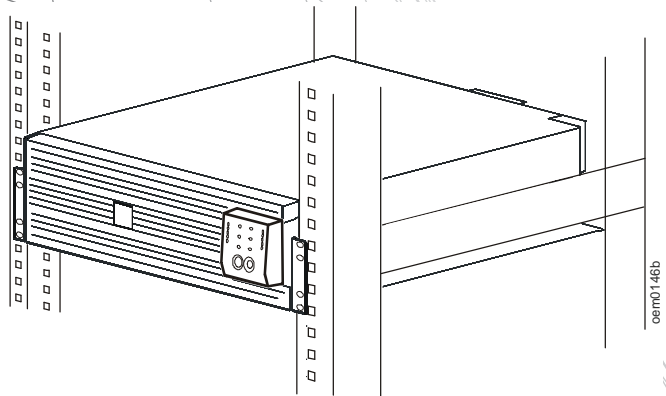**APC**

by Schneider Electric

Installation and Operation

Smart-UPS® On Line Uninterruptible Power Supply

SURT5KSR3UXIX438

Overview

About the Product

The APC® by Schneider Electric Smart-UPS® SURT5KSR3UXIX438 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.

Safety and General information

Read the safety guide included in the package before installing the UPS.

Inspect the UPS upon receipt. Notify the carrier and dealer if there is damage.

Wiring must be performed by a qualified electrician. Adhere to all national and local electrical codes.
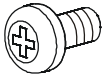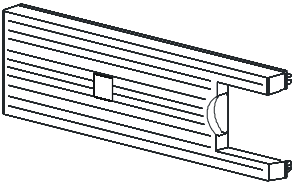
Recycle the packaging.
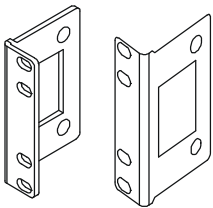
Accessories

Refer to the APC Web site **www.apc.com,** for available accessories.

- External battery pack frame SURT192SR2XLBF
- Replacement battery cartridge APCRBC134

Inventory

Product documentation, Safety Guide, carton containing the Rail Kit

Hardware

| Ornamental screws (4)		Flat head screws (4)	
Bezel (1)		Rack-Mount brackets (1 pair)	

Specifications

Operating Conditions

This unit is intended for indoor use only. Select a location sturdy enough to support the weight of the UPS and external battery pack (XLBP).

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

This unit has front and rear air vents. Allow adequate space for proper ventilation.

Environmental Specifications

Environmental factors impact battery life. Elevated ambient temperatures, poor quality utility power, and frequent, short duration discharges will shorten battery life.
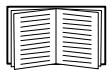
For additional specifications, refer to the APC Web site at www.apc.com.

|		
Temperature	**Operating**	0° to 40° C (32° to 104° F)
	Storage	-15° to 45° C (5° to 113° F) charge UPS battery every six months
Maximum Elevation	**Operating**	3,000 m (10,000 ft)
	Storage	15,000 m (50,000 ft)
Humidity	0% to 95% relative humidity, non-condensing	

Radio Frequency Warning

This product has been tested and found to comply with the limits for Class A digital device pursuant to Part 15 of the FCC rules. The limits for Class A equipment were derived for commercial and industrial environments to provide a reasonable protection against interference with licensed communication equipment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance in a residential area is likely to causes harmful interference.The user is repolishing for correcting the interference.

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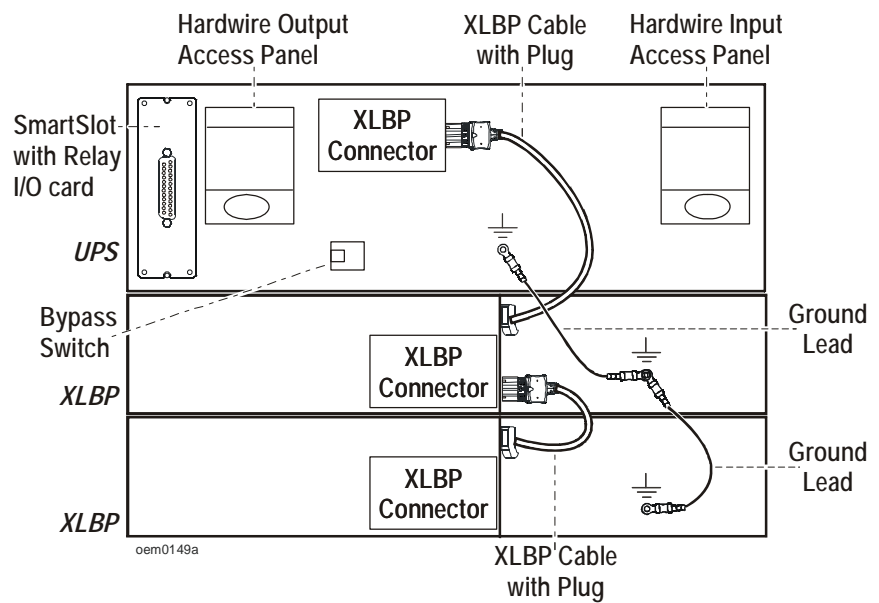
Product Overview

NOTE: The model and serial numbers are located on a front panel label.

UPS Front Panel
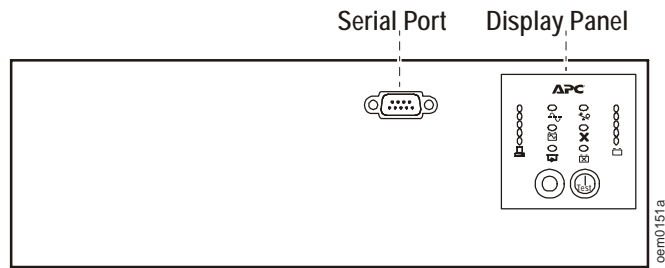
UPS rear panel shown connected to two XLBPs

Installation

Install Rails in Rack

Rail installation instructions are included in the rail kit.

Install Rack-Mount Brackets on UPS

Use two flat head screws (supplied), to secure each bracket to the UPS.
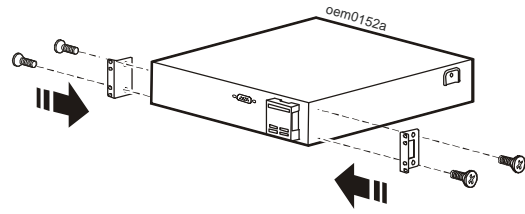
Install UPS in Rack

⚠️ **The UPS and XLBP(s) should be installed at or near the bottom of the rack.**

Always place the UPS above the XLBP(s) in the rack.

Use two ornamental screws (supplied), to secure each bracket on the UPS to the rack.
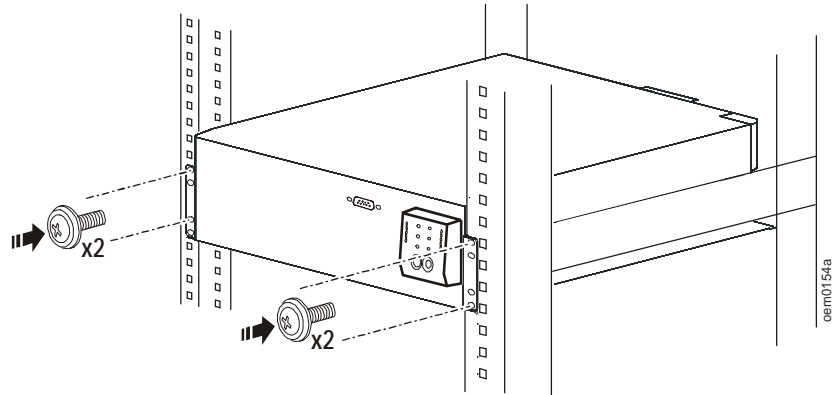
🛈 For XLBP rack-mount installation instructions refer to the XLBP, and replacement battery cartridge (RBC) documentation.

Install the Bezel on the UPS

Secure the bezel to the front of the UPS.

Hardwire the UPS
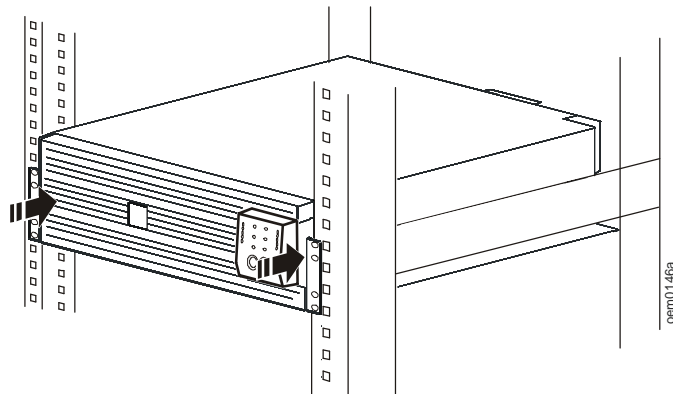
Hardwiring must be performed by a qualified electrician. Adhere to all national and local electrical codes.

Install a high magnetic 30/32 Amp utility circuit breaker.

Use #8 AWG gauge (8 mm^2) wire.

Input Access panel

1. Switch the utility circuit breaker off.
2. Remove the screw that secures the input access panel.
3. Slide the access panel up to remove it from the chassis.
4. Insert #8 AWG gauge (8 mm^2) wire through the hole in the access panel.
5. Connect the wires to the terminal block.
6. Install an appropriate strain relief (not supplied).
7. Switch the utility circuit breaker on.
8. Check the line voltages.
9. Reinstall the access panel on the chassis.
10. Secure the access panel to the chassis using the screw removed previously.
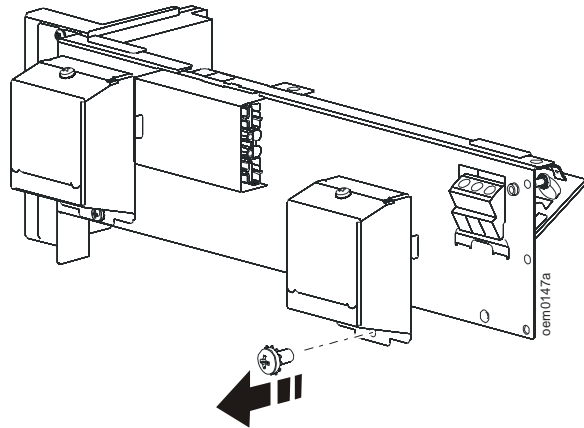
Output Access panel

1. Switch the utility circuit breaker off.
2. Remove the screw that secures the input access panel.
3. Slide the access panel up to remove it from the chassis.
4. Insert #8 AWG gauge (8 mm^2) wire through the hole in the access panel.
5. Connect the wires to the terminal block.
6. Install an appropriate strain relief (not supplied).
7. Switch the utility circuit breaker on.
8. Check the line voltages.
9. Reinstall the access panel on the chassis.
10. Secure the access panel to the chassis using the screw removed previously.
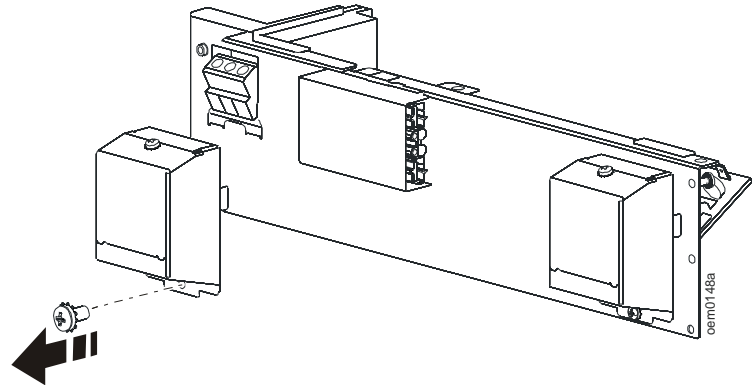
Connect the XLBPs

Refer to the XLBP user manual for instructions on how to connect the XLBP batteries.

The UPS will not operate until at least one XLBP is connected to the XLBP connector on the UPS.

Operation

The UPS will charge one connected XLBP to 90% capacity in the first three hours of operation on utility power. Each additional XLBP will cause the charge time to increase. Do not expect full battery runtime capability during this initial charge period.
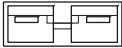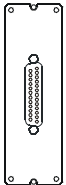
Front Panel Features

(⏻ Test)	The TEST button has three functions: • Press this button to turn on the UPS. • Press this button to initiate a **Self-Test**. **Automatic:** The UPS performs a self-test automatically when turned on, and every two weeks there after by default. During the self-test, the UPS briefly operates on battery power. **Manual:** Press and hold the TEST button for a few seconds to initiate a self-test. • Press and hold this button to initiate a **Cold Start**. **Cold Start** is not a normal condition. When there is no utility power and the UPS is off, press and hold this button to restore power to the UPS. The UPS will emit two beeps. During the second beep, release the button.
◯	The POWER OFF button is used to turn off the UPS.
⌁	**On Line:** The LED illuminates when the UPS draws utility power and performs double conversion to supply power to connected equipment.
⊡	**On Battery:** The UPS supplies battery power to connected equipment.
⎍	**Bypass:** The LED illuminates indicating that UPS is in bypass mode. Utility power is sent directly to connected equipment during bypass mode operation. Bypass mode operation is the result of an internal UPS fault or an overload condition. Refer to "Troubleshooting" on page 10 in this manual. **Battery operation is not available while UPS is in bypass mode.**
✕	**Fault:** The LED illuminates when the UPS detects an internal fault. Refer to "Troubleshooting" on page 10 in this manual.
⚖	**Overload:** The LED illuminates when an overload condition exists. Refer to "Troubleshooting" on page 10 in this manual.
⊠	**Replace Battery:** The LED illuminates when the UPS battery is disconnected or is fully discharged and must be replaced. Refer to "Troubleshooting" on page 10 in this manual.
⬤⬤⬤	**Serial Port:** Use the serial port to connect the UPS and a computer to use power management software. **Use only interface cables supplied or approved by APC. Any other serial interface cable will be incompatible with the UPS connector.**

Diagnostic Utility Feature

200V **208V** ○236 ○245 ○217 ○226 ○199 ○207 ○180 ○189 ○161 ○170 **220V** **230V** **240V** ○256 ○266 ○276 ○238 ○248 ○258 ○219 ○229 ○239 ○200 ○210 ○220 ○181 ○192 ○202	The UPS has a diagnostic feature that indicates utility voltage. The UPS starts a **Self-Test** as part of this procedure. The **Self-Test** does not affect the voltage display. Press and hold the TEST button to view the utility voltage bar graph LED. The **On Line** LED will flash to indicate that a **Self-Test** is in progress. The five LED **Battery Charge** LED to the right side of the display panel will show the utility input voltage. Refer to the diagram in this table for voltage levels. Values are not listed on the UPS. The LED on the UPS shows the voltage is between the displayed value on the list and the next higher value. Refer to "Troubleshooting" on page 10 in this manual.

Rear Panel Features

⏚	**Ground bond:** Connect the ground cable from the XLBP to the UPS chassis ground, located on the rear panel of the UPS.
	External Battery Connector: This UPS supports up to 10 external battery packs. Refer to the Replacement Battery Cartridge installation guide for installation instructions.
▭ ↔ ⬚	**Bypass Switch:** The BYPASS switch enables the user to manually put connected equipment into **Bypass mode**.
	SmartSlot with Relay I/O card installed

Configuration

UPS Settings

Settings are adjusted through PowerChute software, optional SmartSlot accessory cards, or terminal mode.

Function	Factory Default	User Selectable Choices	Description
Automatic Self-Test	On start-up and every 14 days (336 hr) there after	• Every 7 days (168 hr) • On start-up and every 14 days (336 hr) there after • On start-up only • No self-test	Set the interval at which the UPS will execute a self-test.
UPS ID	UPS_IDEN	Up to 8 characters (alphanumeric)	Uniquely identify UPS, (i.e. server name or location) for network management purposes.
Date of last battery replacement	Manufacture date	mm/dd/yy	Reset date when you replace the battery module.

Function	Factory Default	User Selectable Choices	Description
Minimum capacity before return from shutdown	0%	0%, 15%, 25%, 35%, 50%, 60%, 75%, 90%	Specify percentage to which batteries will be charged following a low battery shutdown before powering connected equipment.
Alarm delay after line failure	5 second delay	• 5 or 30 second delay • At low battery • Never	•Mute ongoing alarms. •Disable all alarms permanently.
Shutdown delay	900 seconds (15 min)	0, 20, 60, 120, 240, 480, 720, 960 seconds	Set interval between time when UPS receives a shutdown command and actual shutdown.
Low battery warning PowerChute software interface provides automatic, unattended shutdown when approximately two minutes of battery operated run time remains.	2 minutes	2, 5, 7, 10, 12, 15, 18, 20 minutes	The low-battery warning beeps are continuous when two minutes of run time remain. Change low battery warning interval setting to the time that the operating system or system software requires to safely shut down.
Synchronize turn-on delay	0 seconds	0, 20, 60, 120, 240, 480, 720, 960 seconds	Specify time UPS will wait after the return of utility power before start up, to avoid branch circuit overload.
High bypass point	+10% of output voltage	+5%, +10%, +15%, +20%	Maximum voltage that UPS will pass to connected equipment during internal bypass operation.
Low bypass point	-30%	-15%, -20%, -25%, -30%	Minimum voltage that the UPS will pass to connected equipment during internal bypass operation.
Output voltage			Allows the user to select output voltage while operating on-line.
220 V models	220 Vac	200, 208, 220, 230, 240 Vac	
230 V models	230 Vac	200, 208, 220, 230, 240 Vac	
Output frequency	Automatic 50 ± 3 Hz 60 ± 3 Hz	Automatic 50 ± 3 Hz, 50 ± 0.1 Hz, 60 ± 3 Hz, 60 ± 0.1 Hz	Sets allowable UPS output frequency. Whenever possible, output frequency tracks input frequency.
Number of XLBPs	1	Number of connected XLBPs	

Number of XLBPs	Setting
1	1
2	1
3	2
4	2
5	3
6	3
7	4
8	4
9	5
10	5

Terminal Mode Configuration

Configure the UPS or Network Management Cards using terminal mode

If relay input/output card AP9610 is installed in the UPS SmartSlot, remove it prior to performing terminal mode configuration. Replace the relay card after UPS configuration is complete.

Use the serial port on the UPS to access the terminal modes of the UPS or the Network Management Card (NMC). Use the UPS terminal mode to check the status of the UPS and to configure the unit. Use the NMC terminal mode to configure the network functions of the NMC.

Configure the UPS

1. Connect the serial cable supplied with the unit to the serial port on the back of the UPS.
2. Open a terminal program, such as HyperTerminal®.
3. In the blank terminal window, press ENTER to display the menu.
4. Configure the UPS to use these settings:
   - bits per second - 2400
   - date - 8 bits
   - parity - none
   - stop bit - 1
   - flow control - none

Configure the Network Management Cards

1. Connect the serial cable supplied with the unit to the serial port on the front of the UPS.
2. Open a terminal program, such as HyperTerminal®.
3. In the blank terminal window, press ENTER twice to display the menu.
4. When promoted for a password and user name, type "DSFµ for both.
5. Configure the UPS to use these settings:
   - bits per second - 2400
   - date - 8 bits
   - parity - none
   - stop bit - 1
   - flow control - none

Troubleshooting

Refer to "Front Panel Features" on page 6 and "Rear Panel Features" on page 7 for the locations and graphical representations of the buttons and LEDs referred to in this table.

Problem and Possible Cause	Solution
The Fault LED is illuminated, the UPS displays a fault message and emits a constant beeping tone	
An internal UPS fault has occurred.	Do not attempt to use the UPS. Switch off the utility service breaker. Disconnect the XLBPs from the UPS. Have the UPS serviced immediately.
The UPS will not turn on or there is no output	
The unit has not been turned on.	Press the TEST button once to turn on the UPS.
The battery connector is not securely connected to the UPS.	Be sure that all battery connections are secure.
The UPS is not connected to utility power.	Be sure the power cable is securely connected to the unit and to the utility power supply.
The **Fault** LED illuminates to indicate there is an internal UPS fault.	Do not attempt to use the UPS. Switch off the utility service breaker. Disconnect the XLBPs from the UPS. Have the UPS serviced immediately.
The utility circuit breaker has tripped.	To reduce the load on the UPS disconnect nonessential equipment and reset the circuit breaker
The unit shows very low or no input utility voltage.	Have a qualified electrician check the utility voltage and confirm the UPS is correctly hardwired.
The UPS is operating on battery, while connected to input utility power	
The utility circuit breaker has tripped.	Reduce the branch load if necessary and reset the utility circuit breaker.
There is very high, very low, or distorted input line voltage.	Have a qualified electrician check the utility voltage and confirm the UPS is correctly hardwired. Test the input voltage with the utility voltage display. If acceptable to the connected equipment, reduce the UPS sensitivity.
UPS is emitting an audible beep	
This is normal when the UPS operates on battery power.	Verify that the **On Battery** LED is illuminated. 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 and wear out 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 illuminated.
The UPS is experiencing an overload condition.	Check the UPS load display. Disconnect nonessential equipment.

Problem and Possible Cause	Solution

Display interface LEDs flash sequentially

The UPS has been shut down remotely through software or an optional accessory card.	The UPS will restart automatically when utility power returns.

No LEDs are illuminated and the UPS is properly hardwired

The UPS has shut down and the battery has discharged from an extended outage.	The UPS will return to normal operation when the power is restored and the battery has a sufficient charge.

Bypass and overload LEDs are illuminated and the UPS emits a constant alarm tone

The UPS is experiencing an overload condition.	The connected equipment exceeds the specified "maximum load" as defined in Specifications on the APC Web site. The alarm remains on until the overload condition is corrected. To reduce the load on the UPS disconnect nonessential equipment.

The Bypass LED is illuminated

The **Bypass** switch has been turned on manually or through an accessory.	If **Bypass** is the chosen mode of operation, ignore the illuminated LED. If **Bypass** is not the chosen mode of operation, move the **Bypass** switch located on the rear panel of the UPS to the NORMAL position.

The Replace Battery LED is illuminated

The battery has reached the end of its life.	Replace the battery.
At the time of installation the battery is not fully charged.	Allow the battery to recharge for at least four hours, then, run a self-test. If the problem persists after recharging, replace the battery.
The replacement battery is not properly connected.	Be sure the battery is securely connected.

OnLine LED

The **OnLine** LED is not illuminated and the on battery is illuminated amber.	The UPS is operating on battery.
The **OnLine** LED is blinking and the amber on battery LED is illuminated.	The UPS is running an internal self-test.

APC Worldwide Customer Support

Customer support for this or any other APC product is available at no charge in any of the following ways:

- Visit the APC Web site to find answers to frequently asked questions (FAQs), to access documents in the APC Knowledge Base, and to submit customer support requests.
  - **www.apc.com** (Corporate Headquarters)
    Connect to localized APC Web sites for specific countries, each of which provides customer support information.
  - **www.apc.com/support/**
    Global support with FAQs, knowledge base, and e-support.
- Contact an APC Customer Support center by telephone or e-mail.
  - Regional centers:
  - Local, country-specific centers: go to **www.apc.com/support/contact** for contact information.

Contact the APC representative or other distributor from whom you purchased your APC product for information on how to obtain local customer support.

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 model and serial numbers are located on the rear panel of the unit and are 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 properly to avoid damage in transit. Never use foam beads for packaging. Damage sustained in transit is not covered under warranty.
   a. **Always DISCONNECT THE UPS BATTERY before shipping in compliance with U.S. Department of Transportation (DOT) and IATA regulations.** The battery may remain in the unit.
   b. 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.

Transport the unit

1. Shut down and disconnect all connected equipment.
2. Disconnect the unit from utility power.
3. Disconnect all internal and external batteries (if applicable).
4. Follow the shipping instructions outlined in the *Service* section of this manual.

Two-Year Factory Warranty

This warranty applies only to the products you purchase for your use in accordance with this manual.

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. APC will repair or replace defective products covered by this warranty. 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 extends only to the original purchaser who must have properly registered the product. The product may be registered at the APC Web site, **www.apc.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's or any third person's 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, 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 customer support network through the Support page of the APC Web site, **www.apc.com/support**. Select your country from the country selection pull-down menu at the top of the Web page. Select the Support tab to obtain contact information for customer support in your region.