEN IF
- ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. Specifically, APC is not liable for any costs, such as lost profits or revenue, loss of equipment, loss of use of equipment, loss of software, loss of data, costs of substitutes, claims by third parties, or otherwise.
-
- APC, Smart-UPS, and Power Chute are registered trademarks of American Power Conversion Corporation. All

other trademarks are the property of their respective owners.

FAQ (Frequently Asked Questions)

Q: Can I connect a laser printer to the UPS?
A: No, connecting a laser printer may overload the UPS as it draws significantly more power than other equipment.

Q: What should I do if the replace battery LED flashes?
A: The flashing LED and beeping sound every two seconds indicate that the battery is disconnected. Reconnect or replace the battery as needed.

Documents / Resources

	APC 1000VA Tower Uninterruptible Power Supply [pdf] User Manual 1000VA, 1500VA, 750XL, 1000XL, 1000VA Tower Uninterruptible Power Supply, 1000VA, Tower Uninterruptible Power Supply, Uninterruptible Power Supply, Power Supply

References

- Your Ultimate Resource for Millions of User Manuals
- User Manual