www.apc.com

User's Manual

English

APC Smart-UPS®

5000VA 5U Rack Mount XL
208VAC/230VAC

Uninterruptible Power Supply

990-1139, 3/02

Introduction

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 disconnecting 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.

1: INSTALLATION

Read the Safety Instruction sheet before installing the UPS.

Unpacking

Inspect the UPS upon receipt. Notify the carrier 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, four battery packs, rail kit, and a literature kit containing cable(s), and product documentation.

The UPS is shipped with the battery disconnected.

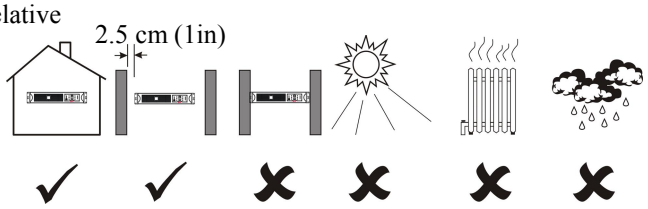
Positioning the UPS

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

0° - 40°C (32°-104°F)
0-95% Relative Humidity

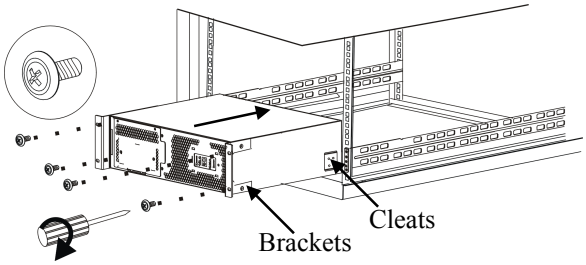


A qualified or licensed electrician must install the UPS.

Mounting the UPS in the Rack

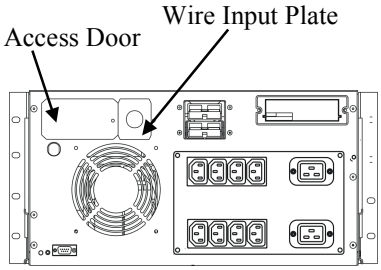
Due to the weight of the UPS, two people are required for mounting.

Battery installation is to follow.



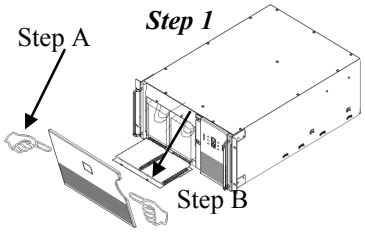
Hardwire the Electrical Connection (230V Models Only)

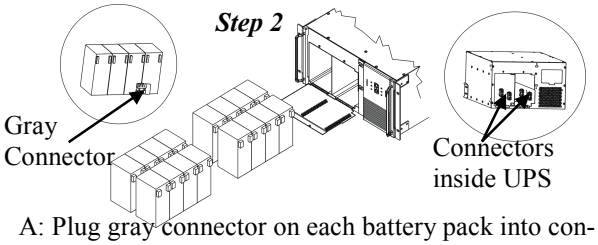
Verify that the supply line contains a 25 Amp circuit breaker BEFORE hardwiring the UPS. Batteries are installed in the UPS upon hardwiring completion. Incorporate an easy access disconnect device in the fixed wiring design.



1. Select the appropriate wire size and connectors. For most applications, #10 AWG (5 sq. mm) wire should be sufficient.
2. Remove screw and access door.
3. Slide the wire input plate to the left and remove.
4. Detach circular knockout and feed the wire cable through this opening. Using a threaded lock nut, fasten the plate to the cable or conduit connectors.
5. Connect the wires to the terminal block inside the UPS. Loosen the screw, then feed the copper wire into the terminal block and tighten the screw. Connect the protective earth ground to the terminal block at the position marked with the ground symbol (⏚). The UPS wiring color code is: GREEN for GROUND
   WHITE for NEUTRAL
   BLACK for HOT
6. Replace the wire input plate.
7. Inspect the connections and location of the excess wires before installing the access door.
8. Replace the access door (removed in step 2).

Installing the Batteries

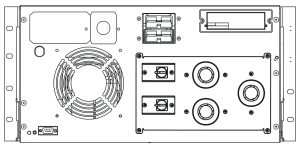




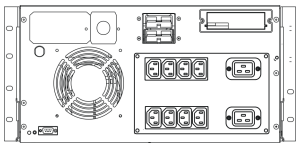
A: Plug gray connector on each battery pack into connectors inside the UPS. B: Tuck the white cord, which serves as a handle for the connector, to the side.

Connecting Equipment and Power to the UPS

SMART-UPS REAR PANEL



208V



230 Volt

1. Connect equipment to the UPS.
2. Add any optional accessories to the Smart-Slot. The UPS is shipped with the APC Network Management card pre-installed. Refer to the documentation in the literature kit and/or CD-ROM provided.
3. *208V Models Only:* Using a power cord, plug the UPS into a two-pole, three-wire, grounded receptacle only.

   Avoid using extension cords and adaptor plugs.
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 three hours of normal operation. ***Do not*** expect full battery run capability during this initial charge period.
6. For additional computer system security, install PowerChutePlus® Smart-UPS monitoring software. It provides automatic shutdown capabilities on most major network operating systems. See APC website, www.apc.com, for other available accessories.

BASIC CONNECTORS

Serial 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.

Battery Connector

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.

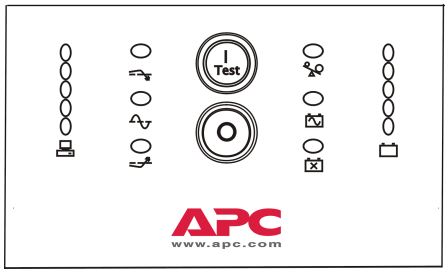
2: OPERATION

INDICATORS AND CONTROLS ON THE SMART-UPS

SMART-UPS FRONT PANEL

Power On

Power Off



Load

85%
67%
50%
33%
17%

Battery Charge

96%
72%
48%
24%
0%

Online

The online LED illuminates when the UPS is supplying utility power to the connected equipment.

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 illuminated the UPS is supplying battery power to the connected equipment.

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.

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

CIRCUIT BREAKERS (208V MODELS ONLY)

Input Circuit Breaker

One 40 Amp input circuit breaker is provided to the right of the rear connector plug and to the left of the battery pack connector.

Output Circuit Breakers

Two output circuit breakers are provided.

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 Test button 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.

Optional External Battery Pack(s)

To connect an optional external battery pack(s), refer to the *3U Rack Mount External Battery Pack User's Manual.*

3: 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 software manual for details.
UPS ID	UPS_IDEN	Up to eight characters to define the UPS	Use this field to uniquely identify the UPS, (ie. 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, 50, 90 percent	The UPS will charge its batteries to the specified percentage.
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 ☼ medium ● low	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 PowerChute software.
Alarm Delay After Line Fail	5 second delay	30 second delay, At Low Battery Condition, No Alarm	Set alarm delay to avoid alarms for minor power glitches.
Shutdown Delay	20 seconds	180, 300, 600 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 shutdown when approximately two minutes (by default) of battery operated run time remains.	☼ 2 min.	*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 seven minutes. ☼ 2 min. ☼ 5 min. ● 7 min.	The low battery warning beeps are continuous when less than 7 minutes of run time remain. To change the warning interval default setting, press the *voltage sensitivity* button while pressing and holding the (Test) button.
Synchronized Turn-on Delay	0 seconds	60, 180, 300 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 *208V models:* 229VAC	*230V models:* 264, 271, 280VAC *208V models:* 234, 239, 224VAC	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:* 196VAC *208V models:* 177VAC	*230V models:* 188, 204, 208VAC *208V models:* 182, 168, 172VAC	Set the low transfer point lower if the utility voltage is chronically low and the connected equipment can tolerate this condition.

4: STORAGE, MAINTENANCE, AND TRANSPORTING

Storage

Store the UPS covered and flat (rack mount orientation) 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.

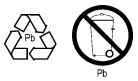
Replacing the Battery Module

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 procedure. 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.

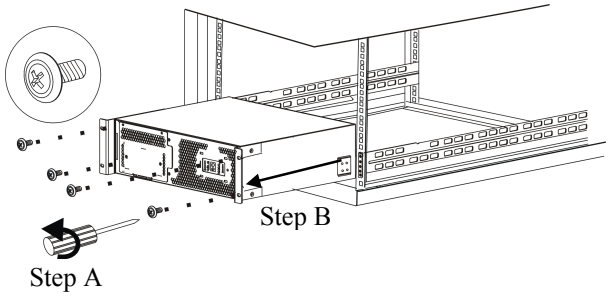
Refer to *Installing the Batteries*, in this manual.

Reverse the instructions for battery removal. **Note: Pull the front battery out of the UPS by pulling the clear label, *not* the white cord.**



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

REMOVING THE UPS FROM THE RACK

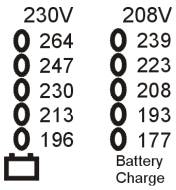


5: TROUBLESHOOTING

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.	Check that the battery connector is 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 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 ILLUMINATED 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.
THE SITE WIRING FAULT LED IS ILLUMINATED	
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.

Problem and Possible Cause	Solution
The overload LED is illuminated 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 illuminated	
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 Input Circuit Breaker trips (208V Models Only)	
The toggle handle on the circuit breaker (located to the right of the input cable connection) switches off.	Reduce the load on the UPS by unplugging equipment and resetting the toggle handle to ON.
AVR Boost or AVR Trim LEDs illuminate	
Your system is experiencing excessive periods of low or high voltage.	Have qualified service personnel check your facility for electrical problems. If the problem continues, contact the utility company for further assistance.
UPS operates on battery although normal line voltage exists	
UPS input circuit breaker tripped.	Reduce the load on the UPS by unplugging equipment and resetting the circuit breaker (on the back of UPS) by pressing the plunger in.
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 (see below). If acceptable to the connected equipment, reduce the UPS sensitivity.
Battery Charge and Battery Load LEDs flash simultaneously	
The internal temperature of the UPS has exceeded the allowable threshold for safe operation.	Check that the room temperature is within the specified limits for operation. Check that the UPS is properly installed allowing for adequate ventilation. Allow the UPS to cool down. Restart the UPS. If the problem continues contact APC at, www.apc.com/supoport.

PROBLEM AND POSSIBLE CAUSE	SOLUTION
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.

6: REGULATORY AND WARRANTY INFORMATION

Regulatory Agency Approvals and Radio Frequency Warnings

208V MODELS

LISTED 42C2

LR 63938

警告使用者:
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

230V MODELS

N394

Declaration of Conformity

CE 2001

EC Declaration of Conformity

We, the undersigned, declare under our sole responsibility that the equipment specified below conforms to the following standards and directives:

Standards to Which Conformity Declared:	EN55022; EN50091-2; En60950; EN50091-1-1, 2; 55024; IEC60950; EN61000-3-2, 3-3, 4-2, 4-3, 4-4, 4-5, 4-6, 4-8, 4-11
Application of Council Directives:	73/23/EEC, 93/68/EEC 89/336/EEC, 92/31/EEC, 91/157/EEC
Type of Equipment: **Model Numbers:**	Uninterruptible Power Supply SU5000RMXL2U
Manufacturer's Name and Address:	American Power Conversion 132 Fairgrounds Road West Kingston, Rhode Island, 02892, USA -or- American Power Conversion (A. P. C.) b. v. Ballybritt Business Park Galway, Ireland -or- American Power Conversion Main Avenue, Peza Rosario, Cavite, Philippines -or- American Power Conversion 2nd Street, Peza, Cavite Economic Zone Rosario, Cavite Philippines -or- American Power Conversion Lot 32 Phase 1 Carmelray Industrial Park Canlubang, Calamba, Laguna Philippines -or- APC (Suzhou) UPS Co., Ltd No. 189 Suhong Road, China-Singapore Suzhou Industrial Park Suzhou 215021, Jiangsu, P.R.C
Importer's Name and Address:	American Power Conversion (A. P. C.) b. v. Ballybritt Business Park Galway, Ireland
Place: N. Billerica, MA U.S.	5 Jan 02 Richard J. Everett, Sr. Regulatory Compliance Engineer
Place: Galway, Ireland	5 Jan 02 Ray S. Ballard, Managing Director, Europe

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.

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