



**IBM UPS 3000XLV
IBM UPS 3000XHV
Uninterruptible Power Supply
Operation and Setup Guide**

02R2711

TABLE OF CONTENTS

Safety.....	1
<i>Introduction</i>	5
1: INSTALLATION.....	5
<i>Unpacking</i>	5
<i>Rail Installation</i>	5
<i>Positioning the UPS</i>	5
<i>Mounting the UPS in a Rack</i>	6
<i>Installing and Connecting the Battery and Attaching the Front Bezel</i>	6
<i>Tower Configuration</i>	7
<i>Connecting Equipment and Power to the UPS</i>	8
<i>Setting the Nominal Voltage</i>	9
<i>Startup</i>	9
<i>Remote Emergency Power Off Switch</i>	10
2: HARDWARE MAINTENANCE INFORMATION	11
<i>Field Replaceable Unit Part Numbers</i>	11
3: OPERATION	12
<i>Front Display Panel</i>	12
<i>Maximum Power and VA Specifications</i>	13
<i>On Battery Operation</i>	14
<i>Determining On Battery Runtime</i>	14
<i>Battery Runtime Table</i>	14
4: USER CONFIGURABLE ITEMS	15
5: STORAGE, MAINTENANCE, TRANSPORTING, AND SERVICE	17
<i>Storage</i>	17
<i>Replacing the Battery Module</i>	17
<i>Replacing the Power Processing Module</i>	17
<i>Disconnecting the Battery for Transport of the Whole UPS</i>	18
<i>Service</i>	18
6: TROUBLESHOOTING	19
7: RADIO FREQUENCY WARNINGS, NOTICES, AND TRADEMARKS	23
<i>Electronic emission notices</i>	23
<i>General Notices</i>	24
<i>Edition notice</i>	24
<i>Trademarks</i>	24

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.


 **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 table 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.
- Use qualified service personnel to change the plug on the UPS.
- When grounding cannot be verified, disconnect the equipment from the utility power outlet before installing or connecting to other equipment. Reconnect the power cord 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.
- *HV models only:*
 - In order to maintain compliance with the EMC directive for products sold in Europe, output cords attached to the UPS should not exceed 10 meters in length.

- Total leakage current from connected equipment and the UPS must not exceed 3.5 mA for a pluggable A Type UPS.

  **CAUTION! De-energizing Safety**

- The UPS 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 UPS, press the OFF button to shut the equipment off. Unplug the UPS 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.

Introduction

The IBM® UPS 3000XLV and UPS 3000XHV models are designed to prevent blackouts, brownouts, sags, and surges from reaching your computer and other valuable electronic equipment. The uninterruptible power supply (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 fully discharged.

1: INSTALLATION

Unpacking

Attention: Read the Safety Instructions before installing the UPS.

Inspect the UPS upon receipt. Accidents and damage may 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:

Attention: The UPS comes with the battery disconnected.

- UPS
- Two bezels (front and display)
- Rail kit including rails and rack mounting brackets
- Tower conversion kit including top panels and mounting stabilizers
- UPS literature kit containing:
 - Quick Installation Guide
 - Warranty flyer
 - UPS Documentation CD
 - PowerChute® CD
 - Serial and USB communication cables
 - Four 2M C13/C14 jumper cables
 - One 2.5M C19/C20 jumper cable (*3000XHV models only*)
 - Remote Emergency Power Off Cable
 - Embedded Network Module CD

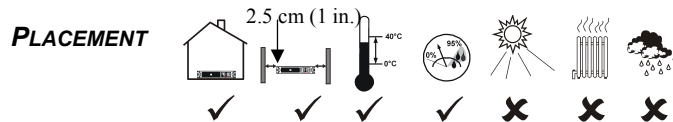
Rail Installation

For installation in a rack, install the provided rails following the instructions in the rail kit.

Positioning the UPS

Attention: The UPS is heavy. Select a location sturdy enough to handle the weight.

Do not operate the UPS in excessive dust or in temperature and humidity outside the specified limits.



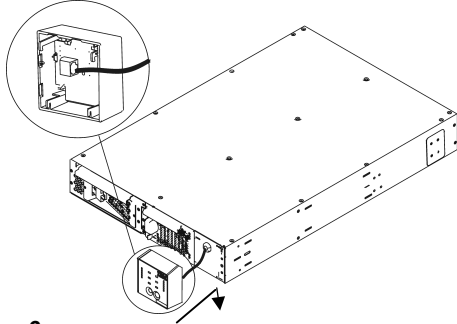
Mounting the UPS in a Rack

Note: Illustrations in this document might differ slightly from your hardware.

Step 1

Connect the display bezel.

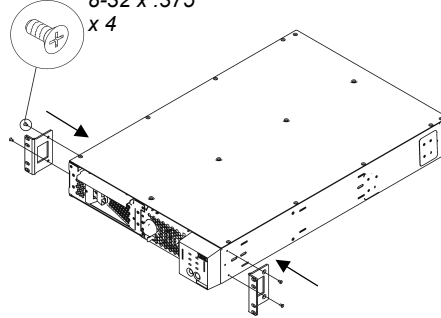
Rear: Connect



Step 2

Attach the mounting brackets.

Flat Head
8-32 x .375"
x 4

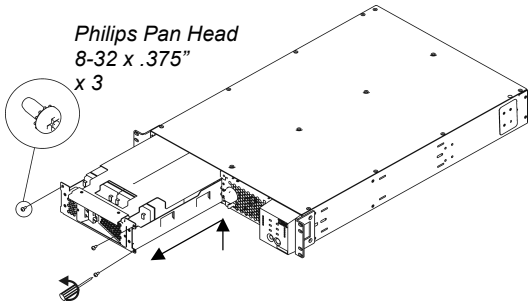


Step 3

To lighten the UPS, remove the battery module before mounting.

Attention: The battery module is heavy.

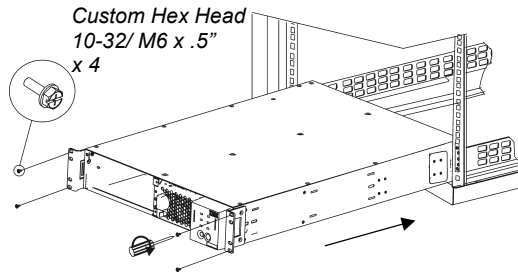
Philips Pan Head
8-32 x .375"
x 3



Step 4

Install the UPS at or near the bottom of the rack. Make sure the rack will not tip.

Custom Hex Head
10-32/ M6 x .5"
x 4

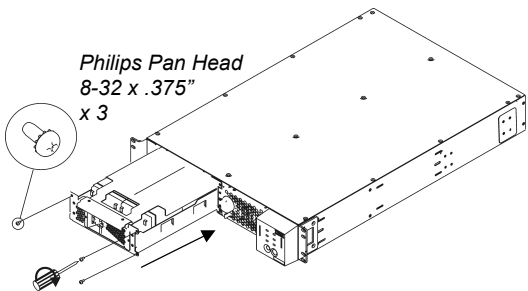


Installing and Connecting the Battery and Attaching the Front Bezel

Step 1

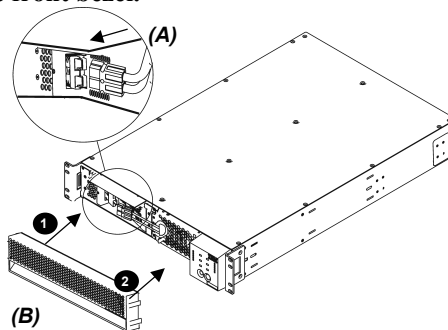
Reinstall the battery.

Philips Pan Head
8-32 x .375"
x 3



Step 2

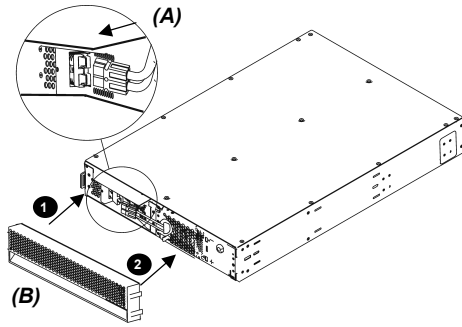
Connect the battery to the UPS, and attach the front bezel.



Tower Configuration

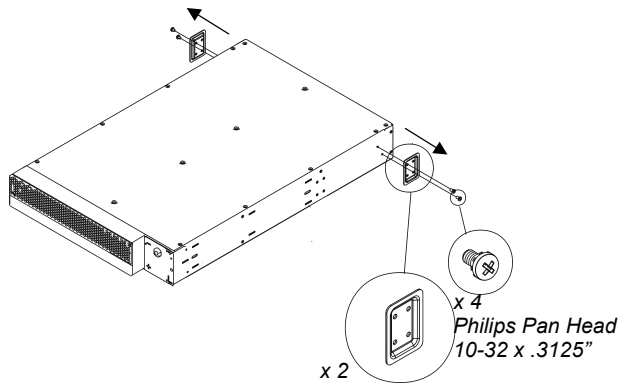
Step 1

Connect the battery to the UPS and attach the front bezel.



Step 2

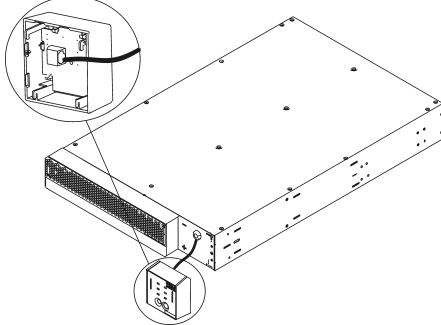
Remove the rail guides from the UPS.



Step 3

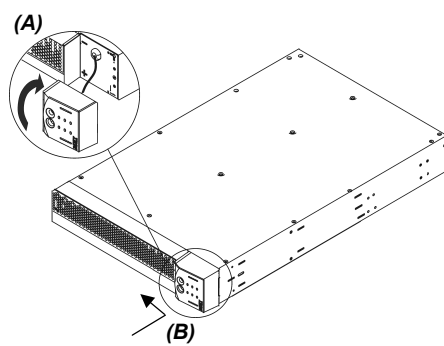
Connect the display bezel.

Rear: Connect



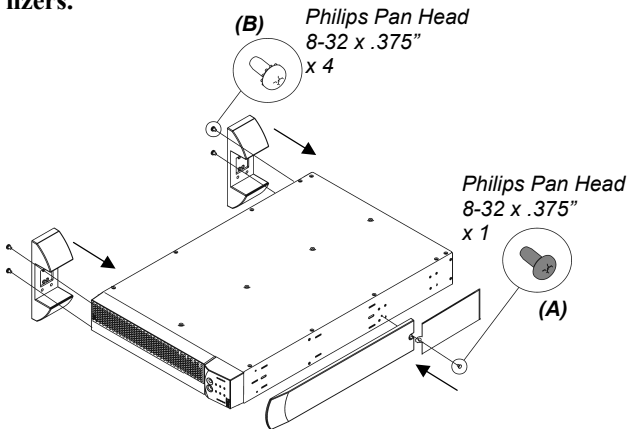
Step 4

Rotate and attach the display bezel.



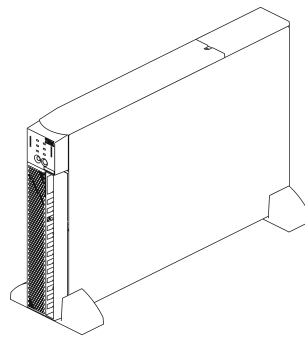
Step 5

Attach the top panels and mounting stabilizers.

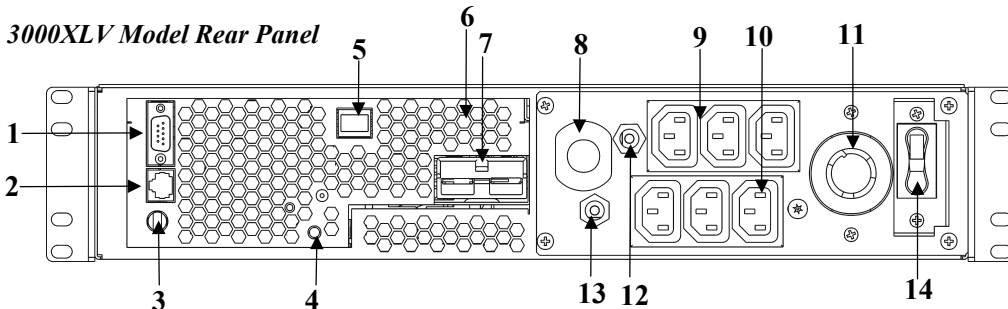


Step 6

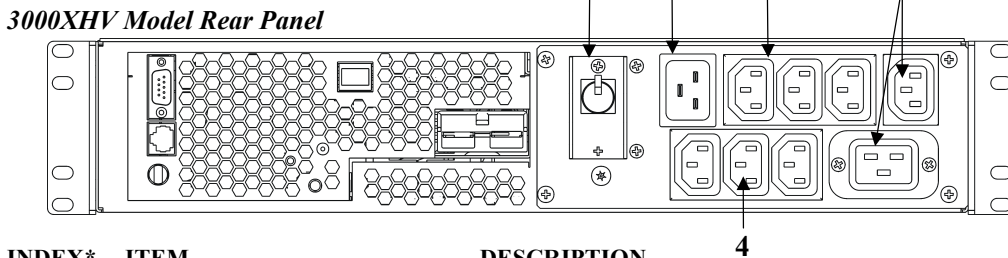
Rotate the unit to tower position.



Connecting Equipment and Power to the UPS



INDEX	ITEM	DESCRIPTION
1 & 2	Serial Port & USB Port	Power management software and interface kits can be used with the UPS. Use only interface kits supplied or approved by IBM. Use the supplied serial cable to connect to the serial port. DO NOT use a standard serial interface cable since it is incompatible with the UPS connector. Serial and USB ports cannot be used simultaneously.
3	Voltage Selection Switch	See <i>Setting the Nominal Voltage</i> .
4	Site Wiring Fault LED	See <i>Troubleshooting</i> .
5	Network Port	See <i>Quick Installation Guide</i> .
6	Network Reset Button	Reset the Embedded Network Module.
7	Extend Run Battery Pack Connector	See <i>Extend Run Battery Pack Operation and Setup Guide</i> .
8	Input Cord	See <i>Startup</i> .
9, 10 & 11	Outlet Banks 1, 2 & 3	Separate outlet banks are controlled by the Embedded Network Module. See <i>Embedded Network Module CD</i> .
12, 13 & 14	Circuit Breakers for Outlet Banks 1, 2 & 3	See <i>Troubleshooting</i> .



INDEX*	ITEM	DESCRIPTION
1	Input Circuit Breaker	See <i>Troubleshooting</i> .
2	Input Connector	See <i>Startup</i> .
3, 4 & 5	Outlet Banks 1, 2 & 3	Separate outlet banks are controlled by the Embedded Network Module. See <i>Embedded Network Module CD</i> .

*Exceptions from the 3000XLV are noted here.

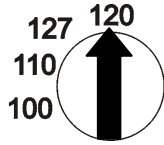
Setting the Nominal Voltage

Before the UPS is connected to utility power, select the appropriate voltage via the voltage selection switch, located on the rear panel. This will enable the UPS to start with the proper output voltage.

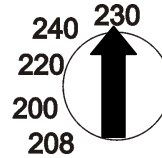
The 3000XLV UPS is able to output 100, 110, 120 and 127V; and the 3000XHV is able to output 200, 208, 220, 230 and 240V. To ensure that the UPS output is centered at or near a voltage that the user requires, set this selection switch appropriately. (Default voltages are pictured below.)

If this is not done *before* UPS startup, turn off the UPS, set voltage and restart. Loads connected beforehand might not have optimal voltage.

3000XLV Model



3000XHV Model



While operating on battery, the output voltage equals that of the actual voltage setting dialed. While operating online, the output voltage is regulated to a range around the nominal voltage. The upper and lower limits of this range can be user-configured through PowerChute. The input voltage range can vary while the UPS regulates output without going to battery, and is wider than the regulated output voltage because of the UPS regulating transformer.

Startup


1. Connect equipment to the UPS.

Note: A laser printer draws significantly more power than other types of equipment and may overload the UPS.

2. Using the supplied power cord, plug the UPS into a two-pole, three-wire, grounded receptacle only. Avoid using extension cords. **Upon utility power outlet connection, the UPS will automatically turn on.**

3000XLV: The power cord is permanently attached to the rear panel of the UPS. The input plug is a NEMA L5-30P.

3000XHV: The supplied power cord plugs into the rear panel of the UPS.

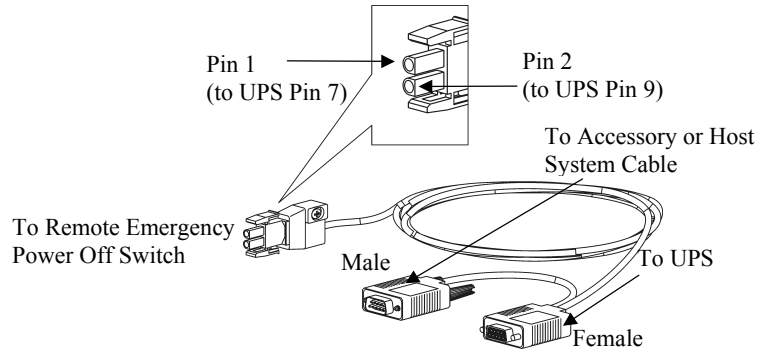
3. *3000XLV:* Check the *site wiring fault* LED  located on the rear panel. It will be illuminated if the UPS is plugged into an improperly wired utility power outlet (See *Troubleshooting*).
4. Turn on all connected equipment. To use the UPS as a master *on/off* switch, be sure all connected equipment is turned on.
5. For optimal computer system security, install PowerChute monitoring software onto all computers powered by the UPS.

Remote Emergency Power Off Switch

The UPS can be de-energized with a Remote Emergency Power Off Switch. These switches are installed in situations where, for safety reasons, power to the loads must be quickly disconnected.

An electrical connection between Pin 1 and Pin 2 will initiate an immediate Power Off of the UPS. The UPS will not restart until the connection is broken.

Note: Do not connect Pin 1 to any signal or chassis ground other than Pin 2. Unpredictable operation may result.

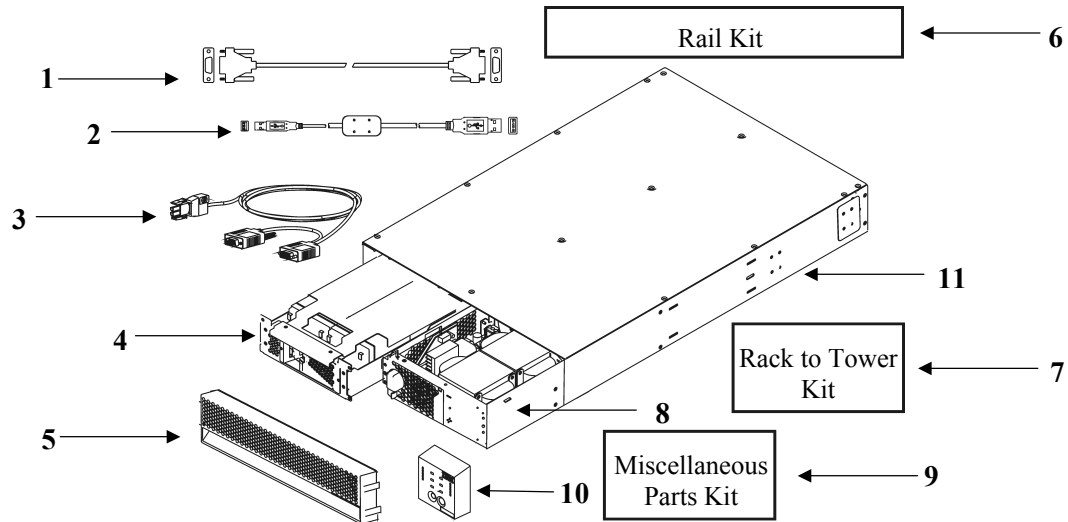


2: HARDWARE MAINTENANCE INFORMATION

This chapter contains information about IBM field replaceable unit (FRU) availability for the IBM UPS 3000XLV and IBM UPS 3000XHV.

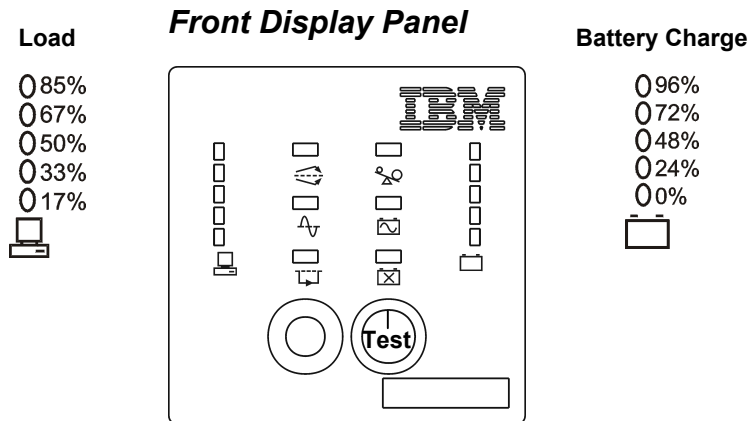
Field Replaceable Unit Part Numbers

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






Index	FRU Part #	Description
1	73P5767	Serial Cable
2	73P5766	USB Cable
3	73P5765	Remote Emergency Power Off Cable
4	32P1792	UPS Battery Module
5	32P1797	UPS Bezel
6	73P5769	Rail Kit
7	73P5768	Rack to Tower Kit
8	32P1794	High Voltage Power Processing Module
	32P1795	Low Voltage Power Processing Module
9	73P5770	Miscellaneous Parts Kit (hardware)
10	32P1796	Display Bezel
11	32P1789	Low Voltage UPS Chassis
	32P1790	High Voltage UPS Chassis


3: OPERATION



INDICATOR	DESCRIPTION
	This LED illuminates when the UPS is supplying utility power to the connected equipment. If not illuminated, the UPS is either not turned on, or is supplying battery power. When blinking, the UPS is running an internal self-test.
	This LED illuminates to indicate the UPS is compensating for either a high or low utility voltage.
<p>On Battery</p>	This LED illuminates when the UPS is supplying battery power to the connected equipment.
<p>Overload</p>	This LED illuminates when the connected loads are drawing more than the UPS power rating (see <i>Troubleshooting</i>).
<p>Bypass</p>	This LED illuminates to indicate that the loads are being powered directly by the utility power connection and not through the power processing module. This is a fault condition, which may be caused by an overload or a failure within the module (See <i>Troubleshooting</i>).
<p>Replace Battery/ Battery Disconnected</p>	<p>Failure of a battery self-test causes the UPS to emit short beeps for one minute and this LED to illuminate (see <i>Troubleshooting</i>).</p> <p>This LED also flashes and a short beep is emitted every two seconds to indicate when the battery is disconnected (see <i>Troubleshooting</i>).</p>
FEATURE	FUNCTION
<p>Power Off</p>	Press this button to turn off the UPS.

FEATURE	FUNCTION
Self-Test	<p>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.</p> <p>If the UPS fails the self-test, the <i>replace battery</i> LED illuminates 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>
Cold Start	When the UPS is off and there is no utility power, use the <i>cold start feature</i> to supply power to the connected equipment from the UPS battery module (See <i>Troubleshooting</i>).
Diagnostic Utility Voltage	<p>The UPS has a diagnostic feature that displays the utility voltage. Plug the UPS into the utility power outlet.</p> <p>The UPS 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 <i>Battery Charge</i>  display on the right of the front panel will show the utility input voltage.</p> <p>Refer to the figure at left for the voltage reading, corresponding to the configured nominal output voltage.</p> <p>The display indicates the voltage is between the displayed value on the list and the next higher value.</p> <p>If <i>three LEDs are illuminated</i>, the utility voltage is close to the nominal output voltage setting. If <i>no LEDs are illuminated</i> and the UPS is plugged into a properly functioning utility power outlet, the line voltage is extremely low. If <i>all five LEDs are illuminated</i>, make sure that the nominal voltage selection is correct. If <i>all LEDs remain illuminated</i>, the line voltage is extremely high and should be checked by an electrician.</p>


Maximum Power and VA Specifications

The UPS can supply up to its VA (Volt-Amps) or power (Watts) limits (whichever is higher for the connected load) of output power, before it enters an alarm state. When operating online, the alarm state will result in a continuous audible alarm and the *overload* LED  will be illuminated. However, when operating on battery, an overload condition might cause the load to be shut down immediately. The VA and power limits depend on the nominal voltage of the UPS.

UPS and Volt	Maximum Power Output	
	Volts x Amp	Watts
3000XLV 100V	2400	2400
3000XLV 110V	2600	2600
3000XLV 120V	2850	2850
3000XLV 127V	3000	2850
3000XHV 200-240V	3000	2850

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 UPS alarm. If the utility power does not return, the UPS 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 UPS fully discharges the battery.

Determining On Battery Runtime

The UPS battery charges when connected to utility power. The battery charges to 90% capacity during the first three hours of normal operation. (If additional batteries are connected, see *Battery Runtime Table* for corresponding recharge times). **Do not** expect full battery run capability during the initial charge period.

Battery Runtime Table

(gray= minutes; other= hours)

	Number of Battery Packs				
	Internal	+1	+2	+3	+4
90 W	4.2	18.5	30.5	43.2	55.9
190.0 W	2.3	8.2	15.2	20.5	26.5
290.0 W	1.5	4.6	9.0	13.9	18.1
380.0 W	57.0	3.0	6.9	9.5	13.6
570.0 W	36.8	2.5	3.8	6.4	8.5
760.0 W	24.8	2.1	2.8	4.2	6.2
950.0 W	17.0	1.7	2.6	3.0	4.4
1,140.0 W	13.4	1.2	2.3	2.8	3.2
1,330.0 W	11.3	57.0	2.1	2.6	2.9
1,520.0 W	8.6	51.2	1.8	2.4	2.7
1,710.0 W	7.0	45.5	1.5	2.2	2.6
1,900.0 W	6.3	39.7	1.3	2.0	2.5
2,090.0 W	5.6	33.9	1.0	1.9	2.3
2,280.0 W	4.9	29.3	57.0	1.7	2.2
2,470.0 W	4.4	27.0	53.6	1.5	2.0
2,700.0 W	4.0	25.1	48.3	1.1	1.7
2,850.0 W	3.4	22.6	46.9	1.1	1.8
	Number of Battery Packs				
	Internal	+1	+2	+3	+4
Recharge Hours*	3	9	15	22	28

*Recharge time is approximate time to 90% capacity from a complete discharge at a 50% load.

4: USER CONFIGURABLE ITEMS

NOTE: SETTINGS ARE MADE THROUGH THE SUPPLIED POWERCHUTE SOFTWARE OR THE NETWORK INTERFACE CONNECTION. REFER TO THE SOFTWARE HELP GUIDES FOR DETAILS.			
<i>FUNCTION</i>	<i>FACTORY DEFAULT</i>	<i>USER SELECTABLE CHOICES</i>	<i>DESCRIPTION</i>
Automatic Self-Test	Every 14 days (336 hours)	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.
UPS ID	UPS_IDEN	Up to eight characters	Use this field to uniquely identify the UPS, (i.e. server name or location) for network management purposes.
Date of Last Battery Replacement	Manufacture Date	mm/dd/yy	Reset this date when you replace the internal battery module.
Minimum Capacity Before Return from Shutdown	0 percent	0, 15, 30, 45, 60, 75, 90 percent	The UPS will charge its batteries to the specified percentage before it powers up connected equipment, following a low-battery shutdown.
Voltage Sensitivity	High	High, Medium, Low	The UPS detects and reacts to line voltage distortions by transferring to battery power to protect the connected equipment. When power quality is poor, the UPS may frequently transfer to battery power. If the connected equipment can operate normally under such line voltage conditions, reduce the sensitivity setting to conserve battery's capacity and service life.
Alarm Control	Enable	Enable, Mute, Disable	User can mute an ongoing alarm or disable all existing alarms permanently.
Shutdown Delay	90 seconds	90, 180, 270, 360, 450, 540, 630, 0 seconds	The interval is set between the times when the UPS receives a shutdown command and when it shuts off power to the outlets.
Low Battery Warning	2 minutes	2, 5, 8, 11, 14, 17, 20, 23 minutes	PowerChute software provides automatic, unattended shutdown when the remaining battery runtime matches this setting while on battery. Change the low battery warning interval default setting to the time that the operating system or system software requires to safely shut down.
Synchronized Turn-on Delay	0 seconds	0, 60, 120, 180, 240, 300, 360, 420 seconds	The UPS will wait the specified time after the return of utility power before turn-on (to avoid branch circuit overload).

**NOTE: SETTINGS ARE MADE THROUGH THE SUPPLIED POWERCHUTE SOFTWARE OR
THE NETWORK INTERFACE CONNECTION. REFER TO THE SOFTWARE HELP GUIDES FOR DETAILS.**

FUNCTION	FACTORY DEFAULT	USER SELECTABLE CHOICES	DESCRIPTION
High Transfer Point	<i>100V: 108VAC</i> <i>110V: 117VAC</i> <i>120V: 127VAC</i> <i>127V: 135VAC</i> <i>200V: 216VAC</i> <i>208V: 225VAC</i> <i>220V: 242VAC</i> <i>230V: 253VAC</i> <i>240V: 264VAC</i>	<i>100V: 108, 110, 112, 114VAC</i> <i>110V: 117, 119, 121, 123VAC</i> <i>120V: 127, 130, 133, 136VAC</i> <i>127V: 135, 138, 141, 144VAC</i> <i>200V: 216, 220, 224, 228VAC</i> <i>208V: 225, 229, 233, 237VAC</i> <i>220V: 242, 246, 250, 254VAC</i> <i>230V: 253, 257, 261, 265VAC</i> <i>240V: 264, 268, 272, 276VAC</i>	If the utility voltage is usually high and the connected equipment is specified to operate with input voltages this high, set the high transfer point higher to avoid unnecessary battery usage.
Low Transfer Point	<i>100V: 92VAC</i> <i>110V: 97VAC</i> <i>120V: 106VAC</i> <i>127V: 112VAC</i> <i>200V: 184VAC</i> <i>208V: 182VAC</i> <i>220V: 199VAC</i> <i>230V: 208VAC</i> <i>240V: 217VAC</i>	<i>100V: 92, 90, 88, 86VAC</i> <i>110V: 97, 95, 93, 91VAC</i> <i>120V: 106, 103, 100, 97VAC</i> <i>127V: 112, 109, 106, 103VAC</i> <i>200V: 184, 180, 176, 172VAC</i> <i>208V: 182, 178, 174, 170VAC</i> <i>220V: 199, 195, 191, 187VAC</i> <i>230V: 208, 204, 200, 196VAC</i> <i>240V: 217, 213, 209, 205VAC</i>	If the utility voltage is usually low and the connected equipment is specified to operate with input voltages this low, set the low transfer point lower.

5: STORAGE, MAINTENANCE, TRANSPORTING, AND SERVICE

Storage

Store the UPS covered 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

The UPS battery life differs based on usage and environment. Consider replacing the battery once every three years.


This UPS has an easy to replace, hot-swappable battery module. Replacement is a safe procedure, isolated from electrical hazards. You may leave the UPS and connected equipment on for the replacement procedure.

Note: Upon battery disconnection, connected equipment is not protected from power outages.

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

Refer to *Mounting the UPS in a Rack* (Step 3) for instructions on battery removal.

For replacement, refer to *Installing and Connecting the Battery and Attaching the Front Bezel*.

	Be sure to deliver the spent battery to a recycling facility or send it to IBM in the replacement battery packing material.
---	---

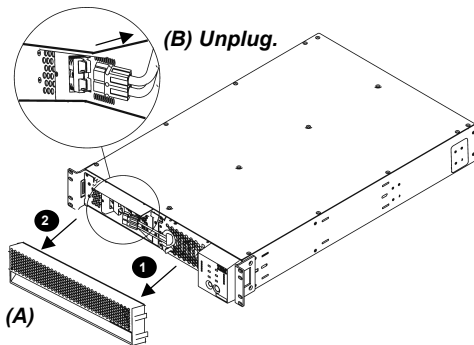
Replacing the Power Processing Module

The power processing module in this UPS can be replaced if it has failed.

Note: If swapped while the UPS is still connected to utility power, loads will remain on, but will be unprotected in the event of a power disturbance.

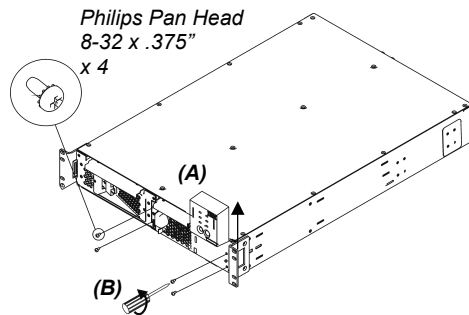
Step 1

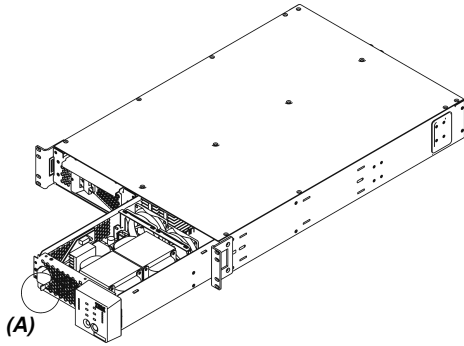
Remove the front bezel and disconnect the battery from the UPS.



Step 2

Remove the display bezel and the four screws attaching the power processing module.





Step 3: Press and hold the black switch (see **(A)** at left) to the right, while removing the power processing module.

Step 4: Reverse steps 1-3 for installation of the new module.

Upon installation, the UPS will automatically perform a self-test.

Disconnecting the Battery for Transport of the Whole UPS

1. Shut down and disconnect any equipment attached to the UPS.
2. Shut down the UPS, and disconnect the UPS input cord from the utility.
3. Remove the front bezel, and unplug the battery connector.

For shipping instructions and to obtain appropriate packing materials, contact IBM.

Service

If the UPS requires service do not return it. 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 IBM.
 - Note the model number of the UPS, the serial number, and the date purchased. If you call IBM Customer Service, a technician will ask you to describe the problem and try to solve it over the phone, if possible. If the UPS or one of its components is faulty, then IBM will send you a replacement FRU for the UPS or the component.
 - If the UPS or the component is under warranty, repairs are free. If not, there is a repair charge.
3. Pack the UPS or the faulty component in packaging sent by IBM, and use the return label to ship back to IBM. Pack the UPS 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 may remain in the UPS; it does not have to be removed.



6: TROUBLESHOOTING

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

PROBLEM AND/OR POSSIBLE CAUSE	SOLUTION
UPS WILL NOT TURN ON	
UPS not connected to utility power supply.	Check that the power cord from the UPS to the utility power supply is securely connected at both ends.
Battery not connected properly.	Check that the battery connector is fully snapped into position.
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	
The front display is not lit, yet the outlets are powered. The black switch is stuck in the off (<i>right</i>) position. In this position, the switch disables operation of the power module and power to the loads is bypassed around the power module.	Gently attempt to reposition the black switch to the <i>left</i> , and the module will be activated.
UPS BEEPS OCCASIONALLY	
Normal operating UPS beeps when running on battery.	None. The UPS is protecting the connected equipment from occasional utility power irregularities.
UPS IS NOT PROVIDING EXPECTED BACKUP TIME	
The UPS battery is weak due to a recent outage or is near the end of the 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 <i>replace battery</i> LED is not yet illuminated.
THE OUTPUT VOLTAGE IS NOT MEETING EXPECTATIONS	
The output voltage <i>on battery</i> is too low or too high.	Check that the voltage selection rotary switch is set to the desired level (See <i>Installation</i>). <i>Note: In order to register any modification in voltage selection, the UPS must be turned off and then on again.</i>
The output voltage <i>online</i> is too high or too low.	The UPS allows a certain range of output voltage to be filtered from the input before it goes to battery. If this range is too wide for the load equipment, the upper and lower limits can be customized (through software) to your application.

PROBLEM AND/OR POSSIBLE CAUSE	SOLUTION
NOT ALL OUTLETS ARE POWERED	
One or more of the outlet groups (labeled '1', '2', and '3') are shut off via the network interface connection.	Access the UPS control panel via the network interface connection and check the status of the outlets. If the settings are not what are expected, change them accordingly and review security settings (password, etc.).
<i>3000XLV only:</i> One or more of the outlet groups are overloaded and the circuit breaker(s) tripped.	The three outlet groups are individually protected by circuit breakers, in some cases lower than the overall limit of the UPS. If any one of these has tripped, reduce the load and/or distribute appropriately among the outlet groups and reset the breaker.
RUNTIME IS SUFFICIENT, BUT THE LOW BATTERY WARNING INTERVAL IS LONGER THAN EXPECTED	
The UPS perceives there are fewer batteries than are connected and provides too much warning time.	Configure the UPS via PowerChute to register the number of external battery packs connected (See <i>User Configurable Items</i>).
The configured low battery warning interval is longer than necessary or expected.	Configure the UPS via PowerChute to provide an adequate low battery warning interval (See <i>User Configurable Items</i>).
THE LEDS IN THE BATTERY BAR GRAPH ARE BLINKING TOGETHER	
While <i>online</i> or <i>on battery</i> , the expected remaining runtime is lower than the configured low battery warning interval. <i>Note: The number of blinking LEDs still indicates the relative state of charge of the connected batteries.</i>	If the runtime is too short for a graceful shutdown of the connected equipment, additional battery packs must be connected. If the low battery warning interval is longer than required for a graceful shutdown, configure it appropriately via PowerChute.
The battery runtime meter has fallen out of calibration and needs to be recalibrated.	Program the UPS via PowerChute to conduct a runtime calibration test.
ALL LEDS ARE ILLUMINATED AND THE UPS EMITS A CONSTANT BEEPING	
Internal UPS fault.	Do not attempt to use the UPS. Replace the power processing module (See <i>Storage, Maintenance, Transporting, and Service</i>).
FRONT PANEL LEDS FLASH SEQUENTIALLY	
The UPS has been shut down remotely through software or network interface connection.	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 or the battery is discharged from an extended outage.	None. The UPS will return to normal operation when the power is restored and the battery has a sufficient charge.

PROBLEM AND/OR POSSIBLE CAUSE	SOLUTION
THE OVERLOAD LED IS ILLUMINATED AND THE UPS EMITS A SUSTAINED ALARM TONE	
The UPS is overloaded. The connected equipment is drawing more VA or more Watts than the UPS 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 UPS to eliminate the overload.</p> <p>The UPS continues to supply power as long as it is online and the circuit breaker does not trip; the UPS will not provide power from batteries in the event of a utility voltage interruption.</p> <p>If a continuous overload occurs while the UPS is on battery, the unit turns off output in order to protect the UPS from possible damage.</p> <p>(See Maximum Power and VA Specifications)</p>
The condition persists for a few seconds, stops and then repeats approximately every minute.	Equipment such as laser printers draw a great amount of power in short bursts periodically. For instance, laser printers commonly draw nearly 1000W of power (varies among different printers) for a few seconds, the draw will then stop, only to resume seconds later. The UPS is then subjected to periodic high power draws, and will be briefly overloaded. If the UPS must power a laser printer, be sure the UPS can meet the maximum draw of the laser printer.
THE REPLACE BATTERY LED IS ILLUMINATED	
<i>Replace battery</i> 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 clears if the battery passes the self-test.
THE SITE WIRING FAULT LED ON THE REAR PANEL IS ILLUMINATED (3000XLV ONLY)	
The UPS is plugged into an improperly wired utility power outlet.	<p>Wiring faults detected include missing ground, hot-neutral polarity reversal, and overloaded neutral circuit.</p> <p>Contact a qualified electrician to correct the building wiring.</p>
THE INPUT CIRCUIT BREAKER HAS TRIPPED (3000XHV ONLY)	
The circuit breaker switches off.	Reduce the load on the UPS by unplugging equipment. Reset the breaker.
THE AVR LED IS ILLUMINATED	
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.

PROBLEM AND/OR POSSIBLE CAUSE	SOLUTION
THE BYPASS LED IS ILLUMINATED	
The UPS has briefly directed power around the power processing module during a startup sequence.	Nothing. This is a normal behavior of the UPS during startup.
The UPS has directed power around the power processing module because too much load was placed on the UPS.	Check the PowerChute log file to confirm that an overload condition has occurred. Reduce the load on the UPS and restart the UPS.
The UPS has directed power around the power processing module because of an internal fault.	Replace the power processing module (See <i>Storage, Maintenance, Transporting, and Service</i>).
THERE IS NO UTILITY POWER	
There is no utility power and the UPS is off.	<p>Use the Cold Start feature to supply power to the connected equipment from the UPS battery.</p> <p>Press the  button for one second and release. The UPS will beep briefly and go quiet. Press and hold the  button again, but for about three seconds. The unit will emit a sustained beep. Release the button during this beep. This will supply immediate power to the UPS and the connected equipment.</p>
UPS OPERATES ON BATTERY ALTHOUGH NORMAL LINE VOLTAGE EXISTS	
3000XHV only: UPS input circuit breaker tripped.	To reduce the load on the UPS, unplug equipment and reset the circuit breaker.
Very high, low, or distorted line voltage.	Move the UPS to a different outlet on a different circuit, as inexpensive fuel powered generators may distort the voltage. Test the input voltage with the utility voltage display (see <i>Operation</i>). 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.	<p>Check that the room temperature is within the specified limits for operation.</p> <p>Check that the UPS is properly installed, allowing for adequate ventilation.</p> <p>Allow the UPS to cool down. Restart the UPS. If the problem continues, contact IBM.</p>

7: RADIO FREQUENCY WARNINGS, NOTICES, AND TRADEMARKS

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. IBM is not responsible for any radio or television interference caused 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 classe A est conforme à la norme NMB-003 du Canada.

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.

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.

Taiwan electronic emission statement

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，在這種情形下，使用者會被要求採取某些適當的對策。

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

Technology Equipment (VCCI) Class A ITE for Regular Members.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

General Notices

This publication was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:
IBM Director of Licensing, IBM Corporation, North Castle Drive, Armonk, NY 10504-1785, U.S.A.

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions; therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this publication to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product, and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

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 UPS 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.

Edition notice

© Copyright International Business Machines Corporation, 2002. All rights reserved.

Note to U.S. Government Users – Documentation related to restricted rights – Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract with IBM Corp.

Trademarks

IBM is trademark of International Business Machines Corporation in the United States, other countries, or both.

APC, Smart-UPS, and PowerChute are registered trademarks of American Power Conversion Corporation. Other company, product, or service names may be the trademarks or service marks of others.