



**IBM UPS 7500XHV
IBM UPS 10000XHV
Uninterruptible Power Supply
Operation and Setup Guide**

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安装本产品之前，请仔细阅读 **Safety Information**
(安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας
(safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

WARNING: Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. ***Wash hands after handling.***

ADVERTENCIA: El contacto con el cable de este producto o con cables de accesorios que se venden junto con este producto, pueden exponerle al plomo, un elemento químico que en el estado de California de los Estados Unidos está considerado como un causante de cáncer y de defectos congénitos, además de otros riesgos reproductivos. ***Lávese las manos después de usar el producto.***

 **CAUTION! Handling Safety** - Use safe practices when lifting.

 <18 kg (<40 lb)

 32–55 kg (70–120 lb)

 18–32 kg (40–70 lb)

 >55 kg (>120 lb)


 >10°

  **CAUTION! Electrical Safety**

Electrical Current from power, telephone, and communication cables is hazardous. Please read the following safety statements.

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet.
- Connect to properly wired outlets any equipment that will be attached to this product.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following steps when installing, moving, or opening covers on this product or attached devices.
 - To Connect:**
 1. Turn everything OFF.
 2. First attach all cables to devices.
 3. Attach signal cables to connectors.
 4. Attach power cords to outlet.
 5. Turn device ON.
 - To Disconnect:**
 1. Turn everything OFF.
 2. First remove power cords from outlet.
 3. Remove signal cables from connectors.
 4. Remove all cables from devices.
- Do not work alone under hazardous conditions.
- High current through conductive materials could cause severe burns.
- Check that the power cord(s), plug(s), and sockets are in good condition.
- When grounding cannot be verified, disconnect the equipment from the utility power outlet before installing or connecting to other equipment. Reconnect the power only after all connections are made.
- Do not handle any metallic connector before the power has been disconnected.
- Connect the equipment to a three wire utility outlet (two poles plus ground). The receptacle must be connected to appropriate branch circuit/mains protection (fuse or circuit breaker). Connection to any other type of receptacle may result in risk of electrical shock.
- In order to maintain compliance with the EMC directive for products sold in Europe, output cords attached to the uninterruptible power supply should not exceed 10 meters in length.

  **CAUTION! De-energizing Safety**

- The uninterruptible power supply has an internal energy source, the battery. The output may be energized when the unit is not connected to a utility power outlet.
- To de-energize the uninterruptible power supply, press the OFF button to shut the equipment off. Unplug the uninterruptible power supply from the utility power outlet. Disconnect the external batteries where applicable and disconnect the internal battery (see *Operation and Setup Guide*). Push the ON button to de-energize the capacitors.

  **CAUTION! Battery Safety**

- **This equipment contains potentially hazardous voltages.** Refer to your product documentation to determine which parts are user-replaceable.
- Do not dispose of batteries in a fire; they may explode.
- Do not open or mutilate batteries. They contain an electrolyte that is toxic and harmful to the skin and eyes.
- To avoid personal injury due to energy hazard, remove wristwatches and jewelry such as rings when replacing the batteries. Use tools with insulated handles.
- Replace the battery module with the same number and type as originally installed in the equipment.



Be sure to deliver the spent battery to a recycling facility.

1: INSTALLATION

Introduction

The IBM® UPS 7500XHV and UPS 10000XHV models are high-performance uninterruptible power supplies, designed to prevent blackouts, brownouts, sags, and surges from reaching your computer and other sensitive electronic equipment. The uninterruptible power supply filters small utility line fluctuations and isolates your equipment from large disturbances by internally disconnecting from the utility line. The uninterruptible power supply provides continuous power from its internal battery until the utility line returns to safe levels or the battery is fully discharged.

Unpacking

Attention:

- Read the Safety Instructions in this documentation before you install the uninterruptible power supply.
- The uninterruptible power supply comes with its battery disconnected.

Note: The illustrations in this documentation might differ slightly from your hardware.

Inspect the uninterruptible power supply upon receipt. Accidents and damage can occur during shipment. Notify the carrier and your IBM marketing representative or authorized reseller if there is damage.

The packaging is recyclable; save it for reuse or dispose of it properly.

Check the package contents:

- Uninterruptible power supply
- Two front bezels
- Rail kit
- Tower conversion kit
- Accessory kit containing:
 - Quick Installation Guide
 - Documentation CD
 - PowerChute® Business Edition CD
 - Network Management Card CD
 - Warranty Flyer
 - Rack-mounting brackets
 - Temperature probe
 - Serial communication cable – 4.6 m (15 ft)
 - Serial to USB adapter cable – 2 m (6.5 ft)
 - Four output power cables – 2 m (6.5 ft)

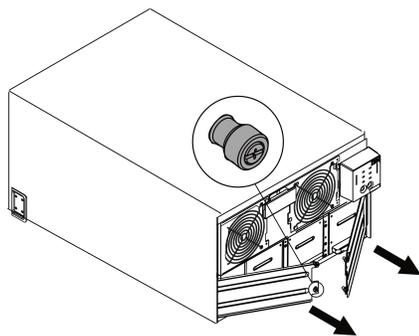
You will need the following tools to install the uninterruptible power supply:

- Utility knife or scissors
- Two Philips screwdrivers (#1 and #2)
- Two wrenches (.438" and .250")
- Cage-nut-insertion tool or flat-blade screwdriver (for installing cage-nuts in some rack cabinets)

Removing the Battery Modules

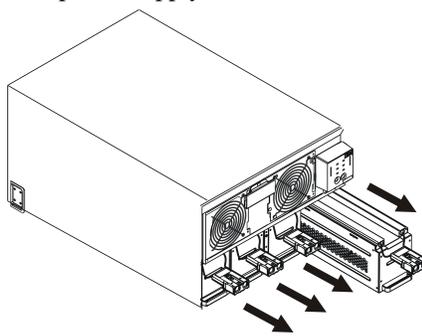
The uninterruptible power supply is heavy. To lighten the weight of the unit, remove the battery modules.

❶ Remove the battery doors.



❷ Remove all battery modules.

Note: Write down the MAC address from under the uninterruptible power supply.



Positioning the Uninterruptible Power Supply

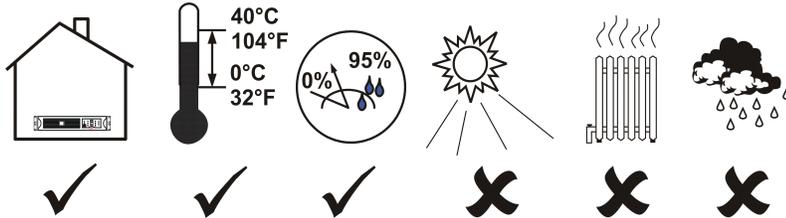


Attention: The uninterruptible power supply will remain heavy without the battery modules. Select a location sturdy enough to handle the weight.

Do not operate the uninterruptible power supply in excessive dust or in temperature and humidity conditions outside the specified limits.

Make sure that the air vents on the front and rear of the uninterruptible power supply are not blocked.

Placement of the unit should correspond with the following graphical depiction.



Hardwiring the Uninterruptible Power Supply

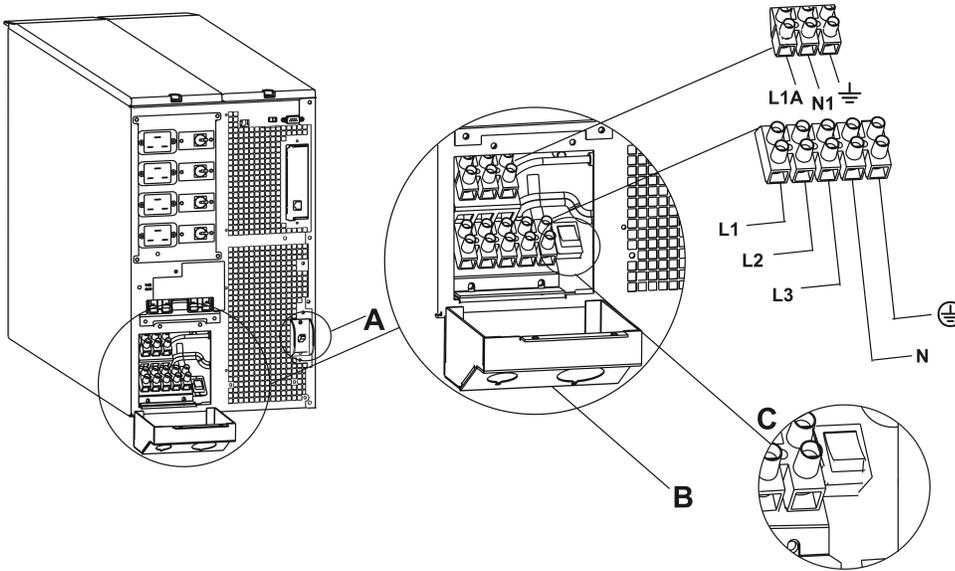
Attention: Wiring must be performed by a qualified electrician.

1. Install a utility circuit breaker according to local electrical codes (see tables below) for input wiring.

Input Connections	Output Connection (optional)
Single-Phase: Wire to L1, N, and \oplus .	Wire to L1A, N1, and \oplus .
Three-Phase: Wire to L1, L2, L3, N, and \oplus .	

System	Wiring	Number of Phases	Voltage	Current Full Load (Nominal)	External Circuit Breaker (typical)	Wire Size (typical)
UPS 7500XHV	Input	1	200/208/220/230/240 V	38 amps	50 amps / 2-pole	10 mm ²
	Input	3+ Neutral	380/400/415 V	14 amps / phase when online, 38 amps on L1 in bypass	50 amps / 4-pole	10 mm ²
	Output	1	200/208/220/230/240 V	38 amps	(as needed)	10 mm ²
UPS 10000XHV	Input	1	200/208/220/230/240 V	50 amps	63 or 70 amps / 2-pole	16 mm ²
	Input	3+ Neutral	380/400/415 V	18 amps / phase when online, 50 amps on L1 in bypass	63 amps / 4-pole	16 mm ²
	Output	1	200/208/220/230/240 V	50 amps	(as needed)	16 mm ²

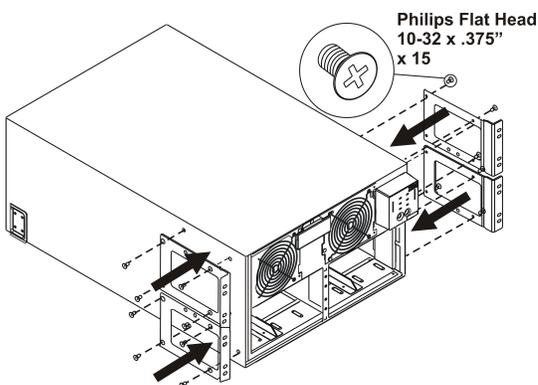
- Switch the uninterruptible power supply input circuit breaker (see **A** in the diagram that follows) and the utility circuit breakers off.



- Remove the access panel (see **B** in the diagram).
- Remove the circular knockouts on the access panel.
- Run wires through the access panel to the terminal blocks. Connect the wire to the ground block first. *Adhere to all national and local electrical codes.* (See tables and diagram.)
- Use appropriate cable fitting to achieve strain-relief on the hardwired input and output power cables.
- For three-phase input, set the Input Phase Selector switch (see **C** in the diagram) to '3'. For single-phase input, leave the switch in the default position of '1'.
- Switch the circuit breakers on.
- Check the line voltages.
- Replace the access panel.

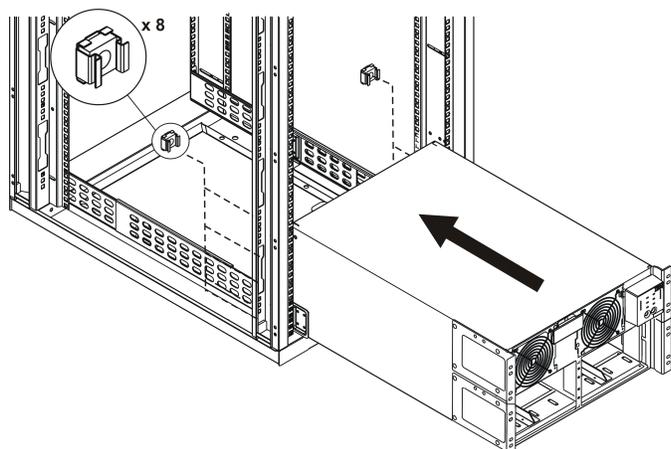
Mounting the Uninterruptible Power Supply in a Rack and Attaching the Front Bezel

- Attach the mounting brackets.

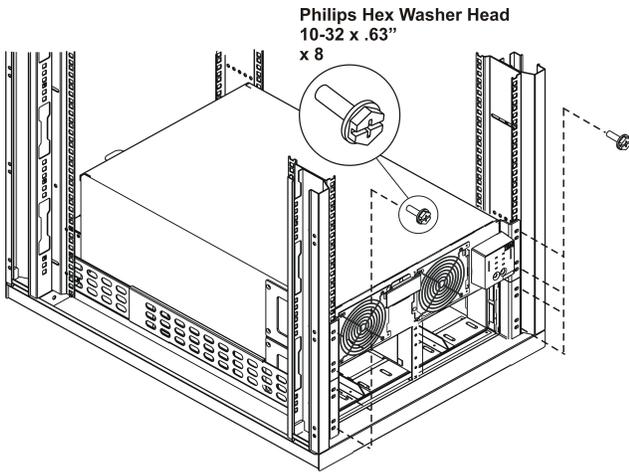


- Install the rails per the rail installation diagram in the Rail Kit. Install the cage-nuts (or clip-nuts) and mount the uninterruptible power supply at the bottom of the rack.

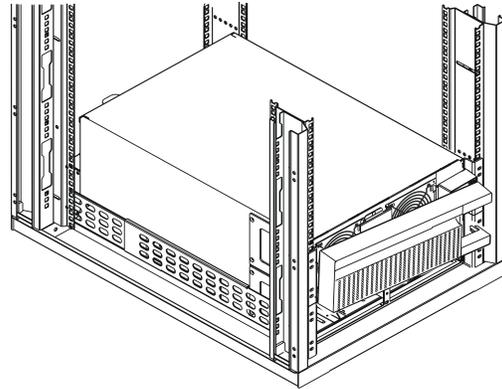
Note: Leave 3U of space below the uninterruptible power supply for each battery pack that you plan to install.



- 3** Secure the uninterruptible power supply in the rack.

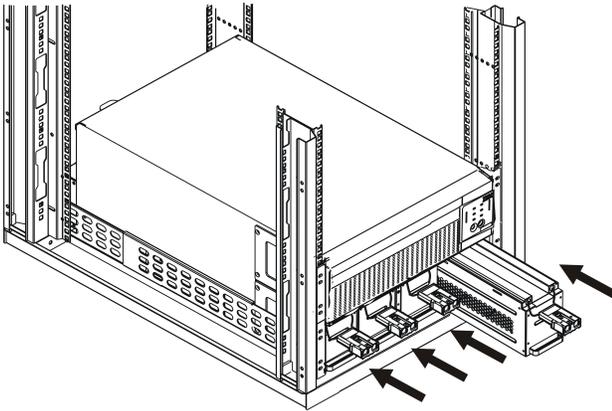


- 4** Attach the front bezel.

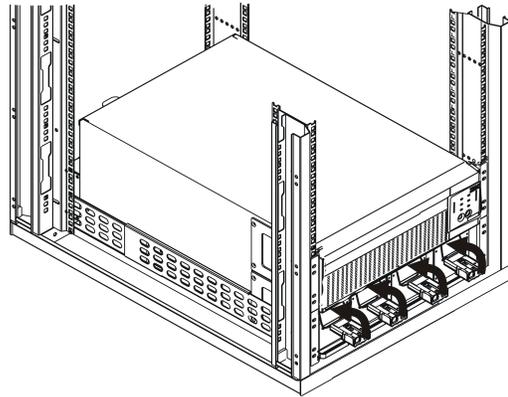


Installing and Connecting the Batteries and Attaching the Front Battery Bezel

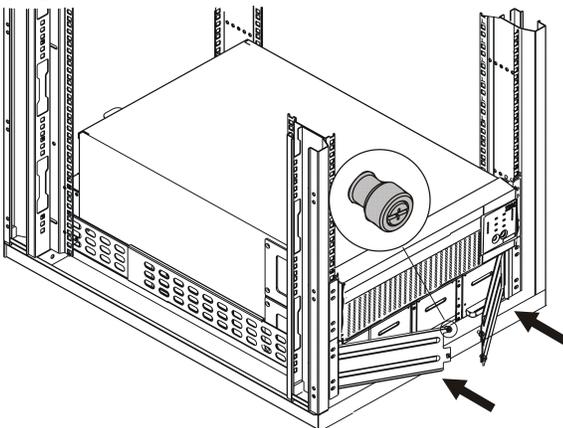
- 1** Install all battery modules.



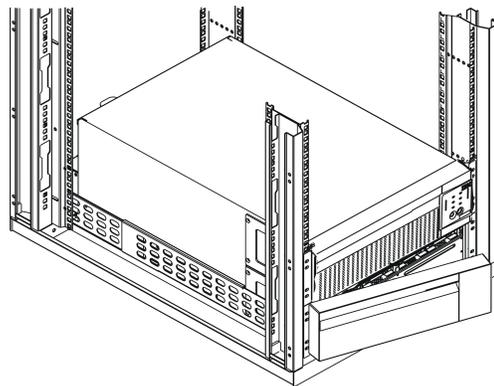
- 2** Connect the batteries.



- 3** Reinstall and secure the battery doors with the captive screws. Make sure the cords are positioned so that they do not get pinched.



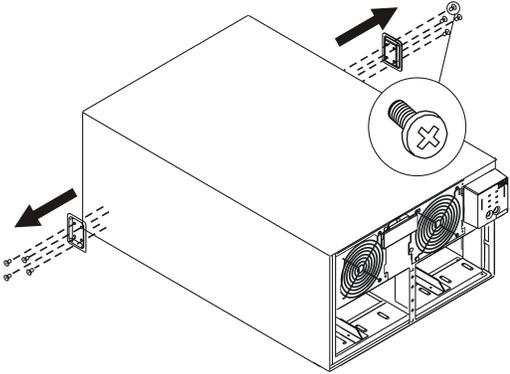
- 4** Attach the front battery bezel.



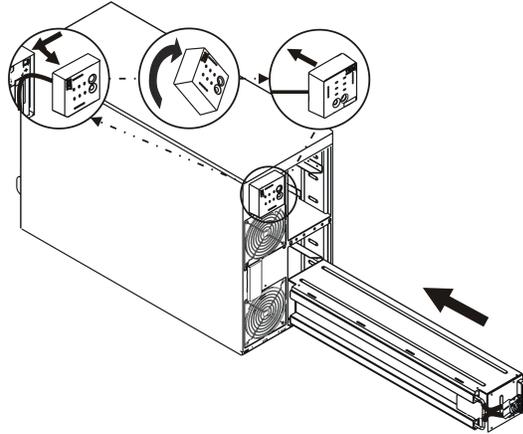
Tower Configuration

Attention: Before converting to a tower configuration, remove the battery modules (see *Removing the Battery Modules*).

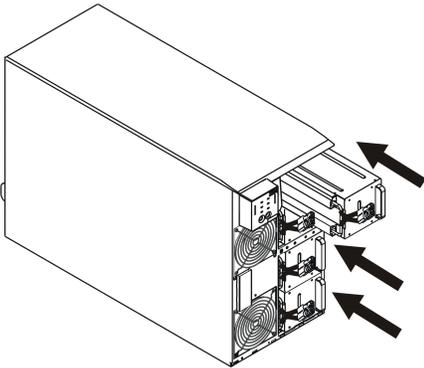
1 Remove the rail guides.



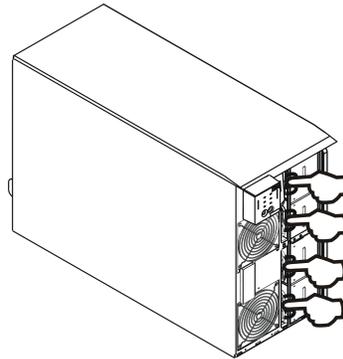
2 Bring the unit to tower position, and remove the display bezel by sliding to the left and out. Rotate the display bezel and reinstall. Install the first battery module at the bottom.



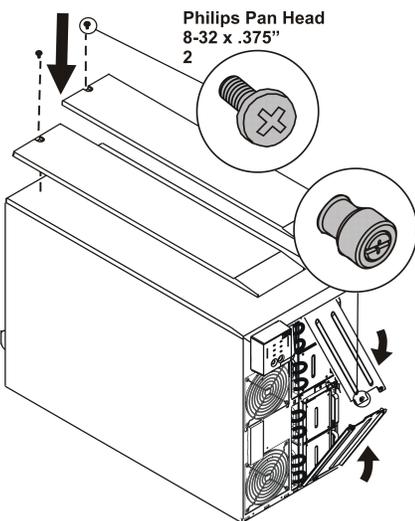
3 Reinstall the remaining three battery modules.



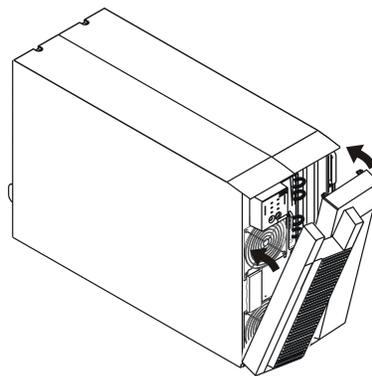
4 Connect the batteries.



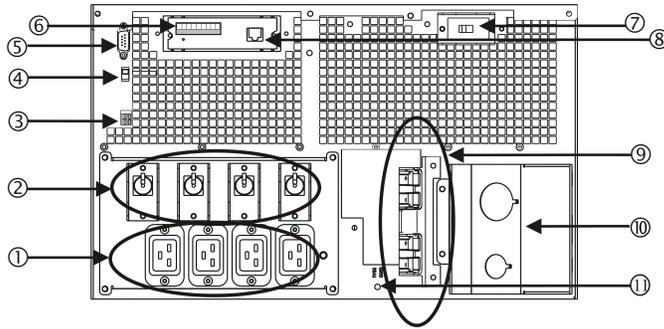
5 Reinstall and secure the battery doors with captive screws. Make sure that the cords are positioned so that they do not get pinched. Attach the top panels.



6 Attach the bezels.



Connecting Equipment and Power to the Rear Panel of the Uninterruptible Power Supply



INDEX	ITEM	DESCRIPTION
1	Outlets	Connect equipment to the uninterruptible power supply.
2	Output Circuit Breakers	Each circuit breaker protects its nearest outlet.
3	EPO Terminal	The optional Emergency Power Off (EPO) feature enables connected loads to be immediately de-energized from a remote location, without switching to battery operation. See <i>Emergency Power Off (EPO) Option</i> .
4	Bypass Switch	This switch will put the unit in bypass mode. See <i>Operation</i> .
5	Serial Port	Power management software and serial port communication can be used with the uninterruptible power supply. Use only cables supplied or approved by IBM. Note: Use the supplied serial cable to connect to the serial port. <i>Do not</i> use a standard serial interface cable because it is incompatible with the uninterruptible power supply connector.
6	Integrated Environmental Monitor	This Network Management Card monitor features a temperature/humidity probe, two input contacts, and a two-position output relay. For information on connecting and using the probes, contacts, and relay, see the <i>Network Management Card CD</i> .
7	Input Circuit Breaker	The uninterruptible power supply is protected from extreme overloads when in the on position. The breaker must be on for the unit to operate.
8	Ethernet Port/ Network Management Card	Connect the uninterruptible power supply to the network.
9	Battery Pack Connectors	Optional battery packs provide extended runtime during power outages. See <i>3U Extend Run Battery Pack Operation and Setup Guide</i> .
10	Access Panel	Provides access to the terminal blocks. See <i>Hardwiring the Uninterruptible Power Supply</i> .
11	TVSS Screw	The uninterruptible power supply 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 a grounding cable, disconnect the uninterruptible power supply from the utility power outlet.

Startup

1. Hardwire the uninterruptible power supply. See *Hardwiring the Uninterruptible Power Supply*.
2. Connect equipment to the uninterruptible power supply.
3. Turn on all connected equipment. To use the uninterruptible power supply as a master on/off switch, be sure all connected equipment is turned on.
4. Press the  button on the front panel to turn on the uninterruptible power supply.
5. Select the output voltage (default is 230 V). See *Setting the Output Voltage via Terminal Mode*.

Note: For setting the number of external battery packs through Terminal Mode, see the *3U Extend Run Battery Pack Operation and Setup Guide*.
6. Configure the Network Management Card (optional).

Selecting the Output Voltage via Terminal Mode

Terminal Mode is a menu driven interface that enables enhanced configuration of the uninterruptible power supply.

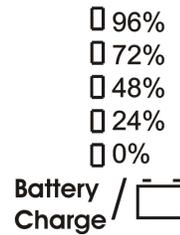
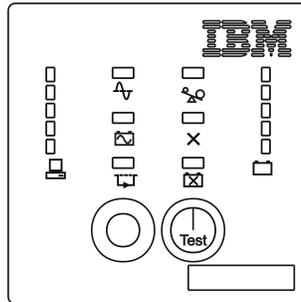
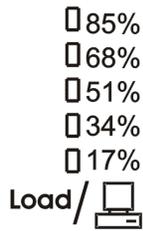
Connect the serial cable to the serial port on the back of the uninterruptible power supply.

When using the PowerChute® Network Shutdown utility:

1. Exit the PowerChute Business Edition agent and server using the following steps:
 - a. From the desktop, click **Start=> Settings=> Control Panel=> Administrative Tools=> Services**.
 - b. Select **PCBE Server and PCBE Agent**; then, right click the mouse and select **Stop**.
2. Open a terminal program, for example HyperTerminal.
From the desktop, click **Start => Programs => Accessories => Communication =>HyperTerminal**.
3. Double-click on the **HyperTerminal** icon.
 - a. Follow the prompts to choose a name and select an icon. Disregard the message, must install a modem, if it is displayed. Click **OK**.
 - b. Select the **COM** port that is connected to your uninterruptible power supply. The port settings are:
 - ✓ **bits per second - 2400**
 - ✓ **data - bits 8**
 - ✓ **parity - none**
 - ✓ **stop bit - 1**
 - ✓ **flow control - none**
 - c. Click Enter.
4. Once the blank terminal window is open, follow these steps to configure the output voltage:
 - a. Press Enter to initiate terminal mode. Press Enter multiple times, until the **User Name** prompt is displayed. Follow the prompts. Type slowly, waiting until each character is displayed on the screen before typing the next character.
Network Management Card defaults:
 - User Name: **apc**
 - Password: **apc**
 - b. Press 1 and Enter to select **Device Manager**.
Select the number corresponding to the desired model and press Enter.
 - c. Press 3 and Enter to select **Configuration**.
 - d. Press 2 and Enter to select **Line Transfer**.
 - e. Press 3 and Enter to select **Output Voltage**.
Select the number corresponding to the desired voltage setting and press Enter.
 - f. Press 5 and Enter to **Accept Changes**.
 - g. Press Esc multiple times to return to the main menu.
 - h. Press 4 and Enter to log out.

2: OPERATION

Front Display Panel



INDICATOR	DESCRIPTION
Online 	This LED is lit when the uninterruptible power supply is supplying utility power to the connected equipment and performing double conversion to supply power to the connected equipment. If not lit, the uninterruptible power supply is either not turned on, or is supplying battery power. When flashing, the uninterruptible power supply is running an internal self-test.
On Battery 	This LED is lit when the uninterruptible power supply is supplying battery power to the connected equipment.
Bypass 	This LED is lit when the unit is sending utility power directly to the connected equipment. Bypass mode operation is the result of an internal fault, an overload condition, or a user-initiated command (performed manually through the manual bypass switch). Battery operation is not available while the uninterruptible power supply is in bypass mode. See <i>Troubleshooting</i> .
Fault 	This LED is lit when the uninterruptible power supply detects an internal fault. See <i>Troubleshooting</i> .
Overload 	This LED is lit and the uninterruptible power supply emits a sustained alarm tone when the connected loads are drawing more than the uninterruptible power supply power rating. See <i>Troubleshooting</i> .
Replace Battery 	Failure of a battery self-test causes the uninterruptible power supply to emit short beeps for one minute and this LED to be lit. See <i>Troubleshooting</i> .
FEATURE	FUNCTION
Power On 	Press this button to turn on the uninterruptible power supply. (Additional capabilities will be described later in the document.)
Power Off 	Press this button to turn off the uninterruptible power supply.
Self-Test	<p>Automatic: The uninterruptible power supply performs a self-test automatically when turned on, and every two weeks thereafter (by default). During the self-test, the uninterruptible power supply briefly operates the connected equipment on battery.</p> <p>If the uninterruptible power supply fails the self-test, the replace battery LED is lit and immediately returns to online operation. The connected equipment is not affected by a failed test. Allow the battery to recharge for 24 hours and perform another self-test. If it fails, the battery must be replaced.</p> <p>Manual: Press and hold the  button for a few seconds to initiate the self-test.</p>

FEATURE	FUNCTION
<p>Diagnostic Utility Voltage</p> <p>200 V 208 V 220 V</p> <p>□ 236 □ 245 □ 256 □ 217 □ 226 □ 238 □ 199 □ 207 □ 219 □ 180 □ 189 □ 200 □ 161 □ 170 □ 181</p> <p>□ □ □</p> <p>230 V 240 V</p> <p>□ 266 □ 276 □ 248 □ 258 □ 229 □ 239 □ 210 □ 220 □ 192 □ 202</p> <p>□ □</p>	<p>The uninterruptible power supply has a diagnostic feature that displays the utility voltage.</p> <p>Note: The uninterruptible power supply starts a self-test as part of this procedure. The self-test does not affect the voltage display.</p> <p>Press and hold the  button to view the utility voltage bar graph display. After a few seconds, this five-LED Battery Charge  display on the right of the front panel will show the utility input voltage.</p> <p>Refer to the figure to the left for the voltage reading corresponding to the configured nominal output voltage.</p> <p>The display indicates that the voltage is between the displayed value on the list and the next higher value.</p> <p>If <i>three LEDs are lit</i>, the utility voltage is within the normal range. If <i>no LEDs are lit</i> and the uninterruptible power supply is plugged into a properly functioning utility power outlet, the line voltage is extremely low. If <i>all five LEDs are lit</i>, the line voltage is extremely high and should be checked by an electrician.</p>

On Battery Operation

The uninterruptible power supply automatically switches to battery operation if the utility power fails. While running on battery, an alarm beeps four times every 30 seconds.

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

If you are not using PowerChute, shut down the operating system and turn off the computer before the uninterruptible power supply fully discharges the battery.

Determining On Battery Runtime

The uninterruptible power supply battery charges when 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 the initial charge period.

Battery Runtime Tables

The dark gray shaded areas in the charts that follow represent minutes; the other areas represent hours.

Note: The recharge time is the approximate time it takes to get to a 90% capacity from a complete discharge at a 50% load.

UPS 7500XHV Model:

Load (W)	Number of Battery Packs			
	Internal	+1	+2	+4
50	7.56	13.83	21.50	37.68
100	6.00	10.93	17.06	29.83
200	4.16	7.65	11.93	20.90
300	3.16	5.83	9.11	16.00
400	2.51	4.68	7.36	12.89
500	2.11	3.91	6.12	10.75
600	1.80	3.33	5.25	9.23
700	1.56	2.90	4.52	8.00
800	1.38	2.56	4.01	7.03
900	1.23	2.30	3.61	6.38
1000	1.10	2.08	3.28	5.78
1200	55	1.73	2.74	4.83
1400	47	1.50	2.35	4.16
1600	41	1.28	2.05	3.63
1800	36	1.13	1.81	3.23
2000	32	1.00	1.61	2.90
2500	24	48	1.28	2.28
3000	19	39	1.05	1.88
3400	17	34	55	1.65
4000	13	28	46	1.36
5000	10	21	35	1.06
6000	7	16	28	52
Recharge Hours	3	7	10	17

UPS 10000XHV Model:

Load (W)	Number of Battery Packs			
	Internal	+1	+2	+4
50	7.56	13.83	21.55	37.68
100	6.00	10.93	17.06	29.83
200	4.16	7.65	11.93	20.90
300	3.16	5.83	9.11	16.00
400	2.55	4.68	7.35	12.88
500	2.11	3.91	6.12	10.75
600	1.80	3.33	5.24	9.21
700	1.56	2.90	4.56	8.03
800	1.38	2.56	4.05	7.11
900	1.23	2.30	3.61	6.38
1000	1.16	2.08	3.28	5.78
1200	55	1.73	2.73	4.85
1400	47	1.50	2.35	4.16
1600	41	1.28	2.05	3.63
1800	36	1.13	1.81	3.23
2000	32	1.00	1.61	2.90
2500	24	48	1.28	2.28
3000	19	39	1.05	1.88
3400	17	34	55	1.65
4000	13	28	46	1.36
5000	10	21	35	1.06
6000	7	16	28	52
7000	5	13	23	44
8000	4	11	20	37
Recharge Hours	3	7	10	17

3: USER CONFIGURABLE ITEMS

NOTE: SETTINGS ARE MADE THROUGH THE SUPPLIED POWERCHUTE BUSINESS EDITION SOFTWARE, NETWORK MANAGEMENT CARD, OR TERMINAL MODE. REFER TO THE SOFTWARE HELP GUIDES FOR DETAILS.			
FUNCTION	FACTORY DEFAULT	USER SELECTABLE CHOICES	DESCRIPTION
Automatic Self-Test	Every 14 days (336 hours)	Every 7 days (168 hours), Every 14 days (336 hours), On Startup Only, No Self-Test	This function sets the interval at which the uninterruptible power supply will execute a self-test.
Uninterruptible Power Supply ID	UPS_IDEN	Up to eight characters	Use this field to uniquely identify the uninterruptible power supply, (i.e. server name or location) for network management purposes.
Date of Last Battery Replacement	Manufacture Date	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	The uninterruptible power supply will charge its batteries to the specified percentage before it powers up connected equipment, following a low-battery shutdown.
Alarm Delay After Line Failure	5 second delay	5 second delay, 30 second delay, At Low Battery, Never	The user can mute an ongoing alarm or disable all existing alarms permanently.
Shutdown Delay	20 seconds	0, 20, 60, 120, 240, 480, 720, 960 seconds	The interval is set between the times when the uninterruptible power supply receives a shutdown command and actual shutdown.
Duration of Low Battery Warning	2 minutes (PowerChute software provides automatic, unattended shutdown when approximately two minutes of battery runtime remain.)	2, 5, 7, 10, 12, 15, 18, 20 minutes	The low battery warning beeps become continuous when two minutes of runtime remain. Change the warning interval 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 uninterruptible power supply 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%	The uninterruptible power supply will pass this maximum voltage to connected equipment during internal bypass operation.
Low Bypass Point	-30% of output voltage setting	-15%, -20%, -25%, -30%	The uninterruptible power supply will pass this minimum voltage to connected equipment during internal bypass operation.
Output Voltage	230 Vac	200, 208, 220, 230, 240 Vac	The user is able to select the uninterruptible power supply output voltage while online. Use the voltage setting applicable to your region.

NOTE: SETTINGS ARE MADE THROUGH THE SUPPLIED POWERCHUTE BUSINESS EDITION SOFTWARE, NETWORK MANAGEMENT CARD, OR TERMINAL MODE. REFER TO THE SOFTWARE HELP GUIDES FOR DETAILS.			
FUNCTION	FACTORY DEFAULT	USER SELECTABLE CHOICES	DESCRIPTION
Output Frequency	Automatic (50 ± 3 Hz or 60 ± 3 Hz)	Automatic, 50 ± 3 Hz, 50 ± 0.1 Hz, 60 ± 3 Hz, 60 ± 0.1 Hz	The user is able to set the allowable uninterruptible power supply output frequency. Whenever possible, the output frequency tracks the input frequency.
Number of Battery Packs	1	Number of Connected Battery Packs (four battery modules per pack)	The user can define the number of connected battery packs for proper runtime prediction.

Emergency Power Off (EPO) Option

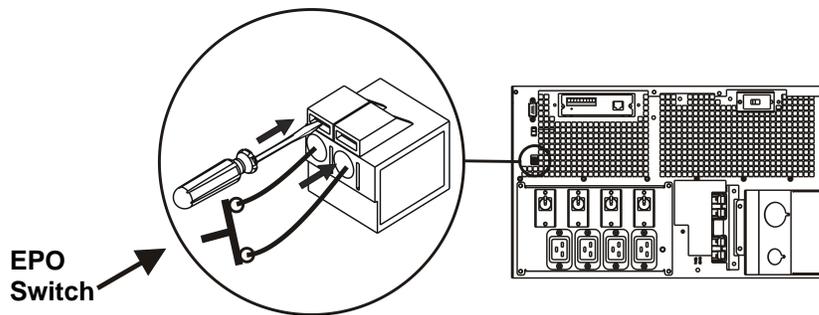
The output power can be disabled in an emergency by closing a switch connected to the EPO.

Note: Adhere to national and local electrical codes when wiring.

The switch should be connected in a normally open switch contact. External voltage is not required; the switch is powered by a 12 V internal power supply. A closed switch draws 2 mA of current.

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

Note: The EPO circuit is considered a Class 2 circuit, (UL, CSA standards) and an 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 the circuit standard cannot be confirmed, use a contact closure switch.

Use one of the following cable types to connect the uninterruptible power supply 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
- For installation in Canada: Use only CSA certified, type ELC (extra-low voltage control cable)
- For installation in other countries: Use a standard low-voltage cable according to local regulations

4: STORAGE, MAINTENANCE, SHIPPING, AND SERVICE

Storage

Store the uninterruptible power supply covered in a cool, dry location, with the batteries fully charged.

At -15 to +30 °C (+5 to +86 °F), charge the uninterruptible power supply battery every six months.

At +30 to +45 °C (+86 to +113 °F), charge the uninterruptible power supply battery every three months.

Replacing the Battery Modules

Attention:

- Upon battery disconnection, connected equipment is not protected from power outages.
- Use caution when handling heavy battery modules.

The uninterruptible power supply battery life differs based on usage and environment.

This uninterruptible power supply has easy to replace, hot-swappable battery modules. Replacement is a safe procedure, isolated from electrical hazards. You can leave the uninterruptible power supply and connected equipment turned on for the replacement procedure.

Contact your IBM marketing representative or authorized reseller for information about replacement battery modules.

Refer to *Removing the Battery Modules* for removal instructions. For battery replacement, see *Installing and Connecting the Batteries and Attaching the Front Battery Bezel*.

This product contains sealed lead acid batteries. The battery modules must be recycled or disposed of properly. IBM has established a collection process for reuse, recycling, or proper disposal of used IBM sealed lead acid battery modules. For information on proper disposal of these modules, please contact IBM at 1-800-426-4333. Please have the model number listed on the uninterruptible power supply available before you call.

For information about the disposal of sealed lead acid batteries outside of the United States, contact your local IBM service organization.

Replacing the Network Management Card

Refer to the *Network Management Card CD* for removal and replacement procedures.

Shipping and Service

Prepare the uninterruptible power supply for shipping:

Shut down and disconnect any equipment attached to the uninterruptible power supply. Shut down the uninterruptible power supply, and disconnect the uninterruptible power supply from the utility power outlet. Remove the front bezel and disconnect the batteries.

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

1. Review the problems discussed in *Troubleshooting* to eliminate common problems.
2. If the problem persists, contact IBM.
 - Note the model number of the uninterruptible power supply, the serial number, and the date purchased. If you call IBM Customer Service, a technician will ask you to describe the problem and attempt to solve it over the phone, if possible. If the uninterruptible power supply or one of its components is faulty, IBM will send you a replacement CRU for the uninterruptible power supply or the component.
 - If the uninterruptible power supply or the component is under warranty, repairs are free. If not, there is a repair charge.
3. Pack the uninterruptible power supply or the faulty component in packaging sent by IBM, and use the return label to ship back to IBM. Pack the uninterruptible power supply properly to avoid damage in transit. Never use Styrofoam beads for packaging. Damage sustained in transit is not covered under warranty.

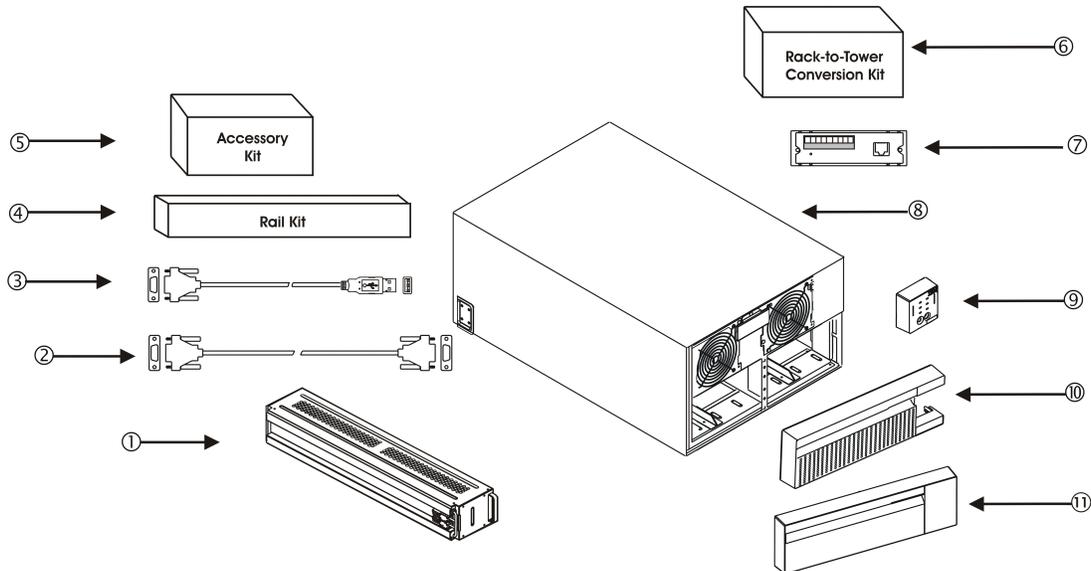
Attention: Always *disconnect the battery* before shipping. The battery modules may remain in the uninterruptible power supply; they do not have to be removed.

5: HARDWARE MAINTENANCE INFORMATION

This chapter contains information about IBM customer replaceable unit (CRU) availability for the *UPS 7500XHV* and *UPS 10000XHV* models.

Customer Replaceable Unit Part Numbers

IBM CRU part numbers are subject to change without notice. This section contains a listing of the CRU part numbers available at the time this document was published.



INDEX	CRU PART #	DESCRIPTION
1	25R5591	Replacement Battery Module
2	73P5767	Serial Cable
3	25R5596	Serial to USB Adapter Cable
4	73P5769	Rail Kit
5	25R5600	Accessory Kit
6	25R5597	Rack-to-Tower Conversion Kit
7	25R5599	Network Management Card
8	25R5589	UPS 7500XHV Chassis
	25R5590	UPS 10000XHV Chassis
9	25R5592	UPS 7500XHV Display Bezel
	25R5593	UPS 10000XHV Display Bezel
10	25R5594	Front Bezel
11	25R5595	Battery Bezel

6: TROUBLESHOOTING

Use the chart below to solve minor uninterruptible power supply installation and operation problems. Refer to IBM for assistance with complex uninterruptible power supply problems.

PROBLEM AND POSSIBLE CAUSE	SOLUTION
UNINTERRUPTIBLE POWER SUPPLY WILL NOT TURN ON	
The uninterruptible power supply is not connected to the utility power supply.	Check that the power cord from the uninterruptible power supply to the utility power supply is securely connected at both ends.
The batteries are not connected properly.	Check that the battery connectors are fully engaged.
There is very low or no utility voltage.	Check the utility power supply to the uninterruptible power supply by plugging in a table lamp. If the light is very dim, have the utility voltage checked.
UNINTERRUPTIBLE POWER SUPPLY WILL NOT TURN OFF	
There is an internal uninterruptible power supply fault.	Do not attempt to use the uninterruptible power supply. Unplug the uninterruptible power supply and have it serviced immediately.
UNINTERRUPTIBLE POWER SUPPLY BEEPS OCCASIONALLY	
The uninterruptible power supply beeps when running on battery during normal operation.	None. The uninterruptible power supply is protecting the connected equipment from occasional utility power irregularities.
UNINTERRUPTIBLE POWER SUPPLY IS NOT PROVIDING EXPECTED BACKUP TIME	
The uninterruptible power supply 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 faster when frequently put into service or when operated at elevated temperatures. If the battery is near the end of the service life, consider replacing the battery even if the replace battery LED is not yet lit.
ALL LEDES ARE LIT AND THE UNINTERRUPTIBLE POWER SUPPLY EMITS A CONSTANT BEEPING	
There is an internal uninterruptible power supply fault.	Do not attempt to use the uninterruptible power supply. Turn off the uninterruptible power supply and have it serviced immediately.
FRONT PANEL LEDES FLASH SEQUENTIALLY	
The uninterruptible power supply has been shut down remotely through software.	None. The uninterruptible power supply will restart automatically when utility power returns.
ALL LEDES ARE OFF AND THE UNINTERRUPTIBLE POWER SUPPLY IS PLUGGED INTO A WALL OUTLET	
The uninterruptible power supply is shut down or the battery is discharged from an extended outage.	None. The uninterruptible power supply will return to normal operation when the power is restored and the battery has a sufficient charge.

PROBLEM AND POSSIBLE CAUSE	SOLUTION
BYPASS AND OVERLOAD LEDS ARE LIT; UNINTERRUPTIBLE POWER SUPPLY EMITS A SUSTAINED ALARM TONE	
The uninterruptible power supply is overloaded. The connected equipment is drawing more VA or more watts than the uninterruptible power supply can sustain.	<p>The connected equipment exceeds the specified maximum load.</p> <p>The alarm remains on until the overload is removed. Disconnect nonessential equipment from the uninterruptible power supply to eliminate the overload.</p> <p>The uninterruptible power supply continues to supply power as long as it is online and the circuit breaker does not trip; the uninterruptible power supply will not provide power from batteries in the event of a utility voltage interruption.</p> <p>If a continuous overload occurs while the uninterruptible power supply is on battery, the unit turns off output in order to protect the uninterruptible power supply from possible damage.</p>
BYPASS LED IS LIT	
The bypass switch has been turned on manually.	<p>If bypass is the chosen mode of operation, ignore the lit LED.</p> <p>If bypass is not the chosen mode of operation, move the bypass switch on the back of the uninterruptible power supply to the normal position.</p>
FAULT AND OVERLOAD LEDS ARE LIT; UNINTERRUPTIBLE POWER SUPPLY EMITS A SUSTAINED ALARM TONE	
The uninterruptible power supply has stopped sending power to connected equipment.	<p>The connected equipment exceeds the specified maximum load.</p> <p>Disconnect nonessential equipment from the uninterruptible power supply to eliminate the overload condition.</p> <p>Press the off button, then the on button to restore power to connected equipment.</p>
FAULT LED LIT	
There is an internal uninterruptible power supply fault.	Do not attempt to use the uninterruptible power supply. Turn off the unit and have it serviced immediately.
REPLACE BATTERY LED IS LIT	
The replace battery LED flashes and a short beep is emitted every two seconds to indicate the battery is disconnected.	Check that the battery connectors are fully engaged.
The battery is weak.	Allow the battery to recharge for 24 hours. Then, perform a self-test. If the problem persists after recharging, replace the battery.
A battery self-test has failed.	The uninterruptible power supply emits short beeps for one minute and the replace battery LED is lit. The uninterruptible power supply 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.
UNINTERRUPTIBLE POWER SUPPLY OPERATES ON BATTERY ALTHOUGH NORMAL LINE VOLTAGE EXISTS	
There is very high, low, or distorted line voltage.	Move the uninterruptible power supply to a different outlet on a different circuit. Inexpensive fuel powered generators might distort the voltage. Test the input voltage with the utility voltage display. See <i>Operation</i> .

7: GETTING HELP AND TECHNICAL ASSISTANCE

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This chapter contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your xSeries or IntelliStation system, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation, and use diagnostic tools that come with your system.
- Go to the IBM Support Web site at <http://www.ibm.com/pc/support/> to check for technical information, hints, tips, and new device drivers.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the publications that are provided with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. Most xSeries and IntelliStation systems, operating systems, and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the information for the operating system or program.

Using the Documentation

Information about your IBM xSeries or IntelliStation system and preinstalled software, if any, is available in the documentation that comes with your system. That documentation includes printed books, online books, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/pc/support/> and follow the instructions. Also, you can order publications through the IBM Publications Ordering System at <http://www.elink.ibm.com/public/applications/publications/cgibin/pbi.cgi>.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM xSeries and IntelliStation products, services, and support. The address for IBM xSeries information is <http://www.ibm.com/eserver/xseries/>. The address for IBM IntelliStation information is <http://www.ibm.com/pc/intellistation/>.

You can find service information for your IBM products, including supported options, at <http://www.ibm.com/pc/support/>.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with xSeries servers, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, go to <http://www.ibm.com/services/sl/products/>.

For more information about Support Line and other IBM services, go to <http://www.ibm.com/services/>, or go to <http://www.ibm.com/planetwide/> for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Hardware service and support

You can receive hardware service through IBM Integrated Technology Services or through your IBM reseller, if your reseller is authorized by IBM to provide warranty service. Go to <http://www.ibm.com/planetwide/> for support telephone numbers, or in the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

Replacement part handling

If the issue cannot be resolved through any of the aforementioned steps, you will be sent a replacement part. Pack the uninterruptible power supply or the faulty component in packaging sent by IBM, and use the return label to ship back to IBM. Pack the uninterruptible power supply properly to avoid damage in transit. Never use Styrofoam beads for packaging. Damage sustained in transit is not covered under warranty.

Attention: Always *disconnect the battery* before shipping. The battery can remain in the uninterruptible power supply; it does not have to be removed.

Complete the following steps.

1. Shut down and disconnect any equipment attached to the uninterruptible power supply.
2. Shut down the uninterruptible power supply, and disconnect the uninterruptible power supply input cord from the utility.
3. Disconnect the battery connectors.

8: NOTICES, TRADEMARKS, AND RADIO FREQUENCY WARNINGS

Notices

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Attention! Life Support

American Power Conversion (APC) Corporation and International Business Machines (IBM) Corporation, their affiliates and subsidiaries world-wide, do not recommend the use of any of their products in life support applications where failure or malfunction of the product can be reasonably expected to cause failure of the life support device or to significantly affect its safety or effectiveness. APC and IBM do not permit the use of any of their products in direct patient care. APC and IBM will not knowingly sell their products for use in such applications.

Examples of devices considered to be life support devices include, but are not limited to, neonatal oxygen analysers, nerve stimulators (whether used for anesthesia, pain relief, or other purposes), autotransfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, neonatal ventilator incubators, ventilators for both adults and infants, anesthesia ventilators, infusion pumps, and any other device designated as "critical" by the U.S.F.D.A.

Hospital grade wiring devices and reduced leakage currents that meet medical safety standards may be ordered as options on many uninterruptible power supply systems. APC and IBM do not claim that units with these modifications are certified or listed as such by APC, IBM or any other organizations, therefore these units do not meet the requirements for use in direct patient care.

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Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

Product recycling and disposal

This unit contains materials such as circuit boards, cables, electromagnetic compatibility gaskets, and connectors which may contain lead and copper/beryllium alloys that require special handling and disposal at end of life. Before this unit is disposed of, these materials must be removed and recycled or discarded according to applicable regulations. IBM offers product-return programs in several countries. Information on product recycling offerings can be found on IBM's Internet site at <http://www.ibm.com/ibm/environment/products/prp.shtml>.

Battery return program

This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to <http://www.ibm.com/ibm/environment/products/batteryrecycle.shtml> or contact your local waste disposal facility.

In the United States, IBM has established a collection process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and battery packs from IBM equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Have the IBM part number listed on the battery available prior to your call.

In the Netherlands, the following applies.



Electronic emission notices

Federal Communications Commission (FCC) Statement

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

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. 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.

Industry Canada Class A emission compliance statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Australia and New Zealand Class A statement

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

United Kingdom telecommunications safety requirement

Notice to Customers

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunication systems in the United Kingdom.

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Taiwan electronic emission statement

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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，在這種情形下，使用者會被要求採取某些適當的對策。

Chinese Class A warning statement

聲 明
此為 A 級產品。在生活環境中，該產品可能會造成無線電干擾。在這種情況下，可能需要用戶對其干擾採取切實可行的措施。

Statement of Conformity to the Voluntary Control Council for Interference from Information

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