

IBM Distributed Power Interconnect
Front-end Power Distribution Unit



Installation and Maintenance Guide



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Note: Before using this information and the product it supports, be sure to read the warranty information in Appendix A, "Warranty information," on page 19 and the notices information in Appendix B, "Notices," on page 31.

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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

在安裝本產品之前，請仔細閱讀 **Safety Information** (安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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

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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

Important:

All caution and danger statements in this 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 the *IBM NetBAY Rack Safety Information* book.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in the *IBM NetBAY Rack Safety Information* book under statement 1.

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

Statement 4:



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:

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

To Disconnect:

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

Statement 8:



DANGER

- Plug power cords from devices in the rack cabinet into electrical outlets that are located near the rack cabinet and are easily accessible.
- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet before servicing any device in the rack cabinet.
- Install an emergency-power-off switch if more than one power device (power distribution unit or uninterruptible power supply) is installed in the same rack cabinet.
- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.

Statement 9:



DANGER

Overloading a branch circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards, ensure that your system electrical requirements do not exceed branch circuit protection requirements. Refer to the information that is provided with your device for electrical specifications.

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

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



CAUTION:

To prevent damage to a power device and other connected devices, always connect the power device to an authorized power source for that device. If you connect the power device to an unauthorized power source, the circuit protection in the power device will not protect the power device and other connected devices.

- Do not connect a device authorized only for connection to a single-phase/neutral power source to a similarly rated phase-to-phase power source.
- Do not connect a device authorized only for connection to a phase-to-phase power source to a similarly rated single-phase/neutral power source.
- See the label attached to the power device, and the information that comes with the power device, for a description of the authorized power source for that power device.



تحذير :

لتفادي حدوث أي تلف للجهاز الكهربائي وأي أجهزة أخرى متصلة به، قم دائما بوصل الجهاز بمصدر طاقة مصرح به لهذا الجهاز. إذا قمت بوصل الجهاز الكهربائي بمصدر طاقة غير مصرح به، فإن الجزء الخاص بحماية الدائرة الكهربائية في الجهاز لن يقوم بحماية الجهاز أو أي أجهزة أخرى متصلة به .

• لا تقوم بوصل جهاز مصرح باستخدامه فقط مع مصدر طاقة single-phase/neutral الى مصدر طاقة مساوى phase-to-phase

• لا تقوم بوصل جهاز مصرح باستخدامه فقط مع مصدر طاقة phase-to-phase الى مصدر طاقة مساوى single-phase/neutral

• أنظر الشارة المرفقة على الجهاز الكهربائي، والبيانات التي تم ارسالها مع الجهاز الكهربائي، للحصول على وصف لمصدر الطاقة المصرح به للجهاز الكهربائي.

**CUIDADO:**

Para evitar danos ao dispositivo de alimentação e outros dispositivos conectados, conecte sempre o dispositivo de alimentação a uma fonte de alimentação autorizada para este dispositivo. Se você conectar o dispositivo de alimentação a uma fonte de alimentação não autorizada, o circuito de proteção no dispositivo de alimentação não irá proteger o dispositivo de alimentação e outros dispositivos conectados.

- Não conecte um dispositivo autorizado somente para conexão para uma fonte de alimentação para fase única/neutra a uma fonte de alimentação fase a fase taxada de forma semelhante.
- Não conecte um dispositivo autorizado somente para conexão para uma fonte de alimentação fase a fase a uma fonte de alimentação de fase única/neutra taxada de forma semelhante.
- Verifique a etiqueta anexada ao dispositivo de alimentação, e as informações que vêm com o dispositivo de alimentação, para obter uma descrição de fonte de alimentação autorizada para este dispositivo de alimentação.

**ATTENTION:**

Pour éviter d'endommager un dispositif d'alimentation ou d'autres dispositifs connectés, raccordez toujours l'alimentation à une source d'alimentation autorisée pour ce dispositif. Un dispositif d'alimentation raccordé à une source d'alimentation non autorisée ne sera pas protégé par le circuit de protection de l'alimentation et aucun des dispositifs raccordés ne sera protégé.

- Ne raccordez pas un dispositif prévu pour une source d'alimentation monophasée neutre à une source d'alimentation triphasée de même valeur nominale.
- Ne raccordez pas un dispositif prévu pour une source d'alimentation triphasée à une source d'alimentation monophasée neutre de même valeur nominale.
- Consultez l'étiquette fixée sur le dispositif d'alimentation et la documentation qui l'accompagne afin d'obtenir une description de la source d'alimentation autorisée pour ce dispositif d'alimentation.



ACHTUNG:

Zur Vermeidung von Beschädigungen an einer Netzeinheit und an anderen angeschlossenen Einheiten die Netzeinheit immer an einen für diese Einheit zulässigen Versorgungsstromkreis anschließen. Wenn Sie die Netzeinheit an einen nicht zulässigen Versorgungsstromkreis anschließen, sind die Einheit und andere angeschlossene Einheiten nicht durch die Netzsicherung in der Netzeinheit geschützt.

- Eine Einheit, die nur für den Anschluss an einen einphasigen Versorgungsstromkreis mit Neutralleiter vorgesehen ist, darf nicht an einen Phase-zu-Phase-Versorgungsstromkreis mit ähnlichem Nennstrom angeschlossen werden.
- Eine Einheit, die nur für den Anschluss an einen Phase-zu-Phase-Versorgungsstromkreis vorgesehen ist, darf nicht an einen einphasigen Versorgungsstromkreis mit Neutralleiter mit ähnlichem Nennstrom angeschlossen werden.
- Eine Beschreibung des für diese Einheit zulässigen Versorgungsstromkreises finden Sie auf dem Etikett auf der Netzeinheit und in den Informationen, die im Lieferumfang der Netzeinheit enthalten sind.



זהירות:

כדי למנוע נזק ליחידת כוח וליחידות מחוברות אחרות, יש לחבר את יחידת הכוח רק למקור כוח מאושר עבור אותה יחידה. חיבור יחידת הכוח למקור כוח לא מאושר יגרום לכך שהגנת הנתיד ביחידת הכוח לא תגן על יחידת הכוח והיחידות המחוברות האחרות.

- אין לחבר יחידה המאושרת לחיבור למקור כוח מסוג פאזה-יחידה/אפס אל מקור כוח מסוג פאזה-לפאזה בעל מיפרט דומה.
- אין לחבר יחידה המאושרת לחיבור למקור כוח מסוג פאזה-לפאזה אל מקור כוח מסוג פאזה-יחידה/אפס בעל מיפרט דומה.
- ראו תיאור של מקור הכוח המאושר עבור יחידת הכוח בתוויות המודבקות על יחידת הכוח, ובתיעוד המצורף ליחידת הכוח.



ATTENZIONE:

Per evitare danni all'alimentatore e agli altri dispositivi collegati, collegare sempre l'alimentatore ad una sorgente di alimentazione adatta a questo dispositivo. Se si collega l'alimentatore ad una alimentazione non idonea, l'alimentatore e gli altri dispositivi collegati potrebbero non essere protetti dal dispositivo di protezione dell'alimentatore stesso.

- **Non collegare dispositivi adatti solo al collegamento ad alimentazione monofase/neutro ad una fonte di alimentazione di simile voltaggio ma di tipo fase/fase.**
- **Non collegare dispositivi idonei solo al collegamento a fonti di alimentazione di tipo fase/fase a sorgenti di alimentazione monofase/neutro.**
- **Per una descrizione della sorgente di alimentazione adatta all'alimentatore di cui si dispone, fare riferimento all'etichetta apposta sul dispositivo di alimentazione ed alle informazioni fornite con l'alimentatore stesso.**



주의:

전원 장치와 다른 연결된 장치의 손상을 방지하려면, 전원 장치를 항상 해당 장치에 대해 사용 권한이 부여된 전원으로 연결하십시오. 전원 장치를 권한 부여되지 않은 전원으로 연결하면, 전원 장치의 회로 보호는 전원 장치 및 다른 연결된 장치를 보호하지 않습니다.

- 단극-상/중성 전원의 연결에 대해서만 권한이 부여된 장치를 유사하게 여겨지는 쌍극 전원으로 연결하지 마십시오.
- 쌍극 전원의 연결에 대해서만 권한이 부여된 장치를 유사하게 여겨지는 단극-상/중성 전원으로 연결하지 마십시오.
- 해당 전원 장치와 함께 사용하도록 권한이 부여된 전원 에 대한 설명은 전원 장치에 부착된 라벨과 전원 장치와 함께 제공되는 정보를 참조하십시오.



PRECAUCIÓN:

Conecte siempre el dispositivo a una fuente de alimentación aprobada para dicho dispositivo con el fin de evitar posibles daños al dispositivo o a otros aparatos eléctricos que tenga conectados. Si se enchufa el dispositivo a una fuente no aprobada, la protección del circuito del dispositivo no podrá proteger el dispositivo ni otros aparatos eléctricos conectados.

- Los dispositivos aprobados solamente para conectarse a fuentes de alimentación monofásicas/neutrales no se deben conectar a fuentes de alimentación de fase a fase con una clasificación similar.
- Los dispositivos aprobados solamente para conectarse a fuentes de alimentación de fase a fase no se deben conectar a fuentes de alimentación monofásicas/neutrales con una clasificación similar.
- Consulte la etiqueta y la información que vienen con el dispositivo para informarse del tipo de fuente de alimentación aprobada para dicho dispositivo.

Chapter 1. Introduction

The IBM® Distributed Power Interconnect (DPI) Front-end Power Distribution Unit (PDU) enables you to connect a single-phase dedicated power source to three different single-phase Rack PDUs, such as the Universal Rack PDU. Below is a list of Front-end PDUs available at the time of publication:

- DPI 30amp/125V Front-end PDU with NEMA L5-30P connector
- DPI 30amp/250V Front-end PDU with NEMA L6-30P connector
- DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd connector
- DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd connector
- DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd connector

The latest version of this publication is available from the IBM Web site. Go to <http://www.ibm.com/> and click **Support & downloads**. In the **Technical Support** keyword search field, type "DPI PDU" and click **Go**. The latest version of this publication will be in the list of publications displayed.

All Front-end PDUs have a green LED beside each of the three outlets to indicate when power is supplied to that outlet. Each LED lights when the Front-end PDU is connected to a power source and the outlet has power.

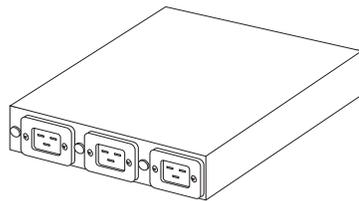
Note: The illustrations in this documentation might differ slightly from your hardware.

You can install Front-end PDUs vertically in the side of a rack cabinet, or horizontally within 1U of EIA mounting space in a rack cabinet. The 1U-mounting bracket for horizontal installation comes with a Universal Rack PDU. The mounting hardware that comes with this option enables you to install two Front-end PDUs beside each other in the same vertical mounting space within a rack cabinet.

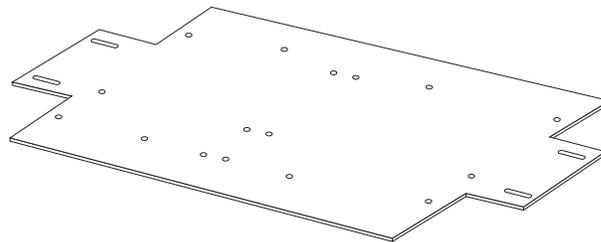
Attention: You must remove any horizontally-mounted Front-end PDUs from the EIA mounting space before you relocate your rack cabinet. Horizontal installation of Front-end PDUs is not supported during relocation or shipping of a rack cabinet.

The following parts come with your Front-end PDU:

- One Front-end PDU



- One large vertical-mounting plate



. One U is equal to 4.45 cm (1.75 in.)

- One country or region-specific power cord
- Miscellaneous hardware kit (for attaching the Front-end PDU to a mounting plate and installing the Front-end PDU in a rack cabinet)
- Cable straps
- *IBM NetBAY™ Rack Safety Information* book
- This documentation

Note: You will have some unused parts depending upon how you install the Front-end PDU.

You will need the following tools to install the Front-end PDU in a rack cabinet:

- One Phillips screwdriver
- One 10 mm (11/32-in.) wrench
- One cage-nut-insertion tool or flat-blade screwdriver (for installing cage nuts in some rack cabinets)

Chapter 2. Installing PDUs with the vertical-mounting plate

You can install Front-end PDUs on the vertical mounting plate in two different orientations. You can install two Front-end PDUs, or one Front-End PDU and a Universal Rack PDU, beside each other on the same vertical mounting plate. You can alternatively install one Front-end PDU in the center of the vertical mounting plate.

Installing one or two PDUs beside each other

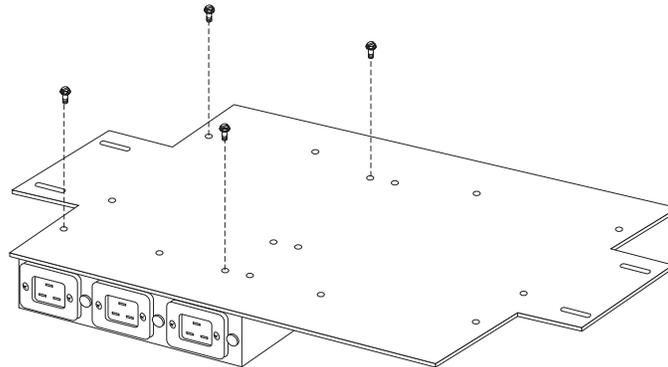
Complete the following steps to install two Front-end PDUs, or one Front-end PDU and a Universal Rack PDU, in the side of a rack cabinet, using the vertical-mounting plate.

Note: The mounting holes on upper and lower side braces in a rack side compartment must be between 48.6 cm (19.1 in.) and 56.9 cm (22.4 in.) apart. If your rack cabinet has movable side braces, refer to your rack cabinet documentation for information about relocating your side braces if they are not already spaced for this installation.

1. Refer to your rack cabinet documentation for additional information.

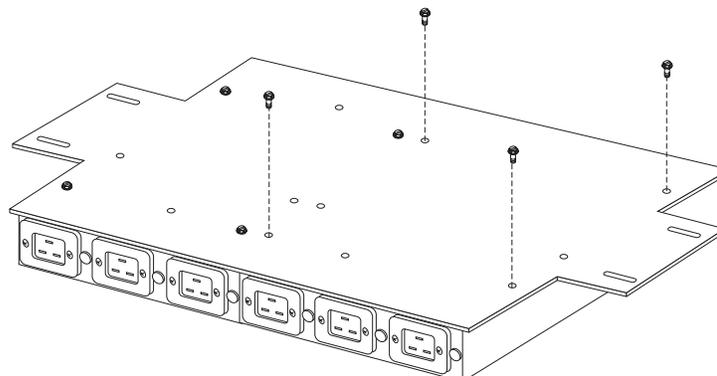
Note: Removing the rack doors and side panels might make installing PDUs easier.

2. Attach a Front-end PDU to the vertical-mounting plate with four M3x5 screws that come with the Front-end PDU. Make sure that the countersink holes in the vertical-mounting plate are facing away from the Front-end PDU.



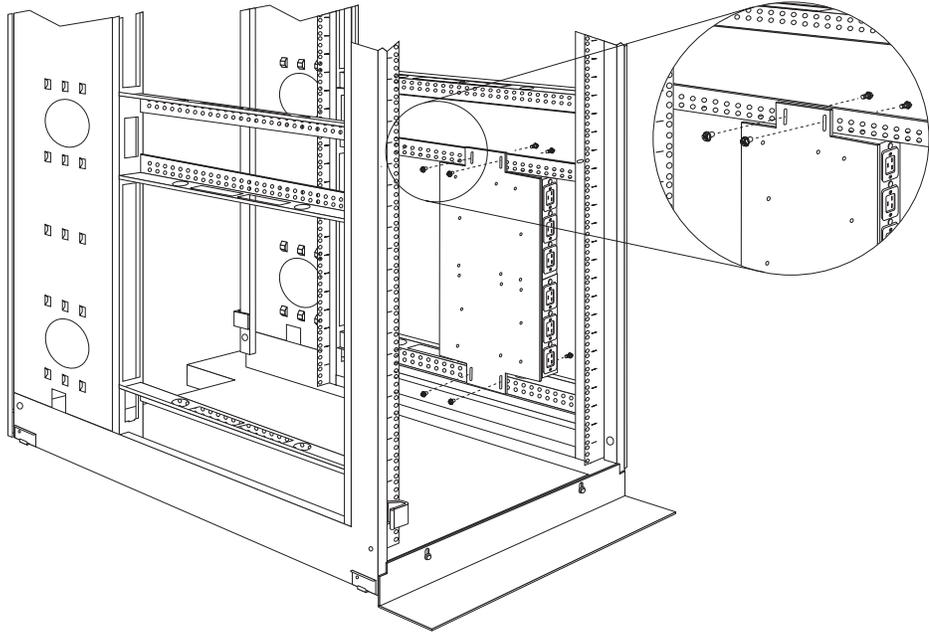
3. If you have a second Front-end PDU to install, install it on the vertical-mounting plate with four M3x5 screws that come with the second Front-end PDU.

Note: You can install Rack and Front-end PDUs on the same vertical-mounting plate.



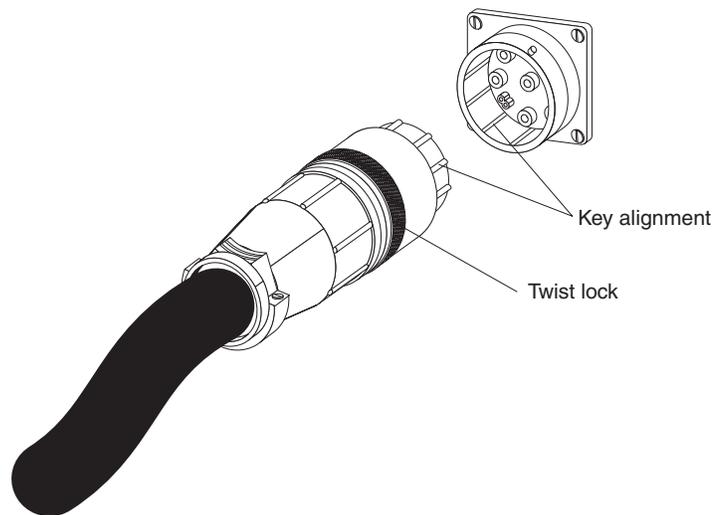
4. While one person holds the vertical-mounting plate in the side of the rack cabinet, attach the plate to the side braces with four M6 screws and nuts that come with the Front-end PDU.

Note: Leave enough space to allow you to connect and disconnect power cables.

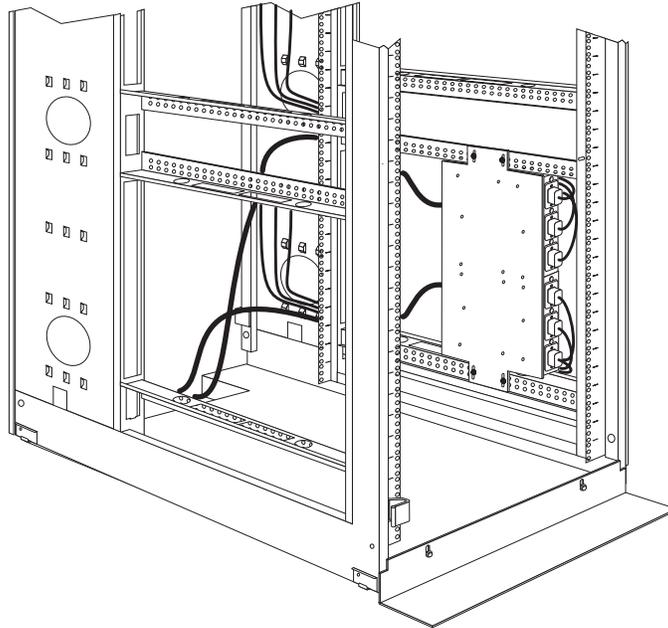


5. Align the connector on the power cord that comes with the Front-end PDU with the inlet on the Front-end PDU, turning as necessary for key alignment; then, turn the twist-lock on the connector clockwise until it locks into place. Repeat this step for all Front-end PDUs.

Note: The power cord connector and the inlet on the Front-end PDU are specifically keyed to each other for each type of Front-end PDU.



- Route the power cords from each Front-end PDU toward the rack cabinet side braces; then, route the power cords along a side brace towards the back of the rack cabinet and secure the power cords with the cable straps that come with the Front-end PDU.



- Route each power cord toward a dedicated power source. Use the provided cable straps to secure power cords along the way. Use the openings in the rack cabinet, if you must exit the rack cabinet to connect to a power source.



CAUTION:

To prevent damage to a power device and other connected devices, always connect the power device to an authorized power source for that device. If you connect the power device to an unauthorized power source, the circuit protection in the power device will not protect the power device and other connected devices.

- Do not connect a device authorized only for connection to a single-phase/neutral power source to a similarly rated phase-to-phase power source.
 - Do not connect a device authorized only for connection to a phase-to-phase power source to a similarly rated single-phase/neutral power source.
 - See the label attached to the power device, and the information that comes with the power device, for a description of the authorized power source for that power device.
- After you connect the power cords to properly wired and grounded dedicated power sources, you can connect Universal Rack PDUs in the rack cabinet to the power outlets on the Front-end PDUs.
 - Route all the other power cables neatly and secure the power cables with cable straps.

Installing one Front-end PDU in the center of the vertical-mounting plate

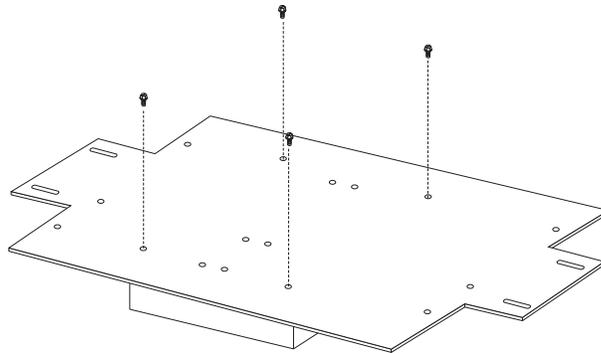
Complete the following steps to install one Front-end PDU, in the center of the vertical-mounting plate, in the side of a rack cabinet.

Note: The mounting holes on upper and lower side braces in a rack side compartment must be between 48.6 cm (19.1 in.) and 56.9 cm (22.4 in.) apart. If your rack cabinet has movable side braces, refer to your rack cabinet documentation for information about relocating your side braces if they are not already spaced for this installation.

1. Refer to your rack cabinet documentation for additional information.

Note: Removing the rack doors and side panels might make installing PDUs easier.

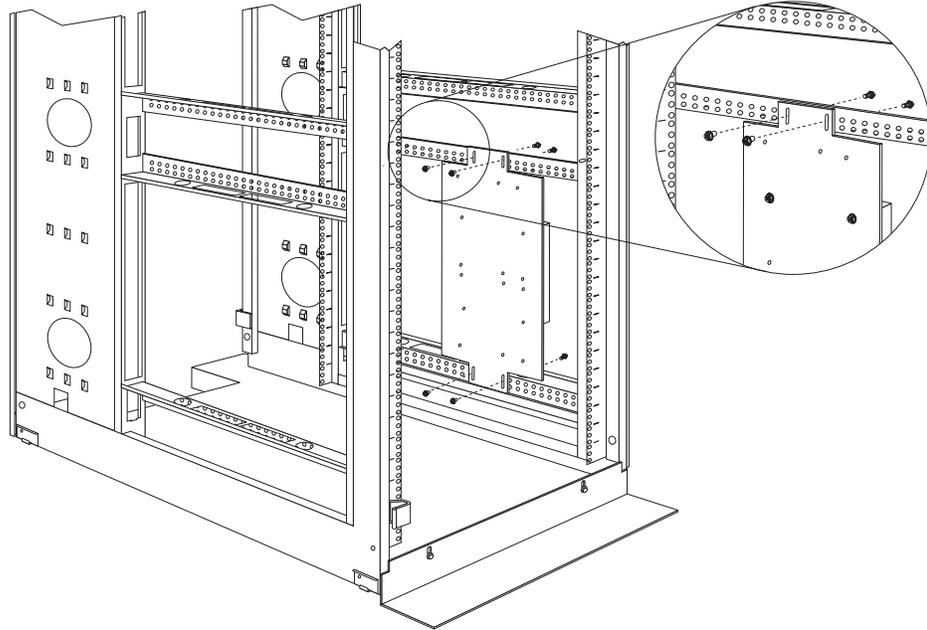
2. Attach a Front-end PDU to the center of the vertical-mounting plate with four M3x5 screws that come with the Front-end PDU. Make sure that the countersink holes in the vertical-mounting plate are facing away from the Front-end PDU.



3. While one person holds the vertical-mounting plate in the side of the rack cabinet, attach the plate to the side braces with four M6 screws and nuts that come with the Front-end PDU.

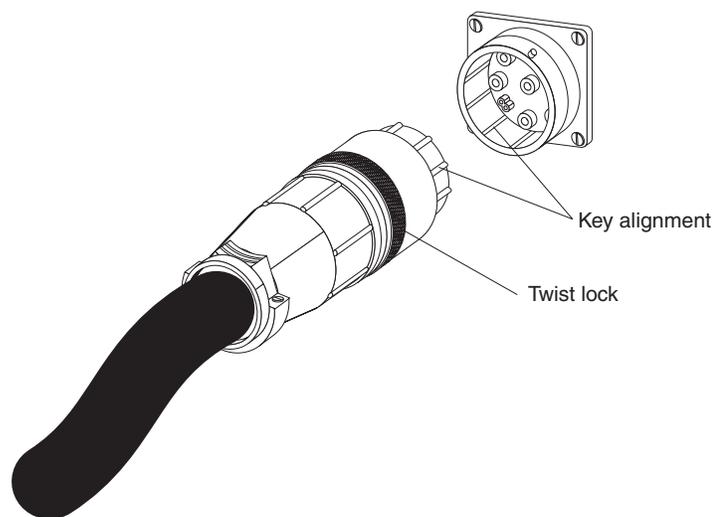
Notes:

- a. Make sure that the inlet on the Front-end PDU is pointing downward, and the outlets are pointing upward.
- b. Leave enough space to allow you to connect and disconnect power cables.

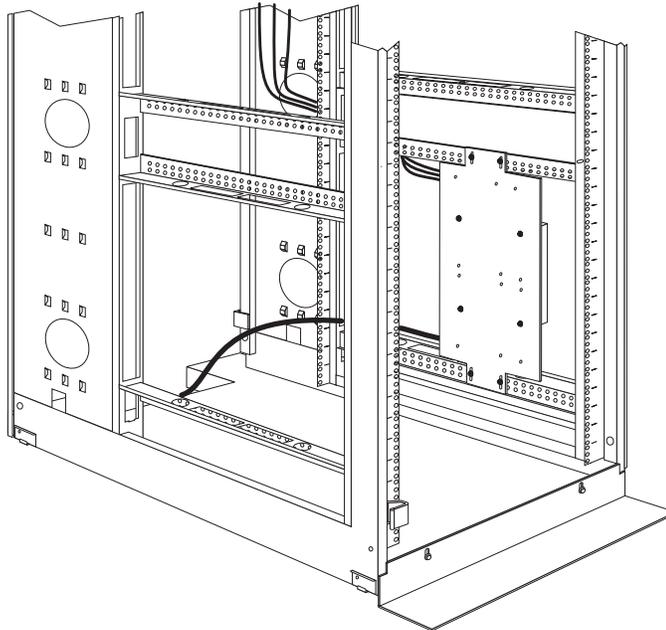


4. Align the connector on the power cord that comes with the Front-end PDU with the inlet on the Front-end PDU, turning as necessary for key alignment; then, turn the twist-lock on the connector clockwise until it locks into place.

Note: The power cord connector and the inlet on the Front-end PDU are specifically keyed to each other for each type of Front-end PDU.



5. Route the power cord from the Front-end PDU toward the rack cabinet side braces; then, route the power cord along a side brace towards the back of the rack cabinet and secure the power cord with the cable straps that come with the Front-end PDU.



6. Route each power cord toward a dedicated power source. Use the provided cable straps to secure power cords along the way. Use the openings in the rack cabinet, if you must exit the rack cabinet to connect to a power source.



CAUTION:

To prevent damage to a power device and other connected devices, always connect the power device to an authorized power source for that device. If you connect the power device to an unauthorized power source, the circuit protection in the power device will not protect the power device and other connected devices.

- Do not connect a device authorized only for connection to a single-phase/neutral power source to a similarly rated phase-to-phase power source.
 - Do not connect a device authorized only for connection to a phase-to-phase power source to a similarly rated single-phase/neutral power source.
 - See the label attached to the power device, and the information that comes with the power device, for a description of the authorized power source for that power device.
7. After you connect the power cords to properly wired and grounded dedicated power sources, you can connect Universal Rack PDUs in the rack cabinet to the power outlets on the Front-end PDUs.
 8. Route all the other power cables neatly and secure the power cables with cable straps.

Chapter 3. Installing PDUs with the 1U-mounting bracket

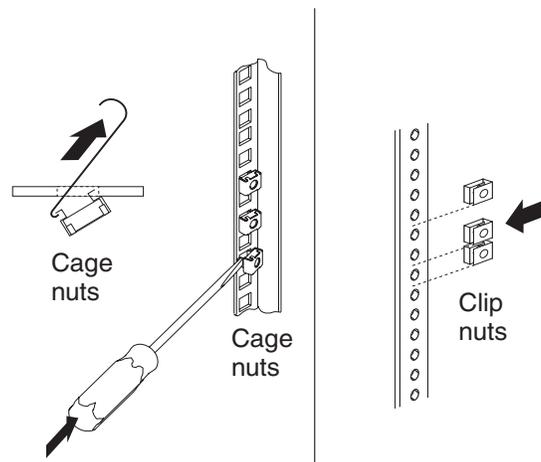
Complete the following steps to install Front-end PDUs in a 1U space within a rack cabinet, using the 1U-mounting bracket that comes with a Universal Rack PDU.

Attention: You must remove any horizontally-mounted Front-end PDUs from the EIA mounting space before you relocate your rack cabinet. Horizontal installation of Front-end PDUs is not supported during relocation or shipping of a rack cabinet.

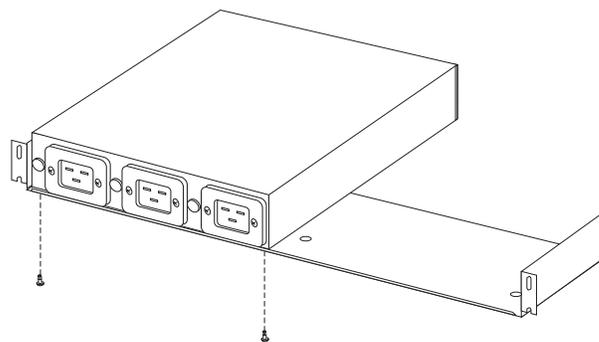
1. Refer to your rack cabinet documentation for additional information.

Notes:

- a. Removing rack doors and side panels might make installing PDUs easier.
- b. Use cage nuts for rack cabinets with square holes, or clip nuts for rack cabinets with round holes.
- c. If your rack cabinet requires cage nuts, use the cage-nut-insertion tool or a flat-blade screwdriver to install them.

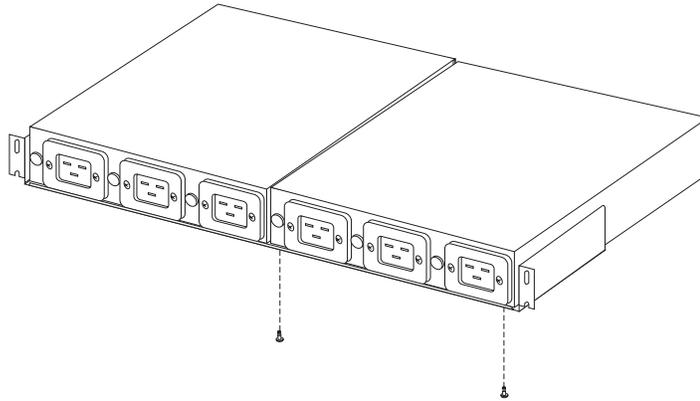


2. Attach a Front-end PDU to the 1U-mounting bracket with two M3x5 screws that come with the Front-end PDU.



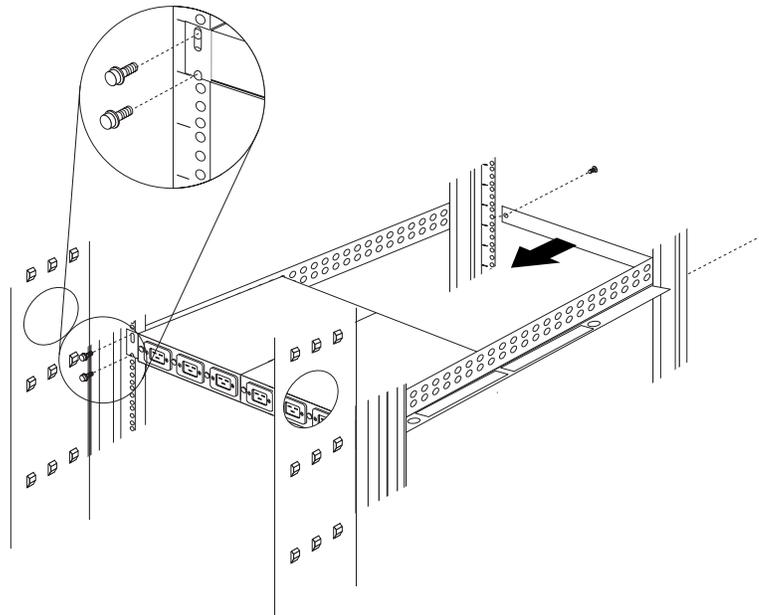
3. If you have a second Front-end PDU to install, install it on the 1U-mounting bracket with two M3x5 screws that come with the second Front-end PDU.

Note: You can install Rack and Front-end PDUs on the same 1U-mounting bracket.



4. Determine the 1U space within the rack cabinet where you are going to install the Front-end PDUs; then, while one person holds the 1U-mounting bracket in place, attach the bracket to the front or the rear of the rack cabinet with four M6 screws and clip nuts or cage nuts that come with the Front-end PDU.

Note: Leave enough space to allow you to connect and disconnect power cables.

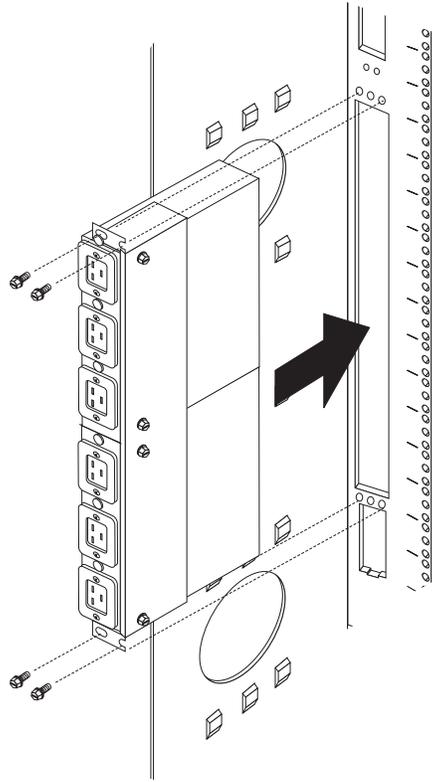


5. If you install the Front-end PDUs in the rear of the rack cabinet, you must install the 1U blank filler panel on the front of the rack cabinet at the same U level as the 1U-mounting bracket. Use two M6 screws that come with the Front-end PDU.

Note: The 1U blank filler panel comes with the Universal Rack PDU.

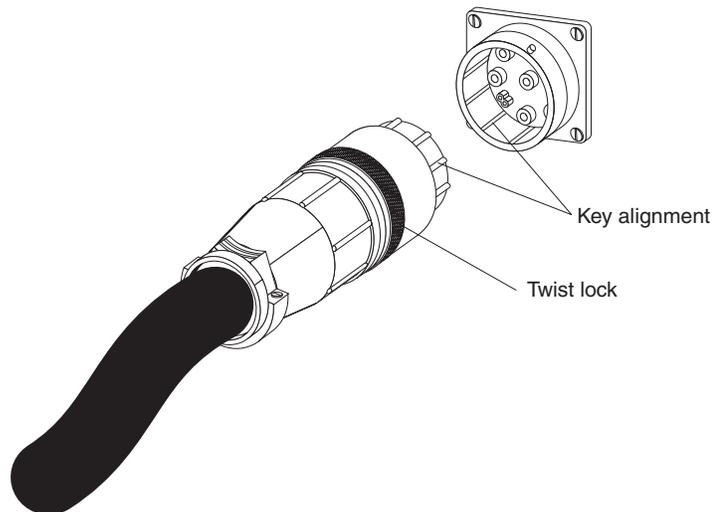
6. Some rack cabinets have 1U mounting space in the side of the rack cabinet where you can install the 1U-mounting bracket as shown below.

Note: You will not install the 1U blank filler panel if you install your Front-end PDUs this way.

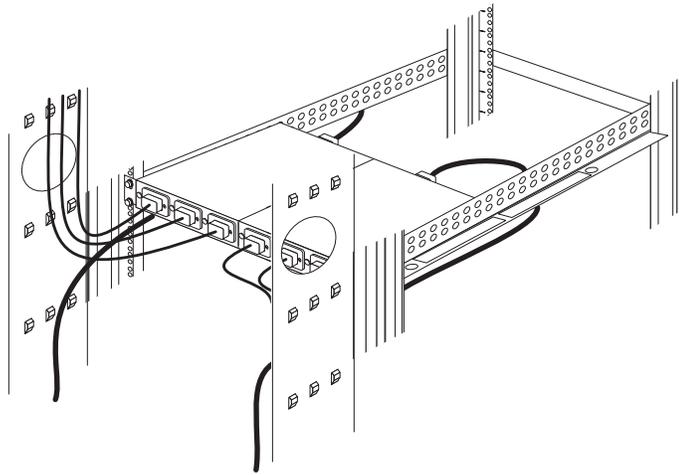


7. Align the connector on the power cord that comes with the Front-end PDU with the inlet on the Front-end PDU, turning as necessary for key alignment; then, turn the twist-lock on the connector clockwise until it locks into place. Repeat this step for all Front-end PDUs.

Note: The power cord connector and the inlet on the Front-end PDU are specifically keyed to each other for each type of Front-end PDU.



8. Route the power cords from each Front-end PDU toward the rack cabinet side braces; then, route the power cords along a side brace towards the back of the rack cabinet and secure the power cords with the cable straps that come with the Front-end PDU.



9. Route each power cord toward a dedicated power source. Use the provided cable straps to secure power cords along the way. Use the openings in the rack cabinet, if you must exit the rack cabinet to connect to a power source.



CAUTION:

To prevent damage to a power device and other connected devices, always connect the power device to an authorized power source for that device. If you connect the power device to an unauthorized power source, the circuit protection in the power device will not protect the power device and other connected devices.

- Do not connect a device authorized only for connection to a single-phase/neutral power source to a similarly rated phase-to-phase power source.
 - Do not connect a device authorized only for connection to a phase-to-phase power source to a similarly rated single-phase/neutral power source.
 - See the label attached to the power device, and the information that comes with the power device, for a description of the authorized power source for that power device.
10. After you connect the power cords to properly wired and grounded dedicated power sources, you can connect Universal Rack PDUs in the rack cabinet to the power outlets on the Front-end PDUs.
 11. Route all the other power cables neatly and secure the power cables with cable straps.

Chapter 4. Hardware maintenance information

This chapter contains information about IBM field replaceable unit (FRU) availability for Front-end PDUs. Troubleshooting and servicing of complex problems should be performed only by trained service personnel.

Attention: The Front-end PDUs do not contain any serviceable parts.

This chapter also contains information about how to obtain help and technical assistance for the Front-end PDUs.

Field replaceable unit part numbers

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

FRU Part #	Description
32P1734	Single-phase Front-end PDU without power cord; Use to replace: <ul style="list-style-type: none">• 32amp/250V Front-end PDU with IEC 309 2P+Gnd connector• 63amp/250V Front-end PDU with IEC 309 2P+Gnd connector
32P1735	Phase-to-phase Front-end PDU without power cord; Use to replace: <ul style="list-style-type: none">• 30amp/125V Front-end PDU with NEMA L5-30P connector• 30amp/250V Front-end PDU with NEMA L6-30P connector• 60amp/250V Front-end PDU with IEC 309 2P+Gnd connector
73P5843	Mounting hardware kit
74P4311	Front-end PDU power cord with 63 A IEC 309 2P+Gnd connector
74P4312	Front-end PDU power cord with 30 A NEMA L6-30P connector
74P4313	Front-end PDU power cord with 60 A IEC 309 2P+Gnd connector
74P4314	Front-end PDU power cord with 30 A NEMA L5-30P connector
74P4315	Front-end PDU power cord with 32 A IEC 309 2P+Gnd connector

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 xSeries™ or IntelliStation® system, and whom to call for service, if it is necessary.

Before you call

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

- Check all cables to make sure 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.

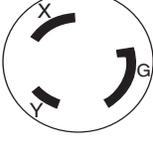
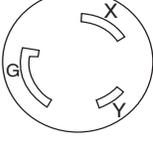
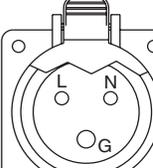
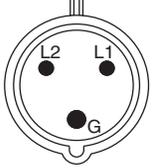
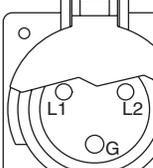
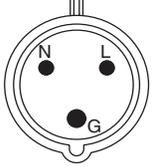
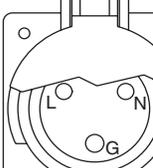
In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

Chapter 5. Front-end PDU Specifications

When connected to a dedicated power source, the Front-end PDUs conform to UL1950, CSA 22.2-950, EN-60950, and IEC-950 standards. The following table contains the product specifications for the Front-end PDUs.

Height	41.5 mm (1.63 in.)
Width	222.5 mm (8.76 in.)
Depth	222.5 mm (8.76 in.)
Additional Clearance	19 mm (0.75 in.) for inlet connector 2 mm (0.08 in.) above PDU for inlet connector 3.3 mm (0.13 in.) for outlets
Weight	1.8 kg (3.9 lb), without power cord
Operating temperature at 0-914 m (0-3000 ft)	10°-35° C (50°-95° F)
Operating temperature at 914-2133 m (3000-7000 ft)	10°-32° C (50°-90° F)
Operating humidity	8-80% (non-condensing)
Rated voltage	100-120 V ac, 30 A, single-phase 200-240 V ac, 30 A, single-phase 220-240 V ac, 32 A, single-phase 200-208 V ac, 60 A, single-phase 220-240 V ac, 63 A, single-phase
Rated frequency	50-60 Hz
Maximum power rating	2880 VA 5760 VA 7680 VA 9984 VA 11520 VA
Power inlet	One proprietary inlet rated at 63 A
Power outlets	Three IEC 320-C19 outlets rated at 16 A (VDE) / 20 A (UL/CSA)

You must connect the plug on the power cord that comes with your Front-end PDU to a properly wired and grounded outlet. The following table shows illustrations of the power cord plug and an appropriate outlet for each of the Front-end PDUs.

Front-end PDU	Plug	Outlet
30amp/125V Front-end PDU with NEMA L5-30P connector		
30amp/250V Front-end PDU with NEMA L6-30P connector		
32amp/250V Front-end PDU with IEC 309 2P+Gnd connector		
60amp/250V Front-end PDU with IEC 309 2P+Gnd connector		
63amp/250V Front-end PDU with IEC 309 2P+Gnd connector		

Appendix A. Warranty information

This section contains information about your warranty period and the service and support that are provided by your warranty.

Warranty period

The warranty period varies by machine type and country or region.

Contact your place of purchase for warranty service information. Some IBM Machines are eligible for on-site warranty service depending on the country or region where service is performed.

Prior to on-site warranty service, you are required to go through problem determination with an IBM service specialist call center technician.

This paragraph applies only to products with a warranty period of 3 years on parts and 1 year on labor. A warranty period of 3 years on parts and 1 year on labor means that IBM will provide warranty service without charge for:

1. parts and labor during the first year of the warranty period
2. parts only, on an exchange basis, in the second and third years of the warranty period. IBM will charge you for any labor it provides in performance of the repair or replacement.

The IBM Machine Warranties Web site at http://www.ibm.com/servers/support/machine_warranties/ contains a worldwide overview of the IBM Statement of Limited Warranty for IBM Machines, a glossary of terms used in the Statement of Limited Warranty, Frequently Asked Questions (FAQ), and links to Product Support Web pages. The IBM Statement of Limited Warranty is available from this Web site in 29 languages in Portable Document Format (PDF).

Machine - IBM Distributed Power Interconnect Front-end Power Distribution Unit

Country or region	Warranty period	Service delivery method
Worldwide	Parts - 3 years, labor - 3 years	Customer carry-in or mail-in

Problem determination

Prior to on-site warranty service, you are required to go through problem determination with an IBM service specialist call center technician. The service specialist will run diagnostic tests on the hardware and check the software.

Running diagnostics: The IBM service specialist will help you determine whether your equipment is functioning as specified. It might be necessary to isolate the failing xSeries, Netfinity®, or IntelliStation system; IBM component; or both from any active production environment to run diagnostics and perform defect-isolation programs. You are responsible for making the system, IBM component, or both available for running diagnostics and defect-isolation programs.

Checking software: The IBM service specialist will help you ensure that the correct BIOS code, firmware, device drivers, and other supporting IBM software are installed and correctly configured. It might be necessary to manually gather information about the relevant software levels or run IBM-approved utility programs to gather this information. It might be necessary to isolate the failing system from any active production environment to gather this information. You are responsible, with assistance from the service specialist, for gathering this information. The IBM Statement of Limited Warranty does not include on-site assistance with this activity.

Warranty service and support

With the original purchase of an IBM xSeries or IntelliStation system, you have access to extensive service and support. During the IBM Machine warranty period, you may call IBM or your reseller for problem-determination assistance under the terms of the IBM Statement of Limited Warranty.

The following services are available during the warranty period:

- **Problem determination** - Trained personnel are available to assist you with determining if you have a hardware problem and deciding what action is necessary to fix the problem.
- **IBM hardware repair** - If the problem is determined to be caused by IBM hardware under warranty, trained service personnel are available to provide the applicable level of service, either on-site or at an IBM service center as determined by IBM.
- **Engineering Change management** - Occasionally, there might be changes that are required after a product has been shipped from IBM. In those instances, IBM will make Engineering Changes (ECs) available that apply to your hardware.
- **Customer replaceable units (CRUs)** - Some parts of IBM xSeries and IntelliStation systems are designated as customer replaceable units. IBM ships CRUs to you for replacement by you. CRUs include keyboards, monitors, memory, diskette drives, hard disk drives, and mice (this list is not inclusive of all CRUs).

The following items are not covered under warranty service:

- Replacement or use of non-IBM parts. All IBM parts contain a 7-character identification in the format IBM FRU XXXXXXX.
- Identification of software problem sources.
- Installation of customer replaceable units (CRUs).
- Installation and configuration of BIOS code, firmware, or device drivers that are designated as customer installable.

See the IBM Statement of Limited Warranty for a full explanation of IBM warranty terms. Be sure to retain your proof of purchase to obtain warranty service.

Please have the following information ready when you call:

- The machine type and model of your IBM hardware product (if available)
- Serial numbers of your IBM hardware products
- A description of the problem
- The exact wording of any error messages
- Hardware and software configuration information

International Warranty Service

If you travel with your xSeries or IntelliStation system or relocate it to a country or region where your system is sold and serviced by IBM or IBM resellers authorized to perform warranty service, International Warranty Service (IWS) is available during the warranty period. Eligible IBM systems are identified by their four-digit machine types.

You can obtain IWS through the service delivery method (such as depot, carry-in, or on-site) provided in the servicing country or region. Service methods and procedures vary by country or region, and some service or parts might not be available in all countries and regions. Service centers in certain countries or regions might not be able to service all models of a particular machine type. In addition, some countries or regions might have fees and restrictions that apply at the time of service.

To determine whether your system is eligible for IWS, go to <http://www.ibm.com/pc/support/> and click **Warranty lookup**.

Purchasing additional services

During and after the warranty period, you can purchase additional services, such as support for IBM and non-IBM hardware, operating systems, and application programs; network setup and configuration; upgraded or extended hardware repair services; and custom installations. Service availability and service name might vary by country or region.

For more information about these services, contact your IBM marketing representative.

IBM Statement of Limited Warranty Z125-4753-06 8/2000

Part 1 - General Terms

This Statement of Limited Warranty includes Part 1 - General Terms and Part 2 - Country-unique Terms. The terms of Part 2 replace or modify those of Part 1. The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you purchase for your use, and not for resale, from IBM or your reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. Nothing in this Statement of Limited Warranty affects any statutory rights of consumers that cannot be waived or limited by contract. If you have any questions, contact IBM or your reseller.

The IBM Warranty for Machines: IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications ("Specifications"). The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your sales receipt is the Date of Installation unless IBM or your reseller informs you otherwise.

If a Machine does not function as warranted during the warranty period, and IBM or your reseller are unable to either 1) make it do so or 2) replace it with one that is at least functionally equivalent, you may return it to your place of purchase and your money will be refunded.

Extent of Warranty: The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible. The warranty is voided by removal or alteration of Machine or parts identification labels.

THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

Items Not Covered by Warranty: IBM does not warrant uninterrupted or error-free operation of a Machine. Any technical or other support provided for a Machine under warranty, such as assistance via telephone with "how-to" questions and those regarding Machine set-up and installation, will be provided **WITHOUT WARRANTIES OF ANY KIND.**

Warranty Service: To obtain warranty service for a Machine, contact IBM or your reseller. If you do not register your Machine with IBM, you may be required to present proof of purchase.

During the warranty period, IBM or your reseller, if approved by IBM to provide warranty service, provides without charge certain types of repair and exchange service to keep Machines in, or restore them to, conformance with their Specifications.

IBM or your reseller will inform you of the available types of service for a Machine based on its country of installation. At its discretion, IBM or your reseller will 1) either repair or exchange the failing Machine and 2) provide the service either at your location or a service center. IBM or your reseller will also manage and install selected engineering changes that apply to the Machine.

Some parts of IBM Machines are designated as Customer Replaceable Units (called "CRUs"), e.g., keyboards, memory, or hard disk drives. IBM ships CRUs to you for replacement by you. You must return all defective CRUs to IBM within 30 days of your receipt of the replacement CRU. You are responsible for downloading designated Machine Code and Licensed Internal Code updates from an IBM Internet Web site or from other electronic media, and following the instructions that IBM provides.

When warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item. Many features, conversions, or upgrades involve the removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part.

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;
2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
3. where applicable, before service is provided:
 - a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides;
 - b. secure all programs, data, and funds contained in a Machine;
 - c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations; and
 - d. inform IBM or your reseller of changes in a Machine's location.

IBM is responsible for loss of, or damage to, your Machine while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Neither IBM nor your reseller is responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM or your reseller for any reason. You should remove all such information from the Machine prior to its return.

Limitation of Liability: Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), except for any liability that cannot be waived or limited by applicable laws, IBM is liable for no more than

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages, up to the charges (if recurring, 12 months' charges apply) for the Machine that is subject of the claim. For purposes

of this item, the term "Machine" includes Machine Code and Licensed Internal Code.

This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible.

UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES, LOST PROFITS OR LOST SAVINGS, EVEN IF IBM, ITS SUPPLIERS OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

Governing Law: Both you and IBM consent to the application of the laws of the country in which you acquired the Machine to govern, interpret, and enforce all of your and IBM's rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Agreement, without regard to conflict of law principles.

Part 2 - Country-unique Terms

AMERICAS

BRAZIL

Governing Law: *The following is added after the first sentence:*

Any litigation arising from this Agreement will be settled exclusively by the court of Rio de Janeiro.

NORTH AMERICA

Warranty Service: *The following is added to this Section:*

To obtain warranty service from IBM in Canada or the United States, call 1-800-IBM-SERV (426-7378).

CANADA

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*

laws in the Province of Ontario.

UNITED STATES

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*

laws of the State of New York.

ASIA PACIFIC

AUSTRALIA

The IBM Warranty for Machines: *The following paragraph is added to this Section:*

The warranties specified in this Section are in addition to any rights you may have under the Trade Practices Act 1974 or other similar legislation and are only limited to the extent permitted by the applicable legislation.

Limitation of Liability: *The following is added to this Section:*

Where IBM is in breach of a condition or warranty implied by the Trade Practices Act 1974 or other similar legislation, IBM's liability is limited to the repair or replacement of the goods or the supply of equivalent goods. Where that condition or warranty relates to right to sell, quiet possession or clear title, or the goods are of a kind ordinarily acquired for personal, domestic or household use or consumption, then none of the limitations in this paragraph apply.

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws of the State or Territory.

CAMBODIA, LAOS, AND VIETNAM

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws of the State of New York.

The following is added to this Section:

Disputes and differences arising out of or in connection with this Agreement shall be finally settled by arbitration which shall be held in Singapore in accordance with the rules of the International Chamber of Commerce (ICC). The arbitrator or arbitrators designated in conformity with those rules shall have the power to rule on their own competence and on the validity of the Agreement to submit to arbitration. The arbitration award shall be final and binding for the parties without appeal and the arbitral award shall be in writing and set forth the findings of fact and the conclusions of law.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator.

The two arbitrators appointed by the parties shall appoint a third arbitrator before proceeding upon the reference. The third arbitrator shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the ICC. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

The English language version of this Agreement prevails over any other language version.

HONG KONG AND MACAU

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws of Hong Kong Special Administrative Region.

INDIA

Limitation of Liability: *The following replaces items 1 and 2 of this Section:*

1. liability for bodily injury (including death) or damage to real property and tangible personal property will be limited to that caused by IBM's negligence;
2. as to any other actual damage arising in any situation involving nonperformance by IBM pursuant to, or in any way related to the subject of this Statement of

Limited Warranty, IBM's liability will be limited to the charge paid by you for the individual Machine that is the subject of the claim.

JAPAN

Governing Law: *The following sentence is added to this Section:*

Any doubts concerning this Agreement will be initially resolved between us in good faith and in accordance with the principle of mutual trust.

NEW ZEALAND

The IBM Warranty for Machines: *The following paragraph is added to this Section:*

The warranties specified in this Section are in addition to any rights you may have under the Consumer Guarantees Act 1993 or other legislation which cannot be excluded or limited. The Consumer Guarantees Act 1993 will not apply in respect of any goods which IBM provides, if you require the goods for the purposes of a business as defined in that Act.

Limitation of Liability: *The following is added to this Section:*

Where Machines are not acquired for the purposes of a business as defined in the Consumer Guarantees Act 1993, the limitations in this Section are subject to the limitations in that Act.

PEOPLE'S REPUBLIC OF CHINA (PRC)

Governing Law: *The following replaces this Section:*

Both you and IBM consent to the application of the laws of the State of New York (except when local law requires otherwise) to govern, interpret, and enforce all your and IBM's rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Agreement, without regard to conflict of law principles.

Any disputes arising from or in connection with this Agreement will first be resolved by friendly negotiations, failing which either of us has the right to submit the dispute to the China International Economic and Trade Arbitration Commission in Beijing, the PRC, for arbitration in accordance with its arbitration rules in force at the time. The arbitration tribunal will consist of three arbitrators. The language to be used therein will be English and Chinese. An arbitral award will be final and binding on all the parties, and will be enforceable under the Convention on the Recognition and Enforcement of Foreign Arbitral Awards (1958).

The arbitration fee will be borne by the losing party unless otherwise determined by the arbitral award.

During the course of arbitration, this Agreement will continue to be performed except for the part which the parties are disputing and which is undergoing arbitration.

EUROPE, MIDDLE EAST, AFRICA (EMEA)

THE FOLLOWING TERMS APPLY TO ALL EMEA COUNTRIES:

The terms of this Statement of Limited Warranty apply to Machines purchased from IBM or an IBM reseller.

Warranty Service: If you purchase an IBM Machine in Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland or United Kingdom, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM. If you purchase an IBM Personal Computer Machine in Albania, Armenia, Belarus,

Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kirghizia, Federal Republic of Yugoslavia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, or Ukraine, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

If you purchase an IBM Machine in a Middle Eastern or African country, you may obtain warranty service for that Machine from the IBM entity within the country of purchase, if that IBM entity provides warranty service in that country, or from an IBM reseller, approved by IBM to perform warranty service on that Machine in that country. Warranty service in Africa is available within 50 kilometers of an IBM authorized service provider. You are responsible for transportation costs for Machines located outside 50 kilometers of an IBM authorized service provider.

Governing Law: The applicable laws that govern, interpret and enforce rights, duties, and obligations of each of us arising from, or relating in any manner to, the subject matter of this Statement, without regard to conflict of laws principles, as well as Country-unique terms and competent court for this Statement are those of the country in which the warranty service is being provided, except that in 1) Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Hungary, Former Yugoslav Republic of Macedonia, Romania, Slovakia, Slovenia, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan, the laws of Austria apply; 2) Estonia, Latvia, and Lithuania, the laws of Finland apply; 3) Algeria, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Djibouti, Democratic Republic of Congo, Equatorial Guinea, France, Gabon, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Lebanon, Mali, Mauritania, Morocco, Niger, Senegal, Togo, and Tunisia, this Agreement will be construed and the legal relations between the parties will be determined in accordance with the French laws and all disputes arising out of this Agreement or related to its violation or execution, including summary proceedings, will be settled exclusively by the Commercial Court of Paris; 4) Angola, Bahrain, Botswana, Burundi, Egypt, Eritrea, Ethiopia, Ghana, Jordan, Kenya, Kuwait, Liberia, Malawi, Malta, Mozambique, Nigeria, Oman, Pakistan, Qatar, Rwanda, Sao Tome, Saudi Arabia, Sierra Leone, Somalia, Tanzania, Uganda, United Arab Emirates, United Kingdom, West Bank/Gaza, Yemen, Zambia, and Zimbabwe, this Agreement will be governed by English Law and disputes relating to it will be submitted to the exclusive jurisdiction of the English courts; and 5) in Greece, Israel, Italy, Portugal, and Spain any legal claim arising out of this Statement will be brought before, and finally settled by, the competent court of Athens, Tel Aviv, Milan, Lisbon, and Madrid, respectively.

THE FOLLOWING TERMS APPLY TO THE COUNTRY SPECIFIED:

AUSTRIA AND GERMANY

The IBM Warranty for Machines: *The following replaces the first sentence of the first paragraph of this Section:*

The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

The following paragraphs are added to this Section:

The minimum warranty period for Machines is six months. In case IBM or your reseller is unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

Extent of Warranty: *The second paragraph does not apply.*

Warranty Service: *The following is added to this Section:*

During the warranty period, transportation for delivery of the failing Machine to IBM will be at IBM's expense.

Limitation of Liability: *The following paragraph is added to this Section:*

The limitations and exclusions specified in the Statement of Limited Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

The following sentence is added to the end of item 2:

IBM's liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

EGYPT

Limitation of Liability: *The following replaces item 2 in this Section:*

as to any other actual direct damages, IBM's liability will be limited to the total amount you paid for the Machine that is the subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code.

Applicability of suppliers and resellers (unchanged).

FRANCE

Limitation of Liability: *The following replaces the second sentence of the first paragraph of this Section:*

In such instances, regardless of the basis on which you are entitled to claim damages from IBM, IBM is liable for no more than: *(items 1 and 2 unchanged).*

IRELAND

Extent of Warranty: *The following is added to this Section:*

Except as expressly provided in these terms and conditions, all statutory conditions, including all warranties implied, but without prejudice to the generality of the foregoing all warranties implied by the Sale of Goods Act 1893 or the Sale of Goods and Supply of Services Act 1980 are hereby excluded.

Limitation of Liability: *The following replaces items one and two of the first paragraph of this Section:*

1. death or personal injury or physical damage to your real property solely caused by IBM's negligence; and
2. the amount of any other actual direct damages, up to 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

Applicability of suppliers and resellers (unchanged).

The following paragraph is added at the end of this Section:

IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

ITALY

Limitation of Liability: *The following replaces the second sentence in the first paragraph:*

In each such instance unless otherwise provided by mandatory law, IBM is liable for no more than:

1. *(unchanged)*
2. as to any other actual damage arising in all situations involving nonperformance by

IBM pursuant to, or in any way related to the subject matter of this Statement of Warranty, IBM's liability, will be limited to the total amount you paid for the Machine that is the subject of the claim.

Applicability of suppliers and resellers (unchanged).

The following replaces the third paragraph of this Section:

Unless otherwise provided by mandatory law, IBM and your reseller are not liable for any of the following: *(items 1 and 2 unchanged)* 3) indirect damages, even if IBM or your reseller is informed of their possibility.

SOUTH AFRICA, NAMIBIA, BOTSWANA, LESOTHO AND SWAZILAND

Limitation of Liability: *The following is added to this Section:*

IBM's entire liability to you for actual damages arising in all situations involving nonperformance by IBM in respect of the subject matter of this Statement of Warranty will be limited to the charge paid by you for the individual Machine that is the subject of your claim from IBM.

UNITED KINGDOM

Limitation of Liability: *The following replaces items 1 and 2 of the first paragraph of this Section:*

1. death or personal injury or physical damage to your real property solely caused by IBM's negligence;
2. the amount of any other actual direct damages or loss, up to 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim;

The following item is added to this paragraph:

3. breach of IBM's obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982.

Applicability of suppliers and resellers (unchanged).

The following is added to the end of this Section:

IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

Appendix B. 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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IBM makes no representations or warranties with respect to non-IBM products. Support (if any) for the non-IBM products is provided by the third party, not IBM.

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.

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.



Part Number: 02R2739

(1P) P/N:02R2739

