

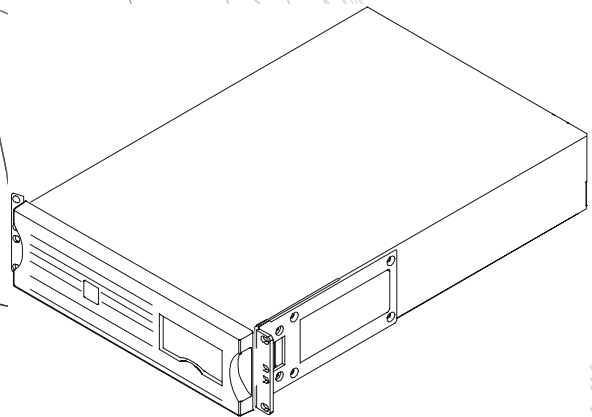
**APC**<sup>®</sup>  
by **Schneider Electric**

# Installation and Operation

**Smart-UPS**<sup>®</sup>

**SUA1500RM2U-BR**  
**120 VAC**

**English**





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This manual and the safety guide are available in English on the enclosed CD and the APC Web site, [www.apc.com](http://www.apc.com).

Este manual e o guia de segurança estão disponíveis em português no CD incluso e no website da APC, [www.apc.com](http://www.apc.com).

## Introduction

The APC® by Schneider Electric Smart-UPS® is a high performance uninterruptible power supply (UPS). It provides protection for electronic equipment from utility power blackouts, brownouts, sags, and surges; small utility fluctuations and large disturbances. The UPS also provides battery backup power until utility power returns to safe levels or the batteries are fully discharged.

## 1: 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, the front bezel, the rail kit, and a literature kit containing:

- CD with product documentation and safety information
- PowerChute® CD
- Serial and USB communication cables

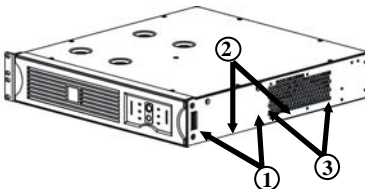


The UPS is shipped with the battery disconnected.

## Rail Installation

Install the rails following instructions in the rail kit.

Mounting rails are supplied for the standard 4-post rack. Two-post racks require only the mounting brackets.



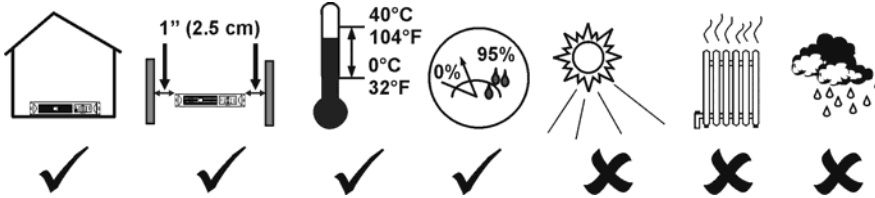
Rack-mount bracket locations:

1. Standard
2. Optional (1.4" setback)
3. 2-post rack (5" setback)

## Positioning the UPS

Place the UPS where it will be used. **The UPS is heavy. Select a location sturdy enough to handle the weight.**

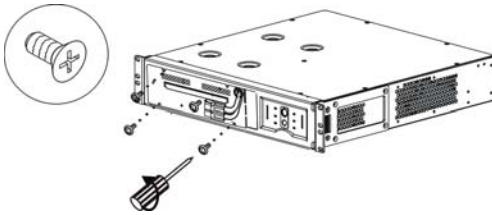
Do not operate the UPS where there is excessive dust or the temperature and humidity are outside the specified limits.



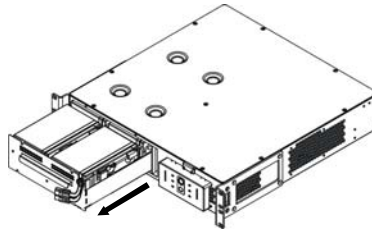
## Mounting the UPS in a Rack

**The UPS is heavy.** To lighten it, you may remove the battery before mounting the unit in the rack (Steps 1 and 2).

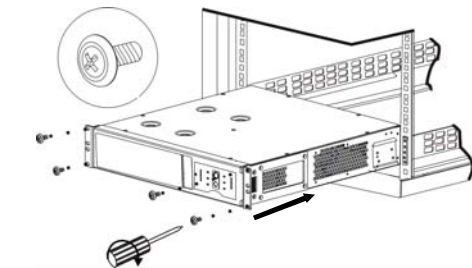
### Step 1



### Step 2 Caution: The battery is heavy.



### Step 3

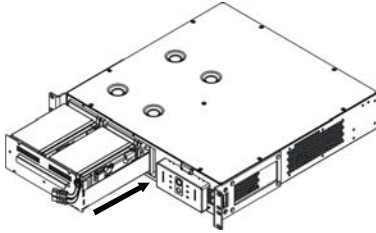


**Install the UPS at or near the bottom of the rack (Step 3).**

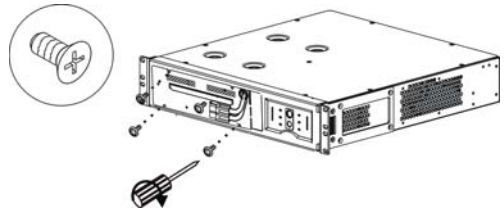
**Check to ensure the rack will not tip after installing the UPS into the rack.**

## Installing and Connecting the Battery and Attaching the Front Bezel

### Step 1

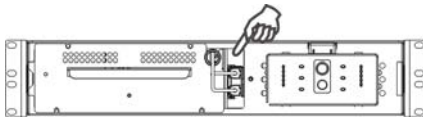


### Step 2

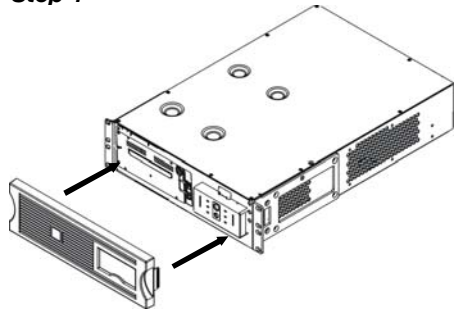


### Step 3

Connect battery plug to UPS. Tuck white battery cord into space above connector.

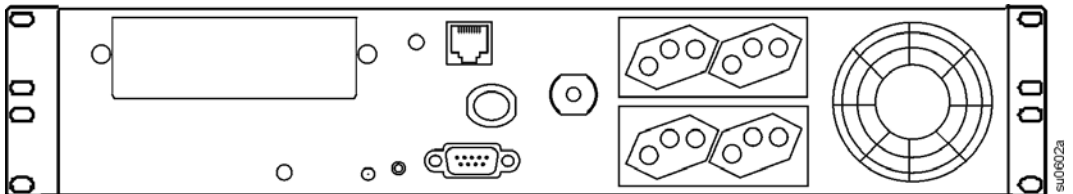


### Step 4




## Connecting Equipment and Power to the UPS

### SMART-UPS REAR PANEL



1. 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.**
2. Add any optional accessories to the SmartSlot.
3. Using a power cord, plug the UPS into a two-pole, three-wire, grounded receptacle only. Avoid using extension cords.
4. 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.

5. 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 four hours of normal operation. **Do not** expect full battery run capability during this initial charge period.
  - 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.
6. For additional computer system security, install PowerChute<sup>®</sup> Smart-UPS monitoring 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 an 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.**

#### **TVSS Screw**

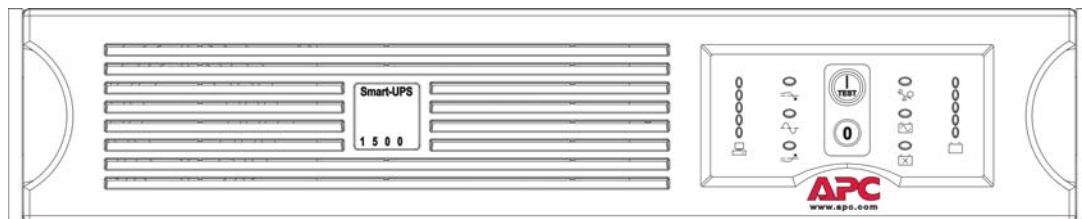


The UPS features a transient voltage surge-suppression (TVSS) screw for connecting the ground lead on surge suppression devices such as telephone and network line protectors.

When connecting grounding cable, disconnect the UPS from utility power.

# 2: OPERATION

## SMART-UPS FRONT PANEL



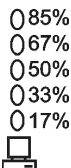
Power On



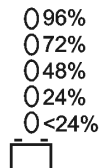
Power Off



Load



Battery Charge



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 *Troubleshooting* 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 turn off the computer before the UPS fully discharges the battery.






## 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](http://www.apc.com), for on battery run times.







### 3: USER CONFIGURABLE ITEMS

**NOTE: SETTINGS ARE MADE THROUGH SUPPLIED POWERCHUTE SOFTWARE OR OPTIONAL SMART SLOT ACCESSORY CARDS.**

<i>FUNCTION</i>	<i>FACTORY DEFAULT</i>	<i>USER SELECTABLE CHOICES</i>	<i>DESCRIPTION</i>
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 software manual for details.
UPS ID	UPS_IDEN	Up to eight characters to define the UPS	Use this field to uniquely identify the UPS, (i.e. server name or location) for network management purposes.
Date of Last Battery Replacement	Manufacture Date	Date of Battery Replacement  mm/dd/yy	Reset this date when you replace the battery module.
Minimum Capacity Before Return from Shutdown	0 percent	15, 25, 35, 50, 60, 75, 90 percent	The UPS will charge its batteries 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.	 high	<i>Brightly lit:</i> UPS is set to <i>high</i> sensitivity.  <i>Dimly lit:</i> UPS is set to <i>medium</i> sensitivity.  <i>Off:</i> UPS is set to <i>low</i> sensitivity.   high  medium  low	To change the UPS sensitivity, press the <i>voltage sensitivity</i> button  (rear panel). Use a pointed object (such as a pen) to do so.  You can change the sensitivity level through PowerChute software.
Alarm Delay After Line Fail	5 second delay	30 second delay, At Low Battery Condition	To avoid alarms for minor power glitches, set the alarm delay.
Shutdown Delay	20 seconds	0, 60, 120, 240, 480, 720, 960 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.**

<i>FUNCTION</i>	<i>FACTORY DEFAULT</i>	<i>USER SELECTABLE CHOICES</i>	<i>DESCRIPTION</i>
<p>Low Battery Warning.</p> <p>PowerChute interface software provides automatic, unattended shutdown when approximately two minutes (by default) of battery operated run time remains.</p>	 2 min.	<p><i>Brightly lit:</i> Low battery warning interval is about two minutes.</p> <p><i>Dimly lit:</i> Low battery warning interval is about five minutes.</p> <p><i>Off:</i> Low battery warning interval is about eight minutes.</p> <p> 2 min.</p> <p> 5 min.</p> <p> 8 min.</p> <p>Possible interval settings: 5, 7, 10, 12, 15, 18 minutes.</p>	<p>The low battery warning beeps are continuous when two minutes of run time remain.</p> <p>You can change the warning interval default setting through PowerChute software.</p>
Synchronized Turn-on Delay	0 seconds	0, 20, 60, 120, 240, 480, 720, 960 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	127 VAC	127, 130, 133, 136 VAC	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	106 VAC	97, 100, 103, 106 VAC	Set the low transfer point lower if the utility voltage is chronically low and the connected equipment can tolerate this condition.

## 4: STORAGE AND MAINTENANCE

### **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 the following procedure. See your dealer or contact APC at the web site, [www.apc.com](http://www.apc.com) 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.**

Refer to *Installing and Connecting the Battery and Attaching the Front Bezel*, in this manual.





Refer to *Mounting the UPS in a Rack* (Steps 1 and 2) for instructions on battery removal.














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

## 5: TROUBLESHOOTING

Use the chart below to solve minor Smart-UPS installation and operation problems. Refer to the APC web site, [www.apc.com](http://www.apc.com), for assistance with complex UPS problems.

PROBLEM AND POSSIBLE CAUSE	SOLUTION
<b>UPS WILL NOT TURN ON</b>	
Battery not connected properly.	Check that the battery connector is fully engaged.
 button not pushed. UPS not connected to utility power supply. Very low or no utility voltage.	Press the  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.
<b>UPS WILL NOT TURN OFF</b>	
 button not pushed. Internal UPS fault.	Press the  button once to turn the UPS off. Do not attempt to use the UPS. Unplug the UPS and have it serviced immediately.
<b>UPS BEEPS OCCASIONALLY</b>	
Normal UPS operation when running on battery.	None. The UPS is protecting the connected equipment.
<b>UPS DOES NOT PROVIDE EXPECTED BACKUP TIME</b>	
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 <i>replace battery</i> LED is not yet lit.
<b>ALL LEDs ARE LIT AND THE UPS EMITS A CONSTANT BEEPING</b>	
Internal UPS fault.	Do not attempt to use the UPS. Turn the UPS off and have it serviced immediately.
<b>FRONT PANEL LEDs FLASH SEQUENTIALLY</b>	
The UPS has been shut down remotely through software or an optional accessory card.	None. The UPS will restart automatically when utility power returns.
<b>ALL LEDs ARE OFF AND THE UPS IS PLUGGED INTO A WALL OUTLET</b>	
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
<b>THE OVERLOAD LED IS LIT AND THE UPS EMITS A SUSTAINED ALARM TONE</b>	
<p>The UPS is overloaded.</p>	<p>The connected equipment exceeds the specified “maximum load” as defined in <i>Specifications</i> at the APC web site, <a href="http://www.apc.com">www.apc.com</a>.</p> <p>The alarm remains on until the overload is removed. Disconnect nonessential equipment from the UPS to eliminate the overload.</p> <p>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.</p> <p>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.</p>
<b>THE REPLACE BATTERY LED IS LIT</b>	
<p>Replace Battery LED flashes and short beep is emitted every two seconds to indicate the battery is disconnected.</p> <p>Weak battery.</p> <p>Failure of a battery self-test.</p>	<p>Check that the battery connectors are fully engaged.</p> <p>Allow the battery to recharge for 24 hours. Then, perform a self-test. If the problem persists after recharging, replace the battery.</p> <p>The UPS emits short beeps for one minute and the <i>replace battery</i> 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 <i>replace battery</i> condition. The alarm stops and the LED clears if the battery passes the self-test.</p>
<b>THE SITE WIRING FAULT LED IS LIT</b>	
<p><i>120V models only.</i> Site wiring LED on rear panel .</p> <p>The UPS is plugged into an improperly wired utility power outlet.</p>	<p>Wiring faults detected include missing ground, hot-neutral polarity reversal, and overloaded neutral circuit.</p> <p>Contact a qualified electrician to correct the building wiring.</p>
<b>THE INPUT CIRCUIT BREAKER TRIPS</b>	
<p>The plunger on the circuit breaker (located to the right of the input cable connection) pops out. .</p>	<p>Reduce the load on the UPS by unplugging equipment and press the plunger in.</p>
<b>AVR BOOST OR AVR TRIM LEDs LIGHT</b>	
<p>Your system is experiencing excessive periods of low or high voltage.</p>	<p>Have qualified service personnel check your facility for electrical problems. If the problem continues, contact the utility company for further assistance.</p>

PROBLEM AND POSSIBLE CAUSE	SOLUTION
<b>THERE IS NO UTILITY POWER AND THE UPS HAS BEEN TURNED OFF</b>	
<p><i>120V/230V Models:</i> When the UPS is off and there is no utility power, use the cold start feature to apply power to the connected equipment from the UPS battery. <b>Cold start is not a normal condition.</b></p>	<p>Press and hold the  button, (for about 3 seconds). The unit will beep, the LED lights will flash, and the unit will beep a second time. Release the ON button during the second beep. This will supply immediate power to the UPS and the connected equipment. Make sure connected equipment is switched to ON.</p>
<b>UPS OPERATES ON BATTERY ALTHOUGH NORMAL LINE VOLTAGE EXISTS</b>	
<p>UPS input circuit breaker tripped.</p> <p>Very high, low, or distorted line voltage. Inexpensive fuel powered generators can distort the voltage.</p>	<p>Reduce the load on the UPS by unplugging equipment and resetting the circuit breaker (on the back of UPS) by pressing the plunger in.</p> <p>Move the UPS to a different outlet on a different circuit. Test the input voltage with the utility voltage display (see below). If acceptable to the connected equipment, reduce the UPS sensitivity.</p>
<b>BATTERY CHARGE AND BATTERY LOAD LEDs FLASH SIMULTANEOUSLY</b>	
<p>The internal temperature of the UPS has exceeded the allowable threshold for safe operation.</p>	<p>Check that the room temperature is within the specified limits for operation.</p> <p>Check that the UPS is properly installed allowing for adequate ventilation.</p> <p>Allow the UPS to cool down. Restart the UPS. If the problem continues contact APC at, <a href="http://www.apc.com/supoport">www.apc.com/supoport</a>.</p>
<b>DIAGNOSTIC UTILITY VOLTAGE FEATURE</b>	
<p><b>Utility Voltage</b></p> <p>120V</p> <p> 133</p> <p> 123</p> <p> 115</p> <p> 105</p> <p> 98</p> <p><b>Battery Charge</b></p>	<p>The UPS has a diagnostic feature that displays the utility voltage. Plug the UPS into the normal utility power.</p> <p>Press and hold the  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.</p> <p>Refer to the figure at left for the voltage reading (values are not listed on the UPS).</p> <p>The display indicates the voltage is between the displayed value on the list and the next higher value.</p> <p>Three LEDs light, indicating utility voltage within the normal range.</p> <p>If no LEDs are lit and the UPS is plugged into a working utility power outlet, the line voltage is extremely low.</p> <p>If all five LEDs are lit, the line voltage is extremely high and should be checked by an electrician.</p>
	<p>The UPS starts a self-test as part of this procedure. The self-test does not affect the voltage display.</p>

## Service

If the unit requires service, do not return it to the dealer. Follow these steps:

1. Review the *Troubleshooting* section of the manual to eliminate common problems.
2. If the problem persists, contact APC Customer Support through the APC Web site, **www.apc.com**.
  - a. Note the model number and serial number and the date of purchase. The serial number is located on the rear panel of the unit and is available through the LCD display on select models.
  - b. Call APC Customer Support and a technician will attempt to solve the problem over the phone. If this is not possible, the technician will issue a Returned Material Authorization Number (RMA#).
  - c. If the unit is under warranty, the repairs are free.
  - d. Service procedures and returns may vary internationally. Refer to the APC Web site for country specific instructions.
3. Pack the unit in its original packaging. If this is not available, refer to **www.apc.com** to obtain a new set.
  - a. Pack the unit properly to avoid damage in transit. Never use foam beads for packaging. Damage sustained in transit is not covered under warranty.
  - b. **For the UPS, always DISCONNECT THE BATTERY before shipping in compliance with U.S. Department of Transportation (DOT) and IATA regulations.** The battery may remain in the unit.
  - c. Internal batteries may remain connected in the XLBP during shipment, (if applicable, not all units have XLBPs).
4. Write the RMA# provided by Customer Support on the outside of the package.
5. Return the unit by insured, pre-paid carrier to the address provided by Customer Support.

## Transporting the unit

1. Shut down and disconnect all connected equipment.
2. Disconnect the unit from utility power.
3. Follow the shipping instructions in the *Service* section of this manual.

## APC Worldwide Customer Support

Refer to **www.apc.com** (Corporate Headquarters)

Connect to localized APC Web sites for specific countries, each of which provides customer support information.

Contact the APC Customer Support Center by telephone or e-mail.

Telephone: Global (888) 272 2782

Brazil (11) 4689 8600

## **6: RADIO FREQUENCY WARNINGS AND WARRANTY**

### ***120 VAC MODELS***

This device complies with FCC Part 15 Class A requirements. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

### ***Limited Warranty***

The limited warranty provided by American Power Conversion (APC®) in this Statement of Limited Factory Warranty applies only to Products you purchase for your commercial or industrial use in the ordinary course of your business.

### **Terms of Warranty**

APC warrants its products to be free from defects in materials and workmanship for a period of two years from the date of purchase. The APC obligation under this warranty is limited to repairing or replacing, at its sole discretion, any such defective products. 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. Repair or replacement of a defective product or part thereof does not extend the original warranty period. Any parts furnished under this warranty may be new or factory remanufactured.

### **Non-transferable Warranty**

This warranty applies only to the original purchaser who must have properly registered the product. Product may be registered at [www.apc.warranty.com](http://www.apc.warranty.com).

### **Exclusions**

APC shall not be liable under the warranty if its testing and examination disclose that the alleged defect in the product does not exist or was caused by end user or any third person misuse, negligence, improper installation or testing. Further APC shall not be liable under the warranty for unauthorized attempts to repair or modify wrong or inadequate electrical voltage or connection, inappropriate on-site operation conditions, corrosive atmosphere, repair, installation, start-up by non-APC designated personnel, a change in location or operating use, exposure to the elements, Acts of God, fire, theft, or installation contrary to APC recommendations or specifications or in any event if the APC serial number has been altered, defaced, or removed, or any other cause beyond the range of the intended use.

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**NO SALESMAN, EMPLOYEE OR AGENT OF APC IS AUTHORIZED TO ADD TO OR VARY THE TERMS OF THIS WARRANTY. WARRANTY TERMS MAY BE MODIFIED, IF AT ALL, ONLY IN WRITING SIGNED BY AN APC OFFICER AND LEGAL DEPARTMENT.**

### **Warranty Claims**

Customers with warranty claims issues may access the APC worldwide customer support network by referring to the APC Web site, [www.apc.com](http://www.apc.com) . Select your country from the country selection pull-down menu. Open the Support tab at the top of the web page to obtain contact information for customer support in your region.

<sup>1</sup> To determine which factory warranty applies to the APC product you purchased, consult the factory warranties located on the APC Web site, [www.apc.com/products](http://www.apc.com/products).



