

Installation and Operation

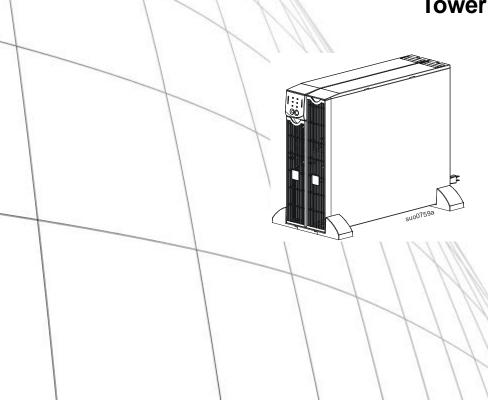
Smart-UPS™ **Uninterruptiple Power Supply**

SR13KXIET

SR16KXIET

220/230/240 Vac

Tower



INTRODUCTION

The Schneider Electric Smart-UPS $^{\text{TM}}$ RT is a high performance, uninterruptible power supply (UPS) that provides protection for electronic equipment from utility power blackouts, brownouts, sags and surges. The UPS filters small utility line fluctuations and isolates electronic equipment from large disturbances by internally disconnecting from utility line power. The UPS provides continuous power from the internal battery until utility power returns to safe levels or the battery is fully discharged.

IMPORTANT SAFETY INFORMATION

Read the instructions carefully to become familiar with the equipment before trying to install, operate, service or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Caution product safety label indicates that a hazard exists that can result in injury and product damage if the instructions are not followed.



CAUTION indicates a potentially hazardous situation which, if not avoided, can result in equipment damage and minor or moderate injury.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, can result in equipment damage or personal injury.

Read, understand, and follow ALL safety instructions in this manual. Failure to follow safety instructions and cautions could result in personal injury or equipment damage.

Changes and modifications to the UPS not expressly approved by APC could void the warranty.

- Adhere to all national and local electrical codes.
- All wiring must be performed by a qualified electrician.
- This UPS is intended for indoor use only.
- Be sure the air vents on the UPS are not blocked. Allow adequate space for proper ventilation.
- The battery typically lasts for two to five years. Environmental factors impact battery life. Elevated ambient temperatures, poor quality utility power, and frequent short duration discharges will shorten battery life.
- The batteries are heavy. Remove the batteries prior to installing the UPS in a rack.
- The model and serial numbers are located on a small, rear panel label. For some models, an additional label is located on the chassis under the front bezel.
- Always recycle used batteries.
- Recycle the package materials or save them for reuse.

Deenergizing

The UPS contains internal batteries and may present a shock hazard even when disconnected from the branch circuit (mains). Before installing or servicing the equipment, check that the system enable switch is set to stand by (off), the internal batteries are removed, the external extended run batteries are disconnected and the branch circuit (main) is disconnected.

ACAUTION

DAMAGE TO EQUIPMENT OR PERSONNEL

- Adhere to all national and local electrical codes.
- Wiring must be performed by a qualified electrician.
- Before installing or replacing the batteries, remove jewelry such as wristwatches and rings. High short circuit current through conductive materials could cause severe burns.

Failure to follow these instructions can result in equipment damage and minor or moderate injury

Electrical Safety

- The protective earth conductor for the UPS carries the leakage current from the load devices. An insulated ground conductor is to be installed as part of the branch circuit that supplies the UPS. The conductor must have the same size and insulation material as the grounded and ungrounded branch circuit supply conductors. The conductor will be green and with or without a yellow stripe.
- The grounding conductor is to be grounded to earth at the service equipment, or if supplied by a separately derived system, at the supply transformer or motor generator set.

Battery Safety

- Do not dispose of batteries in a fire. The batteries may explode.
- Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes, and may be toxic

Hardwire Safety

- Verify that all branch circuit (mains) and low voltage (control) circuits are deenergized, and locked out before installing cables or making connections, whether in the junction box or to the UPS.
- Strain relief is required for all hardwiring.
- All openings allowing access to UPS hardwiring terminals must be covered. Failure to do so may result in personal injury or equipment damage.
- Select wire size and connectors according to national and local codes.
- Ensure that the total load DOES NOT EXCEED the branch circuit breaker.
- Use flexible metal conduit to make maintenance and service easier.

SPECIFICATIONS

TEMPERATURE OPERATING STORAGE	32° to 104° F (0° to 40° C) 5° to 113° F (-15° to 45° C) charge the UPS battery every six months	
MAXIMUM ELEVATION OPERATING STORAGE	10,000 ft (3,000 m) 50,000 ft (15,240 m)	
HUMIDITY	0 to 95% relative humidity	
WEIGHT UPS UPS WITH PACKAGING	120 lbs (55 kg) 140 lbs (64 kg)	

INVENTORY

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

Check the package contents:

- UPS (with battery modules disconnected)
- Front bezel

- Literature kit containing:
 - Product documentation,
 Warranty registration card
 - Documentation CD
 - Serial communication cable

INSTALLATION



DAMAGE TO EQUIPMENT OR PERSONNEL

- The equipment is heavy. Always practice safe lifting techniques adequate for the weight of the equipment.
- Remove the batteries before installing the UPS in a rack.

Failure to follow these instructions can result in equipment damage and minor or moderate injury



DAMAGE TO EQUIPMENT OR PERSONNEL

- Adhere to all local and national electrical codes.
- Wiring must be performed by a qualified electrician.
- Install a high magnetic utility circuit breaker with appropriate rating for the product.

Failure to follow these instructions can result in equipment damage and minor or moderate injury

Hardwire Instructions

Install a high magnetic utility circuit breaker.

SR13KXIET model:

Install a 16 Amp circuit breaker.

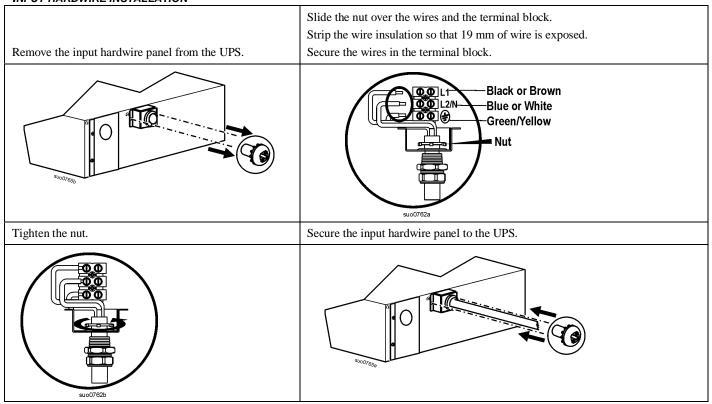
Use 2mm^{^2} wire (#14 AWG gauge).

SR16KXIET model:

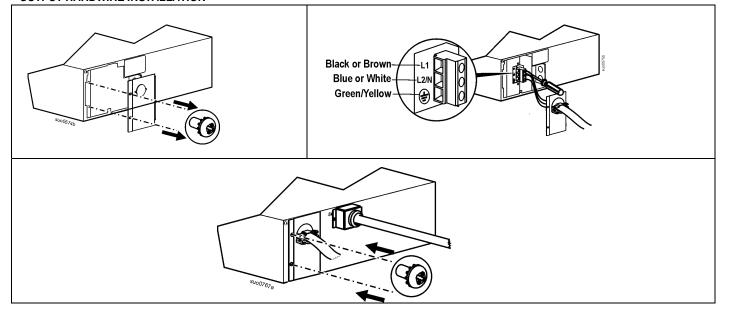
Install a 32 Amp circuit breaker.

Use 5mm² wire (#10 AWG gauge).

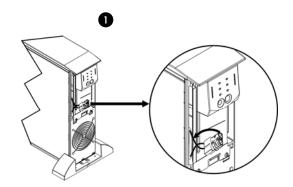
INPUT HARDWIRE INSTALLATION

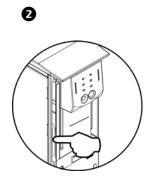


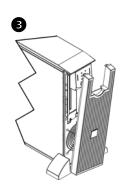
OUTPUT HARDWIRE INSTALLATION

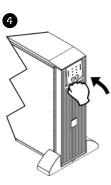


Connect the Battery Modules and Attach the Front Bezel









Basic Connectors

⊚(::::)⊚ serial com	Power management software and interface kits can be used with the UPS. Use only interface kits supplied or approved by APC by Schneider Electric. Any other serial interface cable will be incompatible with the UPS connector.
☐ ← □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	Manual bypass enables the user to manually put connected equipment into bypass mode.
normal bypass	
	Emergency Power Off terminal allows the user to connect the UPS to the central EPO system.
EPO terminal	
\oplus	The UPS features a ground screw for connecting the ground lead on surge suppression devices such as telephone and network line protectors.
ground screw	When connecting ground cable, disconnect the UPS from the utility power outlet.
external battery	Optional external battery packs provide extended runtime during power outages. The UPS can support up to ten external battery packs. See the APC by Schneider Electric Web site, www.apc.com for the information on the
pack connector	external battery pack, SURT192XLBP.

Connect Equipment and Power to the UPS

- 1. Connect equipment to the UPS.
- 2. To use the UPS as a master ON/OFF switch, be sure all connected equipment is switched ON. The equipment will not turn on until the UPS is turned on.
- 3. To turn on the UPS press the button on the front panel.
 - The UPS battery charges 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 time capability during this initial charge period.

Options

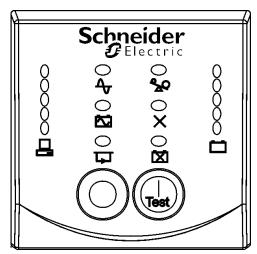
Refer to the APC by Schneider Electric Web site, www.apc.com for available accessories.

For additional computer system security, install PowerChuteTM Business Edition Smart-UPS monitoring software.

OPERATION

Load
085%
068%
051%
034%
017%





Dattery Charge
096%
072%
048%
024%
0<24%

Indicator	Description
Online	The Online LED illuminates when the UPS is drawing utility power and performing double conversion to supply power to connected equipment.
On Battery	The UPS is supplying battery power to the connected equipment.
Bypass	The Bypass LED illuminates indicating that the 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, an overload condition or a user initiated command either through an accessory or the manual bypass switch. Battery operation is not available while the UPS is in bypass mode. Refer to <i>Troubleshooting</i> in this manual.
Fault X	The UPS detects an internal fault. Refer to <i>Troubleshooting</i> in this manual.
Overload Q Q	An overload condition exists. See <i>Troubleshooting</i> .
Replace Battery	The battery is disconnected or must be replaced. See <i>Troubleshooting</i> .

Feature	Function
Power On	Press this button to turn on the UPS. See below for additional capabilities.
Power Off	Press this button to turn off the UPS.

Feature	Function
Cold Start	When there is no utility power and the UPS is off, press and hold the connected equipment. The UPS will emit two beeps. During the second beep, release the button.
Self-Test	Automatic: 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. Manual: Press and hold the button for a few seconds to initiate the self-test.

Diagnostic Utility	y Voltage	The UPS has a diagnostic feature that displays the utility voltage. Plug the UPS into the normal utility power.
0 256 0 2 0 238 0 2 0 219 0 2 0 200 0 2	230V 240V 266 0 276 248 0 258 229 0 239 210 0 220 192 0 202	The UPS starts a self-test as part of this procedure. The self-test does not affect the voltage display. 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. Refer to the figure at left for the voltage reading. Values are not displayed on the UPS. The display indicates the voltage is between the displayed value on the list and the next higher value.

On Battery Operation

The 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 to silence this alarm. If the utility power does not return, the UPS continues to supply power to the connected equipment until the battery is fully discharged.

When 2 minutes of run time remain the UPS emits a continuous beeping. If PowerChute is not being used, files must be manually saved and the computer must be turned off before the UPS fully discharges the battery.

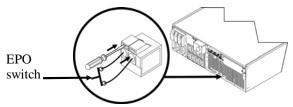
The UPS battery life differs based on usage and environment. Refer to the APC by Schneider Electric Web site, www.apc.com for on battery runtimes.

USER CONFIGURABLE ITEMS

Note	E: SETTINGS ARE MADE	THROUGH SUPPLIED POWEF ACCESSORY CARDS OR	CHUTE SOFTWARE OPTIONAL SMART SLOT TERMINAL MODE.
Function	Factory Default	USER SELECTABLE CHOICES	DESCRIPTION
Automatic Self-Test	Every 14 days (336 hours)	Every 7 days(168 hours), 14 days (336 hours) On Startup Only, No Self-Test	Set the interval at which the UPS will execute a self-test.
UPS ID	UPS_IDEN	Up to eight characters to define the UPS	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 modules.
Minimum Capacity Before Return from Shutdown	0 percent	0, 15, 25, 35, 50, 60, 75, 90 percent	Following a low battery shutdown, the battery modules will be charged to the specified percentage before powering connected equipment.
Alarm Delay After Line Failure	5 second delay	5 or 30 second delay At Low Battery Never	Mute ongoing alarms or disable all alarms permanently.
Shutdown Delay	20 seconds	0, 20, 60, 120, 240, 480, 720, 960 seconds	Set the interval between the time when the UPS receives a shutdown command and the actual shutdown.
Duration of Low Battery Warning.	2 minutes PowerChute software provides automatic, unattended shutdown when approximately 2 minutes of battery operated runtime remains.	2, 5, 7, 10, 12, 15, 18, 20 minutes	The low battery warning beeps are continuous when two minutes of run time remain. Change the warning interval default to a higher setting if the operating system requires a longer interval for shutdown.
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 Bypass Point	+10% of output voltage setting	+5%, +10%, +15%, +20%	Maximum voltage that the UPS will pass to connected equipment during internal bypass operation.
Low Bypass Point	-30% of output voltage setting	-15%, -20%, -25%, -30%	Minimum voltage that the UPS will send to connected equipart during internal bypass operation.
Output Voltage	230 Vac	220, 230, 240 Vac	Allows the user to select the UPS output voltage while online.
Output Frequency	Automatic 50 ± 3 Hz or 60 ± 3 Hz	50 ± 3 Hz 50 ± 0.1 Hz 60 ± 3 Hz 60 ± 0.1 Hz	Sets the allowable UPS output frequency. Whenever possible, the output frequency tracks the input frequency.
Number of Battery Packs	1	Number of Connected Internal Battery Packs, (two modules per pack)	Defines the number of internal and external connected battery packs for proper run time prediction.

CONNECT THE EMERGENCY POWER OFF OPTION

The output power can be disabled in an emergency by closing a switch connected to the emergency power off (EPO) button.



The EPO switch is internally powered by the UPS for use with non-powered switch circuit breakers.

The EPO circuit is considered a Class 2 circuit, (UL, CSA standards) and a SELV circuit (IEC standard).

Both Class 2 and SELV circuits must be isolated from all primary circuitry. Do not connect any circuit to the EPO terminal block unless it can be confirmed that the circuit is Class 2 or SELV.

If circuit standard cannot be confirmed, use a contact closure switch.

Use one of the following cable types to connect the UPS to the EPO switch:

- CL2: Class 2 cable for general use
- CL2P: Plenum cable for use in ducts, plenums, and other spaces used for environmental air.
- CL2R: Riser cable for use in a vertical run in a floor to floor shaft.
- CLEX: Limited use cable for use in dwellings and for use in raceways.

Terminal Mode to Configure UPS Parameters

Terminal Mode is a menu driven interface that enables enhanced configuration of the UPS.

Connect the serial cable (supplied), to the serial com connector on the back of the UPS.

If PowerChute Business Edition is not installed do not perform step 1. Go directly to step 2 in these instructions.

- 1. **EXIT** the PowerChute *Business Edition* using the following steps:
 - From the Desktop, go to Start => Settings => Control Panel => Administrative Tools => Services.
 - Select PCBE Server and PCBE Agent right click the mouse and select Stop.
- 2. Open a terminal program. Example: HyperTerminal
 - From the Desktop, go to Start => Programs => Accessories => Communication => HyperTerminal.
- 3. Double-click on the **HyperTerminal** icon.
 - Follow the prompts to choose a name and select an icon. Disregard the message, "...must install a modem," if it is displayed. Click OK.
 - Select the **COM** port that is connected to your UPS. The port settings are:
 - ✓ bits per second 2400
 - ✓ data bits 8
 - √ parity none
 - ✓ stop bit 1
 - ✓ flow control none
 - Press ENTER
- 4. Example for setting the number of external battery packs (SURT192XLBP):

Once the blank terminal window is open, follow these steps to enter the number of battery packs:

- Press ENTER to initiate terminal mode. Follow the prompts:
 - Press 1 to modify UPS Settings. Press e (or E) to modify the number of battery packs. Enter the number of battery packs, including the internal battery pack (Number of packs: 1= internal battery module, 2 = 1 SURT192XLBP,
 - 3 = 2 SURT192XLBP, etc.
 - Press ENTER.
 - Follow the prompts.
- 5. Exit the terminal program.

MAINTENANCE

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 during the procedure.

CAUTION

DAMAGE TO EQUIPMENT

- Once the batteries are disconnected, the devices connected to the UPS are no longer protected from power surges and outages.
- Replace internal and external battery modules with APC approved replacement battery modules. Go to the APC by Schneider Electric Web site, www.apc.com for information on replacement battery modules for your UPS and external battery packs.

Failure to follow these instructions can result in equipment damage



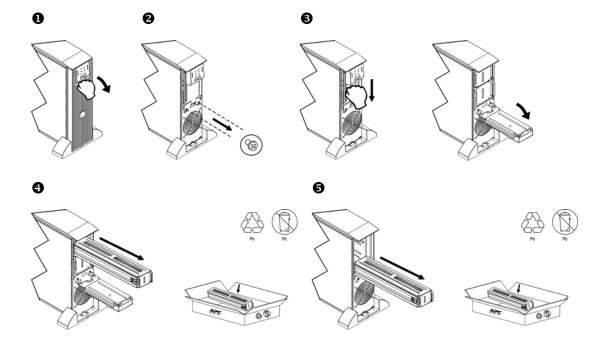
Be sure to deliver used batteries to a recycling facility or ship to the manufacturer in the replacement battery packing material.

Remove Battery Modules

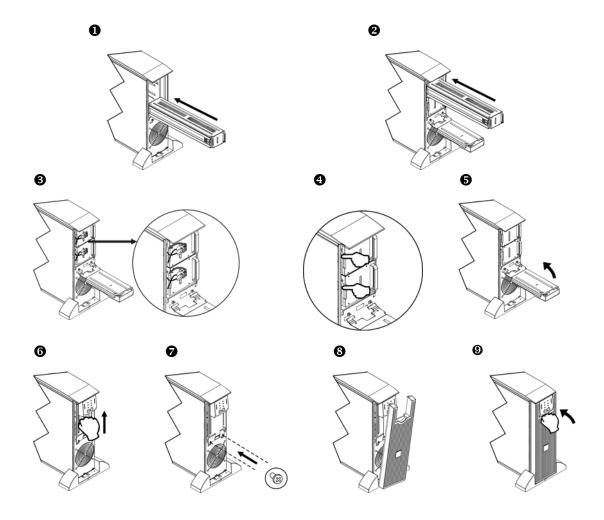
Shut down and disconnect any equipment attached to the UPS.

Shut down and disconnect the UPS from utility power.

Disconnect the batteries from the UPS.



Replace Battery Modules



TROUBLESHOOTING

Use the table below to solve minor installation and operation problems. Refer to the APC by Schneider Electric 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.	Check that the battery connectors are fully engaged.	
button not pushed.	Press the button once to power the UPS and the connected equipment.	
UPS not connected to utility power supply.	Check that the power cable from the UPS to the utility power supply is securely connected at both ends.	
Very low or no utility voltage.	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		
button not pushed.	Press the button once to turn the UPS 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 when running on battery.	None. The UPS is protecting the connected equipment.	
UPS DOES NOT PROVIDE EXPEC	TED BACKUP TIME	
The UPS battery(s) are weak due to a recent outage or battery(s) are near the end of their service life.	Charge the battery(s). Battery modules require recharging after extended outages. They wear faster when put into service often or when operated at elevated temperatures. If the battery(s) are near the end of their service life, consider replacing the battery(s) even if the <i>Replace Battery</i> LED is not illuminated.	
FRONT PANEL LED S FLASH SEQ	UENTIALLY	
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 LED S ARE OFF AND THE UF	PS 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.	
BYPASS AND OVERLOAD LED S I	LLUMINATE, UPS EMITS A SUSTAINED ALARM TONE	
The UPS is overloaded	The connected equipment exceeds the specified "maximum load" as defined in <i>Specifications</i> on the APC by Schneider Electric Web site, www.apc.com .	
	The alarm remains on until the overload is removed. Disconnect nonessential equipment from the UPS to eliminate the overload condition.	
BYPASS LED ILLUMINATES		
The bypass switch has been	If bypass is the chosen mode of operation, ignore the illuminated LED.	
turned on manually or through an accessory.	If bypass is not the chosen mode of operation move the bypass switch on the back of the UPS, to the <i>normal</i> position.	
FAULT AND OVERLOAD LEDS IL	LUMINATE, UPS EMITS A SUSTAINED ALARM TONE	
The UPS has ceased sending power to connected equipment.	The connected equipment exceeds the specified "maximum load" as defined in <i>Specifications</i> on the APC by Schneider Electric Web site, www.apc.com .	
	Disconnect nonessential equipment from the UPS to eliminate the overload condition.	
	Press the OFF button, then the ON button to restore power to connected equipment.	

PROBLEM AND POSSIBLE CAUSE	SOLUTION
FAULT LED ILLUMINATES	
Internal UPS fault.	Do not attempt to use the UPS. Turn the UPS off and have it serviced immediately.
REPLACE BATTERY LED ILLUMII	NATES
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 <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 extinguishes if the battery passes the self-test.
UPS OPERATES ON BATTERY AL	THOUGH NORMAL LINE VOLTAGE EXISTS
Very high, low, or distorted line voltage. Inexpensive fuel powered generators can distort the voltage.	Move the UPS to a different outlet on a different circuit. Test the input voltage with the utility voltage display.
DIAGNOSTIC UTILITY VOLTAGE	
All five LEDs are illuminated	The line voltage is extremely high and should be checked by an electrician.
There is no LED illumination	If the UPS is plugged into a properly functioning utility power outlet, the line voltage is extremely low.
ONLINE LED	
There is no LED illumination	The UPS is running on battery, or it is not turned on.
The LED is blinking	The UPS is running an internal self-test.

Two Year Limited Factory Warranty

Schneider Electric IT Corporation (SEIT), warrants its products to be free from defects in materials and workmanship for a period of two (2) years from the date of purchase. The SEIT obligation under this warranty is limited to repairing or replacing, at its own sole option, any such defective products. Repair or replacement of a defective product or parts thereof does not extend the original warranty period.

This warranty applies only to the original purchaser who must have properly registered the product within 10 days of purchase. Products may be registered online at warranty.apc.com.

SEIT 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, testing, operation or use of the product contrary to SEIT's recommendations or specifications. Further, SEIT shall not be liable for defects resulting from: 1) unauthorized attempts to repair or modify the product, 2) incorrect or inadequate electrical voltage or connection, 3) inappropriate on site operation conditions, 4) Acts of God, 5) exposure to the elements, or 6) theft. In no event shall SEIT have any liability under this warranty for any product where the serial number has been altered, defaced, or removed.

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NOTHING IN THIS LIMITED WARRANTY SHALL SEEK TO EXCLUDE OR LIMIT SEIT'S LIABILITY FOR DEATH OR PERSONAL INJURY RESULTING FROM ITS NEGLIGENCE OR ITS FRAUDULENT MISREPRESENTATION OF TO THE EXTENT THAT IT CANNOT BE EXCLUDED OR LIMITED BY APPLICABLE LAW.

To obtain service under warranty you must obtain a Returned Material Authorization (RMA) number from customer support. Customers with warranty claims issues may access the SEIT worldwide customer support network through the SEIT Web site: app-support.com. Select your country from the country selection drop down menu. Open the Support tab at the top of the web page to obtain information for customer support in your region. 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.

Schneider Electric Worldwide Customer Support

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

- Visit the APC by Schneider Electric Web site to access documents in the APC Knowledge Base and to submit customer support requests.
 - www.apc.com
 - Connect to localized APC by Schneider Electric web sites for specific countries, each of which provides customer support information.
 - www.apc.com/support
 - Global support searching APC Knowledge Base and using e-support.
- Contact the APC by Schneider Electric Customer Support Center by telephone or e-mail.
 - Local, country specific centers: go to **www.apc.com** for contact information.
 - For information on how to obtain local customer support, contact the APC by Schneider Electric representative or other distributors from whom you purchased your Schneider Electric product.

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 by Schneider Electric Customer Support through the APC by Schneider Electric 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 by Schneider Electric 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 by Schneider Electric Web site for country specific instructions.
- 3. Pack the unit in the original packaging whenever possible 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 BATTERIES before shipping. The United States Department of Transportation (DOT), and the International Air Transport Association (IATA) regulations require that UPS batteries be disconnected before shipping. The internal batteries may remain in the UPS.
 - b. External Battery Pack products are deenergized when disconnected from the associated UPS product. It is not necessary to disconnect the internal batteries for shipping. Not all units utilize an external battery pack.
- 4. Write the RMA# provided by Customer Support on the outside of the package.
- 5. Return the unit by insured, prepaid carrier to the address provided by Customer Support.

Transport

- 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.

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EN 990-5163 05/2013