IBM

®

**IBM 3U Extend Run Battery Pack
Operation and Setup Guide**

TABLE OF CONTENTS

Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الآمنية

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 pečítaje 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.

Important:

Each caution and danger statement in this document is labeled with a number. This number is used to cross reference an English-language caution or danger statement with translated versions of the caution or danger statement in the *Systems Safety Notices* document.

For example, if a caution statement is labeled "D005," translations for that caution statement are in the *Systems Safety Notices* document under "D005."

Be sure to read all caution and danger statements in this document before you perform the procedures. Read any additional safety information that comes with the server or optional device before you install the device.

DANGER

Hazardous voltage, current, or energy levels are present inside any component that has this label attached. Do not open any cover or barrier that contains this label.

(L001)

DANGER

To prevent a possible shock from touching two surfaces with different protective ground (earth), use one hand, when possible, to connect or disconnect signal cables. (D001)

DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.

- Do not open or service any power supply assembly.

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.

- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.

- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.

- Connect any equipment that will be attached to this product to properly wired outlets.

- 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 procedures when installing, moving, or opening covers on this product or attached devices.

To disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices.

To connect:

5. Turn off everything (unless instructed otherwise).
6. Attach all cables to the devices.
7. Attach the signal cables to the connectors.
8. Attach the power cords to the outlets.
9. Turn on the devices.

(D005)

DANGER

Uninterruptible power supply (UPS) units contain specific hazardous materials. Observe the following precautions if your product contains a UPS:

- The UPS contains lethal voltages. All repairs and service must be performed only by an authorized service support representative. There are no user serviceable parts inside the UPS.

- The UPS contains its own energy source (batteries). The output receptacles might carry live voltage even when the UPS is not connected to an AC supply.

- Do not remove or unplug the input cord when the UPS is turned on. This removes the safety ground from the UPS and the equipment connected to the UPS.

- The UPS is heavy because of the electronics and batteries that are required. To avoid injury, observe the following precautions:
  - Do not attempt to lift the UPS by yourself. Ask another service representative for assistance.
  - Remove the battery, electronics assembly, or both from the UPS before removing the UPS from the shipping carton or installing or removing the UPS in the rack. (D007)

CAUTION

Energy hazard present. Shorting might result in system outage and possible physical injury.
Remove all metallic jewelry before servicing. (C001)

CAUTION

Lead-acid batteries can present a risk of electrical burn from high, short-circuit current. Avoid battery contact with metal materials; remove watches, rings, or other metal objects, and use tools with insulated handles. To avoid possible explosion, do not burn.

Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations. In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (C004)

 or >32 kg (70.5 lb) or 32-55 kg (70.5-121.2 lb)

CAUTION

The weight of this part or unit is between 32 and 55 kg (70.5 and 121.2 lb). It takes three persons to safely lift this unit. (C010)

CAUTION

To avoid personal injury, before lifting this unit, remove all appropriate subassemblies per instructions to reduce the system weight. (C012)

1:   OVERVIEW

Introduction

The IBM® 3U Extend Run Battery Pack, for use with the IBM *5000XHV, 7500XHV* and *UPS 10000XHV* uninterruptible power supplies, provides extended load protection and extra security during the uninterruptible power supply battery replacement.

The IBM *5000XHV, 7500XHV* and *10000XHV* each support up to four 3U extend run battery packs. Extend run battery packs are intended for either tower or rack-mount configuration. The *7500XHV* and *10000XHV* units are intended for rack-mount and tower configurations. The IBM *5000XHV* is intended for rack-mount configuration only.

Battery pack connectors on the IBM *7500XHV* and *10000XHV* are color-coded and keyed to prevent improper connection.

Battery pack connectors on the IBM *5000XHV* are not color-coded or keyed. Refer to the *Connecting Extend Run Battery Packs to the Uninterruptible Power Supply* section in this manual.

Refer to the *Service* section in the *Uninterruptible Power Supply Operation and Setup Guide* for battery replacement and service information.

Attention:

- Read the Safety Instructions before installing the battery pack.
- The uninterruptible power supply and battery modules are heavy. Select a location sturdy enough to handle the weight.
- Refer to the *Service* section in this manual for information on how to obtain service and support for the unit.

Note: Illustrations in this document might vary in appearance from the purchased unit.

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

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

The following tools will be needed for installing the extend run battery pack:

- Utility knife or scissors
- Two Phillips screwdrivers (#1 and #2)
- One wrench (10mm)
- Cage nut insertion tool or flat-blade screwdriver (for installing cage nuts in some rack cabinets)

Inventory

- Extend run battery pack
- Front bezel
- Tower to Rack-mount conversion kit
- Accessary kit containing:
  - Quick Installation Guide
  - Documentation CD
  - Warranty Flyer
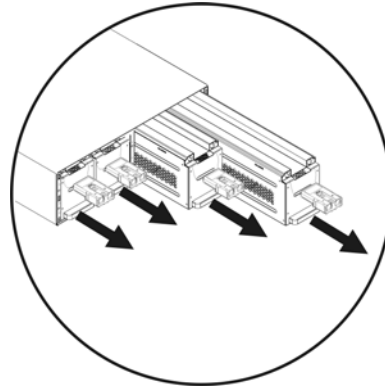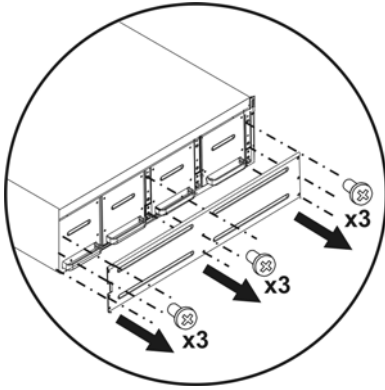 - Rack-mount brackets
  - Hardware

2: INSTALLATION

DANGER

Energy hazard present. Shorting might result in system outage and possible physical injury.
Remove all metallic jelewlry before servicing. (C001)

Removing the Battery Modules

The battery pack is heavy. Remove the battery modules to lighten the weight of the unit.

❶ Remove the nine screws that secure the battery compartment door.
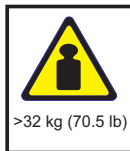
❷ Remove the battery modules.

Specifications

|			
Temperature	**Operation**	0° to 40° C (32° to 104° F)	This unit is intended for indoor use only. Select a location sturdy enough to handle the weight.
	Storage	-15° to 30° C (5° to 86° F) charge the UPS battery every six months	Do not operate the unit where there is excessive dust or the temperature and humidity are outside the specified limits.
		30° to 45° C (86° to 113° F) charge the UPS battery every three months	
Maximum Elevation	**Operating**	3,000 m (10,000 ft)	**Be sure that the air vents on the front and rear of the unit are not blocked. Allow adequate space for proper ventilation.**
	Storage	15,000 m (50,000 ft)	
Humidity		0 to 95% relative humidity	Environmental factors impact battery life. High temperatures, poor utility power, and frequent, short duration discharges will shorten battery life.

or   >32 kg (70.5 lb)   or   32-55 kg (70.5-121.2 lb)

CAUTION

The weight of this part or unit is between 32 and 55 kg (70.5 and 121.2 lb). It takes three persons to safely lift this unit. (C010)

Installing the Battery Pack in a Rack

❶ Secure the rack-mount brackets to the battery pack.
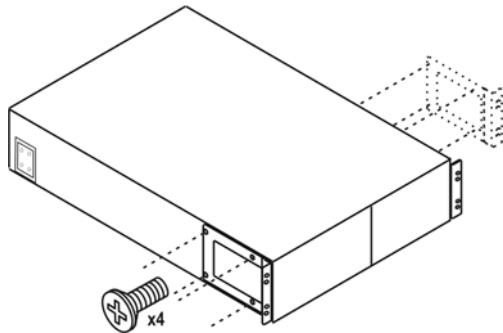
❷ Refer to the instruction sheet included in the rail kit for rail installation details. Refer to the diagram below for cage nut (clip nut) installation. The solid squares indicate the cage nut (clip nut) locations. Install the uninterruptible power supply at the bottom of the rack. **Note:** The battery packs must be mounted below the uninterruptible power supply.
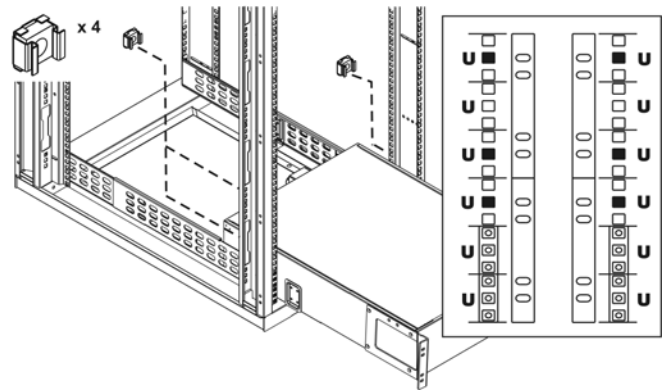
❸ Secure the uninterruptible power supply in the rack using four Phillips hex screws.
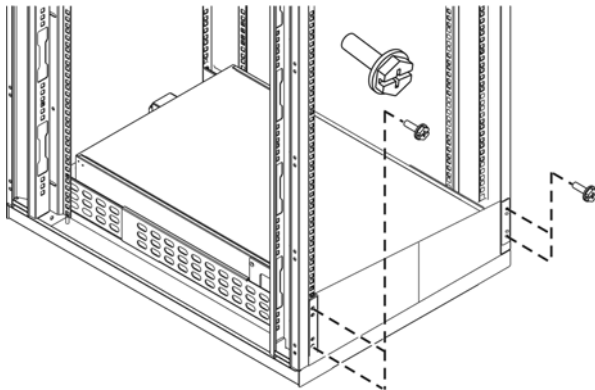
Connecting the Extend Run Battery Packs to the Uninterruptible Power Supply

CAUTION

Energy hazard present. Shorting might result in system outage and possible physical injury.
Remove all metallic jewelry before servicing. (C001)

To configure the uninterruptible power supply to recognize the battery packs, refer to *Settting the Uninterruptible Power Supply to Recognize the Battery Packs through Terminal Mode* in this manual.

Rack-Mount Configuration

Connecting a single extend run battery pack to the uninterruptible power supply

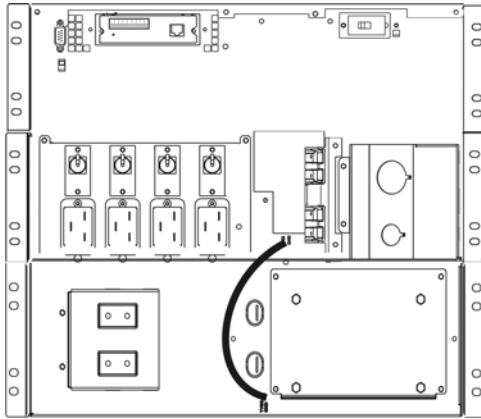❶ Locate the TVSS GND screw on the rear panel of the uninterruptible power supply and on the rear panel of each extend run battery pack.

Locate the green/yellow ground wire secured to the rear panel of each extend run battery pack.

Connect the ground wire to the TVSS GND screw as shown in the diagrams below.

IBM7500/10000XHV   IBM5000XHV

❷ Locate the battery pack connectors on the rear panel of the uninterruptible power supply and the extend run battery pack.

IBM7500/10000XHV   IBM5000XHV

NOTE: The connectors on the 7500/1000XHV models are color coded and keyed to ensure proper battery pack connection.

NOTE: The connectors on the 5000XHV models must be connected exactly as depicted in the diagram to ensure proper battery pack connection. The top connector on the battery pack must be plugged into the top connector on the uninterruptible power supply.

5000XHV models only: There is a cover over the battery connector on the uninterruptible power supply. Remove the screw that secures the cover and remove the cover.

Connecting multiple extend run battery packs to the uninterruptible power supply

❶ Locate the TVSS GND screw on the rear panel of the uninterruptible power supply and on the rear panel of each extend run battery pack.
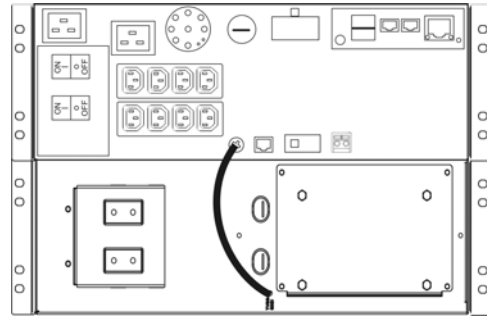
Locate the green/yellow ground wire secured to the rear panel of each extend run battery pack.

Connect the ground wire to the TVSS GND screw as shown in the diagrams below.
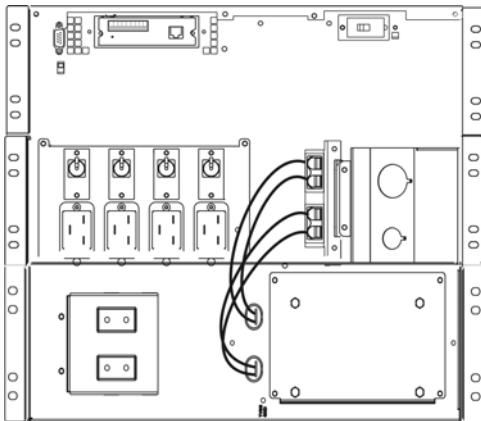
IBM7500/10000XHV

IBM5000XHV

❷ Locate the battery pack connectors on the rear panel of the uninterruptible power supply and the extend run battery pack.
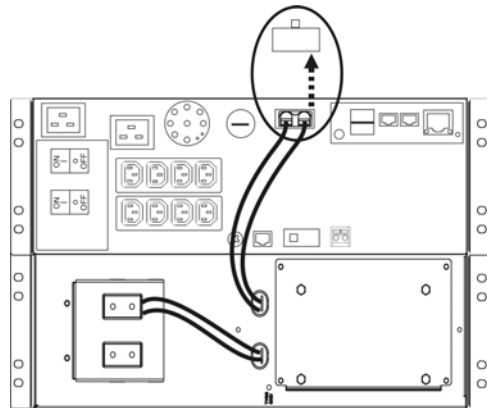
IBM7500/10000XHV

IBM5000XHV

NOTE: The connectors on the 7500/1000XHV models are color coded and keyed to ensure proper battery pack connection.

NOTE: The connectors on the 5000XHV models must be connected exactly as depicted in the diagram to ensure proper battery pack connection. The top connector on the battery pack must be plugged into the top connector on the uninterruptible power supply.

5000XHV models only: There is a cover over the battery connector on the uninterruptible power supply. Remove the screw that secures the cover and remove the cover.

Installing and Connecting the Batteries and Attaching the Bezel

❶ Reinstall all of the battery modules.
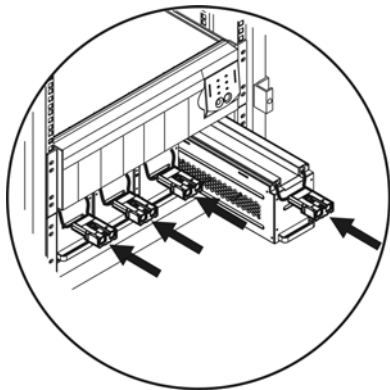
❷ Connect all of the battery modules.
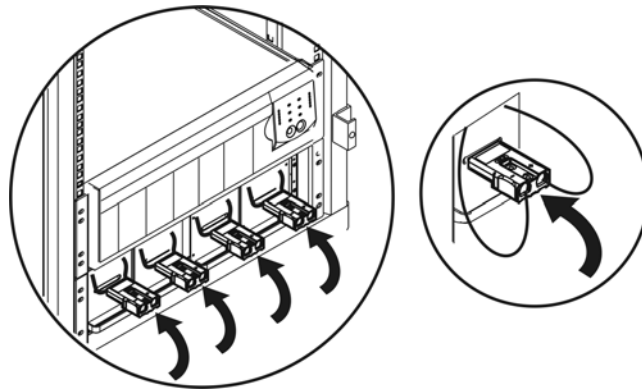
❺ Secure the battery compartment door using all nine screws. Be sure the battery cables are positioned so that they are not pinched.

x3
x3
x3
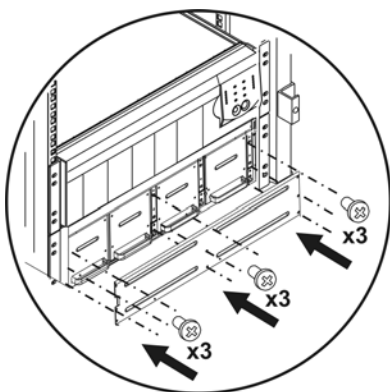
❻ Attach the bezel.

Tower Configuration 7500XHV/10000XHV models only

Before converting to tower configuration, remove the battery modules. Refer to *Removing the Battery Modules* in this manual.

Note: The external battery packs must be installed to the right of the uninterruptible power supply when facing the front of the units.

❶ Remove the rail guides.
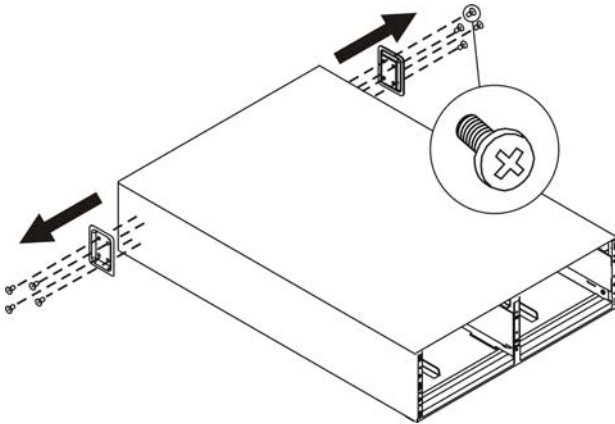
❷ Install the top tie bracket.

**Phillips Pan Head
10-32 x .500"
x 2**
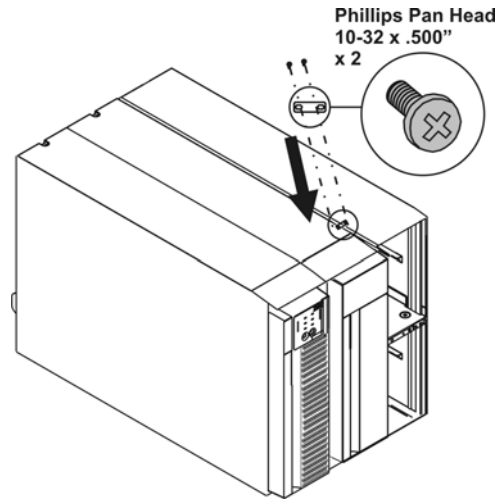
❸ Install the rear panel tie brackets. Note: Tie brackets on the center battery pack share a common screw.
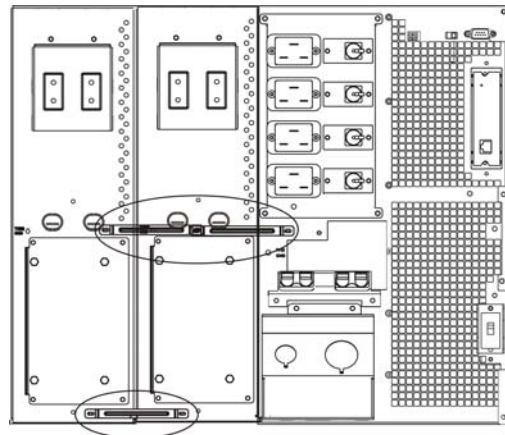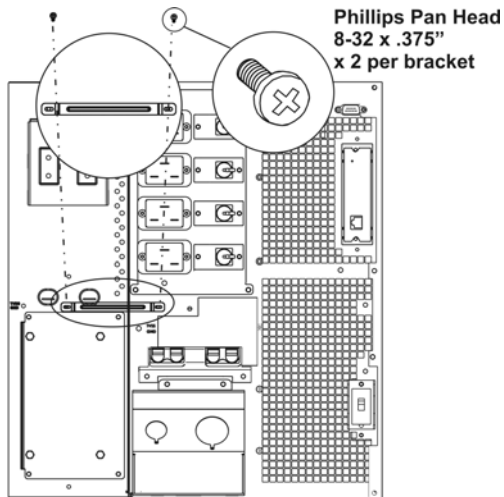
**Phillips Pan Head
8-32 x .375"
x 2 per bracket**

11

❹ Locate the TVSS GND screw on the rear panel of the uninterruptible power supply and on the rear panel of each extend run battery pack.
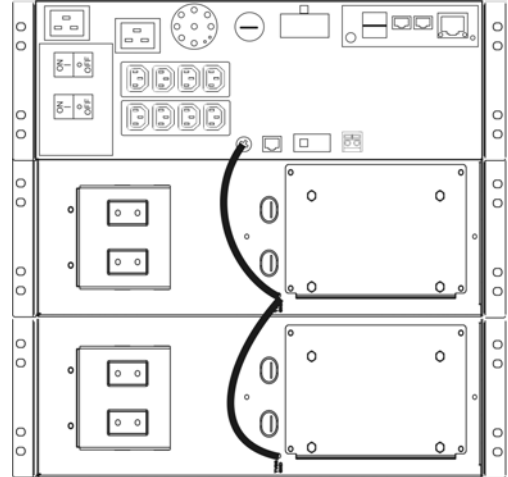
Locate the green/yellow ground wire secured to the rear panel of each extend run battery pack.

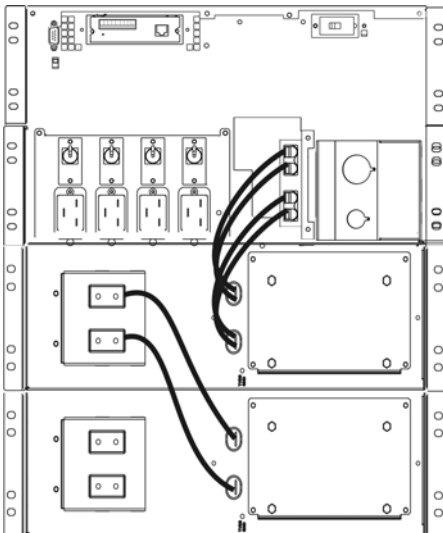Connect the ground wire to the TVSS GND screw as shown in the diagrams below. For multiple battery packs, connect the wire to the TVSS screw on the nearest battery pack.
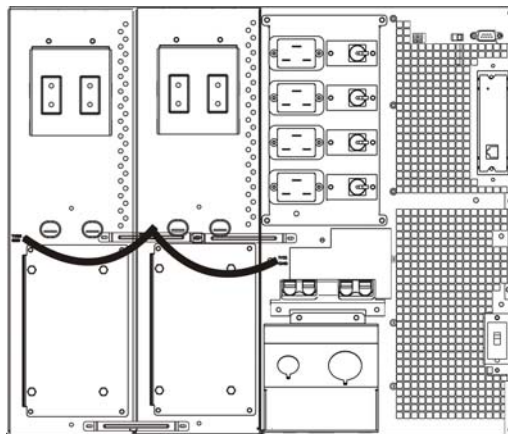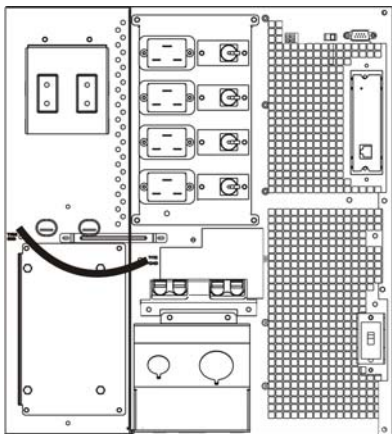
❺ Locate the battery pack connectors on the rear panel of the uninterruptible power supply and the extend run battery pack.
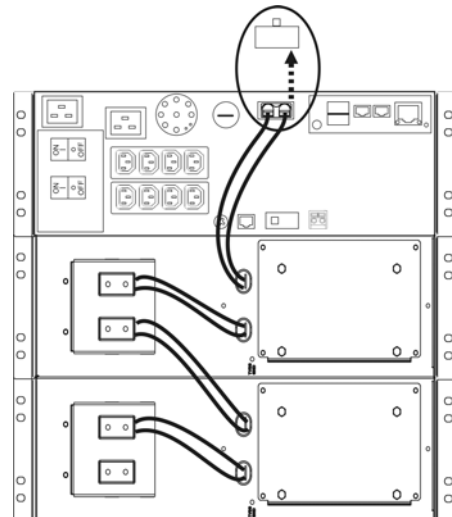
NOTE: The connectors on the 7500XHV/1000XHV models are color coded and keyed to ensure proper battery pack connection.


❻ Install the top panel.

Phillips Pan Head
8-32 x .375"
x 1
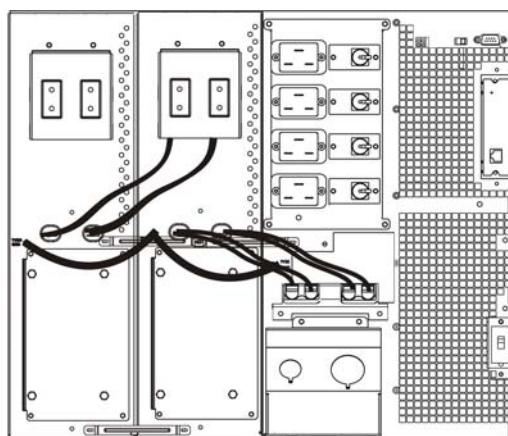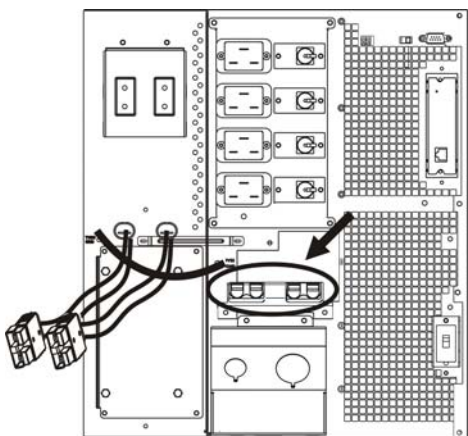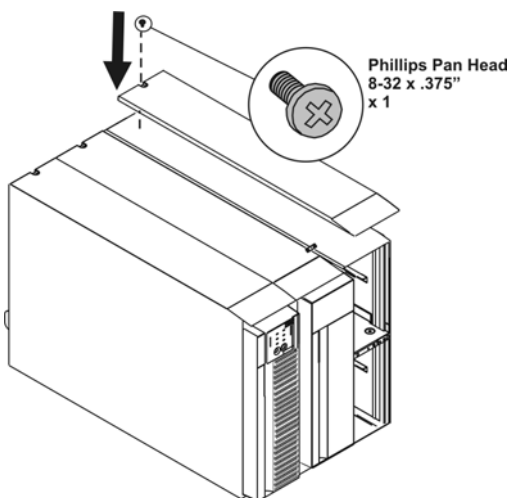
Installing and Connecting the Battery Modules and Attaching the Bezel

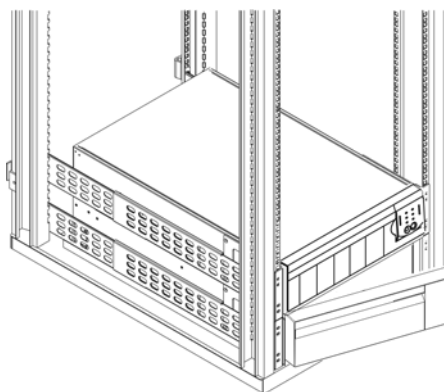❶ Reinstall all battery modules. Install the bottom battery module first.
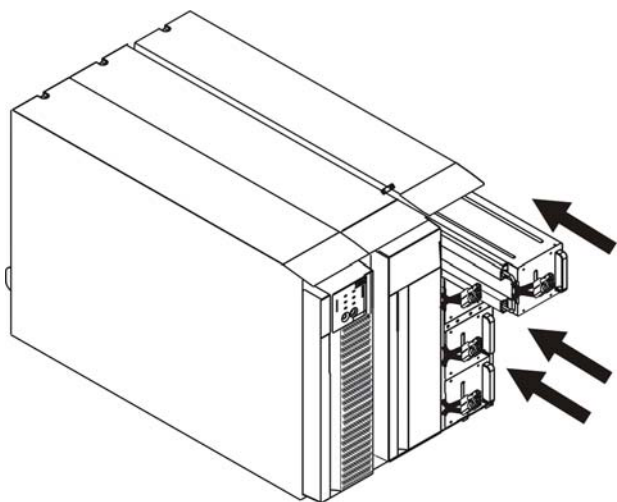
❷ Connect all of the battery modules.
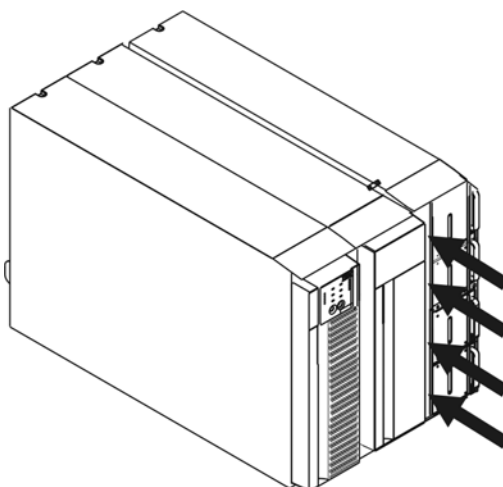
❸ Secure the battery compartment door using all nine screws. Be sure the battery cables are positioned so that they are not pinched.

Phillips Pan Head
8-32 x .375"
x 9
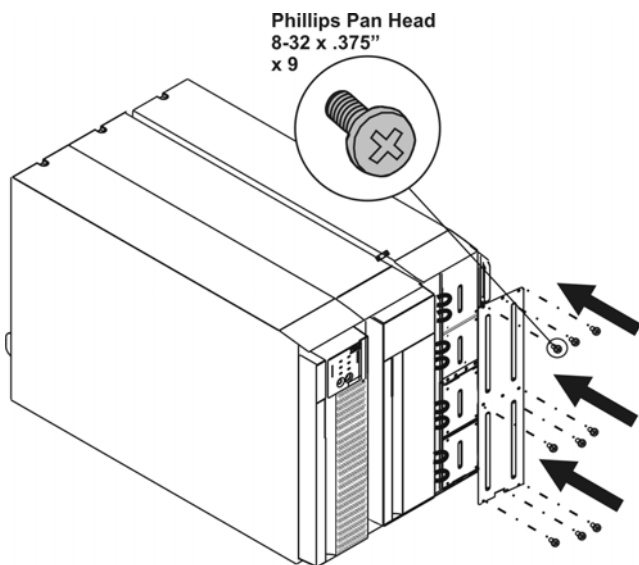
❹ Attach the bezel.
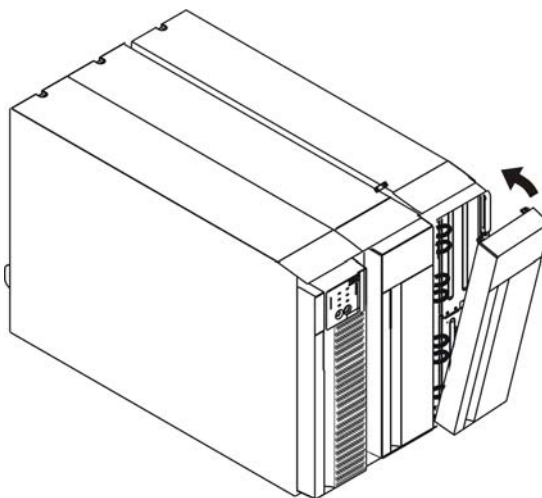
3: CONFIGURATION

Detmining On Battery Runtime

The battery pack charges when connected to an uninterruptible power supply. Refer to the battery runtime tables for corresponding recharge times. Do not expect full battery run capability during the initial charge period.

Battery Runtime Tables

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

5000XHV model:

Load (W)	Number of Battery Packs			
	Internal	+1	+2	+4
50	6:49	18:03	31:32	59:56
100	4:50	12:51	22:29	42:46
200	3:00	8:03	14:06	26:50
300	2:09	5:47	10:10	19:22
400	1:39	4:30	7:54	15:04
500	1:20	3:39	6:26	12:17
600	1:07	3:04	5:24	10:20
700	0:57	2:38	4:39	8:54
800	0:50	2:18	4:04	7:48
900	0:44	2:02	3:37	6:56
1000	0:39	1:50	3:15	6:14
1200	0:32	1:30	2:41	5:11
1400	0:26	1:16	2:17	4:25
1600	0:22	1:06	1:59	3:50
1800	0:19	0:58	1:45	3:23
2000	0:17	0:52	1:33	3:01
2500	0:12	0:40	1:13	2:22
3000	0:09	0:32	1:00	1:57
3400	0:08	0:25	0:50	1:40
4000	0:06	0:23	0:43	1:25
4500	0:05	0:20	0:38	1:15
Recharge Hours	3	9	15	27

7500XHV model:

Load (W)	Number of Battery Packs			
	Internal	+1	+2	+4
50	7.33	13.49	21.30	37.40
100	6.00	10.55	17.03	29.49
200	4.09	7.39	11.55	20.54
300	3.09	5.49	9.06	16.00
400	2.30	4.40	7.21	12.53
500	2.06	3.54	6.07	10.45
600	1.80	3.33	5.25	9.23
700	1.33	2.54	4.31	8.00
800	1.22	2.336	4.00	7.01
900	1.13	2.18	3.36	6.22
1000	1.06	2.04	3.16	5.46
1200	0.55	1.43	2.44	4.49
1400	0.47	1.30	2.21	4.09
1600	0.41	1.16	2.03	3.37
1800	0.36	1.07	1.48	3.13
2000	0.32	1.00	1.36	2.54
2500	0.24	0.48	1.16	2.16
3000	0.17	0.39	1.03	1.52
3400	0.17	0.34	0.55	1.39
4000	0.13	0.28	0.46	1.21
5000	0.10	0.21	0.35	1.03
6000	0.07	0.16	0.28	0.52
Recharge Hours	3	7	10	17

10000XHV model:

Load (W)	Number of Battery Packs			
	Internal	+1	+2	+4
50	7.33	13.49	21.33	37.40
100	6.00	10.55	17.03	29.49
200	4.09	7.39	11.55	20.54
300	3.09	5.49	9.06	16.00
400	2.33	4.40	7.21	12.52
500	2.06	3.54	6.07	10.45
600	1.48	3.19	5. 14	9.12
700	1.33	2.54	4.33	8.01
800	1.22	2.33	4.03	7.06
900	1.13	2.18	3.36	6.22
1000	1.09	2.04	3.16	5.46
1200	0.55	1.43	2.43	4.51
1400	0.47	1.30	2.21	4.09
1600	0.41	1.16	2.03	3.37
1800	0.36	1.07	1.48	3.13
2000	0.32	1.00	1.36	2.54
2500	0.24	0.48	1.16	2.16
3000	0.19	0.39	1.03	1.52
3400	0.17	0.34	0.55	1.39
4000	0.13	0.28	0.46	1.21
5000	0.10	0.21	0.35	1.03
6000	0.07	0.16	0.28	0.52
7000	0.05	0.13	0.23	0.44
8000	0.04	0.11	0.20	0.37
Recharge Hours	3	7	10	17

Configure the Uninterruptible Power Supply
to Recognize the Battery Packs Through Terminal Mode

The uninterruptible power supply must be configured to recognize the number of connected external battery packs. Configuration is done through the supplied PowerChute® software, or through terminal mode. Terminal Mode is a menu driven interface that enables enhanced configuration of the uninterruptible power supply through a serial connection.

5000XHV models only:
Connect the serial cable to the serial port on the rear side of the uninterruptible power supply.

1. When using the PowerChute® Business Edition or Network Shutdown software, stop the PowerChute Business Edition agent and server services using the following steps:

   a. From the desktop, click **Start**=> **Settings**=> **Control Panel**=> **Administrative Tools**=> **Services**.

   b. Select **PCBE Server** and **PCBE Agent** or **APC PBE Agent**, then, right click the mouse and select **Stop**.

2. The Network Management Card (NMC) is factory installed in the IBM 5000XHV SmartSlot located on the rear panel. The NMC must be removed from the SmartSlot prior to uninterruptible power supply terminal mode configuration.
   Remove the two screws that secure the NMC to the uninterruptible power supply chassis. Carefully remove the NMC.

3. Open a terminal program, for example HyperTerminal.

   From the desktop, click **Start** => **Programs** => **Accessories** => **Communication** =>**HyperTerminal.**

4. 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 the uninterruptible power supply. The port settings are:

      ✓ **bits per second - 9600**

      ✓ **data - bits 8**

      ✓ **parity - none**

      ✓ **stop bit - 1**

      ✓ **flow control - none**

   c. Click Enter.

5. Once the blank terminal window is open, follow these steps to configure the output voltage:

   a. Press **Enter** to initiate terminal mode.

   b. Press **1** to select uninterruptible power supply **Settings**.
      Wait for the uninterruptible power supply **Settings** menu to appear on the screen.

   c. Press **D** to select **Number of External Battery Packs**.

   d. Select the number external battery packs connected to the uninterruptible power supply, then press **Y** to confirm.

   f. Press **Esc** multiple times until logged out.

6. Reinstall the NMC using the two screws previously removed.

7. Start the PowerChute Business Edition agent and server services using the following steps:

   a. From the desktop, click **Start**=> **Settings**=> **Control Panel**=> **Administrative Tools**=> **Services**.

   b. Select **PCBE Server** and **PCBE Agent** or **APC PBE Agent**; then, right click the mouse and select **Start**.

7500/10000XHV models only:

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

When using PowerChute® Network Shutdown software:

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. To set the number of external battery packs (IBM 3U Extend Run Battery Packs):

   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 model by entering the corresponding number, then press Enter.

   c. Press 3 and Enter to select **Configuration**.

   d. Press 1 and Enter to select **Battery**.

   e. Press 2 and Enter to change the **Battery Settings**.

      Type in the number of external battery packs (four battery modules per pack), then press Enter. (Number of packs: 1= internal battery module, 2 = 1 IBM 3U Extend Run Battery Pack, 3 = 2 IBM 3U Extend Run Battery Packs, etc.)

   f. Press 3 and Enter to **Accept Changes**.

   g. Press Esc multiple times to return to the main menu.

   h. Press 4 and Enter to log out.

4: HARDWARE MAINTENANCE INFORMATION

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.
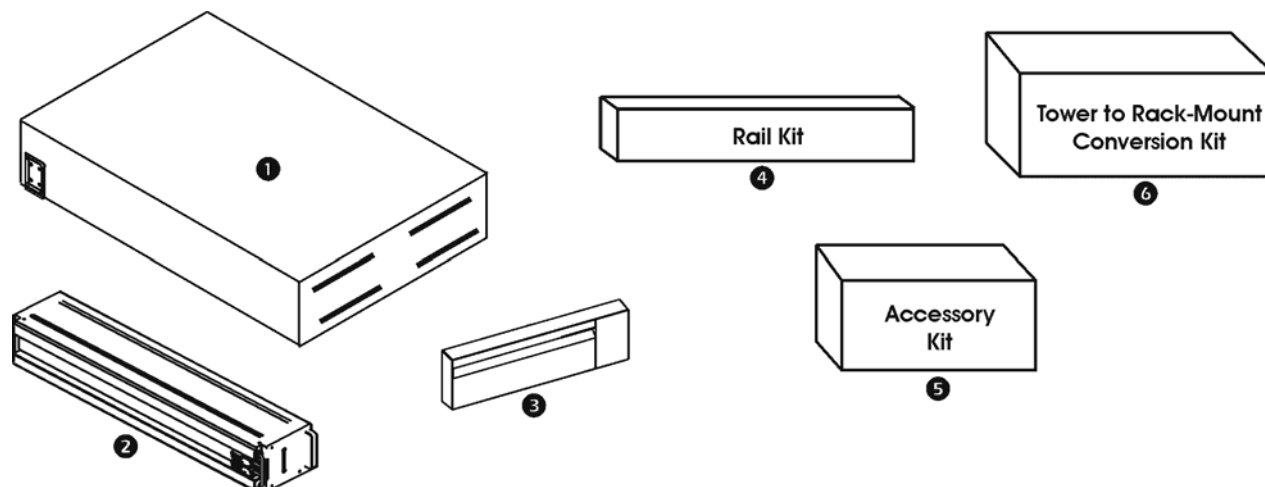
INDEX	CRU PART #	DESCRIPTION
❶	25R5588	Extend Run Battery Pack Chassis
❷	46M5386	Replacement Battery Module
❸	25R5995	Front Bezel
❹	73P5769	Rail Kit
❺	25R5600	Accessory Kit
❻	25R5597	Rack-to-Tower Conversion Kit

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:	GETTING HELP AND TECHNICAL ASSISTANCE

If you need help, service, or technical assistance or just want more information about IBM^(R) products, you will find a wide variety of sources available from IBM to assist you. This section contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your 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 that they are connected.

- Check the power switches to make sure that the system and any optional devices are turned on.

- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Problem Determination and Service Guide* on the IBM *Documentation* CD that comes with your system.

- Go to the IBM support Web site at http://www.ibm.com/systems/support/ to check for technical information, hints, tips, and new device drivers or to submit a request for information.

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

USING THE DOCUMENTATION

Information about your IBM system and preinstalled software, if any, or optional device is available in the documentation that comes with the product. That documentation can include printed documents, online documents, 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/systems/support/ and follow the instructions. Also, some documents are available through the IBM Publications Center at http://www.ibm.com/shop/publications/order/.

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 systems, optional devices, services, and support. The address for IBM System x^(TM) and xSeries^(R) information is http://www.ibm.com/systems/x/. The address for IBM BladeCenter^(R) information is http://www.ibm.com/systems/bladecenter/. The address for IBM IntelliStation^(R) information is http://www.ibm.com/intellistation/.

You can find service information for IBM systems and optional devices at http://www.ibm.com/systems/support/.

SOFTWARE SERVICE AND SUPPORT

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

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In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

HARDWARE SERVICE AND SUPPORT

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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.

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台北市松仁路 7 號 3 樓
電話：0800-016-888

IBM Taiwan product service contact information:

> IBM Taiwan Corporation
>
> 3F, No 7, Song Ren Rd.
>
> Taipei, Taiwan
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6: NOTICES

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First Edition (September 2009)

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Processor speeds indicate the internal clock speed of the microprocessor; other factors also affect application performance.

CD drive speeds list the variable read rate. Actual speeds vary and are often less than the maximum possible.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1 000 000 bytes, and GB stands for approximately 1 000 000 000 bytes.

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Attention: Airborne particulates (including metal flakes or particles) and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the device that is described in this document. Risks that are posed by the presence of excessive particulate levels or concentrations of harmful gases include damage that might cause the device to malfunction or cease functioning altogether. This specification sets forth limits for particulates and gases that are intended to avoid such damage. The limits must not be viewed or used as definitive limits, because numerous other factors, such as temperature or moisture content of the air, can influence the impact of particulates or environmental corrosives and gaseous contaminant transfer. In the absence of specific limits that are set forth in this document, you must implement practices that maintain particulate and gas levels that are consistent with the protection of human health and safety. If IBM determines that the levels of particulates or gases in your environment have caused damage to the device, IBM may condition provision of repair or replacement of devices or parts on implementation of appropriate remedial measures to mitigate such environmental contamination. Implementation of such remedial measures is a customer responsibility.

Table 1. Limits for particulates and gases

Contaminant	Limits
Particulate	- The room air must be continuously filtered with 40% atmospheric dust spot efficiency (MERV 9) according to ASHRAE Standard 52.2[1]. - Air that enters a data center must be filtered to 99.97% efficiency or greater, using high-efficiency particulate air (HEPA) filters that meet MIL-STD-282. - The deliquescent relative humidity of the particulate contamination must be more than 60%[2]. - The room must be free of conductive contamination such as zinc whiskers.
Gaseous	- Copper: Class G1 as per ANSI/ISA 71.04-1985[3] - Silver: Corrosion rate of less than 300 Å in 30 days

[1] ASHRAE 52.2-2008 - *Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size*. Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

[2] The deliquescent relative humidity of particulate contamination is the relative humidity at which the dust absorbs enough water to become wet and promote ionic conduction.

[3] ANSI/ISA-71.04-1985. *Environmental conditions for process measurement and control systems: Airborne contaminants*. Instrument Society of America, Research Triangle Park, North Carolina, U.S.A.

ELECTRONIC EMISSION NOTICES

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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.

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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.

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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.

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European Community contact:

IBM Technical Regulations
Pascalstr. 100, Stuttgart, Germany 70569
Telephone: 0049 (0)711 785 1176
Fax: 0049 (0)711 785 1283
E-mail: tjahn@de.ibm.com

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求採取某些適當的對策。

Germany Electromagnetic Compatibility Directive

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