

IBM EXP400 Storage Expansion Unit
Type 1733

Hardware Maintenance Manual and Troubleshooting
Guide





@server

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Note

Before using this information and the product it supports, be sure to read Appendix C, "Notices," on page 79.

Eighth Edition (April 2004)

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About this manual

This manual contains diagnostic information, a Symptom-to-FRU index, service information, and configuration information for the IBM® EXP400 Storage Expansion Unit.

Important safety information

Be sure to read all caution and danger statements in this book before performing any of the instructions. See "Safety information" on page 37.

Lea todas as instruções de cuidado e perigo antes de executar qualquer operação.

注意和危险声明 (简体中文)

重要事项:

本书中的所有注意和危险声明之前都有编号。该编号用于英语的注意或危险声明与 *Safety Information* 一书中可以找到的翻译版本的注意或危险声明进行交叉引用。

例如，如果一个注意声明以编号 1 开始，那么对该注意声明的翻译出现在 *Safety Information* 一书中的声明 1 中。

在按说明执行任何操作前，请务必阅读所有注意和危险声明。

注意及危险声明 (中文)

重要資訊：

本書中所有「注意」及「危險」的聲明均以數字開始。此一數字是用來作為交互參考之用，英文「注意」或「危險」聲明可在「安全資訊」(Safety Information)一書中找到相同內容的「注意」或「危險」聲明的譯文。

例如，有一「危險」聲明以數字 1 開始，則該「危險」聲明的譯文將出現在「安全資訊」(Safety Information)一書的「聲明」1 中。

執行任何指示之前，請詳讀所有「注意」及「危險」的聲明。

Prenez connaissance de toutes les consignes de type Attention et Danger avant de procéder aux opérations décrites par les instructions.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

Accertarsi di leggere tutti gli avvisi di attenzione e di pericolo prima di effettuare qualsiasi operazione.

중요:

본 *Server Library*에 있는 모든 주의 및 위험 경고문은 번호로 시작합니다. 이 번호는 영문 주의 혹은 위험 경고문과 이 절에 나오는 번역된 버전의 주의 혹은 위험 경고문을 상호 참조하는 데 사용됩니다.

예를 들어, 주의 경고문이 번호 1로 시작하면, 번역된 해당 주의 경고문을 본 절의 경고문 1에서 찾아볼 수 있습니다.

모든 지시사항을 수행하기 전에 반드시 모든 주의 및 위험 경고문을 읽으십시오.

Lea atentamente todas las declaraciones de precaución y peligro ante de llevar a cabo cualquier operación.

Online support

You can download the most current diagnostic, H8 flash, and device driver files from <http://www.ibm.com/pc/support> on the World Wide Web.

Support telephone numbers

View support telephone numbers at <http://www.ibm.com/planetwide/> on the World Wide Web.

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Chapter 1. General information

The IBM EXP400 Storage Expansion Unit, referred to in this manual as expansion unit, provides high-capacity, small computer system interface (SCSI) disk storage. It supports up to seven Ultra320 SCSI hard disk drives on each half of the dual bus. It delivers fast, high-volume data transfer, retrieval, and storage functions across multiple drives, to multiple hosts. The expansion unit is designed for continuous, reliable service; the modular, redundant disk drives, power supply with fan units, and SCSI Bus Expander and Enclosure Services Module (referred to in this book as ESM) use hot-swap technology for easy replacement without turning off the expansion unit. For more information, see “What your expansion unit offers” on page 4.

Expansion unit models 1RU and 1RX come with two 500-watt ac power supply with fan units, one ESM (the second ESM is optional), a filler panel to cover the empty ESM bay, and 14 drive filler panels. Expansion unit model 2RX comes with two -48 volt dc power supply with fan units, two ESMs, and 14 drive filler panels. The drive filler panels are replaced with hard disk drive options.

Related publications

This *Hardware Maintenance Manual and Troubleshooting Guide* is in Portable Document Format (PDF) on the IBM Support Web site, <http://www.ibm.com/pc/support/>. It contains information to help you solve problems yourself, and it contains information for service technicians.

- *Installation Guide*

This printed publication contains instructions for setting up your expansion unit and basic instructions for installing some options.

- *User's Guide*

This publication provides general information about your expansion unit, including information about features and how to configure and use your expansion unit.

- *Safety Information*

This publication is in PDF on the IBM *Documentation CD*. It contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the *Safety Information* book.

- *Rack Installation Instructions*

This printed publication contains instructions for installing your expansion unit in a rack.

- *Rack-to-Tower Conversion Kit Installation Instructions*

This printed publication comes with the Rack-to-Tower Conversion kit and contains detailed instructions for converting a rack-model expansion unit to a tower-model expansion unit.

Your expansion unit documentation might be updated occasionally to include information about new features, a translated version of the documentation might be available in your language, or technical updates might be available to provide additional information that is not included in your expansion unit documentation. These updates are available from the IBM Web site. Complete the following steps to check for updated documentation and technical updates:

1. Go to <http://www.ibm.com/pc/support/>.
2. In the **Learn** section, click **Online publications**.
3. On the “Online publications” page, in the **Brand** field, select **Servers**.
4. In the **Family** field, select **Rack/Storage Enclosures**.
5. Click **Display documents**.

Notices and statements used in this publication

The caution and danger statements that appear in this publication are also in the multilingual *Safety Information* publication, which is on the IBM *Documentation CD*. Each statement is numbered for reference to the corresponding statement in the *Safety Information* publication.

The following notices and statements are used in this publication:

- **Notes:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Features and operating specifications

Table 1 on page 3 contains a summary of the features and operating specifications for your expansion unit. Depending on your expansion unit model, some features might not be available, or some specifications might not apply.

Table 1. Features and operating specifications

<p>General:</p> <ul style="list-style-type: none"> • Modular components <ul style="list-style-type: none"> – High-capacity disk drives – SCSI Bus Expander and Enclosure Services Module (ESM) – Power supplies with built-in fan units • Technology <ul style="list-style-type: none"> – Supports disk array technology – Supports clustering – SCSI (Ultra320) host interface, redundant data storage, power and cooling system, and ESMs – Hot-swap technology for hard disk drives, power supply with fan units, and ESMs • User interface <ul style="list-style-type: none"> – Built-in power, activity, and fault indicators, identification labeling on CRUs, rear indicator lights, switches, and connectors – Easy-to-replace drives, power supplies with built-in fan units, and ESMs <p>Hard disk drive storage:</p> <ul style="list-style-type: none"> • Current capabilities: <ul style="list-style-type: none"> – Maximum hard disk drives per expansion unit: 14 – Hard disk drives per SCSI bus segment: 7 – SCSI buses per unit: 2 – SCSI buses can be configured as one continuous SCSI bus. <p>ESMs:</p> <ul style="list-style-type: none"> • Technology and interfaces: <ul style="list-style-type: none"> – SCSI: Ultra320 – SCSI bus interface: Two 68-pin, Very High Density Connector Interface (VHDCI) connectors for SCSI bus cables 	<p>Acoustical noise emissions: For open bay (no drives installed) and maximum system configurations (14 hard disk drives installed).</p> <ul style="list-style-type: none"> • Sound power (idling): <ul style="list-style-type: none"> – 5.5 bels (open bay) – 5.7 bels (typical) • Sound power (operating): <ul style="list-style-type: none"> – 6.0 bels (open bay) – 6.5 bels (typical) • Sound pressure (idling): <ul style="list-style-type: none"> – 44 dBA (open bay) – 47 dBA (typical) • Sound pressure (operating): <ul style="list-style-type: none"> – 44 dBA (open bay) – 54 dBA (typical) <p>AC power supply with built-in fan:</p> <ul style="list-style-type: none"> • Expansion unit model 1RU or 1RX comes with two hot-swap 500 watt (115 - 230 V ac) power supply with fan units. • The two power supplies provide redundant power to the expansion unit. <p>-48 volt dc power supply:</p> <p>At a nominal voltage of -48 volt dc, the expansion unit draws approximately 5 amperes.</p> <p>Size:</p> <ul style="list-style-type: none"> • Height: 12.8 cm (5.0 in.) • Depth: 54.0 cm (21.8 in.) • Width: 44.7 cm (17.6 in.) • Weight: approximately 24.3 kg (53.6 lb) for a standard unit. When fully configured 37.3 kg (82 lb) <p>Environment:</p> <ul style="list-style-type: none"> • Air temperature: <ul style="list-style-type: none"> – Expansion unit on: 10° to 40°C (50.0° to 104°F); altitude: 30.5 (100 ft) below to 3000 m (9840 ft) above sea level; temperature change: 10°C to (18°F) per hour – Expansion unit off: 10° to 50°C (14.0° to 120.0°F); maximum altitude: 3000 m (9840 ft); temperature change: 15°C (27.0°F) per hour 	<p>Environment cont.</p> <ul style="list-style-type: none"> • Humidity: <ul style="list-style-type: none"> – Expansion unit on: 20% to 80% – Expansion unit off: 10% to 90% – Maximum dew point: 26°C (79°F) – Maximum humidity gradient: 10% per hour <p>Heat output:</p> <p>Approximate heat output in British thermal units (Btu) per hour:</p> <ul style="list-style-type: none"> • Minimum configuration: 82.4 Btu (282 watts) • Maximum configuration: 91.0 Btu (311 watts) <p>Electrical input:</p> <ul style="list-style-type: none"> • Sine-wave input (50-60 Hz) required • Input voltage low range: <ul style="list-style-type: none"> – Minimum: 90 V ac – Maximum: 136 V ac • Input voltage high range: <ul style="list-style-type: none"> – Minimum: 198 V ac – Maximum: 264 V ac • Input kilovolt-amperes (kVA), approximately: <ul style="list-style-type: none"> – Minimum: 0.06 kVA – Maximum: 0.45 kVA <p>Notes:</p> <ol style="list-style-type: none"> 1. Power consumption and heat output vary depending on the number and type of optional features installed and the power-management optional features in use. 2. These levels were measured in controlled acoustical environments according to the procedures specified by the American National Standards Institute (ANSI) S12.10 and ISO 7779 and are reported in accordance with ISO 9296. Actual sound-pressure levels in a given location might exceed the average values stated because of room reflections and other nearby noise sources. The declared sound-power levels indicate an upper limit, below which a large number of computers will operate.
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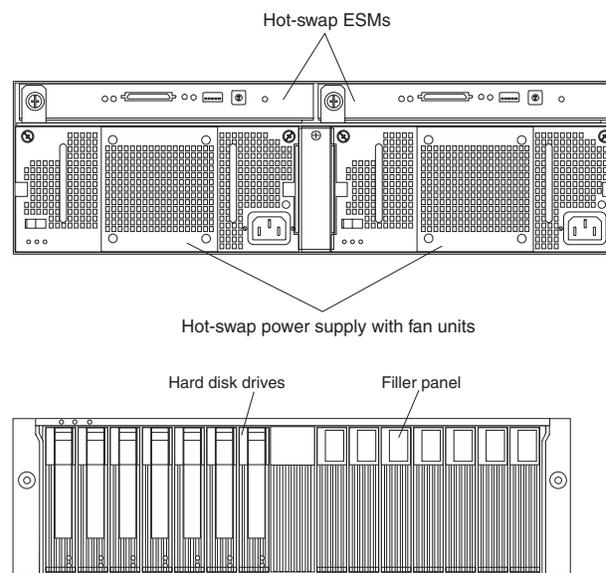
Major components of the expansion unit

The orange color on components and labels in the expansion unit indicates hot-swap or hot-plug components. You can install or remove these components while the expansion unit is running. For information about installing hot-swap and hot-plug components, see Chapter 4, “Installing and replacing components,” on page 23.

The blue color on components and labels indicates touch points, where a component can be gripped, a latch moved, and so on.

The following illustration shows the locations of major components in your expansion unit.

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



What your expansion unit offers

The expansion unit provides several features for easy operation, including:

- **Customer replaceable units (CRUs)**

The CRUs in your expansion unit are: Ultra320 hard disk drives, ESMs, and power supply with fan units.

- **Fault indicators**

All CRUs have fault or status light emitting diodes (LEDs) to indicate hardware failures.

- **Switch selectable Box ID and user configuration settings**

The ESM contains five sets of configuration switches that you can set according to your configuration. For detailed information about these switches and their settings, see Chapter 2, “ESM configuration switches,” on page 15.

- **Redundant cooling and power capabilities**

Expansion unit models 1RU and 1RX use a dual ac input power system. This means both power switches must be turned on for proper redundant operation. The redundant cooling of the fans in your expansion unit enables continued operation if one fan fails. Your expansion unit comes with two 500-watt hot-swap power supply with fan units, which provide redundant power for many expansion

unit configurations. If the average load on your expansion unit is less than 500 watts and a problem occurs with one of the power supplies, the other power supply can meet the power requirements.

Expansion unit model 2RX uses a dual dc input power system. For detailed information about working with the dual dc input power system, see Chapter 3, "Information for the -48 volt dc power model," on page 19.

- **ServeRAID™ support**

Your expansion unit supports servers with ServeRAID adapters to create redundant array of independent disks (RAID) configurations.

- **Clustering support**

Twin-tailed clustering support is a feature of the expansion unit. Clustering is a way to share SCSI buses and hard disk drives between two SCSI controllers to provide redundancy of SCSI controllers and servers. This redundancy is important if one of the controlling servers fails. If a hardware component fails after clustering is set up, another server will take ownership of the hard disk drives.

With twin-tailed clustering, you can connect two IBM ServeRAID controllers to an expansion unit. In the twin-tailed clustering environment, you can use dual-host controllers cabled separately to the expansion unit; however, only a single bus of 13 drives is supported. Each SCSI device on a SCSI bus must have a unique ID.

Service tip: If you use IBM ServeRAID controllers in a cluster configuration, the termination-power LED on the back of the expansion unit is useful. The ServeRAID controller provides the signal for termination power. If the termination power LED is not lit, it indicates that a particular expansion unit is not attached to a controller that is turned on. Make a note of which expansion unit is attached to which server before the hardware is serviced.

Clustering requires additional hardware and specialized software. For more information, go to <http://www.ibm.com/pc/ww/eserver/xseries/clustering/>.

Expansion unit bays

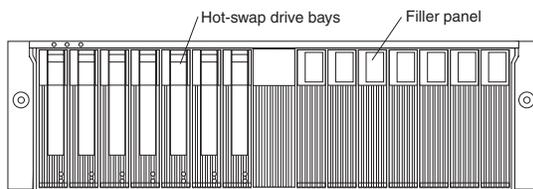
The following sections describe the hot-swap components of the expansion unit and the bridge card bay.

With the hot-swap features of the expansion unit, you can remove and replace a hard disk drive, power supply with fan unit, and ESM without turning off the expansion unit. You can maintain the availability of your expansion unit while a hot-swap component is removed, installed, or replaced.

Hot-swap hard disk drive bays

The following illustration shows the location of the hot-swap hard disk drive bays that are accessible from the front of your expansion unit. The expansion unit supports up to 14 IBM Ultra320 SCSI hard disk drives. These drives come preassembled in a drive tray. You install the hard disk drives in the 14 drive bays on the front of the expansion unit.

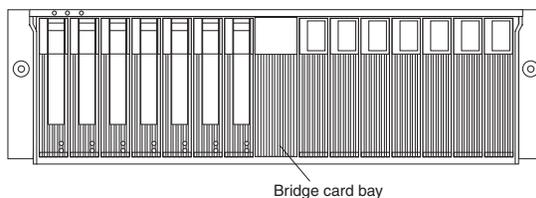
In the following illustration, seven of the 14 hard disk drive bays contain hard disk drives, and seven bays contain filler panels. To maintain proper cooling within your expansion unit, always keep a filler panel in each drive bay that does not contain a hard disk drive. For information about installing and replacing drives, see “Working with hot-swap hard disk drives” on page 24.



Attention: Never hot-swap a hard disk drive when its green activity LED is flashing. Hot-swap a hard disk drive only when its amber status LED is lit (not flashing) or when the drive is inactive with the green activity LED off (not flashing). Use the ServeRAID system-management software to set the hard disk drive state to “defunct” and then you can hot-swap it.

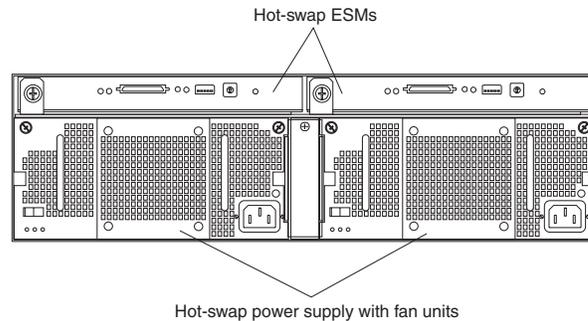
Bridge card bay

The following illustration shows the location of the bridge card bay. This bay is accessible from the front of the expansion unit. You can replace the bridge card, but you must turn off the expansion unit before doing so. For more information about replacing a bridge card, see “Replacing a bridge card” on page 26.



Hot-swap ESM and power supply bays

The following illustration shows the location of the hot-swap ESM bays (for the hot-swap ESMs) and the power supply bays (for the hot-swap power supply with fan units).



Hot-swap ESM bays

The expansion unit comes with two ESM bays for the hot-swap ESMs. ESMs provide a SCSI interface to the hard disk drives and monitor the overall status of the expansion unit. An ESM has five sets of switches for user configuration. For more information about replacing an ESM, see “Replacing an ESM” on page 27. For more information about ESM switches, see Chapter 2, “ESM configuration switches,” on page 15.

Hot-swap power supply with fan unit bays

Expansion unit models 1RU and 1RX come with two 500 watt hot-swap and redundant power supply with fan units. The power supplies are redundant in that a single power supply can provide adequate power and cooling for the entire expansion unit. A single power supply can support up to 14 hard disk drives; however, both power supplies must be installed, even if one power supply is not operational. For more information about working with hot-swap power supplies, see “Replacing a hot-swap power supply with fan unit” on page 28.

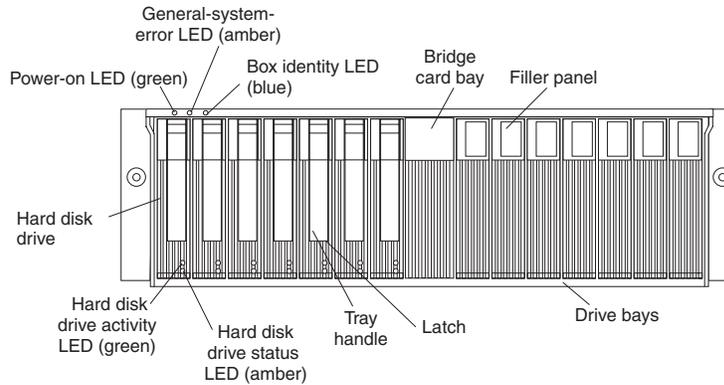
Expansion unit model 2RX comes with two -48 volt dc power supply with fan units. For information about installing or replacing the -48 volt power supplies, see Chapter 3, “Information for the -48 volt dc power model,” on page 19.

Expansion unit controls, LEDs, components, connectors

The primary controls of the expansion unit are located on the front of the unit. The user controls of the expansion unit are located on the back of the unit. Two hot-swap power supply with fan units and two ESMs are accessible from the back of the expansion unit. These components contain several user indicators and connectors.

Front view

The primary controls on the front of the expansion unit are shown in the following illustration and are described in this section.



Power-on LED (green)

This green LED is lit when the power supply is turned on and is supplying both 5 volt and 12 volt dc power to the expansion unit.

General-system-error LED (amber)

When lit, this amber LED indicates that the unit has a fault, such as in a power supply, ESM, or hard disk drive.

Box identity (blue)

The box identity LED is used to identify the expansion unit. When this blue LED is lit, the system-management software on the server connected to the expansion unit has identified this expansion unit.

Bridge card bay

The bridge card is located in the center of the front panel between bay 7 and bay 8.

Filler panel

Expansion units come with drive filler panels in the unused drive bays. Before installing new hard disk drives, you must remove the filler panels and save them for later use. Each of the 14 bays must contain either a filler panel or a hard disk drive.

Drive bays

There are 14 drive bays that contain either a hard disk drive or a filler panel.

Latch This multipurpose blue latch releases or locks the hard disk drive in place.

Tray handle

You can use this multipurpose handle to insert or remove a hard disk drive.

Status LED (amber)

Each hard disk drive has a status LED. When lit continuously, this amber LED indicates a drive failure. When flashing, this amber LED indicates that a drive Identify or Rebuild is in progress.

Activity LED (green)

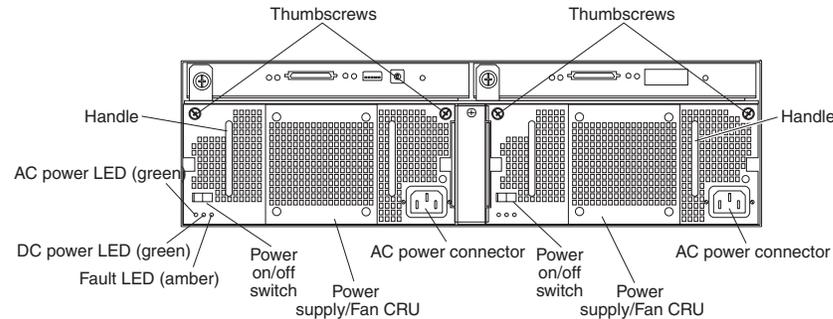
Each hard disk drive has an activity LED. When flashing, this green LED indicates drive activity.

Hard disk drive

You can install up to 14 hot-swap hard disk drives in the expansion unit. Each drive contains an Ultra320 hard disk drive and tray.

Rear view: ac power supply with fan units

Two hot-swap power supply with fan units are accessible from the back of the expansion unit. These components at the back of the expansion unit contain several user controls, LEDs, and connectors as shown in the following illustration.



Thumbscrews

Loosen the thumbscrews to remove or install a power supply with fan unit.

AC power connector

The power cord for the power supply with fan unit connects here.

Power supply with fan unit

The two hot-swap power supply with fan units are located on the back of the expansion unit.

Attention: The expansion unit comes with two power supply with fan units installed. When one power supply fails, the power-supply unit must be replaced to reestablish redundancy. When replacing the failed unit with the new power supply unit, ensure that this operation is performed in less than 10 minutes to prevent overheating.

The fan that is visible from the rear of the power supply is an auxiliary fan that is normally off. This fan turns on only when the main fan within the power supply fails.

Power on/off switch

Use this switch to turn the power supply on and off.

Fault LED (amber)

When lit continuously, this amber fault LED indicates a power supply failure or that a redundant power supply is not turned on. This LED also flashes when the built-in fan fails.

DC power LED (green)

This green LED is lit when the expansion unit is turned on and is supplying both 5 volt and 12 volt dc power to the expansion unit.

AC power LED (green)

This green LED is lit when the power supply is receiving ac power.

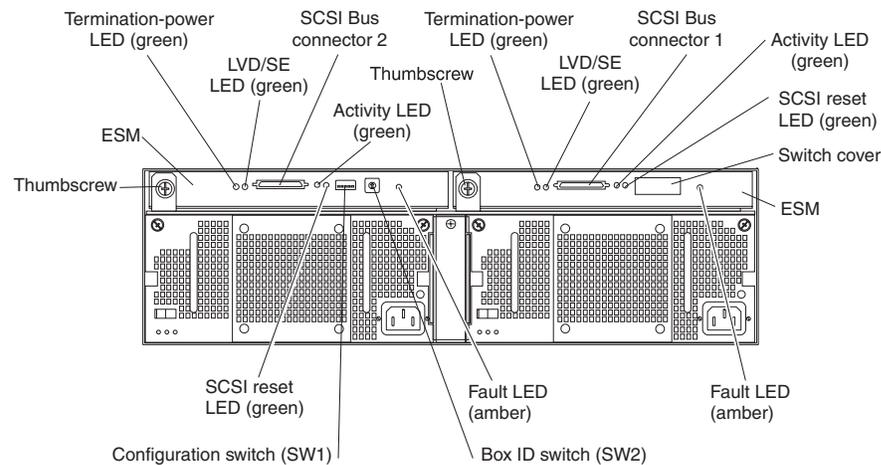
Handles

The two handles are used for installing and removing the power supply with fan unit.

Rear view: ESMs

The ESMs are accessible from the back of the expansion unit. These components contains user controls, LEDs, switches, and connectors as shown in the following illustration.

Note: The ESM on the right side is optional on expansion unit models 1RU and 1RX.



ESM Each ESM contain SCSI controls, LEDs, and connectors.

Fault LED (amber)

When lit, this amber LED indicates an ESM failure.

SCSI reset LED

When lit, this green LED indicates a SCSI bus reset.

Thumbscrews

Each ESM has a thumbscrew on the left side of the module. Use the thumbscrew and lever to remove and insert the ESM.

Termination-power LED (green)

When lit, this green LED indicates that termination power is present. When a termination-power LED is lit, it indicates that the other end of the SCSI bus connector is connected to a powered-on controller. Each external bus has a separate termination-power LED.

LVD/SE LED (green)

When lit, this green LED indicates that the external host bus is in low voltage differential (LVD) mode. When this LED is off, it indicates that the external host bus is in single-ended (SE) mode. Each external bus has a separate LVD/SE LED. Only LVD host bus controllers are supported.

SCSI bus connector

The 68-pin Very High Density Connector Interface (VHDCI) connectors are for connecting your SCSI cables to SCSI bus 1 and SCSI bus 2.

Activity LED (green)

When lit, this green LED indicates there is activity on the external SCSI bus. Both external buses have a separate activity LED.

Configuration switch SW1

Configuration switch SW1 is a 5-position switch that is mounted on the ESM and is accessible from the rear of the expansion unit.

Box ID switch SW2

Box ID switch SW2 is a 10-position rotary switch that sets the expansion unit ID using values 0 through 9. System-management software, such as IBM Director or ServeRAID Manager, uses this ID when it provides data and alerts for the expansion unit.

Power features

This section contains instructions for turning the expansion unit on and off under normal and emergency circumstances.

Turning on the expansion unit

If you are turning on the expansion unit after an emergency shutdown or power outage, see “Turning on the expansion unit after an emergency” on page 12.

Complete the following steps to turn on the power for the initial startup of the expansion unit.

1. Verify that:
 - a. All cables are properly attached.
 - b. Both power cords are plugged into the back of the expansion unit and into properly grounded electrical outlets.
 - c. All hard disk drives are locked securely in place.
 - d. The configuration switches are set correctly. See Chapter 2, “ESM configuration switches,” on page 15.
2. Check the system documentation for all the hardware devices you intend to turn on and determine the proper power-on sequence.

Note: Be sure to turn on the expansion unit before or at the same time as you turn on the server.

3. Turn on each device, based on the power-on sequence that is described in the documentation that comes with the device.
4. Turn on both power supplies on the back of the expansion unit.

The expansion unit might take a few seconds to turn on. During this time, you might see the fault (amber) and the power (green) LEDs on the expansion unit turn on and off intermittently. When the power-on sequence is complete, only the power (green) LEDs on the front and back should remain on. If one or more fault (amber) LEDs remain lit, refer to Chapter 5, “Symptom-to-FRU index,” on page 31.

Turning off the expansion unit

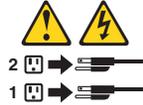
Attention: Except in an emergency situation, never turn off the power if any fault LEDs are lit on the expansion unit. Correct the fault before you attempt to turn off the power, using the proper troubleshooting or servicing procedure. This will ensure that the expansion unit will turn on correctly later. See Chapter 5, “Symptom-to-FRU index,” on page 31.

Statement 5:



CAUTION:

The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



The expansion unit is designed to run continuously, 24 hours a day. Turn off the power only when at least one of the following is true:

- Instructions in a hardware or software procedure require you to turn off the power.
- A service technician tells you to turn off the power.
- A power outage or emergency situation occurs. See “Turning off the expansion unit in an emergency.”

Complete the following steps to turn off the expansion unit:

1. Close all active operating system windows and programs.
2. Power down the server attached to the expansion unit.
3. Make sure that all amber status and fault LEDs are off. If any status or fault LEDs are lit (on hard disk drives, power supplies, or ESMs), identify or correct the problem before you turn off the power. For more information, see Chapter 5, “Symptom-to-FRU index,” on page 31.
4. Turn off both power supplies.

Turning off the expansion unit in an emergency

Attention: Emergency situations might include fire, flood, extreme weather conditions, or other hazardous circumstances. If a power outage or emergency situation occurs, always turn off all power switches on all computing equipment. This will help safeguard your equipment from potential damage due to electrical surges when power is restored. If the expansion unit loses power unexpectedly, it might be due to a hardware failure in the power system or midplane, see Chapter 5, “Symptom-to-FRU index,” on page 31.

Complete the following steps to turn off the expansion unit during an emergency situation:

1. Close all active operating system windows and programs.
2. Power down the server attached to the expansion unit.
3. If you have time, stop all activity and check the LEDs (front and back). Make note of any status or fault LEDs that are lit so that you can correct the problem when you turn on the power again.
4. Turn off all expansion unit power supplies; then, unplug the power cables from the expansion unit.

Turning on the expansion unit after an emergency

Complete the following steps to restart the expansion unit if you turned off the power supplies during an emergency shutdown, or if a power failure or a power outage occurred:

1. After the emergency situation is over or power is restored, check the expansion unit for damage. If there is no visible damage, continue with step 2; otherwise, have your unit serviced.
2. After you check for damage, plug in the expansion-unit power cables and turn on the power switches.
3. Check the system documentation for the hardware devices you intend to turn on, and determine the proper power-on sequence.

Note: Be sure to turn on the expansion unit before or at the same time you turn on the server.

4. Turn on each device, based on the power-on sequence that is described in the documentation that comes with the device.
5. Turn on both power supplies on the back of the expansion unit.
6. Only the power (green) LEDs on the front and back should be on. If one or more of the fault (amber) LEDs are on, see Chapter 5, "Symptom-to-FRU index," on page 31 for instructions.
7. Use your installed software application as appropriate to check the status of the expansion unit.

System-management software support

The expansion unit provides software alert functions through the system monitor functions provided in the IBM Director and IBM ServeRAID software.

The following alerts are supported:

- Hard disk drive disabled
- Power supply failure
- Fan failure
- Expansion unit exceeds normal operating temperature

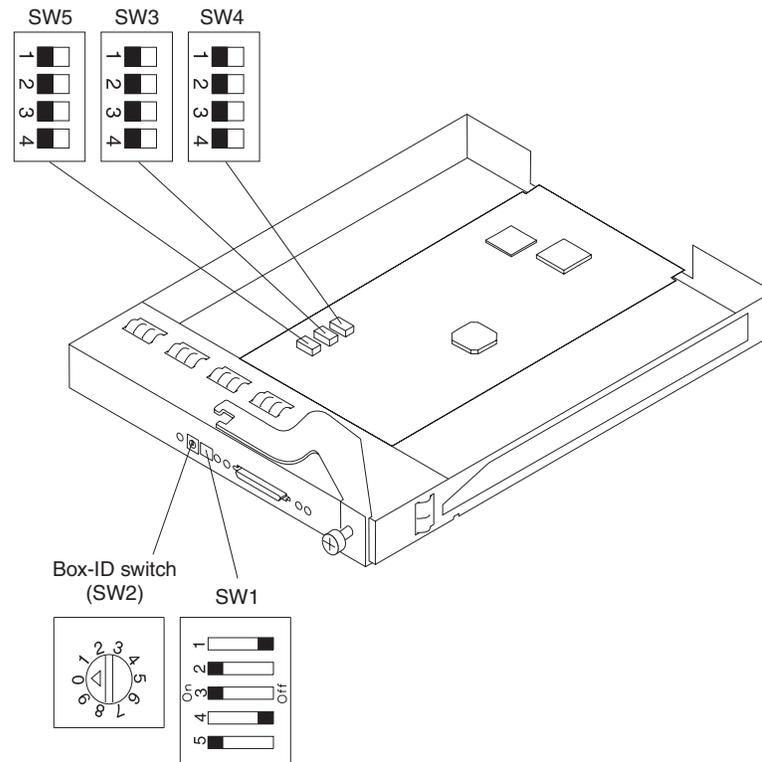
You must use IBM ServeRAID version 6.10.25 or later for your ServeRAID controller to report status and alerts properly. To download the latest ServeRAID software, go to <http://www.ibm.com/pc/support/>.

For up-to-date information about IBM Director software support available for your expansion unit, go to http://www.ibm.com/pc/ww/eserver/xseries/systems_management/index.html.

Chapter 2. ESM configuration switches

This chapter provides general information about ESM functionality as it relates to ESM configuration switch settings. The ESM configuration switches control how power is supplied to the expansion unit and what expansion unit services are enabled (for example, switching between a rack configuration and a tower configuration or switching between a single bus and a dual-bus configuration.) In a dual-bus configuration, each bus uses seven drives. A single-bus configuration uses all 14 drives.

An ESM contains five sets of configuration switches, shown in the following illustration.



Note: If both ESMs are installed, the ESM on the left must have valid switch settings. The switch settings on the ESM that is installed in the right bay are ignored. If only one ESM is installed, it must be in the left bay.

Configuration switches are summarized in Table 2 and described in this section.

Table 2. Factory default configuration switch settings

Switch location	Position	Description	Factory default switch setting
Configuration switch SW1	1	Reserved	Off
	2	Reserved	On
	3	Reserved	On
	4	Reserved	Off

Table 2. Factory default configuration switch settings (continued)

Switch location	Position	Description	Factory default switch setting
	5	Remote power control disable	On
Box ID switch SW2	Rotary	Expansion unit ID	0
Configuration switch SW3	1	SCSI ID configuration 1	Off
	2	SCSI ID configuration 2	Off
	3	SCSI ID configuration 3	Off
	4	Reserved	Off
Configuration switch SW4	1	SCSI-bus split control	Off
	2	Rack and tower LED	Off
	3	Reserved	Off
	4	Reserved	Off
Configuration switch SW5	1	Reserved	Off
	2	Reserved	Off
	3	Reserved	Off
	4	Reserved	Off

Configuration switch SW1 settings

Configuration switch SW1 is a five-position switch that is mounted on the ESM and is accessible from the rear of the expansion unit. The five switch positions are set as follows:

- Switch positions 1 through 4 - Reserved
- Switch position 5 - Remote power control disable

When switch position 5 is set to Off, the ESM will enable the power supplies when the termination power (TERMPWR) is active in any external SCSI port. This means that the expansion unit will be powered on and off automatically when the host server is powered on and off or when TERMPWR is disabled. When switch position 5 is set to On (the default setting), power on and off is not controlled by the TERMPWR signal, but by the power on/off switches on the power supplies.

Box ID switch SW2

Box ID switch SW2 is a 10-position rotary switch that sets the expansion unit ID using values 0 through 9. System-management software, such as IBM Director or IBM ServerAID Manager, uses this ID when it provides data and alerts for the expansion unit.

Configuration switch SW3 — SCSI ID configuration switch

Configuration switch SW3 defines the SCSI bus ID configurations. The user should prevent a SCSI ID conflict in a specific bus mode. SCSI bus mode is controlled by configuration switch SW4.

There are two SCSI buses (bus 1 and bus 2) in the expansion unit. Each bus uses seven SCSI ID numbers. Each hard disk drive within the expansion unit has a unique SCSI bus and ID assignment, based on its physical location in the expansion unit and the setting of configuration switch SW3. This prevents a SCSI ID conflict in a specific bus mode.

The switch positions configure the SCSI ID assignment. Switch positions 1, 2, and 3 are set to Off for rack enclosures. Rack enclosure SCSI IDs are identified from left to right. The SCSI addresses are 0, 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14.

Switch positions 1, 2, and 3 are set to On for a tower enclosures. The enclosure unit is rotated counter-clockwise 90 degrees to be converted to a tower unit. In this case, the SCSI addresses are reversed and they are 0, 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14 from top to bottom. All other switch settings are reserved. Numbered stickers for the front of the drives are provided so you can label the drives with the SCSI IDs.

- **Switch position 1 - SCSI ID configuration 1**
This switch position (default is Off) is used to configure SCSI ID assignment with a combination of SCSI ID switch positions 2 and 3.
- **Switch position 2 - SCSI ID configuration 2**
This switch position (default is Off) is used to configure SCSI ID assignment with a combination of SCSI ID switch positions 1 and 3.
- **Switch position 3 - SCSI ID configuration 3**
This switch position (default is Off) is used to configure SCSI ID assignment with a combination of SCSI ID switch positions 1 and 2.
- **Switch position 4 - Reserved**
This switch position is reserved and set to Off (the default).

Table 3. SCSI ID configuration matrix

SW position			Bus Config	L-segment							R-segment						
1	2	3		Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11	Slot 12	Slot 13	Slot 14
Off	Off	Off	Rack	0	1	2	3	4	5	6	8	9	10	11	12	13	14
On	On	On	Tower	14	13	12	11	10	9	8	6	5	4	3	2	1	0

Configuration switch SW4

Configuration switch SW4 controls the SCSI bus configuration. When switch position 1 is set to Off (default is Off), the expansion unit configuration is set as a single SCSI bus mode. When switch position 1 is set to On, the expansion unit configuration is set as a dual SCSI bus (split bus) mode.

- **Switch position 1 - SCSI-bus split control**
This switch position controls the SCSI bus mode. When the switch position is set to Off (default is Off), the expansion unit is configured as a single SCSI bus. When this switch position is set to On, the expansion unit is configured as a dual or split SCSI bus.
- **Switch position 2 - Rack-to-tower LED mode**
Set switch position 2 to Off (default is Off) for rack enclosures and to On for tower enclosures. These settings control the power and fault LEDs on the midplane, which are exchanged from one orientation to the other. In a tower enclosure, the top LED is green and in a rack enclosure, the left side LED is green.

Note: If you are installing the expansion unit in a tower enclosure, see the *Rack-to-Tower Conversion Kit Installation Instructions* for configuration switch settings and labeling information.

- **Switch position 3 - Reserved**
This switch position is reserved and set to Off (the default).

- **Switch position 4 - Reserved**

This switch position is reserved and set to Off (the default).

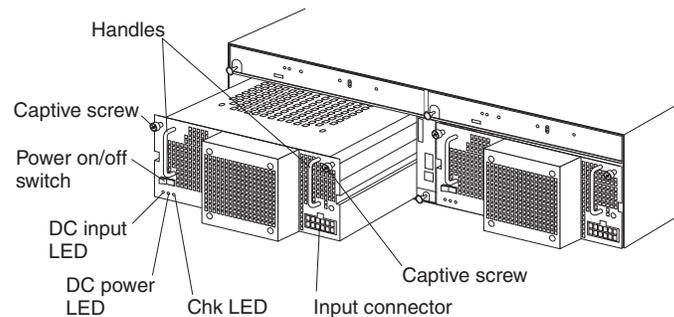
Chapter 3. Information for the -48 volt dc power model

Attention: Only a trained service technician may connect or disconnect the -48 volt dc power supply from its power source, install or remove the power connection on the rear of the expansion unit, and remove or install the power supply in the expansion unit.

Important: To be compliant with EN55024:1998, the power cables for this -48 volt dc product must not exit the building in which the equipment is installed.

This chapter provides instructions for connecting the power supply to a power-distribution unit and for replacing the power supply in the expansion unit. Read this chapter completely before making the power connections.

The following illustration shows the major components of the -48 volt dc power supply.



Handle: Use the two handles for installing and removing the power supply.

Captive screws: Use these screws to secure the power supply to the expansion unit.

Power on/off switch: Press this switch to turn the power supply on and off.

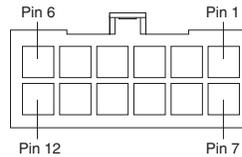
DC input LED: When this LED is lit, it indicates that the power supply is receiving dc power from the external power-distribution unit.

DC power LED: When this LED is lit, it indicates that the power supply is supplying power to the expansion unit.

Chk LED: When this LED is lit, it indicates that the power supply has failed or the power switch is turned off. When this LED is flashing, the fan has failed.

Input connector: Connect the dc cable to this connector.

The input connector is a 12-position connector at the lower-right side of the power supply. The following illustration shows the pin-number assignments as viewed from the wiring side.



The pin assignments are shown in the following table. For cable connection instructions, see “Connecting the power supply to a power-distribution unit.”

Table 4. Input connector pin assignments

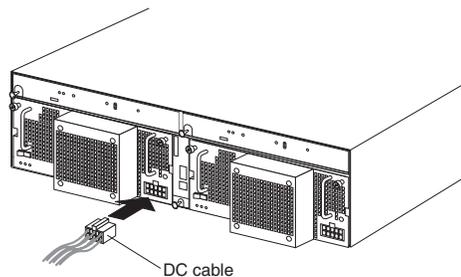
Pin	Assignment	Pin	Assignment
1	Frame ground	7	Frame ground
2	Not used	8	Not used
3	-48 V return (0 V)	9	-48 V return (0 V)
4	-48 V return (0 V)	10	-48 V return (0 V)
5	-48 V in	11	-48 V in
6	-48 V in	12	-48 V in

Connecting the power supply to a power-distribution unit

The following instructions are an overview of the procedure for connecting the power supply to a power-distribution unit. For specific information about connecting the power cable to a power-distribution unit, see the installation instructions that come with the power-distribution unit.

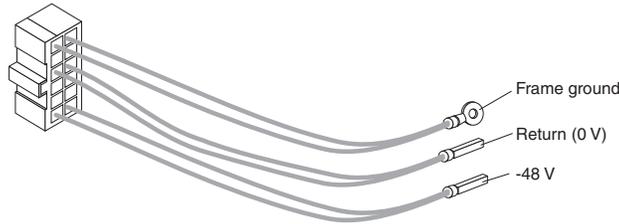
Complete the following steps to connect the power supply to a power-distribution unit:

1. Review the safety information beginning on page 37.
2. Connect the dc cable to the input connector on the power supply. Make sure that the dc cable is fully seated in the connector and locks into place.



3. Open the terminal-block cover on the power-distribution unit.
4. Connect the wires on the dc cable to the power-distribution unit.

Attention: You must connect the wires in the order described to ensure proper operation of the power supply. The wires are color-coded.



- a. Connect the frame ground (green and yellow) to the main ground terminal (also known as earth ground) in the terminal block.
 - b. Connect the 0 V wire (blue) to the return terminal on the terminal block.
 - c. Connect the -48 V wire (brown) to the -48 V terminal on the terminal block.
5. Close the terminal-block cover.
 6. Turn on the power supply. Check the LEDs for proper operation of the power supply.

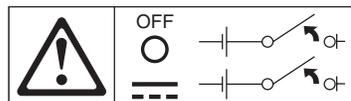
Disconnecting and removing the dc power supply

Statement 19:



CAUTION:

The power-control button on the device does not turn off the electrical current supplied to the device. The device also might have more than one connection to dc power. To remove all electrical current from the device, ensure that all connections to dc power are disconnected at the dc power input terminals.



Complete the following steps to disconnect the dc power connection and remove the power supply from the expansion unit:

1. See the operating-system documentation and “Turning off the expansion unit” on page 11 for the proper procedure to shut down the system.
2. When the expansion unit is ready for shutdown, press the power on/off switch on the power supply.
3. Turn off the power from the power-distribution unit. See the documentation that comes with the power-distribution unit.

Note: If you need to disconnect the cables from the power-distribution unit, see the documentation that comes with the power-distribution unit.

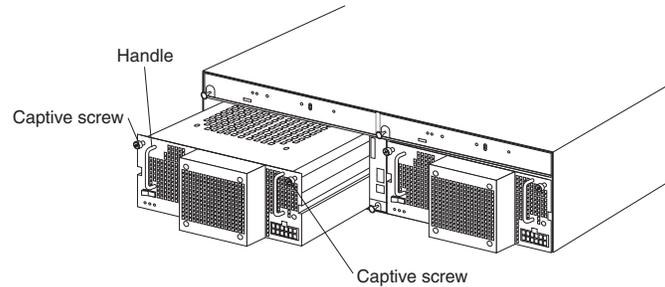
4. Remove the dc cable from the input connector on the power supply.
5. Loosen the captive screws on the power supply and remove the power supply from the bay of the expansion unit.

Installing the dc power supply

Attention: Do not use the power supply with an ac input power supply in the same expansion unit.

Complete the following steps to install the power supply:

1. Review the safety information beginning on page 37.
2. Make sure that the power supply is turned off.
3. Insert the power supply into the open bay until it is fully seated in the expansion unit.



4. Tighten the two captive screws by turning them clockwise.
5. For instructions about how to connect the power supply to a power-distribution unit, see “Connecting the power supply to a power-distribution unit” on page 20.

Chapter 4. Installing and replacing components

This chapter provides instructions for installing and replacing components.

Installation guidelines

Before you begin installing your expansion unit, read the following information:

- Read the safety information beginning on page 37 and the guidelines in “Handling electrostatic discharge-sensitive devices” on page 40. This information will help you work safely with your expansion unit and options.
- Make sure that you have an adequate number of properly grounded electrical outlets for your expansion unit and other devices that you will connect to the expansion unit.
- Back up all important data before you make changes to disk drives.
- You do not need to turn off the expansion unit to install or replace hot-swap power supply with fan units, hot-swap hard disk drives, or ESMs.
- The orange color on components and labels identifies hot-swap or hot-plug components. You can install or remove hot-swap and hot-plug components while the expansion unit is running.
- The blue color on components and labels indicates touch points, where a component can be gripped, a latch moved, and so on.
- For a list of supported options for your expansion unit, go to <http://www.ibm.com/us/compat/>.

System reliability guidelines

To help ensure proper cooling and system reliability, make sure that:

- Each of the drive bays has a drive or a filler panel and electromagnetic compatibility (EMC) shield installed in it.
- Each of the power-supply bays has a power supply installed in it.
- There is adequate space around the expansion unit to allow the enclosure cooling system to work properly. Leave approximately 50 mm (2.0 in.) of open space around the front and rear of the expansion unit. Do not place objects in front of the power supplies with fan units.
- You have replaced a failed power supply with fan unit within 48 hours.
- You have replaced a hot-swap hard disk drive within 2 minutes of removal with a new drive or filler panel.

Handling static-sensitive devices

Attention: Static electricity can damage electronic devices and your expansion unit. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

To reduce the possibility of damage from electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Do not leave the device where others can handle and damage it.

- While the device is still in its static-protective package, touch it to an unpainted metal part of the expansion unit for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the expansion unit without setting down the device. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on your expansion unit enclosure or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Working with hot-swap hard disk drives

This section explains how you can increase the expansion unit capacity by adding more drives or replacing existing drives with larger capacity drives.

Before you remove drive CRUs, review the following information:

Hot-swap hardware

You can replace a failed hard disk drive without turning off the expansion unit. Therefore, you can continue to operate your system while a hard disk drive is removed or installed. These drives are known as *hot-swap* drives.

Hard disk drives

Your expansion unit supports IBM Ultra320 SCSI hard disk drives. These IBM drives come pre-installed in a drive tray, ready for installation. (Do not detach the drive from the tray.) This drive and tray assembly is called a *customer replaceable unit (CRU)*. You can install the drives directly into the 14 drive bays on the front of the expansion unit. Be sure to record the location information for each drive *before* you remove it. Ensure that you keep track of the drives and their corresponding bays. Also, record the location information in the Installed-device records section of the *Installation Guide*.

Attention: If you reinstall a hard disk drive in the wrong bay, you can lose data.

Hard disk drive LEDs

Each hard disk drive bezel has two LEDs that indicate the status for that particular hard disk drive. The drive LED states and descriptions are as follows:

LED	LED state	Description
Activity LED	Green/flashing	Flashes during read/write or inquiry operations to the hard disk drive.
Status LED	Amber/flashing	Flashes to indicate a hard disk drive rebuild is under way or that a hard disk drive has been identified by the system-management software.
Status LED	Amber On	Lit continuously to indicate a drive failure.

Filler panels

Expansion units come with drive filler panels in the drive bays. Before

installing new drives, remove the filler panels and save them for future use. Each of the 14 bays must contain either a filler panel or a hard disk drive.

Hard disk drives

You can install only slim Ultra320 hot-swap hard disk drives in the expansion unit.

Replacing a hot-swap hard disk drive

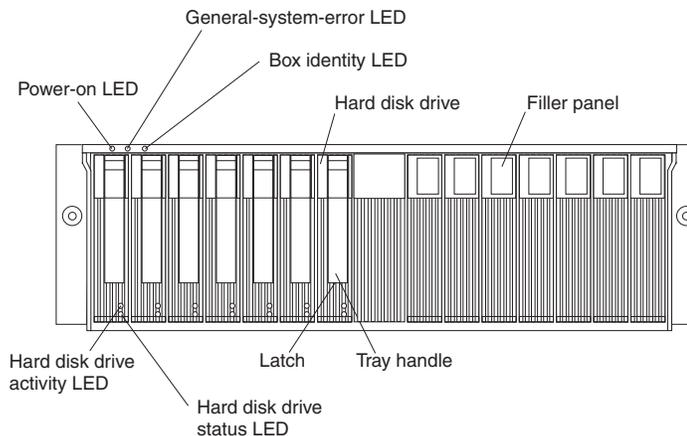
Hard disk drive problems include any malfunctions that delay, interrupt, or prevent successful I/O activity between the hosts and the hard disk drives in the expansion unit. This includes transmission problems between the host controllers, the ESMS, and the drives. This section explains how to replace a failed drive.

Attention: Failure to replace a hard disk drive in the correct bay might result in loss of data. If you have data stored on the hard disk drive, label the drive before you remove it. Then, when you replace the drive, install it in the same drive bay from which you removed it.

Check the hardware and software documentation provided with your server to see if there are restrictions regarding hard disk drive configurations. Some system SCSI configurations might not allow mixing different hard disk drive capacities or types within an array.

Complete the following steps to replace a hot-swap hard disk drive:

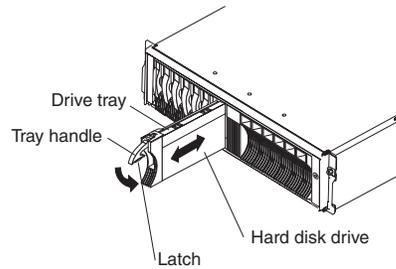
1. Read the instructions that come with the hard disk drive.
2. Read the “Installation guidelines” on page 23 and the safety information beginning on page 37.



3. Determine the location of the hard disk drive that you want to remove.

Attention: Never hot-swap a hard disk drive when its green activity LED is flashing. Hot-swap a drive only when its amber status LED is lit (not flashing) or when the drive is inactive (activity LED is off).

4. Remove the hard disk drive.



- a. Press the latch on the bottom of the tray handle to release it.
 - b. Pull out the tray handle to the open position.
 - c. Lift the drive partially out of the bay and wait at least 20 seconds before fully removing the drive from the expansion unit. This enables the drive to spin down and avoids possible damage to the drive.
 - d. Verify that there is proper identification (such as a label) on the hard disk drive; then, gently slide it completely out of the expansion unit.
5. Install the new hard disk drive.
 - a. Gently push the drive into the empty bay until the tray handle touches the expansion unit tray.
 - b. Push down the tray handle into the closed (latched) position.
 6. Check the hard disk drive LEDs.
 - a. When a drive is ready for use, the green activity LED and the amber status LED are off.
 - b. If the amber status LED is lit and not flashing, remove the drive from the unit and wait 10 seconds; then, reinstall the drive. If the amber LED is flashing, the drive is rebuilding.

ServeRAID information In some cases, the ServeRAID controller will automatically reset the drive to the Hot Spare or Rebuild state. If the drive state change does not occur automatically (amber LED stays lit), refer to your ServeRAID documentation for information about manually changing the state of the drive from the current state to another state, such as Hot Spare or Ready. The amber LED should turn off within 10 seconds after the drive-state change.

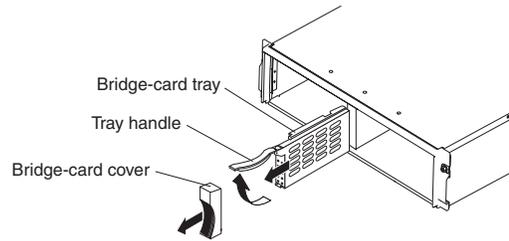
Replacing a bridge card

Attention: Before replacing the bridge card, you must turn off the expansion unit. See “Turning off the expansion unit” on page 11 for detailed instructions.

Complete the following steps to replace the bridge card:

1. Read “Installation guidelines” on page 23 and the safety information beginning on page 37.
2. Turn off the expansion unit. See “Turning off the expansion unit” on page 11.
3. For easier removal and installation of the bridge card, remove the hard disk drive or filler panel from drive bays 7 and 8 (the drive bays immediately left and right of the bridge card bay). You do not need to remove all of the hard disk drives and filler panels. For instructions for removing filler panels or hard disk drives, see “Replacing a hot-swap hard disk drive” on page 25.

4. Squeeze the bridge-card cover tabs and pull it off.



5. Lift the tray handle and pull the tray that contains the bridge card out of the bridge card bay.
6. Hold the new bridge card tray so that the tray handle is at the top of the bridge card tray and pointing outward.
7. Gently slide the tray that contains the bridge card into the bridge card bay.
8. Push down the tray handle to lock the bridge card into place.
9. Replace the bridge card cover by squeezing each of the four tabs, locking the cover into place.
10. Turn on the expansion unit. See “Turning on the expansion unit” on page 11.

Replacing an ESM

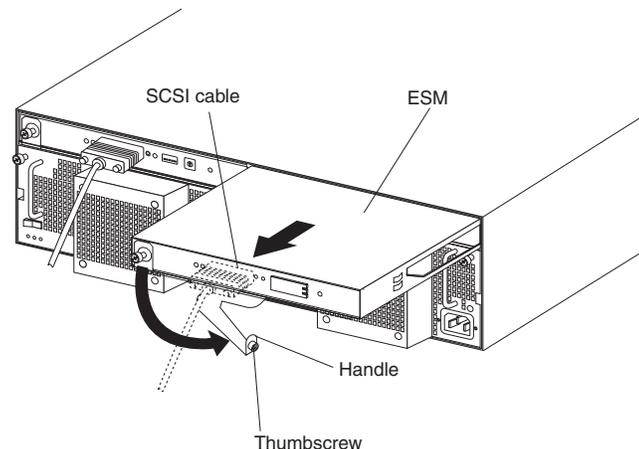
You can replace a hot-swap ESM and SCSI cable without turning off power to the expansion unit.

Note: If you are replacing a left ESM that has failed, read the following information:

- If you hot-swap the ESM that has failed, the new ESM will automatically assume the previous configuration switch settings.
- If you remove the left ESM that has failed and then turn off the expansion unit, the configuration returns to the switch settings of the new left ESM.

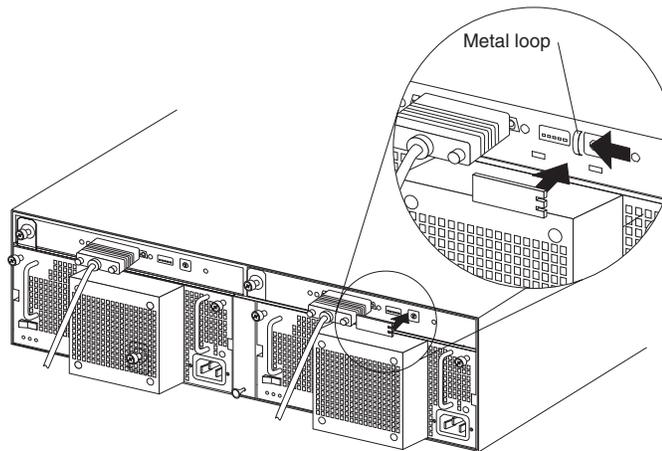
Complete the following steps to replace an ESM:

1. Read “Installation guidelines” on page 23 and the safety information beginning on page 37.
2. Disconnect the SCSI cable from the ESM.



3. Loosen the thumbscrew on the left side of the ESM that you want to replace.
4. Rotate the handle out and to the right.

5. Using the handle, gently slide the ESM out of the expansion unit.
6. If you are replacing the left ESM, set the configuration switches on the new ESM before installing it into the ESM bay. See Chapter 2, “ESM configuration switches,” on page 15.
7. Hold the new ESM so the handle is attached to the bottom of the tray, and the handle is fully extended.
8. Gently slide the ESM into the bay, and move the handle to the closed position (left) until it clicks.
9. Tighten the thumbscrew to secure the handle to the ESM.
10. If the switch cover is not preinstalled on the right ESM, install it now:
 - a. Position the hook on the back of the switch cover to the right of the metal loop on the ESM as shown in the illustration.



- b. Press the switch cover in place; then slide it to the left until the tab locks under the metal loop on the right ESM.
11. Connect a SCSI cable to the ESM.

Replacing a hot-swap power supply with fan unit

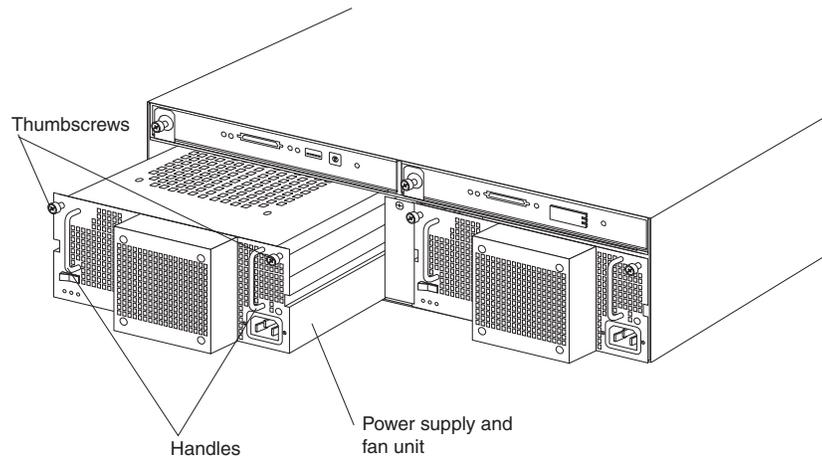
Before replacing a power supply with fan unit, read the following important information:

- The power supply with fan unit does not require preventive maintenance.
- The power supply with fan unit must be installed in the proper place to maintain proper expansion unit cooling.
- Use only power supplies that are supported for your specific expansion unit.

Complete the following steps to replace a hot-swap power supply with fan unit:

1. Read the “Installation guidelines” on page 23 and the safety information beginning on page 37.
2. Turn off the power supply.
3. Unplug the power supply cord from the electrical outlet.
4. Disconnect the power cord from the power supply.
5. Loosen the two thumbscrews on the power supply.

6. Grasp the handles on each side of the power supply and pull the unit out of the expansion unit.



7. Ensure that the new power supply you are installing is turned off.
8. Grasp the handles on the new power supply with fan unit and slide it into the expansion unit.
9. Tighten the two thumbscrews on the power supply.
10. Connect the power cord to the power supply.
11. Plug the supply power cord into a properly grounded electrical outlet.

Note: The fault (amber) LED is lit on the new power supply because its power switch is turned off.

12. Turn on the power supply.
After you turn on the power, the fault (amber) LED is off and the ac and dc power (green) LEDs are lit.

Chapter 5. Symptom-to-FRU index

The following table contains troubleshooting information to help you solve some of the basic problems you might have with your expansion unit. It contains the problem symptoms and suggested actions to take to resolve the problem.

Table 5. Troubleshooting information

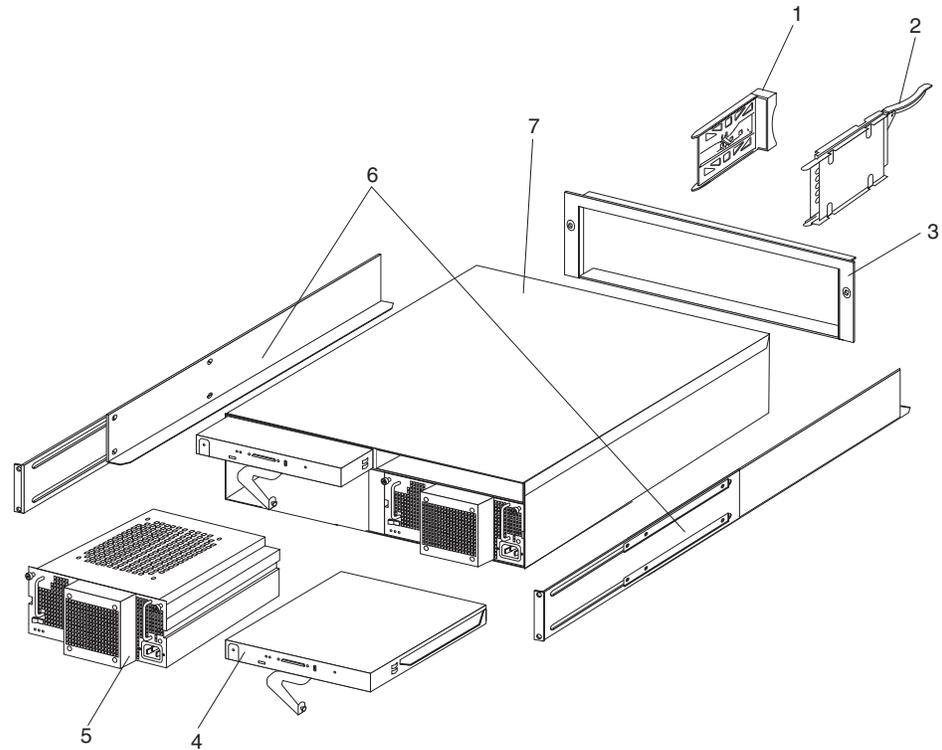
Component	Problem indicator	Possible cause	Possible solutions
Drive CRU	Amber LED on	Drive failure	Replace the failed hard disk drive. See “Replacing a hot-swap hard disk drive” on page 25.
ESM		Board failure	Replace the failed ESM. See “Replacing an ESM” on page 27.
Front panel		General machine fault	Indicates that a status or fault LED somewhere on the expansion unit is turned on. Check for amber LEDs on CRUs. See “Expansion unit controls, LEDs, components, connectors” on page 7.
All CRUs	All green LEDs off	The expansion unit is turned off	Check that all expansion unit power cables are plugged in and the power is on. If applicable, check that the main circuit breakers for the rack are turned on. If configuration switch SW1 is set to Off, the SCSI controller must be cabled to the expansion unit and turned on.
		ac or dc power failure	Check the main circuit breaker and ac or dc outlet.
		Power supply failed	Replace the power supply. See “Replacing a hot-swap power supply with fan unit” on page 28.
		Midplane failure	Replace the chassis assembly.
Drive CRUs	Amber LED flashing	Drive rebuild or identity is in process	No corrective action is needed.
Power supply CRU		Fan failure	Replace the power supply. See “Replacing a hot-swap power supply with fan unit” on page 28.
Power supply CRU	Amber LED on and green dc power LED off	Power supply failure or power supply is turned off.	If the power switch is on, replace the power supply CRU. See “Replacing a hot-swap power supply with fan unit” on page 28.
Power supply CRU	Amber LED on and green ac power LED off	No ac power to power supply. Check the ac power cord (cable) or breaker	If ac power is good at the source, replace the power cord. If the power supply has failed, replace the power supply. See “Replacing a hot-swap power supply with fan unit” on page 28.
Drive CRU ID=6	Green LED on	Cluster configuration	If not currently configured for clustering, power cycle the expansion unit to reenable ID=6.

Table 5. Troubleshooting information (continued)

Component	Problem indicator	Possible cause	Possible solutions
One or more drive CRUs	One or more green LEDs are off	No activity to the drives	No action is required.
All drive CRUs or those on one bus		No activity to the drives	No action is required.
		Damaged or loose SCSI cables	Check the SCSI-bus cables and connections.
		ESM failure	Use the system-management software to check the SCSI-bus status. Replace the ESM. See "Replacing an ESM" on page 27.
Front panel		Midplane failure	Replace the chassis assembly.
	Power supply	Make sure the cables are plugged in and power supplies are turned on.	
Some or all CRUs	Intermittent or sporadic power loss to the expansion unit	Hardware failure	Run the diagnostic program on the server attached to the expansion unit. Replace the failing device.
		Defective ac or dc power source or partially plugged power cable	Check the ac or dc power source. Secure all installed power cables and power supplies. If applicable, check the power components (power supply units, uninterruptible power supply, and so on). Replace defective power cables.
		Power supply failure	Check for a fault LED on the power supply and replace the failed CRU. See "Replacing a hot-swap power supply with fan unit" on page 28.
Drives and SCSI bus	Unable to access drives on one or both SCSI buses	Midplane failure	Replace the chassis assembly.
		Incorrect SCSI ID settings	Make sure the SCSI cables are undamaged and properly connected. Check the drive SCSI ID settings. Be sure that configuration switches SW3 and SW4 (on the ESM) are set to the appropriate positions. Attention: Change configuration switch positions only when your host server and expansion unit are turned off.
Bridge card		ESM failure	Replace the EMS. See "Replacing an ESM" on page 27.
		Bridge card failure	All high address or all low address hard disk drives failed; check the bridge card CRU and replace if necessary. See "Replacing a bridge card" on page 26.
Subsystem	Random errors	Midplane failure	Replace the chassis assembly.

Chapter 6. Parts listing

This parts listing supports the IBM EXP400 Storage Expansion Unit Type 1733.



Note: Field replaceable units (FRUs) should be serviced only by qualified field service technicians. Customer replaceable units can be replaced by the customer.

Index	Expansion Unit (Type 1733)	FRU No.	CRU/FRU
1	Blank tray	19K1291	CRU
2	Bridge card	59P4869	CRU
3	Front bezel assembly	59P4864	CRU
4	Enclosure Services Module	59P4866	CRU
4	Blank, Enclosure Services Module	59P4867	CRU
5	Power supply (AC)	14J0665	CRU
5	Power supply (DC)	14J0666	FRU
6	Rails, left and right	19K1169	CRU
7	Chassis assembly with midplane	59P4865	FRU
	DC power cable	59P5022	CRU
	Jumper, 2.8M	36L8886	CRU

Index	Expansion Unit (Type 1733)	FRU No.	CRU/FRU
	Miscellaneous hardware kit	59P4870	CRU
	<ul style="list-style-type: none"> • Cover, switch (quantity 1) • Cover, switch G (quantity 1) • Pipe light, 3p U320 (quantity 1) • Screw, M5x8 slotted flat head (quantity 2) • Screw, M6 hex head (quantity 2) • Nut, M6 caged (quantity 2) • Label, ID customer (quantity 1) • Label, ID tower (quantity 1) • Label, SCSI ID (quantity 1) • Bezel, front bridge (quantity 1) • C-clip (quantity 2) 		
	Power cord	6952300	CRU
	Tower enclosure assembly	19K1184	CRU
	Tower enclosure bezel assembly	19K1223	CRU
	Tower enclosure feet	09N7269	CRU
	Tower enclosure lock assembly	19K1186	CRU

Appendix A. 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 appendix contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your BladeCenter unit, 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 is turned on.
- Use the troubleshooting information in your system documentation, and use the 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.
- Use an IBM discussion forum on the IBM Web site to ask questions.

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>. If you click **Profile** from the support page, you

can create a customized support page. The support page has many sources of information and ways for you to solve problems, including:

- Diagnosing problems, using the IBM Online Assistant
- Downloading the latest device drivers and updates for your products
- Viewing Frequently Asked Questions (FAQ)
- Viewing hints and tips to help you solve problems
- Participating in IBM discussion forums
- Setting up e-mail notification of technical updates about your products

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.

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.

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.

Appendix B. Related service information

Note: The service procedures are designed to help you isolate problems. They are written with the assumption that you have model-specific training on all computers, or that you are familiar with the computers, functions, terminology, and service information provided in this manual.

Safety information

The following section contains the safety information that you need to be familiar with before servicing an IBM computer.

General safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- When lifting any heavy object:
 1. Ensure you can stand safely without slipping.
 2. Distribute the weight of the object equally between your feet.
 3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
 4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that weigh more than 16 kg (35 lb) or objects that you think are too heavy for you.*
- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your tool case away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

Remember: Metal objects are good electrical conductors.
- Wear safety glasses when you are: hammering, drilling soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.

Electrical safety



CAUTION:

Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunication systems, networks, and modems before you open the server covers, unless instructed otherwise in the installation and configuration procedures.

Observe the following rules when working on electrical equipment.

Important: Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that do not insulate you when working with live electrical currents.

Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
 - Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
 - Disconnect all power before:
 - Performing a mechanical inspection
 - Working near power supplies
 - Removing or installing main units
 - Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine and to lock the wall box in the off position.
 - If you need to work on a machine that has exposed electrical circuits, observe the following precautions:
 - Ensure that another person, familiar with the power-off controls, is near you.
Remember: Another person must be there to switch off the power, if necessary.
 - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.
Remember: There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.
 - When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
 - Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.
- Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.
- Regularly inspect and maintain your electrical hand tools for safe operational condition.
 - Do not use worn or broken tools and testers.

- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered-off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts with the power on when they are removed from their normal operating places in a machine:
 - Power supply units
 - Pumps
 - Blowers and fans
 - Motor generators and similar units. (This practice ensures correct grounding of the units.)
- If an electrical accident occurs:
 - Use caution; do not become a victim yourself.
 - Switch off power.
 - Send another person to get medical aid.

Safety inspection guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of non-IBM features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock).
- Explosive hazards, such as a damaged CRT face or bulging capacitor
- Mechanical hazards, such as loose or missing hardware

The guide consists of a series of steps presented in a checklist. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Turn off the computer. Disconnect the power cord.

3. Check the power cord for:
 - a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
 - b. The power cord should be the appropriate type as specified in the parts listings.
 - c. Insulation must not be frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling electrostatic discharge-sensitive devices

Any computer part containing transistors or integrated circuits (Is) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the server, the part, the work mat, and the person handling the part are all at the same charge.

Notes:

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD-protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those in the following list, to provide protection that meets the specific service requirement.

Note: The use of a grounding system is desirable but not required to protect against ESD damage.

- Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
- Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.
- Use the round ground-prong of the ac plug on ac-operated computers.

Grounding requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Safety notices (multi-lingual translations)

The caution and danger safety notices in this section are provided in the following languages:

- English
- Brazilian/Portuguese
- Chinese
- French
- German
- Italian
- Japanese
- Korean
- Spanish

Important: All caution and danger statements in this IBM documentation begin with a number. This number is used to cross reference an English caution or danger statement with translated versions of the caution or danger statement in this section.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in this section under statement 1.

Be sure to read all caution and danger statements before performing any of the instructions.

Statement 1



DANGER

Electrical current from power, telephone and communication cables is hazardous.

To avoid a shock hazard:

- **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	To Disconnect
<ol style="list-style-type: none">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.	<ol style="list-style-type: none">1. Turn everything OFF.2. First, remove power cords from outlet.3. Remove signal cables from connectors.4. Remove all cables from devices.

Statement 2



CAUTION:

When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

Statement 3



CAUTION:

When laser products (such as CD-ROMs, DVD-ROM drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.



DANGER: Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following:

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Class 1 Laser Product

Statement 4



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

CAUTION:
Use safe practices when lifting.

Statement 5



CAUTION:
The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



Statement 10

CAUTION:

Do not place any object weighing more than 82 kg (180 lbs.) on top of rack-mounted devices.



Statement 20



CAUTION:

To avoid personal injury, before lifting the unit, remove all the blades to reduce the weight.

Statement 21



CAUTION:

Hazardous energy is present when the blade is connected to the power source. Always replace the blade cover before installing the blade.

Importante:

Todas as instruções de cuidado e perigo da IBM documentation começam com um número. Este número é utilizado para fazer referência cruzada de uma instrução de cuidado ou perigo no idioma inglês com as versões traduzidas das instruções de cuidado ou perigo encontradas nesta seção.

Por exemplo, se uma instrução de cuidado é iniciada com o número 1, as traduções para aquela instrução de cuidado aparecem nesta seção sob a instrução 1.

Certifique-se de ler todas as instruções de cuidado e perigo antes de executar qualquer operação.

Instrução 1



PERIGO

A corrente elétrica proveniente de cabos de alimentação, de telefone e de comunicações é perigosa.

Para evitar risco de choque:

- Não conecte ou desconecte cabos e não realize instalação, manutenção ou reconfiguração deste produto durante uma tempestade com raios.
- Conecte todos os cabos de alimentação a tomadas elétricas corretamente instaladas e aterradas.
- Conecte todos os equipamentos ao qual esse produto será conectado a tomadas corretamente instaladas.
- Sempre que possível, utilize apenas uma das mãos para conectar ou desconectar cabos de sinal.
- Nunca ligue qualquer equipamento quando existir evidência de danos por fogo, água ou na estrutura.
- Desconecte cabos de alimentação, sistemas de telecomunicação, redes e modems antes de abrir as tampas dos dispositivos, a menos que especificado de maneira diferente nos procedimentos de instalação e configuração.
- Conecte e desconecte cabos conforme descrito na seguinte tabela, ao instalar ou movimentar este produto ou os dispositivos conectados, ou ao abrir suas tampas.

Para Conectar:	Para Desconectar:
<ol style="list-style-type: none">1. DESLIGUE Tudo.2. Primeiramente, conecte todos os cabos aos dispositivos.3. Conecte os cabos de sinal aos conectores.4. Conecte os cabos de alimentação às tomadas.5. LIGUE os dispositivos.	<ol style="list-style-type: none">1. DESLIGUE Tudo.2. Primeiramente, remova os cabos de alimentação das tomadas.3. Remova os cabos de sinal dos conectores.4. Remova todos os cabos dos dispositivos.

Instrução 2



CUIDADO:

Ao substituir a bateria de lítio, utilize apenas uma bateria IBM, Número de Peça 33F8354 ou uma bateria de tipo equivalente, recomendada pelo fabricante. Se o seu sistema possui um módulo com uma bateria de lítio, substitua-o apenas pelo mesmo tipo de módulo, do mesmo fabricante. A bateria contém lítio e pode explodir se não for utilizada, manuseada e descartada de maneira correta.

Não:

- Jogue ou coloque na água
- Aqueça a mais de 100°C (212°F)
- Conserte nem desmonte

Para descartar a bateria, entre em contato com a área de atendimento a clientes IBM, pelo telefone (011) 889-8986, para obter informações sobre como enviar a bateria pelo correio para a IBM.

Instrução 3



PRECAUCIÓN:

Quando produtos a laser (unidades de CD-ROM, unidades de DVD, dispositivos de fibra ótica, transmissores, etc.) estiverem instalados, observe o seguinte:

- Não remova as tampas. A remoção das tampas de um produto a laser pode resultar em exposição prejudicial à radiação de laser. Nenhuma peça localizada no interior do dispositivo pode ser consertada.
- A utilização de controles ou ajustes ou a execução de procedimentos diferentes dos especificados aqui pode resultar em exposição prejudicial à radiação.

PERIGO

Alguns produtos a laser contêm um diodo laser da Classe 3A ou Classe 3B embutido. Observe o seguinte:

Radiação de laser quando aberto. Não olhe diretamente para o raio a olho nu ou com instrumentos óticos, e evite exposição direta ao raio.

Laser Klasse 1.

Instrução 4



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

CUIDADO:

Ao levantar a máquina, faça-o com segurança.

Instrução 5



CUIDADO:

Os botões Liga/Desliga localizados no dispositivo e na fonte de alimentação não desligam a corrente elétrica fornecida ao dispositivo. O dispositivo também pode ter mais de um cabo de alimentação. Para remover toda a corrente elétrica do dispositivo, assegure que todos os cabos de alimentação estejam desconectados da fonte de energia elétrica.



2  → 

1  → 

CUIDADO:

Instrução 10



CUIDADO:



Não coloque nenhum objeto com peso superior a 82 kg (180 lbs.) sobre dispositivos montados em rack.

Instrução 20



CUIDADO:

Para prevenir accidentes, antes de erguer a unidade, remova todas as lâminas para reduzir o peso.

Instrução 21



CUIDADO:

A energia é uma ameaça quando a lâmina estiver conectada à fonte de alimentação. Sempre substitua a cobertura da lâmina antes de efetuar a instalação.

重要:

Server Library 中的所有提醒和危险条款前都有一个数字标识。该数字是用来交叉引用一个英文的提醒和危险条款及本部分中的与之对应的已翻译成其它文字的提醒和危险条款。

例如, 如果一个提醒条款前的数字为 1, 则本部分中相应的译文也带有标号 1。

在执行任何指示的操作之前, 请确保您已经阅读了全部提醒和危险条款。

声明 1



危险

电源、电话和通信电缆中带有危险电流。
为避免电击：
雷电期间不要拆接电缆或安装、维修及重新配置本产品。
将所有电源线连接至正确布线并已安全接地的电源插座上。
将与本产品连接的所有设备连接至正确布线的插座上。
尽量只使用单手拆接信号电缆。
有水、火及结构损坏迹象时, 请勿打开任何设备。
除非在安装配置过程中有明确指示, 否则, 打开设备机盖前应首先断开与电源线、远程通信系统、网络和调制解调器的所有连接。
安装、移动或打开本产品及其附带设备的机盖时, 应按下表所述连接和断开电缆。

连接时:	断开连接时:
1. 关闭所有设备。	1. 关闭所有设备。
2. 首先将所有电缆连接至设备。	2. 首先从插座中拔出电源线。
3. 将信号电缆连接至接口。	3. 从接口上拔出信号电缆。
4. 将电源线连接至插座。	

声明 2



警告:

更换锂电池时, 只能使用 IBM 产品号 33F8354 或者是厂商推荐的等同类型的电池。

如果系统模块中含有锂电池, 则只能使用同一厂商制造的同一类型的模块进行更换。电池中含有锂, 如果使用、拿放或处理不当, 可能会发生爆炸。

请勿对电池进行下列操作:

扔入或浸入水中

加热超过 100 (212 F)

进行修理或分解

请按本地法规要求处理电池。

声明 3



警告:

安装激光产品 (如 CD-ROM、DVD 驱动器、光纤设备或送话器) 时, 应注意以下事项:

不要拆除外盖。拆除激光产品的外盖可能会导致激光辐射的危险, 本设备中没有用户可维修的部件。

非此处指定的其它控制、调整或与性能有关的操作都有可能致激光辐射的危险。



危险

某些激光产品中包含内嵌的 3A 级或 3B 级激光二极管。请注意以下事项。

打开时会产生激光辐射。不要直视光束, 不要使用光学仪器直接观看光束, 避免直接暴露于光束之下。

Laser Class 1.

声明 4



≥18 kg (37 磅)



≥32 kg (70.5 磅)



≥55 kg (121.2 磅)

警告：
抬起时请采用安全操作方法。

声明 5



警告：

使用设备上的电源控制按钮和电源上的开关都不能断开本设备上的电流。
另外，本设备可能带有多条电源线。如要断开设备上的所有电流，请确保所有电源线均已与电源断开连接。



声明 6



警告：

如果在电源线连接设备的一端安装了固定松紧夹，则必须将电源线的另一端连接至使用方便的电源。

声明 7



警告:

如果设备带有外门，则在移动或抬起设备前应将其拆除或固定以避免造成人员伤害。外门支撑不了设备的重量。

声明 8



警告:

不要拆除电源外盖或贴有下列标签的任何部件。



贴有此标签的组件内部存在高电压、高电流的危险。这些组件中没有用户可维修的部件。如果怀疑其中的部件存在问题，应与服务技术人员联系。

声明 9



警告:

为避免人员伤害，拆除设备上的风扇前应拨下热插拔风扇电缆。

声明 10



警告:

机柜安装的设备上面不能放置重于 82kg (180 磅) 的物品。



> 82 kg (180 磅)

声明 11



警告:

下面的标签表明附近有锋利的边、角或接头。



声明 12



警告:

下面的标签表明附近有高热表面。



• 声明 20



警告:

为避免人身伤害，请在抬起设备之前卸下所有刀片服务器以减轻重量。

• 声明 21



警告:

当刀片服务器连接到电源时会有危险的能量，请始终在安装刀片服务器之前重新装上刀片服务器机盖。

重要資訊：

Server Library 中所有「注意」及「危險」的聲明均以數字開始。此一數字是用來作為交互參考之用，英文「注意」或「危險」聲明可在本節中找到相同內容的「注意」或「危險」聲明的譯文。

例如，有一「危險」聲明以數字 1 開始，則該「危險」聲明的譯文將出現在本節的「聲明」1 中。

執行任何指示之前，請詳讀所有「注意」及「危險」的聲明。

聲明 1



危險

電源、電話及通信電纜上所產生的電流均有危險性。

欲避免電擊危險：

- 在雷雨期間，請勿連接或切斷本產品上的任何電纜線，或安裝、維修及重新架構本產品。
- 請將電源線接至接線及接地正確的電源插座。
- 請將本產品隨附的設備連接至接線正確的插座。
- 儘可能使用單手來連接或切斷信號電纜線。
- 當設備有火燒或泡水的痕跡，或有結構性損害時，請勿開啓該設備的電源。
- 在安裝及架構之時，若非非常熟悉，在開啓裝置蓋子之前，請切斷電源線、電信系統、網路及數據機。
- 在安裝、移動本產品或附加裝置，或開啓其蓋子時，請依照下表中「連接」及「切斷」電纜線的步驟執行。

連接：

1. 關閉所有開關。
2. 先將所有電纜線接上裝置。
3. 將信號電纜線接上接頭。
4. 再將電源線接上電源插座。
5. 開啓裝置的電源。

切斷：

1. 關閉所有開關。
2. 先自電源插座拔掉電源線。
3. 從接線頭上的所有信號電纜。
4. 再從裝置上的所有電纜線。

聲明 2



注意：

更換電池時，只可使用 IBM 零件編號 33F8354 的電池，或製造商建議之相當類型的電池。若系統中具有包含鋰電池的模組，在更換此模組時，請使用相同廠商製造的相同模組類型。如未正確使用、處理或丟棄含有鋰的電池時，可能會引發爆炸。

請勿將電池：

- 丟入或浸入水中
- 加熱超過 100 °C (212 °F)
- 修理或拆開

請遵照當地法令規章處理廢棄電池。

聲明 3



注意：

安裝雷射產品 (如 CD-ROM、DVD 光碟機、光纖裝置或發射器) 時，請注意下列事項：

- 請勿移開蓋子。移開雷射產品的蓋子，您可能會暴露於危險的雷射輻射之下。裝置中沒有需要維修的組件。
- 不依此處所指示的控制、調整或處理步驟，您可能會暴露於危險的輻射之下。



危險

有些雷射產品含有內嵌式 Class 3A 或 Class 3B 雷射二極體。請注意下列事項：

開啓時會產生雷射輻射，請勿凝視光束，不要使用光學儀器直接觀察，且應避免直接暴露在光線下。

Luokan 1 Laserlaite

聲明 4



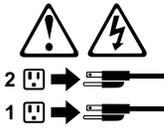
≥ 18 公斤 (37 磅) ≥ 32 公斤 (70.5 磅) ≥ 55 公斤 (121.2 磅)

注意：
抬起裝置時，請注意安全措施。

聲明 5



注意：
裝置上的電源控制按鈕及電源供應器上的電源開關均無法關閉裝置上的電流。
本裝置可能有一條以上的電源線。如要移除裝置上的所有電流，請確認所有電源線已與電源分離。



聲明 10



注意：
請勿將任何重量超過 82 公斤 (180 磅) 的物品置於已安裝機架的裝置上方。



> 82 公斤 (180 磅)

聲明 20



警告：
為了避免人身傷害，抬起裝置之前，請先卸下所有的螺旋槳，以便減輕重量。

聲明 21



警告：
當螺旋槳連到電源時可能會有危險之虞。安裝螺旋槳之前，請先更換螺旋槳外蓋。

Important:

Toutes les consignes Attention et Danger indiquées dans la bibliothèque IBM documentation sont précédées d'un numéro. Ce dernier permet de mettre en correspondance la consigne en anglais avec ses versions traduites dans la présente section.

Par exemple, si une consigne de type Attention est précédée du chiffre 1, ses traductions sont également précédées du chiffre 1 dans la présente section.

Prenez connaissance de toutes les consignes de type Attention et Danger avant de procéder aux opérations décrites par les instructions.

Notice n° 1



DANGER

Le courant électrique passant dans les câbles de communication, ou les cordons téléphoniques et d'alimentation peut être dangereux.

Pour éviter tout risque de choc électrique:

- Ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.
- Branchez tous les cordons d'alimentation sur un socle de prise de courant correctement câblé et mis à la terre.
- Branchez sur des socles de prise de courant correctement câblés tout équipement connecté à ce produit.
- Lorsque cela est possible, n'utilisez qu'une seule main pour connecter ou déconnecter les câbles d'interface.
- Ne mettez jamais un équipement sous tension en cas d'incendie ou d'inondation, ou en présence de dommages matériels.
- Avant de retirer les carters de l'unité, mettez celle-ci hors tension et déconnectez ses cordons d'alimentation, ainsi que les câbles qui la relie aux réseaux, aux systèmes de télécommunication et aux modems (sauf instruction contraire mentionnée dans les procédures d'installation et de configuration).
- Lorsque vous installez ou que vous déplacez le présent produit ou des périphériques qui lui sont raccordés, reportez-vous aux instructions ci-dessous pour connecter et déconnecter les différents cordons.

Connexion	Déconnexion
<ol style="list-style-type: none">1. Mettez les unités hors tension.2. Commencez par brancher tous les cordons sur les unités.3. Branchez les câbles d'interface sur des connecteurs.4. Branchez les cordons d'alimentation sur des prises.5. Mettez les unités sous tension.	<ol style="list-style-type: none">1. Mettez les unités hors tension.2. Débranchez les cordons d'alimentation des prises.3. Débranchez les câbles d'interface des connecteurs.4. Débranchez tous les câbles des unités.

Notice n° 2



ATTENTION:

Remplacez la pile au lithium usagée par une pile de référence identique exclusivement - voir la référence IBM - ou par une pile équivalente recommandée par le fabricant. Si votre système est doté d'un module contenant une pile au lithium, vous devez le remplacer uniquement par un module identique, produit par le même fabricant. La pile contient du lithium et présente donc un risque d'explosion en cas de mauvaise manipulation ou utilisation.

- Ne la jetez pas à l'eau.
- Ne l'exposez pas à une température supérieure à 100° C.
- Ne cherchez pas à la réparer ou à la démonter.

Pour la mise au rebut, reportez-vous à la réglementation en vigueur.

Notice n° 3



ATTENTION:

Si des produits laser sont installés (tels que des unités de CD-ROM ou de DVD, des périphériques contenant des fibres optiques ou des émetteurs-récepteurs), prenez connaissance des informations suivantes:

- N'ouvrez pas ces produits pour éviter une exposition directe au rayon laser. Vous ne pouvez effectuer aucune opération de maintenance à l'intérieur.
- Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites dans le présent document.



DANGER

Certains produits laser contiennent une diode laser de classe 3A ou 3B. Prenez connaissance des informations suivantes:

Rayonnement laser lorsque le carter est ouvert. évitez de regarder fixement le faisceau ou de l'observer à l'aide d'instruments optiques. évitez une exposition directe au rayon.

Appareil A Laser de Classe 1.

Notice n° 4





≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

ATTENTION:

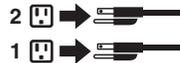
Faites-vous aider pour soulever ce produit.

Notice n° 5



ATTENTION:

Le bouton de mise sous tension/hors tension de l'unité et l'interrupteur d'alimentation du bloc d'alimentation ne coupent pas l'arrivée de courant électrique à l'intérieur de la machine. Il se peut que votre unité dispose de plusieurs cordons d'alimentation. Pour isoler totalement l'unité du réseau électrique, débranchez tous les cordons d'alimentation des socles de prise de courant.



Notice n° 10



ATTENTION:

Ne posez pas d'objet dont le poids dépasse 82 kg sur les unités montées en armoire.

Notice n° 20



ATTENTION:

Pour éviter tout risque de blessure, retirez tous les Serveurs lame de l'unité avant de la soulever.

Notice n° 21

**ATTENTION:**

Un courant électrique dangereux est présent lorsque le Serveur lame est connecté á une source d'alimentation. Remettez toujours en place le carter du Serveur lame avant d'installer le Serveur lame.

Wichtig:

Alle Sicherheitshinweise in dieser IBM documentation beginnen mit einer Nummer. Diese Nummer verweist auf einen englischen Sicherheitshinweis mit den übersetzten Versionen dieses Hinweises in diesem Abschnitt.

Wenn z. B. ein Sicherheitshinweis mit der Nummer 1 beginnt, so erscheint die übersetzung für diesen Sicherheitshinweis in diesem Abschnitt unter dem Hinweis 1.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

Hinweis 1



VORSICHT

Elektrische Spannungen von Netz-, Telefon- und Datenübertragungsleitungen sind gefährlich.

Aus Sicherheitsgründen:

- Bei Gewitter an diesem Gerät keine Kabel anschließen oder lösen. Ferner keine Installations-, Wartungs- oder Rekonfigurationsarbeiten durchführen.
- Gerät nur an eine Schutzkontaktsteckdose mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Alle angeschlossenen Geräte ebenfalls an Schutzkontaktsteckdosen mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Signalkabel möglichst einhändig anschließen oder lösen.
- Keine Geräte einschalten, wenn die Gefahr einer Beschädigung durch Feuer, Wasser oder andere Einflüsse besteht.
- Die Verbindung zu den angeschlossenen Netzkabeln, Telekommunikationssystemen, Netzwerken und Modems ist vor dem öffnen des Gehäuses zu unterbrechen. Es sei denn, dies ist in den zugehörigen Installations- und Konfigurationsprozeduren anders angegeben.
- Nur nach den nachfolgend aufgeführten Anweisungen arbeiten, die für Installation, Transport oder öffnen von Gehäusen von Personal Computern oder angeschlossenen Einheiten gelten.

Kabel anschließen:	Kabel lösen:
<ol style="list-style-type: none">1. Alle Geräte ausschalten und Netzstecker ziehen.2. Zuerst alle Kabel an Einheiten anschließen.3. Signalkabel an Anschlußbuchsen anschließen.4. Netzstecker an Steckdose anschließen.5. Gerät einschalten.	<ol style="list-style-type: none">1. Alle Geräte ausschalten.2. Zuerst Netzstecker von Steckdose lösen.3. Signalkabel von Anschlußbuchsen lösen.4. Alle Kabel von Einheiten lösen.

Hinweis 2



ACHTUNG:

Eine verbrauchte Batterie nur durch eine Batterie mit der IBM Teilenummer 33F8354 oder durch eine vom Hersteller empfohlene Batterie ersetzen. Wenn Ihr System ein Modul mit einer Lithium-Batterie enthält, ersetzen Sie es immer mit dem selben Modultyp vom selben Hersteller. Die Batterie enthält Lithium und kann bei unsachgemäßer Verwendung, Handhabung oder Entsorgung explodieren.

Die Batterie nicht:

- mit Wasser in Berührung bringen.
- über 100 C erhitzen.
- reparieren oder zerlegen.

Die örtlichen Bestimmungen für die Entsorgung von Sondermüll beachten.

Hinweis 3



ACHTUNG:

Wenn ein Laserprodukt (z. B. CD-ROM-Laufwerke, DVD-Laufwerke, Einheiten mit Glasfaserkabeln oder Transmitter) installiert ist, beachten Sie folgendes.

- Das Entfernen der Abdeckungen des CD-ROM-Laufwerks kann zu gefährlicher Laserstrahlung führen. Es befinden sich keine Teile innerhalb des CD-ROM-Laufwerks, die vom Benutzer gewartet werden müssen. Die Verkleidung des CD-ROM-Laufwerks nicht öffnen.
- Steuer- und Einstellelemente sowie Verfahren nur entsprechend den Anweisungen im vorliegenden Handbuch einsetzen. Andernfalls kann gefährliche Laserstrahlung auftreten.



VORSICHT

Manche CD-ROM-Laufwerke enthalten eine eingebaute Laserdiode der Klasse 3A oder 3B. Die nachfolgend aufgeführten Punkte beachten.

Laserstrahlung bei geöffneter Tür. Niemals direkt in den Laserstrahl sehen, nicht direkt mit optischen Instrumenten betrachten und den Strahlungsbereich meiden.

Hinweis 4



≥18 kg



≥32 kg



≥55 kg

ACHTUNG:

Beim Anheben der Maschine die vorgeschriebenen Sicherheitsbestimmungen beachten.

Hinweis 5



ACHTUNG:

Mit dem Betriebsspannungsschalter an der Vorderseite des Servers und dem Betriebsspannungsschalter am Netzteil wird die Stromversorgung für den Server nicht unterbrochen. Der Server könnte auch mehr als ein Netzkabel aufweisen. Um die gesamte Stromversorgung des Servers auszuschalten, muß sichergestellt werden, daß alle Netzkabel aus den Netzsteckdosen herausgezogen wurden.



2 →

1 →

Hinweis 10



ACHTUNG:



Keine Gegenstände, die mehr als 82 kg wiegen, auf Rack-Einheiten ablegen.

Hinweis 20



ACHTUNG:

Um Verletzungen zu vermeiden, entfernen Sie vor dem Anheben der Einheit zur Verringerung des Gewichts alle Blades.

Hinweis 21



ACHTUNG:

Wenn das Blade an eine Stromquelle angeschlossen ist, besteht die Gefahr eines Stromschlags. Bringen Sie die Abdeckung der Blades immer an, bevor Sie sie installieren.

Importante:

Tutti gli avvisi di attenzione e di pericolo riportati nella pubblicazione IBM documentation iniziano con un numero. Questo numero viene utilizzato per confrontare avvisi di attenzione o di pericolo in inglese con le versioni tradotte riportate in questa sezione.

Ad esempio, se un avviso di attenzione inizia con il numero 1, la relativa versione tradotta è presente in questa sezione con la stessa numerazione.

Prima di eseguire una qualsiasi istruzione, accertarsi di leggere tutti gli avvisi di attenzione e di pericolo.

Avviso 1



PERICOLO

La corrente elettrica circolante nei cavi di alimentazione, del telefono e di segnale è pericolosa.

Per evitare il pericolo di scosse elettriche:

- Non collegare o scollegare i cavi, non effettuare l'installazione, la manutenzione o la riconfigurazione di questo prodotto durante i temporali.
- Collegare tutti i cavi di alimentazione ad una presa elettrica correttamente cablata e munita di terra di sicurezza.
- Collegare qualsiasi apparecchiatura collegata a questo prodotto ad una presa elettrica correttamente cablata e munita di terra di sicurezza.
- Quando possibile, collegare o scollegare i cavi di segnale con una sola mano.
- Non accendere qualsiasi apparecchiatura in presenza di fuoco, acqua o se sono presenti danni all'apparecchiatura stessa.
- Scollegare i cavi di alimentazione, i sistemi di telecomunicazioni, le reti e i modem prima di aprire i coperchi delle unità, se non diversamente indicato nelle procedure di installazione e configurazione.
- Collegare e scollegare i cavi come descritto nella seguente tabella quando si effettuano l'installazione, la rimozione o l'apertura dei coperchi di questo prodotto o delle unità collegate.

Per collegare:	Per scollegare:
<ol style="list-style-type: none">1. SPEGNERE tutti i dispositivi.2. Collegare prima tutti i cavi alle unità.3. Collegare i cavi di segnale ai connettori.4. Collegare i cavi di alimentazione alle prese elettriche.5. ACCENDERE le unità.	<ol style="list-style-type: none">1. SPEGNERE tutti i dispositivi.2. Rimuovere prima i cavi di alimentazione dalle prese elettriche.3. Rimuovere i cavi di segnale dai connettori.4. Rimuovere tutti i cavi dalle unità.

Avviso 2



ATTENZIONE:

Quando si sostituisce la batteria al litio, utilizzare solo una batteria IBM con numero parte 33F8354 o batterie dello stesso tipo o di tipo equivalente consigliate dal produttore. Se il sistema di cui si dispone è provvisto di un modulo contenente una batteria al litio, sostituire tale batteria solo con un tipo di modulo uguale a quello fornito dal produttore. La batteria contiene litio e può esplodere se utilizzata, maneggiata o smaltita impropriamente.

Evitare di:

- Gettarla o immergerla in acqua
- Riscaldarla ad una temperatura superiore ai 100°C
- Cercare di ripararla o smontarla

Smaltire secondo la normativa in vigore (D.Lgs 22 del 5/2/9) e successive disposizioni nazionali e locali.

Avviso 3



ATTENZIONE:

Quando si installano prodotti laser come, ad esempio, le unità DVD, CD-ROM, a fibre ottiche o trasmettitori, prestare attenzione a quanto segue:

- Non rimuovere i coperchi. L'apertura dei coperchi di prodotti laser può determinare l'esposizione a radiazioni laser pericolose. All'interno delle unità non vi sono parti su cui effettuare l'assistenza tecnica.
- L'utilizzo di controlli, regolazioni o l'esecuzione di procedure non descritti nel presente manuale possono provocare l'esposizione a radiazioni pericolose.



PERICOLO

Alcuni prodotti laser contengono all'interno un diodo laser di Classe 3A o Classe 3B. Prestare attenzione a quanto segue:

Aperto l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici ed evitare l'esposizione diretta al fascio.

Avviso 4



≥18 kg



≥32 kg



≥55 kg

ATTENZIONE:

Durante il sollevamento della macchina seguire delle norme di sicurezza.

Avviso 5



ATTENZIONE:

Il pulsante del controllo dell'alimentazione situato sull'unità e l'interruttore di alimentazione posto sull'alimentatore non disattiva la corrente elettrica fornita all'unità. L'unità potrebbe disporre di più di un cavo di alimentazione. Per disattivare la corrente elettrica dall'unità, accertarsi che tutti i cavi di alimentazione siano scollegati dalla sorgente di alimentazione.



2  → 

1  → 

Avviso 10



ATTENZIONE:



Non poggiare oggetti che pesano più di 82 kg sulla parte superiore delle unità montate in rack.

Avviso 20



ATTENZIONE:

Per evitare incidenti, prima di sollevare l'unità, rimuovere tutte le lame in modo da ridurre il peso.

Avviso 21



ATTENZIONE:

Quando la lama è collegata alla sorgente elettrica è presente una tensione pericolosa. Sostituire sempre il coperchio della lama prima di installarla.

重要:

Netfinity Server ライブラリーにあるすべての注意および危険の記述は数字で始まります。この数字は、英語版の注意および危険の記述と翻訳された注意および危険の記述を相互参照するために使用します。

例えば、もし注意の記述が数字の1で始まっている場合は、その注意の翻訳は、記述 1 の下にあります。

手順を実施する前に、すべての注意:

- ・ 記述 1

⚠ 危険

感電を防止するため、雷の発生時には、いかなるケーブルの取り付けまたは取り外しも行わないでください。また導入、保守、再構成などの作業も行わないでください。

感電を防止するため:

- 電源コードは正しく接地および配線が行われている電源に接続してください。
- 本製品が接続されるすべての装置もまた正しく配線された電源に接続されている必要があります。

できれば、信号ケーブルに取り付けまたは取り外しのときは片方の手のみで行うようにしてください。これにより、電位差がある二つの表面に触ることによる感電を防ぐことができます。

電源コード、電話ケーブル、通信ケーブルからの電流は身体に危険を及ぼします。設置、移動、または製品のカバーを開けたり装置を接続したりするときには、以下のようにケーブルの接続、取り外しを行ってください。

接続するには	取り外すには
1. すべての電源を切る	1. すべての電源を切る
2. まず、装置にすべてのケーブルを接続する。	2. まず、電源コンセントから電源コードを取り外す
3. 次に、通信ケーブルをコネクタに接続する	3. 次に、通信ケーブルをコネクタから取り外す。
4. その後、電源コンセントに電源コードを接続する	4. その後、装置からすべてのケーブルを取り外す
5. 装置の電源を入れる。	

・記述 2

⚠ 注意

本製品には、システム・ボード上にリチウム電池が使用されています。電池の交換方法や取り扱いを誤ると、発熱、発火、破裂のおそれがあります。

電池の交換には、IBM部品番号33F8354の電池またはメーカー推奨の同等の電池を使用してください。

交換用電池の購入については、お買い求めの販売店または弊社の営業担当までお問い合わせください。

電池は幼児の手の届かない所に置いてください。

万一、幼児が電池を飲み込んだときは、直ちに医師に相談してください。

以下の行為は絶対に行わないでください。

- 水にぬらすこと
- 100度C 以上の過熱や焼却
- 分解や充電
- ショート

電池を廃棄する場合、および保存する場合にはテープなどで絶縁してください。他の金属や電池と混ざると発火、破裂の原因となります。電池は地方自治体の条例、または規則に従って廃棄してください。ごみ廃棄場で処分されるごみの中に捨てないでください。

・記述 3

⚠ 注意

レーザー製品（CD-ROM、DVD、または光ファイバー装置または送信器など）が組み込まれている場合は、下記に御注意ください。

- ここに記載されている制御方法、調整方法、または性能を超えて使用すると、危険な放射線を浴びる可能性があります。
- ドライブのカバーを開けると、危険な放射線を浴びる可能性があります。ドライブの内部に修理のために交換可能な部品はありません。カバーを開けないでください。

⚠ 危険

一部 CD-ROM ドライブは、Class 3A または Class 3B レーザーダイオードを使用しています。次の点に注意してください。

CD-ROMドライブのカバーを開けるとレーザーが放射されます。光線を見つめたり、光学器械を使って直接見たりしないでください。また直接光線を浴びないようにしてください。

・記述 4

⚠ 注意



18Kg 以上



32Kg 以上



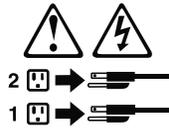
55Kg 以上

装置を持ち上げる場合は、安全に持ち上げる方法に従ってください。

・記述 5

注意

サーバーの前面にある電源制御ボタンは、サーバーに供給された電流を遮断しません。
サーバーには、複数の電源コードが接続されているかもしれません。
サーバーから電流を完全に遮断するために、すべての電源コードが電源から取り外されていることを確認してください。



・記述 10

注意

ラック・モデルのサーバーの上に 82 Kg 以上の物を置かないでください。



・記述 20



危険：
怪我を避けるため、ユニットを持ち上げる場合は、その前にすべてのブレード・サーバーを取り外して重量を軽くしてください。

・記述 21



危険：
ブレード・サーバーを差し込んだ状態では感電する危険性があります。
ブレードを差し込む前に、ブレードのカバーは必ず取り付けておいてください。

중요:

본 *Server Library*에 있는 모든 주의 및 위험 경고문은 번호로 시작합니다. 이 번호는 영문 주의 혹은 위험 경고문과 이 절에 나오는 번역된 버전의 주의 혹은 위험 경고문을 상호 참조하는 데 사용됩니다.

예를 들어, 주의 경고문이 번호 1로 시작하면, 번역된 해당 주의 경고문을 본 절의 경고문 1에서 찾아볼 수 있습니다.

모든 지시사항을 수행하기 전에 반드시 모든 주의 및 위험 경고문을 읽으십시오.

경고문 1



위험

전원, 전화 및 통신 케이블로부터 흘러 나오는 전류는 위험합니다.

전기 충격을 피하려면:

- 뇌우를 동반할 때는 케이블의 연결이나 철수, 이 제품의 설치, 유지보수 또는 재구성을 하지 마십시오.
- 모든 전원 코드를 적절히 배선 및 접지해야 합니다.
- 이 제품에 연결될 모든 장비를 적절하게 배선된 콘센트에 연결하십시오.
- 가능한 한 신호 케이블을 한 손으로 연결하거나 끊으십시오.
- 화재, 수해 또는 구조상의 손상이 있을 경우 장비를 켜지 마십시오.
- 설치 및 구성 프로시저에 다른 설명이 없는 한, 장치 덮개를 열기 전에 연결된 전원 코드, 원격기 통신 시스템, 네트워크 및 모뎀을 끊어 주십시오.
- 제품 또는 접속된 장치를 설치, 이동 및 덮개를 열 때 다음 설명에 따라 케이블을 연결하거나 끊도록 하십시오.

연결하려면:	연결을 끊으려면:
1. 모든 스위치를 끕니다.	1. 모든 스위치를 끕니다.
2. 먼저 모든 케이블을 장치에 연결합니다.	2. 먼저 콘센트에서 전원 코드를 뽑습니다.
3. 신호 케이블을 커넥터에 연결합니다.	3. 신호 케이블을 커넥터에서 제거합니다.
4. 콘센트에 전원 코드를 연결합니다.	4. 장치에서 모든 케이블을 제거합니다.
5. 장치 스위치를 켭니다.	

경고문 2



주의:

리튬 배터리를 교체할 때는 IBM 부품 번호 33F8354 또는 제조업체에서 권장하는 동등한 유형의 배터리를 사용하십시오. 시스템에 리튬 배터리를 갖고 있는 모듈이 있으면 동일한 제조업체에서 생산된 동일한 모듈 유형으로 교체하십시오. 배터리가 건물이 있을 경우 제대로 사용, 처리 또는 처분하지 않으면 폭발할 수 있습니다.

다음은 주의하십시오.

- 먼지거나 물에 담그지 않도록 하십시오.
- 100°C(212°F) 이상으로 가열하지 마십시오.
- 수리하거나 분해하지 마십시오.

지역 법령이나 규정의 요구에 따라 배터리를 처분하십시오.

경고문 3



주의:
레이저 제품(CD-ROMs, DVD 드라이브, 광 장치 또는 트랜스미터 등과 같은)이 설치되어 있을 경우 다음을 유의하십시오.

- 덮개를 제거하지 마십시오. 레이저 제품의 덮개를 제거했을 경우 위험한 레이저 광선에 노출될 수 있습니다. 이 장치 안에는 서비스를 받을 수 있는 부품이 없습니다.

- 여기에서 지정하지 않은 방식의 제어, 조절 또는 실행으로 인해 위험한 레이저 광선에 노출될 수 있습니다.



위험

일부 레이저 제품에는 클래스 3A 또는 클래스 3B 레이저 다이오드가 들어 있습니다. 다음을 주의하십시오.

열면 레이저 광선에 노출됩니다. 광선을 주시하거나 광학 기계를 직접 쳐다보지 않도록 하고 광선에 노출되지 않도록 하십시오.

경고문 4



≥18 kg (37 lbs)



≥ 32 kg (70.5 lbs)



≥ 55 kg (121.2 lbs)

주의:
기계를 들 때는 안전하게 들어 올리십시오.

경고문 5



주의:
장치의 전원 제어 버튼 및 전원 공급기의 전원 스위치는 장치에 공급되는 전류를 차단하지 않습니다. 장치에 둘 이상의 전원 코드가 연결되어 있을 수도 있습니다. 장치에서 모든 전류를 차단하려면 모든 전원 코드가 전원으로부터 차단되어 있는지 확인하십시오.



경고문 10



주의:
서랍형 모델의 장치 상단에 82 kg(180 lbs.)이 넘는 물체를 올려 놓지 마십시오.



>82 kg (180 lbs)

경고문 20



주의:

부품을 들어올리기 전에 모든 블레이드를 제거하여 무게를 줄여야 위험하지 않습니다.

경고문 21



주의:

블레이드를 전원에 연결할 때 감전 등의 위험이 있을 수 있습니다.
블레이드를 설치하기 전에 항상 블레이드 덮개를 교체하십시오.

Importante:

Todas las declaraciones de precaución de esta IBM documentation empiezan con un número. Dicho número se emplea para establecer una referencia cruzada de una declaración de precaución o peligro en inglés con las versiones traducidas que de dichas declaraciones pueden encontrarse en esta sección.

Por ejemplo, si una declaración de peligro empieza con el número 1, las traducciones de esta declaración de precaución aparecen en esta sección bajo Declaración 1.

Lea atentamente todas las declaraciones de precaución y peligro antes de llevar a cabo cualquier operación.

Declaración 1



PELIGRO

La corriente eléctrica de los cables telefónicos, de alimentación y de comunicaciones es perjudicial.

Para evitar una descarga eléctrica:

- No conecte ni desconecte ningún cable ni realice las operaciones de instalación, mantenimiento o reconfiguración de este producto durante una tormenta.
- Conecte cada cable de alimentación a una toma de alimentación eléctrica con conexión a tierra y cableado correctos.
- Conecte a tomas de alimentación con un cableado correcto cualquier equipo que vaya a estar conectado a este producto.
- Si es posible, utilice una sola mano cuando conecte o desconecte los cables de señal.
- No encienda nunca un equipo cuando haya riesgos de incendio, de inundación o de daños estructurales.
- Desconecte los cables de alimentación, sistemas de telecomunicaciones, redes y módems conectados antes de abrir las cubiertas del dispositivo a menos que se indique lo contrario en los procedimientos de instalación y configuración.
- Conecte y desconecte los cables tal como se describe en la tabla siguiente cuando desee realizar una operación de instalación, de traslado o de apertura de las cubiertas para este producto o para los dispositivos conectados.

Para la conexión	Para la desconexión
<ol style="list-style-type: none">1. APÁGUELO todo.2. En primer lugar, conecte los cables a los dispositivos.3. Conecte los cables de señal a los conectores.4. Conecte cada cable de alimentación a la toma de alimentación.5. ENCIENDA el dispositivo.	<ol style="list-style-type: none">1. APÁGUELO todo.2. En primer lugar, retire cada cable de alimentación de la toma de alimentación.3. Retire los cables de señal de los conectores.4. Retire los cables de los dispositivos.

Declaración 2



PRECAUCIÓN:

Cuando desee sustituir la batería de litio, utilice únicamente el número de pieza 33F8354 de IBM o cualquier tipo de batería equivalente que recomiende el fabricante. Si el sistema tiene un módulo que contiene una batería de litio, sustitúyalo únicamente por el mismo tipo de módulo, que ha de estar creado por el mismo fabricante. La batería contiene litio y puede explotar si el usuario no la utiliza ni la maneja de forma adecuada o si no se desprende de la misma como corresponde.

No realice las acciones siguientes:

- Arrojarla al agua o sumergirla
- Calentarla a una temperatura que supere los 100°C (212°F)
- Repararla o desmontarla

Despréndase de la batería siguiendo los requisitos que exija el reglamento o la legislación local.

Declaración 3



PRECAUCIÓN:

Cuando instale productos láser (como, por ejemplo, CD-ROM, unidades DVD, dispositivos de fibra óptica o transmisores), tenga en cuenta las advertencias siguientes:

- No retire las cubiertas. Si retira las cubiertas del producto láser, puede quedar expuesto a radiación láser perjudicial. Dentro del dispositivo no existe ninguna pieza que requiera mantenimiento.
- El uso de controles o ajustes o la realización de procedimientos que no sean los que se han especificado aquí pueden dar como resultado una exposición perjudicial a las radiaciones.



PELIGRO

Algunos productos láser contienen un diodo de láser incorporado de Clase 3A o de Clase 3B. Tenga en cuenta la advertencia siguiente.

Cuando se abre, hay radiación láser. No mire fijamente el rayo ni lleve a cabo ningún examen directamente con instrumentos ópticos; evite la exposición directa al rayo.

Declaración 4





≥18 kg



≥32 kg



≥55 kg

PRECAUCIÓN:

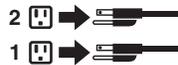
Tome medidas de seguridad al levantar el producto.

Declaración 5



PRECAUCIÓN:

El botón de control de alimentación del dispositivo y el interruptor de alimentación de la fuente de alimentación no apagan la corriente eléctrica suministrada al dispositivo. Es posible también que el dispositivo tenga más de un cable de alimentación. Para eliminar la corriente eléctrica del dispositivo, asegúrese de desconectar todos los cables de alimentación de la fuente de alimentación.



Declaración 10



PRECAUCIÓN:



No coloque ningún objeto que pese más de 82 kg (180 libras) encima de los dispositivos montados en bastidor.

Declaración 20



PRECAUCIÓN:

Para prevenir ferimentos pessoais, antes de levantar a unidade retire todas as lâminas para diminuir o peso.

Declaración 21



PRECAUCIÓN:

Existe energia perigosa quando a lâmina está ligada à fonte de alimentação.
Substitua sempre a cobertura da lâmina antes de instalar a mesma.

Appendix C. Notices

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Important notes

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

CD-ROM 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.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity may vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives available from IBM.

Maximum memory may require replacement of the standard memory with an optional memory module.

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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. For country-specific instructions, refer to the following Web site:
<http://www.ibm.com/ibm/environment/products/prp.shtml>.

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, 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.

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 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 nonrecommended 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.

Taiwanese Class A warning 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，在這種情況下，使用者會被要求採取某些適當的對策。

Chinese Class A warning statement

声 明
此为 A 级产品。在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

Japanese Voluntary Control Council for Interference (VCCI) statement

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。

Power cords

For your safety, IBM provides a power cord with a grounded attachment plug to use with this IBM product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.

IBM power cords used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA).

For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.

For units intended to be operated at 230 volts (U.S. use): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a tandem blade, grounding-type attachment plug rated 15 amperes, 250 volts.

For units intended to be operated at 230 volts (outside the U.S.): Use a cord set with a grounding-type attachment plug. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed.

IBM power cords for a specific country or region are usually available only in that country or region.

IBM power cord part number	Used in these countries and regions
02K0546	China
13F9940	Australia, Fiji, Kiribati, Nauru, New Zealand, Papua New Guinea

IBM power cord part number	Used in these countries and regions
13F9979	Afghanistan, Albania, Algeria, Andorra, Angola, Armenia, Austria, Azerbaijan, Belarus, Belgium, Benin, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Democratic Republic of), Congo (Republic of), Cote D'Ivoire (Ivory Coast), Croatia (Republic of), Czech Republic, Dahomey, Djibouti, Egypt, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Finland, France, French Guyana, French Polynesia, Germany, Greece, Guadeloupe, Guinea, Guinea Bissau, Hungary, Iceland, Indonesia, Iran, Kazakhstan, Kyrgyzstan, Laos (People's Democratic Republic of), Latvia, Lebanon, Lithuania, Luxembourg, Macedonia (former Yugoslav Republic of), Madagascar, Mali, Martinique, Mauritania, Mauritius, Mayotte, Moldova (Republic of), Monaco, Mongolia, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Reunion, Romania, Russian Federation, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Slovakia, Slovenia (Republic of), Somalia, Spain, Suriname, Sweden, Syrian Arab Republic, Tajikistan, Tahiti, Togo, Tunisia, Turkey, Turkmenistan, Ukraine, Upper Volta, Uzbekistan, Vanuatu, Vietnam, Wallis and Futuna, Yugoslavia (Federal Republic of), Zaire
13F9997	Denmark
14F0015	Bangladesh, Lesotho, Maceo, Maldives, Namibia, Nepal, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda
14F0033	Abu Dhabi, Bahrain, Botswana, Brunei Darussalam, Channel Islands, China (Hong Kong S.A.R.), Cyprus, Dominica, Gambia, Ghana, Grenada, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar (Burma), Nigeria, Oman, Polynesia, Qatar, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Sudan, Tanzania (United Republic of), Trinidad and Tobago, United Arab Emirates (Dubai), United Kingdom, Yemen, Zambia, Zimbabwe
14F0051	Liechtenstein, Switzerland
14F0069	Chile, Italy, Libyan Arab Jamahiriya
14F0087	Israel
1838574	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Caicos Islands, Canada, Cayman Islands, Costa Rica, Colombia, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Japan, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Taiwan, United States of America, Venezuela
24P6858	Korea (Democratic People's Republic of), Korea (Republic of)
34G0232	Japan
36L8880	Argentina, Paraguay, Uruguay
49P2078	India
49P2110	Brazil

IBM power cord part number	Used in these countries and regions
6952300	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Caicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Thailand, Taiwan, United States of America, Venezuela

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