



System i and System p Planning





System i and System p Planning

Note

Before using this information and the product it supports, read the information in “Notices” on page 505 and the *IBM Systems Safety Information* manual, G229-9054.

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Safety and environmental notices

Safety notices may be printed throughout this guide:

- **DANGER** notices call attention to a situation that is potentially lethal or extremely hazardous to people.
- **CAUTION** notices call attention to a situation that is potentially hazardous to people because of some existing condition.
- **Attention** notices call attention to the possibility of damage to a program, device, system, or data.

World Trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, a safety information booklet is included in the publications package shipped with the product. The booklet contains the safety information in your national language with references to the U.S. English source. Before using a U.S. English publication to install, operate, or service this product, you must first become familiar with the related safety information in the booklet. You should also refer to the booklet any time you do not clearly understand any safety information in the U.S. English publications.

Laser safety information

IBM® System i™ models and System p™ servers can use I/O cards or features that are fiber-optic based and that utilize lasers or LEDs.

Laser compliance

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with IEC 60825 as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

CAUTION:

This product might contain one or more of the following devices: CD-ROM drive, DVD-ROM drive, DVD-RAM drive, or laser module, which are Class 1 laser products. Note the following information:

- 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 the controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

(C026)

CAUTION:

Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. (C027)

CAUTION:

This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)

CAUTION:

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following information: laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam. (C030)

Power and cabling information for NEBS (Network Equipment-Building System) GR-1089-CORE

The following comments apply to the IBM System i models and IBM System p servers that have been designated as conforming to NEBS (Network Equipment-Building System) GR-1089-CORE:

The equipment is suitable for installation in the following:

- Network telecommunications facilities
- Locations where the NEC (National Electrical Code) applies

The intrabuilding ports of this equipment are suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding ports of this equipment *must not* be metalically connected to the interfaces that connect to the OSP (outside plant) or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metalically to OSP wiring.

Note: All Ethernet cables must be shielded and grounded at both ends.

The ac-powered system does not require the use of an external surge protection device (SPD).

The dc-powered system employs an isolated DC return (DC-I) design. The DC battery return terminal *shall not* be connected to the chassis or frame ground.

Product recycling and disposal

This unit must be recycled or discarded according to applicable local and national regulations. IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found on IBM's Internet site at <http://www.ibm.com/ibm/environment/products/prp.shtml>.

Esta unidad debe reciclarse o desecharse de acuerdo con lo establecido en la normativa nacional o local aplicable. IBM recomienda a los propietarios de equipos de tecnología de la información (TI) que reciclen responsablemente sus equipos cuando éstos ya no les sean útiles. IBM dispone de una serie de programas y servicios de devolución de productos en varios países, a fin de ayudar a los propietarios de equipos a reciclar sus productos de TI. Se puede encontrar información sobre las ofertas de reciclado de productos de IBM en el sitio web de IBM <http://www.ibm.com/ibm/environment/products/prp.shtml>.



EU Only

Note: This mark applies only to countries within the European Union (EU) and Norway.

Appliances are labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local IBM representative.

Battery return program

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

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

For Taiwan: Please recycle batteries.



For the European Union:



Note: This mark applies only to countries within the European Union (EU).

Batteries or packaging for batteries are labeled in accordance with European Directive 2006/66/EC concerning batteries and accumulators and waste batteries and accumulators. The Directive determines the framework for the return and recycling of used batteries and accumulators as applicable throughout the European Union. This label is applied to various batteries to indicate that the battery is not to be thrown away, but rather reclaimed upon end of life per this Directive.

In accordance with the European Directive 2006/66/EC, batteries and accumulators are labeled to indicate that they are to be collected separately and recycled at end of life. The label on the battery may also include a chemical symbol for the metal concerned in the battery (Pb for lead, Hg for mercury and Cd for cadmium). Users of batteries and accumulators must not dispose of batteries and accumulators as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and treatment of batteries and accumulators. Customer participation is important to minimize any potential effects of batteries and accumulators on the environment and human health due to the potential presence of hazardous substances. For proper collection and treatment, contact your local IBM representative.

For California: Perchlorate Material - special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate.

The foregoing notice is provided in accordance with California Code of Regulations Title 22, Division 4.5 Chapter 33. Best Management Practices for Perchlorate Materials. This product/part may include a lithium manganese dioxide battery which contains a perchlorate substance.

IBM Cryptographic Coprocessor Card Return Program

The following information applies only for systems originally sold prior to July 1, 2006:

This machine may contain an optional feature, the cryptographic coprocessor card, which includes a polyurethane material that contains mercury. Please follow local ordinances or regulations for disposal of this card. IBM has established a return program for certain IBM Cryptographic Coprocessor Cards. More information can be found at <http://www.ibm.com/ibm/environment/products/prp.shtml>.

About this topic

This topic provides specifications that site planners can use to assess the physical site and operational requirements necessary to prepare your site for a new server. This topic includes specifications for servers and expansion units, plugs and receptacles, cables, as well as information about power-distribution units, and uninterruptible power supplies.

For information about the accessibility features of this product, for users who have a physical disability, see “Accessibility features,” on page 503.

Planning

Proper planning helps you place your server and identify the unique needs for your server.

Good planning is essential for the successful setup and use of your server. It ensures that you have everything you need and that you have met all the prerequisites for your server. This will minimize errors during install and allow for a quicker upgrade or install. The planning information in this topic helps you place the server, plan power and environmental needs, and prepare for unique configurations based on how you will use the server (for example, clustering of servers, Internet connections and rack mounting).

Planning scenarios that you are responsible for include:

- A new server installation
- A model upgrade
- Hardware modifications (feature additions, removals, conversions, or relocations)
- Software modifications (additions, removals, updates, or other changes)

To ensure that planning is completed successfully, you should assign a planning project manager who will provide a documented plan that includes:

- A timeline for the activities to be performed
- Each major activity phase and the desired outcome
- A list of responsibilities and the person assigned
- A current system diagram and configuration listing, including all hardware content, software content, cabling, and other pertinent configuration items (if this is a modification to an existing system)
- An end-system diagram showing hardware content and configuration details, including cabling




Note: Give special attention to disk units, clustering, and logical partitions (LPAR) system configurations

- A key contacts list, including off-hours contact information for all key task or activities participants
- A plan for communicating appropriate elements of your plan with key personnel (for example, seller, installer, management)

PDF files for Planning

You can view and print a PDF of this information.

To view or download the PDF version of detailed server and hardware specifications, general physical site guidelines, or solution planning information, select one of the following:

- Planning  (about 14094 KB).
- Physical site planning and preparation  (about 4008 KB).
- Solution planning  (about 1794 KB).


Saving PDF files

To save a PDF on your workstation for viewing or printing:

1. Right-click the PDF link in your browser.

2. Click the option that saves the PDF locally.
3. Navigate to the directory in which you want to save the PDF.
4. Click **Save**.

Downloading Adobe Reader

You need Adobe Reader installed on your system to view or print these PDFs. You can download a free copy from the Adobe Web site (www.adobe.com/products/acrobat/readstep2.html) .

Full planning checklists

Planning checklists help to guide and simplify the planning for your server.

Each checklist provides categories of tasks you must consider when planning for your server. The categories of planning tasks that appear in the checklists link to the in-depth information that you need to build your plan.

Select the server model from the following.

IBM eServer™ hardware and IBM Systems hardware	Other server models
7037-A50	7028-6C4 or 7028-6E4 (model 630)
7047-185	7029-6C3 or 7029-6E3 (model 615)
9111-285	7039-650
9110-510	7039-655
9110-51A	7040-670
9111-520	7040-690
9113-550	9406-810
9115-505	9406-820
9116-561	9406-825
9117-570	9406-830 or SB2
9117-MMA	9406-840 or SB3
9118-575	9406-870 or 9406-890
9119-590	
9119-595	
9131-52A	
9133-55A	
9405-520	
9406-520	
9406-525	
9406-550	
9406-570	
9406-595	
9407-515	
OpenPower™ 710	
OpenPower 720	

Model 7037-A50 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- [__ Planning for Model 7037-A50 server specifications](#)
- [__ Planning for power](#)
- [__ Planning for IBM racks](#)
- [__ Planning for cables](#)
- [__ Physical site planning and preparation](#)

Solution planning

- [__ Planning for hardware needs](#)
- [__ Planning for logical partitions \(LPAR\)](#)
- [__ Planning for operating systems on your server](#)
- [__ Planning for AIX®](#)
- [__ Planning for i5/OS®](#)
- [__ Planning for Linux®](#)
- [__ Planning for availability](#)
- [__ Planning for availability with AIX](#)
- [__ Planning for availability with i5/OS](#)
- [__ Planning for consoles](#)
- [__ Planning for performance](#)
- [__ Planning for performance with AIX](#)
- [__ Planning for performance with i5/OS](#)
- [__ Planning for service and support](#)
- [__ Planning for IBM services](#)
- [__ Planning for migrating or upgrading your server](#)

Model 7047-185 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- [__ Planning for Model 7047-185 server specifications](#)
- [__ Planning for power](#)
- [__ Planning for IBM racks](#)
- [__ Planning for cables](#)
- [__ Physical site planning and preparation](#)

Physical planning

Solution planning

- ☐ Planning for hardware needs
- ☐ Planning for logical partitions (LPAR)
- ☐ Planning for operating systems on your server
- ☐ Planning for AIX
- ☐ Planning for i5/OS
- ☐ Planning for Linux
- ☐ Planning for availability
- ☐ Planning for availability with AIX
- ☐ Planning for availability with i5/OS
- ☐ Planning for consoles
- ☐ Planning for performance
- ☐ Planning for performance with AIX
- ☐ Planning for performance with i5/OS
- ☐ Planning for service and support
- ☐ Planning for IBM services
- ☐ Planning for migrating or upgrading your server

Model 9110-510 and 9110-51A planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- ☐ Planning for Model 9110-510 and 9110-51A server specifications
- ☐ Planning for power
- ☐ Planning for IBM racks
- ☐ Planning for cables
- ☐ Physical site planning and preparation

Solution planning

- ☐ Planning for hardware needs
- ☐ Planning for logical partitions (LPAR)
- ☐ Planning for operating systems on your server
- ☐ Planning for AIX
- ☐ Planning for Linux
- ☐ Planning for availability
- ☐ Planning for availability with AIX
- ☐ Planning for consoles
- ☐ Planning for performance
- ☐ Planning for performance with AIX
- ☐ Planning for service and support
- ☐ Planning for IBM services
- ☐ Planning for migrating or upgrading your server

Model 9111-285 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- ☐ Planning for Model 9111-285 server specifications
- ☐ Planning for power
- ☐ Planning for IBM racks
- ☐ Planning for cables
- ☐ Physical site planning and preparation

Solution planning

- ☐ Planning for hardware needs
- ☐ Planning for logical partitions (LPAR)
- ☐ Planning for operating systems on your server
- ☐ Planning for AIX
- ☐ Planning for Linux
- ☐ Planning for availability
- ☐ Planning for availability with AIX
- ☐ Planning for consoles
- ☐ Planning for performance
- ☐ Planning for performance with AIX
- ☐ Planning for service and support
- ☐ Planning for IBM services
- ☐ Planning for migrating or upgrading your server

Model 9111-520 and 9406-520 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- ☐ Planning for Model 9111-520 and 9406-520 server specifications
- ☐ Planning for power
- ☐ Planning for IBM racks
- ☐ Planning for cables
- ☐ Physical site planning and preparation

Solution planning

- ☐ Planning for hardware needs
- ☐ Planning for logical partitions (LPAR)

Physical planning

- Planning for operating systems on your server
- Planning for AIX
- Planning for i5/OS
- Planning for Linux
- Planning for availability
- Planning for availability with AIX
- Planning for availability with i5/OS
- Planning for consoles
- Planning for performance
- Planning for performance with AIX
- Planning for performance with i5/OS
- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Model 9406-525 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- Planning for Model 9406-525 server specifications
- Planning for power
- Planning for IBM racks
- Planning for cables
- Physical site planning and preparation

Solution planning

- Planning for hardware needs
- Planning for logical partitions (LPAR)
- Planning for operating systems on your server
- Planning for AIX
- Planning for i5/OS
- Planning for Linux
- Planning for availability
- Planning for availability with AIX
- Planning for availability with i5/OS
- Planning for consoles
- Planning for performance
- Planning for performance with AIX
- Planning for performance with i5/OS
- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Model 9113-550 and 9406-550 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- [__ Planning for Model 9113-550 and 9406-550 server specifications](#)
- [__ Planning for power](#)
- [__ Planning for IBM racks](#)
- [__ Planning for cables](#)
- [__ Physical site planning and preparation](#)

Solution planning

- [__ Planning for hardware needs](#)
- [__ Planning for logical partitions \(LPAR\)](#)
- [__ Planning for operating systems on your server](#)
- [__ Planning for AIX](#)
- [__ Planning for i5/OS](#)
- [__ Planning for Linux](#)
- [__ Planning for availability](#)
- [__ Planning for availability with AIX](#)
- [__ Planning for availability with i5/OS](#)
- [__ Planning for consoles](#)
- [__ Planning for performance](#)
- [__ Planning for performance with AIX](#)
- [__ Planning for performance with i5/OS](#)
- [__ Planning for service and support](#)
- [__ Planning for IBM services](#)
- [__ Planning for migrating or upgrading your server](#)

Model 9115-505 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- [__ Planning for Model 9115-505 server specifications](#)
- [__ Planning for power](#)
- [__ Planning for IBM racks](#)
- [__ Planning for cables](#)
- [__ Physical site planning and preparation](#)

Physical planning

Solution planning

- Planning for hardware needs
- Planning for logical partitions (LPAR)
- Planning for operating systems on your server
- Planning for AIX
- Planning for Linux
- Planning for availability
- Planning for availability with AIX
- Planning for consoles
- Planning for performance
- Planning for performance with AIX
- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Model 9116-561 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- Planning for Model 9116-561 server specifications
- Planning for power
- Planning for IBM racks
- Planning for cables
- Physical site planning and preparation

Solution planning

- Planning for hardware needs
- Planning for logical partitions (LPAR)
- Planning for operating systems on your server
- Planning for AIX
- Planning for i5/OS
- Planning for Linux
- Planning for availability
- Planning for availability with AIX
- Planning for availability with i5/OS
- Planning for consoles
- Planning for performance
- Planning for performance with AIX
- Planning for performance with i5/OS
- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Model 9117-570 and 9406-570 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- [__ Planning for Model 9117-570 and 9406-570 server specifications](#)
- [__ Planning for power](#)
- [__ Planning for IBM racks](#)
- [__ Planning for cables](#)
- [__ Physical site planning and preparation](#)

Solution planning

- [__ Planning for hardware needs](#)
- [__ Planning for logical partitions \(LPAR\)](#)
- [__ Planning for operating systems on your server](#)
- [__ Planning for AIX](#)
- [__ Planning for i5/OS](#)
- [__ Planning for Linux](#)
- [__ Planning for availability](#)
- [__ Planning for availability with AIX](#)
- [__ Planning for availability with i5/OS](#)
- [__ Planning for consoles](#)
- [__ Planning for performance](#)
- [__ Planning for performance with AIX](#)
- [__ Planning for performance with i5/OS](#)
- [__ Planning for service and support](#)
- [__ Planning for IBM services](#)
- [__ Planning for migrating or upgrading your server](#)

Model 9117-MMA planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- [__ Planning for Model 9117-MMA server specifications](#)
- [__ Planning for power](#)
- [__ Planning for IBM racks](#)
- [__ Planning for cables](#)
- [__ Physical site planning and preparation](#)

Physical planning

Solution planning

- Planning for hardware needs
- Planning for logical partitions (LPAR)
- Planning for operating systems on your server
- Planning for AIX
- Planning for Linux
- Planning for availability
- Planning for availability with AIX
- Planning for consoles
- Planning for performance
- Planning for performance with AIX
- Planning for service and support
- Planning for IBM services
- Planning for upgrading your server

Model 9118-575 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- Planning for Model 9118-575 server specifications
- Planning for power
- Planning for IBM racks
- Planning for cables
- Physical site planning and preparation

Solution planning

- Planning for hardware needs
- Planning for logical partitions (LPAR)
- Planning for operating systems on your server
- Planning for AIX
- Planning for Linux
- Planning for availability
- Planning for availability with AIX
- Planning for consoles
- Planning for performance
- Planning for performance with AIX
- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Model 9119-590 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- ☐ Planning for Model 9119-590 server specifications
- ☐ Planning for power
- ☐ Planning for cables
- ☐ Physical site planning and preparation

Solution planning

- ☐ Planning for hardware needs
- ☐ Planning for logical partitions (LPAR)
- ☐ Planning for operating systems on your server
- ☐ Planning for AIX
- ☐ Planning for i5/OS
- ☐ Planning for Linux
- ☐ Planning for availability
- ☐ Planning for availability with AIX
- ☐ Planning for availability with i5/OS
- ☐ Planning for consoles
- ☐ Planning for performance
- ☐ Planning for performance with AIX
- ☐ Planning for performance with i5/OS
- ☐ Planning for service and support
- ☐ Planning for IBM services
- ☐ Planning for migrating or upgrading your server

Model 9119-595 and 9406-595 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- ☐ Planning for Model 9119-595 and 9406-595 server specifications
- ☐ Planning for power
- ☐ Planning for cables
- ☐ Physical site planning and preparation

Solution planning

- ☐ Planning for hardware needs
- ☐ Planning for logical partitions (LPAR)
- ☐ Planning for operating systems on your server
- ☐ Planning for AIX
- ☐ Planning for i5/OS
- ☐ Planning for Linux

Physical planning

- Planning for availability
- Planning for availability with AIX
- Planning for availability with i5/OS
- Planning for consoles
- Planning for performance
- Planning for performance with AIX
- Planning for performance with i5/OS
- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Model 9407-515 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- Planning for Model 9407-515 server specifications
- Planning for power
- Planning for IBM racks
- Planning for cables
- Physical site planning and preparation

Solution planning

- Planning for hardware needs
- Planning for logical partitions (LPAR)
- Planning for operating systems on your server
- Planning for AIX
- Planning for i5/OS
- Planning for Linux
- Planning for availability
- Planning for availability with AIX
- Planning for availability with i5/OS
- Planning for consoles
- Planning for performance
- Planning for performance with AIX
- Planning for performance with i5/OS
- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Model 9131-52A planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- ☐ Planning for Model 9131-52A server specifications
- ☐ Planning for power
- ☐ Planning for IBM racks
- ☐ Planning for cables
- ☐ Physical site planning and preparation

Solution planning

- ☐ Planning for hardware needs
- ☐ Planning for logical partitions (LPAR)
- ☐ Planning for operating systems on your server
- ☐ Planning for AIX
- ☐ Planning for Linux
- ☐ Planning for availability
- ☐ Planning for availability with AIX
- ☐ Planning for consoles
- ☐ Planning for performance
- ☐ Planning for performance with AIX
- ☐ Planning for service and support
- ☐ Planning for IBM services
- ☐ Planning for migrating or upgrading your server

Model 9133-55A planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- ☐ Planning for Model 9133-55A server specifications
- ☐ Planning for power
- ☐ Planning for IBM racks
- ☐ Planning for cables
- ☐ Physical site planning and preparation

Solution planning

- ☐ Planning for hardware needs
- ☐ Planning for logical partitions (LPAR)
- ☐ Planning for operating systems on your server
- ☐ Planning for AIX
- ☐ Planning for Linux
- ☐ Planning for availability
- ☐ Planning for availability with AIX

Physical planning

- Planning for consoles
- Planning for performance
- Planning for performance with AIX
- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Model OpenPower 710 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- Planning for Model OpenPower 710 server specifications
- Planning for power
- Planning for IBM racks
- Planning for cables
- Physical site planning and preparation

Solution planning

- Planning for hardware needs
- Planning for logical partitions (LPAR)
- Planning for operating systems on your server
- Planning for Linux
- Planning for consoles
- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Model OpenPower 720 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- Planning for Model OpenPower 720 server specifications
- Planning for power
- Planning for IBM racks
- Planning for cables
- Physical site planning and preparation

Physical planning

Solution Planning

- Planning for hardware needs
- Planning for logical partitions (LPAR)
- Planning for operating systems on your server
- Planning for Linux
- Planning for consoles
- Planning for service and support
- Planning for IBM services

Model 9405-520 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- Planning for Model 9405-520 server specifications
- Planning for power
- Planning for IBM racks
- Planning for cables
- Physical site planning and preparation

Solution planning

- Planning for hardware needs
- Planning for logical partitions (LPAR)
- Planning for operating systems on your server
- Planning for AIX (optional after delivery)
- Planning for i5/OS (pre-installed)
- Planning for Linux (optional after delivery)
- Planning for availability
- Planning for availability with AIX
- Planning for availability with i5/OS
- Planning for consoles
- Planning for performance
- Planning for performance with AIX
- Planning for performance with i5/OS
- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Model 9406-250 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the

checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- ☐ Planning for Model 9406-250 server specifications
- ☐ Planning for power
- ☐ Planning for cables
- ☐ Physical site planning and preparation

Solution planning

- ☐ Planning for hardware needs
- ☐ Planning for logical partitions (LPAR)
- ☐ Planning for operating systems on your server
- ☐ Planning for Linux
- ☐ Planning for i5/OS
- ☐ Planning for availability
- ☐ Planning for availability with i5/OS
- ☐ Planning for consoles
- ☐ Planning for performance
- ☐ Planning for performance with i5/OS
- ☐ Planning for service and support
- ☐ Planning for IBM services
- ☐ Planning for migrating or upgrading your server

Model 9406-270 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- ☐ Planning for Model 9406-270 server specifications
- ☐ Planning for power
- ☐ Planning for IBM racks
- ☐ Planning for cables
- ☐ Physical site planning and preparation

Solution planning

- ☐ Planning for hardware needs
- ☐ Planning for logical partitions (LPAR)
- ☐ Planning for operating systems on your server
- ☐ Planning for Linux
- ☐ Planning for i5/OS
- ☐ Planning for availability
- ☐ Planning for availability with i5/OS
- ☐ Planning for consoles
- ☐ Planning for performance
- ☐ Planning for performance with i5/OS

Physical planning

- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Model 9406-800 and 9406-810 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- Planning for Model 9406-800 and 9406-810 server specifications
- Planning for power
- Planning for IBM racks
- Planning for cables
- Physical site planning and preparation

Solution planning

- Planning for hardware needs
- Planning for logical partitions (LPAR)
- Planning for operating systems on your server
- Planning for i5/OS
- Planning for Linux
- Planning for availability
- Planning for availability with i5/OS
- Planning for consoles
- Planning for performance
- Planning for performance with i5/OS
- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Model 9406-820 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- Planning for Model 9406-820 server specifications
- Planning for power
- Planning for cables

Physical planning

- Physical site planning and preparation

Solution planning

- Planning for hardware needs
- Planning for logical partitions (LPAR)
- Planning for operating systems on your server
- Planning for Linux
- Planning for i5/OS
- Planning for availability
- Planning for availability with i5/OS
- Planning for consoles
- Planning for performance
- Planning for performance with i5/OS
- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Model 9406-825 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- Planning for Model 9406-825 server specifications
- Planning for power
- Planning for IBM racks
- Planning for cables
- Physical site planning and preparation

Solution planning

- Planning for hardware needs
- Planning for logical partitions (LPAR)
- Planning for operating systems on your server
- Planning for Linux
- Planning for i5/OS
- Planning for availability
- Planning for availability with i5/OS
- Planning for consoles
- Planning for performance
- Planning for performance with i5/OS
- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Models 9406-830 and SB2 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- Planning for Model 9406-830 and SB2 server specifications
- Planning for power
- Planning for cables
- Physical site planning and preparation

Solution planning

- Planning for hardware needs
- Planning for logical partitions (LPAR)
- Planning for operating systems on your server
- Planning for Linux
- Planning for i5/OS
- Planning for availability
- Planning for availability with i5/OS
- Planning for consoles
- Planning for performance
- Planning for performance with i5/OS
- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Models 9406-840 and SB3 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- Planning for Model 9406-840 and SB3 server specifications
- Planning for power
- Planning for cables
- Physical site planning and preparation

Solution planning

- Planning for hardware needs
- Planning for logical partitions (LPAR)
- Planning for operating systems on your server
- Planning for Linux

Physical planning

- Planning for i5/OS
- Planning for availability
- Planning for availability with i5/OS
- Planning for consoles
- Planning for performance
- Planning for performance with i5/OS
- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Model 9406-870 and 9406-890 planning checklist

Planning checklists identify common tasks that you should plan for before the arrival and installation of your server.

Use the following checklist to guide and simplify your planning process. The items that appear in the checklist are categories of tasks you must consider. The categories of planning tasks that appear in the checklist link to the in-depth information that you need to build your plan. Each topic indicates what you need to know before you can begin your planning process and what you should have or know when you are finished. You may need to have your server order information or know the requirements of your existing server as reference.

Physical planning

- Planning for Model 9406-870 and 9406-890 server specifications
- Planning for power
- Planning for cables
- Physical site planning and preparation

Solution planning

- Planning for hardware needs
- Planning for logical partitions (LPAR)
- Planning for operating systems on your server
- Planning for Linux
- Planning for i5/OS
- Planning for availability
- Planning for availability with i5/OS
- Planning for consoles
- Planning for performance
- Planning for performance with i5/OS
- Planning for service and support
- Planning for IBM services
- Planning for migrating or upgrading your server

Planning for other models

A planning checklist is not available for the model you selected.

For planning information on this model, see the Hardware documentation category in the AIX and eServer System p Information Center.

Planning reference

This quick reference organizes your site planning information into categories. Within each category, you can choose topics that consist of explanations and step-by-step procedures to give you the information you need to prepare your site for your server.

Physical site planning and preparation

Provides physical site planning information to assist you in preparing your site for the arrival of your server. This topic includes location considerations, power planning, and environmental requirements, such as air quality, temperature, and humidity.

Server specifications

Provides detailed server information such as dimensions, electrical, power, temperature, environment, and service clearances.

Hardware specification sheets

Provides detailed specification information for expansion units, migration expansion units, racks, and Hardware Management Consoles (HMCs). This topic also includes links to sources for removable media storage devices, display stations, printers, and communications equipment, such as communication controllers, hubs, routers, and modems.

Power

Provides detailed information for planning power requirements for your server. This topic includes power planning, power specifications, and detailed power cord, plug, and receptacle information.

Cables

Provides detailed requirements for twinaxial, ASCII, and other cables, as well as workstation cabling configurations.

Server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

Select the appropriate models to view the specifications for your server.

Model 7037-A50 server and 7047-185 workstation specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

Use the following specifications to plan for your server.

Table 1. Server or workstation specifications

Plan views					
Rear view with connectors					
ASHRAE declarations					
Rack-mounted 7037-A50 server					
Dimensions	Width	Depth	Height	EIA units¹	Weight

Table 1. Server or workstation specifications (continued)

Metric	429 mm	524 mm	218 mm	5	25 kg
English	16.9 in.	20.6 in.	8.6 in.		55 lb.
Stand-alone 7037-A50 server					
Dimensions	Width	Depth	Height		Weight
Metric	216 mm 257 mm (including stabilizer foot)	496 mm (without rear cover 525 mm (with rear cover ⁸)	469 mm		25 kg
English	8.5 in. 10.1 in. (including stabilizer foot)	19.5 in. (without rear cover) 20.7 in. (with rear cover ⁸)	18.5 in.		55 lb.
Stand-alone 7047-185 workstation					
Dimensions	Width	Depth	Height		Weight
Metric	216 mm 257 mm (including stabilizer foot)	640 mm (with acoustical cover)	469 mm		25 kg
English	8.5 in. 10.1 in. (including stabilizer foot)	25.2 in. (with acoustical cover)	18.5 in.		55 lb.
Shipping dimensions	Width	Depth	Height	Weight	
Metric	625 mm	655 mm	485 mm	30 kg	
English	24.6 in.	25.8 in.	19.1 in.	67 lb.	
Shipping dimensions (China)	Width	Depth	Height	Weight	
Metric	625 mm	655 mm	599 mm	30 kg	
English	24.6 in.	25.8 in.	23.5 in.	67 lb.	
Feature code for drawer mounted in rack					
Electrical					
kVA (maximum)			0.474		
Rated voltage and frequency ⁵			100 - 127/200 - 240 V ac at 50/60 plus or minus 0.5 Hz		
Thermal output (maximum)			1536 BTU/hr		
Maximum power consumption			530 W (1-way 7037-A50 , 1-way 7047-185, and 2-way 7047-185)		
			750 W (2-way 7037-A50)		
Power factor			0.95		
Inrush current (maximum)			90 A		

Table 1. Server or workstation specifications (continued)

Leakage current (maximum)		1.6 mA		
Phase		1		
Compatible plug types		2, 4, 5, 6, 18, 19, 22, 23, 24, 25, 26, 32, 57, 59, 62, 66, 69, 70, 73, 75, 76		
Branch circuit breaker		20 A (maximum)		
Power cord length		2.8 m (9 ft.) - except United States 1.8 m (6 ft.) - United States		
Environment requirements				
Recommended operating temperature ²		5 degrees to 35 degrees C (41 degrees to 95 degrees F)		
Nonoperating temperature		5 degrees to 45 degrees C (41 degrees to 113 degrees F)		
Shipping temperature		-40 degrees to 60 degrees C (-40 degrees to 140 degrees F)		
	Operating	Nonoperating		
Maximum dew point	28 degrees C (82.4 degrees F)	29 degrees C (84.2 degrees F)		
Noncondensing humidity	8 to 80%	8 to 80%		
Maximum altitude	3048 m (10 000 ft.)	3048 m (10 000 ft.)		
Noise emissions ^{3, 4, 6, 7}				
Product description	Declared A-weighted sound power level, L _{WAd} (B)		Declared A-weighted sound pressure level, L _{pAm} (dB)	
	Operating	Idling	Operating	Idling
7047-185 1-way workstation with two 10 000 rpm hard disk drives, 2843 graphics card and 2 GB of memory (workstations have acoustical front and rear covers)	5.0	4.7	31 ⁴	28 ⁴
7047-185 2-way workstation with two 10 000 rpm hard disk drives, 2843 graphics card and 4GB of memory (workstations have acoustical front and rear covers)	5.1	4.9	33	31

Table 1. Server or workstation specifications (continued)

7037-A50 1-way server tower with three 10 000 rpm hard disk drives ⁸	5.3	5.0	38	35
7037-A50 2-way server tower with three 10 000 rpm hard disk drives ⁸	5.8	5.6	40	39
7037-A50 1-way rack-mounted server with three 10 000 rpm hard disk drives	5.3	5.0	38 ⁴	35 ⁴
7037-A50 2-way server tower or rack-mounted server with three 10 000 rpm hard disk drives and 4 GB of memory	5.7	5.6	42	41
Service clearances				
Clearances	Front	Back	Left or right	Top
Operating	762 mm (30 in.)	762 mm (30 in.)		
Nonoperating	762 mm (30 in.)	762 mm (30 in.)	762 mm (30 in.)	762 mm (30 in.)
Seismic considerations				
Data communications				
Electromagnetic compatibility compliance: This server meets the following electromagnetic compatibility specifications: FCC (CFR 47, Part 15); VCCI; CISPR-22; 89/336/EEC; BSMI (A2/NZS 3548:1995); C-Tick; ICES/NMB-003; Korean EMI/EMC (MIC Notice 2000-94, Notice 2000-72); People's Republic of China Commodity Inspection Law				
Safety compliance: This server is designed and certified to meet the following safety standards: UL 60950; CAN/CSA C22.2 No. 60950-00; EN 60950; IEC 60950 including all National Differences				
Note: <ol style="list-style-type: none"> 1. See 0551, 0553, or 7014 rack configurations for typical configurations when the 0551, 0553, or 7014 rack is populated with various server models. 2. Class 3 product as defined in ASHRAE Thermal Guidelines for Data Processing Environments. The allowable operating range is 5 degrees to 35 degrees C (41 degrees to 95 degrees F). See the Temperature and humidity design criteria topic for more information. 3. For a description of noise emission values, see Acoustics. 4. Estimated value 5. The power supplies automatically accept any voltage with the published, rated-voltage range. If dual power supplies are installed and operating, the power supplies draw approximately equal current from the utility (mains) and provide approximately equal current to the load. 6. When a tape drive is installed, using the acoustic cover feature will reduce the noise emissions when the tape drive is in use. 7. All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296. 8. An optional acoustical cover is available for the 7037-A50 server tower that will reduce $L_{WA,d}$ and L_{pAm} approximately 0.3 B and 3 dB, respectively. 				

ASHRAE declarations

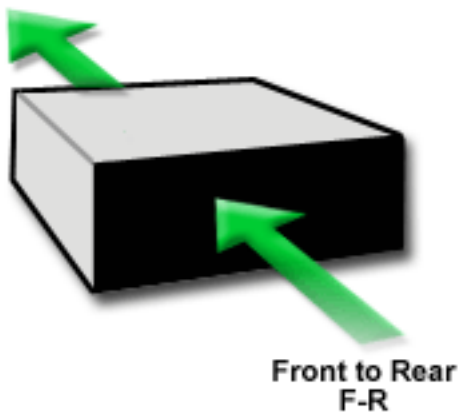
Use the ASHRAE declarations table and figures to determine the measurement reporting requirements defined in the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Thermal Guidelines for Data Processing Environments.

These guidelines are available at <http://tc99.ashraetcs.org> .

Table 2. ASHRAE declarations

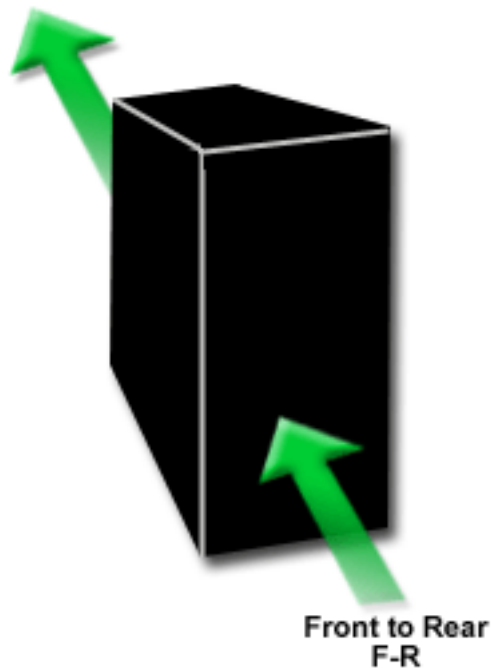
	Typical Heat Release	Airflow nominal		Airflow maximum at 35 degrees C (95 degrees F)		Weight	Overall system dimensions
Description	watts	cfm	m ³ /hr	cfm	m ³ /hr		
Minimum configuration	300	42	71	83	141	See 7037-A50 and 7047-185	See 7037-A50 and 7047-185
Maximum configuration	450	42	71	83	141	See 7037-A50 and 7047-185	See 7037-A50 and 7047-185
Typical configuration	375	42	71	83	141	See 7037-A50 and 7047-185	See 7037-A50 and 7047-185
ASHRAE Class	3						
Minimum configuration	1-way, 2.5 GHz processor, 2 GB memory, three hard disk drives, five PCI cards						
Maximum configuration	2-way, 2.5 GHz processor, 8 GB memory, three hard disk drives, six PCI cards						
Typical configuration	2-way, 2.5 GHz processor, 4 GB memory, three hard disk drives, four PCI cards						

Airflow Diagram Rack-mount Cooling scheme F-R



Airflow figure for server mounted in a rack

**Airflow Diagram Desk-side
Cooling scheme F-R**



Airflow figure for desk-side server

Model 9110-510, OpenPower 710 (9123-710), and 9110-51A server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

Use the following specifications to plan for your server.

Table 3. Server specifications

Plan views					
Front and rear views with connectors					
Rack-mounted drawer					
Dimensions	Width	Depth	Height	EIA units ¹	Weight
Metric	437 mm	691 mm	88.9 mm	2	23 kg
English	17.20 in.	27.2 in.	3.5 in.		51 lb.
Rack-mounted drawer					
Shipping Dimensions	Width	Depth	Height	Weight	
Metric	635 mm	864 mm	457 mm	53 kg	
English	25 in.	34 in.	18 in.	117 lb.	
Rack-mounted drawer (China)					
Shipping Dimensions	Width	Depth	Height	Weight	
Metric	635 mm	864 mm	457 mm	53 kg	

Table 3. Server specifications (continued)

English	25 in.	34 in.	18 in.	117 lb.
Feature code for drawer mounted in rack			7998	
Optional power distribution unit (PDU), 0551 rack, 7014-T00, 7014-T42 and 0553 racks			7999	
Electrical				
kVA (maximum)			0.500 (9110-510 OpenPower 710) 0.658 (9110-51A with 4-way, 1.5 GHz processor configuration)	
Rated voltage and frequency			100 - 127 or 200-240V ac at 50/60 plus or minus 0.5 Hz	
Thermal output (maximum)			1622 Btu/hr (9110-510 OpenPower 710) 2133 Btu/hr (9110-51A with 4-way, 1.5 GHz processor configuration)	
Maximum power consumption			475 W (9110-510 OpenPower 710) 625 W (9110-51A with 4-way, 1.5 GHz processor configuration)	
Power factor			0.95	
Inrush current (maximum)			75 A	
Leakage current (maximum)			1.2 mA	
Phase			1	
Compatible plug types			2, 4, 5, 6, 18, 19, 22, 23, 24, 25, 32, 59, Nema 6-15, 62, 66, 69, 70, 73	
Dual power feature code			7989 (quantity 2)	
Branch circuit breaker			20 A (maximum)	
Power cord length			2.8 m (9 ft.) - except United States 1.8 m (6 ft.) - United States	
Environment requirements				
Recommended operating temperature ²			5 degrees to 35 degrees C (41 degrees to 95 degrees F)	
Nonoperating temperature			5 degrees to 45 degrees C (41 degrees to 113 degrees F)	
Shipping temperature			-40 degrees to 60 degrees C (-40 degrees to 140 degrees F)	
	Operating		Nonoperating	
Maximum dew point	28 degrees C (82 degrees F)		29 degrees C (84.2 degrees F)	
Noncondensing humidity	8 to 80%		8 to 80%	
Maximum altitude	3048 m (10000 ft.)		3048 m (10000 ft.)	
Noise emissions ³				
	Operating		Idle	

Table 3. Server specifications (continued)

L _{WAd} (Category 2D, General business) – rack drawer	6.2 bels ⁴	6.2 bels ⁴		
L _{pAm} (1-meter bystander)	44 dB ⁴	44 dB ⁴		
Service clearances				
Clearances	Front	Back	Left or right	Top
Operating	762 mm (30 in.)	762 mm (30 in.)	Not applicable	Not applicable
Nonoperating	762 mm (30 in.)	762 mm (30 in.)	762 mm (30 in.)	762 mm (30 in.)
Seismic considerations				
Data communications				
Electromagnetic compatibility compliance: This server meets the following electromagnetic compatibility specifications: FCC (CFR 47, Part 15); VCCI; CISPR-22; 89/336/EEC; BSMI (A2/NZS 3548:1995); C-Tick; ICES/NMB-003; Korean EMI/EMC (MIC Notice 2000–94, Notice 2000–72); People’s Republic of China Commodity Inspection Law				
Safety compliance: This server is designed and certified to meet the following safety standards: UL 60950; CAN/CSA C22.2 No. 60950–00; EN 60950; IEC 60950 including all National Differences				
Note:				
1. See 0551, 0553 or 7014 rack configurations for typical configurations when the 0551, 0553, or 7014 rack is populated with various server models.				
2. Class 3 product as defined in ASHRAE Thermal Guidelines for Data Processing Environments. The allowable operating range is 5 degrees to 35 degrees C (41 degrees to 95 degrees F). See the Temperature and humidity design criteria topic for more information.				
3. For a description of noise emission values, see Acoustics.				
4. Preliminary data.				

Model 9406-520, 9111-520, 9405-520, 9111-285, 9131-52A, 9406-525, 9407-515 server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

Use the following specifications to plan for your server.

Table 4. Server specifications⁵

Plan views					
Top down view					
Front and rear view with connectors					
ASHRAE declarations					
Rack-mounted drawer					
Dimensions	Width	Depth	Height	EIA units ¹	Weight
Metric	437 mm	584 mm	178 mm	4	43 kg
English	17.20 in.	23 in.	7 in.		95 lb.
Desk-side server					
Dimensions	Width	Depth	Height		Weight

Table 4. Server specifications⁵ (continued)

Metric	201 mm	630 mm (without rear cover) 706 mm (with 6587 rear cover)	533 mm	43 kg
English	7.9 in.	23 in. (without rear cover) 27.8 in. (with 6587 rear cover)	21 in.	95 lb.
Rack-mounted drawer				
Shipping Dimensions	Width	Depth	Height	Weight
Metric	630 mm	933 mm	584 mm	53 kg
English	24.80 in.	36.75 in.	23 in.	117 lb.
Rack-mounted drawer (China)				
Shipping Dimensions	Width	Depth	Height	Weight
Metric	679 mm	978 mm	610 mm	53 kg
English	26.75 in.	38.50 in.	24 in.	117 lb.
Desk-side server				
Shipping Dimensions	Width	Depth	Height	Weight
Metric	584 mm	880 mm	813 mm	50 kg
English	23 in.	34.65 in.	32 in.	110 lb.
Desk-side server (China)				
Shipping Dimensions	Width	Depth	Height	Weight
Metric	616 mm	904 mm	832 mm	63 kg
English	24.25 in.	35.60 in.	32.75 in.	138 lb.
Feature code for drawer mounted in rack			7884 (9406-520, 9405-520, 9406-525, 9407-515)	
Optional power distribution unit (PDU), 0551 rack, 7014-T00, 7014-T42 and 0553 racks			0229 (9111-520)	
Electrical				
kVA (maximum)			0.789	
Rated voltage and frequency ⁶			100 - 127/200 - 240V ac at 50/60 plus or minus 0.5 Hz	
Thermal output (maximum)			2560 Btu/hr	
Maximum power consumption			750 W	
Power factor			0.95	
Inrush current (maximum)			88 A	
Leakage current (maximum)			1.2 mA	
Phase			1	

Table 4. Server specifications⁵ (continued)

Compatible plug types		2, 4, 5, 6, 10, 18, 19, 22, 23, 24, 25, 32, 34, 62, 64, 66, 69, 70, 75, 76		
Dual power feature code		5158		
Branch circuit breaker		20 A (maximum)		
Power cord length		2.8 m (9 ft.) - except United States 1.8 m (6 ft.) - United States		
Environment requirements				
Recommended operating temperature ²		5 degrees to 35 degrees C (41 degrees to 95 degrees F)		
Nonoperating temperature		5 degrees to 45 degrees C (41 degrees to 113 degrees F)		
Shipping temperature		-40 degrees to 60 degrees C (-40 degrees to 140 degrees F)		
	Operating ⁴	Nonoperating		
Maximum dew point	28 degrees C (82.4 degrees F)	29 degrees C (84.2 degrees F)		
Noncondensing humidity	8 to 80%	8 to 80%		
Maximum altitude	3048 m (10000 ft.)	3048 m (10000 ft.)		
Noise emissions ^{3, 8, 9}				
Product description	Declared A-weighted sound power level, L _{Wad} (B)		Declared A-weighted sound pressure level, L _{pAm} (dB)	
	Operating	Idle	Operating	Idle
9111-285 workstation	5.0	5.0	35	32
9131-52A, 9406-520, 9111-520, and 9405-520 desk side server with two power supplies, eight hard drives and acoustic package	5.7	5.6	40	39
9131-52A, 9406-520, 9111-520, and 9405-520 desk side server with two power supplies and eight hard drives	6.1	5.9	44	41
9406-520 and 9111-520 rack-mounted server	6.0	5.8	43	42
Service clearances				
Clearances	Front	Back	Left or right	Top
Operating	762 mm (30 in.)	762 mm (30 in.)		

Table 4. Server specifications⁵ (continued)

Nonoperating	762 mm (30 in.)	762 mm (30 in.)	762 mm (30 in.)	762 mm (30 in.)
Seismic considerations				
Data communications				
Electromagnetic compatibility compliance: This server meets the following electromagnetic compatibility specifications: FCC (CFR 47, Part 15); VCCI; CISPR-22; 89/336/EEC; BSMI (A2/NZS 3548:1995); C-Tick; ICES/NMB-003; Korean EMI/EMC (MIC Notice 2000-94, Notice 2000-72); People's Republic of China Commodity Inspection Law				
Safety compliance: This server is designed and certified to meet the following safety standards: UL 60950; CAN/CSA C22.2 No. 60950-00; EN 60950; IEC 60950 including all National Differences				
Note: <ol style="list-style-type: none"> 1. See 0551, 0553, or 7014 rack configurations for typical configurations when the 0551, 0553, or 7014 rack is populated with various server models. 2. Class 3 product as defined in ASHRAE Thermal Guidelines for Data Processing Environments. The allowable operating range is 5 degrees to 35 degrees C (41 degrees to 95 degrees F). See the Temperature and humidity design criteria topic for more information. 3. For a description of noise emission values, see Acoustics. 4. All Model 520 disk bays should be filled when the unit is shipped from IBM with either disk drives or slot fillers, but if a disk is removed, refill the disk slot with either another disk drive or a disk slot filler. Filling the disk drive slot will help ensure proper airflow for cooling and help maintain optimal EMI compliance. Ordering feature 6598 results in four additional disk slot fillers being shipped. 5. The model 9405-520 is available as a deskside model only. 6. The power supplies automatically accept any voltage with the published rated voltage range. If dual power supplies are installed and operating, the power supplies draw approximately equal current from the utility (mains) and provide approximately equal current to the load. 7. The model 9111-285⁸, is only available as a desk-side model. 8. When a tape drive is installed, using the acoustic cover feature will reduce the noise emissions when the tape drive is in use. 9. All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296. 				

Special Hardware Management Console considerations

When the 9406-520, 9111-520, 9405-520, 9111-285, 9131-52A, 9406-525, 9407-515 servers are managed by a Hardware Management Console (HMC), the console must be provided within the same room and within 8 m (26 ft.) of the server. For additional considerations, see Planning for consoles, interfaces, and terminals for your service environment.

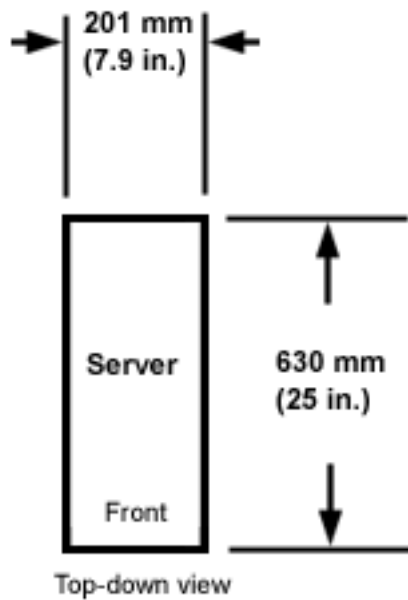
Note: As an alternative to the local HMC requirement, it is acceptable for you to provide a supported device (such as, a PC), with connectivity and authority to operate through a remotely attached HMC. This local device must be in the same room and within 8 m (26 ft.) of your server, and provide functional capability equivalent to the HMC that it replaces and that is needed by the service representative to service the system.

Plan view for model 9406-520 and 9111-520

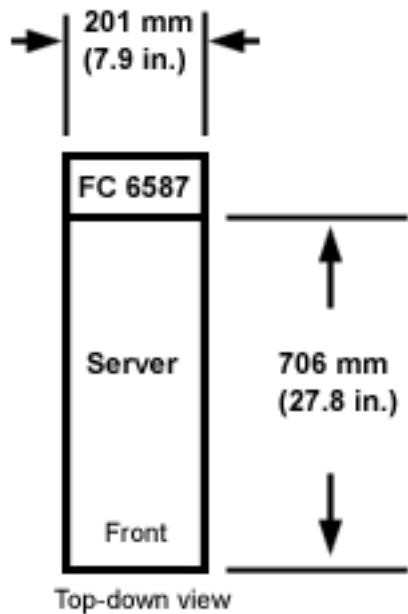
Dimensional planning information is shown in this top down view of your server.

Note: A flat, supportive surface is optimal for placement of the of the 9111-520 and 9406-520 desk-side servers. This allows the front cover to be properly supported.

The following figure shows dimensional planning information for the desk-side model 9406-520 and 9111-520.



Model 9406-520 and 9111-520 plan view



The feature code 6587 is a decorative rear cover that has sound-deadening capability. This cover is for servers that do not have external I/O attached to a high speed link (HSL) loop. The cover cannot be used if HSL cables are attached to the server.

ASHRAE declarations


The following table and figures show the measurement reporting requirements as defined in the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Thermal Guidelines for Data Processing Environments, which is available at <http://tc99.ashraetcs.org> .

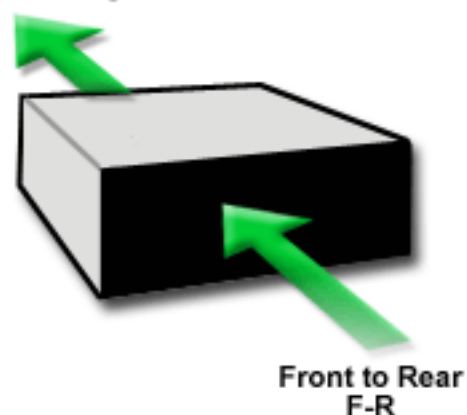
Table 5. ASHRAE declarations

	Typical Heat Release ²	Airflow nominal ¹		Airflow maximum ¹ at 35 degrees C (95 degrees F)		Weight	Overall system dimensions
Description	watts	cfm	m ³ /hr	cfm	m ³ /hr		
Configuration 1	420	26	44	40	68	See 9406-520, 9111-520, 9111-285, and 9131-52A	See 9406-520, 9111-520, 9111-285, and 9131-52A
Configuration 2	450	26	44	40	68	See 9406-520, 9111-520, 9111-285, and 9131-52A	See 9406-520, 9111-520, 9111-285, and 9131-52A
Configuration 3	500	30	51	45	76	See 9406-520, 9111-520, 9111-285, and 9131-52A	See 9406-520, 9111-520, 9111-285, and 9131-52A
Configuration 4	485	30	51	45	76	See 9406-520, 9111-520, 9111-285, and 9131-52A	See 9406-520, 9111-520, 9111-285, and 9131-52A
Configuration 5	550	30	51	45	76	See 9406-520, 9111-520, 9111-285, and 9131-52A	See 9406-520, 9111-520, 9111-285, and 9131-52A
Configuration 6	530	30	51	45	76	9406-520, 9111-520, 9111-285, and 9131-52A	9406-520, 9111-520, 9111-285, and 9131-52A
Configuration 7	560	30	51	45	76	9406-520, 9111-520, 9111-285, and 9131-52A	9406-520, 9111-520, 9111-285, and 9131-52A
ASHRAE Class	3						
Configuration 1	1-way, 1.5 GHz processor, 16 GB memory, eight hard disk drives, six PCI cards, tape, DVD						
Configuration 2	1-way, 1.65 GHz processor, 16 GB memory, eight hard disk drives, four PCI cards, tape, DVD						

Table 5. ASHRAE declarations (continued)

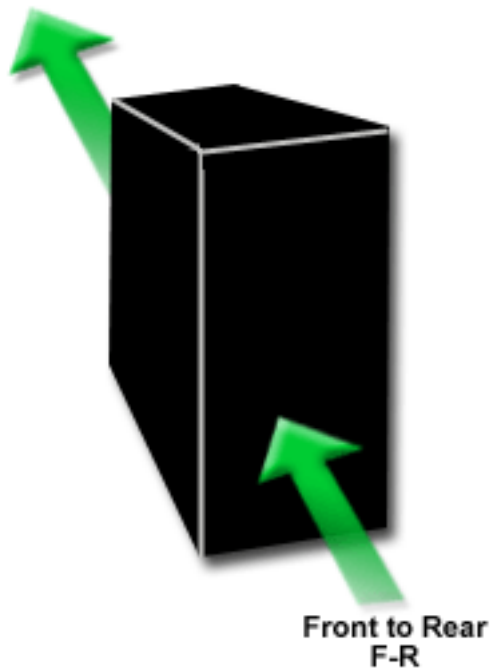
Configuration 3	2-way, 1.65 GHz processor, 32 GB memory, eight hard disk drives, five PCI cards, tape, DVD
Configuration 4	1-way, 1.9 GHz processor, 16 GB memory, eight hard disk drives, three PCI cards, tape, two DVDs
Configuration 5	2-way, 1.9 GHz processor, 32 GB memory, eight hard disk drives, five PCI cards, tape, DVD
Configuration 6	2-way, 2.1 GHz, 8 GB memory, eight hard disk drives, two PCI cards, tape, DVD
Configuration 7	4-way, 1.65 GHz, 8 GB memory, eight hard disk drives, five PCI cards, tape, DVD
Note: 1. Airflow for the typical and minimum configurations do not include redundant power supply, feature code 5158. 2. The product safety rating label contains the following information: <ul style="list-style-type: none"> • 100-127/200-240 Vac • 10/5 A 1.0 kVa • 50/60 Hz 1-phase 	

**Airflow Diagram Rack-mount
Cooling scheme F-R**



Airflow figure for server mounted in a rack

**Airflow Diagram Desk-side
Cooling scheme F-R**



Airflow figure for desk-side server

Planning for model 9406-550, 9113-550, OpenPower 720 (9124-720), and 9133-55A server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

Use the following specifications to plan for your server.

Note: The following specifications are approximate and do not represent measured data. They are provided for informational purposes only.

Table 6. Server specifications

Plan views					
Top down view					
Front and rear views with connectors					
ASHRAE declarations					
Rack-mounted drawer					
Dimensions	Width	Depth	Height	EIA Units ³	Weight
Metric	437 mm	731 mm	178 mm	4	44.7 kg
English	17.2 in.	28.8 in.	7.0 in.		98.5 lb.
Desk-side server					
Dimensions	Width	Depth	Height	Weight	
Metric	201 mm	779 mm	533 mm	62 kg	

Table 6. Server specifications (continued)

English	7.9 in.	30.7 in.	21.0 in.	137 lb.
Rack-mounted drawer				
Shipping Dimensions	Width	Depth	Height	Weight
Metric	648 mm	991 mm	704 mm	80 kg
English	25.5 in.	39 in.	27.7 in.	175 lb.
Rack-mounted drawer (China)				
Shipping Dimensions	Width	Depth	Height	Weight
Metric	640 mm	965 mm	692 mm	80 kg
English	25.2 in.	38 in.	27.25 in.	1.75 lb.
Desk-side server ⁴				
Shipping Dimensions	Width	Depth	Height	Weight
Metric	648 mm	991 mm	704 mm	80 kg
English	25.5 in.	39 in.	27.7 in.	175 lb.
Desk-side server (China) ⁴				
Shipping Dimensions	Width	Depth	Height	Weight
Metric	640 mm	965 mm	692 mm	80 kg
English	25.2 in.	38 in.	27.25 in.	175 lb.
Feature code for drawer mounted in rack			0230 (9113-550), 7886 (9406-550)	
Power distribution Unit (PDU), 0551, 7014-T00 , 7014-T42 and 0553 racks				
Electrical				
kVA (maximum)			1.158	
Rated voltage, rated amps, and frequency ⁶	9113-550, OpenPower 720, 9133-55A		One processor card installed	
	9133-55A, 9113-550, OpenPower 720		100-127 V ac (12 A) to 200-240 V ac (10 A) at 50 to 60 plus or minus 0.5 Hz	
	9406-550		Two processor cards installed	
			200-240 V ac (10 A) at 50 to 60 plus or minus 0.5 Hz	
Thermal output (maximum)			3754 Btu/hr	
Maximum power consumption			1100 W	
Power factor			0.95	
Inrush current (maximum)			85 A	
Leakage current (maximum)			1.5 mA	
Phase			1	
Compatible plug types			2, 4, 5, 6, 10, 18, 19, 22, 23, 24, 25, 32, 34, 59, 62, 64, 66, 69, 70, 73	
Dual power feature code			Included	

Table 6. Server specifications (continued)

Branch circuit breaker		20 A (maximum)		
Power cord length		2.8 m (9 ft.) - except United States		
		1.8 m (6 ft.) - United States		
Environment requirements				
Recommended operating temperature ²		5 degrees to 35 degrees C (41 degrees to 95 degrees F)		
Nonoperating temperature		5 degrees to 45 degrees C (41 degrees to 113 degrees F)		
Shipping temperature		-40 degrees to 60 degrees C (-40 degrees to degrees 140 F)		
	Operating ⁵	Nonoperating		
Maximum dew point	28 degrees C (82.4 degrees F)	29 degrees C (84.2 degrees F)		
Noncondensing humidity	8 to 80%	8 to 80%		
Maximum altitude	3048 m (10000 ft.)	3048 m (10000 ft.)		
Noise emissions ^{1, 10}				
Product description	Declared A-weighted sound power level, L _{Wad} (B)		Declared A-weighted sound pressure level, L _{pAm} (dB)	
	Operating	Idle	Operating	Idle
Desk-side models: 9406-550, 9113-550, OpenPower 720 with two hard drives and non-redundant power	6.0	5.9	42	41
Rack-mounted models:9406-550, 9113-550, OpenPower 720 with two hard drives and non-redundant power	6.1	6.0	44	43
Rack-mounted models:9406-550, 9113-550, OpenPower 720 with eight hard drives and redundant power	6.3	6.2	45	45
Rack-mounted model: 9133-55A with eight hard drives and redundant power	6.8 ⁹	6.6 ⁹		
Service clearances				
Clearances	Front	Back	Left/right	Top

Table 6. Server specifications (continued)

Operating	762 mm (30 in.)	762 mm (30 in.)		
Nonoperating	762 mm (30 in.)	762 mm (30 in.)	762 mm (30 in.)	762 mm (30 in.)
Seismic considerations				
Data communications				
Electromagnetic compatibility compliance: This server meets the following electromagnetic compatibility specifications: FCC (CFR 47, Part 15); VCCI; CISPR-22; 89/336/EEC; BSMI (A2/NZS 3548:1995); C-Tick; ICES/NMB-003; Korean EMI/EMC (MIC Notice 2000-94, Notice 2000-72); People's Republic of China Commodity Inspection Law				
Safety compliance: This server is designed and certified to meet the following safety standards: UL 60950; CAN/CSA C22.2 No. 60950-00; EN 60950; IEC 60950 including all National Differences				
Note: <ol style="list-style-type: none"> 1. For a description of noise emission values, see Acoustics. 2. Class 3 product as defined in ASHRAE Thermal Guidelines for Data Processing Environments. The allowable operating range is 5 degrees to 35 degrees C (41 degrees to 95 degrees F). See the Temperature and humidity design criteria topic for more information. 3. See 0551, 0553, or 7014 rack configurations for typical configurations when the 0551, 0553, or 7014 rack is populated with various server models. 4. Desk-side server is shipped on its side 5. All Model 550 disk bays should be filled when the unit is shipped from IBM with either disk drives or slot fillers, but if a disk is removed, refill the disk slot with either another disk drive or a disk slot filler. Filling the disk drive slot will help ensure proper airflow for cooling and help maintain optimal EMI compliance. Ordering feature 6598 results in four additional disk slot fillers being shipped. 6. The power supplies automatically accept any voltage with the published rated voltage range for a defined processor configuration. If dual power supplies are installed and operating, the power supplies draw approximately equal current from the utility (mains) and provide approximately equal current to the load. 7. Configured with two disk drives and non-redundant power system. 8. Configured with eight disk drives and redundant power system. 9. Estimated value. 10. All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296. 				

Special Hardware Management Console considerations

When the 9406-550, 9113-550, OpenPower 720, 9133-55A servers are managed by a Hardware Management Console (HMC), the console must be provided within the same room and within 8 m (26 ft.) of the server. For additional considerations, see Planning for consoles, interfaces, and terminals for your service environment.

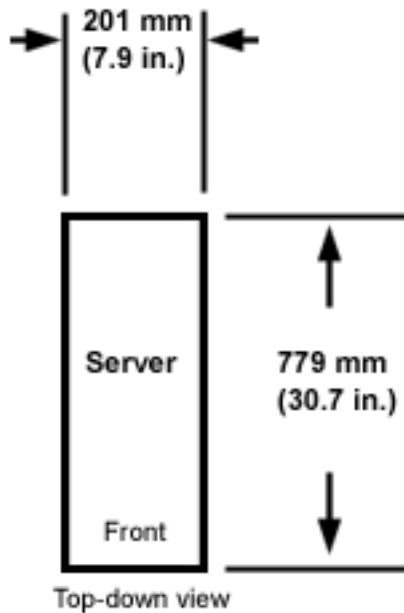
Note: As an alternative to the local HMC requirement, it is acceptable for you to provide a supported device, such as a PC, with connectivity and authority to operate through a remotely attached HMC. This local device must be in the same room and within 8 m (26 ft.) of your server, and provide functional capability equivalent to the HMC that it replaces and that is needed by the service representative to service the system.

Plan view for model 9406-550, 9113-550 and OpenPower 720

Dimensional planning information is shown in this top down view of your server.

Note: A flat, supportive surface is optimal for placement of the 9113-550 and 9406-550 desk-side servers. This allows the front cover to be properly supported.

The following figure shows dimensional planning information for the desk-side model 9406-550 and 9113-550.



Model 9406-550, 9113-550 and OpenPower 720 plan view

ASHRAE declarations


The following table and figures show the measurement reporting requirements as defined in the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Thermal Guidelines for Data Processing Environments, which is available at <http://tc99.ashraetcs.org> .

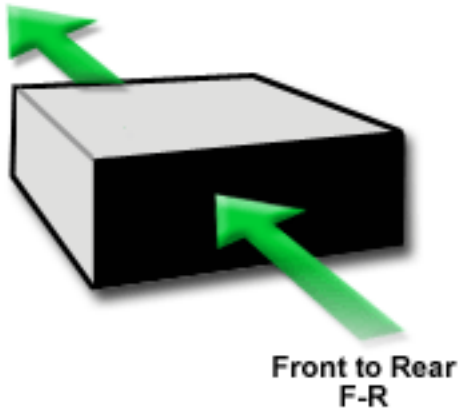
Table 7. ASHRAE declarations

Description	Typical Heat Release ²	Airflow nominal ¹		Airflow maximum ¹ at 35 degrees C (95 degrees F)		Weight	Overall system dimensions
		cfm	m ³ /hr	cfm	m ³ /hr		
Configuration 1	500	28	48	45	76	See 9406-550, 9113-550, OpenPower 720, and 9133-55A	See 9406-550, 9113-550, OpenPower 720, and 9133-55A
Configuration 2	575	32	60	50	85	See 9406-550, 9113-550, OpenPower 720, and 9133-55A	See 9406-550, 9113-550, OpenPower 720, and 9133-55A
Configuration 3	800	32	60	50	85	See 9406-550, 9113-550, OpenPower 720, and 9133-55A	See 9406-550, 9113-550, OpenPower 720, and 9133-55A

Table 7. ASHRAE declarations (continued)

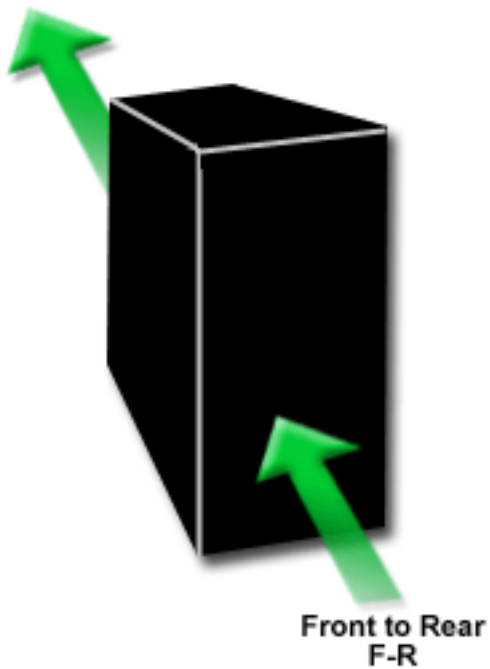
Configuration 4	650	32	60	50	85	See 9406-550, 9113-550, OpenPower 720, and 9133-55A	See 9406-550, 9113-550, OpenPower 720, and 9133-55A
Configuration 5	865	32	60	50	85	See 9406-550 9113-550, OpenPower 720, and 9133-55A	See 9406-550 9113-550, OpenPower 720, and 9133-55A
Configuration 6	925	32	60	50	85	See 9406-550, 9113-550, OpenPower 720, and 9133-55A	See 9406-550, 9113-550, OpenPower 720, and 9133-55A
Configuration 7	699	32	60	50	85	See 9406-550, 9113-550, OpenPower 720, and 9133-55A	See 9406-550, 9113-550, OpenPower 720, and 9133-55A
Configuration 8	935	32	60	50	85	See 9406-550, 9113-550, OpenPower 720, and 9133-55A	See 9406-550, 9113-550, OpenPower 720, and 9133-55A
ASHRAE Class	3						
Configuration 1	1-way, 1.65 GHz processor, 32 GB memory, eight hard disk drives, five PCI cards, tape, DVD						
Configuration 2	2-way, 1.65 GHz processor, 32 GB memory, eight hard disk drives, four PCI cards, tape, DVD						
Configuration 3	4-way, 1.65 GHz processor, 48 GB memory, eight hard disk drives, four PCI cards, tape, DVD						
Configuration 4	2-way, 1.9 GHz processor, 32 GB memory, eight hard disk drives, five PCI cards, tape, DVD						
Configuration 5	4-way, 1.9 GHz processor, 48 GB memory, eight hard disk drives, five PCI cards, tape, DVD						
Configuration 6	8-way, 1.5 GHz processor, 48 GB memory, eight hard disk drives, five PCI cards, tape, 2 DVDs						
Configuration 7	4-way, 2.1 GHz processor, 12 GB memory, eight hard disk drives, four PCI cards, tape, DVD						
Configuration 8	8-way, 1.65 GHz processor, 16 GB memory, eight hard disk drives, five PCI cards, tape, DVD						
Note:							
1. Airflow for the typical and minimum configurations.							
2. The product safety rating label contains the following information:							
• 100-127/200-240 V ac							
• 10/10 A 1.0/2.0 kVa							
• 50/60 Hz 1-phase							

**Airflow Diagram Rack-mount
Cooling scheme F-R**



Airflow figure for server mounted in a rack

**Airflow Diagram Desk-side
Cooling scheme F-R**



Airflow figure for desk-side server

Model 9115-505 server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

Use the following specifications to plan for your server.

Server specifications					
Plan views					
Rear view with connectors					
Rack-mounted drawer					
Dimensions	Width	Depth	Height	EIA Units ³	Weight
Metric	440 mm	710 mm	43 mm	1	17 kg
English	17.3 in.	28.0 in.	1.7 in.		37 lb.
Rack-mounted drawer					
Shipping dimensions	Width	Depth	Height	Weight	
Metric	635 mm	851 mm	330 mm	20 kg	
English	25.0 in.	33.5 in.	13.0 in.	43 lb.	
Rack-mounted drawer (China)					
Shipping dimensions	Width	Depth	Height	Weight	
Metric	610 mm	1016 mm	445 mm	27 kg	
English	24.0 in.	40 in.	17.5 in.	60 lb.	
Feature code for drawer mounted in rack			0259		
Power distribution Unit (PDU), 0551, 7014-T00 , 7014-T42 and 0553 racks					
Electrical					
kVA (maximum)			0.526		
Rated voltage, rated amps, and frequency ⁴		9115-505	100-127 V ac (12 A) to 200-240 V ac (10 A) at 50 to 60 plus or minus 0.5 Hz		
Thermal output (maximum)			1707 Btu/hr		
Maximum power consumption			500 W		
Power factor			0.95		
Inrush current (maximum)			75 A		
Leakage current (maximum)			1.2 mA		
Phase			1		
Compatible plug types			2, 4, 5, 6, 18, 19, 22, 23, 24, 25, 2632, 57, 59, 62 , 66, 69, 70, 73, 75, 76		
Dual power feature code			7958 (quantity 2)		
Branch circuit breaker			20 A (maximum)		
Power cord length			2.8 m (9 ft.) - except United States 1.8 m (6 ft.) - United States		
Environment requirements					
Recommended operating temperature ²			5 degrees to 35 degrees C (41 degrees to 95 degrees F)		
Nonoperating temperature			5 degrees to 45 degrees C (41 degrees to 113 degrees F)		

Server specifications				
Shipping temperature			-40 degrees to 60 degrees C (-40 degrees to degrees 140 F)	
	Operating		Nonoperating	
Maximum dew point	28 degrees C (82.4 degrees F)		29 degrees C (84.2 degrees F)	
Noncondensing humidity	8 to 80%		8 to 80%	
Maximum altitude	3048 m (10000 ft.)		3048 m (10000 ft.)	
Noise emissions ^{1, 5}				
Product description	Declared A-weighted sound power level, L_{Wad} (B)		Declared A-weighted sound pressure level, L_{pAm} (dB)	
	Operating	Idle	Operating	Idle
9115-505 with two hard drives and two power supplies	6.8	6.8	52	52
9115-505 with acoustic door (feature code 6248 or 6249) with two hard drives and two power supplies	6.2	6.2	44	44
Service clearances				
Clearances	Front	Back	Left or right	Top
Operating	762 mm (30 in.)	762 mm (30 in.)		
Nonoperating	762 mm (30 in.)	762 mm (30 in.)	762 mm (30 in.)	762 mm (30 in.)
Seismic considerations				
Data communications				
Electromagnetic compatibility compliance: This server meets the following electromagnetic compatibility specifications: FCC (CFR 47, Part 15); VCCI; CISPR-22; 89/336/EEC; BSMI (A2/NZS 3548:1995); C-Tick; ICES/NMB-003; Korean EMI/EMC (MIC Notice 2000–94, Notice 2000–72); People’s Republic of China Commodity Inspection Law				
Safety compliance: This server is designed and certified to meet the following safety standards: UL 60950; CAN/CSA C22.2 No. 60950–00; EN 60950; IEC 60950 including all National Differences				
Note:				
1. For a description of noise emission values, see Acoustics.				
2. Class 3 product as defined in ASHRAE Thermal Guidelines for Data Processing Environments. The allowable operating range is 5 degrees to 35 degrees C (41 degrees to 95 degrees F). See the Temperature and humidity design criteria topic for more information.				
3. See 0551, 0553, or 7014 rack configurations for typical configurations when the 0551, 0553, or 7014 rack is populated with various server models.				
4. The power supplies automatically accept any voltage with the published rated voltage range for a defined processor configuration. If dual power supplies are installed and operating, the power supplies draw approximately equal current from the utility (mains) and provide approximately equal current to the load.				
5. All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296.				

Model 9406-570, 9117-570, and 9116-561 server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

Use the following specifications to plan for your server.

Table 8. Server specifications


Plan views		Pictured is the model 9406-570, and 9117-570 server.			
Top down view					
Front and rear views with connectors					
ASHRAE declarations					
<i>Figure 1. Model 9406-570, and 9117-570 server</i>					
Dimensions	Width	Depth	Height	EIA units¹	Weight
Metric	483 mm	790 mm	174.1 mm	4	63.6 kg
English	19 in.	31.1 in.	6.85 in.		140 lb.
Rack-mounted drawer					
Shipping Dimensions	Width	Depth	Height	Weight	
Metric	648 mm	991 mm	704 mm	80 kg	
English	25.5 in.	39 in.	27.7 in.	175 lb.	
Rack-mounted drawer (China)					
Shipping Dimensions	Width	Depth	Height	Weight	
Metric	640 mm	965 mm	692 mm	80 kg	
English	25.2 in.	38 in.	27.25 in.	175 lb.	
Drawer mounted in 0551 rack, 7014-T00 , 7014-T42 and 0553 racks, Power distribution unit (PDU)			0231 (9117-570, 4-way), 0232 (9117-570, 8-way), 0241 (9117-570, 12-way), 0242 (9117-570, 16-way) 0260 (9116-561, 8-way) 0261 (9116-561, 16-way)		
Electrical					
kVA (maximum)			1.368		
Rated voltage and frequency ⁶			200-240V ac at 50/60 plus or minus 0.5 Hz		
Thermal output (maximum) ⁹			4437 Btu/hr		

Table 8. Server specifications (continued)

Maximum power consumption ^{4, 7}		1300 W		
Power factor		0.95		
Inrush current (maximum)		88 A		
Leakage current (maximum)		3 mA		
Phase		1		
Compatible plug types		2, 5, 6, 10, 18, 19, 22, 23, 24, 25, 26,32, 34, 62, 64, 66, 69		
Dual power feature code		Included		
Branch circuit breaker		20 A maximum		
Power cord length		2.7 m (9 ft.) Europe; 1.8 m (6 ft.) U.S.; 1.8 m (6 ft.) and 4.3 m (14 ft.) for U.S. cords with plug type 5		
Environment requirements				
Recommended operating temperature		5 degrees to 35 degrees C (41 degrees to 95 degrees F)		
Nonoperating temperature		5 degrees to 40 degrees C (41 degrees to 104 degrees F)		
Shipping temperature		-40 degrees to 60 degrees C (-40 degrees to 140 degrees F)		
	Operating	Nonoperating		
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)		
Noncondensing humidity	8 to 80%	8 to 80% (5 to 100% – shipping)		
Maximum altitude	3048 m (10000 ft.)	3048 m (10000 ft.)		
Noise emissions ^{2, 8}				
Product description	Declared A-weighted sound power level, L _{Wad} (B)		Declared A-weighted sound pressure level, L _{pAm} (dB)	
	Operating	Idle	Operating	Idle
9406-570, 9117-570, and 9116-561, 1.65 and 1.9 GHz, 4-way configuration with four hard drives and two power supplies	6.8	6.8	53 ³	53 ³
9406-570, 9117-570, and 9116-561, 1.65 and 1.9 GHz, 4-way configuration with four hard drives and two power supplies and acoustic doors (feature code 6248 or 6249)	6.2 ³	6.2 ³	46 ³	46 ³

Table 8. Server specifications (continued)

9406-570, 9117-570, and 9116-561, 1.65 and 1.9 GHz, 16-way configuration with four hard drives and two power supplies	7.4	7.3	59	59
9406-570, 9117-570, and 9116-561, 1.65 and 1.9 GHz, 4-way configuration with four hard drives and two power supplies and acoustic doors (feature code 6248 or 6249)	6.8 ³	6.7 ³	53 ³	53 ³
Service clearances				
Clearances	Front	Back	Left or right	Top
Operating	762 mm (30 in.)	762 mm (30 in.)		
Nonoperating	762 mm (30 in.)	762 mm (30 in.)	762 mm (30 in.)	762 mm (30 in.)
Seismic considerations:				
Data communications:				
Electromagnetic compatibility compliance: FCC Part 15, ICES-003				
Safety compliance: IEC 60950; UL 60950; CSA 60950				
Note: <ol style="list-style-type: none"> 1. See 0551, 0553, or 7014 rack configurations for typical configurations when the 0551, 0553, or 7014 rack is populated with various server models. 2. For a description of noise emission values, see Acoustics. 3. Estimated value 4. Maximum power consumption is specified for each 9117-570 4-way drawer. The 8-way, 12-way, and 16-way configurations are based on the use of multiple 4-way drawers (for example, an 8-way configuration consists of two 4-way drawers, a 12-way configuration consists of three 4-way drawers, and a 16-way configuration consists of four 4-way drawers). 5. All Model 570 disk bays should be filled when the unit is shipped from IBM with either disk drives or slot fillers, but if a disk is removed, refill the disk slot with either another disk drive or a disk slot filler. Filling the disk drive slot will help ensure proper airflow for cooling and help maintain optimal EMI compliance. Ordering feature 6598 results in four additional disk slot fillers being shipped. 6. The power supplies automatically accept any voltage with the published, rated-voltage range. If dual power supplies are installed and operating, the power supplies draw approximately equal current from the utility (mains) and provide approximately equal current to the load. 7. Maximum power consumption is specified for each 9116-561 8-way drawer. The 8-way and 16-way configurations are based on the use of multiple 8-way drawers (for example, a 16-way configuration consists of two 8-way drawers). 8. All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296. 9. Thermal output value is for each 4-way drawer configuration. 				

Special Hardware Management Console considerations

When the server is managed by a Hardware Management Console (HMC), the console must be provided within the same room and within 8 m (26 ft.) of the server. For additional considerations, see Planning for consoles, interfaces, and terminals for your service environment.

Note: As an alternative to the local HMC requirement, it is acceptable for you to provide a supported device, such as a PC, with connectivity and authority to operate through a remotely attached HMC. This local device must be in the same room and within 8 m (26 ft.) of your server, and provide functional capability equivalent to the HMC that it replaces and that is needed by the service representative to service the system.

Delivery and subsequent transportation of the equipment

DANGER

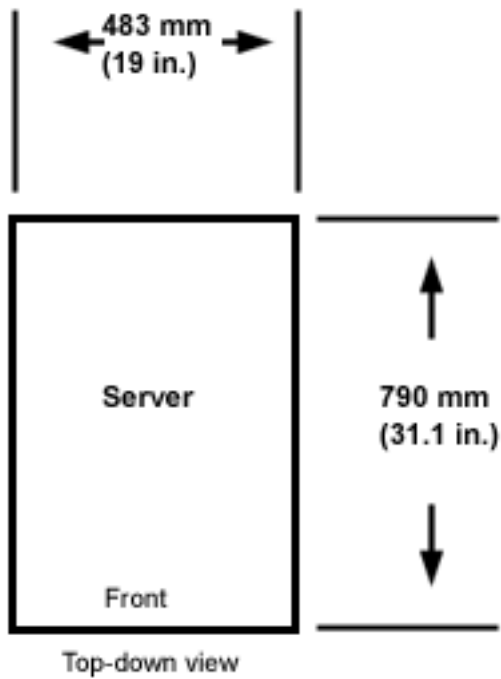
Heavy equipment—personal injury or equipment damage might result if mishandled. (D006)

You must prepare your environment to accept the new product based on the installation planning information provided, with assistance from an IBM Installation Planning Representative (IPR) or IBM authorized service provider. In anticipation of the equipment delivery, prepare the final installation site in advance so that professional movers or riggers can transport the equipment to the final installation site within the computer room. If for some reason, this is not possible at the time of delivery, you must make arrangements to have professional movers or riggers return to finish the transportation at a later date. Only professional movers or riggers should transport the equipment. The IBM authorized service provider can only perform minimal frame repositioning within the computer room, as needed, to perform required service actions. You are also responsible for using professional movers or riggers when you relocate or dispose of equipment.

Plan view for model 9406-570, 9117-570, and 9116-561

Dimensional planning information is shown in this top down view of your server.

The following figure shows dimensional planning information for the model 9406-570, 9117-570, and 9116-561.



Model 9406-570, 9117-570, and 9116-561 plan view (rack-mount)

ASHRAE declarations


The following table and figures show the measurement-reporting requirements as defined in the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Thermal Guidelines for Data Processing Environments, which is available at <http://tc99.ashraetcs.org> .

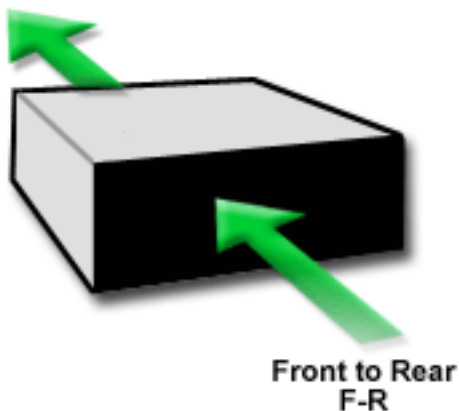
Table 9. ASHRAE declarations

Description	Typical Heat Release ²	Airflow nominal ¹		Airflow maximum ¹ at 35 degrees C (95 degrees F)		Weight	Overall system dimensions
		cfm	m ³ /hr	cfm	m ³ /hr		
Configuration 1	750	90	153	140	238	See 9406-570, 9117-570, and 9116-561	See 9406-570, 9117-570, and 9116-561
Configuration 2	950	90	153	140	238	See 9406-570, 9117-570, and 9116-561	See 9406-570, 9117-570, and 9116-561
Configuration 3	910	90	153	140	238	See 9406-570, 9117-570, and 9116-561	See 9406-570, 9117-570, and 9116-561

Table 9. ASHRAE declarations (continued)

Configuration 4	1000	90	153	140	238	See 9406-570, 9117-570, and 9116-561	See 9406-570, 9117-570, and 9116-561
Configuration 5	925	90	153	140	238	See 9406-570, 9117-570, and 9116-561	See 9406-570, 9117-570, and 9116-561
ASHRAE Class	3						
Configuration 1	4-way, 1.65 GHz processor, 48 GB memory, six hard disk drives, six PCI cards, DVD						
Configuration 2	4-way, 1.9 GHz processor, 12 GB memory, six hard disk drives, five PCI cards, two DVDs						
Configuration 3	8-way, 1.5 GHz processor, 4 GB memory, six hard disk drives, two PCI cards, DVD						
Configuration 4	4-way, 2.2 GHz processor, 32 GB memory, six hard disk drives, four PCI cards, DVD						
Configuration 5	8-way, 1.8 GHz processor, 16 GB memory, six hard disk drives, four PCI cards, two DVDs						
Note:							
1. Airflow for the typical and minimum configurations.							
2. The product safety rating label contains the following information:							
• 200-240 V ac							
• 10 A 2.0 kVa							
• 50/60 Hz 1-phase							

**Airflow Diagram Rack-mount
Cooling scheme F-R**



Airflow figure for server mounted in a rack

Model 9117-MMA and 9406-MMA server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

Use the following specifications to plan for your server.

Table 10. Server specifications

Plan views					
Top down view					
Front and rear views with connectors					
ASHRAE declarations					
Dimensions	Width	Depth	Height	EIA units ¹	Weight
Metric	483 mm	790 mm	174.1 mm	4	63.6 kg
English	19 in.	31.1 in.	6.85 in.		140 lb.
Rack-mounted drawer					
Shipping Dimensions	Width	Depth	Height	Weight	
Metric	648 mm	991 mm	704 mm	80 kg	
English	25.5 in.	39 in.	27.7 in.	175 lb.	
Rack-mounted drawer (China)					
Shipping Dimensions	Width	Depth	Height	Weight	
Metric	640 mm	965 mm	692 mm	80 kg	
English	25.2 in.	38 in.	27.25 in.	175 lb.	
Drawer mounted in 0551 rack, 7014-T00 , 7014-T42 and 0553 racks, Power distribution unit (PDU)			0231 (9117-MMA, 4-way) 0232 (9117-MMA, 8-way) 0241 (9117-MMA, 12-way) 0242 (9117-MMA, 16-way)		
Electrical					
kVA (maximum)			1.428		
Rated voltage and frequency ⁵			200 - 240 V ac at 50/60 plus or minus 0.5 Hz		
Thermal output (maximum) ⁷			4778 Btu/hr		
Maximum power consumption ⁴			1400 W		
Power factor			0.98		
Inrush current (maximum)			88 A		
Leakage current (maximum)			3 mA		
Phase			1		
Compatible plug types			2, 5, 6, 10, 18, 19, 22, 23, 24, 25, 26,32, 5762, 66, 69, 73, 76		
Dual power feature code			Included		
Branch circuit breaker			20 A maximum		
Power cord length			2.7 m (9 ft.) Europe; 1.8 m (6 ft.) U.S.; 1.8 m (6 ft.) and 4.3 m (14 ft.) for U.S. cords with plug type 5		
Environment requirements					
Recommended operating temperature			20 degrees to 25 degrees C (68 degrees to 77 degrees F)		
Operating temperature range			5 degrees to 35 degrees C (41 degrees to 95 degrees F)		
Nonoperating temperature			5 degrees to 40 degrees C (41 degrees to 104 degrees F)		

Table 10. Server specifications (continued)

Shipping temperature			-40 degrees to 60 degrees C (-40 degrees to 140 degrees F)	
	Operating		Nonoperating	
Dew point	28 degrees C (82 degrees F)		21 degrees C (70 degrees F)	
Noncondensing humidity	8 to 80%		8 to 80% (5 to 100% – shipping)	
Maximum altitude	3048 m (10000 ft.)		3048 m (10000 ft.)	
Noise emissions ^{2, 6}				
Product description	Declared A-weighted sound power level, L _{Wad} (B)		Declared A-weighted sound pressure level, L _{pAm} (dB)	
	Operating	Idle	Operating	Idle
2-way or 4-way system with 3.5 or 4.2 GHz processors, six hard drives and two power supplies	7.1	7.1	56	34
2-way or 4-way system with 4.7 GHz processors, six hard drives and two power supplies	7.4	7.4	59	59
16-way system with 3.5 or 4.2 GHz processors, six hard drives per chassis and two power supplies per chassis	7.8	7.8	61	61
16-way system with 4.7 GHz processors, six hard drives per chassis and two power supplies per chassis	8.1	8.1	62	62
2-way or 4-way system with 3.5 or 4.2 GHz processors, six hard drives and two power supplies with rack acoustical doors	6.7 ³	6.7	50 ³	50

Table 10. Server specifications (continued)

2-way or 4-way system with 4.7 GHz processors, six hard drives and two power supplies with rack acoustical doors	6.9 ³	6.9 ³	54 ³	54 ³
16-way system with 3.5 or 4.2 GHz processors, six hard drives per chassis and two power supplies per chassis with rack acoustical doors	7.3 ³	7.3 ³	56 ³	56 ³
16-way system with 4.7 GHz processors, six hard drives per chassis and two power supplies per chassis with rack acoustical doors	7.6 ³	7.6 ³	57 ³	57 ³
Service clearances				
Clearances	Front	Back	Left or right	Top
Operating	762 mm (30 in.)	762 mm (30 in.)		
Nonoperating	762 mm (30 in.)	762 mm (30 in.)	762 mm (30 in.)	762 mm (30 in.)
Seismic considerations:				
Data communications:				
Electromagnetic compatibility compliance: FCC Part 15, ICES-003				
Safety compliance: IEC 60950; UL 60950; CSA 60950				
Note: <ol style="list-style-type: none"> 1. See 0551, 0553, or 7014 rack configurations for typical configurations when the 0551, 0553, or 7014 rack is populated with various server models. 2. For a description of noise emission values, see Acoustics. 3. This is an estimated value 4. Maximum power consumption is specified for each 9117-MMA 4-way drawer. The 8-way, 12-way, and 16-way configurations are based on the use of multiple 4-way drawers (for example, an 8-way configuration consists of two 4-way drawers, a 12-way configuration consists of three 4-way drawers, and a 16-way configuration consists of four 4-way drawers). 5. The power supplies automatically accept any voltage with the published, rated-voltage range. If dual power supplies are installed and operating, the power supplies draw approximately equal current from the utility (mains) and provide approximately equal current to the load. 6. All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296. 7. Thermal output value is for each 4-way drawer configuration. 				

Special Hardware Management Console considerations

When the server is managed by a Hardware Management Console (HMC), the console must be provided within the same room and within 8 m (26 ft.) of the server. For additional considerations, see Planning for consoles, interfaces, and terminals for your service environment.

Note: As an alternative to the local HMC requirement, it is acceptable for you to provide a supported device, such as a PC, with connectivity and authority to operate through a remotely attached HMC. This local device must be in the same room and within 8 m (26 ft.) of your server, and provide functional capability equivalent to the HMC that it replaces and that is needed by the service representative to service the system.

Delivery and subsequent transportation of the equipment

DANGER

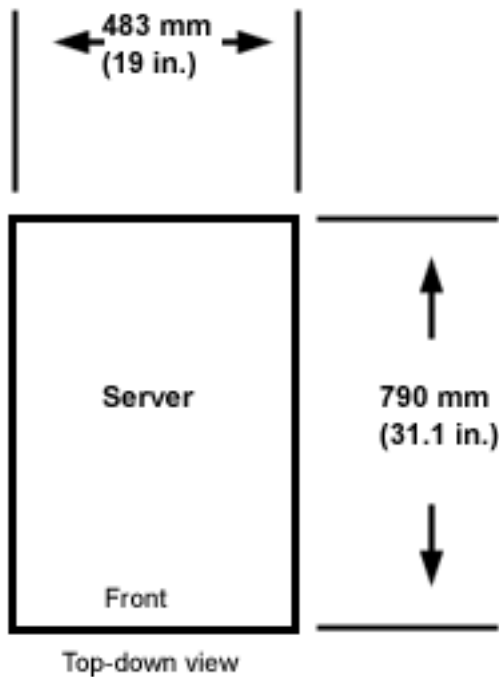
Heavy equipment—personal injury or equipment damage might result if mishandled. (D006)

You must prepare your environment to accept the new product based on the installation planning information provided, with assistance from an IBM Installation Planning Representative (IPR) or IBM authorized service provider. In anticipation of the equipment delivery, prepare the final installation site in advance so that professional movers or riggers can transport the equipment to the final installation site within the computer room. If for some reason, this is not possible at the time of delivery, you must make arrangements to have professional movers or riggers return to finish the transportation at a later date. Only professional movers or riggers should transport the equipment. The IBM authorized service provider can only perform minimal frame repositioning within the computer room, as needed, to perform required service actions. You are also responsible for using professional movers or riggers when you relocate or dispose of equipment.

Plan view for model 9117-MMA and 9406-MMA

Dimensional planning information is shown in this top-down view of your server.

The following figure shows dimensional planning information for the model 9117-MMA and 9406-MMA.



Model 9117-MMA and 9406-MMA plan view (rack-mount)

ASHRAE declarations

Use the ASHRAE declarations table and figures to determine the measurement reporting requirements defined in the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Thermal Guidelines for Data Processing Environments.

These guidelines are available at <http://tc99.ashraetcs.org> .

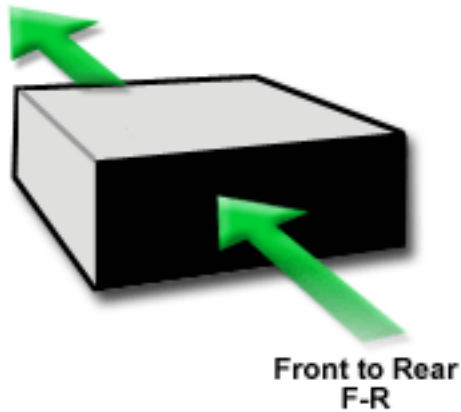
Table 11. ASHRAE declarations

Description	Typical Heat Release ²	Airflow nominal ¹		Airflow maximum ¹ at 35 degrees C (95 degrees F)		Weight	Overall system dimensions
		cfm	m ³ /hr	cfm	m ³ /hr		
Configuration 1	1102	90	153	140	238	See 9117-MMA and 9406-MMA	See 9117-MMA and 9406-MMA
Configuration 2	890	90	153	140	238	See 9117-MMA and 9406-MMA	See 9117-MMA and 9406-MMA
ASHRAE Class	3						
Configuration 1	4-way, 4.7 GHz processor, 96 GB memory, six hard disk drives, four PCI cards, I/O riser, CD-RW						
Configuration 2	4-way, 3.5 GHz processor, 62 GB memory, six hard disk drives, five PCI cards, I/O riser, high speed link (HSL) card, DVD						

Table 11. ASHRAE declarations (continued)

Note:
1. Airflow for the typical and minimum configurations.
2. The product safety rating label contains the following information:
<ul style="list-style-type: none"> • 200-240 V ac • 10 A 2.0 kVa • 50/60 Hz 1-phase

**Airflow Diagram Rack-mount
Cooling scheme F-R**



Airflow figure for server mounted in a rack

Model 9118-575 server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

The model 9118-575 refers to the complete system. The system consists of multiple components, as summarized in the following table.

Table 12. Model 9118-575 components

Model	Description	Minimum per system	Maximum per system
FC5793	42 EIA unit, 24-inch rack (54-inch deep)	1	1
FC7945	Slimline door set for FC5793 rack (front and rear)	1 ¹	1 ¹
FC7947	Acoustic door set for FC5793 rack (front and rear)	1 ¹	1 ¹
9118-575 (FC7836) ³	8-way, 1.9 GHz processor	1	12
9118-575 (FC7657) ³	16-way, 1.5 GHz processor	1	12
9118-575 (FC7675) ³	8-way, 2.2 GHz processor	1	12
9118-575 (FC7676) ³	16-way, 1.9 GHz processor	1	12
Various	Hardware Management Console (HMC) ²	1	2
7045-SW4	HPS switch	0	2
FC5791 and FC5794	I/O drawer	0	5

Table 12. Model 9118-575 components (continued)

FC6200 or FC6201	Optional integrated battery backup	0	6
Note: <ol style="list-style-type: none"> 1. Either slimline doors or acoustical doors are selected during the order process. Slimline doors do not meet the acoustic limits for Category 1A or 1B. 2. For the model 9118-575, a Hardware Management Console must be provided within the same room and within 8 m (26 ft.) of the server. Or, as an alternative to the local HMC requirement, it is acceptable for you to provide a supported device (such as, a PC), with connectivity and authority to operate through a remotely-attached HMC. This local device must be in the same room and within 8 m (26 ft.) of your server, and provide functional capability equivalent to the HMC that it replaces and that is needed by the service representative to service the server. 3. The maximum number of processors per system is the total number of FC7836, FC7657, FC7675, and FC7676 that can be combined to a maximum of 12. 			

Table 13. Specifications for model 9118-575

Specifications for model 9118-575				
Plan views				
Top down view				
Rear view with connectors				
ASHRAE declarations (heat load data for various configurations)				
Dimensions and weight ¹				
Physical Characteristic	Slimline doors ²		Acoustical doors ²	
Height	2025 mm (79.7 in.)		2025 mm (79.7 in.)	
Width	785 mm (30.9 in.)		785 mm (30.9 in.)	
Depth	1529 mm (60.2 in.)		1885 mm (74.2 in.)	
Weight - maximum configuration (with 1.9 GHz processor)				
	With integrated battery backup and slimline doors	Without integrated battery backup with slimline doors	With integrated battery backup and with acoustical doors	Without integrated battery backup and with acoustical doors
Single frame	1569 kg (3460 lb.)	1439 kg (3173 lb.)	1578 kg (3479 lb.)	1448 kg (3192 lb.)
Shipping dimensions and weight				
Height	2311 mm (91 in.)			
Width	940 mm (37 in.)			
Depth	1613 mm (63.5 in.)			
Weight	Varies by configuration			
Electrical and thermal characteristics (3-phase)				
Rated voltage and frequency (3 phase)	200 to 240 V ac at 50 to 60 Hz		380 to 415 V ac at 50 to 60 Hz	480 V ac at 50 to 60 Hz
Rated current, power cord with 48A plug, FC 8688 or 8689 (amps per phase)	48		--	--
Rated current, all other power cords (amps, per phase)	60		32	24
Maximum power	41.6 kW			

Table 13. Specifications for model 9118-575 (continued)

Specifications for model 9118-575				
Power factor, typical		0.99	0.97	0.93
Inrush current (maximum) ³		163 A		
Thermal output		142 kBtu/hr	142 kBtu/hr	142 kBtu/hr
Dual power feature code			Standard ⁷	
Branch circuit breaker and cord information			See “Breaker rating and cord information” on page 60	
Power cord length			4.2 m (14 ft.) - all locations (except Chicago) 1.8 m (6 ft.) - United States (Chicago)	
Environment specifications (based on an altitude of 1295 m (4250 ft.))				
Recommended operating temperature ⁸			10 degrees to 32 degrees C (50 degrees to 89.6 degrees F)	
Nonoperating temperature			10 degrees to 43 degrees C (50 degrees to 109.4 degrees F)	
Storage temperature			1 degree to 60 degrees C (33.8 degrees to 140 degrees F)	
Shipping temperature			-40 degrees to 60 degrees C (-40 degrees to 140 degrees F)	
	Operating	Nonoperating	Storage ⁴	Shipping ⁴
Maximum wet bulb	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	29 degrees C (84.2 degrees F)	29 degrees C (84.2 degrees F)
Noncondensing relative humidity	8 to 80 %	8 to 80 %	5 to 80 %	5 to 100 %
Maximum altitude				
Declared acoustical noise emissions ⁷				
Product configuration	Declared A-Weighted Sound Power Level, L _{WAd} (Bels) ^{5, 6}		Declared A-Weighted Sound Pressure Level, LpAM (dB) ^{5, 6} (bystander, 1 m)	
	Operating	Idle	Operating	Idle
Small configuration: Two processors, bulk power, and one I/O drawer; nominal conditions, slimline door set	8.2	8.2	65	65
Small configuration: Two processors, bulk power, and one I/O drawer; nominal conditions, acoustical door set	7.6	7.6	59	59

Table 13. Specifications for model 9118-575 (continued)

Specifications for model 9118-575				
Typical configuration: six processors, bulk power, and one I/O drawer; nominal conditions, slimline door set	8.6 ⁷	8.6 ⁷	69	69
Typical configuration: six processors, bulk power, and one I/O drawer; nominal conditions, acoustical door set	7.9	7.9	62	62
Maximum configuration: 12 processors, bulk power, and two I/O drawers; nominal conditions, slimline door set	8.9 ⁷	8.9 ⁷	72 ⁷	72 ⁷
Maximum configuration: 12 processors, bulk power, and two I/O drawers; nominal conditions, acoustical door set	8.2	8.2	65	65
Service clearances				
For a graphical representation of service clearances, see “Service clearances” on page 79				
Data communications				
Electromagnetic compatibility compliance: This server meets the following electromagnetic compatibility specifications: FCC (CFR 47, Part 15); VCCI; CISPR-22; 89/336/EEC; BSMI (A2/NZS 3548:1995); C-Tick; ICES/NMB-003; Korean EMI/EMC (MIC Notice 2000–94, Notice 2000–72); People’s Republic of China Commodity Inspection Law				
Safety compliance: This server is designed and certified to meet the following safety standards: UL 60950-1; CAN/CSA C22.2 No. 60950-1; EN 60950-1; IEC 60950-1 including all national differences				

Table 13. Specifications for model 9118-575 (continued)

Specifications for model 9118-575	
Note:	
1.	For configuration weights, see “Approximate system weights by configuration” on page 92
2.	Doors are not installed during product shipment to the customer.
3.	Inrush currents occur only at initial application of power (short duration for charging capacitors). No inrush currents occur during the normal power off-on cycle.
4.	When an IBM-approved vapor bag and desiccant packets are used to protect the system, the storage specifications are valid for 6 months and the shipping specifications are valid for 1 month. Otherwise, storage and shipping specifications are valid for two weeks each.
5.	L_{WAd} is the upper-limit A-weighted sound level; L_{pAM} is the mean A-weighted sound pressure measured at the 1-meter bystander positions; 1 B = 10 dB.
6.	All measurements made in conformance with ISO 7779 and declared in conformance with 9296.
7.	Attention: Your server installation may be subject to government regulations (such as those prescribed by OSHA or European Community Directives) that cover noise level exposure in the workplace. The model 9118-575 is available with an optional acoustical door feature that can reduce the likelihood of exceeding noise level exposure limits for densely populated racks. The actual sound pressure levels in your installation will depend on a variety of factors, including the number of racks in the installation; the size, materials, and configuration of the room where the racks are installed; the noise levels from other equipment; the room ambient temperature, and employees’ location in relation to the equipment. It is recommended that a qualified person, such as an industrial hygienist or acoustical consultant, be consulted to determine whether the sound pressure levels to which employees may be exposed exceed regulatory limits.
8.	The upper limit of the dry bulb temperature must be derated 1 degree C (1.8 degrees F) per 219 m (719 ft.) above 1295 m (4250 ft.). Maximum altitude is 3048 m (10000 ft.).

To effectively plan for the model 9118-575, you will need to view the following topics and incorporate them into your server planning, as appropriate.

- “Breaker rating and cord information” on page 60
- “Power cord features” on page 60
- “Doors and covers” on page 61
- “Plan views” on page 61
- “Raised-floor requirements and preparation” on page 63
- “Cut and place floor panels” on page 63
- “Secure the rack” on page 65
- “Position the rack” on page 66
- “Install the frame tie-down kit” on page 66
- “Attach the rack to a concrete (nonraised) floor” on page 66
- “Attach the rack to a short-raised or long-raised floor” on page 68
- “Considerations for multiple system installations” on page 76
- “Service clearances” on page 79
- “Total system power consumption” on page 84
- “Cooling requirements” on page 85
- “Moving the system to the installation site” on page 88
- “Phase imbalance and BPR configuration” on page 89
- “Balancing power panel loads” on page 90
- “Power cord configurations” on page 91
- “Dual power installation” on page 92
- “Approximate system weights by configuration” on page 92
- “Weight distribution” on page 93

- “Unit emergency power off” on page 95
- “Computer room emergency power off” on page 96
- “Machine holdup times” on page 97

Breaker rating and cord information

Use the Breaker rating and cord information table to determine the circuit breaker rating for the power cords used with your server.

Table 14. Breaker rating and cord information

Three-phase supply voltage (50/60 Hz)	200-240 V	380-415 V	480 V
Recommended customer-circuit-breaker rating¹	60 A (60-A plug) or 80 A (100-A plug)	40 A	30 A
Cord information	1.8 m (6 ft.) and 4.3 m (14 ft.) 6 AWG power cord (60-A plug), or 1.8 m (6 ft.) and 4.3 m (14 ft.) 6 AWG power cord (100-A Plug)	14 foot, 8 AWG power cord, (electrician installed)	6 and 14 foot, 8AWG power cord
Recommended receptacle	IEC309, 60 A, type 460R9W (not provided) or IEC309, 100 A, type 4100R9W (not provided)	Not specified, electrician installed	IEC309, 30 A, type 430R7W (not provided)
Note: <ol style="list-style-type: none"> 1. The exact circuit breaker ratings may not be available in all countries. Where the specified circuit breaker ratings are not acceptable, use the nearest available rating. Always consult local electrical codes. 2. When possible, use metal backbox with power cords using IEC-309 plugs. 			

Power cord features

Use the Power cord features table to view the power cord specifications available for your server.

The following three-phase power cord features are available for the three-phase model 9118-575:

Table 15. Power cord features

Supply type	Nominal voltage range (V ac)	Voltage tolerance (V ac)	Frequency range (Hz)
Two 3-phase power cords	200-480	180-509	47-63
Feature code	Description	Voltage (V ac)	Plug
8697	Power cord, 8 AWG, 4.3 m (14 ft.)	480	IEC309 30 A plug
8698	Power cord, 8 AWG, 1.8 m (6 ft.)	480	IEC309 30 A plug
8688	Power cord, 6 AWG/Type W, 4.3 m (14 ft.)	200-240	IEC309 60 A plug
8689	Power cord, 6 AWG/Type W, 1.8 m (6 ft.)	200-240	IEC309 60 A plug
8686	Power cord, 6 AWG, 4.3 m (14 ft.)	200-240	IEC309 100 A plug
8687	Power cord, 6 AWG, 1.8 m (6 ft.)	200-240	IEC309 100 A plug

Table 15. Power cord features (continued)

8694 ¹	Power cord, 6 AWG/Type W, 4.3 m (14 ft.)	380-415	No plug
8677 ¹	Power cord, 8 AWG, 4.3 m (14 ft.)	380-415	No plug
Note: 1. These power cords are shipped without a plug or receptacle. An electrician may be required to install the plug and receptacle to meet applicable country or region electrical codes.			

Doors and covers

Doors and covers are an integral part of the system and are required for product safety, proper airflow and cooling, and electromagnetic compatibility compliance.

The following rear door options are available for the model 9118-575:

- Enhanced acoustical cover option

This feature provides a low-noise option for customers or sites with stringent acoustical requirements and where a minimal system footprint is not critical. The acoustical cover option consists of special front and rear doors that are approximately 250 mm (10 in.) deep and contain acoustical treatment that lowers the noise level of the machine by approximately 7 dB (0.7 B) compared to the slimline doors. This reduction in noise emission levels means that the noise level of a single model system with slimline covers is about the same as the noise level of five model systems with acoustical covers.

- Slimline cover option

This feature provides a smaller-footprint and lower-cost option for customers or sites where space is more critical than acoustical noise levels. The slimline cover option consists of a front door, which is approximately 100 mm (4 in.) deep, and a rear door, which is approximately 50 mm (2 in.) deep. No acoustical treatment is available for this option.

- Rear door heat exchanger option

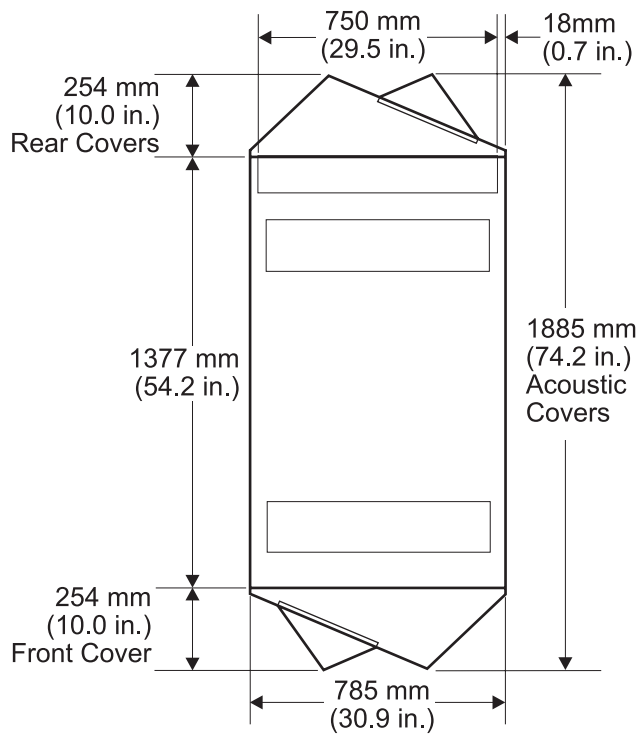
The rear door heat exchanger is a water-cooled device that mounts on the rear of the IBM 19-inch and 24-inch racks to cool the air that is heated and exhausted by devices inside the rack. A supply hose delivers chilled, conditioned water to the heat exchanger. A return hose delivers warmed water back to the water pump or chiller. Each rear door heat exchanger can remove up to 50 000 Btu (or approximately 15 000 watts) of heat from your data center. For detailed information on preparing your data center for using the rear door heat exchanger, see Planning for the installation of rear door heat exchangers. For detailed information about installing a heat exchanger on your rack, see Installing the IBM rear door heat exchanger.

For declared levels of acoustical noise emissions, refer to Acoustical noise emissions.

Plan views

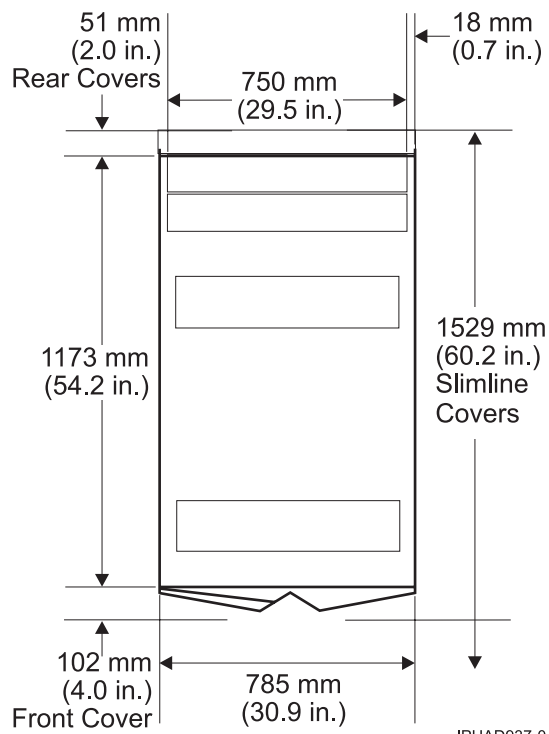
Dimensional planning information is shown in this top down view of your server.

The following figure shows dimensional planning information for single-frame systems.



IPHAD928-0

Figure 2. Plan view for single-frame systems with acoustical doors



IPHAD937-0

Figure 3. Plan view for single frame systems with slimline doors

Attention: When moving the rack, note the caster swivel diameters shown in the following figure. Each caster swivels in an approximate 130 mm (5.1 inch) diameter.

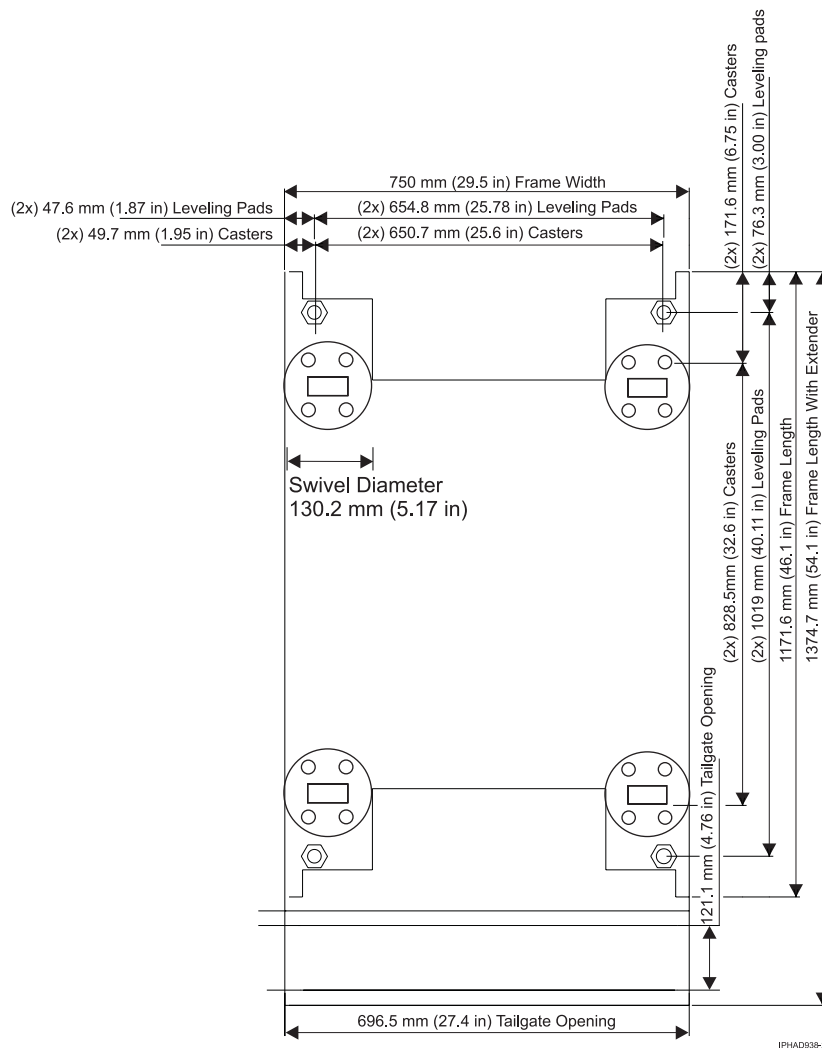


Figure 4. Leveling foot and frame dimensions

Raised-floor requirements and preparation

A raised-floor is strongly recommended for the model 9118-575 and its associated rack to ensure optimal performance for system cooling, cable management, and to comply with electromagnetic compatibility requirements.

Raised-floor cutouts should be protected by electrically nonconductive molding, appropriately sized, with edges treated to prevent cable damage and to prevent casters from rolling into the floor cutouts.

Cut and place floor panels

These guidelines specify how to make the necessary openings in the raised floor for installing your server.

Use the following procedure to cut and place floor panels in the raised floor. The x-y alphanumeric grid positions are used to identify relative positions of cutout floor panels that may be cut in advance.

1. Measure the panel size of the raised floor.
2. Verify the floor panel size. The floor panel size illustrated is 600 mm (23.6 in.) and 610 mm (24 in.) panels.

3. Ensure adequate floor space is available to place the frames over the floor panels exactly as shown in the figure. Use the plan view, if necessary. Consider all obstructions above and below the floor.
4. Identify the panels needed, and list the total quantity of each panel required for the installation.
5. Cut the required quantity of panels. When cutting the panels, you must adjust the size of the cut for the thickness of the edge molding you are using. The dimensions shown in the figures are finished dimensions. For ease of installation, number each panel as it is cut, as shown in the following figure.

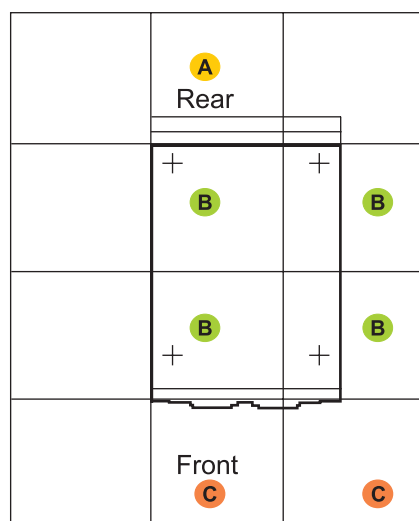
Note: Depending on the panel type, additional panel support (pedestals) may be required to restore structural integrity of the panel. Consult the panel manufacturer to ensure that the panel can sustain a concentrated load of 525 kg (1160 lb). For multiple frame installation, it is possible that two casters will produce loads as high as 1050 kg (2320 lb)..

6. Use the following raised-floor figure to install the panels in the proper positions.

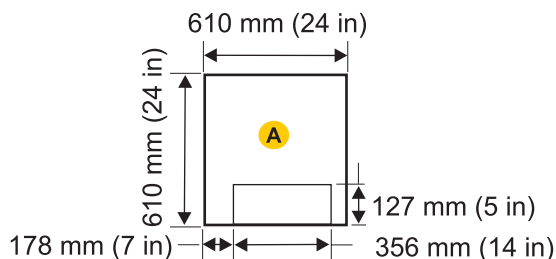
Note:

- a. This floor-tile arrangement is recommended so that the casters or leveling pads are placed on separate floor tiles to minimize the weight on a single floor tile. Furthermore, tiles bearing the weight (having casters or leveling pads on the tiles) should be uncut to retain the strength of the floor tile.
- b. The following figure is intended only to show relative positions and accurate dimensions of floor cutouts. The figure is not intended to be a machine template and is not drawn to scale.

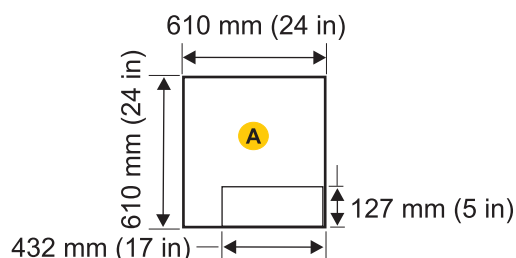
Recommended Raised Floor Cutouts 24" (610 mm) and 23.6" (600 mm) tiles



Rack Entry/Exit	Dimension	
	(mm)	(in)
Rear	635 mm x 127 mm	25 in x 5 in



Recommended for Non-Reinforced Pedestal Type



Recommended for Reinforced Pedestal or Stringer Types

B Uncut Panels

C Perforated Panels

Raised Floor with 610 mm (24-inch) Floor Panels

IPHAD942-0

Figure 5. Raised floor with 610 mm (24 in.) floor panels

Secure the rack

Securing your rack to a concrete (nonraised) floor or to a raised floor prevents movement when vibrations occur.

Securing the rack is an optional procedure. See Vibration and shock for more information..

The following can be ordered by the customer as additional rack-securing options for the model 9118-575.

- RPQ 8A1183 for attaching the rack-mounting plates to the concrete floor (nonraised floor)
- RPQ 8A1185 to attach the rack to a concrete floor when server is on a raised floor 228.6 mm to 330.2 mm (9 in. to 13 in. depth)
- RPQ 8A1186 to attach the rack to a concrete floor when server is on a raised floor 304.8 mm to 558.8 mm (12 in. to 22 in. depth)

Before the service representative can perform the tie-down procedure, you must complete the floor preparation described in “Cut and place floor panels” on page 63 and the procedures described in “Attach the rack to a concrete (nonraised) floor” on page 66 or “Attach the rack to a short-raised or long-raised floor” on page 68.

Install the frame tie-down kit

This procedure describes how to install a frame tie-down kit and floor tie-down hardware.

The following procedures describe how to install a frame tie-down kit and floor tie-down hardware to secure an IBM rack to a concrete floor beneath a 228.6 mm to 330.2 mm (9 in. to 13 in. depth) or a 304.8 mm to 558.8 mm (12 in. to 22 in. depth) raised-floor environment or to a nonraised floor.

- “Position the rack”
- “Attach the rack to a concrete (nonraised) floor”
- “Attach the rack to a short-raised or long-raised floor” on page 68

Position the rack:

Use this procedure to unpack and position your rack.

To unpack and position the rack, do the following:

Note: See “Moving the system to the installation site” on page 88 before attempting to position the rack.

1. Remove all packing and tape from the rack.
2. Place the last floor covering exactly adjacent and in the front of the final installation location.
3. Position the rack according to the customer floor plan.
4. Lock each caster wheel by tightening the thumbscrew on the caster.

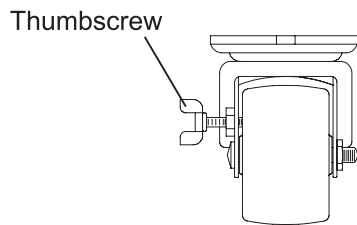


Figure 6. Caster thumbscrew

5. While moving the system to its final installed location and during relocation, it may be necessary to lay down floor covering, such as Lexan sheets, to prevent floor panel damage.

Attach the rack to a concrete (nonraised) floor

Use this procedure to attach the rack to a concrete (nonraised) floor.

Attention: It is the customer's responsibility to ensure the following steps are completed before the service representative performs the tie-down procedure.

Note: The customer should obtain the service of a qualified structural engineer to determine appropriate anchoring of the mounting plates. A minimum of five anchor bolts for each mounting plate must be used to secure the plates to the concrete floor. Because some of the drilled holes may be aligned with concrete reinforcement rods below the surface of the concrete floor, additional holes must be drilled. Each mounting plate must have at least five usable holes, two that are on the right-hand sides and the other two are on opposite ends, and one hole at the center. The mounting plates should be able to withstand 1134 kg (2500 lb.) pulling force on each end.

1. Be sure the rack is in the correct location. To ensure that the holes are in the correct location, the diagonal distance of the center of the holes should be 1211.2 mm (47.7 in.). The distance between the center holes to the center of the next holes should be 654.8 mm (25.8 in.) (the side-to-side distance) and 1019 mm (40.1 in.) (the front-to-back distance).

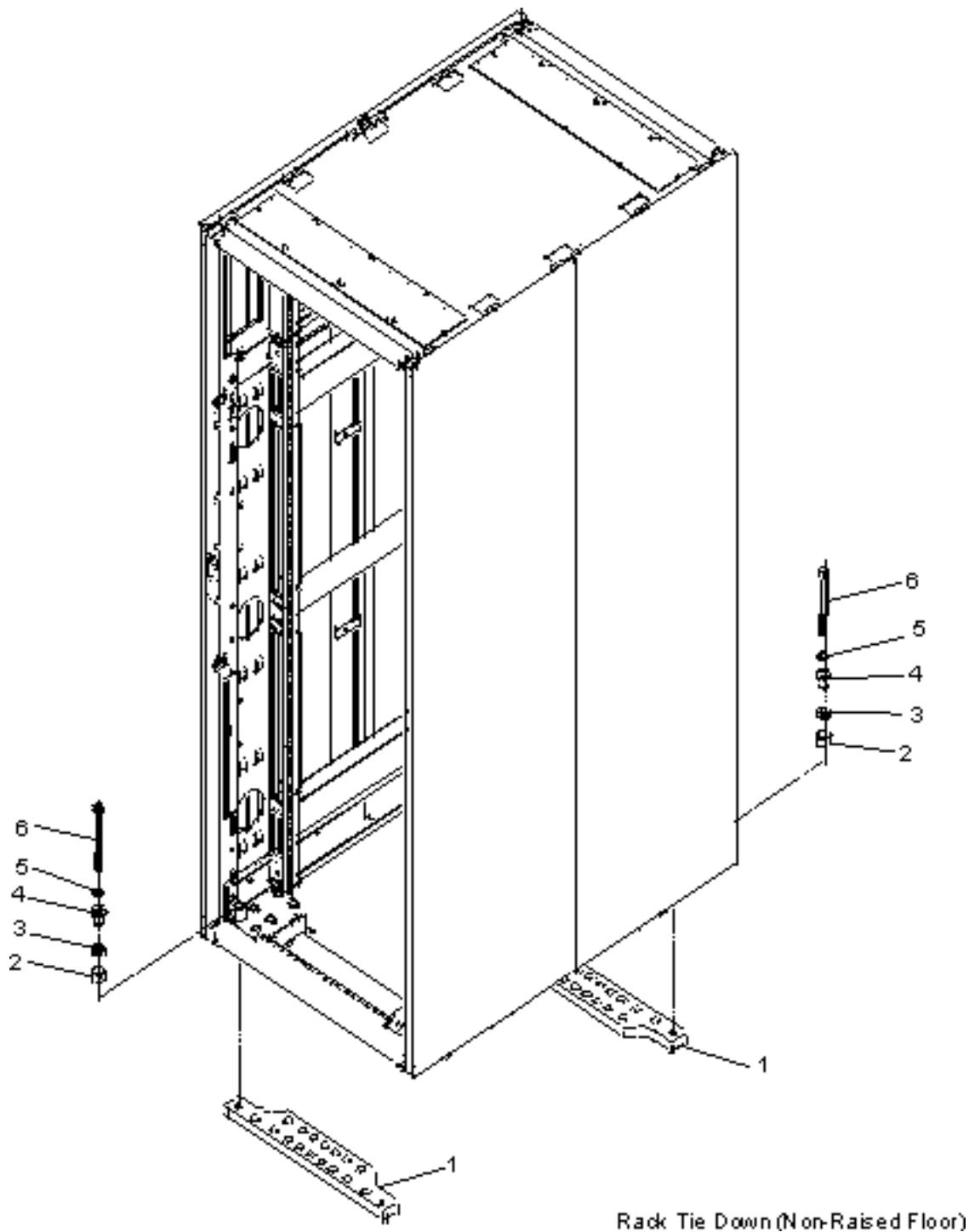


Figure 7. Rack tie down (nonraised floor)

2. Place the mounting plates (item 1 in Figure 7), front and rear, in the approximate mounting position under the system rack.
3. To align the mounting plates to the system rack, do the following:
 - a. Place the four rack-mounting bolts (item 6 in Figure 7) through the plate assembly holes at the bottom of the rack. Install the bushings and washers (item 4 and 5 in Figure 7) to ensure bolt positioning.

Note: The plastic bushing is intended to provide electrical insulation between the frame and the ground. When such insulation is not required, the plastic bushing does not need to be installed.

- b. Position the mounting plates (item 1 in Figure 7 on page 67) under the four rack-mounting bolts (item 6 in Figure 7 on page 67) so that the mounting bolts are centered directly over the tapped holes.
- c. Turn the rack-mounting bolts (item 6 in Figure 7 on page 67) three or four rotations into the tapped holes.
4. Mark the floor around the edge of the mounting plates, as shown in the following figure.

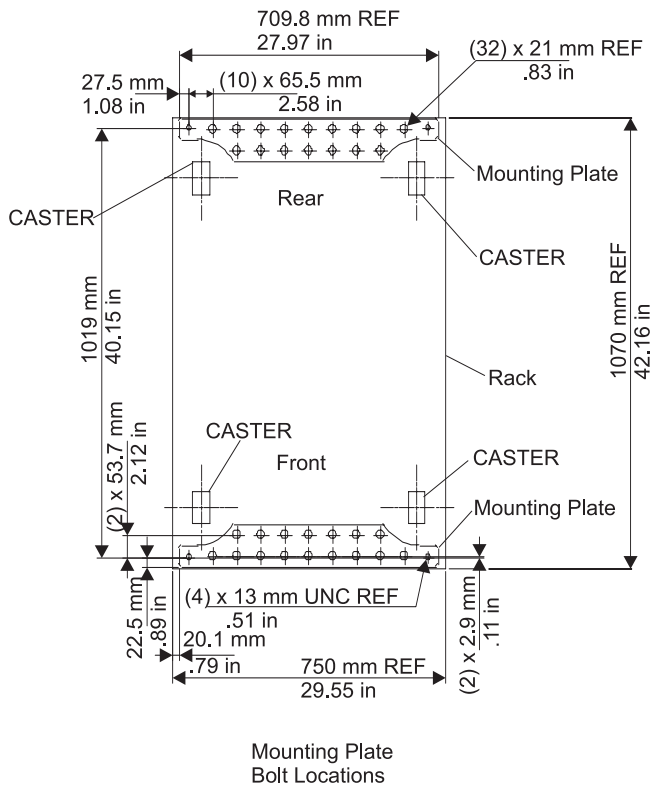


Figure 8. Mark floor around edge of mounting plates

5. Remove the mounting bolts from the threaded holes.
6. Move the rack away from the mounting plates.
7. Mark the floor at the center of each hole in the mounting plate (including tapped holes).
8. Remove the mounting plates from the marked locations.
9. At the marked location of the tapped mounting holes, drill two holes approximately 19 mm (.75 in.) to allow clearance for the ends of the two rack-mounting bolts. The ends of the rack-mounting bolts may protrude past the thickness of the mounting plate. Drill one hole in each group of anchor bolt location marks as indicated on the marked floor.
10. Using at least five heavy-duty-concrete anchoring bolts for each mounting plate, mount the mounting plates to the concrete floor.

Attach the rack to a short-raised or long-raised floor

Use these steps to attach your rack to a short-raised or long-raised floor.

Attention: The frame tie downs are intended to secure a frame weighing less than 1429 kg (3150 lb.). These tie downs are designed to secure the frame on a raised floor installation. It is the customer's responsibility to ensure the following steps are completed before the service representative performs the tie-down procedure.

Use the following to determine your next step:

1. If the rack is being attached to a short depth raised floor environment 228.6 mm to 330.2 mm (9 in. to 13 in. depth) install the Raised Floor Tie Down Kit (Part number 16R1102) described in the following table.

Table 16. Raised Floor Tie Down Kit (Part number 16R1102)

228.6 mm to 330.2 mm (9 in. to 13 in.) Raised Floor Tie Down Kit (Part number 16R1102)			
Item	Part Number	Quantity	Description
1	44P3438	1	Wrench
2	44P2996	2	Stabilizer bar
3	44P2999	4	Turnbuckle Assembly

2. If the rack is being attached to a deep raised floor environment 304.8 mm to 558.8 mm (12 in. to 22 in. depth) install the Raised Floor Tie Down Kit (Part number 16R1103) described in the following table.

Table 17. Raised Floor Tie Down Kit (Part number 16R1103)

304.8 mm to 558.8 mm (12 in. to 22 in.) Raised Floor Tie Down Kit (Part number 16R1103)			
Item	Part Number	Quantity	Description
1	44P3438	1	Wrench
2	44P2996	2	Stabilizer bar
3	44P3000	4	Turnbuckle Assembly

It is the customer's responsibility to ensure the following steps are completed before the service representative performs the tie-down procedure.

Note: To accommodate a floor with a depth of more than 558.8 mm (22 in.), a steel beam or a steel channel adapter for mounting the subfloor eyebolts is required. The customer must supply the floor eyebolts.

Consider the following when preparing the floor for tie-down:

- The hardware is designed to support a frame weighing no more than 1578.5 kg (3480 lb.).
- The estimated maximum concentrated load on one caster for a 1578.5 kg (3480 lb.)-system is 526.2 kg (1160 lb.). For a multiple system installation, it is possible that one floor tile will bear a total concentrated load of 1052.3 kg (2320 lb.).

To install the eyebolts, do the following:

1. Obtain the service of a qualified structural engineer to determine appropriate installation of the eyebolts.
2. Consider the following before installing the eyebolts:
 - Floor eyebolts must be securely anchored to the concrete floor.
 - For a single frame installation, four 1/2-in. diameter by 13-inch subfloor eyebolts should be secured to the subfloor.
 - The minimum height of the center of the internal diameter is 2.54 mm (1 in.) above the concrete floor surface.
 - The maximum height is 63.5 mm (2.5 in.) above the concrete floor surface. Higher than 63.5 mm (2.5 in.) can cause excessive lateral deflection to the tie-down hardware.
 - The eyebolt's internal diameter should be 1-3/16 inch, and each eyebolt should be able to withstand 1224.7 kg (2700 lb). The customer should obtain the service of a qualified consultant or structural engineer to determine the appropriate anchoring method for these eyebolts and to ensure that the raised floor and the building can support the floor-loading specifications.

- To ensure that the holes are in the correct location, the diagonal distance of the center of the holes should be 1211.2 mm (47.7 in.). The distance between the center holes to the center of the next holes should be 654.8 mm (25.8 in.) (the side to side distance) and 1019 mm (40.1 in.) (the front to back distance)

3. Verify that the four eyebolts are positioned to match the dimensions is given in the following figures.

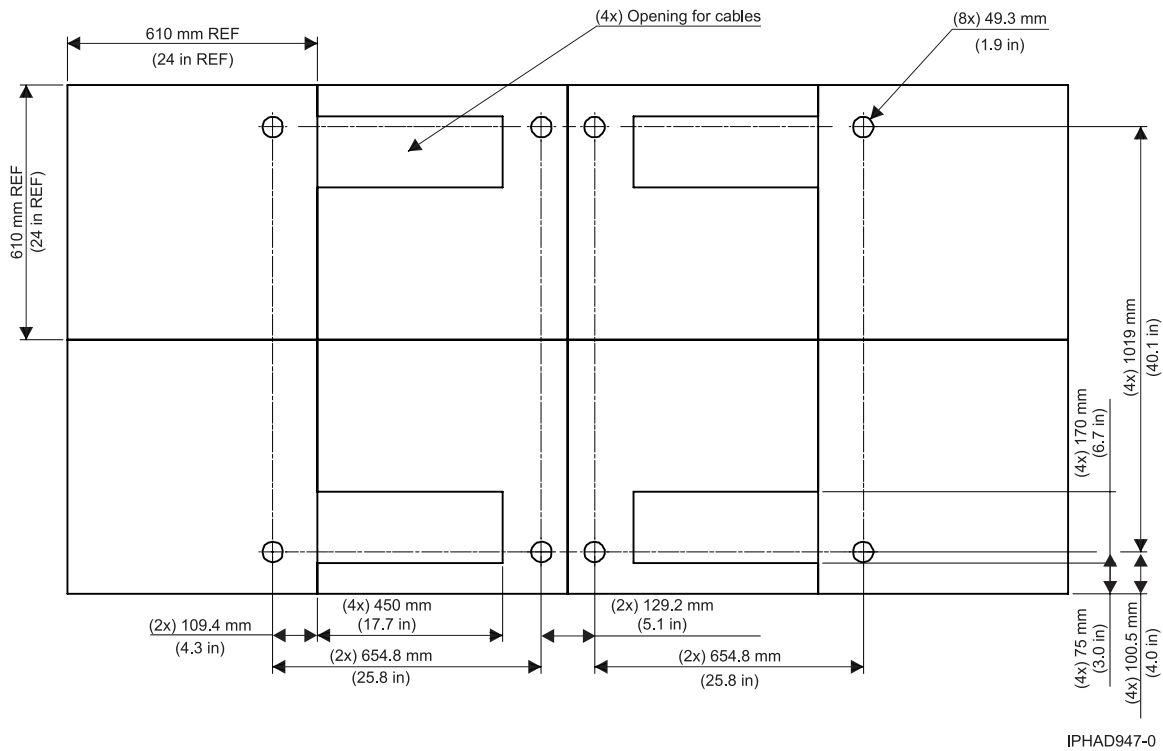


Figure 9. Eyebolt positioning for 610 mm (24 in.) floor tile layout

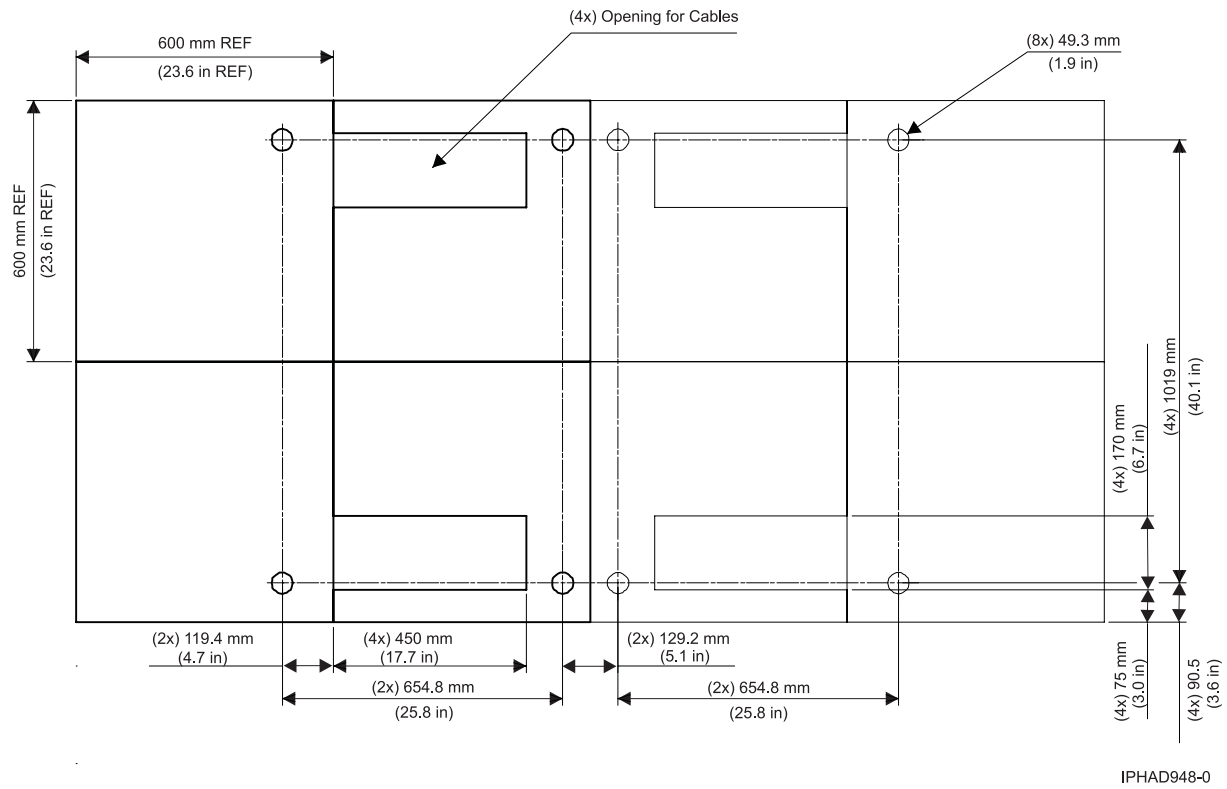


Figure 10. Eyebolt positioning for 600 mm (23.6 in.) floor tile layout



4. Install the eyebolts to the floor.

4. Install the eyebolts to the floor.

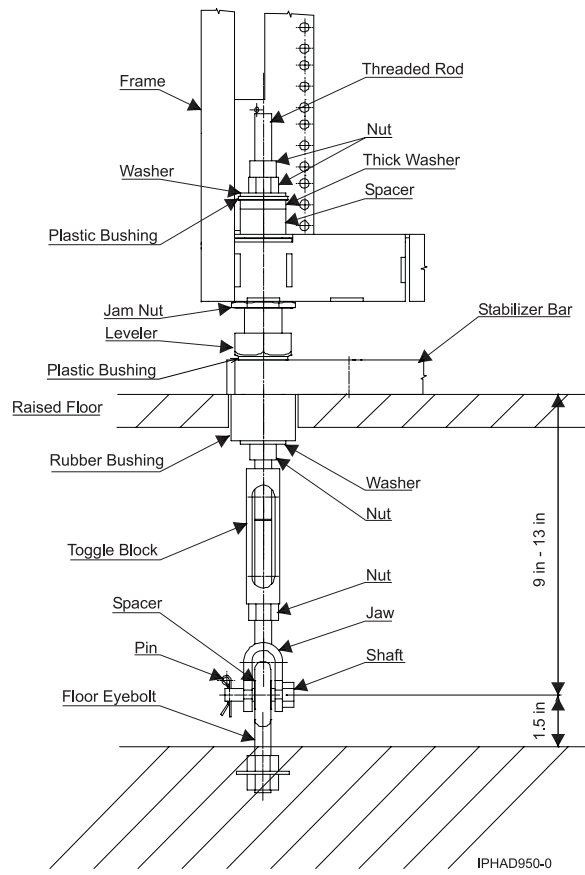


Figure 12. Turnbuckle assembly frame tie-down hardware for 228.6 mm to 330.2 mm (9 in. to 13 in.) raised floor (Part number 44P2999)

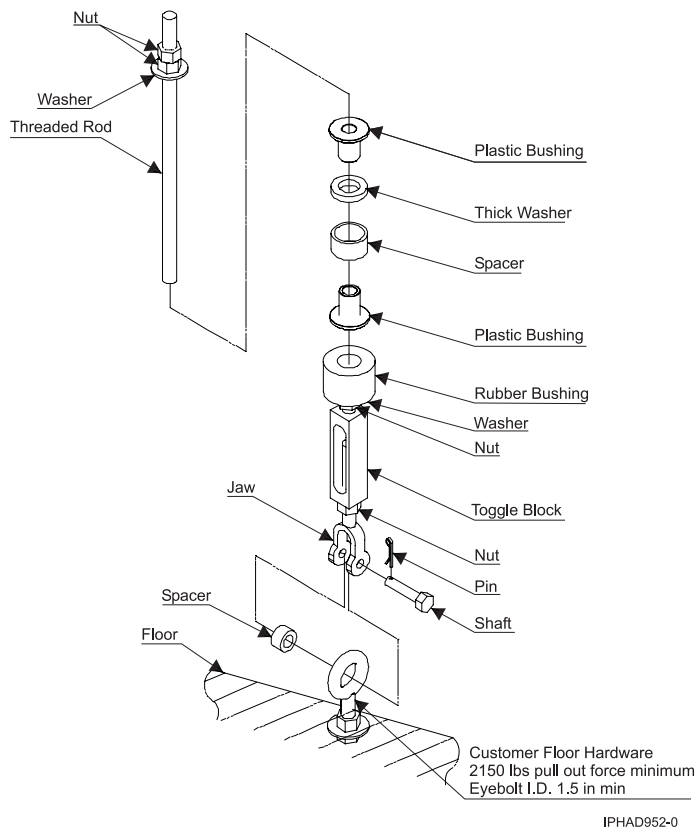


Figure 13. Turnbuckle assembly frame tie-down hardware for 228.6 mm to 330.2 mm (9 in. to 13 in.) raised floor (Part number 44P2999)

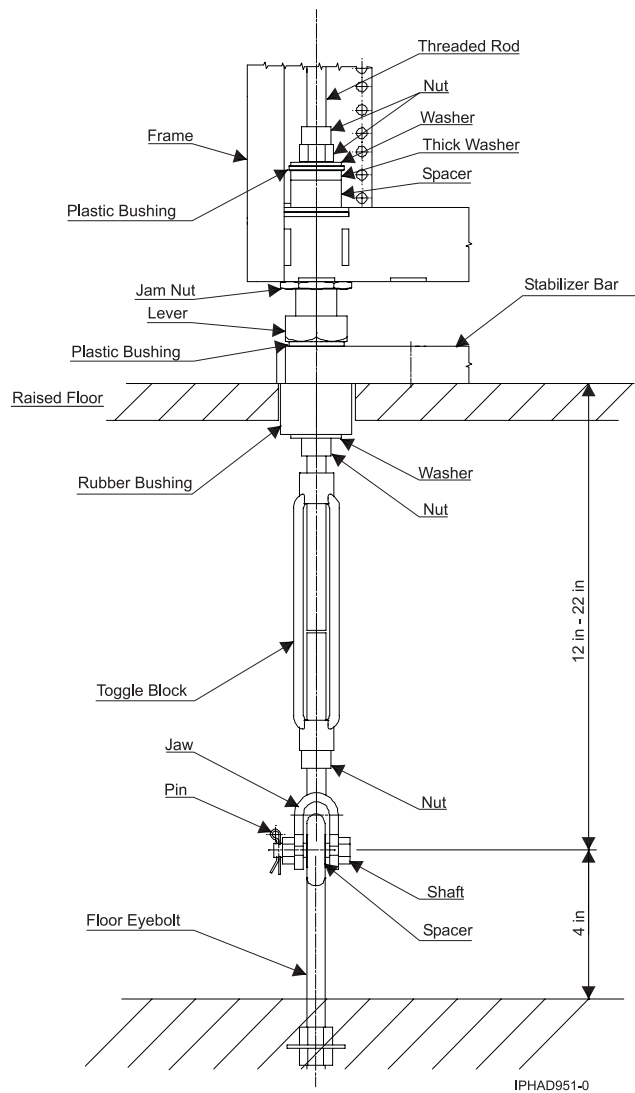
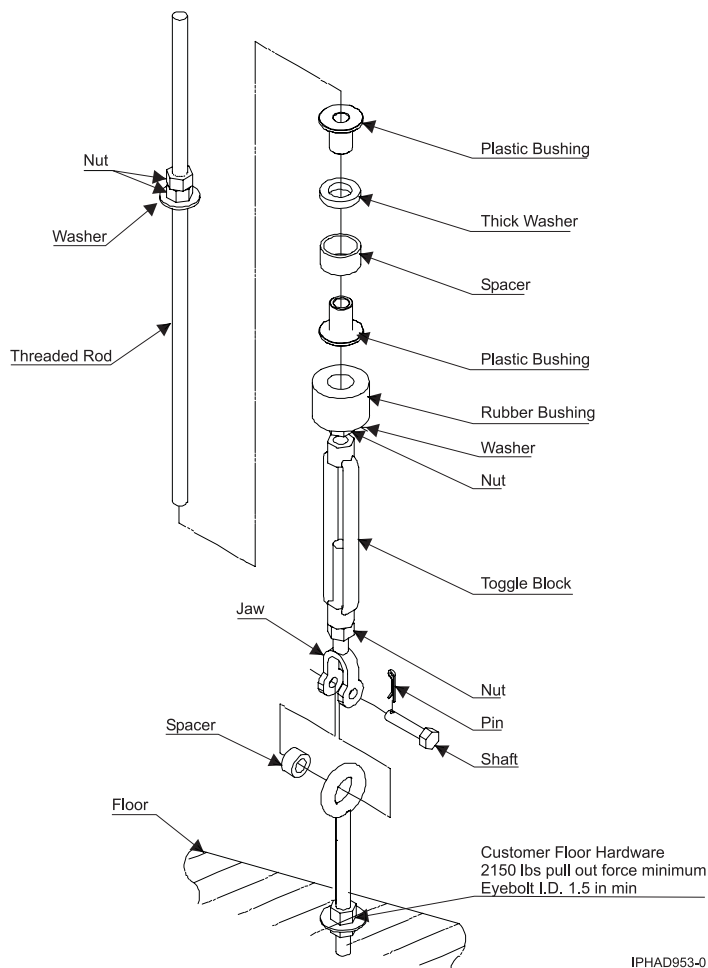


Figure 14. Turnbuckle assembly frame tie-down hardware for 304.8 mm to 558.8 mm (12 in. to 22 in.) raised floor (Part number 44P3000)



IPHAD953-0

Figure 15. Turnbuckle assembly frame tie-down hardware for 304.8 mm to 558.8 mm (12 in. to 22 in.) raised floor (Part number 44P3000)

Considerations for multiple system installations

Learn about the installation requirements for a multiple server installation.

In a multiple-frame installation, it is possible that a floor tile with cable cutouts (refer to “Cut and place floor panels” on page 63) will bear two concentrated static loads up to 526 kg (1160 lb.) per caster and leveler. Thus, the total concentrated load can be as high as 1052 kg (2320 lb.). Contact the floor tile manufacturer or consult a structural engineer to ensure that the raised floor assembly can support this load.

When you are integrating a model 9118-575 into an existing multiple-system environment, or when adding additional systems to an installed 9118-575, consider the following factors:

- Minimum aisle width

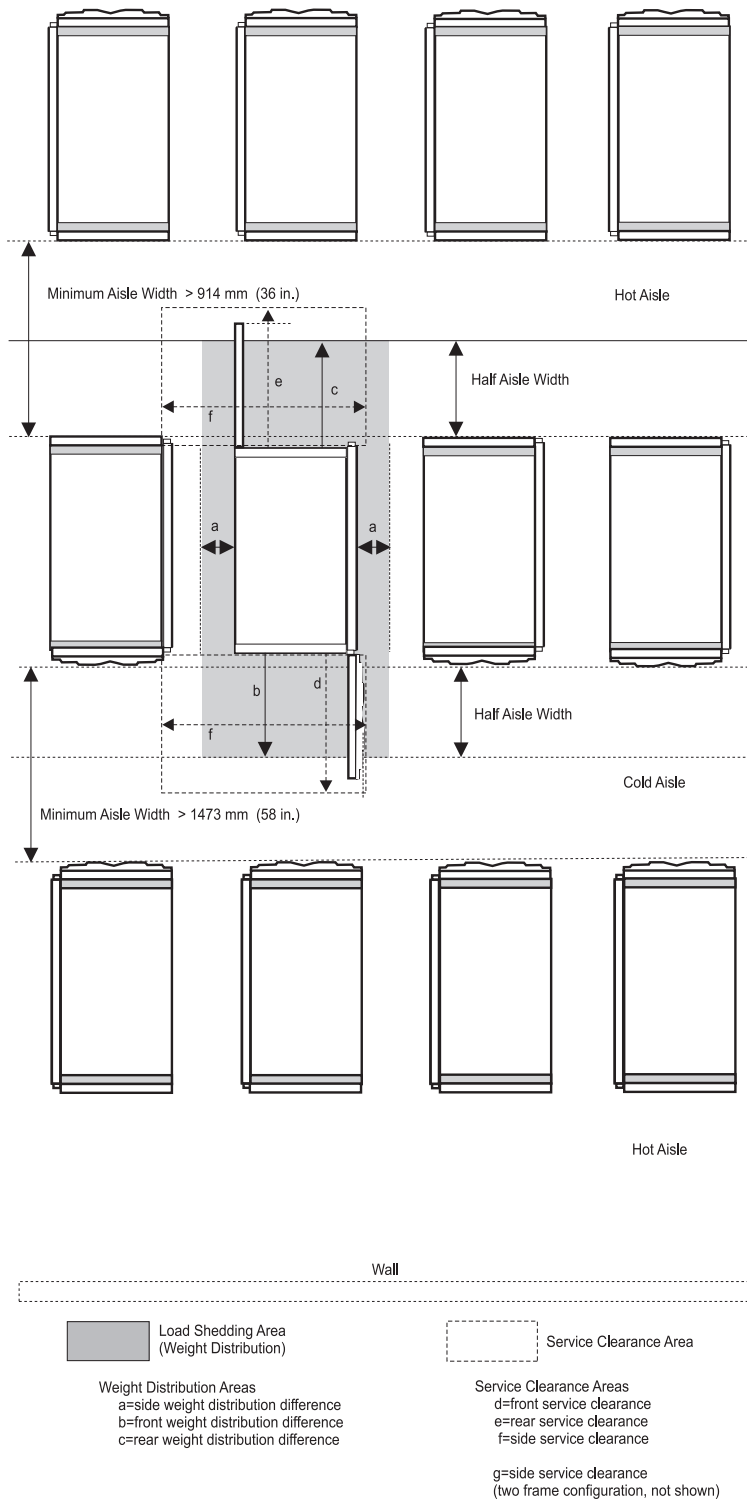
For multiple rows of systems containing one or more 9118-575 models, the minimum aisle width in the front of the system is 1473 mm (58 in.) and 914 mm (36 in.) in the rear of the system to allow room to perform service operations. The front and rear service clearances should be at least 1473 mm (58 in.) and 914 mm (36 in.), respectively. Service clearances are measured from the edges of the frame (with doors open) to the nearest obstacle.

- Thermal interactions

Systems should be faced front-to-front and rear-to-rear to create "cold" and "hot" aisles to maintain effective system thermal conditions, as shown in the following figure.

Cold aisles need to be of sufficient width to support the airflow requirements of the installed systems as indicated in "Cooling requirements" on page 85. The airflow per tile will be dependent on the underfloor pressure and perforations in the tile. A typical underfloor pressure of 0.025 in. of water will supply 300-400 cfm through a 25 percent open 2 ft. by 2 ft. floor tile.

Proposed Floor Layout for Multiple Systems



IPHAD929-4

Figure 16. Proposed floor layout for multiple systems

Service clearances

The service clearance area is the area around the server that is needed for IBM service representatives to service the server.

The minimum service clearance for systems with slimline doors is shown in the following figures.

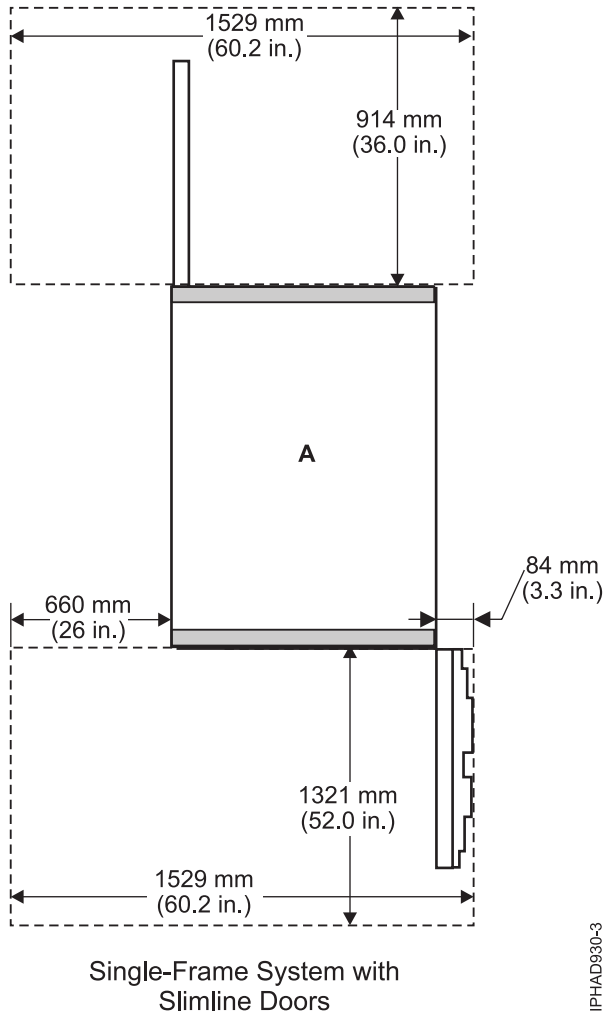


Figure 17. Service clearances for 9118-575 single frame systems with slimline doors

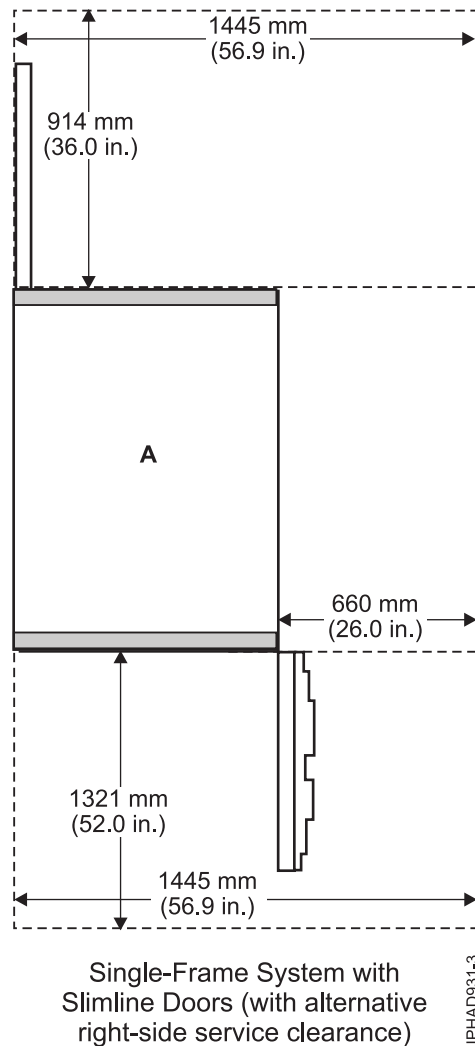


Figure 18. Service clearances for 9118-575 single frame systems with slimline doors (with alternative right-side service clearance)

The minimum service clearance for systems with acoustical doors is shown in the following figures.

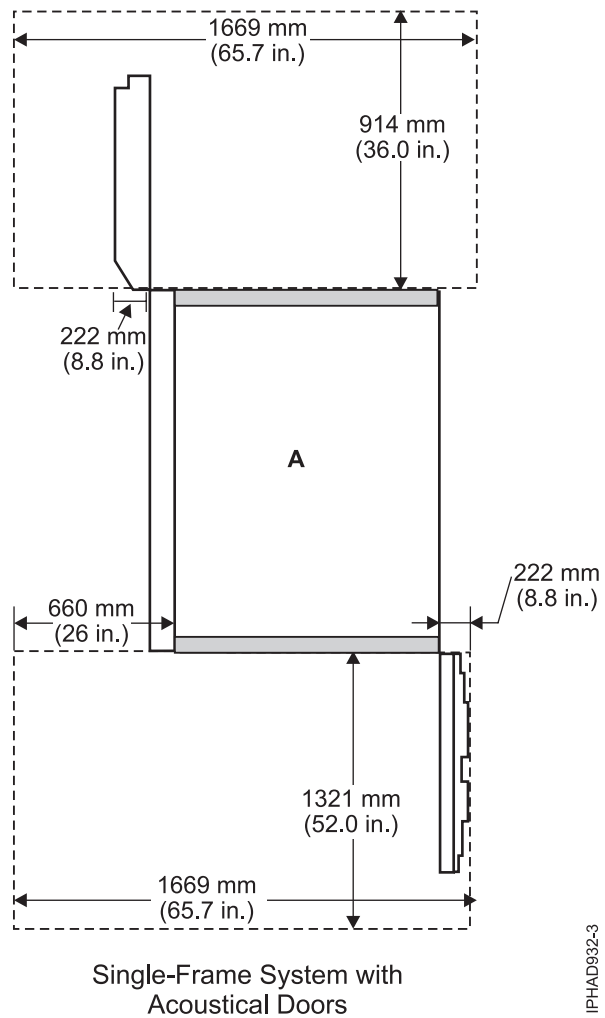
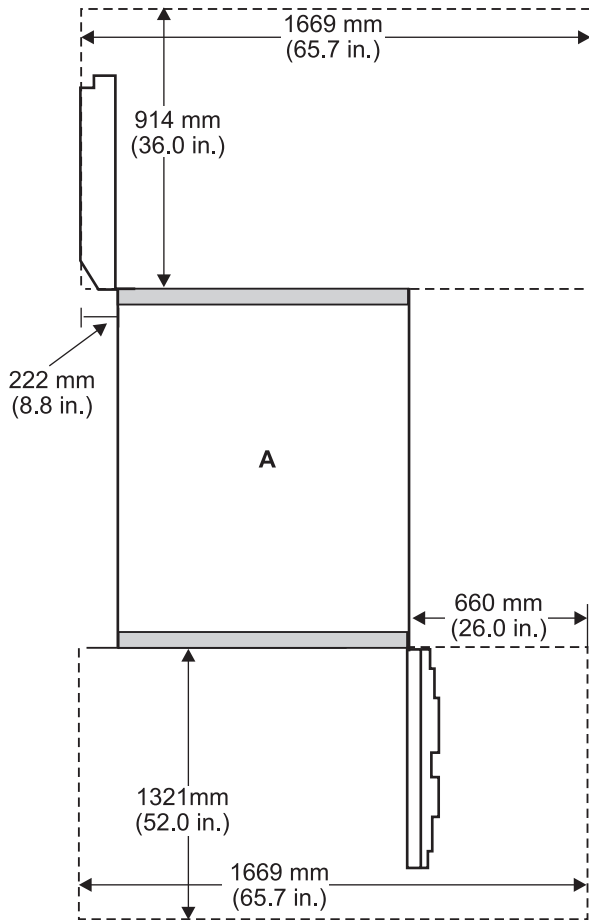


Figure 19. Service clearances for 9118-575 single-frame systems with acoustical doors

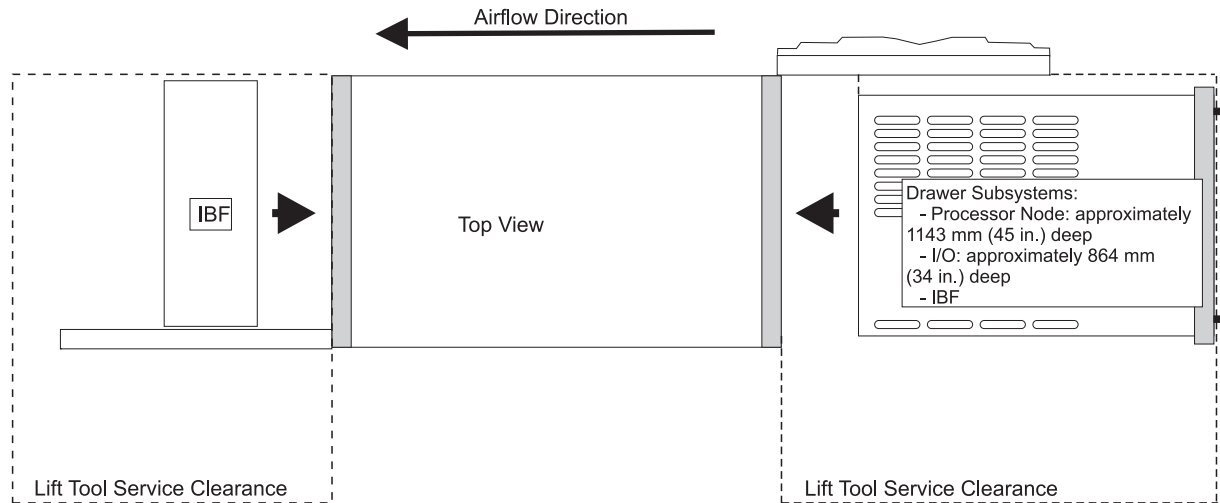


Single-Frame System with
Acoustical Doors (with
alternative right-side service
clearance)

IPHAD933-4

Figure 20. Service clearances for 9118-575 single-frame systems with acoustical doors (with alternative right-side service clearance)

Front service access is necessary on the model 9118-575 to accommodate a lift tool for the servicing of large drawers (the processor books and I/O drawers). Front and rear service access is necessary to accommodate the lift tool for servicing of the optional integrated battery backup.



Floor Plan Considerations for Single Units

A4AA5731-1

Figure 21. Floor plan considerations for single units

ASHRAE declarations

Use the ASHRAE declarations table and figures to determine the measurement reporting requirements defined in the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Thermal Guidelines for Data Processing Environments.

These guidelines are available at <http://tc99.ashraetcs.org> .

Table 18. ASHRAE declarations

Description	Typical Heat Release kW	Airflow nominal ¹		Airflow maximum ¹ at 35 degrees C (95 degrees F)		Weight	Overall system dimensions
		cfm	m ³ /hr	cfm	m ³ /hr		
Minimum configuration	3.7	485	824	725	1232	See 9118-575	See 9118-575
Maximum configuration	41.6	2960	5029	4300	7306	See 9118-575	See 9118-575
Typical configuration	22.2	1610	2735	2350	3993	See 9118-575	See 9118-575
ASHRAE Class	3						
Minimum configuration	One processor drawer						
Maximum configuration	12 processor drawers and two I/O drawers						
Typical configuration	6 processor drawers and 2 I/O drawers						

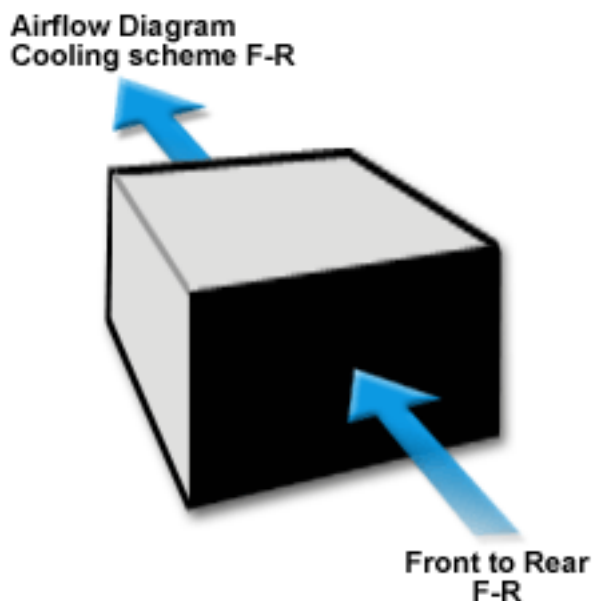


Figure 22. Airflow figure for server mounted in a rack

Total system power consumption

Use the System power requirements for 1.9 GHz processor systems table to determine the total system power consumption for your server's configuration.

The following table contains the maximum power requirements for the model 9118-575.

Table 19. System power requirements for 1.9 GHz processor systems (9118-575 only) - (kW)

Processor drawers ^{8,9}	I/O drawers and switch drawers						
	0	1	2	3	4	5	6
1	3.7 ⁴	4.9 ⁴	5.9 ^{1,4}	7.0 ^{2,4}			
2	6.9 ⁴	8.1 ⁴	9.2 ⁴	10.3 ^{1,4}	11.4 ^{2,4}		
3	10.2 ⁴	11.3 ⁴	12.4 ⁴	13.6 ⁴	14.7 ^{1,4}	15.8 ^{2,4}	
4	13.5 ⁴	14.6 ⁴	15.6 ⁴	16.8 ⁴	17.9 ⁴	19.0 ^{1,5}	20.1 ^{1,5}
5	16.7 ⁴	17.8 ⁴	18.9 ⁵	20.0 ⁵	21.2 ⁵	22.3 ^{3,5}	
6	19.9 ⁵	21.1 ⁵	22.2 ⁵	23.3 ^{6,10}	24.4 ^{6,10}	25.5 ^{3,6,10}	
7	23.2 ^{6,10}	24.3 ^{6,10}	25.4 ^{6,10}	26.5 ^{6,10}	27.6 ^{3,6,10}	28.8 ^{3,6,10}	
8	26.4 ^{6,10}	27.6 ^{6,10}	28.7 ^{6,10}	29.8 ^{6,10}	30.9 ^{3,6,10}		
9	29.7 ^{6,10}	30.8 ^{6,10}	31.9 ^{7,10}	33.0 ^{7,10}	34.1 ^{3,7,10}		
10	32.9 ^{7,10}	34.0 ^{7,10}	35.2 ^{7,10}	36.3 ^{7,10}			
11	36.2 ^{7,10}	37.3 ^{7,10}	38.4 ^{3,7,10}	39.5 ^{7,10}			
12	39.4 ^{7,10}	40.5 ^{7,10}	41.6 ^{3,7,10}				

The following notes apply to the preceding table.

Note:

1. This configuration is valid only when populated with one 7045-SW4 switch drawer.

2. This configuration is valid only when populated with two 7045-SW4 switch drawers.
3. Not supported with integrated battery backup.
4. Power cord rules for this configuration:

60 A cord allowed	60 A cord redundant	Other cords redundant
Yes	Yes	Yes

5. Power cord and bulk power jumper rules for this configuration:

60 A cord allowed	60 A cord redundant	Other cords redundant
Yes	No	Yes

6. Power cord and bulk power jumper rules for this configuration:

60 A cord allowed	60 A cord redundant	Other cords redundant
Yes	No	No

7. Power cord and bulk power jumper rules for this configuration:

60 A cord allowed	60 A cord redundant	Other cords redundant
No	Not applicable	No

8. The maximum number of processors drawers per system is the total number of FC7836, FC7657, FC7675, and FC7676 that can be combined to a maximum of 12.
9. For each FC7657, FC7675, and FC7676 installed, subtract 0.2 kW from the total system power specified in this table.
10. A bulk power jumper (BPJ) is provided for this configuration. The presence of the BPJ prevents the concurrent maintenance of the bulk power controllers (BPC) and bulk power distributors (BPD) in the bulk power assemblies.

Maximum configurations are based on 64 memory cards per processor, two disk drives and four PCI adapter cards. To determine the typical power consumption for a specific configuration, subtract the following typical power values.

Component	Typical power value (W)
Disk drives	20
PCI adapter card	20
Memory cards	10

Cooling requirements

Use the cooling system requirements table below in conjunction with the cooling requirements graph and chilled airflow area graphic to determine the area of floor tiles to supply chilled air to the system.

The model 9118-575 requires air for cooling. As shown in Figure 16 on page 78, rows of model 9118-575, and systems must face front-to-front. The use of a raised floor is recommended to provide air through perforated floor panels placed in rows between the fronts of systems (the cold aisles shown in Figure 16 on page 78).

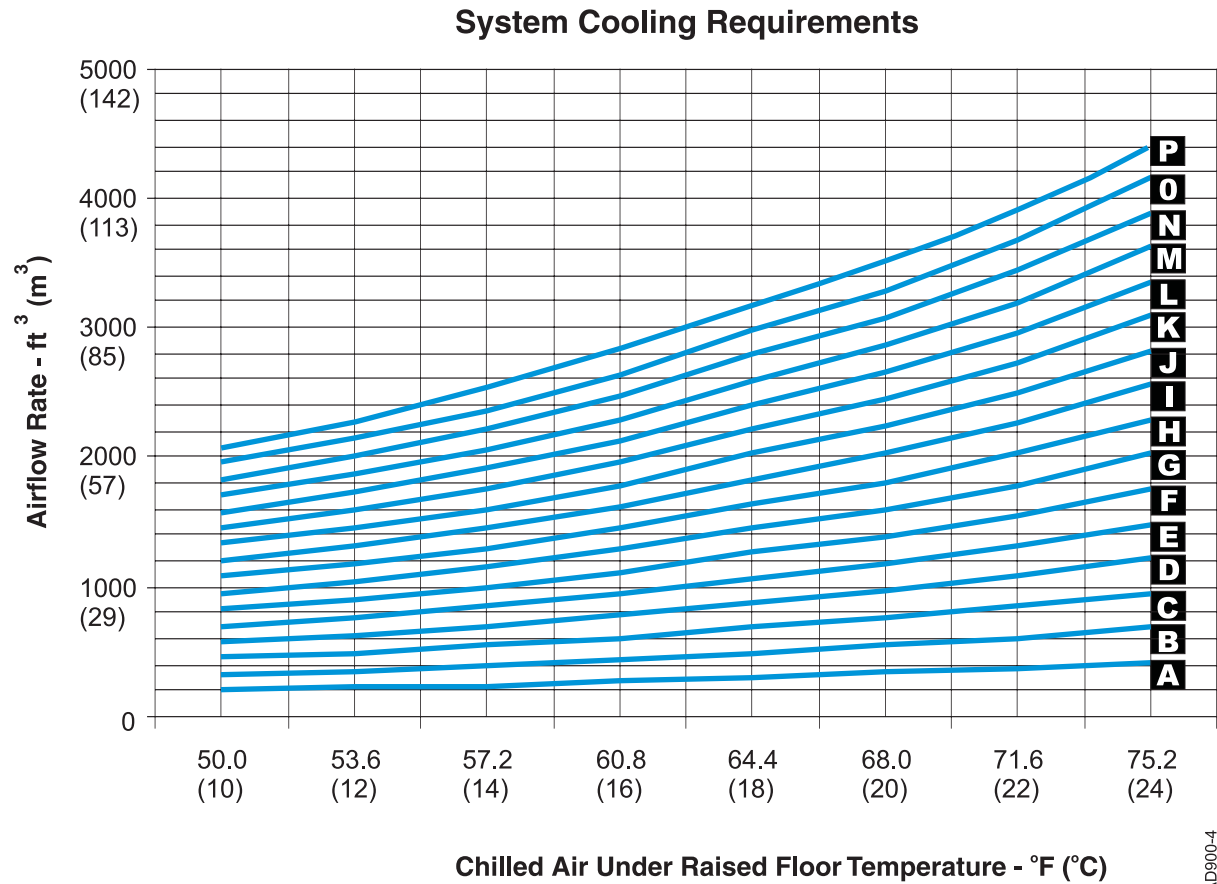
The following table provides system cooling requirements based on system configuration. The letter designations in the table correspond to the letter designations shown in “Cooling requirements graph” on page 86.

Table 20. System cooling requirements for processor systems

Number of processor drawers	Number of I/O drawers and switch drawers						
	0	1	2	3	4	5	6
1	A	B	B ₁	B ₂			
2	B	C	C	D ₁	D ²		
3	D	D	E	E	F ¹	F ²	
4	E	E	F	F	G	G ¹	H ²
5	F	G	G	G	H	H ³	
6	G	H	H	I	I	J ³	
7	J	J	K	K	L ³	L ³	
8	K	K	L	L	M ³		
9	K	K	L	L ³	M ³		
10	L	M	M	N ³			
11	M	N	N ³	O ³			
12	O	O	P ³				
Note: 1. This configuration is valid only when populated with one 7045-SW4 switch drawer. 2. This configuration is valid only when populated with two 7045-SW4 switch drawers. 3. Not supported with integrated battery backup.							

Cooling requirements graph:

Use the cooling requirements graph in conjunction with the cooling requirements tables and the chilled airflow area graphic to determine the area of the floor tiles to supply chilled air to the system.



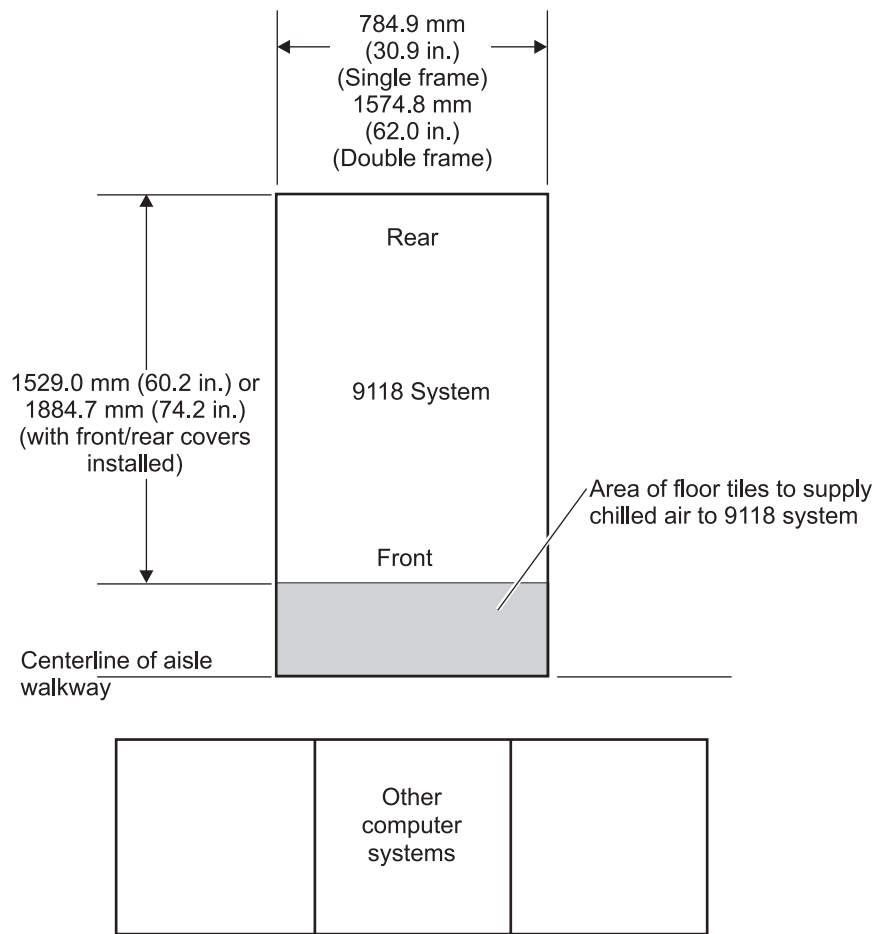
IPHAD900-4

Figure 23. Cooling requirements graph

Requirements for the chilled airflow area:

The Chilled airflow area figure shows the chilled airflow area required for your system.

Use the system cooling requirements tables and the cooling requirements graph to determine the area of floor tiles to supply chilled air to the system.



IPHAD934-1

Figure 24. Chilled airflow area

Moving the system to the installation site

Several factors must be considered before moving the system to the installation site.

Prior to moving the system to the installation site, you should:

- Determine the path that must be taken to move the system from the delivery location to the installation site.
- Verify that the height of all doorways, elevators, and so on are sufficient to allow moving the system to the installation site.
- Verify that the weight limitations of elevators, ramps, floors, floor tiles, and so on are sufficient to allow moving the system to the installation site. If the height or weight of the system can cause a problem when the system is moved to the installation site, you should contact your local site planning or sales representative.

For more detailed information, see [Access](#).

If needed, a height reduction feature 7960 may be ordered. This feature allows for the system frame and the expansion frame to be shipped in two pieces and assembled at your location. With this feature, the top section of the system frame (including the power subsystem) is removed. The height of the system frame with the upper section removed is reduced by .35 m (14 in.) to approximately 1.64 m (65 in.). For

planning purposes, the weight of the rack top frame and components are shown in the following table.

Table 21. Weight of rack top frame and components

Item	Weight ¹
Rack top frame and crate	210.5 kg (463 lb.)
Rack top frame with power (4 bulk power regulators, 4 bulk power distributors, and 2 bulk power assemblies) ²	149.5 kg (329 lb.)
Bulk power regulator	13.6 kg (30 lb.)
Bulk power distributor	6.4 kg (14 lb.)
Bulk power assembly	18 kg (40 lb.)
Rack top frame without rails	30 kg (66 lb.)
Rack top frame with rails	33 kg (73 lb.)
Side cover ³	22.7 kg (50 lb.)
Front acoustic door	17.9 kg (39.4 lb.)
Rear acoustic door	17.2 kg (37.9 lb.)
Front slimline door	17.2 kg (38 lb.)
Rear slimline door	9.1 kg (20 lb.)
Note: 1. Maximum total weight can be up to 255 kg (561 lb.) 2. Can be shipped with up to six bulk power regulators and six bulk power distributors. 3. Each side cover consists of two panels.	

Delivery and subsequent transportation of the equipment

DANGER

Heavy equipment—personal injury or equipment damage might result if mishandled. (D006)

You must prepare your environment to accept the new product based on the installation planning information provided, with assistance from an IBM Installation Planning Representative (IPR) or IBM authorized service provider. In anticipation of the equipment delivery, prepare the final installation site in advance so that professional movers or riggers can transport the equipment to the final installation site within the computer room. If for some reason, this is not possible at the time of delivery, you must make arrangements to have professional movers or riggers return to finish the transportation at a later date. Only professional movers or riggers should transport the equipment. The IBM authorized service provider can only perform minimal frame repositioning within the computer room, as needed, to perform required service actions. You are also responsible for using professional movers or riggers when you relocate or dispose of equipment.

Phase imbalance and BPR configuration

Use the Phase imbalance and BPR configuration table to determine the phase imbalance of your server's configuration.

Depending on the number of bulk power regulators (BPRs) in your system, phase imbalance can occur in line currents. All systems are provided with two bulk power assemblies (BPAs), with separate power cords. Phase currents will be divided between two power cords in normal operation. The following table illustrates phase imbalance as a function of BPR configuration. For information about power consumption, see "Total system power consumption" on page 84.

Table 22. Phase imbalance and BPR configuration

Number of BPRs per BPA	Phase A line current	Phase B line current	Phase C line current
1	Power / Vline	Power / Vline	0
2	0.5 Power / Vline	0.866 Power / Vline	0.5 Power / Vline
3	0.577 Power / Vline	0.577 Power / Vline	0.577 Power / Vline

Note: Power is calculated from “Total system power consumption” on page 84. Vline is line-to-line nominal input voltage. Because total system power is divided between two power cords, divide the power number by 2.

Balancing power panel loads

Use these methods to ensure that power panel loads are balanced.

When three-phase power is used, and depending on the system configuration, the phase currents can be fully balanced or unbalanced. System configurations with three BPRs per BPA have balanced power panel loads, while configurations with only one or two have unbalanced loads. With two BPRs per BPA, two of the three phases will draw an equal amount of current, and will be, nominally, 57.8 percent of the current on the third phase. With one BPR per BPA, two of three phases will carry an equal amount of current, with no current drawn on the third phase. The following figure is an example of feeding several loads of this type from two power panels in a way that balances the load among the three phases.

Note: Use of ground fault interrupt (GFI) circuit breakers is not recommended for this system because GFI circuit breakers are earth leakage current sensing circuit breakers and this system is a high earth leakage current product.

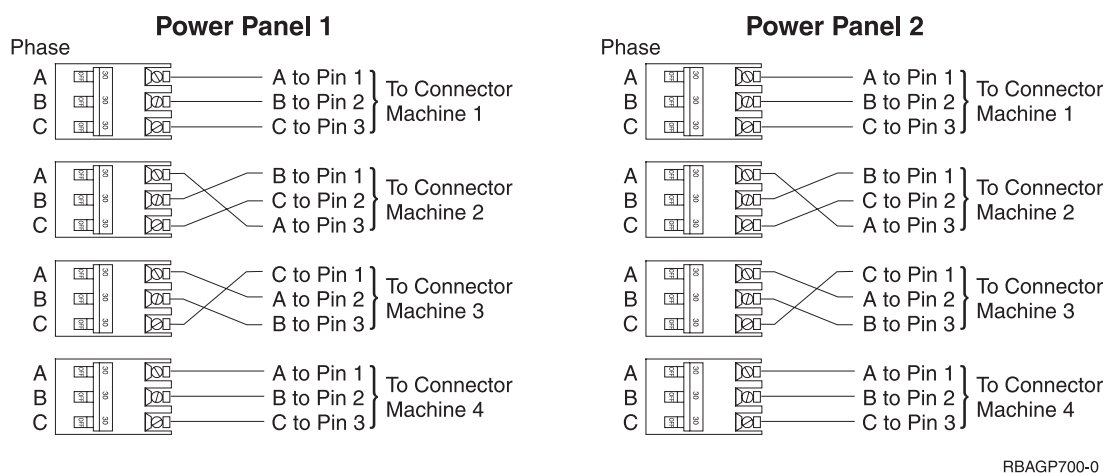


Figure 25. Power panel load balancing

The method illustrated in the preceding figure requires that the connection from the three poles of each breaker to the three phase pins of a connector be varied. Some electricians may prefer to maintain a consistent wiring sequence from the breakers to the connectors. The following figure shows a way to balance the load without changing the wiring on the output of any breakers. The three-pole breakers are alternated with single-pole breakers, so that the three-pole breakers do not all begin on Phase A.

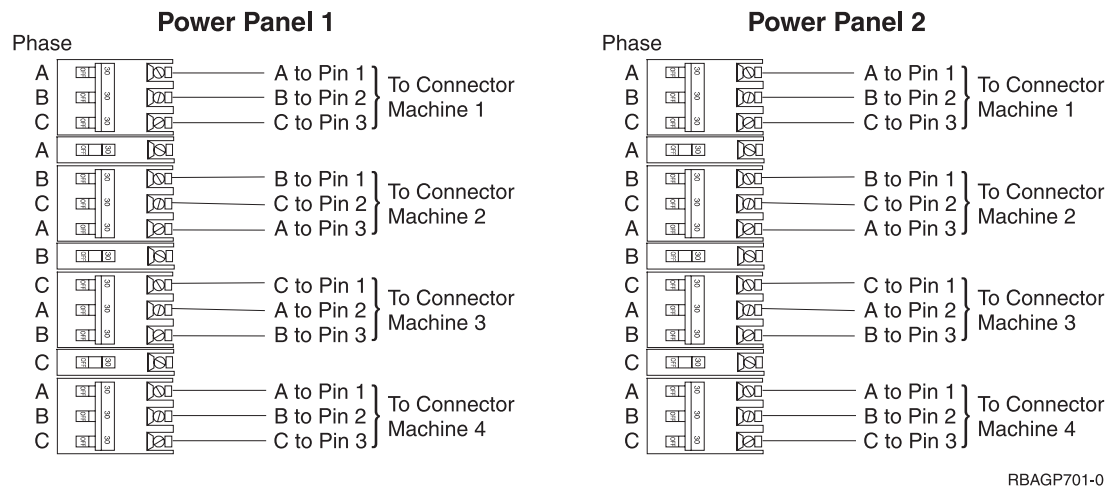


Figure 26. Power panel load balancing

The following figure shows another way of distributing the unbalanced load evenly. In this case, the three-pole breakers are alternated with two-pole breakers.

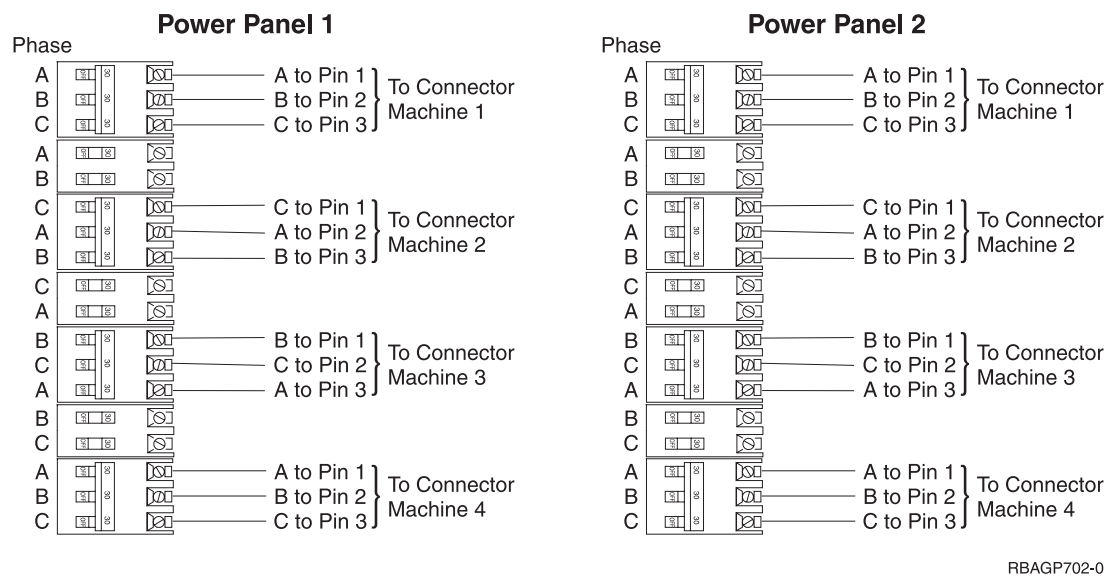


Figure 27. Power panel load balancing

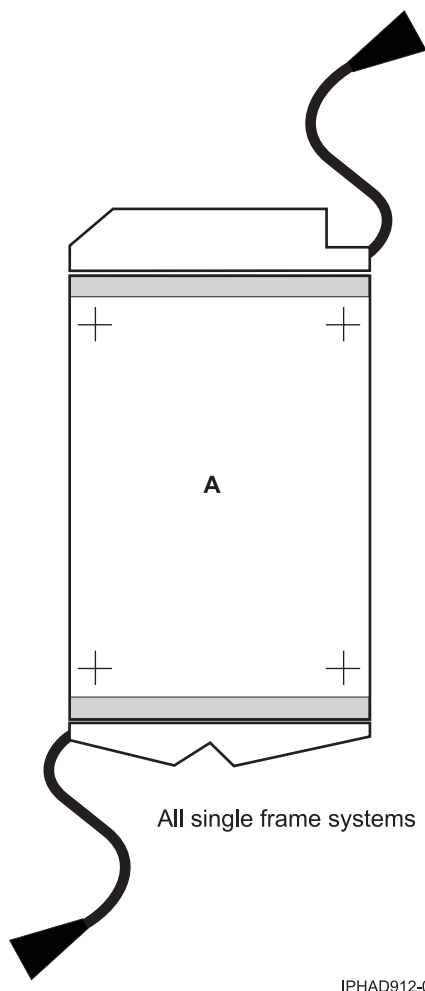


Figure 28. Single-frame system power cord configuration

Dual power installation

To take full advantage of the redundancy and reliability that is built into the 9118-575, the system must be powered from two different power distribution panels.

The model 9118-575 is designed with dual power cords with a fully redundant power system, except on some larger configurations. Table 19 on page 84 and Table 29 on page 98 provide details for the configurations that have fully-redundant power and those that do not. The possible power installation configurations are described in Dual power installations.

Approximate system weights by configuration

If the system that you order weighs more than 1134 kg (2500 lb.) when it is shipped from the factory, a weight-distribution plate will be provided for the system. This plate is used to minimize the point loading from casters and leveling pads.

Table 23. Approximate system weights with acoustical covers and without integrated battery backup – kg (lb.)³

Number of processor drawers	Drawers (I/O and switches)						
	0	1	2	3	4	5	6
1	531 (1168)	636 (1400)	735 (1618) ¹	835 (1836) ²			

Table 23. Approximate system weights with acoustical covers and without integrated battery backup – kg (lb.)³ (continued)

2	587 (1294)	714 (1574)	841 (1853)	939 (2071) ¹	1038 (2289) ²		
3	687 (1515)	793 (1747)	898 (1979)	1003 (2211)	1102 (2429) ¹	1201 (2647) ²	
4	744 (1641)	850 (1873)	955 (2105)	1060 (2337)	1166 (2570)	1265 (2788) ¹	1364 (3006) ²
5	802 (1767)	907 (1999)	1012 (2231)	1117 (2464)	1223 (2696)	1328 (2928)	
6	859 (1893)	964 (2126)	1069 (2358)	1175 (2590)	1280 (2822)	1385 (3054)	
7	916 (2020)	1021 (2252)	1127 (2484)	1232 (2716)	1337 (2948)	1430 (3152)	
8	973 (2146)	1078 (2378)	1184 (2610)	1289 (2842)	1394 (3074)		
9	1030 (2272)	1136 (2504)	1241 (2736)	1346 (2968)	1439 (3172)		
10	1088 (2398)	1193 (2630)	1298 (2862)	1403 (3094)			
11	1145 (2524)	1250 (2756)	1355 (2988)	1448 (3192)			
12	1202 (2650)	1307(2882)	1412 (3114)				

Note:

1. This configuration is only valid when populated with one 7045-SW4 switch drawer.
2. This configuration is only valid when populated with two 7045-SW4 switch drawers.
3. For systems with slimline doors subtract 9 kg (19 lb.).

Table 24. Approximate system weights with acoustical covers and with integrated battery backup – kg (lb.)³

Number of processor drawers	Drawers (I/O and switches)						
	0	1	2	3	4	5	6
1	620 (1367)	725 (1599)	824 (1817) ¹	923 (2035) ²			
2	677 (1493)	894 (1972)	1111 (2450)	1210 (2668) ¹	1309 (2886) ²		
3	958 (2112)	1063 (2344)	1169 (2576)	1274 (2808)	1373 (3026) ¹	1472 (3244) ²	
4	1015 (2238)	1121 (2470)	1226 (2702)	1331 (2934)	1436 (3167)	1535 (3385) ¹	Not supported
5	1072 (2364)	1178 (2596)	1283 (2828)	1388 (3061)	1493 (3293)		
6	1130 (2490)	1235 (2723)	1340 (2955)	1445 (3187)	1551 (3419)		
7	1187 (2617)	1292 (2849)	1397 (3081)	1503 (3313)			
8	1244 (2743)	1349 (2975)	1455 (3207)	1560 (3439)			
9	1301 (2869)	1406 (3101)	1512 (3333)				
10	1358 (2995)	1464 (3227)	1569 (3459)				
11	1416 (3121)	1521 (3353)					
12	1473 (3247)	1578 (3479)					

Note:

1. This configuration is only valid when populated with one 7045-SW4 switch drawer.
2. This configuration is only valid when populated with two 7045-SW4 switch drawers.
3. For systems with slimline doors subtract 9 kg (19 lb.).

Weight distribution

Use the Floor loading dimensions figure and the Floor loading for system tables to determine the floor loading for various configurations.

The following figure shows the floor loading dimensions for the model 9118-575. Use this figure in conjunction with the floor loading tables to determine the floor loading for various configurations.

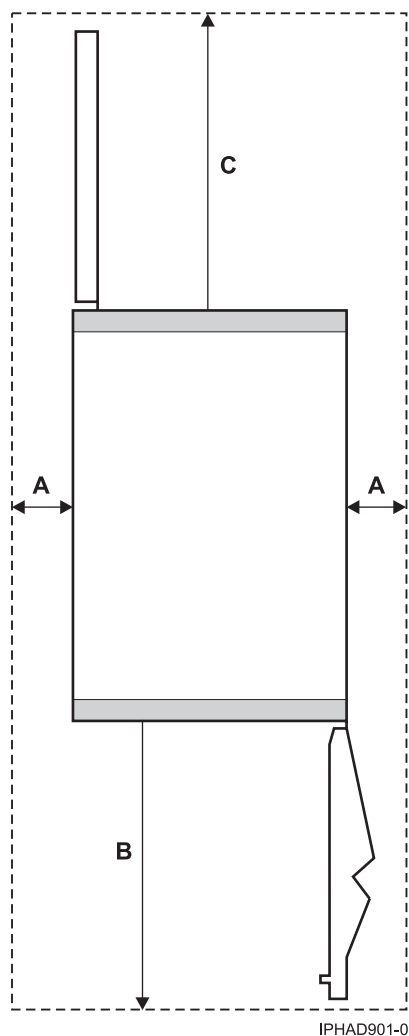


Figure 29. Floor loading dimensions

The following table shows the values used for calculating floor loading for the model 9118-575. Weights include covers, width and depth are indicated without covers.

Table 25. Floor loading for system with 12 processors, 2 I/O drawers, and without integrated battery backup

Floor loading for system with 12 processors, 2 I/O drawers, and without integrated battery backup							
a (sides)		b (front)		c (back)		1 frame	
mm	in.	mm	in.	mm	in.	lb./ft ²	kg/m ²
25	1.0	254	10.0	254	10.0	206.6	1008.7
25	1.0	508	20.0	508	20.0	168.0	820.4
25	1.0	762	30.0	762	30.0	143.0	698.1
254	10.0	254	10.0	254	10.0	140.6	686.3
254	10.0	508	20.0	508	20.0	116.0	566.5
254	10.0	762	30.0	762	30.0	100.1	488.7
508	20.0	254	10.0	254	10.0	107.3	523.9

Table 25. Floor loading for system with 12 processors, 2 I/O drawers, and without integrated battery backup (continued)

508	20.0	508	20.0	508	20.0	89.8	438.6
508	20.0	762	30.0	762	30.0	78.5	383.2
762	30.0	254	10.0	254	10.0	88.9	434.1
762	30.0	508	20.0	508	20.0	75.3	367.9
762	30.0	762	30.0	762	30.0	66.5	324.8

Note:

1. Floor calculations should not be based on a weight shed area beyond 30 in. from each side of the system.
2. All floor calculations are intended for a raised-floor environment.
3. Contact your IBM installation planning representative or structural engineer for further assistance with calculating floor load.

Table 26. Floor loading for system with 12 processors, 1 I/O drawer, and with integrated battery backup

Floor loading for system with 12 processors, 1 I/O drawer, and with integrated battery backup							
a (sides)		b (front)		c (back)		1 frame	
mm	in.	mm	in.	mm	in.	lb./ft ²	kg/m ²
25	1.0	254	10.0	254	10.0	229.1	1118.5
25	1.0	508	20.0	508	20.0	185.7	906.9
25	1.0	762	30.0	762	30.0	157.6	769.5
254	10.0	254	10.0	254	10.0	154.9	756.2
254	10.0	508	20.0	508	20.0	127.3	621.5
254	10.0	762	30.0	762	30.0	109.4	534.1
508	20.0	254	10.0	254	10.0	117.5	573.7
508	20.0	508	20.0	508	20.0	97.9	477.8
508	20.0	762	30.0	762	30.0	85.1	415.5
762	30.0	254	10.0	254	10.0	96.8	472.8
762	30.0	508	20.0	508	20.0	81.6	398.3
762	30.0	762	30.0	762	30.0	71.7	349.9

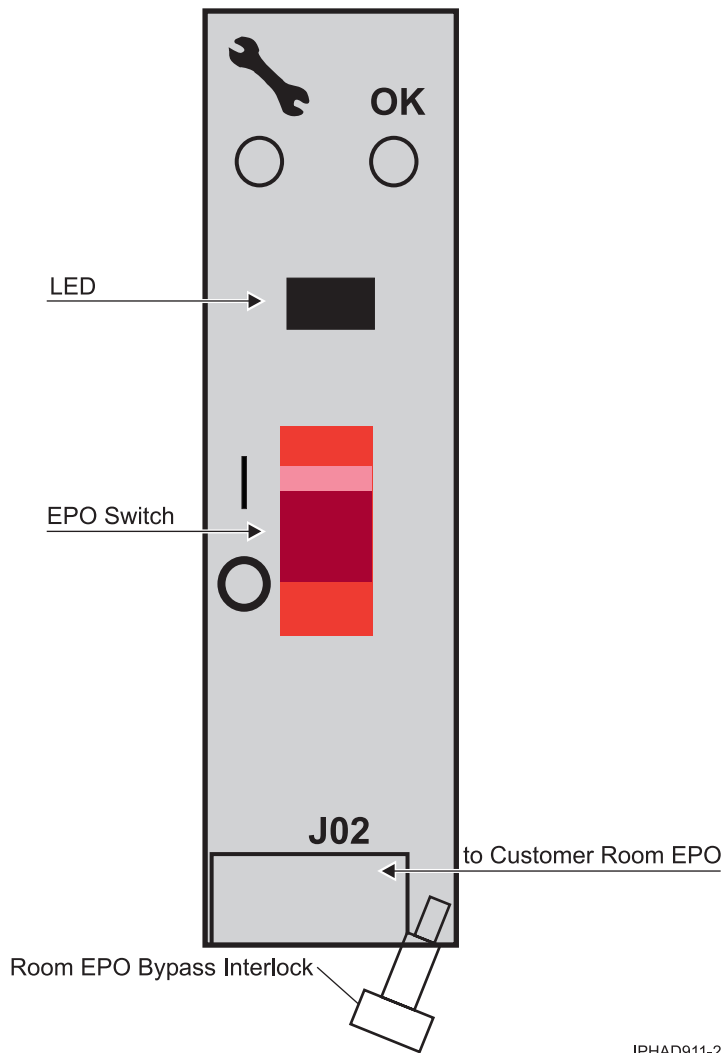
Note:

1. Floor calculations should not be based on a weight shed area beyond 30 in. from each side of the system.
2. All floor calculations are intended for a raised-floor environment.
3. Contact your IBM installation planning representative or structural engineer for further assistance with calculating floor load.

Floor loading for the system is illustrated in the Proposed Floor Layout for Multiple Systems in “Considerations for multiple system installations” on page 76.

Unit emergency power off

The server has a unit emergency power off (UEPO) switch on the front of the first frame (A Frame). Refer to the following figure, which shows a simplified UEPO panel.



IPHAD911-2

Figure 30. Unit emergency power off figure

When the switch is reset, the utility power is confined to the system power compartment. All volatile data will be lost.

It is possible to attach the computer room emergency power off (EPO) system to the system UEPO. When this is done, resetting the computer room EPO disconnects all power from the power cords and the internal battery backup unit, if it is provided. All volatile data will be lost in this case also.

If the room EPO is not connected to the UEPO, resetting the computer room EPO removes ac power from the system. If the interlock bypass feature is used, the system remains powered for a short time based on system configuration.

Computer room emergency power off

You can incorporate the integrated battery backup into a computer room emergency power off (EPO) system. Otherwise, volatile data can be lost.

When the integrated battery backup is installed and the room EPO is reset, the batteries engage and the computer continues to run. It is possible to attach the computer room EPO system to the machine EPO. When this is done, resetting the room EPO disconnects all power from the power cords and the internal battery backup unit. In this event, all volatile data will be lost.

To incorporate the integrated battery backup into the room Emergency Power Off systems (EPO), a cable must connect to the back of the system EPO panel. The following figures illustrate how this connection is made.

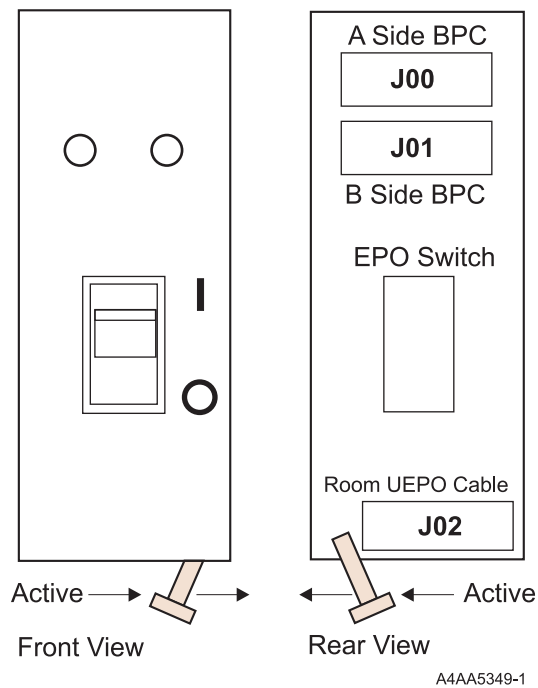
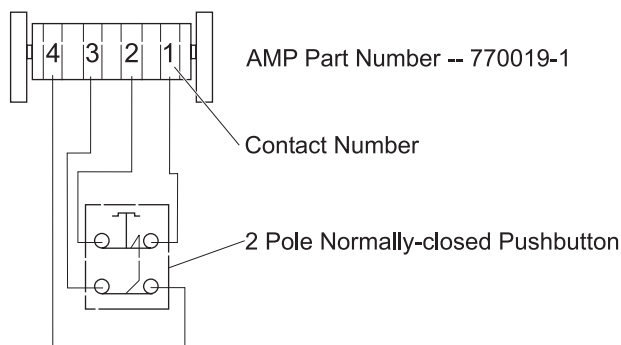


Figure 31. Computer room emergency power off figure

The preceding figure illustrates the back of the machine UEPO panel with the room EPO cable plugging into the machine. Notice the switch actuator. After it is moved to make the cable connection possible, the room EPO cable must be installed for the machine to power on.

In the following figure, AMP connector 770019-1 is needed to connect to the system EPO panel. For room EPO cables using wire sizes #20 AWG to #24 AWG, use AMP pins (part number 770010-4). This connection should not exceed 5 Ohms, which is approximately 61 m (200 ft.) of #24 AWG.



Room UEPO Switch Schematic

Figure 32. AMP connector figure

Machine holdup times

Use the Typical machine holdup time tables to determine the typical machine holdup times (time versus load) for fresh and aged batteries.

The following criteria apply to both machine holdup time tables.

- All times are listed in minutes
- Machine load is listed in total ac input power (power for both power cords combined)
- A fresh battery is defined as 2.5 years old or less.
- An aged battery is defined as 6.5 years.

Note: Battery capacity decreases gradually as the battery ages (from fresh-battery value to aged-battery value). The system diagnoses a failed-battery condition if the capacity decreases below the aged-battery value.

Table 27. Typical machine-holdup time versus load for fresh battery

Typical machine-holdup time versus load for fresh battery														
Machine load	3.3 kW		6.67 kW		10 kW		13.33 kW		16.67 kW		20 kW		21.67 kW	
Integrated battery backup configuration	N	R	N	R	N	R	N	R	N	R	N	R	N	R
1 BPR	7.0	21.0	2.1	7.0										
2 BPR	21.0	50.0	7.0	21.0	4.0	11.0	2.1	7.0						
3 BPR	32.0	68.0	12.0	32.0	7.0	21.0	4.9	12.0	3.2	9.5	2.1	7.0	1.7	6.5
N=Nonredundant, R=Redundant														

Table 28. Typical machine-holdup time versus load for aged battery

Typical machine-holdup time versus load for aged battery														
Machine load	3.3 kW		6.67 kW		10 kW		13.33 kW		16.67 kW		20 kW		21.67 kW	
Integrated battery backup configuration	N	R	N	R	N	R	N	R	N	R	N	R	N	R
1 BPR	4.2	12.6	1.3	4.2										
2 BPR	12.6	30.0	4.2	12.6	2.4	6.6	1.3	4.2						
3 BPR	19.2	41.0	7.2	19.2	4.2	12.6	2.9	7.2	1.9	5.7	1.3	4.2	1.0	3.9
N=Nonredundant, R=Redundant														

Table 29. Bulk power regulator rules

Bulk power regulator (BPR) per bulk power assembly (BPA) rules ⁵							
Number of processor drawers	Number of I/O drawers and switch drawers						
	0	1	2	3	4	5	6
1	1 ²	1 ²	1 ²	1 ²	Not applicable ¹	Not applicable ¹	Not applicable
2	1 ²	2 ²	2 ²	2 ²	2 ²	Not applicable ¹	Not applicable
3	2 ²	2 ²	2 ²	3 ²	3 ²	3 ²	Not applicable
4	3 ²	3 ²	3 ²	3 ²	3 ²	3 ³	3 ³
5	3 ²	3 ²	3 ³	3 ³	3 ³	3 ³	Not applicable
6	3 ³	3 ³	3 ³	3 ⁴	3 ⁴	3 ⁴	Not applicable

Table 29. Bulk power regulator rules (continued)

Bulk power regulator (BPR) per bulk power assembly (BPA) rules ⁵							
7	3 ⁴	3 ⁴	3 ⁴	3 ⁴	3 ⁴	3 ⁴	Not applicable
8	3 ⁴	3 ⁴	3 ⁴	3 ⁴	3 ⁴	Not applicable	Not applicable
9	3 ⁴	3 ⁴	3 ⁵	3 ⁵	3 ⁵	Not applicable	Not applicable
10	3 ⁵	3 ⁵	3 ⁵	3 ⁵	Not applicable	Not applicable	Not applicable
11	3 ⁵	3 ⁵	3 ⁵	3 ⁵	Not applicable	Not applicable	Not applicable
12	3 ⁵	3 ⁵	3 ⁵	Not applicable	Not applicable	Not applicable	Not applicable
13	3 ³	3 ³	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
14	3 ³	3 ³	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

The following notes apply to the preceding table.

Note:

- Maximum of two 7045-SW4 switches in rack and one 5791 or 5794 per processor drawer.
- Power cord and bulk power jumper rules for this configuration:

60 A cord allowed	60 A cord redundant	Other cords redundant	Bulk power jumper provided
Yes	Yes	Yes	No

- Power cord and bulk power jumper rules for this configuration:

60 A cord allowed	60 A cord redundant	Other cords redundant	Bulk power jumper provided
Yes	No	Yes	Yes - for 60 A cords No - for other cords

- Power cord and bulk power jumper rules for this configuration:

60 A cord allowed	60 A cord redundant	Other cords redundant	Bulk power jumper provided
Yes	No	No	Yes

- Power cord and bulk power jumper rules for this configuration:

60 A cord allowed	60 A cord redundant	Other cords redundant	Bulk power jumper provided
No	Not applicable	No	Yes

Model 9119-590, 9406-595, and 9119-595 server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

The IBM eServer i5 and eServer p5 model 590 and 595 consist of multiple components, as summarized in the following table.

Table 30. Model 9119-590, 9406-595, and 9119-595 components

Model	Description	Minimum per system	Maximum per system
FC6251 (9119-590, 9119-595, 9406-595)	Slimline door set for primary rack (front and rear) See “Doors and covers” on page 107.	1	1
FC6252 (9119-590, 9119-595, 9406-595)	Acoustic door set for primary rack (front and rear) See “Doors and covers” on page 107.	1	1
FC8691 (9119-590, 9119-595)	Optional expansion frame (Based on number of I/O and switch drawers installed.)	0	1
FC8294 (9406-595)	Optional base 1.8 m rack	0	1
FC6253 (9119-590, 9119-595)	Slimline door set for 8691 (front and rear)	0	1
FC6254 (9119-590, 9119-595)	Acoustical door set for 8691 (front and rear)	0	1
9119-595 (FC8970)	16-way, 2.1 GHz processor book	1 ¹⁰	4
9119-595 and 9406-595 (FC8968)	16-way, 2.3 GHz processor book	1 ¹⁰	4
9119-590 (FC8967)	16-way, 2.1 GHz processor book	1 ¹⁰	2
9406-595 (FC8966)	16-way, 1.9 GHz processor book	1 ¹⁰	4
9406-595 (FC8981)	16-way, 1.65 GHz processor book	1 ¹⁰	4
9119-590 (FC7981)	16-way, 1.9 GHz processor book	1 ¹⁰	2
9119-595 (FC7813)	16-way, 1.9 GHz processor book	1 ¹⁰	4
9119-595 (FC8969)	16-way, 1.9 GHz processor book		
9119-595 (FC7988)	16-way, 1.65 GHz processor book	1 ¹⁰	4
FC5792 (9119-595)	Optional base rack. See “Planning for 5792 base rack” on page 192.		
Various	Hardware Management Console (HMC) ⁶	0 ⁴	2 ⁴
7040-61D 5791 (9119-590, 9119-595) 5794 (9119-590, 9119-595)	Optional I/O drawer (20 PCI cards max., 16 disk drives maximum)	0 (9406) 1 (9119)	8-way or 16-way: 6 drawers maximum ¹ 32-way: 12 drawers maximum ² 48-way and 64-way: 4 drawers maximum ³ 9406-595 ⁹
FC6200 or FC6201 (9119-590, 9119-595)	Optional integrated battery backup feature	0	6
FC3757 (9119-590, 9119-595, 9406-595)	Service Shelf Tool Kit ⁸	1	1

Table 30. Model 9119-590, 9406-595, and 9119-595 components (continued)

FC9194 (9406-595)	Base PCI-X Expansion tower (shipped with a 9406-595)	1	1
Note: <ol style="list-style-type: none"> For the 9119-590 and 9119-595, the 16-way processor configuration supports up to 6 I/O drawers. For the 9119-590 and 9119-595, the 32-way processor configurations support up to 12 I/O drawers. For the 9119-590 and 9119-595, the 48-way and 64-way processor configurations support a maximum of 12 I/O drawers, which require a FC5792 frame. An HMC can connect to multiple systems (therefore, an HMC may not need to be ordered), or up to two HMCs can connect to the system for redundancy. For the 9119-590 and 9119-595, the The 32-way, 48-way, and 64-way processor configurations are based on the combining of multiple 16-way processors. The 8-way processor configuration is a 16-way with eight processors available for upgrade on demand. For the model 590 and 595, a Hardware Management Console must be provided within the same room and within 8 m (26 ft.) of the server. Or, as an alternative to the local HMC requirement, it is acceptable for you to provide a supported device (such as, a PC), with connectivity and authority to operate through a remotely-attached HMC. This local device must be in the same room and within 8 m (26 ft.) of your server, and provide functional capability equivalent to the HMC that it replaces and that is needed by the service representative to service the server. The 32-way processor configuration of the 9119-590 supports a maximum of eight I/O drawers. The FC3757 Service Shelf Tool Kit contains six separate tool kits that are required for the installation and maintenance of the 9119-590, 9119-595 and 9406-595 processor books and memory cards. Each kit weighs ≤ 40 lb. Without this feature, installation and maintenance may be delayed. At least one FC3757 is required on site where one or more model 590 or 595 are located. A number 4643 indicates that a 7040-61D I/O drawer is installed in the 24-inch primary rack of a model 9406-595. One to four 4643s may be installed. Only AIX and Linux operating system supported I/O features may be installed in the 7040-61D. Other iSeries™ I/O towers or drawers may be attached via HSL/RIO loops. Minimum per system is based on one processor with this feature code. Processor feature codes cannot be mixed. 			

Table 31. Server specifications

Specifications for model 9119-590, 9406-595, and 9119-595 ¹⁴				
Plan views				
Top down view				
ASHRAE declarations (heat load data for various configurations)				
Dimensions and weight⁸				
Physical characteristic	Slimline doors ¹		Acoustical doors ¹	
	1 Frame	2 Frames	1 Frame	2 Frames
Height	2025 mm (79.7 in.)	2025 mm (79.7 in.)	2025 mm (79.7 in.)	2025 mm (79.7 in.)
Width	785 mm (30.9 in.)	1575 mm (62.0 in.)	785 mm (30.9 in.)	1575 mm (62.0 in.)
Depth	1326 mm (52.2 in.)	1326 mm (52.2 in.)	1681 mm (66.2 in.)	1681 mm (66.2 in.)
Weight¹⁰ - model 9119-595 maximum configuration				
	With integrated battery backup and slimline doors	Without integrated battery backup with slimline doors	With integrated battery backup and with acoustical doors	Without integrated battery backup and with acoustical doors
Single frame	1419 kg (3128 lb.)	1358 kg (2995 lb.)	1427 (3147 lb.)	1367 kg (3014 lb.)

Table 31. Server specifications (continued)

Specifications for model 9119-590, 9406-595, and 9119-595 ¹⁴				
Double frame	2441 kg (5381 lb.)	2381 kg (5249 lb.)	2458 (5420 lb.)	2398 (5287 lb.)
Weight ¹⁰ - model 9406-595 configuration (Weight does not include the required I/O tower. See the 9194 I/O expansion unit specification sheet for more details)				
	Without integrated battery backup with slimline doors		Without integrated battery backup and with acoustical doors	
Single frame ^{12, 13}	1358 kg (2995 lb.)		1367 kg (3014 lb.)	
Weight ¹⁰ - model 9119-590 maximum configuration				
	With integrated battery backup and with slimline doors	Without integrated battery backup and with slimline doors	With integrated battery backup and with acoustical doors	Without integrated battery backup and with acoustical doors
Single frame	1419 kg (3128 lb.)	1358 kg (2995 lb.)	1427 kg (3147 lb.)	1367 kg (3014 lb.)
Double frame	2230 kg (4917 lb.)	1960 kg (4321 lb.)	2248 kg (4956 lb.)	1977 kg (4359 lb.)
Shipping dimensions and weight ⁹				
Height	2311 mm (91 in.)			
Width	940 mm (37 in.)			
Depth	1511 mm (59.5 in.)			
Weight	Varies by configuration			
Electrical and thermal characteristics (3-phase) - 9119-590, 9119-595 - for additional information, see Total system power consumption				
Rated voltage and frequency (3 phase)	200 to 240 V ac at 50 to 60 Hz		380 to 415 V ac at 50 to 60 Hz	480 V ac at 50 to 60 Hz
Rated current, power cord with 100 A plug FC 8686 or 8687 (amps per phase)	60		32	24
Rated current, power cord with 60 A plug, FC 8688 or 8689 (amps per phase)	48		--	--
Rated current, all other power cords (amps per phase)	60		32	24
Maximum power (1.9 GHz , 2.1 GHz, and 2.3 GHz processors)	22.7 kW			
Maximum power (1.65 GHz processor)	20.3 kW			
Power factor, typical	0.99		0.97	0.93
Inrush current (maximum) ³	163 A			
Thermal output (maximum for 1.9 GHz , 2.1 GHz, and 2.3 GHz processors)	77.5 kBtu/hr		77.5 kBtu/hr	77.5 kBtu/hr
Thermal output (maximum for 1.65 GHz processor)	69.3 kBtu/hr		69.3 kBtu/hr	69.3 kBtu/hr
Electrical and thermal characteristics (3-phase) - 9406-595 - for additional information, see Total system power consumption				
Rated voltage and frequency (single phase)	200 to 240 V ac at 50 to 60 Hz		380 to 415 V ac at 50 to 60 Hz	480 V ac at 50 to 60 Hz
Rated current, power cord with 100 A plug FC 8686 or 8687 (amps per phase)	60		32	24
Rated current, power cord with 60 A plug, FC 8688 or 8689 (amps per phase)	48		--	--

Table 31. Server specifications (continued)

Specifications for model 9119-590, 9406-595, and 9119-595 ¹⁴				
Rated current, all		60	32	24
Maximum power (1.65 GHz processor)		19.4 kW		
Power factor, typical		0.99	0.97	0.93
Inrush current (maximum) ³		163 A		
Thermal output (maximum for 1.65 GHz processor)		66.2 kBtu/hr	66.2 kBtu/hr	66.2 kBtu/hr
Phase		9406-595, 9119-595, 9119-590	3	
Dual power feature code			Standard ⁷	
Branch circuit breaker and cord information			See “Breaker rating and cord information” on page 106	
Power cord length			4.2 m (14 ft.) - all locations (except Chicago) 1.8 m (6 ft.) - United States (Chicago)	
Environment specifications				
Recommended operating temperature ⁵ (16-way, 32-way)			10 degrees to 32 degrees C (50 degrees to 89.6 degrees F)	
Recommended operating temperature ⁵ (48-way and 64-way)			10 degrees to 28 degrees C (50 degrees to 82.4 degrees F)	
Nonoperating temperature (All models)			10 degrees to 43 degrees C (50 degrees to 109.4 degrees F)	
Storage temperature (All models)			1 degree to 60 degrees C (33.8 degrees to 140 degrees F)	
Shipping temperature (All models)			-40 degrees to 60 degrees C (-40 degrees to 140 degrees F)	
	Operating	Nonoperating	Storage ⁴	Shipping ⁴
Maximum wet bulb	23 degrees C (73.4 degrees F)	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	29 degrees C (84.2 degrees F)
Noncondensing relative humidity	8 to 80 %	8 to 80 %	5 to 80 %	5 to 100 %
Maximum altitude (operating)	8-way, 16-way, 32-way - 3048 m (10000 ft.) 48-way, 64-way - 2133 m (7000 ft.)			
Acoustical noise emissions ^{6, 15}				
Product configuration	L _{WAd} (Bels) ⁶		L _{pAM} (dB) ⁶ (bystander, 1 m)	
	Operating	Idle	Operating	Idle
Typical configuration with two processors, two I/O drawers, and bulk power unit; acoustical door set	7.6	7.6	59	59

Table 31. Server specifications (continued)

Specifications for model 9119-590, 9406-595, and 9119-595 ¹⁴				
Typical configuration with two processors, two I/O drawers, and bulk power unit; slimline door set	8.3	8.3	65	65
Maximum configuration with four processors, four I/O drawers, and bulk power unit; acoustical door set	7.9	7.9	61	61
Maximum configuration with four processors, four I/O drawers, and bulk power unit; slimline door set	8.6 ¹¹	8.6 ¹¹	68 ¹¹	68 ¹¹
Service clearances				
For a graphical representation of service clearances, see “Service clearances” on page 127				
Seismic considerations: See “Secure the rack” on page 112				
Data communications				
Electromagnetic compatibility compliance: This server meets the following electromagnetic compatibility specifications: FCC (CFR 47, Part 15); VCCI; CISPR-22; 89/336/EEC; BSMI (A2/NZS 3548:1995); C-Tick; ICES/NMB-003; Korean EMI/EMC (MIC Notice 2000–94, Notice 2000–72); People’s Republic of China Commodity Inspection Law				
Safety compliance: This server is designed and certified to meet the following safety standards: UL 60950-1; CAN/CSA C22.2 No. 60950-1; EN 60950-1; IEC 60950-1 including all national differences				

Table 31. Server specifications (continued)

Specifications for model 9119-590, 9406-595, and 9119-595 ¹⁴	
<p>Note:</p> <ol style="list-style-type: none"> Doors are not installed during product shipment to the customer. Refer to Approximate system weights by configuration for the approximate weight of your system configuration. Inrush currents occur only at initial application of power (short duration for charging capacitors). No inrush currents occur during the normal power off-on cycle. When an IBM-approved vapor bag and desiccant packets are used to protect the system, the storage specifications are valid for 6 months and the shipping specifications are valid for 1 month. Otherwise, storage and shipping specifications are valid for two weeks each. For the 8-way, 16-way, and 32-way processor configurations, the upper limit of the dry bulb temperature must be derated 1 degree C (1.8 degrees F) per 219 m (719 ft.) above 1295 m (4250 ft.). Maximum altitude is 3048 m (10000 ft.). For the 48-way and 64-way configurations, the upper limit of the dry bulb temperature must be derated 1 degree C (1.8 degrees F) per 210 m (688 ft.) above 1295 m (4250 ft.). Maximum altitude is 2133 m (7000 ft.). L_{WAd} is the upper-limit A-weighted sound level; L_{pAM} is the mean A-weighted sound pressure measured at the 1-meter bystander positions; 1 B = 10 dB. Dual power and power cords are standard on the Model 9119-590, 9406-595, and 9119-595. For maximum availability, each of the power cords should be fed from independent power grids. For specific configuration weights, see “Approximate system weights by configuration” on page 143. The feature code 7960 (Compact Handling Option) allows the processor or expansion frame to pass through doors that are less than 2.0 m (79.5 in.). The top 8U section of the frame, including the power subsystem, is removed at the factory and shipped separately for installation at the customer location. The height of the rack with the upper section removed is approximately 1.65 m (65 in.). Shipping dimensions are indicated for each frame. Each frame is shipped separately. See “Approximate system weights by configuration” on page 143 for detailed information on weights based on configuration. Attention: Your server installation may be subject to government regulations (such as those prescribed by OSHA or European Community Directives that cover noise level exposure in the workplace. The model 9119-590, 9119-595, and 9406-595 is available with an optional acoustical door feature that can reduce the likelihood of exceeding noise level exposure limits for densely populated racks. The actual sound pressure levels in your installation will depend on a variety of factors, including the number of racks in the installation; the size, materials, and configuration of the room where the racks are installed; the noise levels from other equipment; the room ambient temperature, and employees’ location in relation to the equipment. It is recommended that a qualified person, such as an industrial hygienist, be consulted to determine whether the sound pressure levels to which employees may be exposed exceed regulatory limits. The 9406-595 has a maximum of four 7040-61D 24-inch I/O drawers in the primary processor rack. It does not support a double or secondary rack The 9406-595 does not support internal battery backup. The cabling requirements of the model 595 limit the distance between the server frame and a separately powered I/O frame. See “Special requirements for model 595 cabling” on page 451 for details. All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296. 	

To effectively plan for the model 9119-590, 9406-595, and 9119-595, the following topics are also provided.

- “Breaker rating and cord information” on page 106
- “Power cord features” on page 106
- “Doors and covers” on page 107
- “Plan views” on page 108
- “Raised-floor requirements and preparation” on page 110
- “Cut and place floor panels” on page 111
- “Secure the rack” on page 112

- “Position the rack” on page 113
- “Install the frame tie-down kit” on page 113
- “Attach the rack to a concrete (nonraised) floor” on page 113
- “Attach the rack to a short-raised or long-raised floor” on page 116
- “Considerations for multiple system installations” on page 124
- “Service clearances” on page 127
- “Total system power consumption” on page 133
- “Cooling requirements” on page 135
- “Moving the system to the installation site” on page 138
- “Phase imbalance and BPR configuration” on page 139
- “Balancing power panel loads” on page 140
- “Power cord configurations” on page 141
- “Dual power installation” on page 143
- “Approximate system weights by configuration” on page 143
- “Weight distribution” on page 146
- “Unit emergency power off” on page 149
- “Computer room emergency power off” on page 150
- “Machine holdup times” on page 151

Breaker rating and cord information

Use the Breaker rating and cord information table to determine the circuit breaker rating for the power cords used with your server.

Table 32. Breaker rating and cord information

3-phase supply voltage (50/60 Hz)	200-240 V	200-240 V	380-415 V	480 V
Recommended customer-circuit-breaker rating (see Note below)	60 A (60-A plug) or 80 A (100-A plug)	63 A (no plug)	32 A (no plug)	30 A (30A plug)
Cord information	1.8 m (6 ft.) and 4.3 m (14 ft.) 6 AWG power cord (60-A plug), or 1.8 m (6 ft.) and 4.3 m (14 ft.) 6 AWG power cord (100-A Plug)	14 foot, 6 AWG power cord, (electrician installed)	14 foot, 8 AWG power cord, (electrician installed)	6 and 14 foot, 8AWG power cord (30A plug)
Recommended receptacle	IEC309, 60 A, type 460R9W (not provided) or IEC309, 100A, type 4100R9W (not provided)	Not specified, electrician installed	Not specified, electrician installed	IEC309, 30 A, type 430R7W (not provided)
Note: <ol style="list-style-type: none"> 1. The exact circuit breaker ratings may not be available in all countries. Where the specified circuit breaker ratings are not acceptable, use the nearest available rating. Use of a time delayed circuit breaker is recommended. Use of a GFI circuit breaker is not recommended. 2. When possible, use metal backbox with power cords using IEC-309 plugs. 				

Power cord features

Use the Power cord features table to view the power cord specifications available for your server.

The following three-phase power cord features are available for the three-phase model 9119-590, 9406-595, and 9119-595:

Table 33. Power cord features

Supply type	Nominal voltage range (V ac)	Voltage tolerance (V ac)	Frequency range (Hz)
Two redundant three-phase power cords	200-480	180-509	47-63
Feature code	Description	Voltage (V ac)	Plug
8697	Power cord, 8 AWG, 4.3 m (14 ft.)	480	IEC309 30 A plug
8698	Power cord, 8 AWG, 1.8 m (6 ft.)	480	IEC309 30 A plug
8688	Power cord, 6 AWG, 4.3 m (14 ft.)	200-240	IEC309 60 A plug
8689	Power cord, 6 AWG, 1.8 m (6 ft.)	200-240	IEC309 60 A plug
8686	Power cord, 6 AWG, 4.3 m (14 ft.)	200-240	IEC309 100 A plug
8687	Power cord, 6 AWG, 1.8 m (6 ft.)	200-240	IEC309 100 A plug
8694 ¹	Power cord, 6 AWG, 4.3 m (14 ft.)	380-415	no plug
8677 ¹	Power cord, 8 AWG, 4.3 m (14 ft.)	380-415	no plug
Note: 1. These power cords are shipped without a plug or receptacle. An electrician may be required to install the plug and receptacle to meet applicable country or region electrical codes.			

Doors and covers

Doors and covers are an integral part of the system and are required for product safety, proper airflow and cooling, and electromagnetic compatibility compliance.

The following rear door options are available for your server:

- Enhanced acoustical cover option

This feature provides a low-noise option for customers or sites with stringent acoustical requirements and where a minimal system footprint is not critical. The acoustical cover option consists of a special front and rear doors that are approximately 250 mm (10 in.) deep and contain acoustical treatment that lowers the noise level of the machine by approximately 7 dB (0.7 B) compared to the slimline doors. This reduction in noise emission levels means that the noise level of a single model system with slimline covers is about the same as the noise level of five model systems with acoustical covers.

- Slimline cover option

This feature provides a smaller-footprint and lower-cost option for customers or sites where space is more critical than acoustical noise levels. The slimline cover option consists of a front door, which is approximately 100 mm (4 in.) deep, and a rear door, which is approximately 50 mm (2 in.) deep. No acoustical treatment is available for this option.

- Rear Door Heat Exchanger for 7014-T42 option

The Heat Exchanger is a water-cooled device that mounts on the rear of the IBM 19-inch and 24-inch racks to cool the air that is heated and exhausted by devices inside the rack. A supply hose delivers chilled, conditioned water to the Heat Exchanger. A return hose delivers warmed water back to the water pump or chiller. Each Heat Exchanger can remove up to 50 000 Btu (or approximately 15 000 watts) of heat from your data center. For detailed information on preparing your data center for using

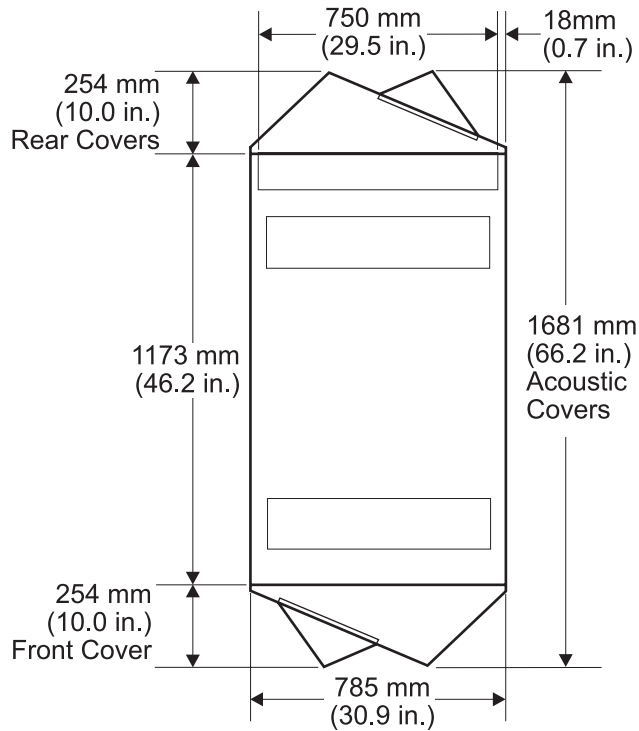
the Heat Exchanger, see Planning for the installation of rear door heat exchangers. For detailed information about installing a heat exchanger on your rack, see Installing the IBM rear door heat exchanger.

Note: For declared levels of acoustical noise emissions, refer to Acoustical noise emissions.

Plan views

Dimensional planning information is shown in this top down view of your server.

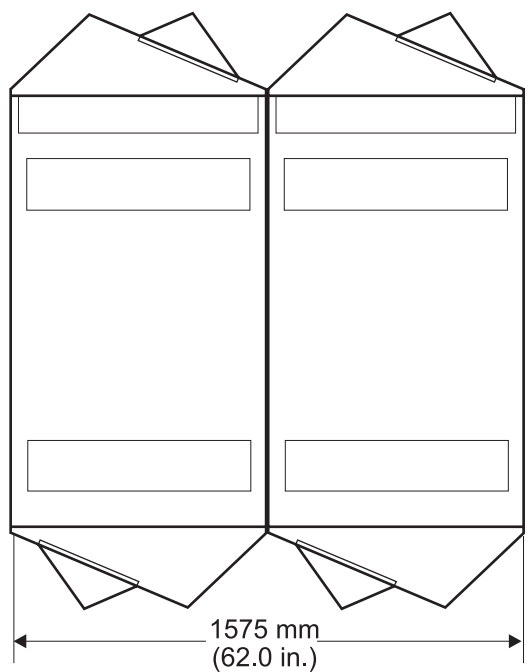
The following figure shows dimensional planning information for single-frame systems.



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Figure 33. Plan view for single-frame systems with acoustical doors

The following figure shows dimensional planning information for double-frame systems.



IPHAD906-0

Figure 34. Plan view for double-frame systems with acoustical doors

Attention: When moving the rack, note the caster swivel diameters shown in the following figure. Each caster swivels in an approximate 130 mm (5.1 inch) diameter.

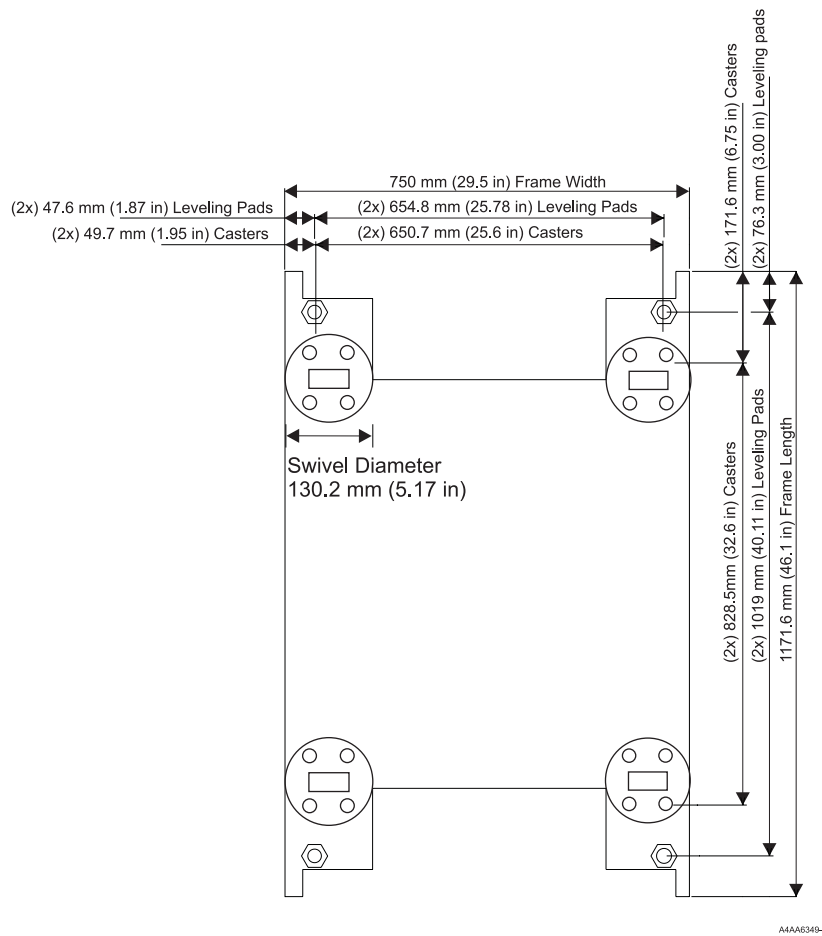


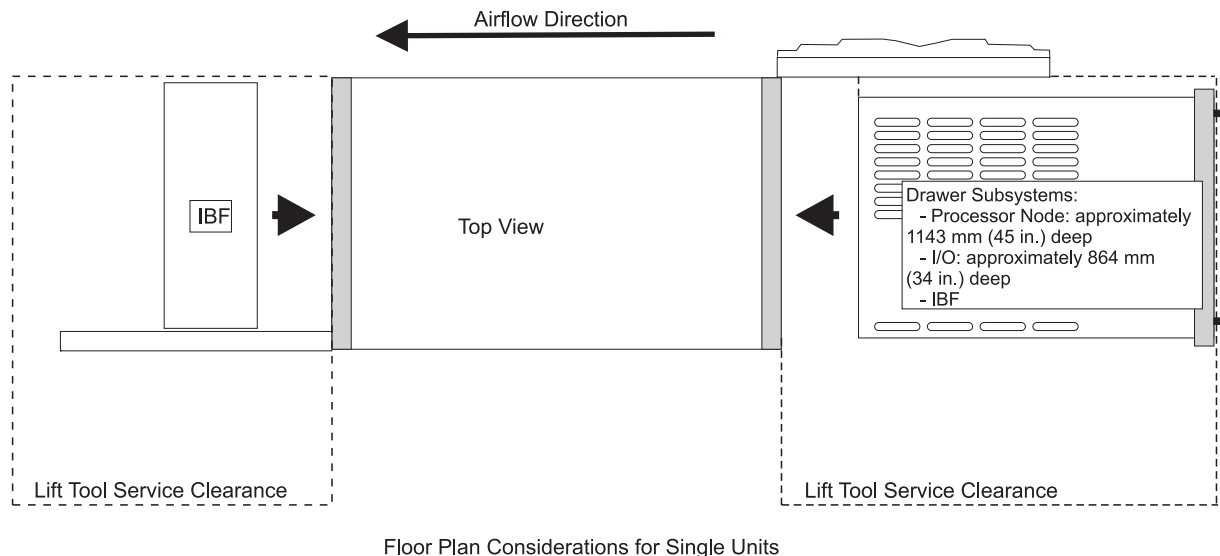
Figure 35. Leveling foot and frame dimensions

Raised-floor requirements and preparation

A raised floor is required for the model 9119-595, 9406-595, and its associated racks to ensure optimal performance and to comply with electromagnetic compatibility requirements.

A raised floor is not required for the model 9119-590, but it is recommended for optimum system cooling and cable management. Raised-floor cutouts should be protected by electrically nonconductive molding, appropriately sized, with edges treated to prevent cable damage and to prevent casters from rolling into the floor cutouts.

Front-service access is necessary on the model 9119-590, 9406-595, and 9119-595 to accommodate a lift tool for the servicing of large drawers (the processor books and I/O drawers). Front and rear service access is necessary to accommodate the lift tool for servicing of the optional integrated battery backup.



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Figure 36. Floor plan considerations for single units

Cut and place floor panels

These guidelines specify how to make the necessary openings in the raised floor for installing your server.

Use the following procedure to cut and place floor panels in the raised floor. The x-y alphanumeric grid positions are used to identify relative positions of cutout floor panels that may be cut in advance.

1. Measure the panel size of the raised floor.
2. Verify the floor panel size. The floor panel size illustrated is 600 mm (23.6 in.) and 610 mm (24 in.) panels.
3. Ensure adequate floor space is available to place the frames over the floor panels exactly as shown in the figure. For front-to-back and side-to-side clearances, refer to “Considerations for multiple system installations” on page 124. Use the plan view, if necessary. Consider all obstructions above and below the floor.
4. Identify the panels needed, and list the total quantity of each panel required for the installation.
5. Cut the required quantity of panels. When cutting the panels, you must adjust the size of the cut for the thickness of the edge molding you are using. The dimensions shown in the figures are finished dimensions. For ease of installation, number each panel as it is cut, as shown in the following figure.

Note: Depending on the panel type, additional panel support (pedestals) may be required to restore structural integrity of the panel. Consult the panel manufacturer to ensure that the panel can sustain a concentrated load of 476 kg (1050 lb). For multiple frame installation, it is possible that two casters will produce loads as high as 953 kg (2100 lb).

6. Use Figure 37 on page 112 to install the panels in the proper positions.

Note:

- a. This floor-tile arrangement is recommended so that the casters or leveling pads are placed on separate floor tiles to minimize the weight on a single floor tile. Furthermore, we recommend that tiles bearing the weight (having casters or leveling pads on the tiles) be uncut to retain the strength of the floor tile.

- b. The following figure is intended only to show relative positions and accurate dimensions of floor cutouts. The figure is not intended to be a machine template and is not drawn to scale.

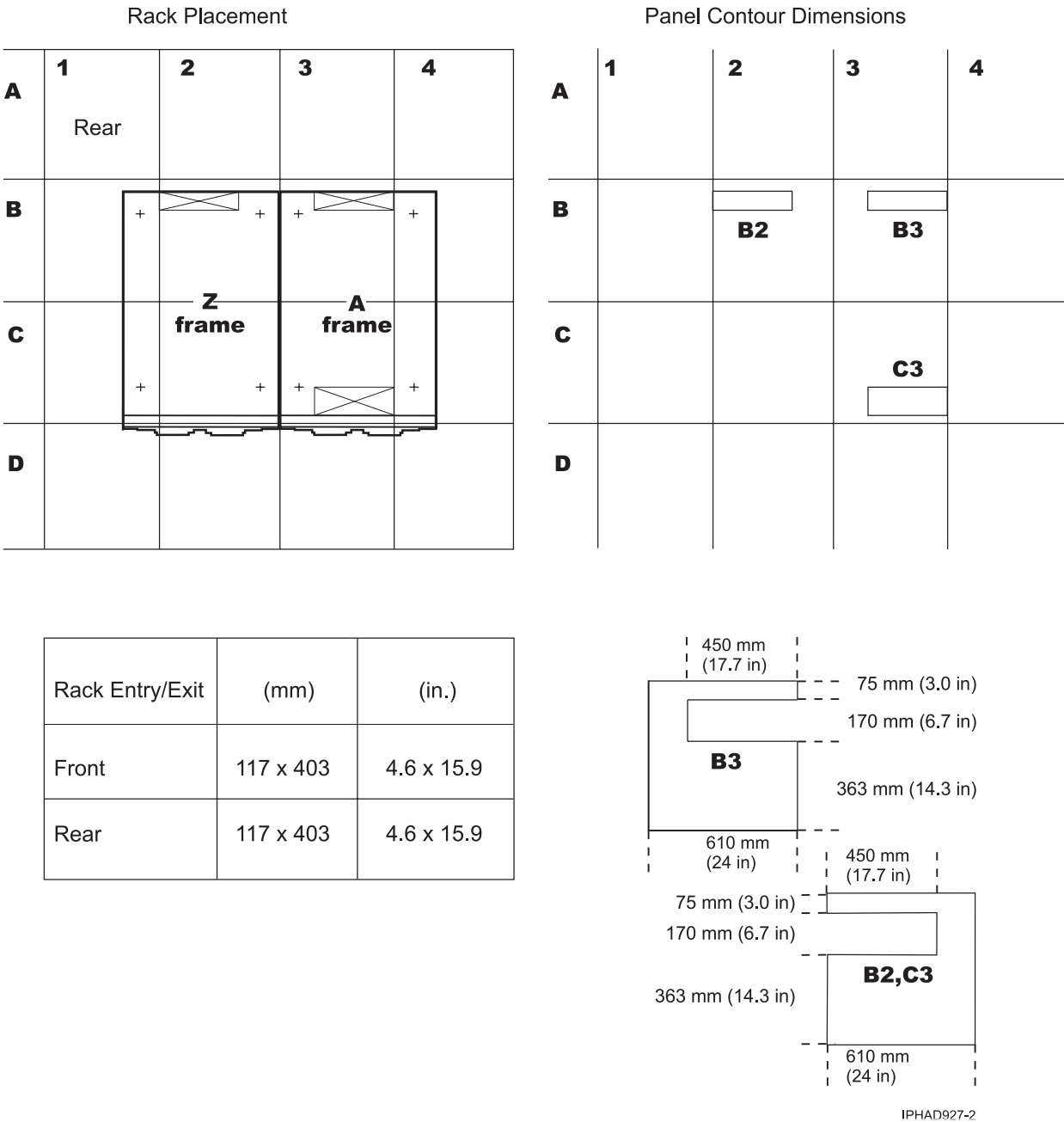


Figure 37. Raised floor with 610 mm (24 in.) floor panels figure

Secure the rack

Securing your rack to a concrete (nonraised) floor or to a raised floor prevents movement when vibrations occur.

Note: Securing the rack is an optional procedure. See Vibration and shock for more information..

The following can be ordered by the customer as additional rack-securing options for the model 9119-590, 9406-595, and 9119-595.

- RPQ 8A1183 for attaching the rack-mounting plates to the concrete floor (nonraised floor)
- RPQ 8A1185 to attach the rack to a concrete floor when on a raised floor 241 mm to 298.5 mm (9.5 in. to 11.75 in. high)
- RPQ 8A1186 to attach the rack to a concrete floor when on a raised floor 298.5 mm to 406.4 mm (11.75 in. to 16 in. high)

Before the service representative can perform the tie-down procedure, you must complete the floor preparation described in “Cut and place floor panels” on page 111 and the procedures described in “Attach the rack to a concrete (nonraised) floor” or “Attach the rack to a short-raised or long-raised floor” on page 116.

Install the frame tie-down kit

This procedure describes how to install a frame tie-down kit and floor tie-down hardware.

The following procedures describe how to install a frame tie down kit and floor tie-down hardware to secure an IBM rack to a concrete floor beneath a 228.6 mm to 330.2 mm (9 in. to 13 in. depth) or a 304.8 mm to 558.8 mm (12 in. to 22 in. depth) raised-floor environment or to a nonraised floor.

- “Position the rack”
- “Attach the rack to a concrete (nonraised) floor”
- “Attach the rack to a short-raised or long-raised floor” on page 116

Position the rack:

Use this procedure to unpack and position your rack.

To unpack and position the rack, do the following:

Note: Before attempting to position the rack, see “Moving the system to the installation site” on page 138.

1. Remove all packing and tape from the rack.
2. Place the last floor covering exactly adjacent and in the front of the final installation location.
3. Position the rack according to the customer floor plan.
4. Lock each caster wheel by tightening the thumbscrew on the caster.

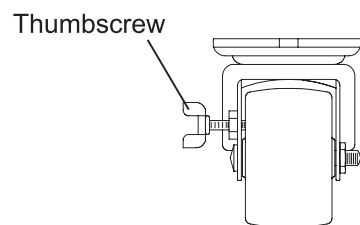


Figure 38. Caster thumbscrew

5. While moving the system to its final installed location and during relocation, it may be necessary to lay down floor covering, such as Lexan sheets, to prevent floor panel damage.

Attach the rack to a concrete (nonraised) floor

Use this procedure to attach the rack to a concrete (nonraised) floor.

Attention: It is the customer's responsibility to ensure the following steps are completed before the service representative performs the tie-down procedure.

Note: The customer should obtain the service of a qualified structural engineer to determine appropriate anchoring of the mounting plates. A minimum of five anchor bolts for each mounting plate must be used to secure the plates to the concrete floor. Because some of the drilled holes may be aligned with concrete reinforcement rods below the surface of the concrete floor, additional holes must be drilled. Each mounting plate must have at least five usable holes, two that are on the right-hand sides and the other two are on opposite ends, and one hole at the center. The mounting plates should be able to withstand 1134 kg (2500 lb.) pulling force on each end.

1. Be sure the rack is in the correct location. To ensure that the holes are in the correct location, the diagonal distance of the center of the holes should be 1211.2 mm (47.7 in.). The distance between the center holes to the center of the next holes should be 654.8 mm (25.8 in.) (the side-to-side distance) and 1019 mm (40.1 in.) (the front-to-back distance).

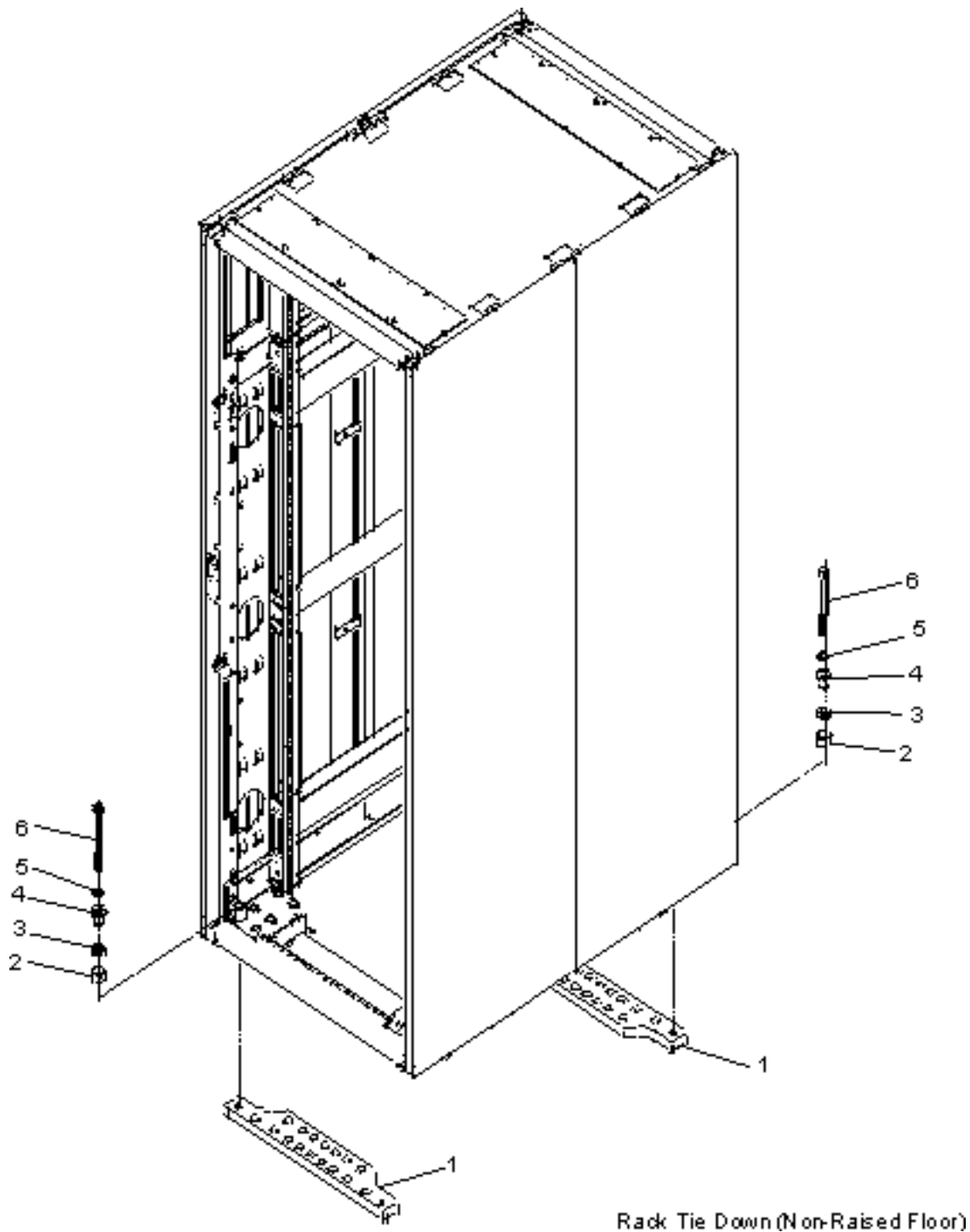


Figure 39. Rack tie down (nonraised floor)

2. Place the mounting plates (item 1 in Figure 39), front and rear, in the approximate mounting position under the system rack.
3. To align the mounting plates to the system rack, do the following:
 - a. Place the four rack-mounting bolts (item 6 in Figure 39) through the plate assembly holes at the bottom of the rack. Install the bushings and washers (item 4 and 5 in Figure 39) to ensure bolt positioning.

- b. Position the mounting plates (item 1 in Figure 39 on page 115) under the four rack-mounting bolts (item 6 in Figure 39 on page 115) so that the mounting bolts are centered directly over the tapped holes.
- c. Turn the rack-mounting bolts (item 6 in Figure 39 on page 115) three or four rotations into the tapped holes.

-
- Technical drawing showing the rear and front views of a rack, detailing mounting plate bolt locations and dimensions.
- Dimensions:**
- Top View (Rear):**
 - Overall width: 709.8 mm REF (27.97 in)
 - Overall height: 1019 mm (40.15 in)
 - Mounting plate width: 27.5 mm (1.08 in)
 - Mounting plate height: 2.58 in
 - Mounting plate bolt pattern: (10) x 65.5 mm
 - Mounting plate bolt spacing: 2.58 in
 - Mounting plate bolt size: (32) x 21 mm REF (.83 in)
 - Mounting plate bolt locations: (2) x 53.7 mm (2.12 in)
 - Mounting plate bolt size: (4) x 13 mm UNC REF (.51 in)
 - Mounting plate bolt spacing: 20.1 mm (.79 in)
 - Mounting plate bolt size: (2) x 2.9 mm (.11 in)
 - Front View:**
 - Overall height: 1070 mm REF (42.16 in)
 - Mounting plate width: 27.5 mm (1.08 in)
 - Mounting plate height: 2.58 in
 - Mounting plate bolt pattern: (10) x 65.5 mm
 - Mounting plate bolt spacing: 2.58 in
 - Mounting plate bolt size: (32) x 21 mm REF (.83 in)
 - Mounting plate bolt locations: (2) x 53.7 mm (2.12 in)
 - Mounting plate bolt size: (4) x 13 mm UNC REF (.51 in)
 - Mounting plate bolt spacing: 20.1 mm (.79 in)
 - Mounting plate bolt size: (2) x 2.9 mm (.11 in)
- Labels:**
- CASTER
 - Rear
 - Mounting Plate
 - CASTER
 - Rack
 - Front
 - CASTER
 - Mounting Plate
- Mounting Plate Bolt Locations**

5. Remove the mounting bolts from the threaded holes.
6. Move the rack away from the mounting plates.
7. Mark the floor at the center of each hole in the mounting plate (including tapped holes).
8. Remove the mounting plates from the marked locations.
9. At the marked location of the tapped mounting holes, drill two holes approximately 19 mm (.75 in.) to allow clearance for the ends of the two rack-mounting bolts. The ends of the rack-mounting bolts may protrude past the thickness of the mounting plate. Drill one hole in each group of anchor bolt location marks as indicated on the marked floor.
10. Using at least five heavy-duty-concrete anchoring bolts for each mounting plate, mount the mounting plates to the concrete floor.

Use these steps to attach your rack to a short-raised or long-raised floor.

Use the following to determine your next step:

1. If the rack is being attached to a short depth raised floor environment 228.6 mm to 330.2 mm (9 in. to 13 in. depth) install the Raised Floor Tie Down Kit (Part number 16R1102) described in the following table.

Table 34. Raised Floor Tie Down Kit (Part number 16R1102)

9" - 13" Raised Floor Tie Down Kit (Part number 16R1102)			
Item	Part Number	Quantity	Description
1	44P3438	1	Wrench
2	44P2996	2	Stabilizer bar
3	44P2999	4	Turnbuckle Assembly

2. If the rack is being attached to a deep raised floor environment 304.8 mm to 558.8 mm (12 in. to 22 in. depth) install the Raised Floor Tie Down Kit (Part number 16R1103) described in the following table.

Table 35. Raised Floor Tie Down Kit (Part number 16R1103)

Raised Floor Tie Down Kit (Part number 16R1103)			
Item	Part Number	Quantity	Description
1	44P3438	1	Wrench
2	44P2996	2	Stabilizer bar
3	44P3000	4	Turnbuckle Assembly

It is the customer's responsibility to ensure the following steps are completed before the service representative performs the tie-down procedure.

Note: To accommodate a floor with a depth of more than 558.8 mm (22 in.), a steel beam or a steel channel adapter for mounting the subfloor eyebolts are required. The customer must supply the floor eyebolts.

Consider the following when preparing the floor for tie-down:

- The hardware is designed to support a frame weighing no more than 1429 kg (3150 lb.).
- The estimated maximum concentrated load on one caster for a 1429 kg (3150 lb.)-system is 476.3 kg (1050 lb.). For a multiple system installation, it is possible that one floor tile will bear a total concentrated load of 952.5 kg (2100 lb.).

To install the eyebolts, do the following:

1. Obtain the service of a qualified structural engineer to determine appropriate installation of the eyebolts.
2. Consider the following before installing the eyebolts:
 - Floor eyebolts must be securely anchored to the concrete floor.
 - For a single frame installation, four 1/2-in. diameter by 13-inch subfloor eyebolts should be secured to the subfloor.
 - The minimum height of the center of the internal diameter is 2.54 mm (1 in.) above the concrete floor surface.
 - The maximum is height 63.5 mm (2.5 in.) above the concrete floor surface. Higher than 2.5 inches can cause excessive lateral deflection to the tie-down hardware.
 - The eyebolt's internal diameter should be 1-3/16 inch, and each eyebolt should be able to withstand 1224.7 kg (2700 lb). The customer should obtain the service of a qualified consultant or structural engineer to determine the appropriate anchoring method for these eyebolts and to ensure that the raised floor and the building can support the floor-loading specifications.

- To ensure that the holes are in the correct location, the diagonal distance of the center of the holes should be 1211.2 mm (47.7 in.). The distance between the center holes to the center of the next holes should be 654.8 mm (25.8 in.) (the side to side distance) and 1019 mm (40.1 in.) (the front to back distance)

3. Verify that the four eyebolts are positioned to match the dimensions is given in the following figures.

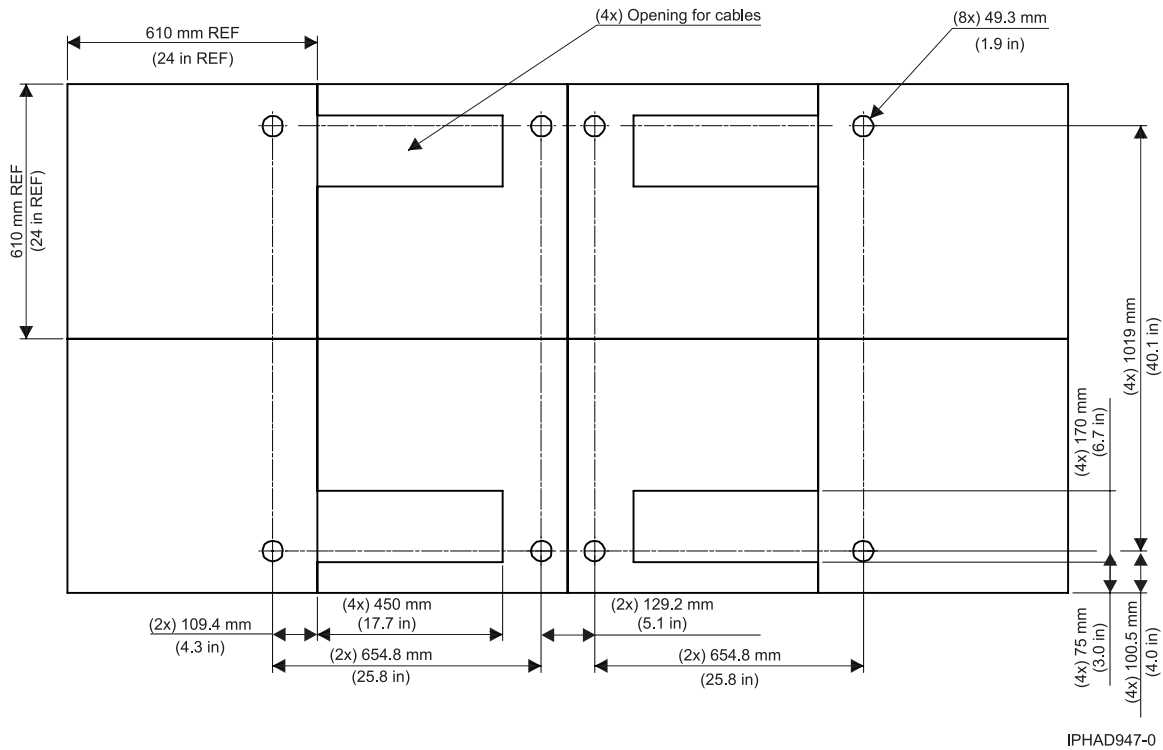


Figure 41. Eyebolt positioning for 610 mm (24 in.) floor tile layout

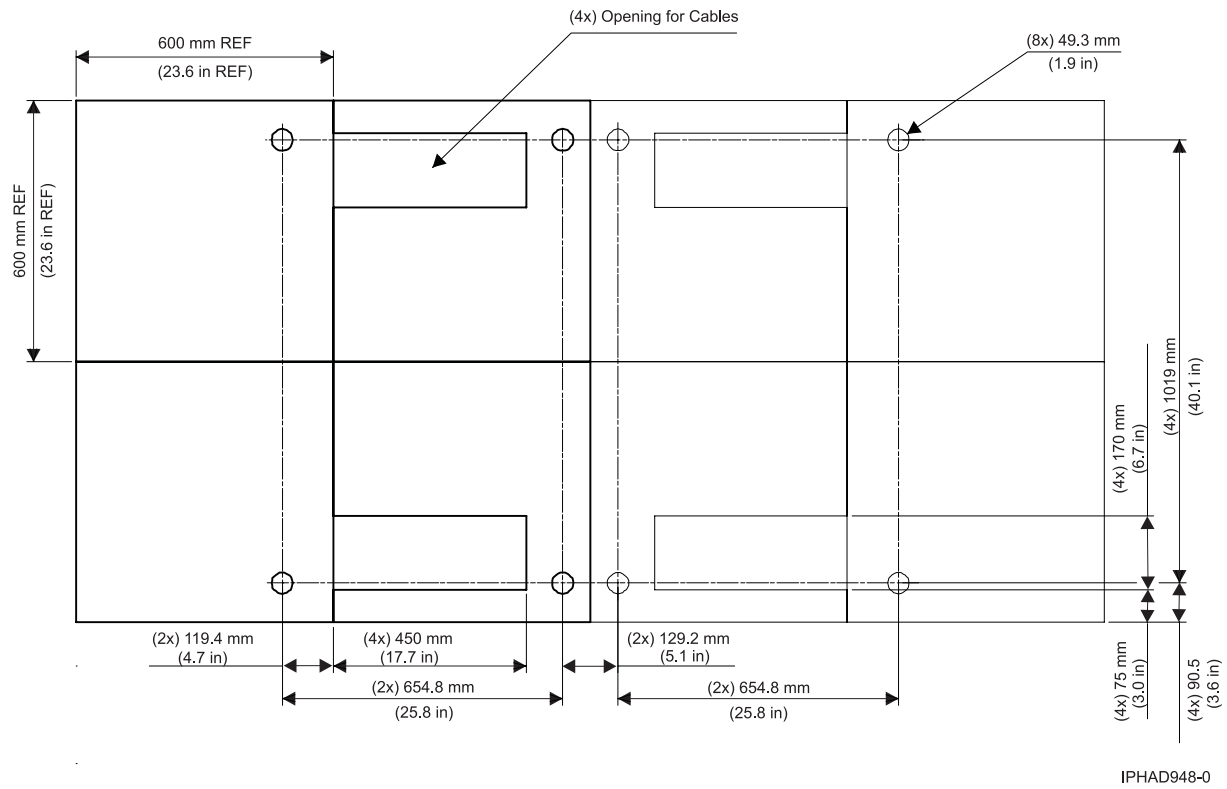
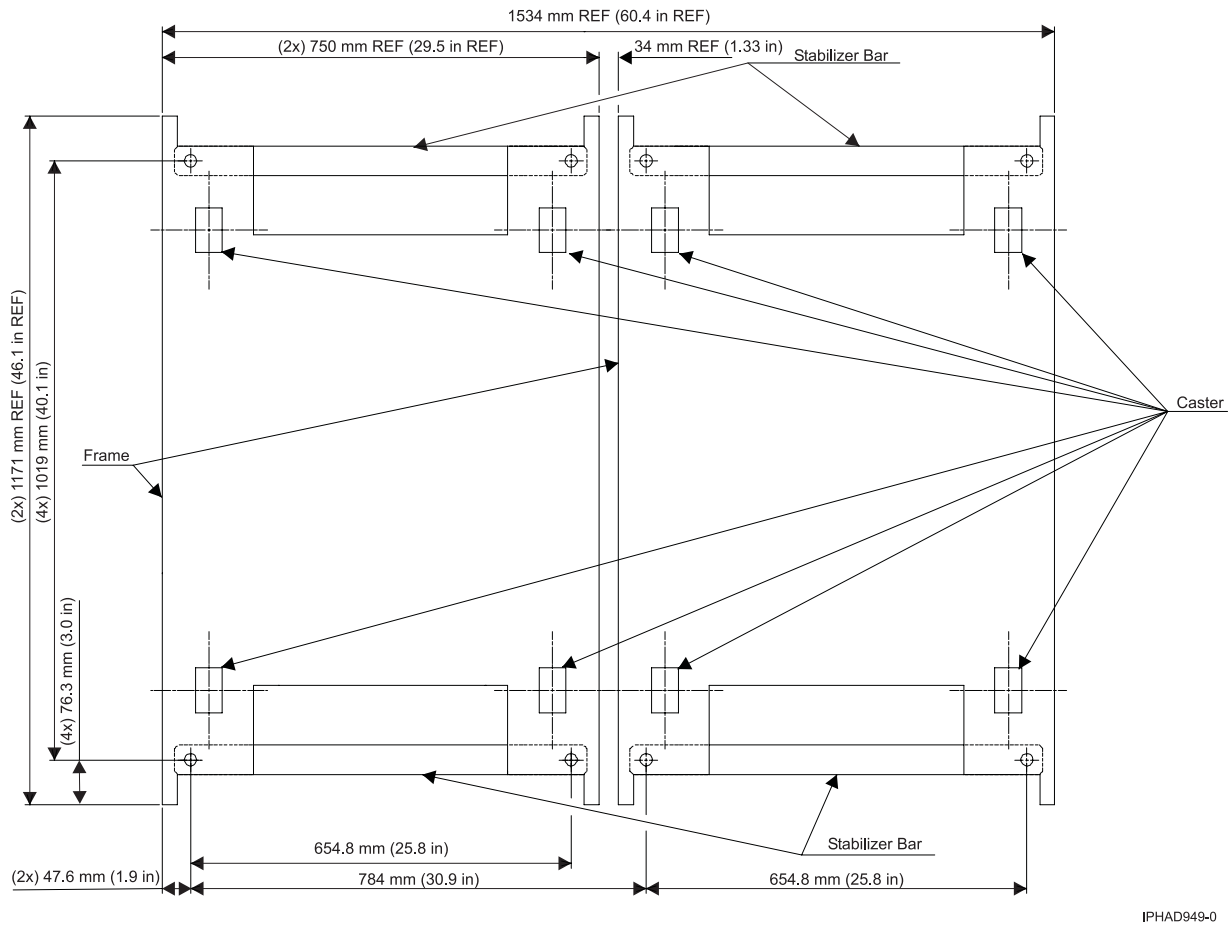


Figure 42. Eyebolt positioning for 600 mm (23.6 in.) floor tile layout



IPHAD949-0

Figure 43. Stabilizer bar layout (top view)

4. Install the eyebolts to the floor. The service representative can now install the frame.

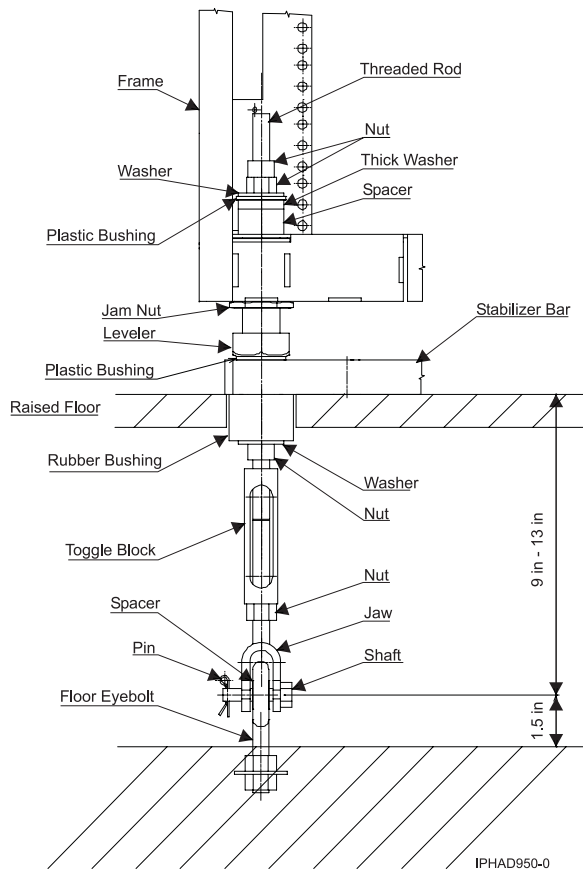


Figure 44. Turnbuckle assembly frame tie-down hardware for 228.6 mm to 330.2 mm (9 in. to 13 in.) raised floor (Part number 44P2999)

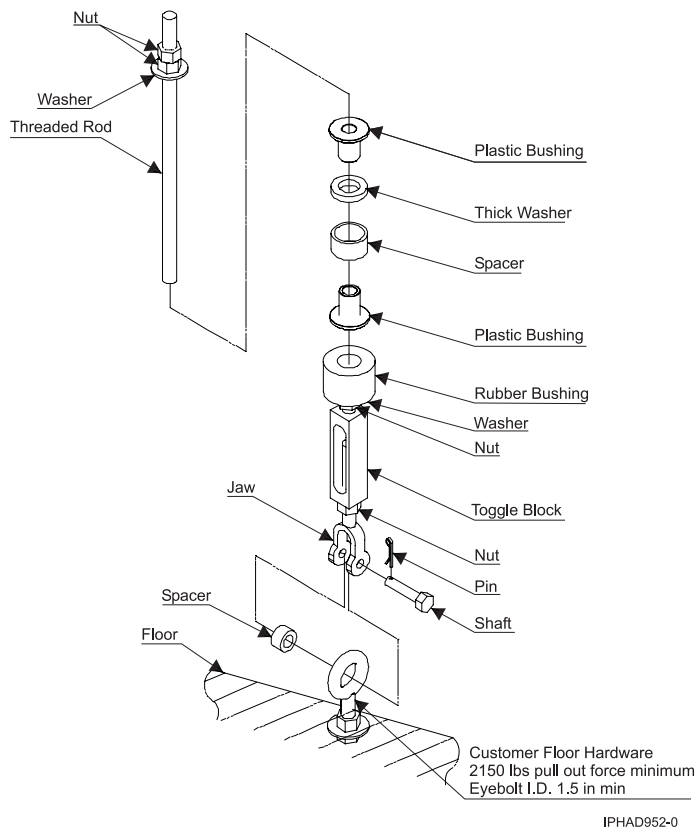


Figure 45. Turnbuckle assembly frame tie-down hardware for 228.6 mm to 330.2 mm (9 in. to 13 in.) raised floor (Part number 44P2999)

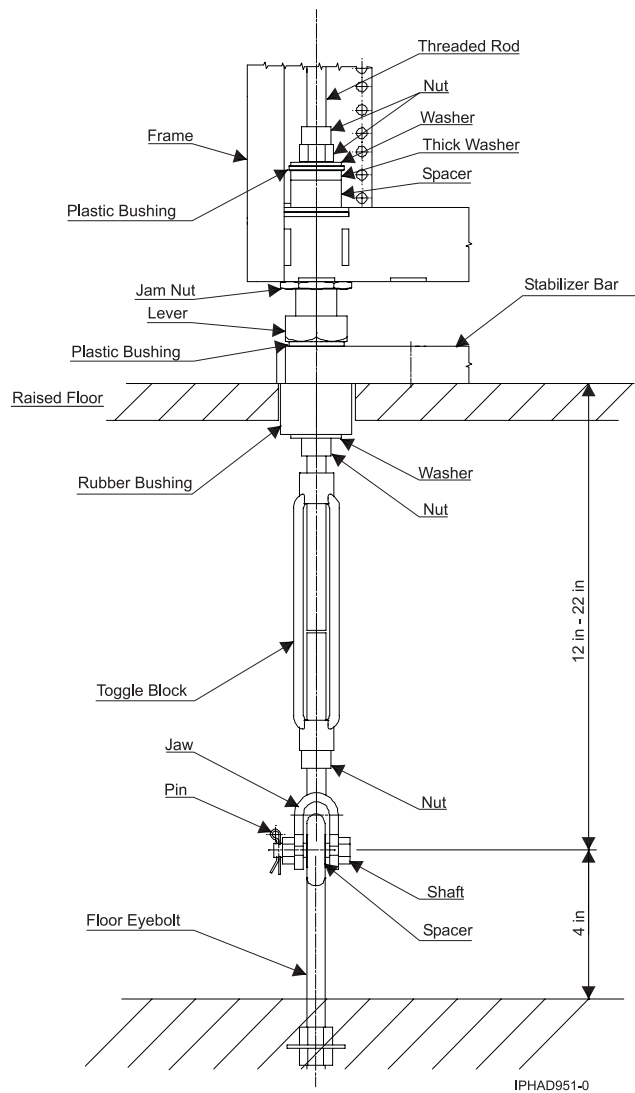


Figure 46. Turnbuckle assembly frame tie-down hardware for 304.8 mm to 558.8 mm (12 in. to 22 in.) raised floor (Part number 44P3000)

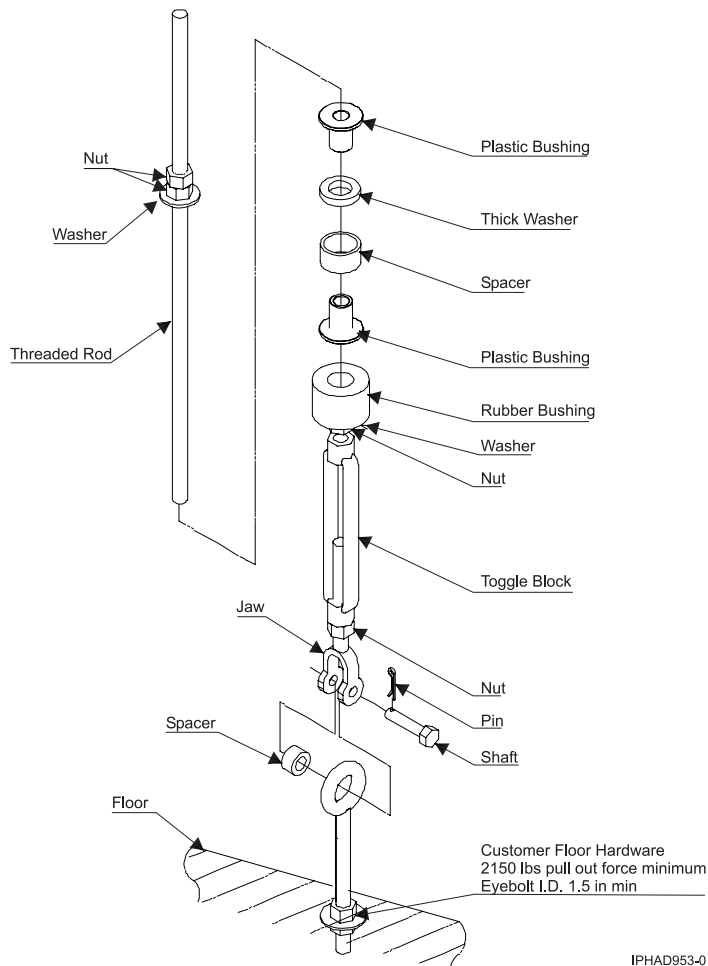


Figure 47. Turnbuckle assembly frame tie-down hardware for 304.8 mm to 558.8 mm (12 in. to 22 in.) raised floor (Part number 44P3000)

Considerations for multiple system installations

Learn about the installation requirements for a multiple server installation.

In a multi-frame installation, it is possible that a floor tile with cable cutouts (refer to “Cut and place floor panels” on page 111) will bear two concentrated static loads up to 476 kg (1050 lb.) per caster and leveler. Thus, the total concentrated load can be as high as 953 kg (2100 lb.). Contact the floor tile manufacturer or consult a structural engineer to ensure that the raised floor assembly can support this load.

When you are integrating a model 9119-590, 9406-595, and 9119-595 into an existing multiple-system environment, or when adding additional systems to an installed 9119-590, 9406-595, and 9119-595, consider the following factors:

- Minimum aisle width

For multiple rows of systems containing one or more model 9119-590, 9406-595, or 9119-595, the minimum aisle width in the front of the system is 1219 mm (48 in.) and 914 mm (36 in.) in the rear of the system to allow room to perform service operations. The front and rear service clearances should be at least 1219 mm (48 in.) and 914 mm (36 in.), respectively. Service clearances are measured from the edges of the frame (with doors open) to the nearest obstacle.

- Thermal interactions

Systems should be faced front-to-front and rear-to-rear to create "cold" and "hot" aisles to maintain effective system thermal conditions, as shown in the following figure.

Cold aisles need to be of sufficient width to support the airflow requirements of the installed systems as indicated in "Cooling requirements" on page 135. The airflow per tile will be dependent on the underfloor pressure and perforations in the tile. A typical underfloor pressure of 0.025 in. of water will supply 300-400 cfm through a 25 percent open 2 ft. by 2 ft. floor tile.

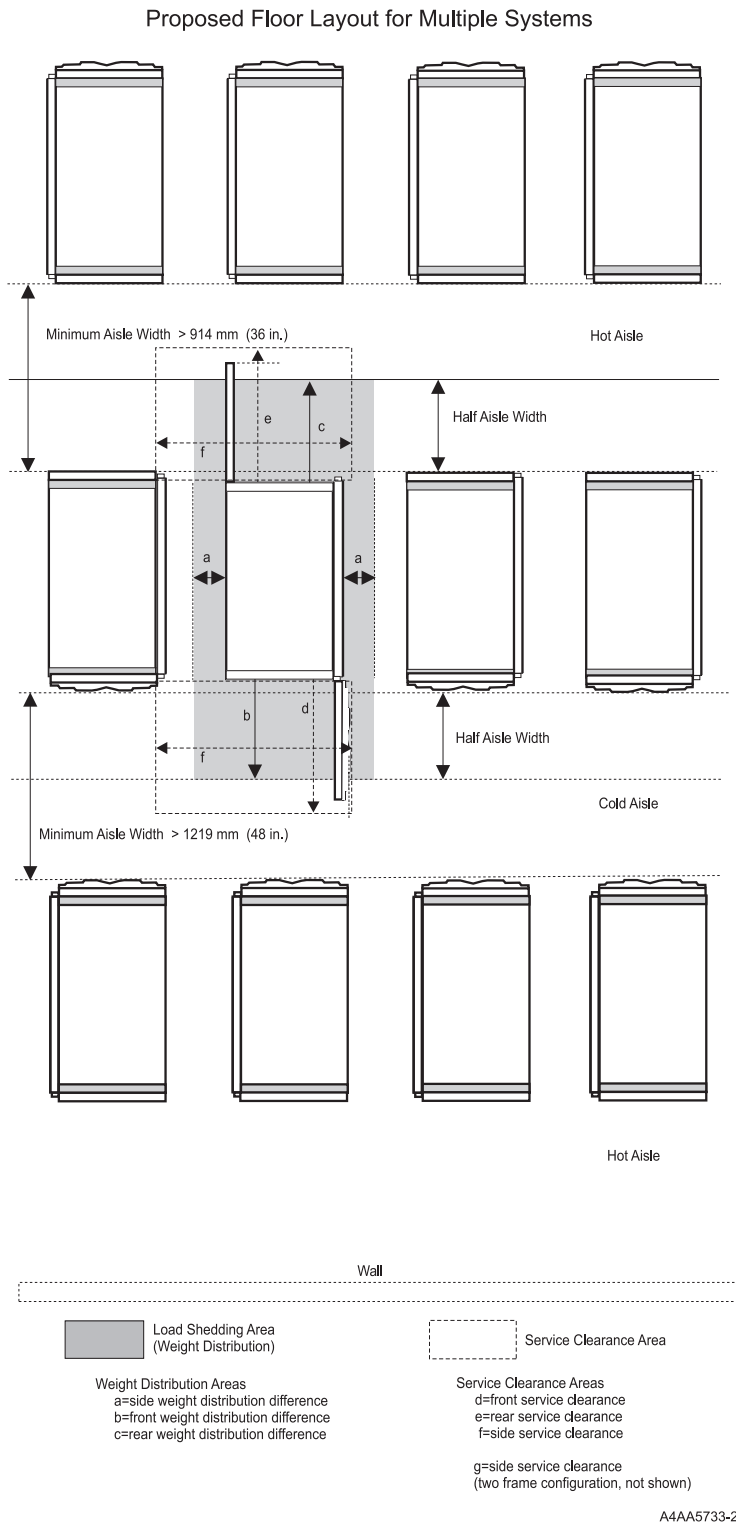


Figure 48. Proposed floor layout for multiple systems

Service clearances

The service clearance area is the area around the server that is needed for IBM service representatives to service the server.

The minimum service clearance for systems with slimline doors is shown in the following figures.

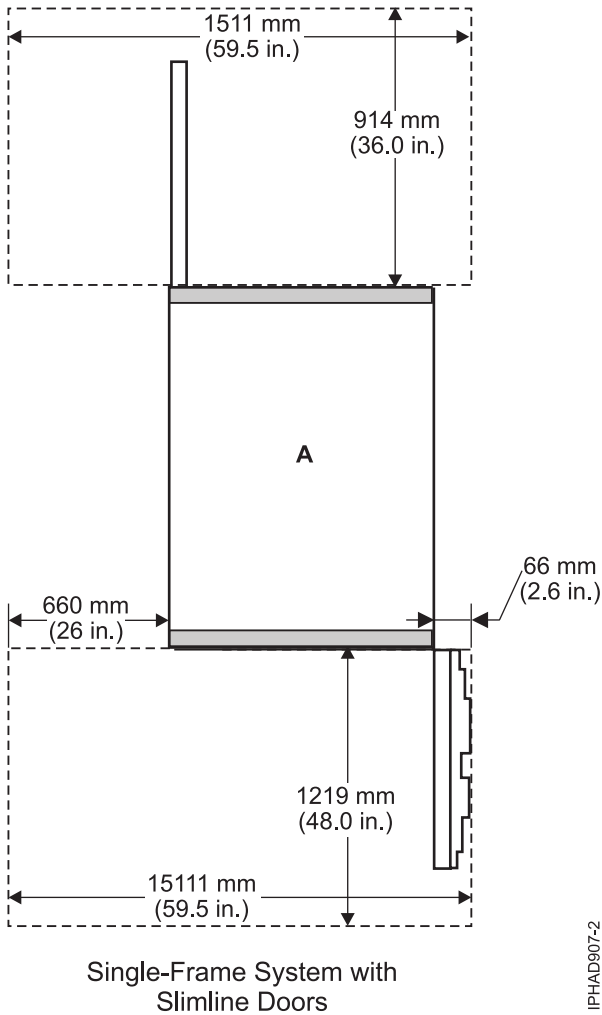


Figure 49. Service clearances for single frame systems with slimline doors

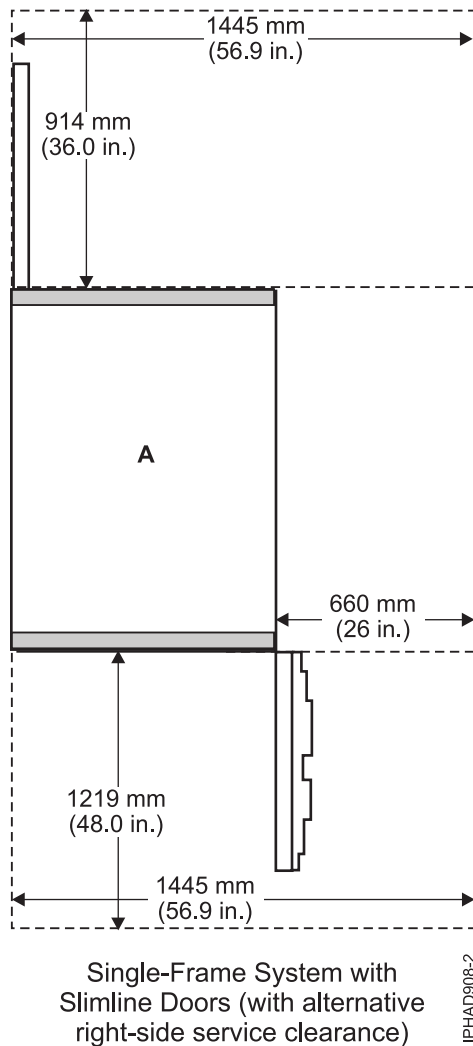
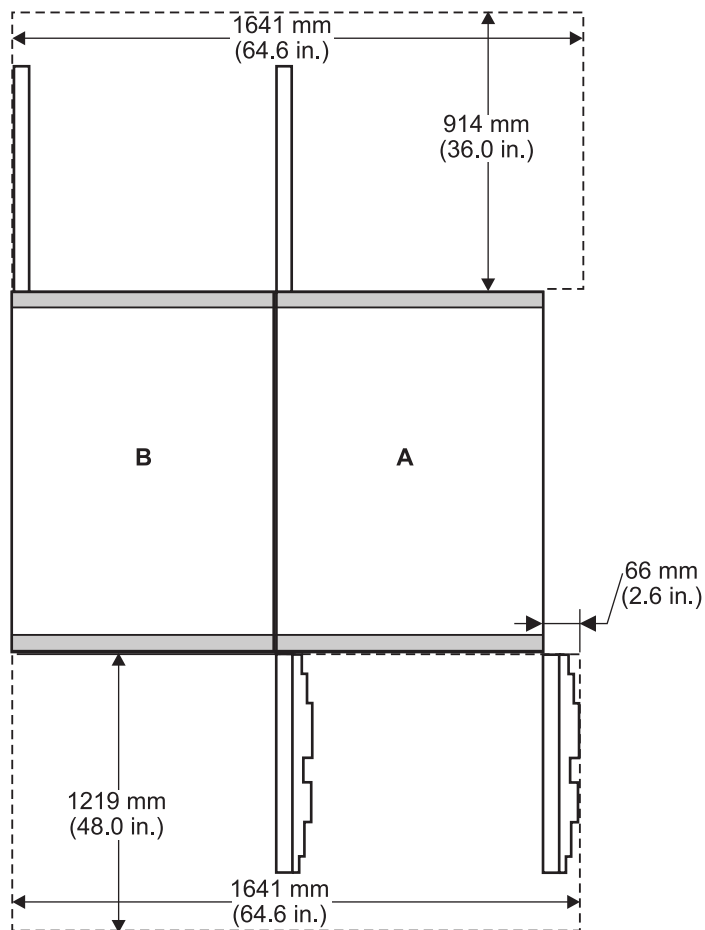


Figure 50. Service clearances for single frame systems with slimline doors (with alternative right-side service clearance)



Double-Frame System
with Slimline Doors

IPHAD909-0

Figure 51. Service clearances for double-frame systems with slimline doors

The minimum service clearance for systems with acoustical doors is shown in the following figures.

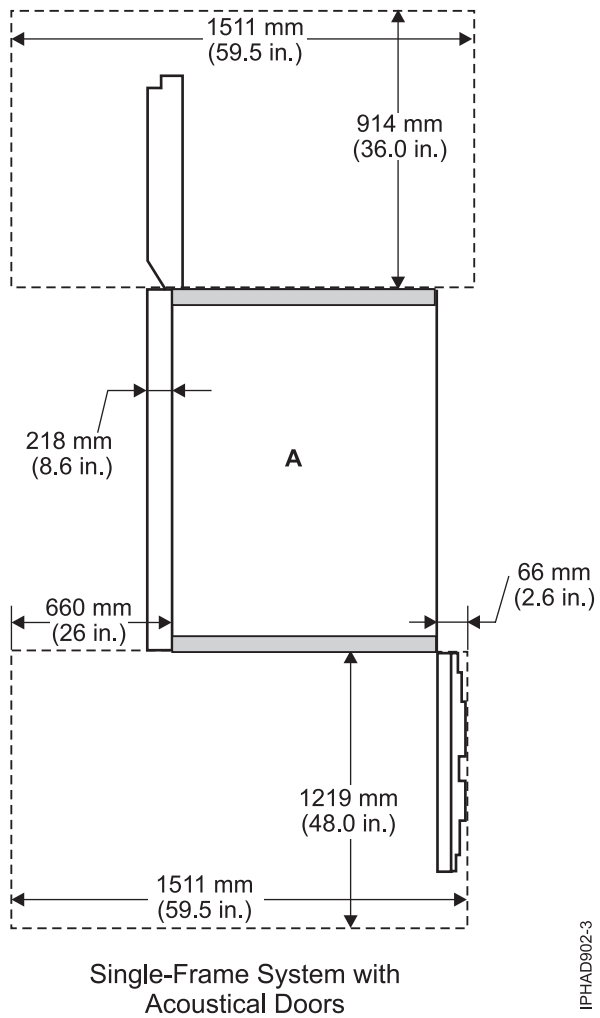
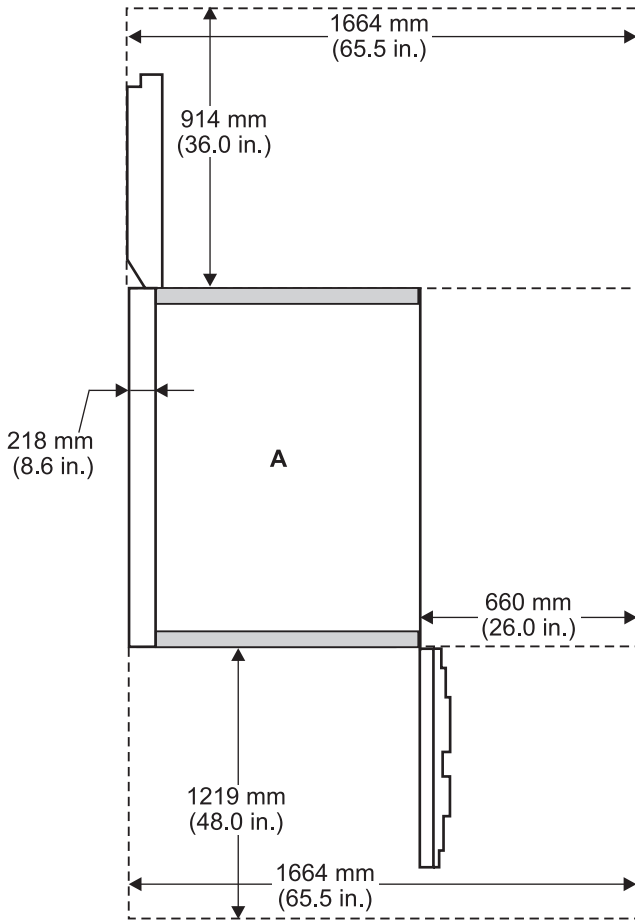


Figure 52. Service clearances for single-frame systems with acoustical doors



Single-Frame System with
Acoustical Doors (with
alternative right-side service
clearance)

IPHAD903-2

Figure 53. Service clearances for single-frame systems with acoustical doors (with alternative right-side service clearance)

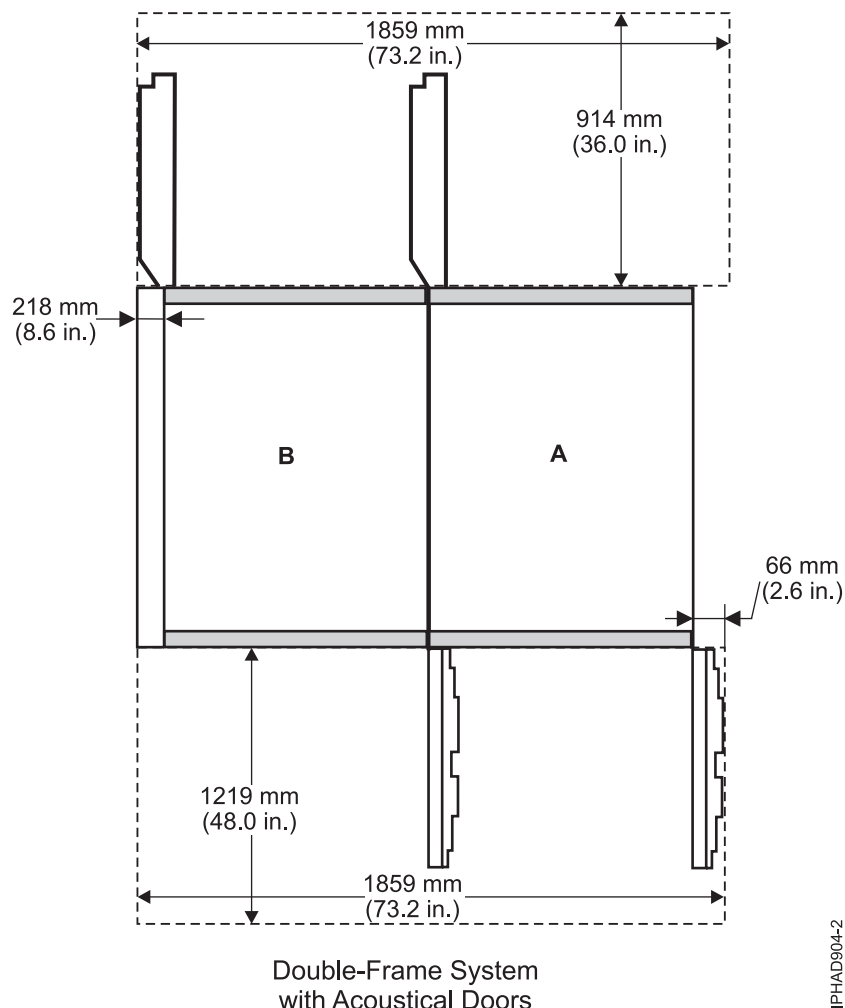


Figure 54. Service clearances for double-frame systems with acoustical doors

Refer to the figure in “Raised-floor requirements and preparation” on page 110 for service clearances shown in a raised-floor installation.

ASHRAE declarations

Use the ASHRAE declarations table and figures to determine the measurement reporting requirements defined in the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Thermal Guidelines for Data Processing Environments.

These guidelines are available at <http://tc99.ashraetcs.org> 

Table 36. ASHRAE declarations

Description	Typical Heat Release kW	Airflow nominal ¹		Airflow maximum ¹ at 35 degrees C (95 degrees F)		Weight	Overall system dimensions
		cfm	m ³ /hr	cfm	m ³ /hr		

Table 36. ASHRAE declarations (continued)

Minimum configuration	6.1	635	1080	915	1556	See 9119-590, 9406-595, and 9119-595	See 9119-590, 9406-595, and 9119-595
Maximum configuration	22.7	1760	2992	2460	4182	See 9119-590, 9406-595, and 9119-595	See 9119-590, 9406-595, and 9119-595
Typical configuration	13.0	1310	2227	1790	3043	See 9119-590, 9406-595, and 9119-595	See 9119-590, 9406-595, and 9119-595
ASHRAE Class	3						
Minimum configuration	16-way with a single I/O drawer						
Maximum configuration	64-way with 4 I/O drawers						
Typical configuration	32-way with 4 I/O drawers						

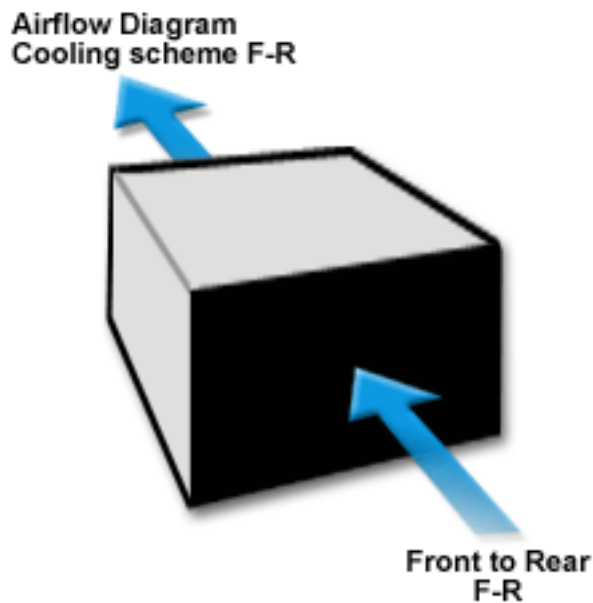


Figure 55. Airflow figure for server mounted in a rack

Total system power consumption

The following table contains the maximum power requirements for the model 9119-590, 9406-595, and 9119-595.

Table 37. System power requirements for 1.9 GHz, 2.1 GHz, or 2.3 GHz processor systems (9119-595 and 9406-595) - (kW)²

I/O drawers and switches	Processor books			
	1	2	3	4
0	6.1	11.1	15.2	19.2
1	7.0	12.1	16.1	20.1
2	8.0	13.0	17.0	21.0
3	8.9	13.9	17.9	21.9 ¹
4	9.8	14.8	18.9	22.7 ¹
5	10.7	15.7		
6	11.6	16.6		
7		17.5		
8		18.5		
9		19.4		
10		20.3		
11		21.2 ¹		
12		22.1 ¹		

Note:

1. 100 A power cord is required unless a 5792 optional base rack is ordered and the noted drawers are installed in the 5792 rack. See Planning for 5792 base rack.
2. To obtain the kBtu/hr value, multiply the kW value times 3.413.

Table 38. System power requirements for 1.65 GHz processor systems (9406-595, 9119-590, and 9119-595 - (kW)¹

I/O drawers and switches	Processor books			
	1	2	3	4
0	5.1	9.3	12.5	15.7
1	6.1	10.2	13.5	16.6
2	7.0	11.2	14.4	17.6
3	7.9	12.1	15.3	
4	8.8	13.0	16.2	
5	9.8	13.9		
6	10.7	14.8		
7		15.8		
8		16.7		
9		17.6		
10		18.5		
11				
12				

Note:

1. To obtain the kBtu/hr value, multiply the kW value times 3.413.

Maximum configurations are based on 16 memory cards per processor book, 16 disk drives per I/O drawer. 20 PCI cards per I/O drawer and 16 switch cards per HPS switch. To determine the typical

power consumption for a specific configuration, subtract the following typical power values.

Table 39. Typical power values

Component	Typical power value (W)
Disk drives	20
I/O PCI card	20
Memory cards	100
Switch card	30

Cooling requirements

Use the system cooling requirements table in conjunction with the cooling requirements graph and chilled airflow area graphic to determine the area of floor tiles to supply chilled air to the system.

The model 9119-590, 9406-595, and 9119-595 require air for cooling. As shown in Figure 48 on page 126, rows of model 9119-590, 9406-595, and 9119-595 systems must face front-to-front. The use of a raised floor is recommended to provide air through perforated floor panels placed in rows between the fronts of systems (the cold aisles shown in Figure 48 on page 126).

The following table provides system cooling requirements based on system configuration. The letter designations in the table correspond to the letter designations in the graph shown in “Cooling requirements graph” on page 136.

Table 40. System cooling requirements for 1.9 GHz, 2.1 GHz, or 2.3 GHz processor systems (9119-595 and 9406-595)

Number of I/O drawers	Number of processor books			
	1	2	3	4
0	B	D	F	H
1	C	E	F	H
2	C	E	G	H
3	C	E	G	I
4	D	F	G	I
5	D	F		
6	E	G		
7		G		
8		G		
9		H		
10		H		
11		H		
12		I		

Table 41. System cooling requirements for 1.65 GHz processor systems (9406-595, 9119-590, and 9119-595)

Number of I/O drawers	Number of processor books			
	1	2	3	4
0	B	D	E	F
1	B	D	E	G
2	C	D	F	G

Table 41. System cooling requirements for 1.65 GHz processor systems (9406-595, 9119-590, and 9119-595) (continued)

Number of I/O drawers	Number of processor books			
	1	2	3	4
3	C	E	F	G
4	C	E	F	H
5	D	E		
6	D	F		
7		F		
8		G		
9		G		
10		G		
11		H		
12		H		

Cooling requirements graph:

Use the cooling requirements graph in conjunction with the cooling requirements tables and the chilled airflow area graphic to determine the area of the floor tiles to supply chilled air to the system.

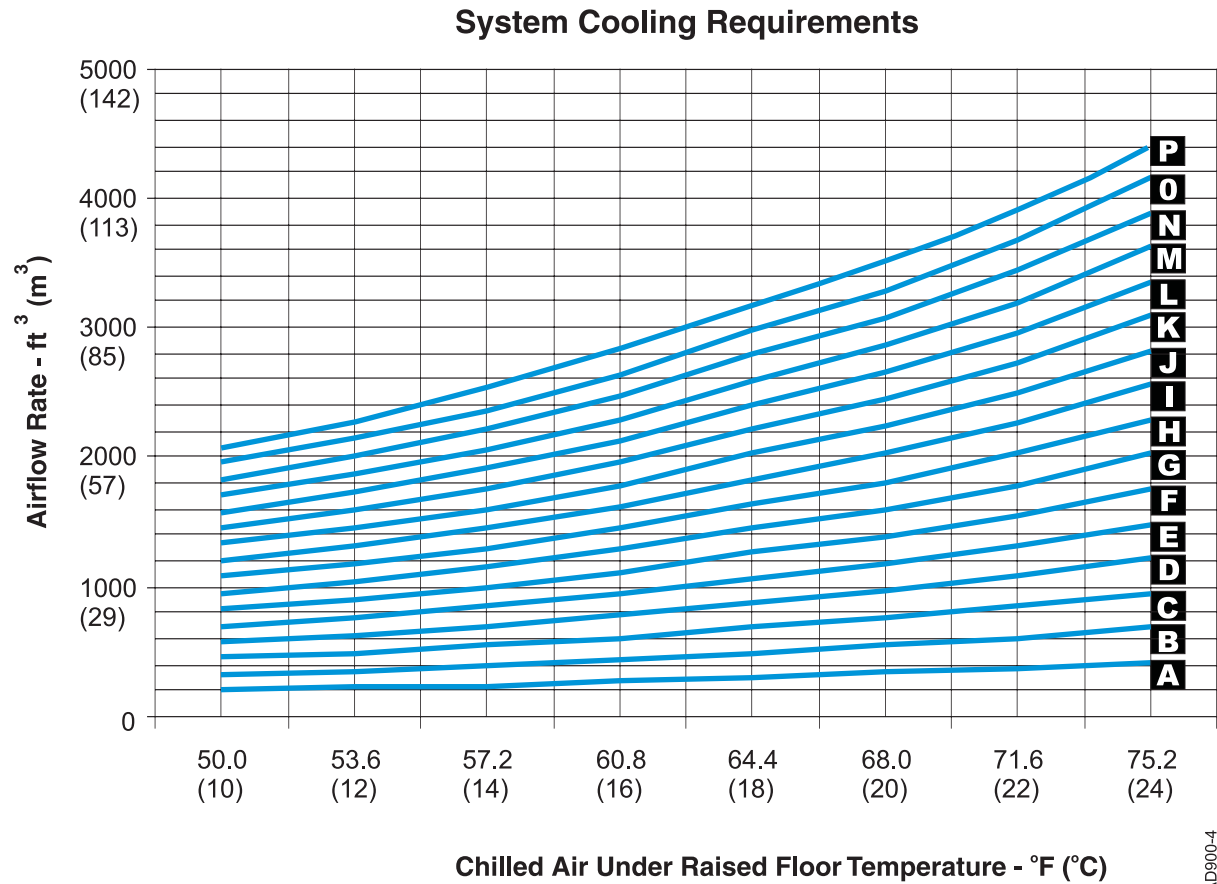
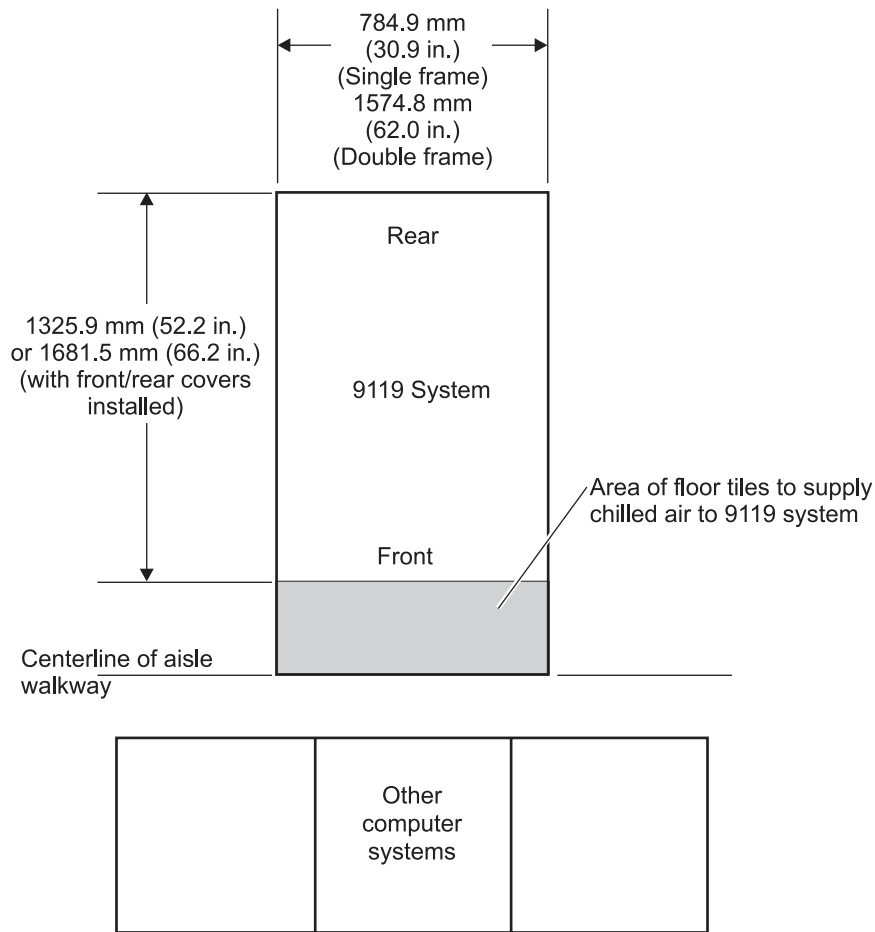


Figure 56. Cooling requirements graph

Requirements for the chilled airflow area:

The Chilled airflow area figure shows the chilled airflow area required for a system.

Use the system cooling requirements tables and the cooling requirements graph to determine the area of floor tiles to supply chilled air to the system.



IPHAD910-1

Figure 57. Chilled airflow area

Moving the system to the installation site

Several factors must be considered before moving the system to the installation site.

Prior to moving the system to the installation site, you should:

- Determine the path that must be taken to move the system from the delivery location to the installation site.
- You should verify that the height of all doorways, elevators, and so on are sufficient to allow moving the system to the installation site.
- Verify that the weight limitations of elevators, ramps, floors, floor tiles, and so on are sufficient to allow moving the system to the installation site. If the height or weight of the system can cause a problem when the system is moved to the installation site, you should contact your local site planning or sales representative.

For more detailed information, see Access.

If needed, a height reduction feature (0126 for System i and System i, and 7960 for System p and System p) may be ordered. This feature allows for the system frame (both System i, System i, System p, and System p) and the expansion frame (System p and System p only) to be shipped in two pieces and assembled at your location. With this feature, the top section of the system frame (including the power subsystem) is removed. The height of the system frame with the upper section removed is reduced by .35

m (14 in.) to approximately 1.64 m (65 in.). For planning purposes, the weight of the rack top frame and components are shown in the following table.

Table 42. Weight of rack top frame and components

Item	Weight ¹
Rack top frame and crate	210.5 kg (463 lb.)
Rack top frame with power (4 bulk power regulators, 4 bulk power distributors, and 2 bulk power assemblies) ²	149.5 kg (329 lb.)
Bulk power regulator	13.6 kg (30 lb.)
Bulk power distributor	6.4 kg (14 lb.)
Bulk power assembly	18 kg (40 lb.)
Rack top frame without rails	30 kg (66 lb.)
Rack top frame with rails	33 kg (73 lb.)
Side cover ³	22.7 kg (50 lb.)
Front acoustic door	17.9 kg (39.4 lb.)
Rear acoustic door	17.2 kg (37.9 lb.)
Front slimline door	17.2 kg (38 lb.)
Rear slimline door	9.1 kg (20 lb.)
Note: 1. Maximum total weight can be up to 255 kg (561 lb.) 2. Can be shipped with up to six bulk power regulators and six bulk power distributors. 3. Each side cover consists of two panels.	

Delivery and subsequent transportation of the equipment

DANGER

Heavy equipment—personal injury or equipment damage might result if mishandled. (D006)

You must prepare your environment to accept the new product based on the installation planning information provided, with assistance from an IBM Installation Planning Representative (IPR) or IBM authorized service provider. In anticipation of the equipment delivery, prepare the final installation site in advance so that professional movers or riggers can transport the equipment to the final installation site within the computer room. If for some reason, this is not possible at the time of delivery, you must make arrangements to have professional movers or riggers return to finish the transportation at a later date. Only professional movers or riggers should transport the equipment. The IBM authorized service provider can only perform minimal frame repositioning within the computer room, as needed, to perform required service actions. You are also responsible for using professional movers or riggers when you relocate or dispose of equipment.

Phase imbalance and BPR configuration

Use the Phase imbalance and BPR configuration table to determine the phase imbalance of your server's configuration.

Depending on the number of Bulk Power Regulators (BPRs) in your system, phase imbalance can occur in line currents. All systems are provided with two bulk power assemblies (BPAs), with separate power cords. Phase currents will be divided between two power cords in normal operation. The following table illustrates phase imbalance as a function of BPR configuration. For information about power consumption, see "Total system power consumption" on page 133.

Table 43. Phase imbalance and BPR configuration

Number of BPRs per BPA	Phase A Line Current	Phase B Line Current	Phase C Line Current
1	Power / Vline	Power / Vline	0
2	0.5 Power / Vline	0.866 Power / Vline	0.5 Power / Vline
3	0.577 Power / Vline	0.577 Power / Vline	0.577 Power / Vline

Note: Power is calculated from “Total system power consumption” on page 133. Vline is line-to-line nominal input voltage. Because total system power is divided between two power cords, divide the power number by 2.

Balancing power panel loads

Use these methods to ensure that power panel loads are balanced.

When three-phase power is used, and depending on the system configuration, the phase currents can be fully balanced or unbalanced. System configurations with three BPRs per BPA have balanced power panel loads, while configurations with only one or two have unbalanced loads. With two BPRs per BPA, two of the three phases will draw an equal amount of current, and will be, nominally, 57.8 percent of the current on the third phase. With one BPR per BPA, two of three phases will carry an equal amount of current, with no current drawn on the third phase. The following figure is an example of feeding several loads of this type from two power panels in a way that balances the load among the three phases.

Note: Use of ground-fault-interrupt (GFI) circuit breakers is not recommended for this system because GFI circuit breakers are earth-leakage-current sensing circuit breakers and this system is a high earth-leakage-current product.

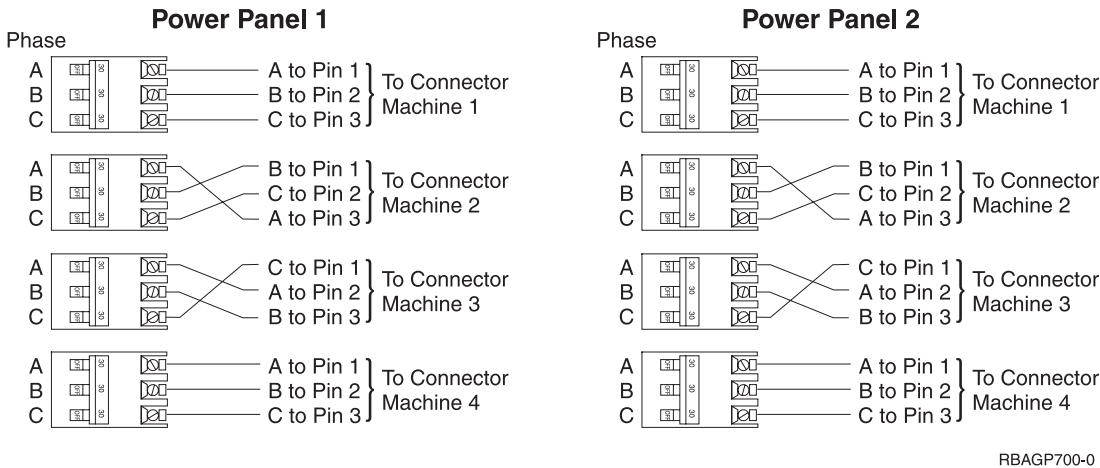


Figure 58. Power panel load balancing

The method illustrated in the preceding figure requires that the connection from the three poles of each breaker to the three phase pins of a connector be varied. Some electricians may prefer to maintain a consistent wiring sequence from the breakers to the connectors. The following figure shows a way to balance the load without changing the wiring on the output of any breakers. The three-pole breakers are alternated with single-pole breakers, so that the three-pole breakers do not all begin on Phase A.

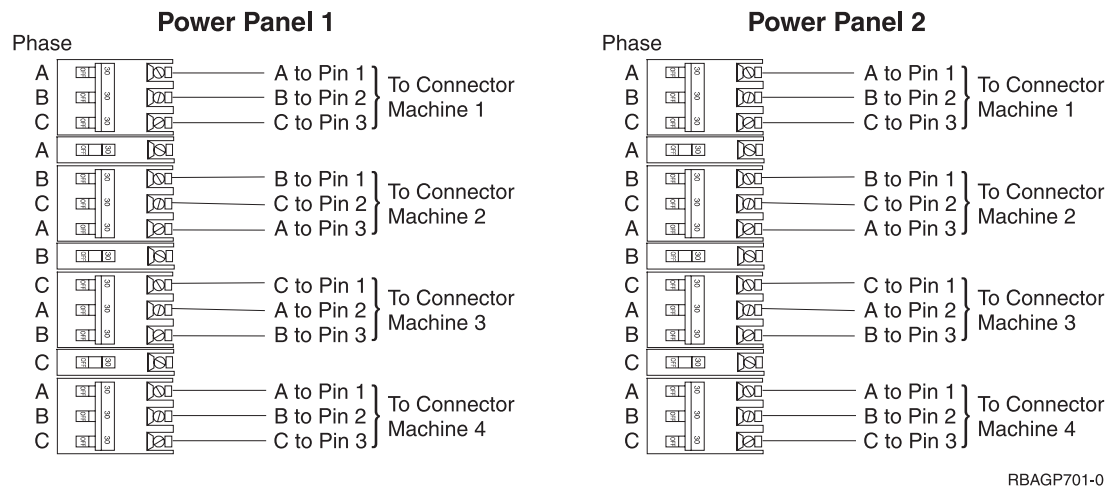


Figure 59. Power panel load balancing

The following figure shows another way of distributing the unbalanced load evenly. In this case, the three-pole breakers are alternated with two-pole breakers.

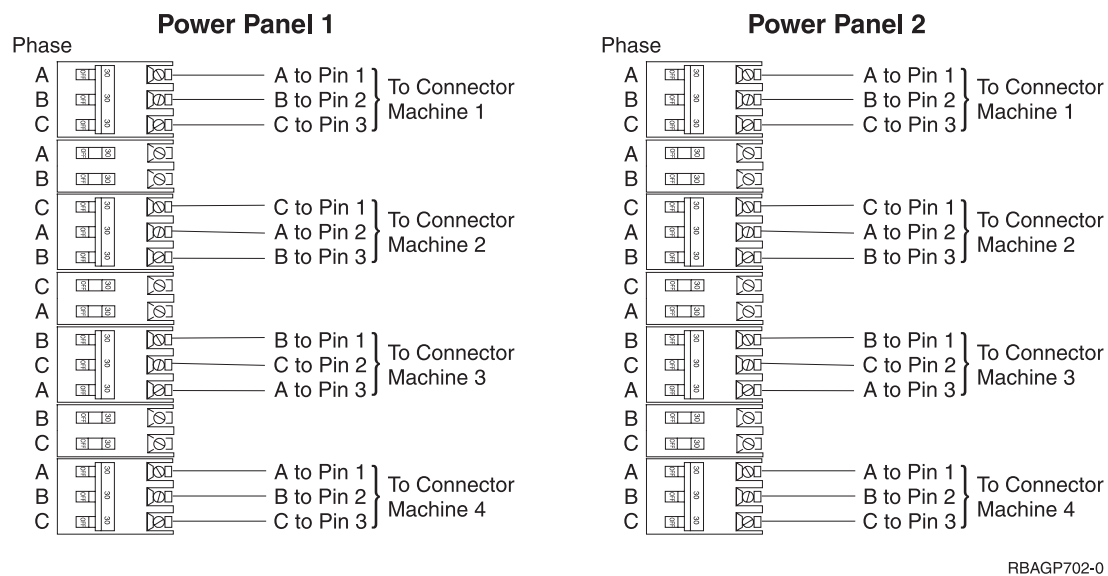
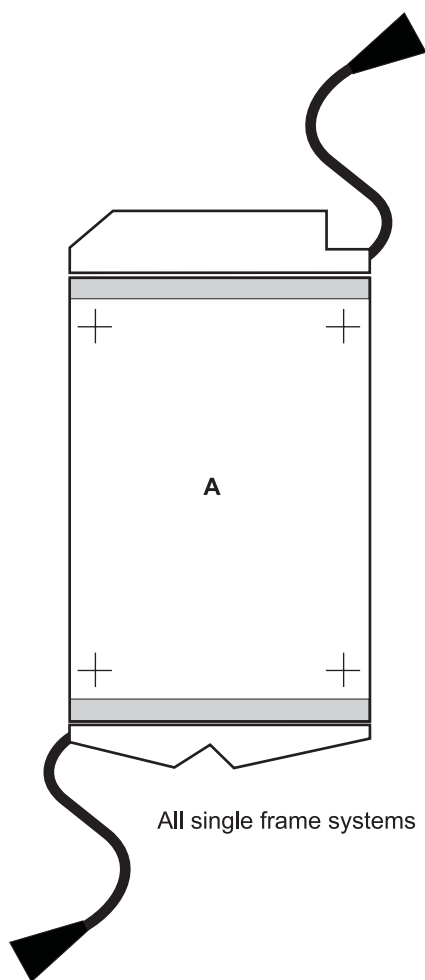


Figure 60. Power panel load balancing

Power cord configurations

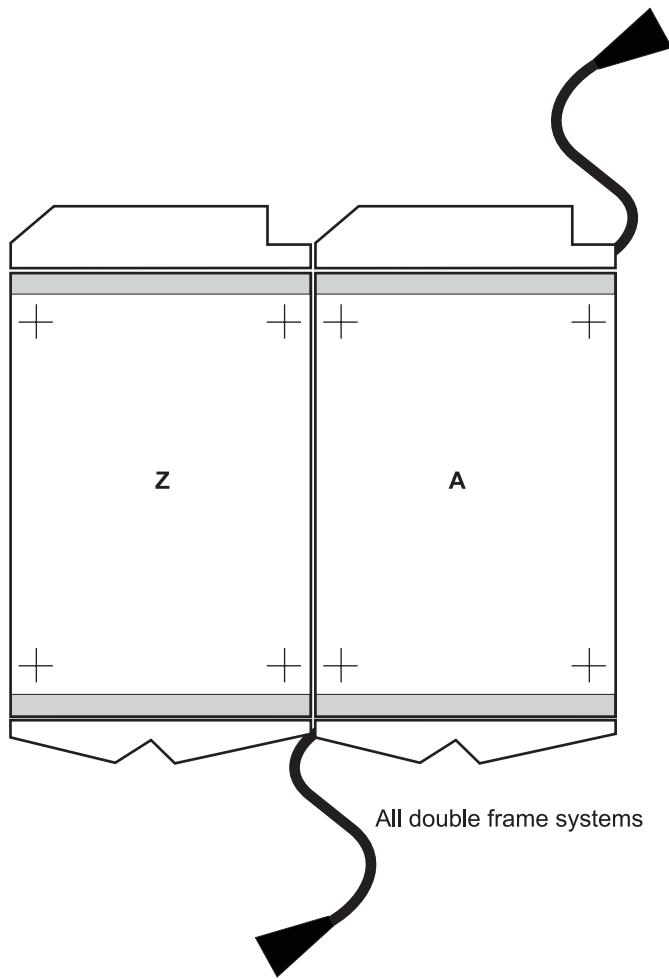
Use the Single-frame system power cord configuration and Double-frame system power cord configuration figures to route power cords through floor tile cutouts.

The power cords exit the system from different points of the frame as indicated in the following figure. For raised-floor applications, it is recommended that both cords be routed to the rear of the frame and through the same floor-tile cutout. For more information about raised-floor applications, refer to “Cut and place floor panels” on page 111 and Figure 37 on page 112.



IPHAD912-0

Figure 61. Single-frame system power cord configuration



IPHAD913-0

Figure 62. Double-frame system power cord configuration

Dual power installation

To take full advantage of the redundancy and reliability that is built into the computer system, the system must be powered from two distribution panels.

The model 9119-590, 9406-595, and 9119-595 configurations are designed with a fully redundant power system. These systems have two power cords attached to two power input ports which, in turn, power a fully redundant power distribution system within the system. The possible power installation configurations are described in Dual power installations.

Approximate system weights by configuration

Use the Approximate system weights tables to calculate the approximate weight of your system based on its configuration.

If the system that you order has a frame that weighs more than 1134 kg (2500 lb.) when it is shipped from the factory, a weight-distribution plate will be provided for the system. This plate is used to minimize the point loading from casters and leveling pads.

Table 44. Approximate system weights with acoustical covers and with integrated battery backup – kg (lb.)^{1, 2, 3}

I/O drawers and switches with redundant integrated battery backup (non-redundant available)	Processor books			
	1	2	3	4
0	809 (1784)	1075 (2370)	1246 (2747)	1223 (2697)
1	908 (2002)	1092 (2408)	1263 (2785)	1322 (2915)
2	1125 (2480)	1309 (2887)	1368 (3017)	1427 (3147)
3	1534 (3382)	1719 (3789)		
4	1639 (3614)	1824 (4021)		
5	1744 (3846)	1929 (4253)		
6	1853 (4085)	2037 (4492)		
7		2143 (4724)		
8		2248 (4956)		
9		2353 (5188)		
10		2458 (5420)		
11				
12				

Note:

1. A primary rack with one or two processor books and either greater than four I/O drawers or greater than two I/O drawers and two integrated battery backup units requires a FC8691. A primary frame with three or four processor books and either greater than four I/O drawers or greater than two I/O drawers and two integrated battery backup units requires a FC5792.
2. The 9119-590 with two processor books supports a maximum of eight I/O drawers.
3. The integrated battery backup option is not available for the model 9406-595.

Table 45. Approximate system weights with acoustical covers and without integrated battery backup – kg (lb.)^{1, 2}

I/O drawers and switches without integrated battery backup	Processor books			
	1	2	3	4
0	719 (1585)	895 (1972)	975 (2150)	952 (2100)
1	818 (1803)	912 (2010)	992 (2188)	1051 (2318)
2	944 (2082)	1039 (2290)	1098 (2420)	1157 (2550)
3	1050 (2315)	1158 (2522)	1203 (2652)	1262 (2782)
4	1155 (2547)	1249 (2754)	1308 (2884)	1367 (3014)
5	1564 (3448)	1658 (3656)		
6	1669 (3680)	1764 (3888)		
7		1869 (4120)		
8		1977 (4359)		
9		2082 (4591)		
10		2188 (4823)		
11		2293 (5055)		
12		2398 (5287)		

Table 45. Approximate system weights with acoustical covers and without integrated battery backup – kg (lb.)¹
² (continued)

Note:				
1. A primary rack with one or two processor books and either greater than four I/O drawers or greater than two I/O drawers and two integrated battery backup units requires a FC8691. A primary frame with three or four processor books and either greater than four I/O drawers or greater than two I/O drawers and two integrated battery backup units requires a FC5792.				
2. The 9119-590 with two processor books supports a maximum of eight I/O drawers.				

Table 46. Approximate system weights with slimline covers and with integrated battery backup – kg (lb.)^{1, 2, 3}

I/O drawers and switches with redundant integrated battery backup (non-redundant available)	Processor books			
	1	2	3	4
0	801 (1765)	985 (2371)	1156 (2748)	1215 (2678)
1	900 (1983)	1084 (2389)	1255 (2766)	1314 (2896)
2	1116 (2461)	1301 (2868)	1360 (2998)	1419 (3128)
3	1517 (3344)	1619 (3750)		
4	1622 (3576)	1806 (3982)		
5	1727 (3808)	1911 (4214)		
6	1836 (4047)	2020 (4453)		
7		2125 (4685)		
8		2230 (4917)		
9		2335 (5149)		
10		2441 (5381)		
11				
12				
Note:				
1. A primary rack with one or two processor books and either greater than four I/O drawers or greater than two I/O drawers and two integrated battery backup units requires a FC8691. A primary frame with three or four processor books and either greater than four I/O drawers or greater than two I/O drawers and two integrated battery backup units requires a FC5792.				
2. The 9119-590 with two processor books supports a maximum of eight I/O drawers.				
3. The integrated battery backup option is not available for the model 9406-595.				

Table 47. Approximate system weights with slimline covers and without integrated battery backup – kg (lb.)^{1, 2}

I/O drawers and switches without integrated battery backup	Processor books			
	1	2	3	4
0	710 (1566)	886 (1953)	967 (2131)	944 (2081)
1	809 (1784)	903 (1991)	984 (2169)	1043 (2299)
2	936 (2063)	1030 (2271)	1089 (2401)	1148 (2531)
3	1041 (2295)	1135 (2503)	1194 (2633)	1253 (2763)
4	1146 (2527)	1241 (2735)	1299 (2865)	1358 (2995)

Table 47. Approximate system weights with slimline covers and without integrated battery backup – kg (lb.)¹,
² (continued)

5	1547 (3410)	1641 (3618)		
6	1652 (3642)	1746 (3850)		
7		1852 (4082)		
8		1960 (4321)		
9		2065 (4553)		
10		2170 (4785)		
11		2276 (5017)		
12		2381 (5249)		

Note:

1. A primary rack with one or two processor books and either greater than four I/O drawers or greater than two I/O drawers and two integrated battery backup units requires a FC8691. A primary frame with three or four processor books and either greater than four I/O drawers or greater than two I/O drawers and two integrated battery backup units requires a FC5792.
2. The 9119-590 with two processor books supports a maximum of eight I/O drawers.

Weight distribution

Use the Floor loading dimensions figure and the Floor loading for system tables to determine the floor loading for various configurations.

The following figure shows the floor loading dimensions for the model 9119-590, 9406-595, and 9119-595. Use this figure in conjunction with the floor loading tables to determine the floor loading for various configurations.

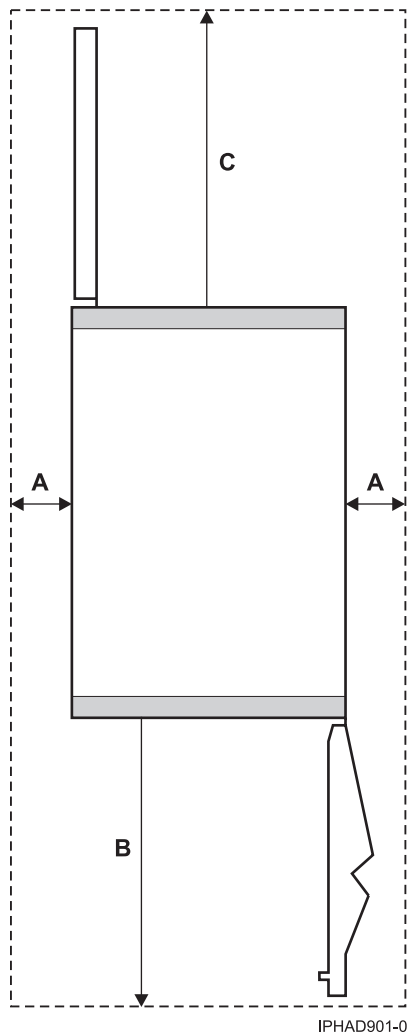


Figure 63. Floor loading dimensions

The following table shows the values used for calculating floor loading for the model 9119-590, 9406-595, and 9119-595. Weights include covers, width and depth are indicated without covers.

Table 48. Floor loading for system with 2 processor books, 12 drawers, and without integrated battery backup

Floor loading for system with 2 processor books, 12 drawers, and without integrated battery backup							
a (sides)		b (front)		c (back)		2 frames	
mm	in.	mm	in.	mm	in.	lb./ft ²	kg/m ²
25	1.0	254	10.0	254	10.0	198.6	969.6
25	1.0	508	20.0	508	20.0	158.3	772.9
25	1.0	762	30.0	762	30.0	133.2	650.4
254	10.0	254	10.0	254	10.0	159.8	780.3
254	10.0	508	20.0	508	20.0	128.5	627.6
254	10.0	762	30.0	762	30.0	109.0	532.4
508	20.0	254	10.0	254	10.0	133.0	649.4
508	20.0	508	20.0	508	20.0	108.0	527.1
508	20.0	762	30.0	762	30.0	92.3	450.8

Table 48. Floor loading for system with 2 processor books, 12 drawers, and without integrated battery backup (continued)

762	30.0	254	10.0	254	10.0	115.1	562.0
762	30.0	508	20.0	508	20.0	94.2	459.9
762	30.0	762	30.0	762	30.0	81.2	396.3

Table 49. Floor loading for systems with 4 processor books, 4 drawers, and without integrated battery backup

Floor loading for systems with 4 processor books, 4 drawers, and without integrated battery backup							
a (sides)		b (front)		c (back)		2 frames	
mm	in.	mm	in.	mm	in.	lb./ft ²	kg/m ²
25	1.0	254	10.0	254	10.0	223.3	1090.5
25	1.0	508	20.0	508	20.0	177.3	865.8
25	1.0	762	30.0	762	30.0	148.6	725.7
254	10.0	254	10.0	254	10.0	151.2	738.3
254	10.0	508	20.0	508	20.0	121.9	595.3
254	10.0	762	30.0	762	30.0	103.7	506.2
508	20.0	254	10.0	254	10.0	114.9	561.0
508	20.0	508	20.0	508	20.0	94.0	459.1
508	20.0	762	30.0	762	30.0	81.0	395.7
762	30.0	254	10.0	254	10.0	94.8	462.9
762	30.0	508	20.0	508	20.0	78.6	383.8
762	30.0	762	30.0	762	30.0	68.5	334.5

Table 50. Floor loading for system with 2 processor books, 10 drawers, and with integrated battery backup

Floor loading for system with 2 processor books, 10 drawers, and with integrated battery backup							
a (sides)		b (front)		c (back)		2 frames	
mm	in.	mm	in.	mm	in.	lb./ft ²	kg/m ²
25	1.0	254	10.0	254	10.0	203.2	992.1
25	1.0	508	20.0	508	20.0	161.9	790.3
25	1.0	762	30.0	762	30.0	136.1	664.4
254	10.0	254	10.0	254	10.0	163.4	797.8
254	10.0	508	20.0	508	20.0	131.3	641.0
254	10.0	762	30.0	762	30.0	111.3	543.3
508	20.0	254	10.0	254	10.0	135.9	663.5
508	20.0	508	20.0	508	20.0	110.2	537.9
508	20.0	762	30.0	762	30.0	94.1	459.6
762	30.0	254	10.0	254	10.0	117.5	573.7
762	30.0	508	20.0	508	20.0	96.0	468.9
762	30.0	762	30.0	762	30.0	82.7	403.6

Table 51. Floor loading for system with 4 processor books, 2 drawers, and with integrated battery backup

Floor loading for system with 4 processor books, 2 drawers, and with integrated battery backup							
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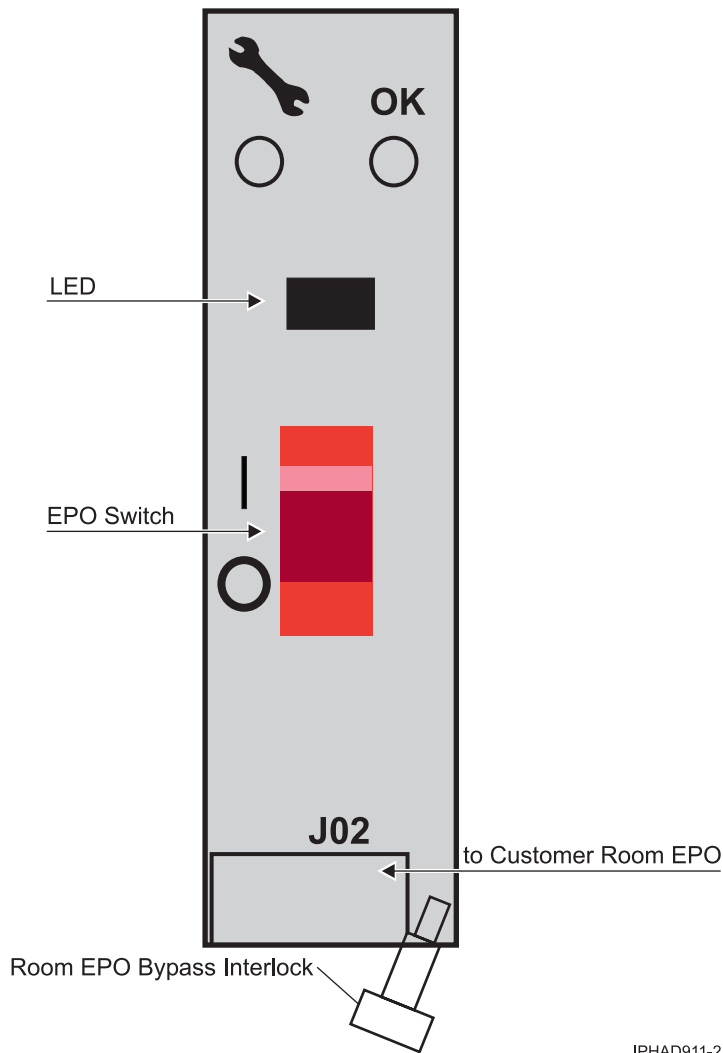
Table 51. Floor loading for system with 4 processor books, 2 drawers, and with integrated battery backup (continued)

a (sides)		b (front)		c (back)		2 frames	
mm	in.	mm	in.	mm	in.	lb./ft ²	kg/m ²
25	1.0	254	10.0	254	10.0	232.5	1135.3
25	1.0	508	20.0	508	20.0	184.4	900.2
25	1.0	762	30.0	762	30.0	154.4	753.6
254	10.0	254	10.0	254	10.0	157.1	766.8
254	10.0	508	20.0	508	20.0	126.4	617.2
254	10.0	762	30.0	762	30.0	107.3	524.0
508	20.0	254	10.0	254	10.0	119.1	581.3
508	20.0	508	20.0	508	20.0	97.2	474.7
508	20.0	762	30.0	762	30.0	83.6	408.3
762	30.0	254	10.0	254	10.0	98.0	478.7
762	30.0	508	20.0	508	20.0	81.1	395.9
762	30.0	762	30.0	762	30.0	70.5	344.3

Floor loading for the system is illustrated in the Proposed Floor Layout for Multiple Systems in “Considerations for multiple system installations” on page 124.

Unit emergency power off

The server has a unit emergency power off (UEPO) switch on the front of the first frame (A Frame). Refer to the following figure, which shows a simplified UEPO panel.



IPHAD911-2

Figure 64. Unit emergency power off figure

When the switch is reset, the utility power is confined to the system power compartment. All volatile data will be lost.

It is possible to attach the computer room emergency power off (EPO) system to the system UEPO. When this is done, resetting the computer room EPO disconnects all power from the power cords and the internal battery backup unit, if it is provided. All volatile data will be lost in this case also.

If the room EPO is not connected to the UEPO, resetting the computer room EPO removes ac power from the system. If the interlock bypass feature is used, the system remains powered for a short time based on system configuration.

Computer room emergency power off

You can incorporate the integrated battery backup into a computer room emergency power off (EPO) system. Otherwise, volatile data can be lost.

When the integrated battery backup is installed and the room EPO is reset, the batteries engage and the computer continues to run. It is possible to attach the computer room EPO system to the machine EPO. When this is done, resetting the room EPO disconnects all power from the power cords and the internal battery backup unit. In this event, all volatile data will be lost.

To incorporate the integrated battery backup into the room Emergency Power Off systems (EPO), a cable must connect to the back of the system EPO panel. The following figures illustrate how this connection is made.

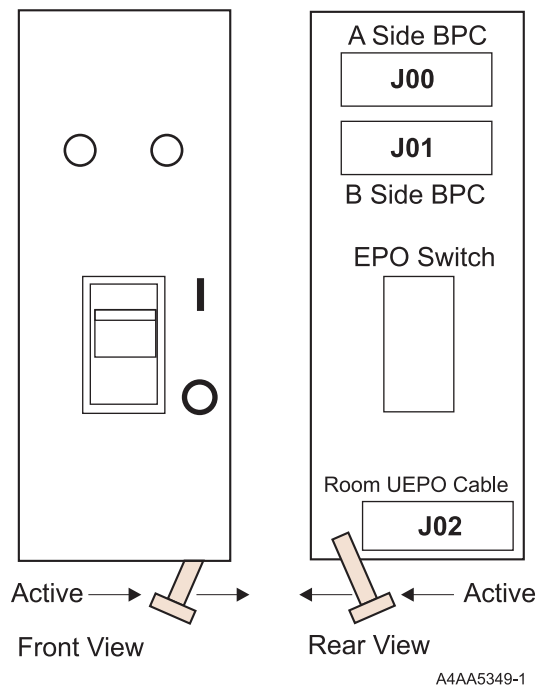
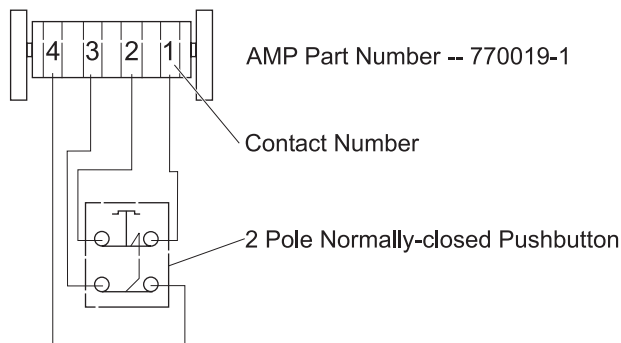


Figure 65. Computer room emergency power off figure

The preceding figure illustrates the back of the machine UEPO panel with the room EPO cable plugging into the machine. Notice the switch actuator. After it is moved to make the cable connection possible, the room EPO cable must be installed for the machine to power on.

In the following figure, an AMP connector 770019-1 is needed to connect to the system EPO panel. For room EPO cables using wire sizes #20 AWG to #24 AWG, use AMP pins (part number 770010-4). This connection should not exceed 5 Ohms, which is approximately 61 m (200 ft.) of #24 AWG.



Room UEPO Switch Schematic

Figure 66. AMP connector figure

Machine holdup times

Use the Typical machine holdup time tables to determine the typical machine holdup times (time versus load) for fresh and aged batteries.

The following criteria apply to both tables.

- All times are listed in minutes
- Machine load is listed in total ac input power (power for both power cords combined)
- A fresh battery is defined as 2.5 years old or less.
- An aged battery is defined as 6.5 years.

Note: Battery capacity decreases gradually as the battery ages (from fresh-battery value to aged-battery value). The system diagnoses a failed-battery condition if the capacity decreases below the aged-battery value.

Table 52. Typical machine holdup time versus load for fresh battery

Typical machine holdup time versus load for fresh battery														
Machine load	3.33 kW		6.67 kW		10 kW		13.33 kW		16.67 kW		20 kW		21.67 kW	
Integrated battery backup configuration	N	R	N	R	N	R	N	R	N	R	N	R	N	R
1 BPR	7.0	21.0	2.1	7.0										
2 BPR	21.0	50.0	7.0	21.0	4.0	11.0	2.1	7.0						
3 BPR	32.0	68.0	12.0	32.0	7.0	21.0	4.9	12.0	3.2	9.5	2.1	7.0	1.7	6.5
N=Non-redundant, R=Redundant														

Table 53. Typical machine holdup time versus load for aged battery

Typical machine holdup time versus load for aged battery														
Machine load	3.3 kW		6.67 kW		10 kW		13.33 kW		16.67 kW		20 kW		21.67 kW	
Integrated battery backup configuration	N	R	N	R	N	R	N	R	N	R	N	R	N	R
1 BPR	4.2	12.6	1.3	4.2										
2 BPR	12.6	30.0	4.2	12.6	2.4	6.6	1.3	4.2						
3 BPR	19.2	41.0	7.2	19.2	4.2	12.6	2.9	7.2	1.9	5.7	1.3	4.2	1.0	3.9
N=Non-redundant, R=Redundant														

Model 9406-250 server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

Use the following specifications to plan for your server.

Table 54. Server specifications


Pictured is the model 9406-250 server. The model 9406-250 allows the 7102 expansion unit to be attached to one side.				
Dimensions	Width	Width with 7101 or 7102	Depth	Height
Metric	340 mm	550 mm	662 mm	610 mm
English	13.4 in.	21.7 in.	26.1 in.	24.0 in.
			Without 7101 or 7102	With 7101 or 7102
Maximum configuration weight			38.6 kg (85 lb.)	70.5 kg (155 lb.)
Electrical				
kVA (maximum)			0.469	0.815
Rated voltage and frequency ²			100-127/200-240 V ac at 50/60 plus or minus 0.5 Hz	
Thermal output (maximum)			1536 Btu/hr	2669 Btu/hr
Power requirements (IP measurement) maximum			450	782
Power factor			0.95	
Inrush current			45 A	
Leakage current (maximum)			3.5 mA	
Phase			1	
Compatible plug types			4, 5, 6, 10, 18, 19, 22, 23, 24, 25, 32,	
Power cord length			2.7 m (9 ft.)	
Temperature requirements				
Operating	10 degrees to 37.8 degrees C (50 degrees to 100 degrees F)			
Nonoperating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)			
Environment requirements	Operating		Nonoperating	
Noncondensing humidity	8 to 80%		8 to 80%	
Wet bulb temperature	23 degrees C (73.4 degrees F)		27 degrees C (80.6 degrees F)	
Maximum altitude	3048 m (10000 ft.)			
Noise emissions ¹				

Table 54. Server specifications (continued)

Model 9406-250	Operating	Idle	
L _{WAd} (Category 2E, General business)	5.7 bels	5.6 bels	
L _{pAm} (1-meter bystander)	40 dB	38 dB	
Model 9406-250 with 7101 or 7102	Operating	Idle	
L _{WAd} (Category 2E, General business)	6.3 bels	6.2 bels	
L _{pAm} (1-meter bystander)	45 dB	44 dB	
Service clearances			
Front	Back	Sides	Top
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Notes:			
1. For a description of noise emission values, see Acoustics.			
2. The power supplies automatically accept any voltage with the published rated voltage range. If dual power supplies are installed and operating, the power supplies draw approximately equal current from the utility (mains) and provide approximately equal current to the load.			

Model 9406-270 server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

Use the following specifications to plan for your server.

Table 55. Server specifications


<p>Pictured is model 9406-270.</p> <p>The 7104 expansion unit is available with model 9406-270. The 7104 expansion unit requires a power cord.</p> <p>Dimensions are shown for model 9406-270 only.</p>				
Dimensions	9406-270 Width	9406-270 with 7104 Width	9406-270 Depth	9406-270 Height
Metric	366 mm	552 mm	728 mm	610 mm

Table 55. Server specifications (continued)

English	14.5 in.	21.9 in.	28.7 in.	24.0 in.
	Model 9406-270		Model 9406-270 with 7104	
Maximum configuration weight	52.7 kg (116 lb.)		79.5 kg (175 lb.)	
Electrical	Model 9406-270		7104 expansion unit	
Maximum kVA (each has its own power cord)	0.421		0.368	
Rated voltage and frequency ³	100-127/200-240 V ac at 50-60 plus or minus 0.5 Hz			
Thermal output (maximum)	1365 Btu/hr		1194 Btu/hr	
Power requirements (IP measurement) maximum (watts)	400		350	
Power factor	0.95			
Inrush current	41 A			
Leakage current (maximum)	3.5 mA			
Phase	1			
Compatible plug types	4, 5, 6, 10, 18, 19, 22, 23, 24, 25, 32, 34			
Power cord length	2.7 m (9 ft.), 1.8 m (6 ft.) (U.S. and Canada only), 4.3 m (14 ft.)			
Temperature requirements				
Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)			
Nonoperating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)			
Environment requirements	Operating		Nonoperating	
Noncondensing humidity	8 to 80%		8 to 80%	
Wet bulb temperature	23 degrees C (73.4 degrees F)		27 degrees C (80.6 degrees F)	
Maximum altitude	3048 m (10000 ft.)			
Noise emissions ¹	Operating		Idle	
L _{WAd} (Category 2E, General business) 9406-270 only	5.9 bels		5.8 bels	
L _{WAd} (Category 2E, General business) 9406-270 with 7104	6.3 bels		6.1 bels	
L _{pAm} (1-meter bystander) 9406-270 only	41 dB		40 dB	
L _{pAm} (1-meter bystander) 9406-270 with 7104	45 dB		43 dB	

Service clearances			
Front	Back	Sides ²	Top ²
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Notes: <ol style="list-style-type: none"> 1. For a description of noise emission values, see Acoustics. 2. Side and top clearances are optional when operating. 3. The power supplies automatically accept any voltage with the published rated voltage range. If dual power supplies are installed and operating, the power supplies draw approximately equal current from the utility (mains) and provide approximately equal current to the load. 			

Model 9406-800 and 9406-810 server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

Use the following specifications to plan for your server.

Table 56. Server specifications


<p>Pictured is the model 9406-800 or 9406-810 server.</p> <p>The 7116 expansion unit is available with model 9406-800 or 9406-810. The 7116 expansion unit requires a power cord.</p> <p>Dimensions are shown for model 9406-800 or 9406-810 only.</p>					
Dimensions	9406-800 and 9406-810 Width	9406-800 and 9406-810 with 7116 Width	9406-800 and 9406-810 Depth	9406-800 and 9406-810 Height	Height in 0551 rack^{2, 4}
Metric	366 mm	552 mm	610 mm	610 mm	16 EIA
English	14.5 in.	21.9 in.	24 in.	24 in.	16 U
	Model 9406-800 and 9406-810		Model 9406-800 and 9406-810 with 7116		
Maximum configuration weight	52.7 kg (116 lb.)		79.6 kg (175 lb.)		
Electrical					
	model 9406-800 and 9406-810		7116 expansion unit		

Table 56. Server specifications (continued)

Maximum kVA (each has its own power cord)	0.421	0.368
Rated voltage and frequency ⁵	100-127/200-240 V ac at 50-60 plus or minus 0.5 Hz	
Thermal output (maximum)	1365 Btu/hr	1194 Btu/hr
Power requirements maximum (watts)	400	350
Power factor	0.95	
Inrush current	41 A	
Leakage current (maximum)	3.5 mA	
Phase	1	
Compatible plug types	4, 5, 6, 10, 18, 19, 22, 23, 24, 25, 32, 34	
Power cord length	2.7 m (9 ft.), 1.8 m (6 ft.) (U.S. and Canada only), 4.3 m (14 ft.) (9406-810 only)	
Temperature requirements		
Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)	
Nonoperating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)	
Environment requirements	Operating	Nonoperating
Noncondensing humidity	8 to 80%	8 to 80%
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)
Maximum altitude	3048 m (10000 ft.)	
Noise emissions ¹	Operating	Idle
L _{WAd} (Category 2E, General business) 9406-800 or 9406-810 only	5.9 bels	5.8 bels
L _{WAd} (Category 2E, General business) 9406-800 or 9406-810 with 7116	6.3 bels	6.1 bels
L _{pAm} (1-meter bystander) 9406-800 or 9406-810 only	41 dB	40 dB

Table 56. Server specifications (continued)

L _{pAm} (1-meter bystander) 9406-800 or 9406-810 with 7116	45 dB	43 dB
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Service clearances			
Front	Back	Sides ³	Top ³
762 mm	1219 mm	762 mm	762 mm
30 in.	48 in.	30 in.	30 in.
Notes: <ol style="list-style-type: none"> For a description of noise emission values, see Acoustics. Feature code 0133 is manufacturing installed in a rack. Feature code 0137 is field installed in a rack. Side and top clearances are optional when operating. See 0551 rack configurations for typical configurations when the 0551 rack is populated with various server models. The power supplies automatically accept any voltage with the published rated voltage range. If dual power supplies are installed and operating, the power supplies draw approximately equal current from the utility (mains) and provide approximately equal current to the load. 			

Delivery and subsequent transportation of the equipment

DANGER

Heavy equipment—personal injury or equipment damage might result if mishandled. (D006)

You must prepare your environment to accept the new product based on the installation planning information provided, with assistance from an IBM Installation Planning Representative (IPR) or IBM authorized service provider. In anticipation of the equipment delivery, prepare the final installation site in advance so that professional movers or riggers can transport the equipment to the final installation site within the computer room. If for some reason, this is not possible at the time of delivery, you must make arrangements to have professional movers or riggers return to finish the transportation at a later date. Only professional movers or riggers should transport the equipment. The IBM authorized service provider can only perform minimal frame repositioning within the computer room, as needed, to perform required service actions. You are also responsible for using professional movers or riggers when you relocate or dispose of equipment.

Model 9406-820 server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

Use the following specifications to plan for your server.

Table 57. Server specifications


<p>Pictured is model 9406-820.</p> <p>The 5074, 5079, 507, or 5078 expansion unit is available with model 9406-820.</p> <p>Dimensions are shown for model 9406-820 only.</p>			
Dimensions	Width	Depth	Height
Metric	483 mm	728 mm	610 mm
English	19.0 in.	28.7 in.	24.0 in.
Maximum configuration weight		96 kg (210 lb.)	
Electrical			
kVA (maximum)	0.862		
Rated voltage and frequency	100-127/200-240 V ac at 50-60 plus or minus 0.5 Hz		
Thermal output (maximum)	2867 Btu/hr		
Power requirements (maximum)	840 W		
Power factor	0.95		
Inrush current	90 A		
Leakage current (maximum)	3.5 mA		
Phase	1		
Compatible plug types	45, 6, 10, 18, 19, 22, 23, 24, 25, 32, 34		
Power cord length	1.8 m (6 ft.) (U.S. only), 4.3 m (14 ft.)		
High-speed link (HSL) cable requirements			
Temperature requirements			
Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)		
Nonoperating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)		
Environment requirements	Operating	Nonoperating	

Table 57. Server specifications (continued)

Noncondensing humidity	8 to 80%	8 to 80%
Wet bulb temperature	22.8 degrees C (73 degrees F)	27 degrees C (80.6 degrees F)
Maximum altitude	3048m (10000 ft.)	
Noise emissions ¹	Operating	Idle
L _{WAd} Category 2E, General Business	6.1 bel	5.9 bel
L _{pAm} (1-meter bystander)	43 dB	40 dB
Service clearances		
Front	Back	Sides ²
762 mm	762 mm	762 mm
30 in.	30 in.	30 in.
Notes:		
1. For a description of noise emission values, see Acoustics.		
2. Side and top clearances are optional during operation.		

Model 9406-825 server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

Use the following specifications to plan for your server.

Note: Redundant power and power cords are standard on the model 9406-825. The server uses dual alternating current power cords. For maximum availability, each of the power cords should be fed from independent power grids.

Table 58. Server specifications


<p>Pictured is the model 9406-825 server.</p> <p>The 5094 and 5095 expansion units are available with model 9406-825.</p> <p>Dimensions are shown for model 9406-825 only.</p>				
				
Dimensions	9406-825 Width	9406-825 Depth	9406-825 Height	Height in 0551 rack ^{2, 4}
Metric	445 mm	830 mm	610 mm	16 EIA

Table 58. Server specifications (continued)

English	17.5 in.	32.7 in.	24 in.	16 U
Maximum configuration weight	110 kg (242 lb.)			
Electrical				
kVA	1.540			
Thermal output (Btu/hr)	4993			
Power requirements (watts)	1463			
Rated voltage and frequency 3-way, 4-way, 5-way, and 6-way ⁵	200-240 V ac at 50-60 plus or minus 0.5 Hz			
Power factor	0.95			
Inrush current	125 A			
Leakage current (maximum)	3.5 mA			
Phase	1			
Compatible plug types	5, 6, 10, 18, 19, 22, 23, 24, 25, 32, 34			
Power cord length	2.7 m (9 ft.), 1.8 m (6 ft.) (U.S. and Canada only), 4.3 m (14 ft.)			
Temperature requirements				
Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)			
Nonoperating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)			
Environment requirements		Operating	Nonoperating	
Noncondensing humidity		8 to 80%	8 to 80%	
Wet bulb temperature		23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	
Maximum altitude		3048 m (10000 ft.)		
Noise emissions ¹		Operating	Idle	
L _{WAd} (Category 2D, General business)		6.8 bels	6.8 bels	
L _{pAm} (1-meter bystander)		50 dB	49 dB	
Service clearances				
Front		Back	Sides ³	Top ³
762 mm		762 mm	762 mm	762 mm
30 in.		30 in.	30 in.	30 in.

Notes:

1. For a description of noise emission values, see Acoustics.
2. Feature codes 0134 and 0138 are both field install in rack.
3. Side and top clearances are optional when operating.
4. See 0551 rack configurations for typical configurations when the 0551 rack is populated with various server models.
5. The power supplies automatically accept any voltage with the published rated voltage range. If dual power supplies are installed and operating, the power supplies draw approximately equal current from the utility (mains) and provide approximately equal current to the load.

Delivery and subsequent transportation of the equipment

DANGER

Heavy equipment—personal injury or equipment damage might result if mishandled. (D006)

You must prepare your environment to accept the new product based on the installation planning information provided, with assistance from an IBM Installation Planning Representative (IPR) or IBM authorized service provider. In anticipation of the equipment delivery, prepare the final installation site in advance so that professional movers or riggers can transport the equipment to the final installation site within the computer room. If for some reason, this is not possible at the time of delivery, you must make arrangements to have professional movers or riggers return to finish the transportation at a later date. Only professional movers or riggers should transport the equipment. The IBM authorized service provider can only perform minimal frame repositioning within the computer room, as needed, to perform required service actions. You are also responsible for using professional movers or riggers when you relocate or dispose of equipment.

Model 9406-830 and SB2 server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

Use the following specifications to plan for your server.

Table 59. Server specifications

<p>Pictured is model 9406-830 or model SB2 including the 9074 I/O enclosure.</p> <p>Both models include the 9074 I/O enclosure.</p> <p>The 5074, 5078, or 5079 PCI expansion unit is available with model 9406-830 or model SB2.</p> <p>Dimensions for both models are identical and include the 9074 I/O enclosure.</p>			
Dimensions	Width	Depth	Height
Metric	483 mm	1080 mm	1270 mm
English	19.0 in.	42.5 in.	50.0 in.
Maximum configuration weight		400 kg (881.5 lb.)	
Electrical			
kVA (maximum)	1.684		
Rated voltage and frequency ³	200-240 V ac at 50-60 plus or minus 0.5 Hz		
Thermal output (maximum)	5461 Btu/hr		
Power requirements (maximum)	1600 W		
Power factor	0.95		
Inrush current	80 A		
Leakage current (maximum)	3.5 mA		
Phase	1		
Compatible plug types	5, 10, 11, 18, 22, 23, 25, 2932, 34, 35, 46 (P+N+G)[16A], 54		
Power cord length	1.8 m (6 ft.)(U.S. only) or 4.3 m (14 ft.)		
High-speed link (HSL) cable requirements			

Table 59. Server specifications (continued)

Temperature requirements			
Operating		10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)	
Nonoperating		1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)	
Environment requirements		Operating	Nonoperating
Noncondensing humidity		8 to 80%	8 to 80%
Wet bulb temperature		22.8 degrees C (73 degrees F)	27 degrees C (80.6 degrees F)
Maximum altitude		3048 m (10000 ft.)	
Noise emissions ¹		Operating	Idle
L _{WAd} (Category 2D, General business)		6.7 bels	6.7 bels
L _{pAm} (1-meter bystander)		50 dB	49 dB
Service clearances			
Front	Back	Sides ²	Top ²
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Notes: <ol style="list-style-type: none"> 1. For a description of noise emission values, see Acoustics. 2. Side and top clearances are optional when operating. 3. The power supplies automatically accept any voltage with the published rated voltage range. If dual power supplies are installed and operating, the power supplies draw approximately equal current from the utility (mains) and provide approximately equal current to the load. 			

Model 9406-840 and SB3 server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

Use the following specifications to plan for your server.


Table 60. Server specifications

Pictured is **model 9406-840** or **model SB3** with the **9079 I/O expansion unit**.

Both models include the 9079 I/O expansion unit.

The 5074 expansion unit, 5078 expansion unit, 8079 optional 1.8 m model 9406-840 I/O rack or 5079 1.8 m expansion unit are available with the model 9406-840 or model SB3 servers.

Dimensions and the following data are for models 9406-840 and SB3 only.



Dimensions	Width	Depth	Height
Metric	565 mm	1320 mm	1577 mm
English	22.3 in.	52.0 in.	62.0 in.
Maximum configuration weight		397 kg (875 lb.)	
Electrical			
kVA (maximum)	2.526		
Rated voltage and frequency ³	200-240 V ac at 50-60 plus or minus 0.5 Hz		
Thermal output (maximum)	8191 Btu/hr		
Power requirements (maximum)	2400 W		
Power factor	0.95		
Inrush current	100 A		
Leakage current (maximum)	3.5 mA		
Phase	1		
Compatible plug types	12, 40, 46(3P+N+G), 46(P+N+G)[32A], KP, PDL		
Power cord length	1.8 m (6 ft.) (U.S. only) or 4.3 m (14 ft.)		

Table 60. Server specifications (continued)

High-speed link (HSL) cable requirements			
Temperature requirements			
Operating		10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)	
Nonoperating		1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)	
Environment requirements		Operating	Nonoperating
Noncondensing humidity		8 to 80%	8 to 80%
Wet bulb temperature		22.8 degrees C (73 degrees F)	27 degrees C (80.6 degrees F)
Maximum altitude		3048 m (10000 ft.)	
Noise emissions¹		Operating	Idle
L _{WAd} (Category 2D, General business)		7.0 bels	6.9 bels
L _{pAm} (1-meter bystander)		51 dB	51 dB
Service clearances			
Front	Back	Sides²	Top²
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Notes: <ol style="list-style-type: none"> For a description of noise emission values, see Acoustics. Side and top clearances are optional when operating The power supplies automatically accept any voltage with the published rated voltage range. If dual power supplies are installed and operating, the power supplies draw approximately equal current from the utility (mains) and provide approximately equal current to the load. 			

Model 9406-870 and 9406-890 server specifications

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

This product meets the technical requirements of IEC 61000-3-3.

Models 9406-870 and 9406-890 have some additional information that is important during planning.

- For power, see iSeries 9406-870 and 9406-890 power and height considerations.
- For a multiple server installation, see Multiple server installation considerations.
- For service clearances, see Service clearances for multiple server installations.
- For cooling requirements, see Cooling requirements for multiple server installations.

Table 61. Server specifications

Pictured is the model 9406-870 or 9406-890 server with the 9094 expansion unit			
Dimensions	Width	Depth	Height
Metric (mm)	785	1494	2025
English (in.)	30.91	58.83	79.72
Depth without covers		1173.5 mm (46.2 in)	
Standard shipping crate	940 mm (37 in.)	1422 mm (56 in.)	2337 mm (92 in.)
Reduced height shipping crate	940 mm (37 in.)	1422 mm (56 in.)	2032 mm (80 in.)
Height reduction feature 0126 System frame is included in two pieces to be fully assembled at customer location.			1.65 m (65 in)
Maximum configuration weight	800 kg (1758 lb.)		
Electrical and thermal			

Table 61. Server specifications (continued)

kVA (maximum) 8-way (9406-870) 16-way (9406-870) 24-way (9406-890) 32-way (9406-890)	6.315 6.315 8.201 10.099
Rated voltage at 50-60 plus or minus 0.5 Hz (3-phase) ^{3, 4}	200-240 V ac 380-415 V ac 480 V ac
Rated current (amps per phase) 200-240 V ac 380-415 V ac 480 V ac	45 A 25 A 20 A
Thermal output (maximum) 8-way (9406-870) 16-way (9406-870) 24-way (9406-890) 32-way (9406-890)	20.478 kBtu/hr 20.478 kBtu/hr 26.591 kBtu/hr 32.744 kBtu/hr
Power requirements maximum 8-way (9406-870) 16-way (9406-870) 24-way (9406-890) 32-way (9406-890)	6000 W 6000 W 7791 W 9594 W
Power factor	0.95
Frequency (Hertz)	50 to 60
Inrush current ³	163 A
Leakage current	42 mA
Phase	3
Power cord feature 200-240 V ac 380-415 V ac 480 V ac	1300, 1301 1304 1302, 1303
Power cord length	4.3 m (14 ft.) or 1.8 m (6 ft.) (U.S. only)
Compatible receptacle 200-240 V ac 380-415 V ac 480 V ac	IEC 309, 60A 460R9W Not specified, electrician installed IEC 309, 30A 430R7W

Table 61. Server specifications (continued)

Plug type (NoIBM plug type available) 200-240 V ac 380-415 V ac 480 V ac	IEC 309, 60A 460P9W Not specified IEC 309, 30A 430P7W			
Temperature requirements				
Operating	10 degrees to 32 degrees C (50 degrees to 89.6 degrees F)			
Nonoperating	10 degrees to 43 degrees C (50 degrees to 109.4 degrees F)			
Storage	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)			
Shipping	-40 degrees to 60 degrees C (-40 degrees to 140 degrees F)			
Environment requirements	Operating	Non operating	Storage	Shipping
Noncondensing humidity	8 to 80%	8 to 100%	5 to 80%	5 to 100%
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	29 degrees C (84.2 degrees F)	29 degrees C (84.2 degrees F)
Maximum altitude	2134 m (7000 ft.)			
Noise emissions ¹	Operating		Idle	
L _{WAd}	7.2 bels		7.2 bels	
L _{pAm} (1-meter bystander)	54 dB		54 dB	

Service clearances			
Front	Back	Sides *	Top *
1143 mm	914 mm	762 mm	762 mm
45 in.	36 in.	30 in.	30 in.
Note: <ol style="list-style-type: none"> 1. For a description of noise emission values, see Acoustics. 2. Inrush currents occur only at initial application of power (very short duration for charging capacitors). No inrush currents occur during the normal power on or off cycle. 3. The system will function normally with a nominal input voltage in the range of 200-480 V ac, three phase. 4. The power supplies automatically accept any voltage with the published rated voltage range. If dual power supplies are installed and operating, the power supplies draw approximately equal current from the utility (mains) and provide approximately equal current to the load. 			

* Side and top clearances are optional when operating if the building floor loading specifications are met.

iSeries 9406-870 and 9406-890 power and height considerations

Special power and height considerations apply to the these servers.

The special power and height considerations for your server are:

- “Doors and covers” on page 170
- “Moving, weight, and height considerations for the 9406-870 and 9406-890” on page 170
- “Power and electrical requirements” on page 170
- “Phase imbalance and bulk power regulator configuration” on page 171

- “Balancing power panel loads” on page 171
- “Power cord configuration” on page 172
- “Checking the facility outlets and power source” on page 173
- “Dual power installation” on page 174
- “Additional installation considerations” on page 175

Doors and covers

Covers are an integral part of the server and are required for product safety and EM compliance.

The enhanced acoustical cover consists of a special rear door which is approximately 200 mm (8 in.) in depth and contains acoustical treatment that lowers the noise level of the machine by approximately 6 dB compared to a non-acoustical rear door. With this door, the server meets the acoustical *Specifications for Category 1A for Data Processing Areas*, with a declared A-weighted sound power level, L_{WAd} of 7.4 bels (B) for the most common system configuration.

Moving, weight, and height considerations for the 9406-870 and 9406-890

Learn about the unique weight and height considerations for your server.

The customer should determine the path that the system must take to be moved from the delivery location to the installation site. The customer should verify that the height of all doorways, elevators, and so on are sufficient to allow movement of the system to the installation site. The customer should also determine that the weight limitation of elevators, ramps and so on are sufficient to allow movement of the system to the installation site, including considerations for the additional height resulting from the use of protective materials on the floors (such as, 3/8 in. plywood to protect floors during movement of heavy systems. If it is determined that the height or weight of the system can cause a problem in movement to the installation site, contact your local site planning or sales representative. See the model 9406-870 and 9406-890 specification sheet for weight and height details.

If height is a concern, order feature code 0126, model 9406-870 and 9406-890 EIA reduction option. This feature indicates that the system frame is to be shipped in two pieces to be fully assembled at the customer’s location. The top section of the system frame (including the power subsystem) is removed. The height of the system frame with the upper section removed is approximately 1.65 meters (65 inches).

Power and electrical requirements

Use the power cord options table to determine the circuit breaker rating, power cord specifications, receptacles, and geographic requirements for your server.

Redundant power and power cords are standard on the Servers 9406-870 and 9406-890. The server uses dual alternating current power cords. For maximum availability, each of the power cords should be fed from independent power grids.

The following table illustrates the power cord options for the Servers 9406-870 and 9406-890 with their geographic, breaker rating, and cord information.

Table 62. Power cord options

3-Phase supply voltage (50/60 Hz)	200-240 V	380-415 V	480 V
Geography	United States, Canada, Japan	Europe, Middle East, Africa, Asia Pacific	United States, Canada
Customer circuit breaker rating (See note 1) (See Note 1)	60 A	30 A	30 A
Cord information	6 and 14 foot, 6 AWG power cord	14 foot, 6 or 8 AWG power cord, (electrician installed)	6 and 14 foot, 10 AWG power cord

Table 62. Power cord options (continued)

Recommended receptacle	IEC309, 60 A, type 460R9W (not provided)	Not specified, electrician installed	IEC309, 30 A, type 430R7W (not provided)
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Note 1: The exact circuit breaker ratings might not be available in all countries. Where the specified circuit breaker ratings are not acceptable, use the nearest available rating. Use of a time delayed circuit breaker is recommended.

Phase imbalance and bulk power regulator configuration

Use the Phase imbalance as a function of BPR configuration table to determine the phase imbalance of your server's configuration.

Depending on the number of Bulk Power Regulators (BPRs) in your system, phase imbalance can occur in line currents. All systems are provided with 2 bulk power assemblies (BPAs), with separate power cords. The following table illustrates phase imbalance as a function of BPR configuration.

Table 63. Phase imbalance as a function of BPR configuration

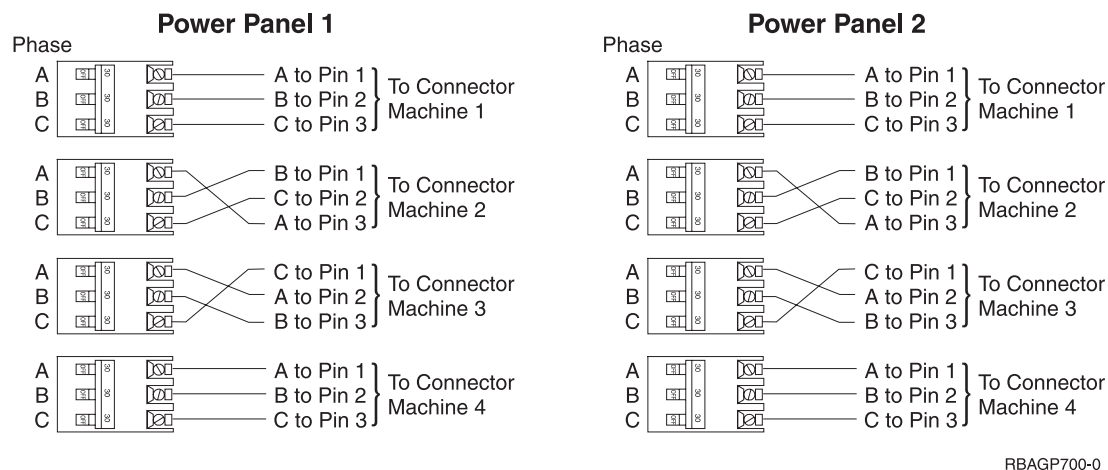
Number of BPRs per BPA	Phase A line current	Phase B line current	Phase C line current
1	Power / V line	Power / V line	0
2	0.5 power / V line	0.866 power / V line	0.5 power / V line

V line is line-to-line nominal input voltage.

Balancing power panel loads

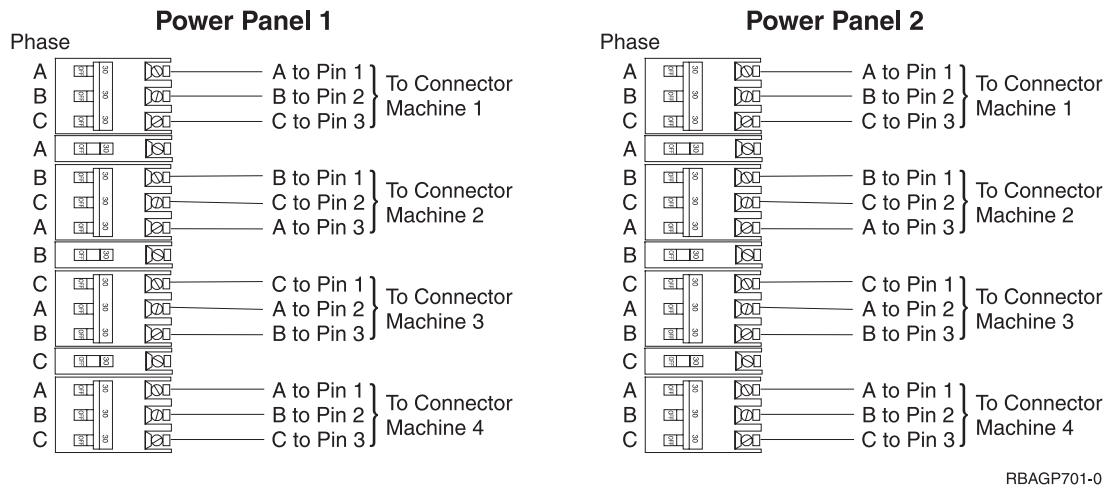
Use these methods to ensure that power panel loads are balanced.

The servers 9406-870 and 9406-890 require three phase power. Depending on the system configuration, the phase currents can be single phase, line-to-line, or unbalanced. System configurations with two bulk power regulators (BPRs) per bulk power assembly (BPA) have unbalanced power panel loads. With two BPRs per BPA, two of the three phases will draw an equal amount of current, and will be, nominally, 57.8 percent of the current on the third phase. With one BPR per BPA, two of the three phases will carry an equal amount of current, with no current drawn on the third phase. The following figure is an example of feeding several loads of this type from two power panels in a way that balances the load among the three phases.

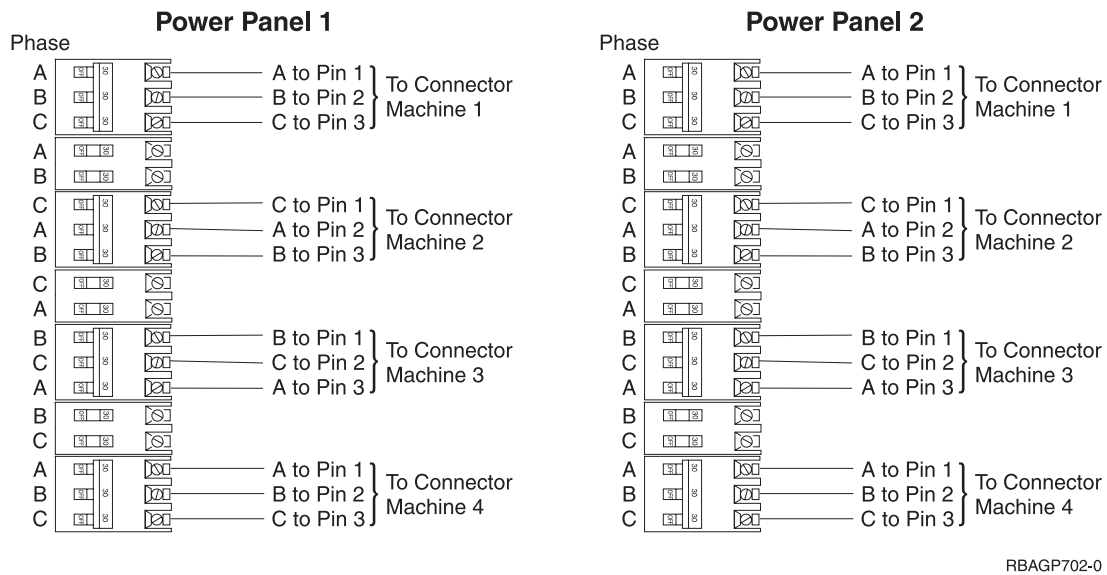


The method illustrated in the preceding figure requires that the connection from the three poles of each breaker to the three phase pins of a connector be varied. Some electricians might prefer to maintain a consistent wiring sequence from the breakers to the connectors. The following figure shows a way to

balance the load without changing the wiring on the output of any breakers. The three-pole breakers are alternated with single-pole breakers. This way the three-pole breakers do not all begin on Phase A.

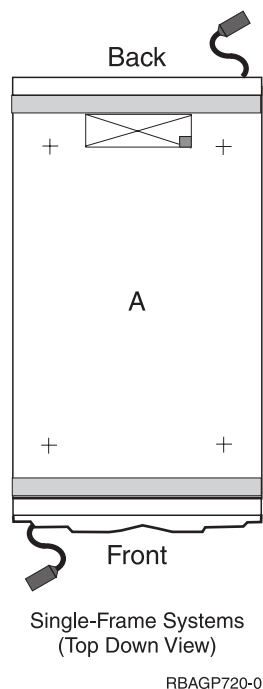


The following figure shows another way of distributing the unbalanced load evenly. In this case, the three-pole breakers are alternated with two-pole breakers.



Power cord configuration

The power cords exit the system from different points of the servers 9406-870 and 9406-890 frame as indicated in the following figure.



Checking the facility outlets and power source

Use these guidelines to ensure that appropriate power is available for your servers.

Attention: Do not touch the receptacle or the receptacle faceplate with anything other than your test probes before you have met the following requirements.

Performing the following will ensure that appropriate power will be used by the iSeries 9406-870 and 9406-890 system frames. The following checklist is for reference purposes and will likely be performed by a service engineer prior to installation.

1. The iSeries 9406-870 and 9406-890 system frames are equipped to use 200-240 V, 380-415 V, and 480 V alternating current, three phase. Check that the correct power source is available.
2. Before system installation, locate and turn off the branch circuit breaker. Attach the "Do not operate" tag, S229-0237.
3. All measurements are made with the receptacle faceplate in the normally installed position. If the receptacle case or faceplate is painted, be sure the probe tip penetrates the paint and makes good electrical contact with the metal. Do not use a digital multimeter to measure grounding resistance. Some receptacles are enclosed in metal housings. On receptacles of this type, perform the following steps:
 - a. Check for less than 1 volt from the receptacle case to any grounded metal structure in the building, such as a raised floor metal structure, water pipe, building steel, or similar structure.
 - b. Check for less than 1 volt from receptacle ground pin to a grounded point in the building.
4. Check the resistance from the ground pin of the receptacle to the receptacle case. Check resistance from the ground pin to building ground. The reading should be less than 1.0 ohm, which indicates the presence of a continuous grounding conductor.
5. If any of the checks made in steps 2 and 3 are not correct, remove the power from the branch circuit and make the wiring corrections; then check the receptacle again.
6. Check for infinite resistance between the phase pins. This is a check for a wiring short.

Attention: If the reading is other than infinity, do not proceed. You must make the necessary wiring corrections to satisfy the above criteria before continuing. Do not turn on the branch circuit, circuit breaker until all the above steps are satisfactorily completed.

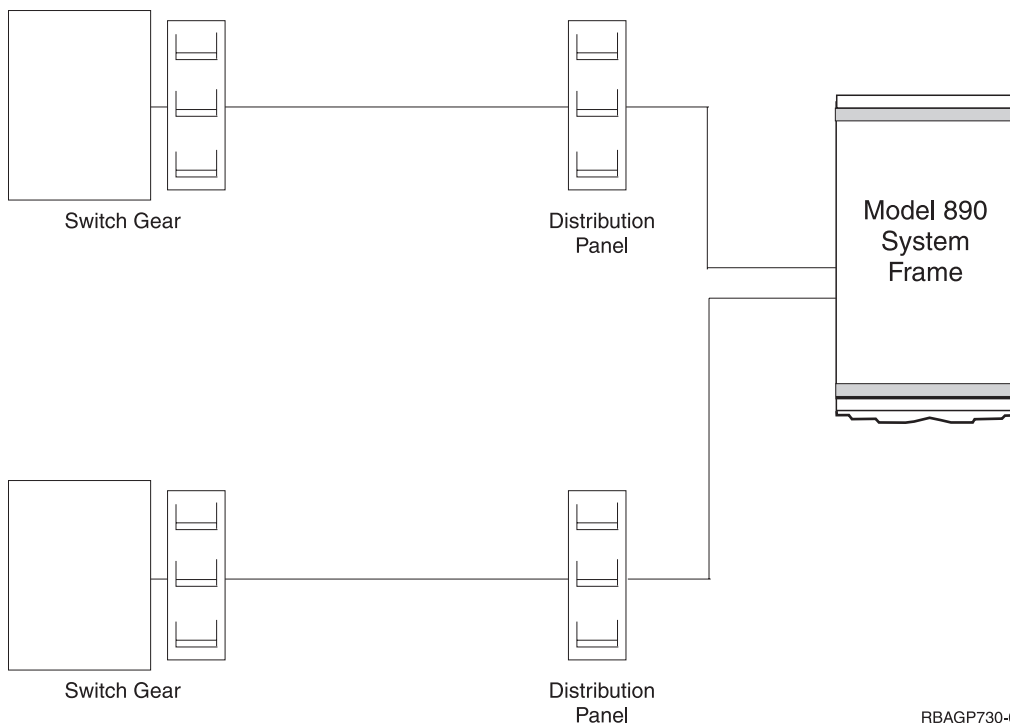
7. Remove the "Do not operate" tag, S229-0237.
8. Turn on the branch-circuit circuit breaker. Measure for appropriate voltages between phases. If no voltage is present on the receptacle case or grounded pin, the receptacle is safe to touch.
9. With an appropriate meter, verify that the voltage at the outlet is correct.
10. Verify that the grounding impedance is correct by using the ECOS 1020, 1023, B7106, or an appropriately approved ground impedance tester.
11. Turn off the branch-circuit circuit breaker.
12. Attach the "Do not operate" tag, S229-0237.
13. You are now ready to install and connect the power cables to the iSeries 9406-870 and 9406-890 system frames.

Dual power installation

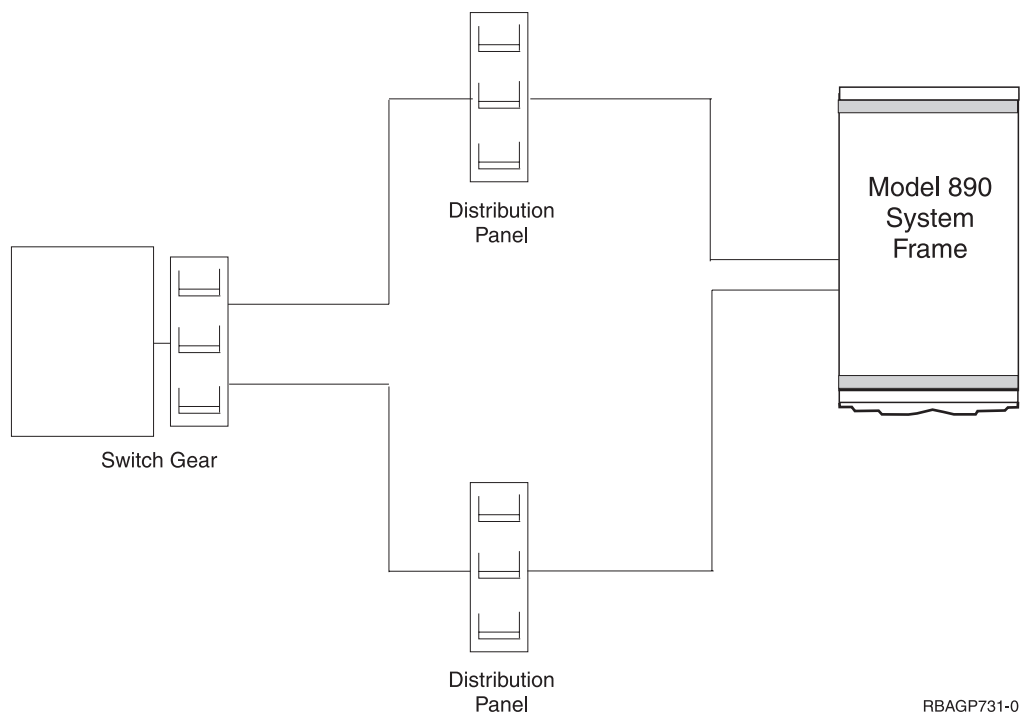
Three dual power installation configurations are available for your server.

The iSeries 9406-890 system frame is designed with a fully redundant power system. Each system has two power cords attached to two power input ports which, in turn, power a fully redundant power distribution system within the system. To take full advantage of the redundancy and reliability that is built into the computer system, the system must be powered from two distribution panels. There are three possible power installation configurations.

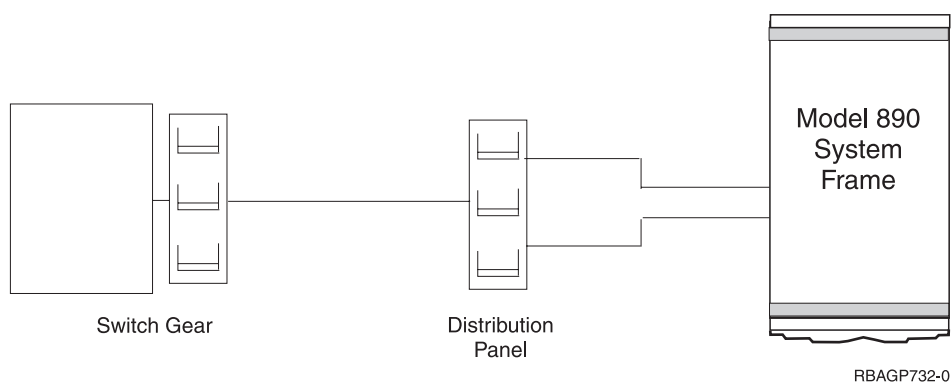
Dual power installation - redundant distribution panel and switch: This configuration requires that the system receives power from two separate power distribution panels. Each distribution panel receives power from a separate piece of building switch gear. This level of redundancy is not available in most facilities.



Dual power installation - redundant distribution panel: This configuration requires that the system receives power from two separate power distribution panels. The two distribution panels receive power from the same piece of building switch gear. Most facilities should be able to achieve this level of redundancy.



Single distribution panel - dual circuit breakers: This configuration requires that the system receives power from two separate circuit breakers in a single power panel. This does not make full use of the redundancy provided by the processor. It is, however, acceptable if a second power distribution panel is not available.



Additional installation considerations





In the United States, installation must be made in accordance with Article 645 of the National Electric Code (NEC). In Canada, installation must be made in accordance with Article 12-020 of the Canadian Electrical Code (CEC).

Hardware specification sheets

Hardware specification sheets provide detailed information for your hardware, including dimensions, electrical, power, temperature, environment, and service clearances.

Select the appropriate category for a list of available hardware specification sheets.

Tip: Print the specification tables for all of your equipment. You will need this information several times during the planning process.

- Removable media storage devices 
- Display stations 
- Printers 
- Communication controllers, hubs, routers, and modems 

Expansion unit and migration tower specifications

Expansion unit and migration tower specifications provide detailed information for your hardware, including dimensions, electrical, power, temperature, environment, and service clearances.

Select a model to view its specifications.

Expansion units and migration towers

- 5074 expansion unit
- 5074 expansion unit with 5078
- 5075 expansion unit
- 5078 and 0578 expansion unit
- 5088 PCI-X expansion unit
- 5094 PCI-X expansion unit
- 5094 PCI-X expansion unit with 5088
- 5095 PCI-X expansion unit
- 5096 expansion unit
- 5296 expansion unit
- 5786 and 5787 expansion unit
- 5790 PCI expansion drawer
- 5796 expansion drawer
- 7031-D24 and 7031-T24 expansion unit
- 7101 and 7102 expansion units
- 7104 expansion unit
- 7116 expansion unit
- 7214-1U2 media drawer
- 7311-D10 expansion unit
- 7311-D11 expansion unit
- 7311-D20 expansion unit
- 7314-G30 expansion drawer
- 8079 optional 1.8 m I/O rack (9079 I/O unit and 5074 expansion unit)
- 8094 and 5097 optional 1.8 m I/O rack (9094 I/O unit and 5074 expansion unit)
- 9079 I/O expansion unit
- 9094 or 9194 I/O expansion unit

5074 expansion unit or 9079 expansion unit with 5078 expansion unit

Hardware specifications provide detailed information for your expansion unit, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 64. Hardware specifications


Pictured is the 5074 expansion unit or 9079 expansion unit with 5078 expansion unit.			
Dimensions	Width	Depth	Height
Metric	485 mm	1075 mm	1110 mm
English	19.1 in.	42.3 in.	43.8 in.
Maximum configuration weight		418 kg (922 lb.)	
Electrical			
kVA (maximum)	1.470		
Rated voltage frequency	200-240 V ac at 50-60 plus or minus 0.5 Hz		
Thermal Output (maximum)	4573 Btu/hr		
Power requirements (maximum)	1340 W		
Power factor	0.91		
Inrush current	90 A		
Leakage current (maximum)	3.5 mA		
Phase	1		
Plug type (Canada and U.S.)	10, 34, or 5		
Power cord length	1.8 m (6 ft.) (U.S. only) or 4.3 m (14 ft.)		
Temperature requirements			
Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)		
Non operating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)		
Environment requirements	Operating	Nonoperating	
Noncondensing humidity	8 to 80%	8 to 80%	
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	

Table 64. Hardware specifications (continued)

Maximum altitude		3048 m (10000 ft.)	
Noise emissions ¹			
5074		Operating	Idle
L _{WAd}		6.7 bels	6.6 bels
L _{pAm} (1-meter bystander)		48 dB	48 dB
5074 with 5078 expansion unit		Operating	Idle
L _{WAd}		6.9 bels	6.8 bels
L _{pAm} (1-meter bystander)		52 dB	51 dB
Service clearances			
Front	Back	Sides ²	Top ²
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Notes:			
1. For a description of noise emission values, see Acoustics.			
2. Side and top clearances are optional during operation.			

5075 PCI expansion entry tower

Hardware specifications provide detailed information for your expansion unit, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 65. Hardware specifications


Pictured is the 5075 PCI expansion entry tower .			
Dimensions are shown for the 5075 PCI expansion entry tower only.			
Dimensions	Width	Depth	Height
Metric	330 mm	690 mm	560 mm
English	12.9 in.	27.1 in.	22.0 in.
Maximum configuration weight		52.7 kg (116 lb.)	
Electrical			
kVA (maximum)		0.316	
Rated voltage and frequency		100-127/200-240 V ac at 50-60 plus or minus 0.5 Hz	
Thermal output (maximum)		1024 Btu/hr	
Power requirements (maximum)		300 W	

Table 65. Hardware specifications (continued)

Power factor	0.95		
Inrush current	74 A		
Leakage current (maximum)	3.5 mA		
Phase	1		
Plug type (Canada and U.S.)	4, 5, 10, or 34		
Power cord length	1.8 m (6 ft.) (U.S. only), 4.3 m (14 ft.)		
Temperature requirements			
Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)		
Nonoperating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)		
Environment requirements	Operating	Nonoperating	
Noncondensing Humidity	8 to 80%	8 to 80%	
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	
Maximum altitude	3048 m (10000 ft.)		
Noise emissions ¹	Operating	Idle	
L _{WAd}	6.0 bels	5.7 bels	
L _{pAm} (1-meter bystander)	42 dB	39 dB	
Service clearances			
Front	Back	Sides ²	Top ²
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Notes:			
1. For a description of noise emission values, see Acoustics.			
2. Side and top clearances are optional when operating.			

5078 or 0578 expansion unit for 5074 expansion unit, 9079 base I/O tower, or 0551 iSeries rack

Hardware specifications provide detailed information for your expansion unit, I/O tower, or rack, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 66. Hardware specifications

<p>Pictured is the 5078 or 0578 expansion unit.</p> <p>The 5078 or 0578 expansion unit is attached to the top of a 5074, 9079. Or it can be mounted in an 0551 iSeries rack.</p>				
Dimensions	Width	Depth	Height	Height in 0551 rack²
Metric	485 mm	1075 mm	200 mm	8 EIA
English	19.1 in.	42.3 in.	8.0 in.	8 U
Maximum configuration weight		68 kg (150 lb.)		
Electrical				
kVA (maximum)	0.370			
Rated voltage and frequency	200-240 V ac at 50-60 plus or minus 0.5 Hz			
Thermal output (maximum)	1195 Btu/hr			
Power requirements (maximum)	350 W			
Power factor	0.95			
Inrush current	48 A			
Leakage current (maximum)	3.5 mA			
Phase	1			
Plug type (Canada and U.S.)	Includes two IEC 320 C13 to C14 power cords.			
Power cord length	3 m (10 ft.)			
Temperature requirements				
Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)			
Non operating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)			
Environment requirements	Operating	Nonoperating		
Noncondensing humidity	8 to 80%	8 to 80%		
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)		

Table 66. Hardware specifications (continued)

Maximum altitude		3048 m (10000 ft.)	
Noise emissions¹		Operating	Idle
L _{WAd} - 5078 with 5074 or 9079		5.7 bels	5.7 bels
L _{pAm} (1-meter bystander) - 5078 with 5074 or 9079		40 dB	40 dB
Service clearances			
Front	Back	Sides³	Top³
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Notes: <ol style="list-style-type: none"> 1. For a description of noise emission values, see Acoustics. 2. Feature code 0578 is PCI expansion unit in a rack. 3. Side and top clearances are optional during operation. 			

0588 and 5088 expansion unit for 5094 expansion unit, 9094 I/O expansion unit, 5074 expansion unit, 9079 I/O expansion unit, or 0551 iSeries rack

Hardware specifications provide detailed information for your expansion unit or rack, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 67. Hardware specifications


<p>Pictured is the 0588 or 5088 PCI-X expansion unit.</p> <p>The 5088 PCI-X expansion unit is attached to the top of a 5094, 9094, 5074.</p> <p>0588 is mounted in an 0551 iSeries rack.</p>				
				
Dimensions	Width	Depth	Height	Height in 0551 rack^{2, 4}
Metric	485 mm	1075 mm	200 mm	8 EIA
English	19.1 in.	42.3 in.	8.0 in.	8 U
Maximum configuration weight				
68 kg (150 lb.)				
Electrical				

Table 67. Hardware specifications (continued)

kVA (maximum)	0.370		
Rated voltage and frequency	200-240 V ac at 50-60 plus or minus 0.5 Hz		
Thermal output (maximum)	1195 Btu/hr		
Power requirements (maximum)	350 W		
Power factor	0.95		
Inrush current	48 A		
Leakage current (maximum)	3.5 mA		
Phase	1		
Plug type (Canada and U.S.)	Includes two IEC 320 C13 to C14 power cords.		
Power cord length	3 m (10 ft.)		
Temperature requirements			
Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)		
Nonoperating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)		
Environment requirements	Operating	Nonoperating	
Noncondensing humidity	8 to 80%	8 to 80%	
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	
Maximum altitude	3048 m (10000 ft.)		
Noise emissions ¹	Operating	Idle	
L _{WAd} - 5088 with 5094, 9094, or 5074 expansion units	5.7 bels	5.7 bels	
L _{pAm} (1-meter bystander) - 5088 with 5094, 9094, or 5074 expansion units	40 dB	40 dB	
Service clearances			
Front	Back	Sides ³	Top ³
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Notes:			
1. For a description of noise emission values, see Acoustics.			
2. Feature code 0588 is a PCI-X expansion unit in a rack.			
3. Side and top clearances are optional during operation.			
4. See 0551 rack configurations for typical configurations when the 0551 rack is populated with various server models.			

5094 expansion unit , 9094 I/O expansion unit with 5088 PCI-X expansion unit , or 9194 expansion unit

Hardware specifications provide detailed information for your expansion unit, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 68. Hardware specifications

Pictured is the 5094 expansion unit or 9094 expansion unit with 5088 PCI-X expansion unit.			
Dimensions	Width	Depth	Height
Metric	485 mm	1075 mm	1110 mm
English	19.1 in.	42.3 in.	43.8 in.
Maximum configuration weight		418 kg (922 lb.)	
Electrical			
kVA (maximum)	1.470		
Rated voltage and frequency	200-240 V ac at 50-60 plus or minus 0.5 Hz		
Thermal output (maximum)	4573 Btu/hr		
Power requirements (maximum)	1340 W		
Power factor	0.91		
Inrush current	90 A		
Leakage current (maximum)	3.5 mA		
Phase	1		
Plug type (Canada and U.S.)	5, 10, or 34		
Power cord length	1.8 m (6 ft.) (U.S. only) or 4.3 m (14 ft.)		
Temperature requirements			
Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)		
Nonoperating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)		
Environmental requirements	Operating	Nonoperating	
Noncondensing humidity	8 to 80%	8 to 80%	
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	

Table 68. Hardware specifications (continued)

Maximum altitude		3048 m (10000 ft.)	
Noise emissions¹		Operating	Idle
L _{WAd}		6.7 bels	6.6 bels
L _{pAm} (1-meter bystander)		48 dB	48 dB
Service clearances			
Front	Back	Sides²	Top²
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Note: 1. For a description of noise emission values, see Acoustics. 2. Side and top clearances are optional during operation.			

0595 or 5095 PCI-X expansion unit

Hardware specifications provide detailed information for your expansion unit, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 69. Hardware specifications


Pictured is the 5095 PCI-X expansion unit.				
Dimensions for 5095 expansion unit	Width	Depth (with 30 mm (1.2 in.) front cover and 100 mm (3.9 in.) rear cover)	Height	
Metric	217 mm	818 mm	555 mm	
English	8.5 in.	32.2 in.	21.9 in.	
Dimensions for 0595 expansion unit	Width	Depth	Height	Height in 0551 rack ^{2, 4}
Metric	430 mm	658 mm	217 mm	5 EIA
English	16.9 in.	25.9 in.	8.5 in.	5 U
Maximum configuration weight		52.7 kg (116 lb.)		
Electrical				
kVA (maximum)		0.358		

Table 69. Hardware specifications (continued)

Rated voltage and frequency	100-127/200-240 V ac at 50-60 plus or minus 0.5 Hz		
Thermal output (maximum)	1161 Btu/hr		
Power requirements (maximum)	340 W		
Power factor	0.95		
Inrush current	60 A		
Leakage current (maximum)	3.5 mA		
Phase	1		
Plug type (Canada and U.S.)	4, 5, 10, or 34		
Power cord length	1.8 m (6 ft.) (U.S. only), 4.3 m (14 ft.)		
Redundant power and cooling	Feature 5138		
Temperature requirements			
Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)		
Nonoperating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)		
Environment requirements	Operating	Nonoperating	
Noncondensing humidity	8 to 80%	8 to 80%	
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	
Maximum altitude	3048 m (10000 ft.)		
Noise emissions ¹	Operating	Idle	
L _{WAd}	6.2 bels	6.1 bels	
L _{pAm} (1-meter bystander)	44 dB	43 dB	
Service clearances			
Front	Back	Sides ³	Top ³
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Notes:			
1. For a description of noise emission values, see Acoustics.			
2. Feature code 0595 is a PCI-X tower unit in a rack.			
3. Side and top clearances are optional when operating.			
4. See 0551 rack configurations for typical configurations when the 0551 rack is populated with various server models.			

5096 expansion unit

Hardware specifications provide detailed information for your expansion unit, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 70. Hardware specifications

Dimensions	Width	Depth	Height	Height in 0551 rack
Metric	485 mm	1075 mm	910 mm	18 EIA
English	19.1 in.	42.3 in.	35.8 in.	18 U
Maximum configuration weight				
280 kg (617 lb.)				

Table 70. Hardware specifications (continued)

Electrical			
kVA ⁴	0.389 - 1.100		
Rated Voltage/Frequency	200-240 V ac at 50-60 plus or minus 0.5 Hz		
Thermal Output ⁴	1075 - 3379 Btu/hr		
Power requirements (maximum) ⁴	315 - 990 W		
Power factor	0.95		
Inrush current	42 A		
Leakage current (maximum)	3.5 mA		
Phase	1		
Plug type (Canada and U.S.)	Type 10 (1453 for 6 ft. power cord p/n 14F1549) and (1454 for 14 ft. cord p/n 14F1550), Type 34 (1455 for 6 ft. power cord p/n 14F1551) and (1456for 14 ft. cord p/n 14F1552), or Type 5 (1451 for 6 ft. power cord p/n 14F1547) and (1452 for 14 ft. cord p/n 14F1548		
Power cord length ²	1.8 m (6 ft.) (U.S. only) 4.3 m (14 ft.)		
Temperature requirements			
Operating	10 to 38 degrees C (50 to 100.4 degrees F)		
Nonoperating	1 to 60 degrees C (33.8 to 140 degrees F)		
Environment requirements	Operating	Non-Operating	
Noncondensing Humidity	8 to 80%	8 to 80%	
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	
Maximum altitude	3048 m (10000 ft.)		
Noise emissions ¹	Operating	Idle	
L _{WAd}	6.7 bels	6.6 bels	
L _{pAm} (1-meter bystander)	49 dB	49 dB	
Service clearances			
Front	Back	Sides ³	Top ³
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Notes:			
1. For a description of noise emission values, see Acoustics.			
2. It is strongly recommended that the customer get the dual power cord feature (feature 5116) for this I/O expansion unit. Feature 5116 uses two power cords and has two AC boxes.			
3. Side and top clearances are optional when operating.			
4. Each tower can have 45 disk drives installed. Each disk drive that is installed adds 15 W, 0.0158 kVa to the power. The range of power represents configurations from no disk drives to 45 disk drives.			

5294 or 8294 1.8 m I/O rack

Hardware specifications provide detailed information for your rack, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 71. Rack specifications


<p>Pictured is the 5294 or 8294 1.8 m I/O rack.</p> <p>There are two 5094 expansions (with side covers and casters removed) in a 5294 1.8 m I/O rack.</p> <p>Dimensions are shown for the 5294 1.8 m I/O rack only.</p>			
			
Dimensions	Height	Width	Depth
Metric	1800 mm	650 mm	1020 mm
English	71.0 in.	25.5 in.	40.1 in.
Maximum configuration weight		726 kg (1600 lb.)	
Electrical ^(1, 2)		5094(1)	5094 (2)
kVA		1.100	1.100
Rated voltage and frequency		200-240 V ac at 50-60 plus or minus 0.5 Hz	200-240 V ac at 50-60 plus or minus 0.5 Hz
Thermal output (maximum)		3379 Btu/hr	3379 Btu/hr
Power requirements (maximum)		990 W	990 W
Power factor		0.91	0.91
Inrush current		50 A	50 A
Leakage current (maximum)		3.5 mA	3.5 mA
Phase		1	1
Plug type (Canada and U.S.)		<p>Type 10 lower unit cord feature 1453 (6 ft. 14F1549) and upper unit cord feature 1458 (9 ft. 12J5119, with only 6 ft. usable length),</p> <p>Type 34 lower unit cord feature 1455 (6 ft. 14F1551) and upper unit cord feature 1459 (9 ft. 55H6644, with only 6 ft. usable length), or</p> <p>Type 5 lower unit cord feature 1451 (6 ft. 14F1547) and upper unit cord feature 1457 (9 ft. 12J5120, with only 6 ft. usable length)</p>	
Power cord length ^(1, 2) (U.S. only)		1.8 m (6 ft.) 2.7 m (9 ft.)	1.8 m (6 ft.) 2.7 m (9 ft.)
Temperature requirements			

Table 71. Rack specifications (continued)

Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)		
Nonoperating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)		
Environment requirements	Operating	Nonoperating	
Noncondensing humidity	8% to 80%	8% to 80%	
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	
Maximum altitude	3048 m (10000 ft.)		
Noise emissions	Operating	Idle	
L _{WAd} Category 2E, General business	7.0 bels	6.9 bels	
<L _{pA} > _m	52 dB	52 dB	
Service clearances			
Front	Back	Sides	Top
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Note:			
1. Because the 5294 1.8 m I/O rack consists of two 5094 PCI-X expansion units, electrical requirements for each 5094 need to be planned for individually. Hence, the (1) and (2) represent the specs for each 5094. The 5094 requires the appropriate receptacle for the power cord included with each 5094			
2. The usable length of the power cord for the top/upper 5094 is reduced by 4 ft. (1.2 m) because of the routing inside the 1.8 m enclosure. Therefore, a 14 ft. (4.3 m) cord results in a usable length of 10 ft. (3 m), and a 9 ft. (2.7 m) cord results in a usable length of 5 ft. (1.5 m).			

For information about floor loading, contact your IBM service or Installation Planning representative. Because the thickness of the covers are negligible, the height, width, and depth of the overall dimensions may be used in floor loading calculations.

5296 1.8 m I/O rack

Hardware specifications provide detailed information for your rack, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 72. Rack specifications

Dimensions	Height	Width	Depth
Metric	1800 mm	650 mm	1020 mm
English	71.0 in.	25.5 in.	40.1 in.
Maximum configuration weight	726 kg (1600 lb.)		
Electrical^(1, 2)	5096 ¹		5096 ²
kVA ³	0.389 - 1.100		0.389 - 1.100
Rated voltage and frequency	200-240 V ac at 50-60 plus or minus 0.5 Hz		200-240 V ac at 50-60 plus or minus 0.5 Hz
Thermal output (maximum) ³	1075 - 3379 Btu/hr		1075 - 3379 Btu/hr
Power requirements (maximum) ³	315 - 990 W		315 - 990 W
Power factor	0.95		0.95
Inrush current	50 A		50 A

Table 72. Rack specifications (continued)

Leakage current (maximum)	3.5 mA	3.5 mA	
Phase	1	1	
Plug type (Canada and U.S.)	Type 10 lower unit cord feature 1453 (6 ft. 14F1549) and upper unit cord feature 1458 (9 ft. 12J5119, with only 6 ft. usable length), Type 34 lower unit cord feature 1455 (6 ft. 14F1551) and upper unit cord feature 1459 (9 ft. 55H6644, with only 6 ft. usable length), or Type 5 lower unit cord feature 1451 (6 ft. 14F1547) and upper unit cord feature 1457 (9 ft. 12J5120, with only 6 ft. usable length)		
Power cord length ^(1, 2) (U.S. only)	1.8 m (6 ft.) 2.7 m (9 ft.)	1.8 m (6 ft.) 2.7 m (9 ft.)	
Temperature requirements			
Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)		
Nonoperating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)		
Environment requirements	Operating	Nonoperating	
Noncondensing humidity	8% to 80%	8% to 80%	
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	
Maximum altitude	3048 m (10000 ft.)		
Noise emissions	Operating	Idle	
L _{WAd} Category 2E, General business	7.0 bels	6.9 bels	
<L _{pA} > _m	52 dB	52 dB	
Service clearances			
Front	Back	Sides	Top
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Note:			
1. Because the 5296 1.8 m I/O rack consists of two 5096 expansion units, electrical requirements for each 5096 need to be planned for individually. Hence, the (1) and (2) represent the specifications for each 5096. The 5096 requires the appropriate receptacle for the power cord included with each 5096			
2. The usable length of the power cord for the top/upper 5096 is reduced by 4 ft. (1.2 m) because of the routing inside the 1.8 m enclosure. Therefore, a 14 ft. (4.3 m) cord results in a usable length of 10 ft. (3 m), and a 9 ft. (2.7 m) cord results in a usable length of 5 ft. (1.5 m).			
3. Each 5096 can have 45 disk drives installed. Each disk drive that is installed adds 15 W, 0.0158 kVa to the power. The range of power represents configurations from no disk drives to 45 disk drives.			

For information about floor loading, contact your IBM service or Installation Planning representative. Because the thickness of the covers are negligible, the height, width, and depth of the overall dimensions may be used in floor loading calculations.

5786, 5787, 7031-D24, 7031-T24 expansion units

Hardware specifications provide detailed information for your expansion unit, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 73. Hardware specifications

Dimensions for rack-mounted expansion unit	Width	Depth	Height
Metric	447 mm	660 mm	171 mm
English	17.5 in.	26 in.	6.75 in.
Dimensions for desk-side expansion unit with stabilizer foot and decorative covers	Width	Depth	Height
Metric	305 mm	655 mm	508 mm
English	12.0 in.	26.0 in.	20.0 in.
Maximum configuration weight (rack-mounted)		54 kg (120 lb.)	
Maximum configuration weight (desk-side)		66 kg (145 lb.)	
Electrical			
kVA (maximum)		0.740	
Rated voltage and frequency		100-127 V ac at 50-60 plus or minus 3 Hz and 12 A 200-240 V ac at 50-60 plus or minus 3 Hz and 6.2 A Machine rating with two redundant power cords	
Thermal output (maximum)		2382 Btu/hr	
Power requirements (maximum)		700 W	
Power factor		0.95	
Inrush current		55 A per power cord	
Leakage current (maximum)		3.10 mA	
Phase		1	
Plug type (Canada and U.S.)		2, 4, 5, 6, 10 (for 5786 and 5787 only), 18, 19, 22, 23, 24, 25, 32, 34 (for 5786 and 5787 only), 57, 59, 62, 66, 69, 70, 73, 75, 76	
Power cord length		1.8 m (6 ft.) (U.S. only) or 4.3 m (14 ft.)	
Temperature requirements			
Operating		10 degrees to 38 degrees C (50 degrees to 100.4 degrees F) ³	
Nonoperating		-40 degrees to 60 degrees C (-40 degrees to 140 degrees F)	
Environmental requirements		Operating	Nonoperating
Noncondensing humidity		20 to 80% (allowable) 40 to 55% (recommended)	8 to 80% (including condensing)
Wet bulb temperature		21 degrees C (69.8 degrees F)	27 degrees C (80.6 degrees F)
Maximum altitude		2134 m (7000 ft.) above sea level	
Noise emissions ^{1, 4}		Operating	Idle

Table 73. Hardware specifications (continued)

Single 5786 or 7031-D24 drawer in standard 19-inch rack with 24 hard drives, nominal environmental conditions, and no front or rear doors on rack.	L _{WAd}	6.6 bels	6.5 bels
	L _{pAm} (1-meter bystander)	49 dB	49 dB
5787 or 7031-T24 tower with 24 hard drives, and nominal environmental conditions.	L _{WAd}	6.6 bels	6.5 bels
	L _{pAm} (1-meter bystander)	47 dB	47 dB
Service clearances			
Service clearances for rack-mounted expansion unit			
Front	Back	Sides²	Top²
914 mm	914 mm	914 mm	
36 in.	36 in.	36 in.	
Service clearances for desk-side expansion unit			
Front	Back	Sides	Top
368.3 mm	381 mm		
14.5 in.	15 in.		
Notes: <ol style="list-style-type: none"> For a description of noise emission values, see Acoustics. Side and top clearances are optional during operation. The maximum 38 degree C (100.4 degree F) temperature must be derated 1 degree C (1.8 degrees F) per 137 m (450 ft.) above 1295 m (4250 ft.). Maximum altitude is 2134 m (7000 ft.). All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296. 			
Safety compliance: This hardware is designed and certified to meet the following safety standards: UL 60950; CAN/CSA C22.2 No. 60950-00; EN 60950; IEC 60950 including all National Differences			

5790 PCI expansion drawer

Hardware specifications provide detailed information for your expansion unit, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 74. Hardware specifications

Physical dimensions			
Dimensions for 5790			
	Height	Width	Depth
Metric	170 mm	220 mm	711 mm
English	6.6 in.	8.7 in.	28.0 in.
Dimensions for two 5790 with 7311 enclosure			
	Height	Width	Depth
Metric	178 mm	445 mm	711 mm
English	7.0 in.	17.5 in.	28.0 in.
Weight			
	5790	Two 5790 with 7311 enclosure	
Metric	16.8 kg	39.1 kg	
English	37 lb.	86 lb.	

Table 74. Hardware specifications (continued)

Physical dimensions			
Electrical			
Power source loading per 5790	0.21 kVa		
Voltage range	200-240 V ac, v dc not supported		
Frequency	50 or 60 Hz		
Thermal output per 5790	683 Btu/hr		
Power requirements for 5790	200 W		
Power factor	0.91		
Inrush current	64 A		
Temperature requirements			
Operating	10 degrees to 38 degrees C	50 degrees to 100.4 degrees F	
Nonoperating	1 degrees to 60 degrees C	33.8 degrees to 140 degrees F	
Storage	1 degrees to 60 degrees C	33.8 degrees to 140 degrees F	
Environment requirements	Operating	Nonoperating	Storage
Noncondensing humidity	8% to 80%	8% to 80%	8% to 80%
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	29 degrees C (84.2 degrees F)
Maximum altitude	3048 m (10000 ft.)		
Noise emissions ¹	Operating	Idle	
L _{WAd} , two 5790	5.9 bels	5.9 bels	
<L _{pA} > _m , two 5790	43 dB	43 dB	
Install/ Air Flow	Maintenance of service clearance will allow proper airflow.		
Service clearances			
Front	Back		
762 mm	762 mm		
30 in.	30 in.		
Note:			
1. For a description of noise emission values, see Acoustics.			

Planning for 5792 base rack

Hardware specifications provide detailed information for your rack, including dimensions, electrical, power, temperature, environment, and service clearances.

The 5792 base rack is an optional second base frame with its own separate connection to AC power that is designed for use with the model 590 and 595. A complete set of planning information is provided to address the resulting system.

The 5792 consists of multiple components, as summarized in the following table.

Table 75. 5792 base rack components

Model	Description	Minimum per system	Maximum per system
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Table 75. 5792 base rack components (continued)

FC6251	Slimline door set for primary rack (front and rear) See “Doors and covers” on page 197.	1	2
FC6252	Acoustic door set for primary rack (front and rear) See “Doors and covers” on page 197.	1	2
FC8691	Optional expansion frame (16-way and 32-way only)	0	1
Various	Hardware Management Console (HMC) ³	0 ¹	2 ¹
7040-61D (9119-590 and 9119-595), 5791 and 5794 (9406-595)	Optional I/O drawer (20 PCI cards max., 16 disk drives max.)	0	12 ²
FC6200 or FC6201	Optional integrated battery backup feature	0	6
Note: 1. A Hardware Management Console (HMC) can connect to multiple systems (therefore, a Hardware Management Console may not need to be ordered), or up to two HMCs can connect to the system for redundancy. 2. A maximum of 12 I/O drawers can be connected to a single 590 or 595 frame. Typically, I/O drawers are populated in the server frame first, which reduces the maximum number of drawers available in the 5792 frame. 3. For the 5792 base rack, a Hardware Management Console must be provided within the same room and within 8 m (26 ft.) of the server. Or, as an alternative to the local HMC requirement, it is acceptable for you to provide a supported device, such as a PC, with connectivity and authority to operate through a remotely attached HMC. This local device must be in the same room and within 8 m (26 ft.) of your server, and provide functional capability equivalent to the HMC that it replaces and that is needed by the service representative to service the server.			

Table 76. Rack specifications

Plan views				
Top down views				
ASHRAE declarations (heat load data for various configurations)				
Dimensions and weight				
Physical Characteristic	Slimline doors		Acoustical doors	
	1 Frame	2 Frames	1 Frame	2 Frames
Height	2025 mm (79.7 in.)	2025 mm (79.7 in.)	2025 mm (79.7 in.)	2025 mm (79.7 in.)
Width	785 mm (30.9 in.)	1575 mm (62.0 in.)	785 mm (30.9 in.)	1575 mm (62.0 in.)
Depth	1326 mm (52.2 in.)	1326 mm (52.2 in.)	1681 mm (66.2 in.)	1681 mm (66.2 in.)
Weight - Maximum Configuration ⁴	1264 kg (2786 lb.)	2659 kg (5863 lb.)	1273 kg (2806 lb.)	2677 kg (5901 lb.)
Shipping dimensions and weight				
Height	2311 mm (91 in.)			
Width	940 mm (37 in.)			
Depth	1511 mm (59.5 in.)			
Weight	Varies by configuration			
Electrical and thermal characteristics (3-phase)				
Rated voltage and frequency (3 phase)	200 to 240 V ac at 50 to 60 Hz	380 to 415 V ac at 50 to 60 Hz	480 V ac at 50 to 60 Hz	

Table 76. Rack specifications (continued)

Rated current, power cord with 100 A plug FC 8686 or 8687 (amps per phase)		60	32	24
Rated current, power cord with 60 A plug, FC 8688 or 8689 (amps per phase)		48	--	--
Rated current, all other power cords (amps per phase)		--	32	24
Maximum power		21.4 kW	21.4 kW	21.4 kW
Power factor, typical		0.99	0.97	0.93
Inrush current (maximum) ³		163 A		
Thermal output		73 kBtu/hr	73 kBtu/hr	73 kBtu/hr
Dual power feature code			Standard	
Branch circuit breaker and cord information			See “Breaker rating and cord information” on page 196	
Power cord length			4.2 m (14 ft.) - all locations (except Chicago)	
			1.8 m (6 ft.) - United States (Chicago)	
Environment specifications				
Recommended operating temperature			10 degrees to 32 degrees C (50 degrees to 89.6 degrees F)	
Nonoperating temperature (All models)			10 degrees to 43 degrees C (50 degrees to 109.4 degrees F)	
Storage temperature (All models)			1 degree to 60 degrees C (33.8 degrees to 140 degrees F)	
Shipping temperature (All models)			-40 degrees to 60 degrees C (-40 degrees to 140 degrees F)	
	Operating	Nonoperating	Storage ³	Shipping ³
Maximum wet bulb	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	29 degrees C (84.2 degrees F)	29 degrees C (84.2 degrees F)
Noncondensing relative humidity	8 to 80 %	8 to 80 %	5 to 80 %	5 to 100 %
Maximum altitude ³	3048 m (10000 ft.)			
Acoustical noise emissions ^{1, 5, 6}				
Product Configuration	L _{WAd} (Bels) ⁵		LpAM (dB) ⁵ (bystander, 1 m)	
	Operating	Idle	Operating	Idle
Single, typical I/O drawer in rack, nominal conditions, slimline door set	7.5	7.5	60	60
Single, typical I/O drawer in rack, nominal conditions, acoustical door set	6.8	6.8	53	53

Table 76. Rack specifications (continued)

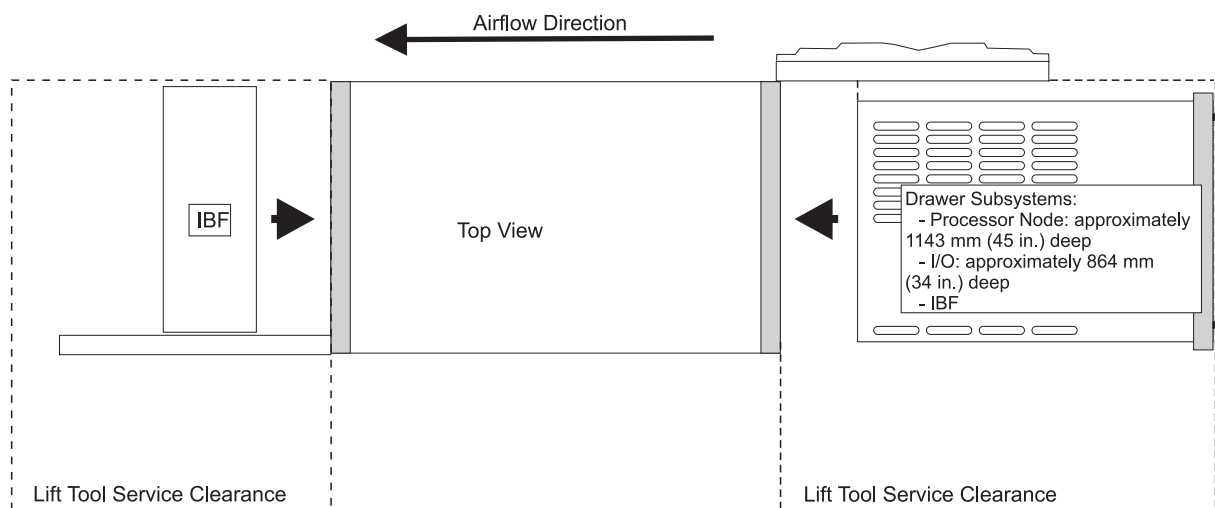
Single, typical I/O drawer in rack plus bulk power unit, nominal conditions, slimline door set	7.8	7.8	62	62
Single, typical I/O drawer in rack plus bulk power unit, nominal conditions, acoustical door set	7.1	7.1	55	55
Service clearances				
For a graphical representation of service clearances, see “Service clearances” on page 215				
Seismic considerations: See “Secure the rack” on page 112				
Data communications				
Electromagnetic compatibility compliance: This server meets the following electromagnetic compatibility specifications: FCC (CFR 47, Part 15); VCCI; CISPR-22; 89/336/EEC; BSMI (A2/NZS 3548:1995); C-Tick; ICES/NMB-003; Korean EMI/EMC (MIC Notice 2000–94, Notice 2000–72); People’s Republic of China Commodity Inspection Law				
Safety compliance: This server is designed and certified to meet the following safety standards: UL 60950-1; CAN/CSA C22.2 No. 60950-1; EN 60950-1; IEC 60950-1 including all national differences				
Note: <ol style="list-style-type: none"> Noise levels are only reported for the base machine type. Inrush currents occur only at initial application of power (short duration for charging capacitors). No inrush occurs during normal power off-on cycle. The upper limit of the dry bulb temperature must be derated 1 degree C (1.8 degrees F) per 219 m (719 ft.) above 1295 m (4250 ft.). Maximum altitude is 3048 m (10000 ft.). For specific configuration weights, see “Approximate system weights by configuration” on page 230 L_{WAd} is the upper-limit A-weighted sound level; L_{pAM} is the mean A-weighted sound pressure measured at the 1-meter bystander positions; 1 B = 10 dB. All measurements made in conformance with ISO 7779 and declared in conformance with 9296. 				

To effectively plan for the 5792, information on the following topics is also provided:

- “Breaker rating and cord information” on page 196
- “Power cord features” on page 197
- “Doors and covers” on page 197
- “Plan views” on page 198
- “Raised-floor requirements and preparation” on page 200
- “Cut and place floor panels” on page 200
- “Secure the rack” on page 202
- “Position the rack” on page 203
- “Install the frame tie-down kit” on page 203
- “Attach the rack to a concrete (nonraised) floor” on page 203
- “Attach the rack to a short-raised or long-raised floor” on page 206
- “Considerations for multiple system installations” on page 213

- “Service clearances” on page 215
- “Total system power consumption” on page 222
- “Cooling requirements” on page 223
- “Moving the system to the installation site” on page 225
- “Phase imbalance and BPR configuration” on page 226
- “Balancing power panel loads” on page 226
- “Power cord configuration” on page 228
- “Dual power installation” on page 230
- “Approximate system weights by configuration” on page 230
- “Weight distribution” on page 232
- “Unit emergency power off” on page 234
- “Computer room emergency power off” on page 235
- “Machine holdup times” on page 236

Front-service access is necessary on the 5792 to accommodate a lift tool for the servicing of large drawers (I/O drawers). Front and rear service access is necessary to accommodate the lift tool for servicing of the optional integrated battery backup.



Floor Plan Considerations for Single Units

A4AA5731-1

Figure 67. Floor plan considerations for single units

Breaker rating and cord information:

Use the Breaker rating and cord information table to determine the circuit breaker rating for the power cords used with your server.

Table 77. Breaker rating and cord information

Voltage (Phase to phase)	200-240 V	200-240 V	380-415 V	480 V
Circuit breaker rating	60 A (60 A plug) or 80 A (100 A plug)	63 A (No plug)	30 A	32 A

Table 77. Breaker rating and cord information (continued)

Note:
1. The exact circuit breaker ratings may not be available in all countries. Where the specified circuit breaker ratings are not acceptable, use the nearest available rating. These recommendations are based on a maximum configuration running in "n-mode."
2. IBM encourages the use of a metal backbox with power cords using IEC-309 plugs.

Power cord features:

Use the Power cord features table to view the power cord specifications available for your server.

The following three-phase power cord features are available for the 5792:

Table 78. Power cord features

Supply type	Nominal voltage range (V ac)	Voltage tolerance (V ac)	Frequency range (Hz)	
Two redundant three-phase power cords	200-480	180-509	47-63	
Feature code	Description	Voltage (V ac)	Plug	Customer receptacle (not provided)
8697	Power cord, 8 AWG, 4.3 m (14 ft.)	480	IEC309 30 A plug	IEC309 Type 430R7W
8698	Power cord, 8 AWG, 1.8 m (6 ft.)			
8688	Power cord, 6 AWG, 4.3 m (14 ft.)	200-240	IEC309 60 A plug	IEC309 Type 460R9W
8689	Power cord, 6 AWG, 1.8 m (6 ft.)			
8686	Power cord, 6 AWG, 4.3 m (14 ft.)	200-240	IEC309 100 A plug	IEC309 Type 4100R9W
8687	Power cord, 6 AWG, 1.8 m (6 ft.)			
8694 ¹	Power cord, 6 AWG, 4.3 m (14 ft.)	380-415	Not provided	--
8677 ¹	Power cord, 8 AWG, 4.3 m (14 ft.)	380-415		
Note:				
1. These power cords are shipped without a plug or receptacle. An electrician may be required to install the plug and receptacle to meet applicable country or region electrical codes.				

Doors and covers:

Covers are an integral part of the 5792 and are required for product safety, proper airflow and cooling, and electromagnetic compatibility compliance.

The following rear door options are available for the 5792:

- Enhanced acoustical cover option

This feature provides a low-noise option for customers or sites with stringent acoustical requirements and where a minimal system footprint is not critical. The acoustical cover option consists of a special front and rear doors which are approximately 250 mm (10 in.) deep and contain acoustical treatment that lowers the noise level of the machine by approximately 7 dB (0.7 B) compared to the slimline doors. This reduction in noise emission levels means that the noise level of a single 5792 with slimline covers is about the same as the noise level of five model 5792 systems with acoustical covers.

- Slimline cover option

This feature provides a smaller-footprint and lower-cost option for customers or sites where space is more critical than acoustical noise levels. The slimline cover option consists of a front door, which is approximately 100 mm (4 in) deep, and a rear door, which is approximately 50 mm (2 in) deep. No acoustical treatment is available for this option.

Note: For declared levels of acoustical noise emissions, refer to Table 76 on page 193.

Plan views:

Dimensional planning information is shown in this top down view of your server.

The following figure shows dimensional planning information for systems with acoustical doors.

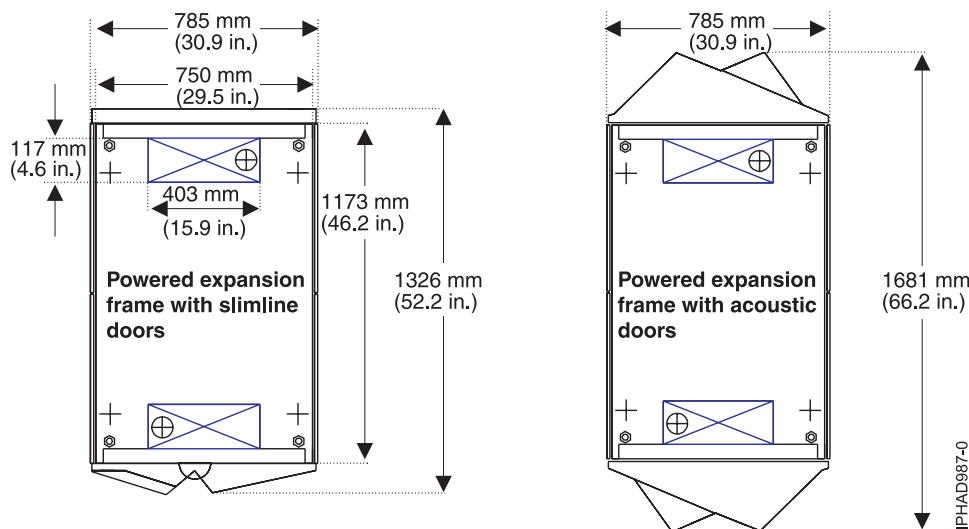


Figure 68. Plan view for single-frame systems with slimline doors and acoustical doors

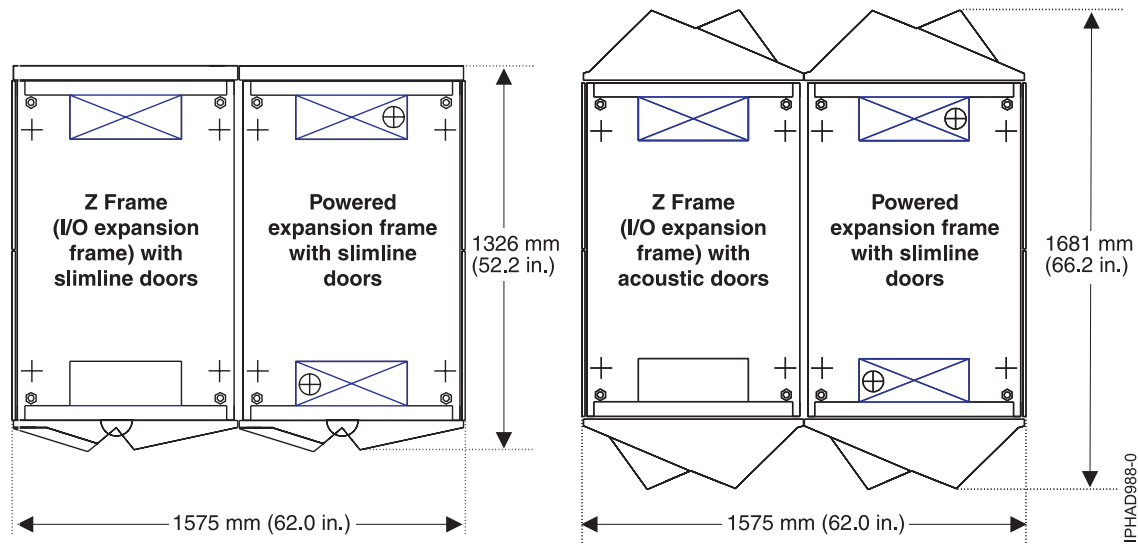


Figure 69. Plan view for double-frame systems with slimline doors and acoustical doors

Attention: When moving the rack, note the caster swivel diameters shown in the following figure. Each caster swivels in an approximate 130 mm (5.1 inch) diameter.

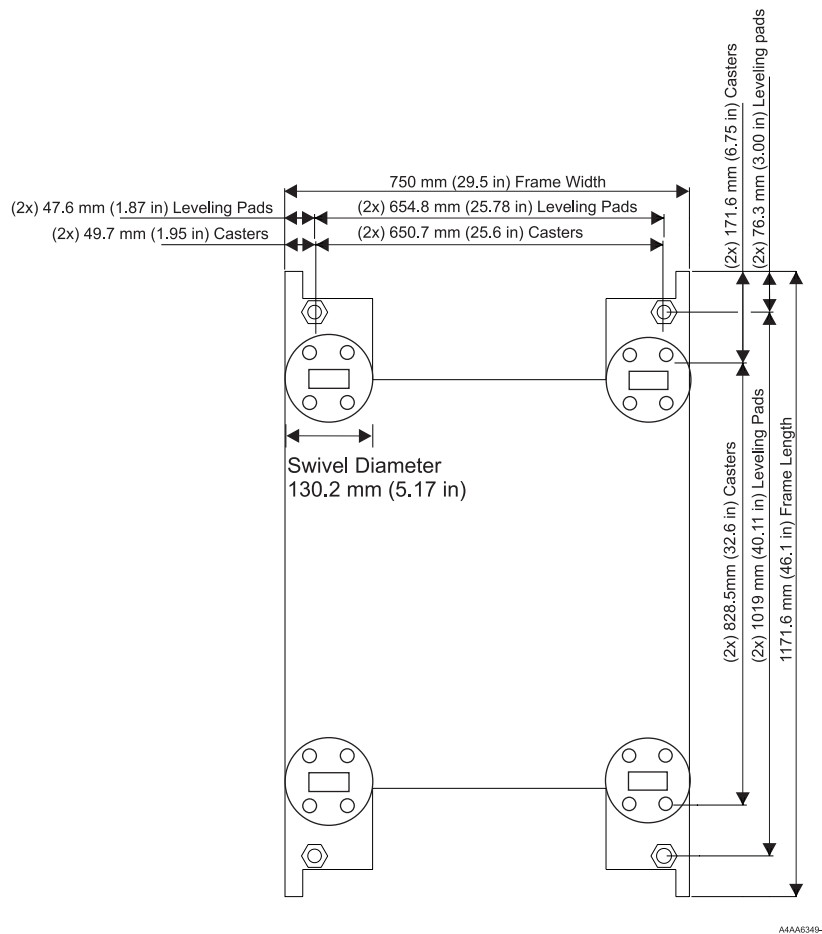


Figure 70. Leveling foot and frame dimensions

Raised-floor requirements and preparation:

A raised-floor is required for the 5792 to ensure optimal performance and to comply with electromagnetic compatibility requirements.

It will also provide optimum system cooling and cable management. Raised-floor cutouts should be protected by electrically nonconductive molding, appropriately sized, with edges treated to prevent cable damage and to prevent casters from rolling into the floor cutouts.

Cut and place floor panels:

These guidelines specify how to make the necessary openings in the raised floor for installing your server.

Use the following procedure to cut and place floor panels in the raised floor. The x-y alphanumeric grid positions are used to identify relative positions of cutout floor panels that may be cut in advance.

1. Measure the panel size of the raised floor.
2. Verify the floor panel size. The floor panel size illustrated is 600 mm (23.6 in.) and 610 mm (24 in.) panels.

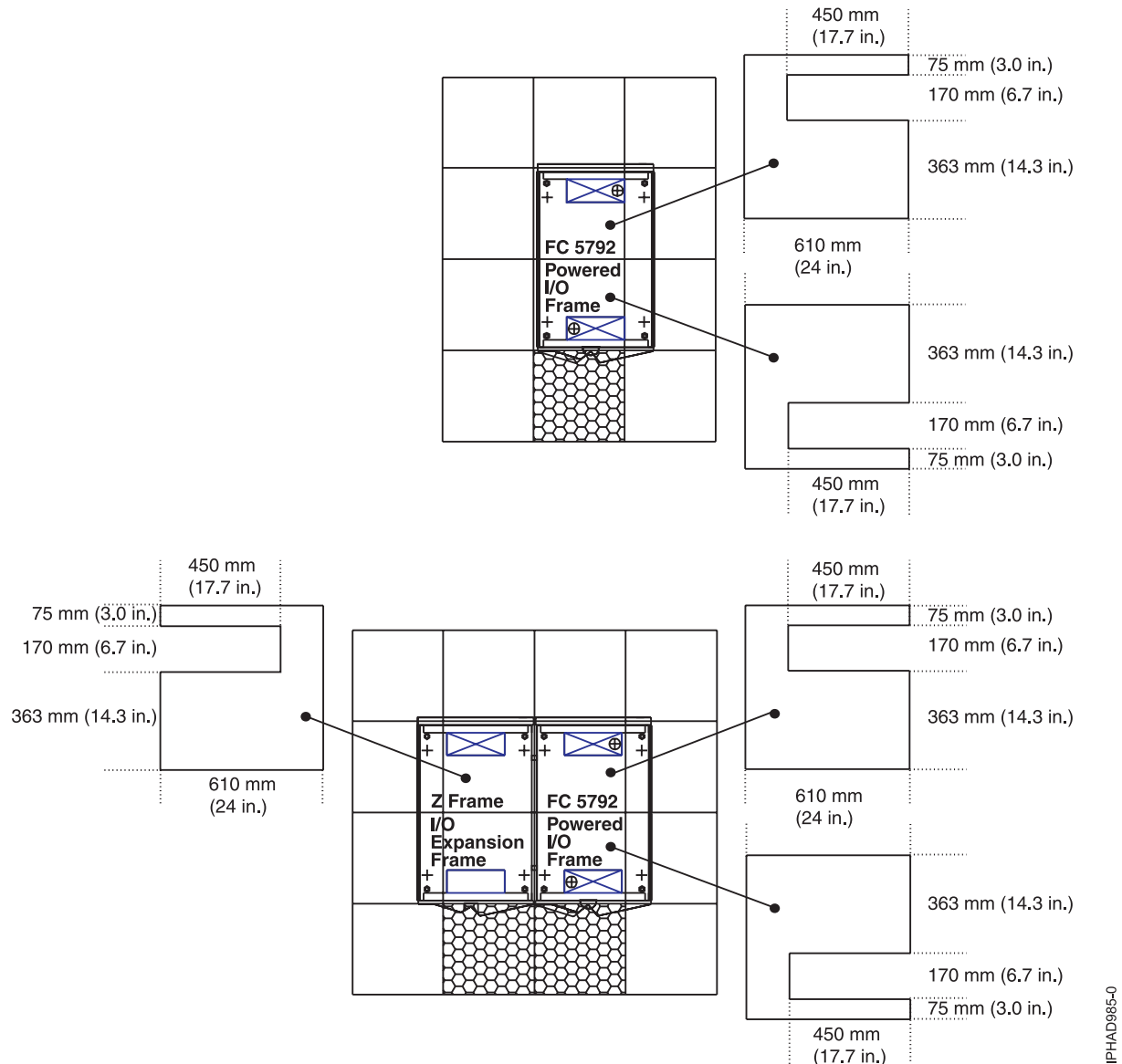
3. Ensure adequate floor space is available to place the frames over the floor panels exactly as shown in the figure. For front-to-back and side-to-side clearances, refer to “Considerations for multiple system installations” on page 124. Use the plan view, if necessary. Consider all obstructions above and below the floor.
4. Identify the panels needed, and list the total quantity of each panel required for the installation.
5. Cut the required quantity of panels. When cutting the panels, you must adjust the size of the cut for the thickness of the edge molding you are using. The dimensions shown in the figures are finished dimensions. For ease of installation, number each panel as it is cut, as shown in the following figure.

Note: Depending on the panel type, additional panel support (pedestals) may be required to restore structural integrity of the panel. Consult the panel manufacturer to ensure that the panel can sustain a concentrated load of 476 kg (1050 lb). For multiple frame installation, it is possible that two casters will produce loads as high as 953 kg (2100 lb).

6. Use Figure 71 on page 202 to install the panels in the proper positions.

Note:

- a. This floor-tile arrangement is recommended so that the castors or leveling pads are placed on separate floor tiles to minimize the weight on a single floor tile. Furthermore, we recommend that the tiles bearing the weight (having castors or leveling pads on the tiles) should be uncut to retain the strength of the floor tile.
- b. The following figure is intended only to show relative positions and accurate dimensions of floor cutouts. The figure is not intended to be a machine template and is not drawn to scale.



Note: This figure shows a dual frame configuration. If your installation uses a single frame configuration, use the dimensions associated with the primary frame.

Figure 71. Raised floor with 610 mm (24 in.) floor panels figure

Secure the rack:

Securing your rack to a concrete (nonraised) floor or to a raised floor prevents movement when vibrations occur.

Note: Securing the rack is an optional procedure. See Vibration and shock for more information..

The following can be ordered by the customer as additional rack-securing options for the 5792.

- RPQ 8A1183 for attaching the rack-mounting plates to the concrete floor (nonraised floor)
- RPQ 8A1185 to attach the rack to a concrete floor when server is on a raised floor 228.6 mm to 330.2 mm (9 in. to 13 in. depth)

- RPQ 8A1186 to attach the rack to a concrete floor when server is on a raised floor 304.8 mm to 558.8 mm (12 in. to 22 in. depth)

Before the service representative can perform the tie-down procedure you must complete the floor preparation described in “Cut and place floor panels” on page 200 and the procedures described in “Attach the rack to a concrete (nonraised) floor” or “Attach the rack to a short-raised or long-raised floor” on page 206.

Install the frame tie-down kit:

This procedure describes how to install a frame tie-down kit and floor tie-down hardware.

The following procedures describe how to install a frame tie down kit and floor tie-down hardware to secure an IBM rack to a concrete floor beneath a 228.6 mm to 330.2 mm (9 in. to 13 in. depth) or a 304.8 mm to 558.8 mm (12 in. to 22 in. depth) raised-floor environment or to a nonraised floor.

- “Position the rack”
- “Attach the rack to a concrete (nonraised) floor”
- “Attach the rack to a short-raised or long-raised floor” on page 206

Position the rack:

Use this procedure to unpack and position your rack.

To unpack and position the rack, do the following:

Note: See “Moving the system to the installation site” on page 225 before attempting to position the rack.

1. Remove all packing and tape from the rack.
2. Place the last floor covering exactly adjacent and in the front of the final installation location.
3. Position the rack according to the customer floor plan.
4. Lock each caster wheel by tightening the thumbscrew on the caster.

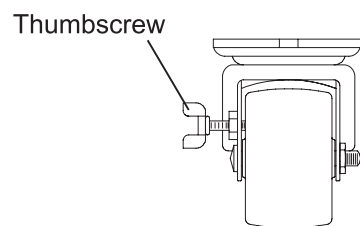


Figure 72. Caster thumbscrew

5. While moving the system to its final installed location and during relocation, it may be necessary to lay down floor covering, such as Lexan sheets, to prevent floor panel damage.

Attach the rack to a concrete (nonraised) floor:

Use this procedure to attach the rack to a concrete (nonraised) floor.

It is the customer’s responsibility to ensure the following steps are completed before the service representative performs the tie-down procedure.

Note: The customer should obtain the service of a qualified structural engineer to determine appropriate anchoring of the mounting plates. A minimum of three anchor bolts for each mounting plate must be used to secure the plates to the concrete floor. Because some of the drilled holes may be aligned with concrete reinforcement rods below the surface of the concrete floor, additional holes must be drilled. Each

mounting plate must have at least three usable holes, two that are on opposite sides and opposite ends of each other, and one hole at the center. The mounting plates should be able to withstand 1134 kg (2500 lb.) of pulling force on each end.

1. Be sure the rack is in the correct location. To ensure that the holes are in the correct location, the diagonal distance of the center of the holes should be 1211.2 mm (47.7 in.). The distance between the center holes to the center of the next holes should be 654.8 mm (25.8 in.) (the side-to-side distance) and 1019 mm (40.1 in.) (the front-to-back distance).

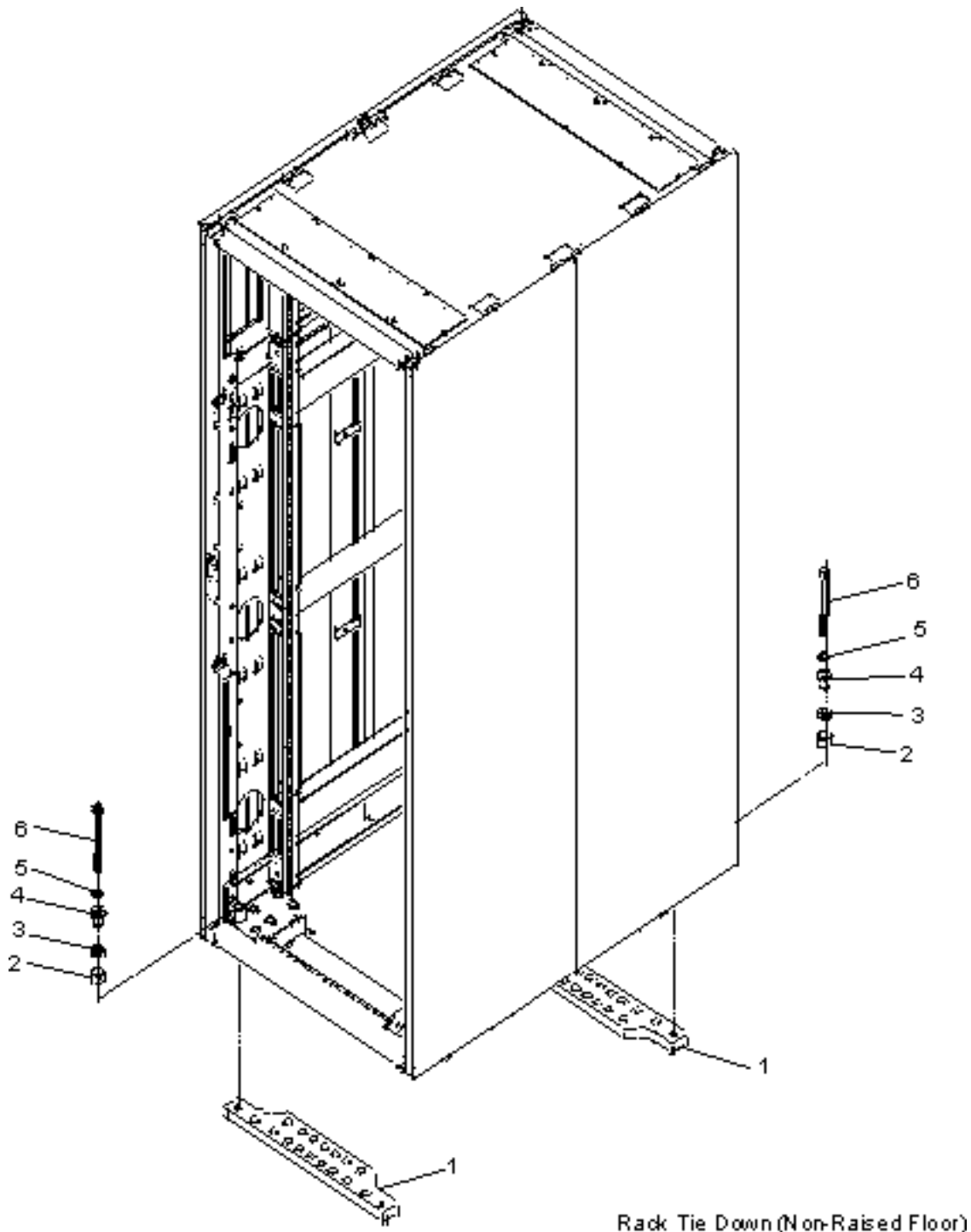


Figure 73. Rack tie down (nonraised floor)

- Note:** The plastic bushing is intended to provide electrical insulation between the frame and the ground. When such insulation is not required, the plastic bushing does not need to be installed.

- [illegible]

5. Remove the mounting bolts from the threaded holes.
6. Move the rack away from the mounting plates.
7. Mark the floor at the center of each hole in the mounting plate (including tapped holes).
8. Remove the mounting plates from the marked locations.
9. At the marked location of the tapped mounting holes, drill two holes approximately 19 mm (.75 in.) to allow clearance for the ends of the two rack-mounting bolts. The ends of the rack-mounting bolts may protrude past the thickness of the mounting plate. Drill one hole in each group of anchor bolt location marks as indicated on the marked floor.
10. Using at least five heavy duty concrete anchoring bolts for each mounting plate, mount the mounting plates to the concrete floor.

Attach the rack to a short-raised or long-raised floor:

Use these steps to attach your rack to a short-raised or long-raised floor.

Attention: The frame tie downs are intended to secure a frame weighing less than 1429 kg (3150 lb.). These tie downs are designed to secure the frame on a raised floor installation.

Use the following to determine your next step:

1. If the rack is being attached to a short depth raised floor environment 228.6 mm to 330.2 mm (9 in. to 13 in. depth) install the Raised Floor Tie Down Kit (Part number 16R1102) described in the following table.

Table 79. Raised Floor Tie Down Kit (Part number 16R1102)

228.6 mm to 330.2 mm (9 in. to 13 in.) Raised Floor Tie Down Kit (Part number 16R1102)			
Item	Part Number	Quantity	Description
1	44P3438	1	Wrench
2	44P2996	2	Stabilizer bar
3	44P2999	4	Turnbuckle Assembly

2. If the rack is being attached to a deep raised floor environment 304.8 mm to 558.8 mm (12 in. to 22 in. depth) install the Raised Floor Tie Down Kit (Part number 16R1103) described in the following table.

Table 80. Raised Floor Tie Down Kit (Part number 16R1103)

304.8 mm to 558.8 mm (12 in. to 22 in.) Raised Floor Tie Down Kit (Part number 16R1103)			
Item	Part Number	Quantity	Description
1	44P3438	1	Wrench
2	44P2996	2	Stabilizer bar
3	44P3000	4	Turnbuckle Assembly

It is the customer's responsibility to ensure the following steps are completed before the service representative performs the tie-down procedure.

Note: To accommodate a floor with a depth of more than 558.8 mm (22 in.), a steel beam or a steel channel adapter for mounting the subfloor eyebolts are required. The customer must supply the floor eyebolts.

Consider the following when preparing the floor for tie-down:

- The hardware is designed to support a frame weighing no more than 1578.5 kg (3480 lb.).
- The estimated maximum concentrated load on one caster for a 1578.5 kg (3480 lb.)-system is 526.2 kg (1160 lb.). For a multiple system installation, it is possible that one floor tile will bear a total concentrated load of 1052.3 kg (2320 lb.).

To install the eyebolts, do the following:

1. Obtain the service of a qualified structural engineer to determine appropriate installation of the eyebolts.
2. Consider the following before installing the eyebolts:
 - Floor eyebolts must be securely anchored to the concrete floor.
 - For a single frame installation, four 1/2-in. diameter by 13-inch subfloor eyebolts should be secured to the subfloor.
 - The minimum height of the center of the internal diameter is 2.54 mm (1 in.) above the concrete floor surface.

- The maximum height is 63.5 mm (2.5 in.) above the concrete floor surface. A height greater than 63.5 mm (2.5 in.) can cause excessive lateral deflection to the tie-down hardware.
 - The eyebolt's internal diameter should be 1-3/16 inch, and each eyebolt should be able to withstand 1224.7 kg (2700 lb). The customer should obtain the service of a qualified consultant or structural engineer to determine the appropriate anchoring method for these eyebolts and to ensure that the raised floor can support the floor-loading specifications.
 - To ensure that the holes are in the correct location, the diagonal distance of the center of the holes should be 1211.2 mm (47.7 in.). The distance between the center holes to the center of the next holes should be 654.8 mm (25.8 in.) (the side to side distance) and 1019 mm (40.1 in.) (the front to back distance)
3. Verify that the four eyebolts are positioned to match the dimensions is given in the following figures.

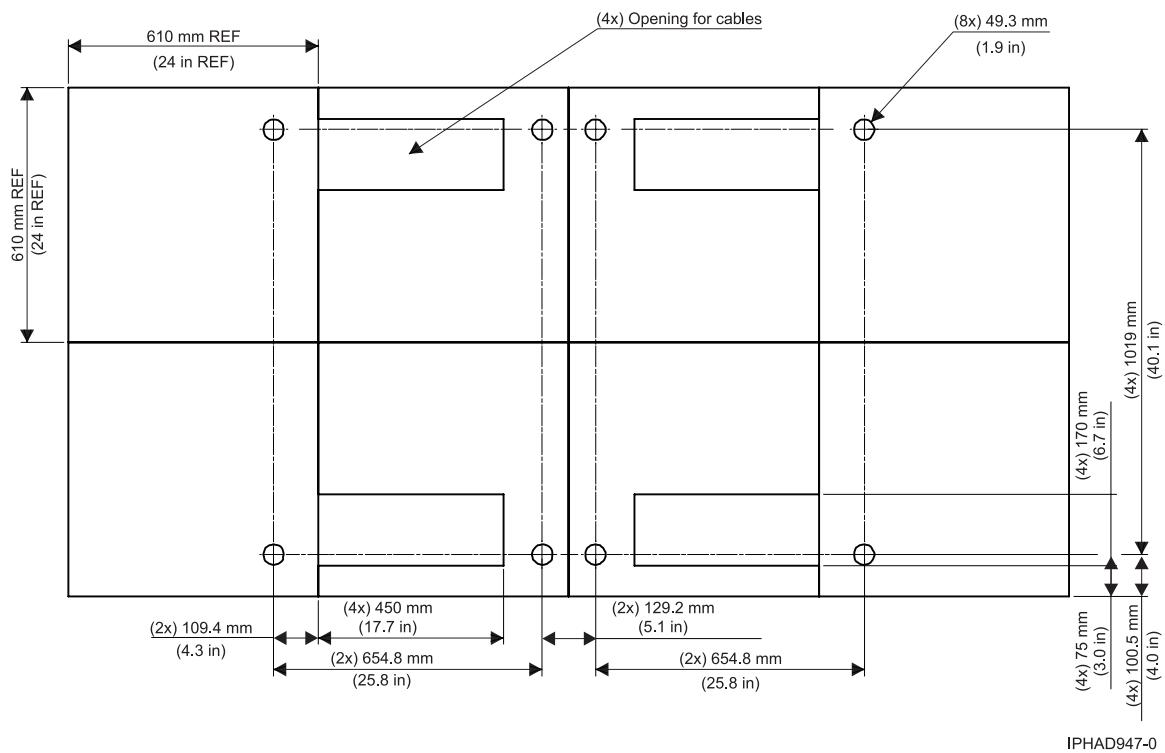


Figure 75. Eyebolt positioning for 610 mm (24 in.) floor tile layout

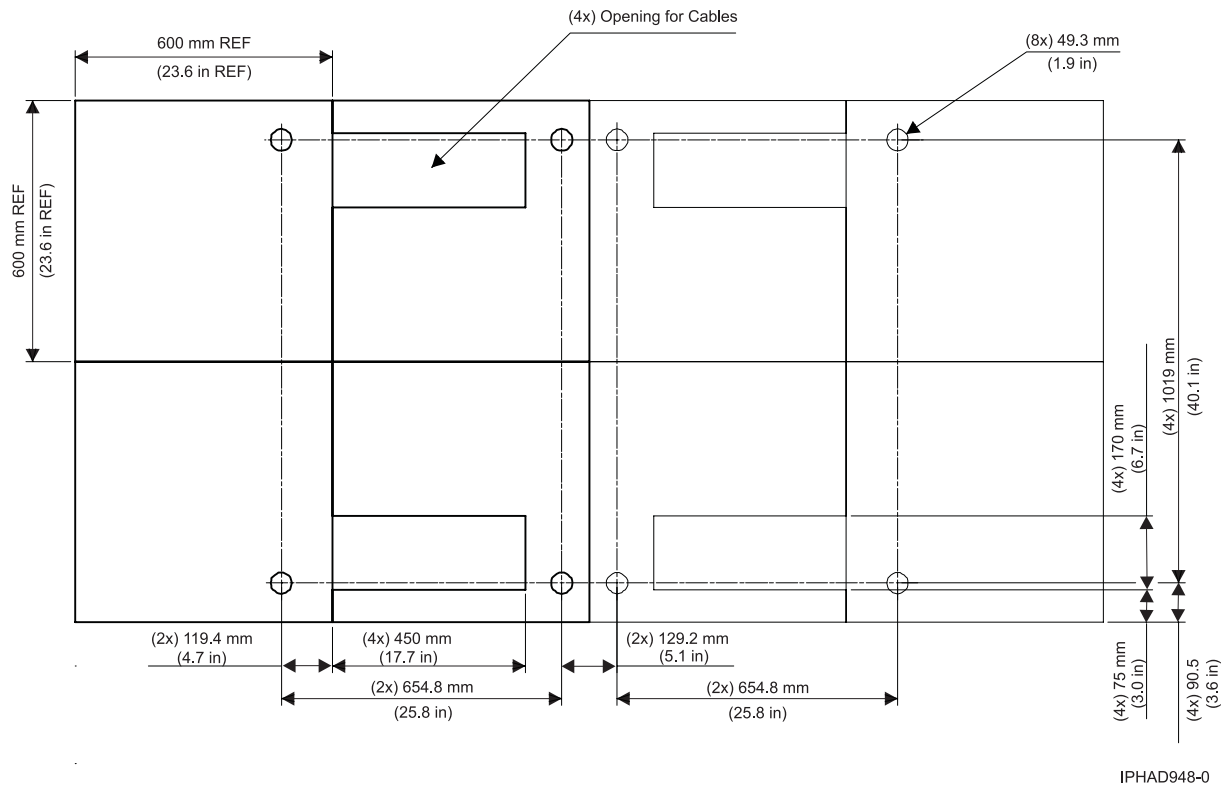
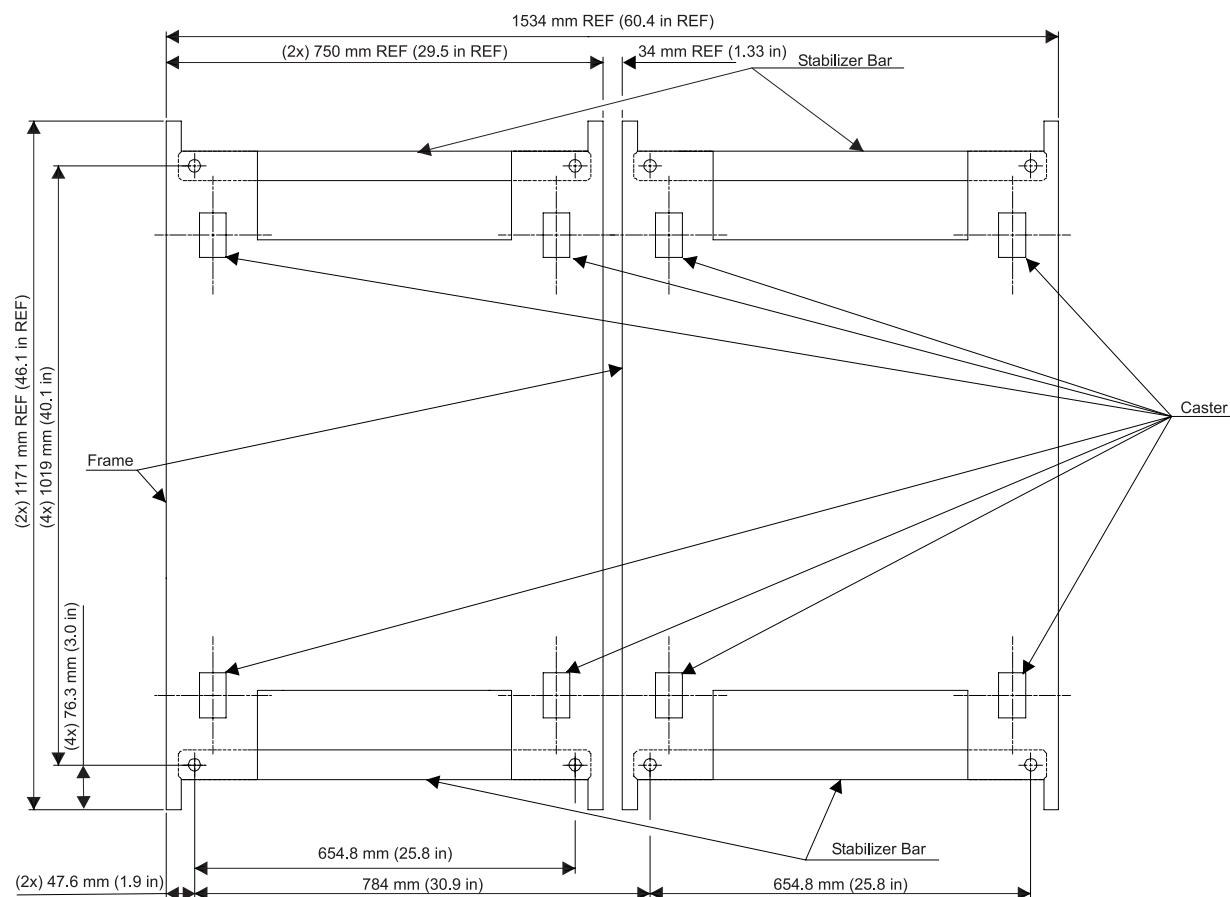


Figure 76. Eyebolt positioning for 600 mm (23.6 in.) floor tile layout



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Figure 77. Stabilizer bar layout (top view)

4. Install the eyebolts to the floor.

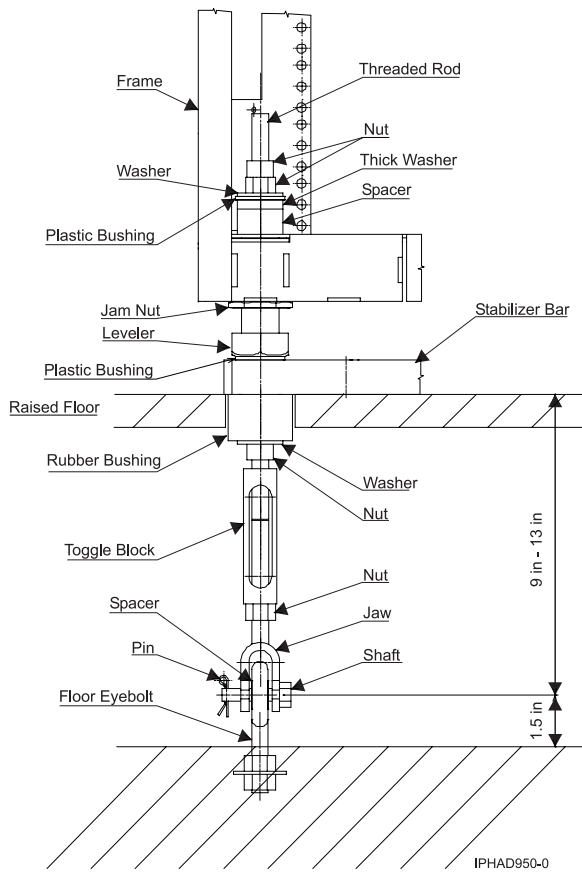


Figure 78. Turnbuckle assembly frame tie-down hardware for 228.6 mm to 330.2 mm (9 in. to 13 in.) raised floor (Part number 44P2999)

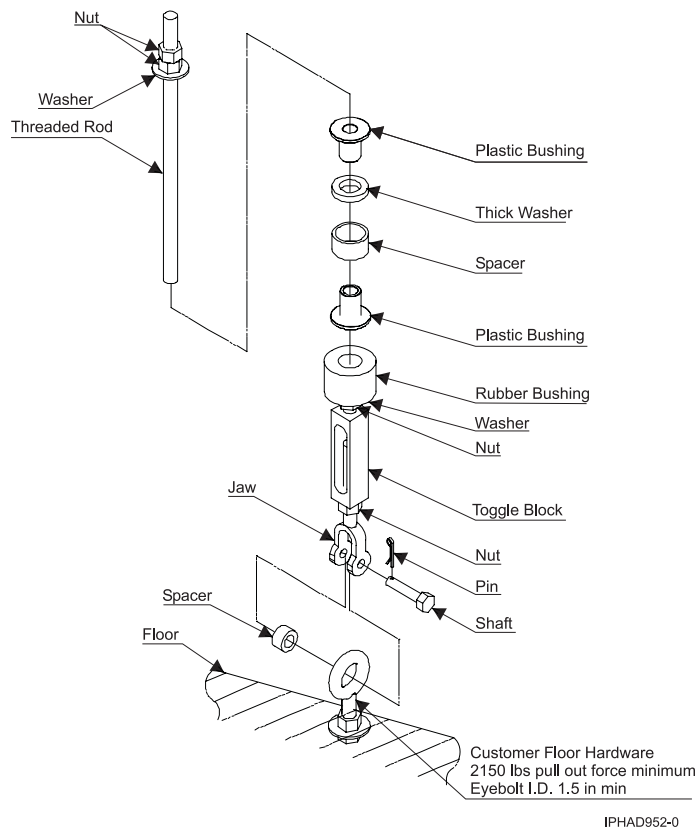


Figure 79. Turnbuckle assembly frame tie-down hardware for 228.6 mm to 330.2 mm (9 in. to 13 in.) raised floor (Part number 44P2999)

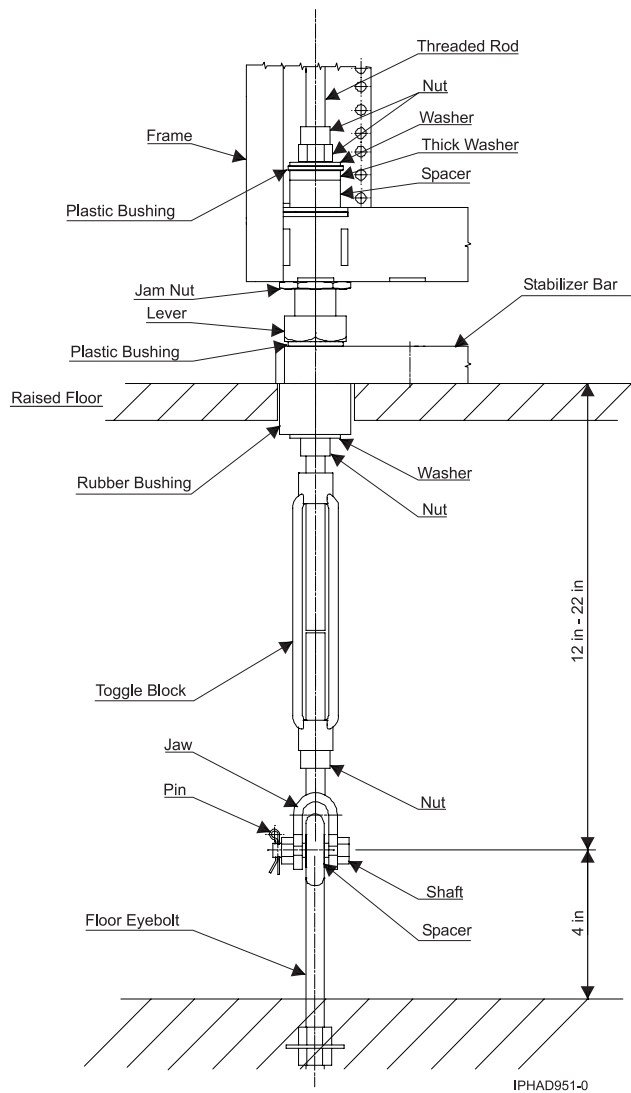


Figure 80. Turnbuckle assembly frame tie-down hardware for 304.8 mm to 558.8 mm (12 in. to 22 in.) raised floor (Part number 44P3000)

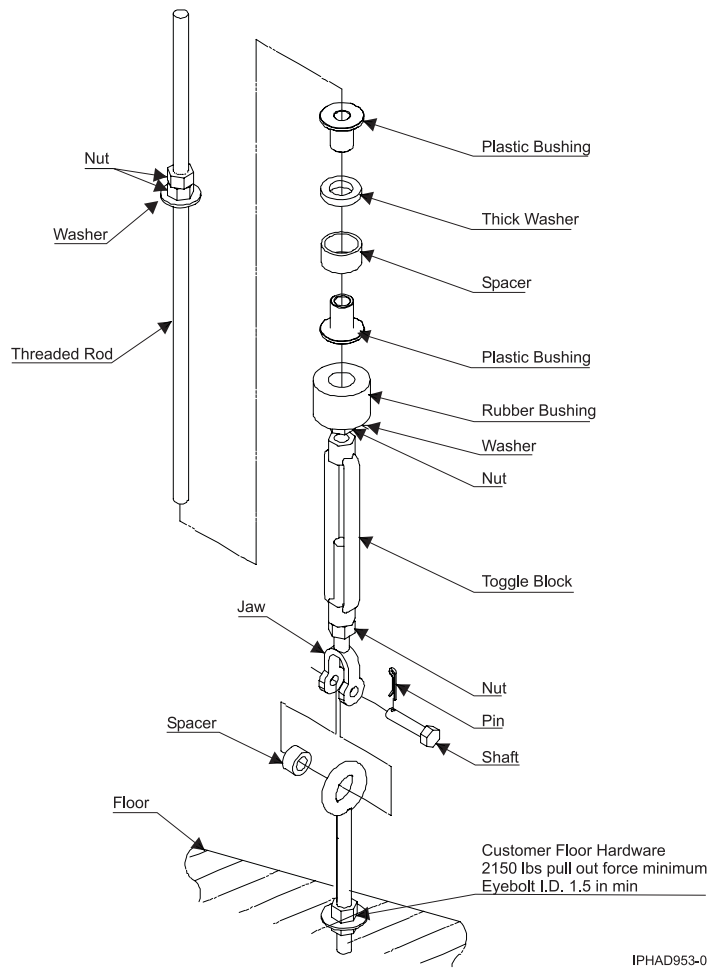


Figure 81. Turnbuckle assembly frame tie-down hardware for 304.8 mm to 558.8 mm (12 in. to 22 in.) raised floor (Part number 44P3000)

Considerations for multiple system installations:

Learn about the installation requirements for a multiple server installation.

When you are integrating a 5792 with a model 9119-590 and other products in your data center, there are several factors to consider:

- Minimum aisle width

The minimum aisle width in the front of the system is 1041 mm (41 in.) to allow room to perform service operations. The minimum aisle width in the rear of the system is 914 mm (36 in.) to allow room to perform service operations. The front and rear service clearances should be at least 1143 mm (45 in.) and 914 mm (36 in.), respectively. Service clearances are measured from the edges of the frame with frame extenders to the nearest obstacle.

- Thermal interactions

Systems should be faced front-to-front and rear-to-rear to create "cold" and "hot" aisles to maintain effective system thermal conditions, as shown in the following figure.

Cold aisles need to be of sufficient width to support the airflow requirements of the installed systems as indicated in "Cooling requirements" on page 135. The airflow per tile will be dependent on the under floor pressure and perforations in the tile. A typical under floor pressure of 0.025 in. of water will supply 300-400 cfm through a 25 percent open 0.61 m by 0.61 m (2 ft. by 2 ft.) floor tile.

- Floor tile requirements

In a multiframe installation, it is possible that a floor tile with cable cutouts (refer to “Cut and place floor panels” on page 111) will bear two concentrated static loads up to 408 kg (900 lb.) per caster or leveler. Thus, the total concentrated load can be as high as 816 kg (1800 lb.). Contact the floor tile manufacturer or consult a structural engineer to ensure that the raised floor assembly can support this load.

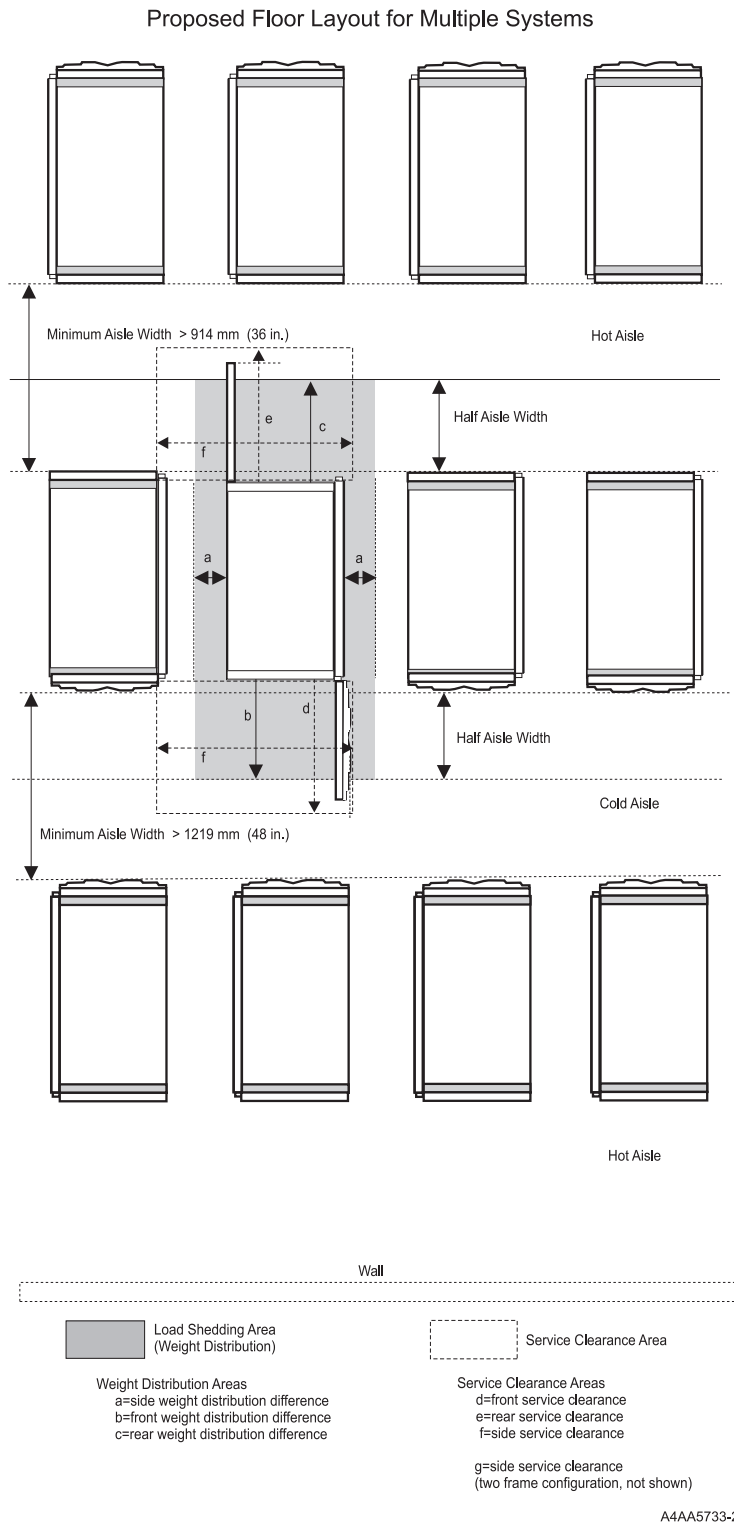
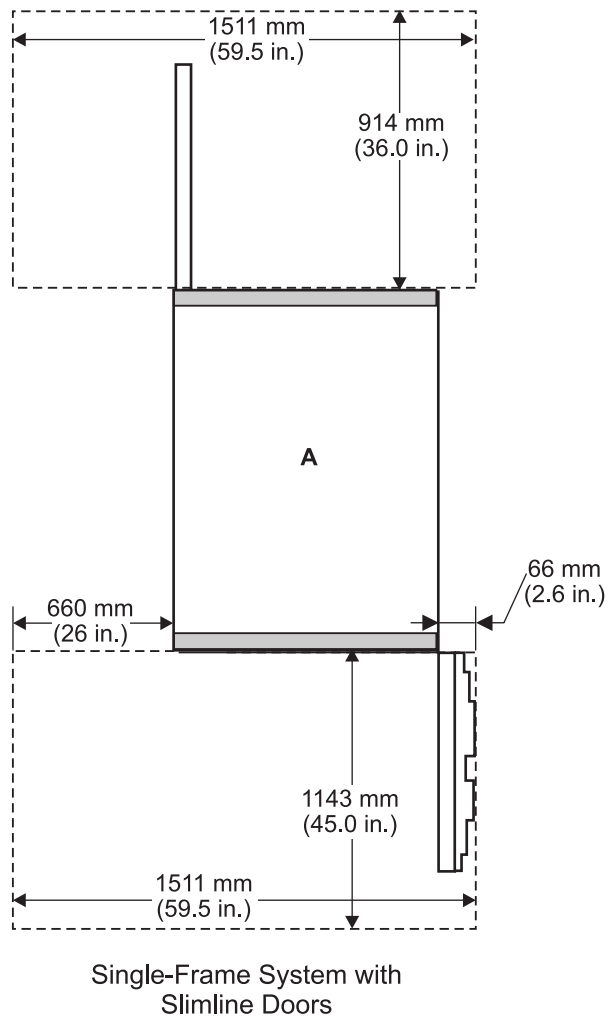


Figure 82. Proposed floor layout for multiple systems

Service clearances:

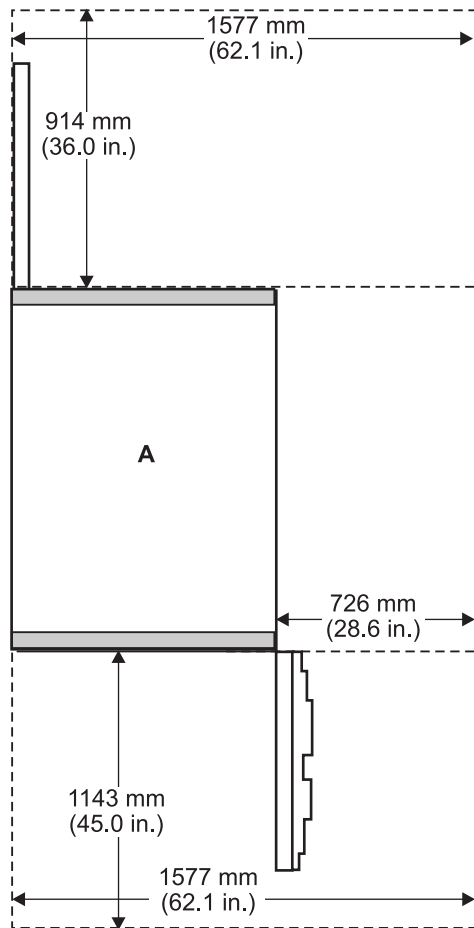
The service clearance area is the area around the server that is needed for IBM service representatives to service the server.

The minimum service clearance for systems with slimline doors is shown in the following figure.



IPHAD916-0

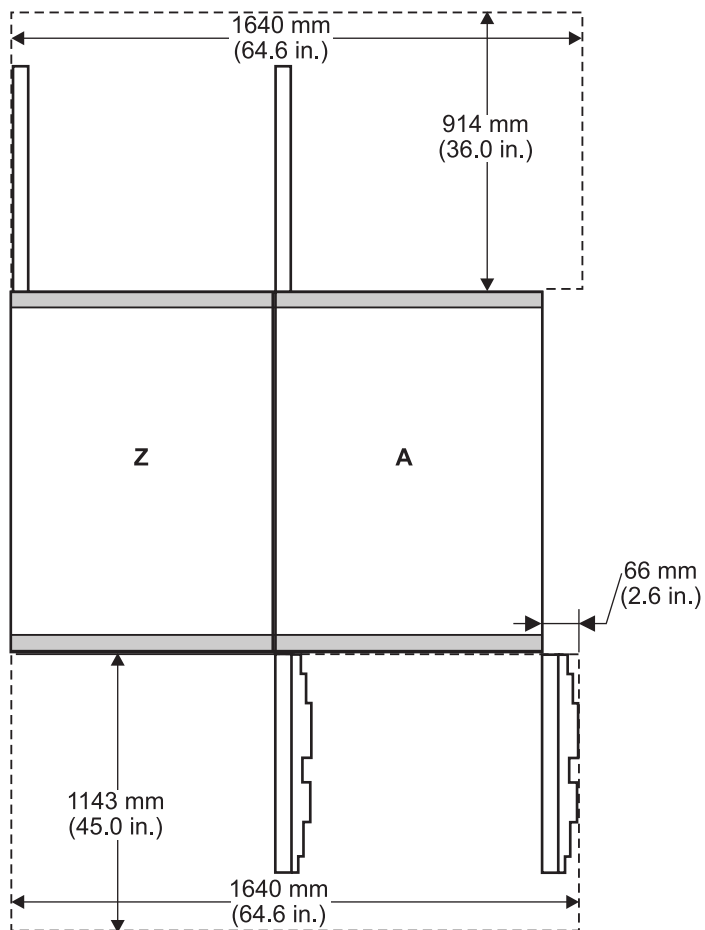
Figure 83. Service clearances for system with slimline doors



Single-Frame System with
Slimline Doors (with alternative
right-side service clearance)

IPHAD917-1

Figure 84. Service clearances for single-frame systems with slimline doors (with alternative right-side service clearance)

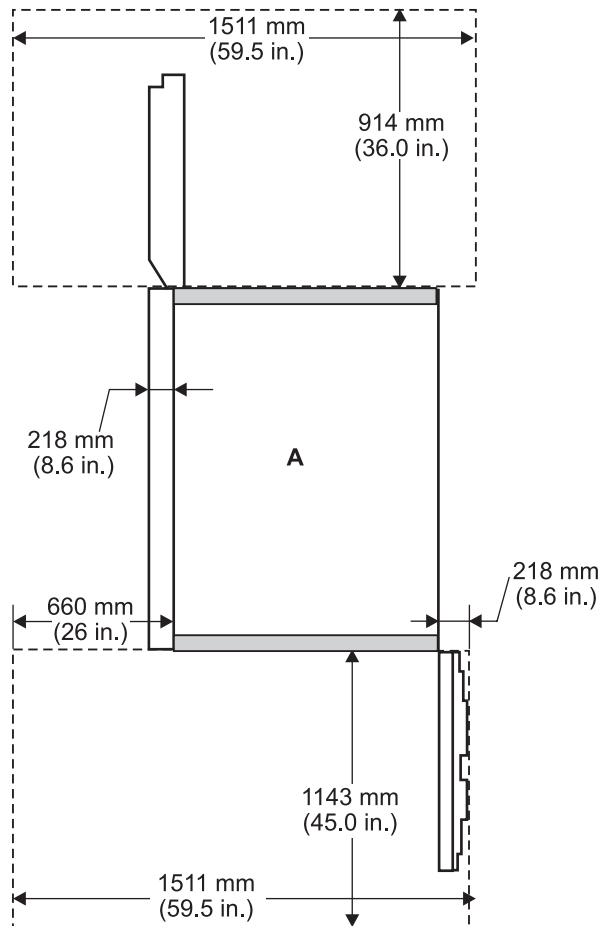


Double-Frame System
with Slimline Doors

IPHAD918-0

Figure 85. Service clearances for double-frame systems with slimline doors

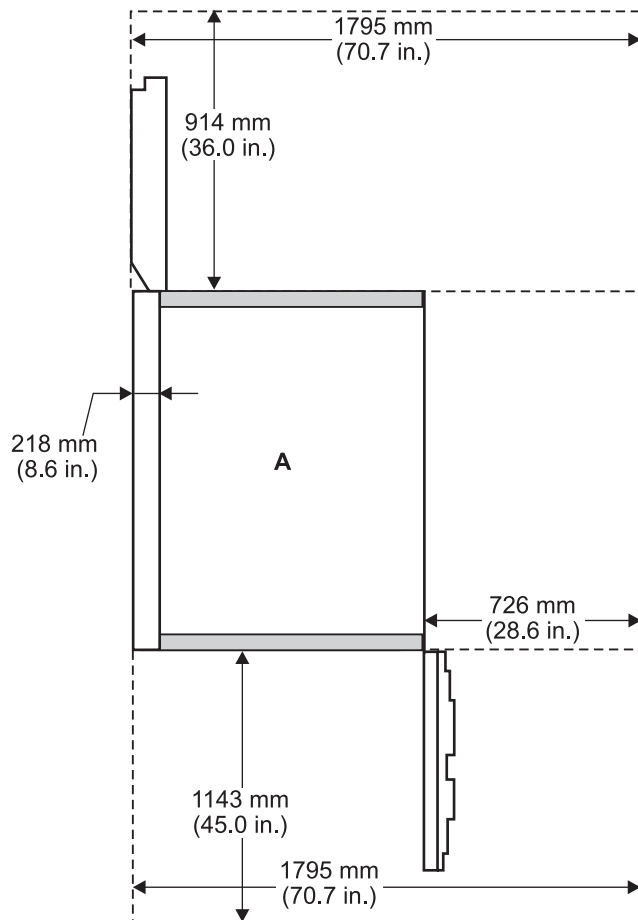
The minimum service clearance for systems with acoustical doors is shown in the following figure.



Single-Frame System with
Acoustical Doors

IPHAD919-1

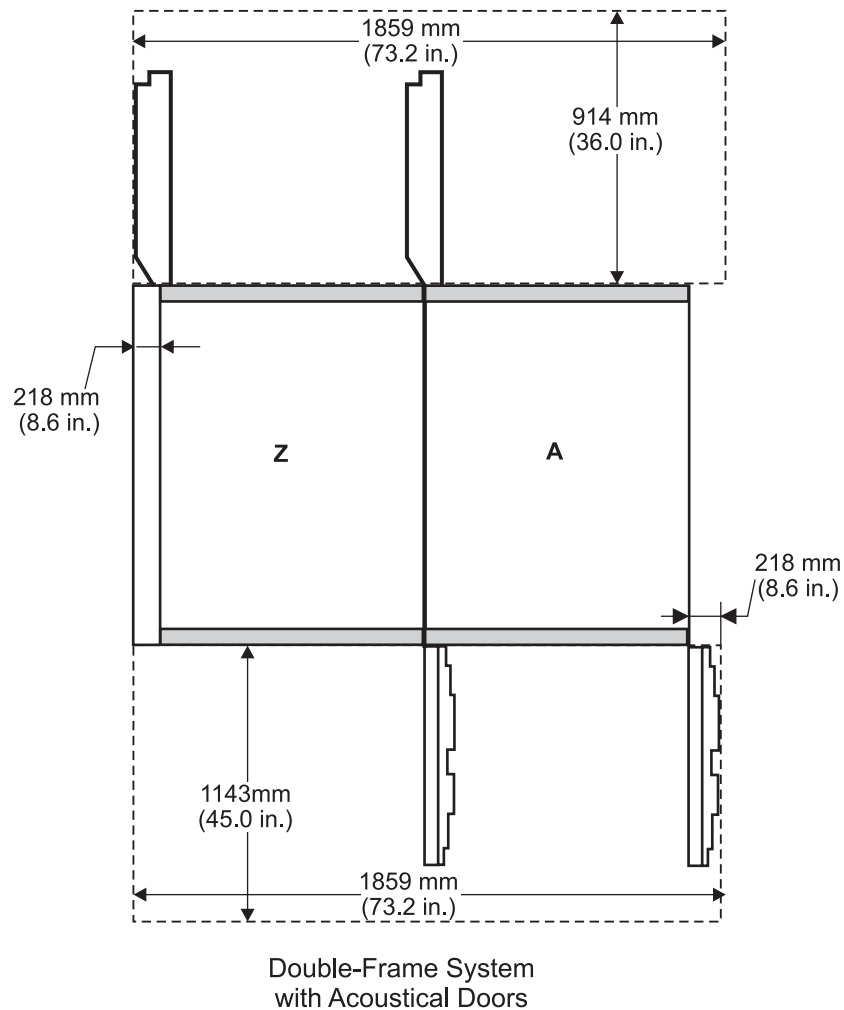
Figure 86. Service clearances for single-frame system with acoustical doors



Single-Frame System with
Acoustical Doors (with
alternative right-side service
clearance)

IPHAD920-1

Figure 87. Service clearances for single-frame system with acoustical doors (with alternative right side service clearance)



IPHAD921-1

Figure 88. Service clearances for double-frame system with acoustical doors

Refer to the figure in “Raised-floor requirements and preparation” on page 110 for service clearances shown in a raised-floor installation.

ASHRAE declarations:

Use the ASHRAE declarations table and figures to determine the measurement reporting requirements defined in the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Thermal Guidelines for Data Processing Environments.

These guidelines are available at <http://tc99.ashraetcs.org> .

Table 81. ASHRAE declarations

	Typical Heat Release	Airflow nominal ¹		Airflow maximum ¹ at 35 degrees C (95 degrees F)		Weight	Overall system dimensions
Description	watts	cfm	m ³ /hr	cfm	m ³ /hr		
Minimum configuration	1500	410	697	580	985	See 5792	See 5792

Table 81. ASHRAE declarations (continued)

Maximum configuration	14400	2060	2990	2560	373876	See 5792	See 5792
Typical configuration	6200	1010	1716	1300	2209	See 5792	See 5792
ASHRAE Class	3						
Minimum configuration	One I/O drawer						
Maximum configuration	12 I/O drawers						
Typical configuration	5 I/O drawers						
Note: 1. Airflow for the typical and minimum configurations do not include redundant power supply, feature code 5158.							

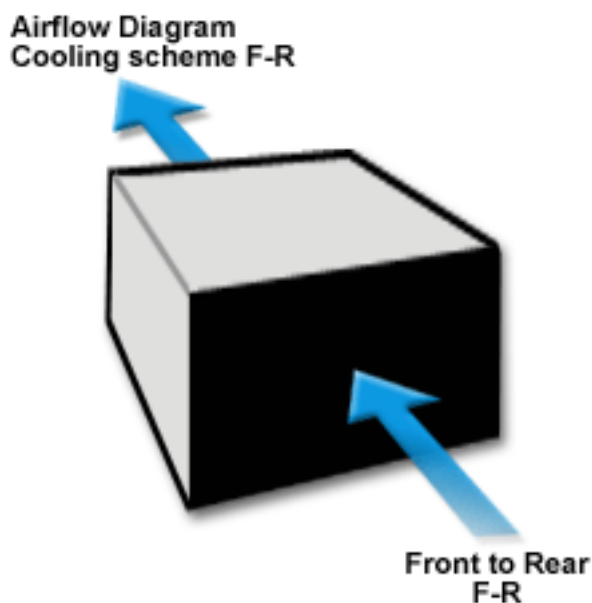


Figure 89. Airflow figure for server mounted in a rack

Total system power consumption:

Use the Total system power consumption table to determine the total system power consumption for your server's configuration.

The following table provides input power ranges based on system configuration.

Table 82. Total system power consumption

Configuration - number of I/O drawers and switches	AC power (kW)
1	1.5
2	2.7
3	3.7

Table 82. Total system power consumption (continued)

4	5.0
5	6.2
6	7.4
7	8.5
8	9.7
9	10.9
10	12.0
11	13.2
12	14.4
Note: 1. Configurations are based in 16 disk drives per I/O drawer and 20 PCI cards per I/O drawer. To determine the typical power consumption for a specific configuration, subtract the following typical power values for each unpopulated disk drive or PCI card: <ul style="list-style-type: none"> • Each PCI card - 20 W • Each disk drive - 20 W 	

Cooling requirements:

Use the system cooling requirements table in conjunction with the cooling requirements graph and chilled airflow area graphic to determine the area of floor tiles to supply chilled air to the system.

The 5792 requires air for cooling. As shown in Figure 82 on page 215, rows of 5792 systems must face front-to-front. The use of a raised floor is recommended to provide air through perforated floor panels placed in rows between the fronts of systems (the cold aisles shown in Figure 82 on page 215).

The following table provides system cooling requirements based on system configuration. The letter designations in the table correspond to the letter designations in the graph shown in "Cooling requirements graph."

Table 83. System cooling requirements based on system configuration

Configuration -number of I/O drawers and switches	AC power (kW)
1	A
2	A
3	A
4	B
5	B
6	C
7	C
8	D
9	D
10	E
11	E
12	F

Cooling requirements graph:

Use the cooling requirements graph in conjunction with the cooling requirements tables and the chilled airflow area graphic to determine the area of the floor tiles to supply chilled air to the system.

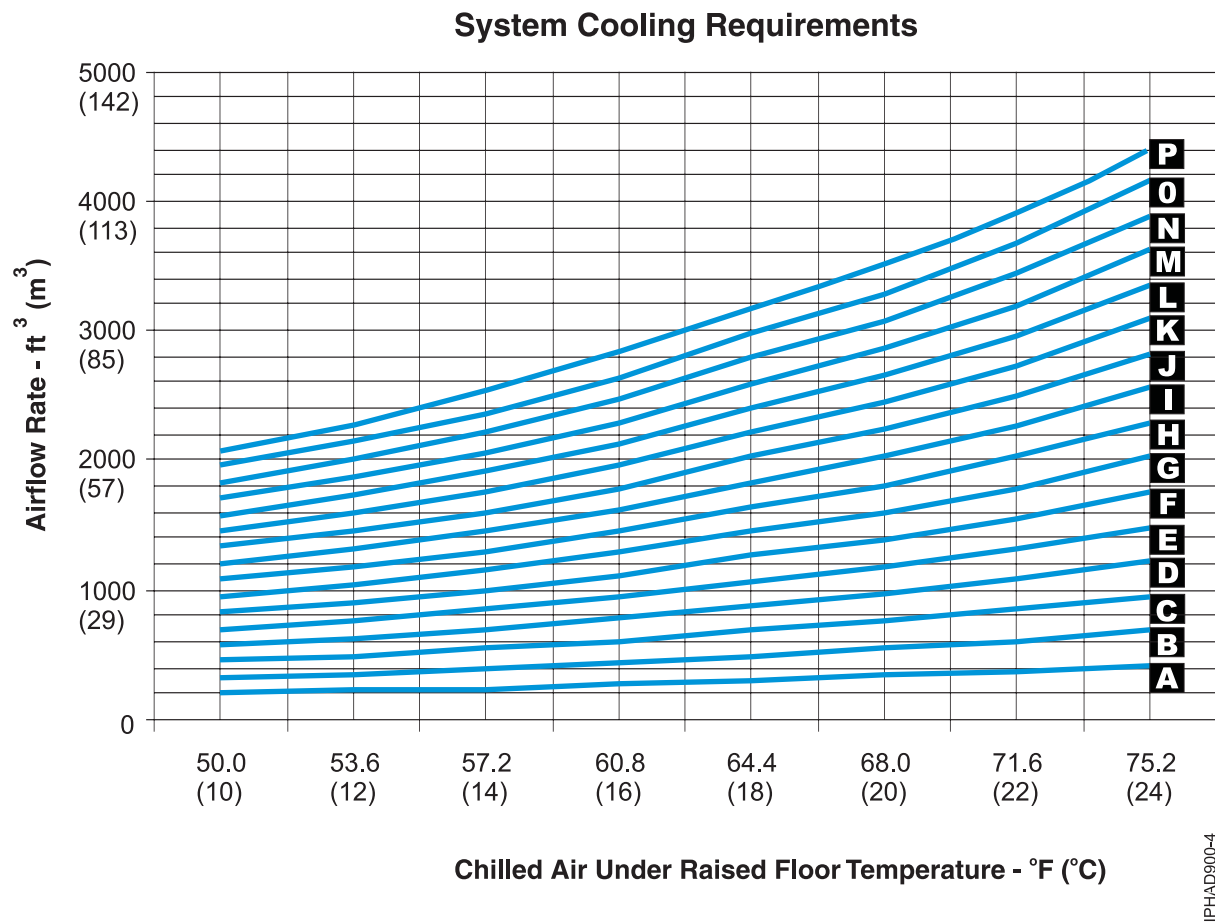
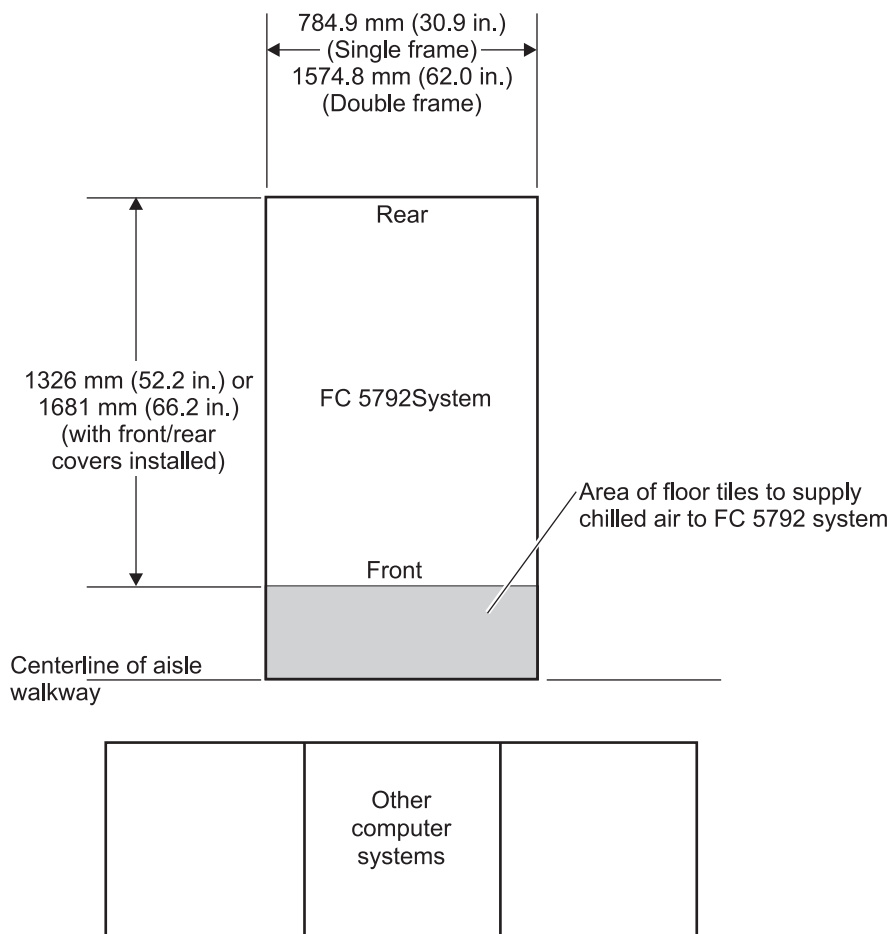


Figure 90. Cooling requirements

Requirements for the chilled airflow area:

The Chilled airflow area figure shows the chilled airflow area required for a system.

Use the system cooling requirements tables and the Cooling requirements graph to determine the area of floor tiles to supply chilled air to the system.



IPHAD922-3

Figure 91. Chilled airflow area

Moving the system to the installation site:

Several factors must be considered before moving the system to the installation site.

You should determine the path that must be taken to move the system from the delivery location to the installation site. You should verify that the height of all doorways, elevators, and so on are sufficient to allow moving the system to the installation site. You should also verify that the weight limitations of elevators, ramps, floors, floor tiles, and so on, are sufficient to allow moving the system to the installation site. If the height or weight of the system can cause a problem when the system is moved to the installation site, you should contact your local site planning or sales representative. For more detailed information, see Access.

Delivery and subsequent transportation of the equipment

DANGER

Heavy equipment—personal injury or equipment damage might result if mishandled. (D006)

You must prepare your environment to accept the new product based on the installation planning information provided, with assistance from an IBM Installation Planning Representative (IPR) or IBM authorized service provider. In anticipation of the equipment delivery, prepare the final installation site in advance so that professional movers or riggers can transport the equipment to the final installation site

within the computer room. If for some reason, this is not possible at the time of delivery, you must make arrangements to have professional movers or riggers return to finish the transportation at a later date. Only professional movers or riggers should transport the equipment. The IBM authorized service provider can only perform minimal frame repositioning within the computer room, as needed, to perform required service actions. You are also responsible for using professional movers or riggers when you relocate or dispose of equipment.

Phase imbalance and BPR configuration:

Use the Phase imbalance and BPR configuration table to determine the phase imbalance of your server's configuration.

Depending on the number of Bulk Power Regulators (BPRs) in your system, phase imbalance can occur in line currents. All systems are provided with two bulk power assemblies (BPAs), with separate power cords. Phase currents will be divided between two power cords in normal operation. The following table illustrates phase imbalance as a function of BPR configuration. For information about power consumption, see "Total system power consumption" on page 133.

Table 84. Phase imbalance and BPR configuration

Number of BPRs per BPA	Phase A Line Current	Phase B Line Current	Phase C Line Current
1	Power / Vline	Power / Vline	0
2	0.5 Power / Vline	0.866 Power / Vline	0.5 Power / Vline
3	0.577 Power / Vline	0.577 Power / Vline	0.577 Power / Vline
Note: Power is calculated from "Total system power consumption" on page 133. Vline is line-to-line nominal input voltage. Because total system power is divided between two power cords, divide the power number by 2.			

Balancing power panel loads:

Use these methods to ensure that power panel loads are balanced.

When three-phase power is used, and depending on the system configuration, the phase currents can be fully balanced or unbalanced. System configurations with three BPRs per BPA have balanced power panel loads, while configurations with only one or two have unbalanced loads. With two BPRs per BPA, two of the three phases will draw an equal amount of current, and will be, nominally, 57.8 percent of the current on the third phase. With one BPR per BPA, two of three phases will carry an equal amount of current, with no current drawn on the third phase. The following figure is an example of feeding several loads of this type from two power panels in a way that balances the load among the three phases.

Note: Use of ground-fault-interrupt (GFI) circuit breakers is not recommended for this system because GFI circuit breakers are earth-leakage-current sensing circuit breakers and this system is a high earth-leakage-current product.

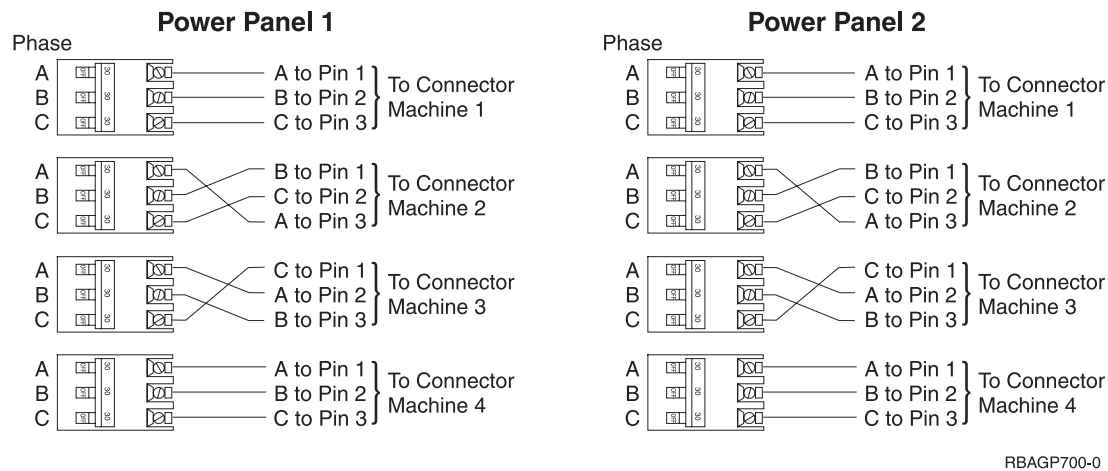


Figure 92. Power panel load balancing

The method illustrated in the preceding figure requires that the connection from the three poles of each breaker to the three phase pins of a connector be varied. Some electricians may prefer to maintain a consistent wiring sequence from the breakers to the connectors. The following figure shows a way to balance the load without changing the wiring on the output of any breakers. The three-pole breakers are alternated with single-pole breakers, so that the three-pole breakers do not all begin on Phase A.

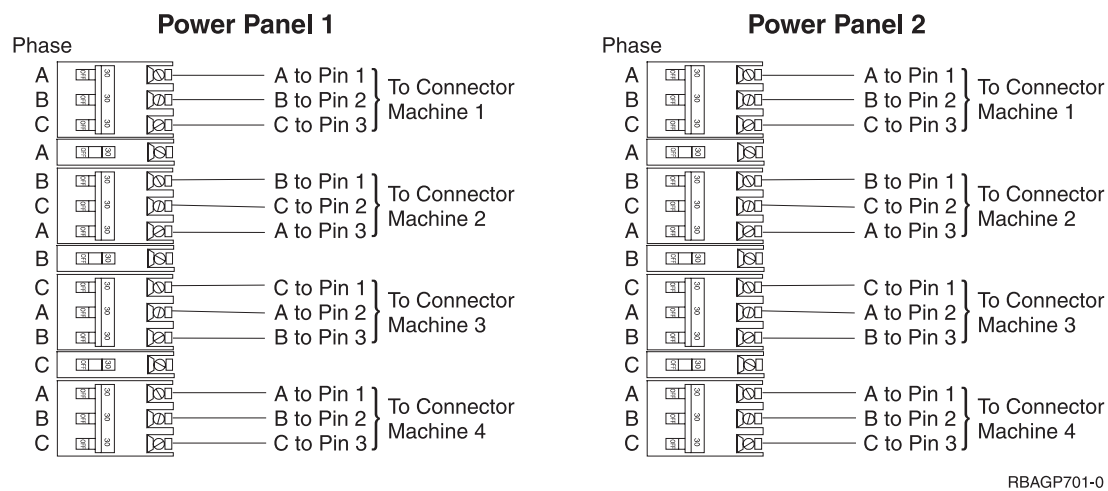


Figure 93. Power panel load balancing

The following figure shows another way of distributing the unbalanced load evenly. In this case, the three-pole breakers are alternated with two-pole breakers.

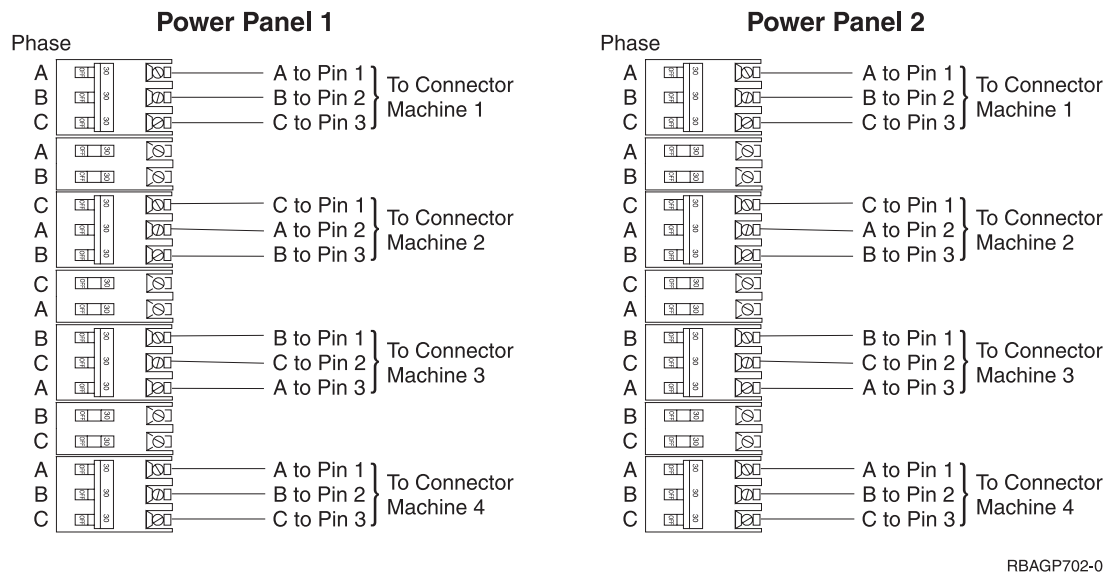
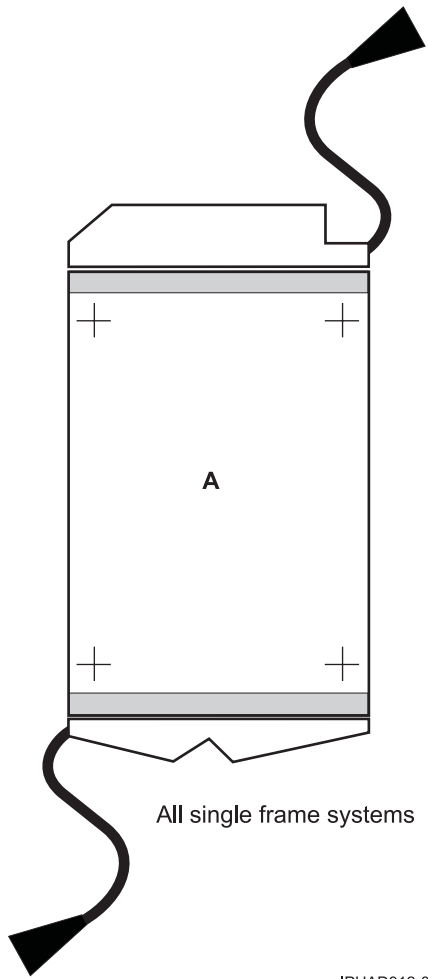


Figure 94. Power panel load balancing

Power cord configuration:

Use the Single-frame system power cord configuration and Double-frame system power cord configuration figures to route power cords through floor tile cutouts.

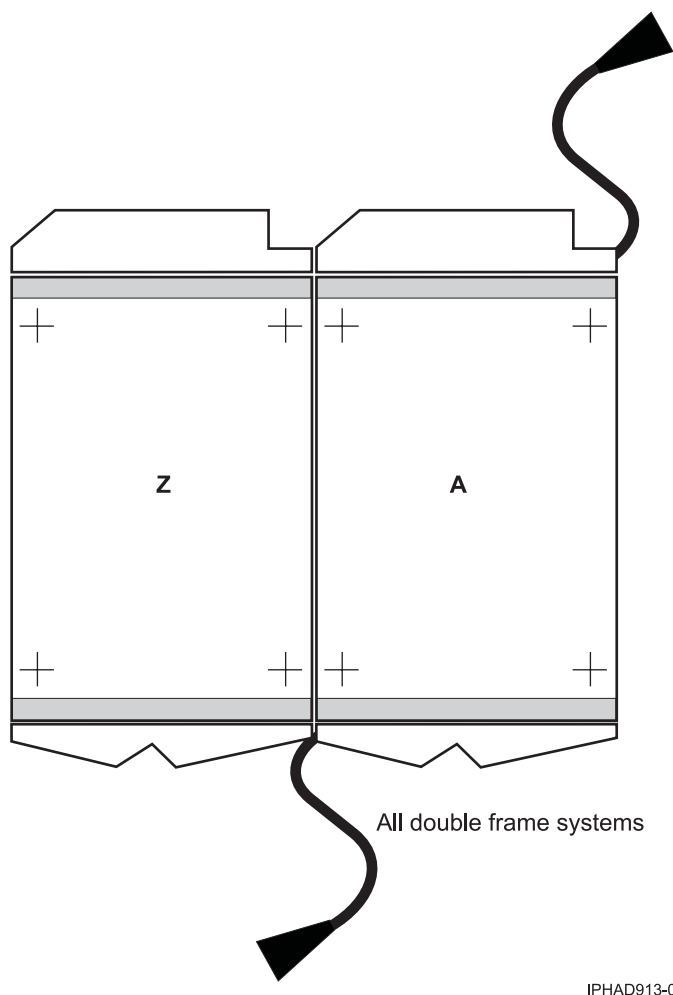
The power cords exit the system from different points of the frame as indicated in the following figure. For raised-floor applications, it is recommended that both cords be routed to the rear of the frame and through the same floor-tile cutout.



All single frame systems

IPHAD912-0

Figure 95. Single-frame system power cord configuration



IPHAD913-0

Figure 96. Double-frame system power cord configuration

Dual power installation:

Some 5792 configurations are designed with a fully redundant power system. These systems have two power cords attached to two power input ports which, in turn, power a fully redundant power distribution system within the system. To take full advantage of the redundancy and reliability that is built into the computer system, the system must be powered from two distribution panels.

Approximate system weights by configuration:

Use the Approximate system weight by configuration tables to calculate the approximate weight of your system based on its configuration.

Table 85. Approximate system weight by configuration without integrated battery backup and with acoustic doors

Number of I/O drawers	System weight - kg (lb.)	A-frame weight - kg (lb.)
1	549 (1211)	549 (1211)
2	649 (1431)	649 (1431)
3	749 (1651)	749 (1651)
4	852 (1878)	852 (1878)
5	952 (2098)	952 (2098)
6	1051 (2318)	1051 (2318)

Table 85. Approximate system weight by configuration without integrated battery backup and with acoustic doors (continued)

7	1173 (2586)	1173 (2586)
8	1273 (2806)	1273 (2806)
9	1680 (3704)	1254 (2765)
10	1780 (3924)	1255 (2767)
11	1880 (4144)	1256 (2769)
12	1980 (4364)	1257 (2771)
Note: 1. I/O drawers are populated based on the number of processor books in the server frame.		

Table 86. Approximate system weight by configuration with integrated battery backup and with acoustic doors

Number of I/O drawers	System weight - kg (lb.)	A-frame weight - kg (lb.)
1	640 (1410)	640 (1410)
2	739 (1630)	739 (1630)
3	839 (1850)	839 (1850)
4	942 (2077)	942 (2077)
5	1042 (2297)	1042 (2297)
6	1142 (2517)	1142 (2517)
7	1658 (3655)	1143 (2519)
8	1758 (3875)	1144 (2521)
9	1861 (4102)	1148 (2530)
10	1960 (4322)	1149 (2534)
11	2060 (4542)	1149 (2534)
12	2159 (4760)	1149 (2534)
Note: 1. I/O drawers are populated based on the number of processor books in the server frame.		

Table 87. Approximate system weight by configuration without integrated battery backup and with slimline doors

Number of I/O drawers	System weight - kg (lb.)	A-frame weight - kg (lb.)
1	541 (1192)	541 (1192)
2	641 (1412)	641 (1412)
3	740 (1632)	740 (1632)
4	843 (1859)	843 (1859)
5	943 (2079)	943 (2079)
6	1043 (2299)	1043 (2299)
7	1164 (2567)	1164 (2567)
8	1264 (2787)	1264 (2787)
9	1672 (3685)	1246 (2746)
10	1771 (3905)	1247 (2750)
11	1871 (4125)	1247 (2750)
12	1971 (4345)	1248 (2752)

Table 87. Approximate system weight by configuration without integrated battery backup and with slimline doors (continued)

Note:		
1. I/O drawers are populated based on the number of processor books in the server frame.		

Table 88. Approximate system weight by configuration with integrated battery backup and with slimline doors

Number of I/O drawers	System weight - kg (lb.)	A-frame weight - kg (lb.)
1	631 (1391)	631 (1391)
2	731 (1611)	731 (1611)
3	831 (1831)	831 (1831)
4	934 (2058)	934 (2058)
5	1033 (2278)	1033 (2278)
6	1133 (2498)	1133 (2498)
7	1649 (3636)	1134 (2500)
8	1749 (3856)	1135 (2502)
9	1842 (4083)	1139 (2511)
10	1952 (4303)	1141 (2515)
11	2052 (4523)	1141 (2515)
12	2151 (4741)	1141 (2515)
Note:		
1. I/O drawers are populated based on the number of processor books in the server frame.		

Weight distribution:

Use the Floor loading for system tables to determine the floor loading for various configurations.

The following table shows the values used for calculating floor loading for the 5792. The weights specified include covers, while the width and depth are indicated without covers.

Table 89. Floor loading for system with 8 I/O drawers and without integrated battery backup

Floor loading for system with 8 I/O drawers and without integrated battery backup							
a (sides)		b (front)		c (back)		1 frame	
mm	in.	mm	in.	mm	in.	lb./ft ²	kg/m ²
25	1.0	254	10.0	254	10.0	208.9	1020.2
25	1.0	508	20.0	508	20.0	166.3	811.8
25	1.0	762	30.0	762	30.0	139.7	681.9
254	10.0	254	10.0	254	10.0	142.1	693.6
254	10.0	508	20.0	508	20.0	114.9	561.0
254	10.0	762	30.0	762	30.0	98.0	478.3
508	20.0	254	10.0	254	10.0	108.4	529.1
508	20.0	508	20.0	508	20.0	89.0	434.7
508	20.0	762	30.0	762	30.0	77.0	375.8
762	30.0	254	10.0	254	10.0	89.7	438.2
762	30.0	508	20.0	508	20.0	74.7	364.8

Table 89. Floor loading for system with 8 I/O drawers and without integrated battery backup (continued)

762	30.0	762	30.0	762	30.0	65.4	319.1
Note: <ol style="list-style-type: none"> 1. Service clearance is independent from weight distribution distance and must be at least 1143 mm (45 in.) for the front of the frame and 914 mm (36 in.) for the rear of the frame (measured from the base frame). 2. Weight distribution area should not be overlapped. 3. Floor loading weight distribution distances should not exceed 762 mm (30 in.) in any direction when measured from the base frame. 							

Table 90. Floor loading for systems with 6 I/O drawers and with integrated battery backup

Floor loading for systems with 6 I/O drawers and with integrated battery backup							
a (sides)		b (front)		c (back)		1 frame	
mm	in.	mm	in.	mm	in.	lb./ft ²	kg/m ²
25	1.0	254	10.0	254	10.0	189.0	922.9
25	1.0	508	20.0	508	20.0	151.0	737.1
25	1.0	762	30.0	762	30.0	127.2	621.2
254	10.0	254	10.0	254	10.0	129.4	631.7
254	10.0	508	20.0	508	20.0	105.2	513.4
254	10.0	762	30.0	762	30.0	90.1	439.7
508	20.0	254	10.0	254	10.0	99.3	485.0
508	20.0	508	20.0	508	20.0	82.1	400.8
508	20.0	762	30.0	762	30.0	71.3	348.3
762	30.0	254	10.0	254	10.0	82.7	403.9
762	30.0	508	20.0	508	20.0	69.3	338.5
762	30.0	762	30.0	762	30.0	61.0	297.8
Note: <ol style="list-style-type: none"> 1. Service clearance is independent from weight distribution distance and must be at least 1143 mm (45 in.) for the front of the frame and 914 mm (36 in.) for the rear of the frame (measured from the base frame). 2. Weight distribution area should not be overlapped. 3. Floor loading weight distribution distances should not exceed 762 mm (30 in.) in any direction when measured from the base frame. 							

Table 91. Floor loading for system with 12 I/O drawers and without integrated battery backup

Floor loading for system with 12 I/O drawers and without integrated battery backup							
a (sides)		b (front)		c (back)		2 frames	
mm	in.	mm	in.	mm	in.	lb./ft ²	kg/m ²
25	1.0	254	10.0	254	10.0	167.5	817.7
25	1.0	508	20.0	508	20.0	134.4	656.3
25	1.0	762	30.0	762	30.0	113.8	555.7
254	10.0	254	10.0	254	10.0	135.5	661.6
254	10.0	508	20.0	508	20.0	109.9	536.4
254	10.0	762	30.0	762	30.0	93.9	458.4
508	20.0	254	10.0	254	10.0	113.4	553.9
508	20.0	508	20.0	508	20.0	92.9	453.7

Table 91. Floor loading for system with 12 I/O drawers and without integrated battery backup (continued)

508	20.0	762	30.0	762	30.0	80.1	391.3
762	30.0	254	10.0	254	10.0	98.7	482.1
762	30.0	508	20.0	508	20.0	81.6	398.5
762	30.0	762	30.0	762	30.0	71.0	346.5
Note: <ol style="list-style-type: none"> 1. Service clearance is independent from weight distribution distance and must be at least 1143 mm (45 in.) for the front of the frame and 914 mm (36 in.) for the rear of the frame (measured from the base frame). 2. Weight distribution area should not be overlapped. 3. Floor loading weight distribution distances should not exceed 762 mm (30 in.) in any direction when measured from the base frame. 							

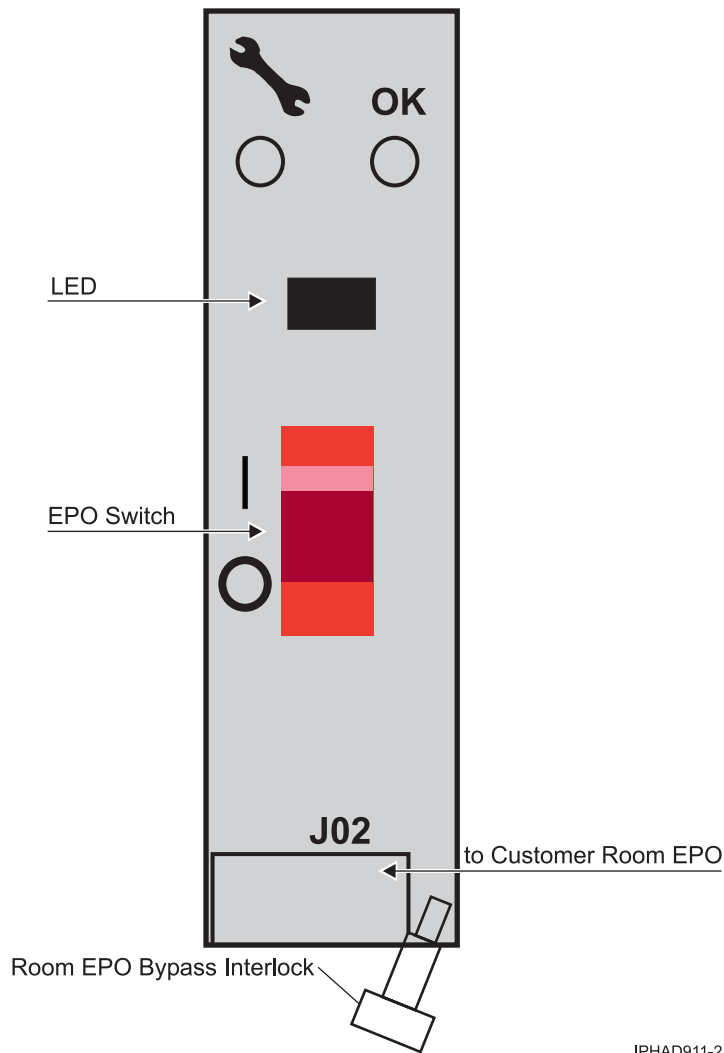
Table 92. Floor loading for system with 12 I/O drawers and with integrated battery backup

Floor loading for system with 12 I/O drawers and with integrated battery backup							
a (sides)		b (front)		c (back)		2 frames	
mm	in.	mm	in.	mm	in.	lb./ft ²	kg/m ²
25	1.0	254	10.0	254	10.0	181.3	885.3
25	1.0	508	20.0	508	20.0	145.1	708.3
25	1.0	762	30.0	762	30.0	122.4	597.9
254	10.0	254	10.0	254	10.0	146.2	714.0
254	10.0	508	20.0	508	20.0	118.1	576.7
254	10.0	762	30.0	762	30.0	100.6	491.1
508	20.0	254	10.0	254	10.0	122.0	595.9
508	20.0	508	20.0	508	20.0	99.5	485.9
508	20.0	762	30.0	762	30.0	85.5	417.4
762	30.0	254	10.0	254	10.0	105.9	517.0
762	30.0	508	20.0	508	20.0	87.1	425.4
762	30.0	762	30.0	762	30.0	75.4	368.3
Note: <ol style="list-style-type: none"> 1. Service clearance is independent from weight distribution distance and must be at least 1143 mm (45 in.) for the front of the frame and 914 mm (36 in.) for the rear of the frame (measured from the base frame). 2. Weight distribution area should not be overlapped. 3. Floor loading weight distribution distances should not exceed 762 mm (30 in.) in any direction when measured from the base frame. 							

Floor loading for the system is illustrated in the Proposed Floor Layout for Multiple Systems in “Considerations for multiple system installations” on page 124.

Unit emergency power off:

The server has a unit emergency power off (UEPO) switch on the front of the first frame (A Frame). Refer to the following figure, which shows a simplified UEPO panel.



IPHAD911-2

Figure 97. Unit emergency power off

When the switch is reset, the utility power is confined to the system power compartment. All volatile data will be lost.

It is possible to attach the computer room emergency power off (EPO) system to the system UEPO. When this is done, resetting the computer room EPO disconnects all power from the power cords and the internal battery backup unit, if it is provided. All volatile data will be lost in this case also.

If the room EPO is not connected to the UEPO, resetting the computer room EPO removes ac power from the system. If the interlock bypass feature is used, the system remains powered for a short time based on system configuration.

Computer room emergency power off:

You can incorporate the integrated battery backup into a computer room emergency power off (EPO) system. Otherwise, volatile data can be lost.

When the integrated battery backup is installed and the room EPO is reset, the batteries will engage and the computer will continue to run. It is possible to attach the computer room EPO system to the machine EPO. When this is done, resetting the room EPO will disconnect all power from the power cords and the internal battery backup unit. In this event all volatile data will be lost.

To incorporate the integrated battery backup into the room Emergency Power Off systems (EPO), a cable must be made to connect to the back of the system EPO panel. The following figures illustrate how this connection is made.

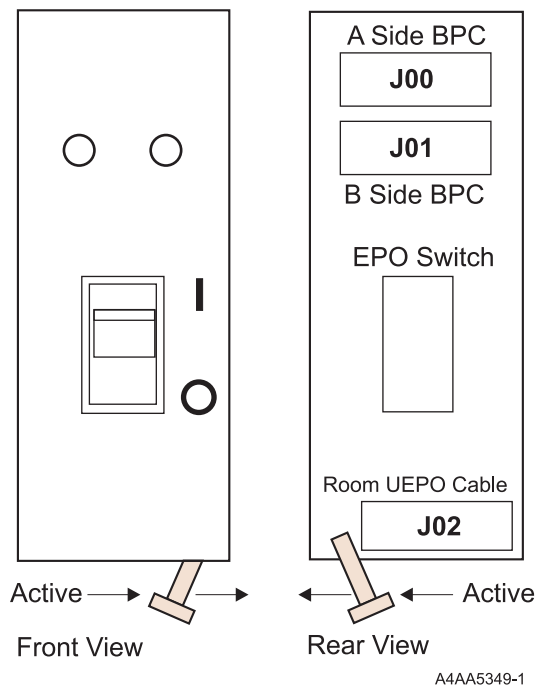
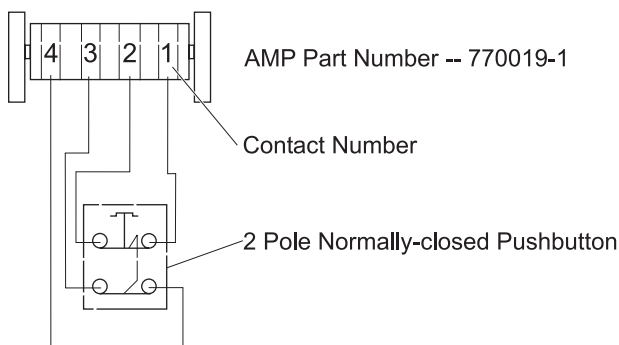


Figure 98. Computer room emergency power off

The preceding figure illustrates the back of the machine UEPO panel with the room EPO cable plugging into the machine. Notice the switch actuator. After it is moved to make the cable connection possible, the room EPO cable must be installed for the machine to power on.

In the following figure, an AMP connector 770019-1 is needed to connect to the system EPO panel. For room EPO cables using wire sizes #20 AWG to #24 AWG, use AMP pins (part number 770010-4). This connection should not exceed 5 Ohms, which is approximately 200 ft.(61 m) of #24 AWG.



Room UEPO Switch Schematic

Figure 99. AMP connector figure

Machine holdup times:

Use the Typical machine holdup time tables to determine the typical machine holdup times (time versus load) for fresh and aged batteries.

The following criteria apply to both tables.

- All times are listed in minutes
- Machine load is listed in total ac input power (power for both power cords combined)
- A fresh battery is defined as 2.5 years old or less.
- An aged battery is defined as 6.5 years.

Note: Battery capacity decreases gradually as the battery ages (from fresh-battery value to aged-battery value). The system diagnoses a failed-battery condition if the capacity decreases below the aged-battery value.

Table 93. Typical machine-holdup time versus load for fresh battery

Typical machine holdup time vs. load for fresh battery														
Machine load	3.3 kW		6.67 kW		10 kW		13.33 kW		16.67 kW		20 kW		21.67 kW	
Integrated battery backup configuration	N	R	N	R	N	R	N	R	N	R	N	R	N	R
1 BPR	7.0	21.0	2.1	7.0										
2 BPR	21.0	50.0	7.0	21.0	4.0	11.0	2.1	7.0						
3 BPR	32.0	68.0	12.0	32.0	7.0	21.0	4.9	12.0	3.2	9.5	2.1	7.0	1.7	6.5
N=Non-redundant, R=Redundant														

Table 94. Typical machine-holdup time versus load for aged battery

Typical machine holdup time vs. load for aged battery														
Machine load	3.3 kW		6.67 kW		10 kW		13.33 kW		16.67 kW		20 kW		21.67 kW	
Integrated battery backup configuration	N	R	N	R	N	R	N	R	N	R	N	R	N	R
1 BPR	4.2	12.6	1.3	4.2										
2 BPR	12.6	30.0	4.2	12.6	2.4	6.6	1.3	4.2						
3 BPR	19.2	41.0	7.2	19.2	4.2	12.6	2.9	7.2	1.9	5.7	1.3	4.2	1.0	3.9
N=Non-redundant, R=Redundant														

7101 or 7102 expansion unit

Expansion units are optional features that you can attach to your server for additional storage.

Expansion units 7101 and 7102 are optional features that you can order for your model 9406-250. The 7101 or 7102 are physically attached to the right side of the base system tower.

Models 9406-250 can use the optional external uninterruptible power supply that acts like a backup battery unit (BBU). The uninterruptible power supply has power cords that connect the uninterruptible power supply to the base system, the 7101 or 7102 expansion units, and a power cord that connects the uninterruptible power supply to the power outlet.

7104 expansion unit

Expansion units are optional features that you can attach to your server for additional storage.

Expansion units 7104 is an optional feature that you can order for your model 9406-270. The 7104 is physically attached to the right side of the base system tower.

Model 9406-270 can use the optional external IBM uninterruptible power supply that acts like a BBU (Backup Battery Unit). The uninterruptible power supply has power cords that connect the uninterruptible power supply to the base system, the 7104 expansion unit, and a power cord that connects the uninterruptible power supply to the power outlet.

7116 expansion unit

Expansion units are optional features that you can attach to your server for additional storage.

System unit expansion 7116 is an optional feature that you can order for your model 9406-800 or 9406-810. The 7116 is physically attached to the right side of the base system tower.

7214-1U2 media drawer

Hardware specifications provide detailed information for your media drawer, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 95. Hardware specifications

Dimensions for rack-mounted media drawer	Width	Depth	Height
Metric	440 mm	735 mm	45 mm
English	17.3 in.	28.9 in.	1.7 in.
Weight		12.25 kg (27 lb.)	
Electrical			
kVA (maximum)		0.092	
Rated voltage and frequency		100-127 V ac or 200-240 V ac at 50-60 Hz	
Thermal output (maximum)		307 Btu/hr	
Power requirements (maximum)		90 W	
Power factor		0.98	
Inrush current		55 A ⁵	
Leakage current (maximum)		3.10 mA ⁵	
Phase		1	
Plug type (Canada and U.S.)		2, 45, 6, 18, 19, 22, 23, 24, 25, 26, 32, 57, 59, 62, 69, 70, 73, 75, 76	
Power cord length		1.8 m (6 ft.) (U.S. only) or 4.3 m (14 ft.)	
Temperature requirements			
Operating		10 degrees to 35 degrees C (50 degrees to 95 degrees F) ³	
Nonoperating		-40 degrees to 65 degrees C (-40 degrees to 149 degrees F)	
Environmental requirements		Operating	Nonoperating
Noncondensing humidity		20 to 80% (allowable) 40 to 55% (recommended)	8 to 80% (including condensing)
Wet bulb temperature		21 degrees C (69.8 degrees F)	27 degrees C (80.6 degrees F)
Maximum altitude		2134 m (7000 ft.) above sea level	
Noise emissions ^{1, 4}		Operating	Idle

Table 95. Hardware specifications (continued)

Single 7214-1U2 media drawer in standard 19-inch rack nominal environmental conditions, and no front or rear doors on rack.	L_{WAd}	4.8 bels ⁵	
	L_{pAm} (1-meter bystander)		
Service clearances			
Service clearances for rack-mounted unit			
Front	Back	Sides²	Top²
914 mm	914 mm	914 mm	
36 in.	36 in.	36 in.	
Notes: <ol style="list-style-type: none"> 1. For a description of noise emission values, see Acoustics. 2. Side and top clearances are optional during operation. 3. The maximum 38 degree C (100.4 degree F) temperature must be derated 1 degree C (1.8 degrees F) per 137 m (450 ft.) above 1295 m (4250 ft.). Maximum altitude is 2134 m (7000 ft.). 4. All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296. 5. Estimated value. 			
Safety compliance: This hardware is designed and certified to meet the following safety standards: UL 60950; CAN/CSA C22.2 No. 60950-00; EN 60950; IEC 60950 including all National Differences			

7311-D10 expansion unit

Hardware specifications provide detailed information for your expansion unit, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 96. Hardware specifications

Dimensions	Height	Width	Depth
Metric	168 mm	221 mm	711 mm
English	6.6 in.	8.7 in.	28.0 in.
Dimensions (two 7311-D10 with drawer enclosure)	Height	Width	Depth
Metric	178 mm	445 mm	711 mm
English	7.0 in.	17.5 in.	28.0 in.
Maximum configuration weight	7311-D10		Two 7311-D10 with drawer enclosure
	16.8 kg (37 lb.)		39.1 kg (86 lb.)
Electrical)			
kVA (maximum configuration)	0.21		0.42
Rated voltage and frequency	200-240 V ac at 50-60 Hz, V dc not supported		200-240 V ac at 50-60 Hz, V dc not supported
Thermal output per 7311-D10 (maximum)	683 Btu/hr		1366 Btu/hr
Power requirements (maximum)	200 W		400 W
Power factor	0.95		0.95
Inrush current per 7311-D10 ²	64 A		
Temperature requirements ³			

Table 96. Hardware specifications (continued)

Operating	10 degrees to 38 degrees C (50 to 100 degrees F)	
Nonoperating	1 degrees to 60 degrees C (33.8 to 140 degrees F)	
Storage	1 degrees to 60 degrees C (33.8 to 140 degrees F)	
Environment requirements	Operating	Nonoperating
Noncondensing humidity	8% to 80%	8% to 80%
Wet bulb temperature ⁴	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)
Maximum altitude ^{3, 4}	3048 m (10000 ft.)	
Noise Emissions ¹	Operating	Idle
L _{WAd} , one 7311-D10	5.6 bels	5.6 bels
L _{WAd} , two 7311-D10	5.9 bels	5.9 bels
L _{WAd} , four 7311-D10	6.2 bels	6.2 bels
<L _{pA} > _m , one 7311-D10	40 dB	40 dB
<L _{pA} > _m , two 7311-D10	43 dB	43 dB
<L _{pA} > _m , four 7311-D10	46 dB	46 dB
Service clearances**		
Front	Back	Sides
915 mm	915 mm	915 mm
36 in.	36 in.	36 in.
Note: 1. For a description of noise emission values, see Acoustics. 2. Inrush currents occur only at initial application of power, no inrush occurs during normal power off-on cycle. 3. The upper limit of the dry bulb temperature must be derated 1 degree C per 137 m (450 ft.) above 915 m (3000 ft.). 4. The upper limit of the wet bulb temperature must be derated 1 degree C per 274 m (900 ft.) above 305 m (1000 ft.).		

7311-D11 expansion unit

Hardware specifications provide detailed information for your expansion unit, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 97. Hardware specifications

Dimensions	Height	Width	Depth
Metric	168 mm	221 mm	711 mm
English	6.6 in.	8.7 in.	28.0 in.
		7311-D11	Two 7311-D11 with drawer enclosure
Maximum configuration weight		16.8 kg (37 lb.)	39.1 kg (86 lb.)
Electrical			
kVA		0.21 ¹	0.42 ¹
Rated voltage and frequency		200-240 V ac at 50-60 plus or minus 0.5 Hz	200-240 V ac at 50-60 plus or minus 0.5 Hz
Thermal output (maximum)		683 Btu/hr ¹	1366 Btu/hr ¹

Table 97. Hardware specifications (continued)

Power requirements (maximum)	200 W ¹	400 W ¹	
Power factor	0.95 ¹		
Inrush current per 7311-D11	71 A ¹		
Leakage current (maximum)	3 mA ¹		
Phase	1		
Plug type (Canada and U.S.)	5, 10, 34		
Power cord length (U.S. only)	1.8 m (6 ft.) 2.7 m (9 ft.)		
Temperature requirements			
Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)		
Nonoperating	1 degree to 60 degrees C (33.8 degrees to 140 degrees F)		
Environment requirements	Operating	Nonoperating	
Noncondensing humidity	8% to 80%	8% to 80%	
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	
Maximum altitude	3048 m (10000 ft.)		
Noise emissions (one 7311-D11 unit) ¹	Operating	Idle	
L _{WAd}	5.6 bels	5.6 bels	
<L _{pA} > _m	40 dB	40 dB	
Service clearances			
Front	Back	Sides	Top
915 mm	915 mm	915 mm	915 mm
36 in.	36 in.	36 in.	36 in.
Note:			
1. For a description of noise emission values, see Acoustics.			

For information about floor loading, contact your IBM service or Installation Planning representative. Because the thickness of the covers are negligible, the height, width, and depth of the overall dimensions may be used in floor loading calculations.

7311-D20 expansion unit

Hardware specifications provide detailed information for your expansion unit, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 98. Hardware specifications

Dimensions	Height	Width	Depth
Metric	178 mm	445 mm	610 mm
English	7.0 in.	17.5 in.	24.0 in.
Maximum configuration weight			
45.9 kg (101 lb.)			
Electrical			
7311-D20			
kVA	0.358		
Rated voltage and frequency	100-240 V ac at 50-60 Hz, V dc not supported		
Thermal output (typical)	775 Btu/hr		

Table 98. Hardware specifications (continued)

Thermal output (maximum)	1161 Btu/hr		
Power requirements (typical)	227 W		
Power requirements (maximum)	340 W		
Power factor	0.95		
Inrush current per 7311-D20 ²	60 A		
Temperature requirements ³			
Operating	5 degrees to 35 degrees C (41 to 95 degrees F)		
Nonoperating	1 degrees to 60 degrees C (33.8 to 140 degrees F)		
Storage	1 degrees to 60 degrees C (33.8 to 140 degrees F)		
Environment requirements	Operating	Nonoperating	Storage
Noncondensing humidity	8% to 80%	8% to 80%	5% to 80 %
Wet bulb temperature ⁴	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	29 degrees C (84.2 degrees F)
Maximum altitude ^{3, 4}	3048 m (10000 ft.)		
Noise emissions ¹	Operating	Idle	
L _{WAd}	6.2 bels	6.1 bels	
<L _{pA} > _m	44 dB	43 dB	
Service clearances**			
Front	Back	Sides	
915 mm	915 mm	915 mm	
36 in.	36 in.	36 in.	
Note:			
1. For a description of noise emission values, see Acoustics.			
2. Inrush currents occur only at initial application of power, no inrush occurs during normal power off-on cycle.			
3. The upper limit of the dry bulb temperature must be derated 1 degree C per 137 m (450 ft.) above 915 m (3000 ft.).			
4. The upper limit of the wet bulb temperature must be derated 1 degree C per 274 m (900 ft.) above 305 m (1000 ft.).			

7314-G30, 5796 expansion unit

Hardware specifications provide detailed information for your expansion unit, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 99. Hardware specifications

Dimensions - I/O drawer only	Height	Width	Depth
Metric	172 mm	224 mm	800 mm
English	6.8 in.	8.8 in.	31.5 in.
Dimensions - with required I/O drawer mounting enclosure	Height	Width	Depth
Metric	176 mm	473 mm	800 mm
English	6.9 in.	18.6 in.	31.5 in.

Table 99. Hardware specifications (continued)

Maximum configuration weight				
One I/O drawer		20 kg (44 lb.)		
Two I/O drawers plus the mounting enclosure		45.9 kg (101 lb.)		
Electrical		7314-G30		
kVA		0.275		
Rated voltage and frequency		100-240 V ac at 50-60 Hz, V dc not supported		
Thermal output		853 Btu/hr		
Power requirements (typical)		250 W		
Power factor		0.91		
Inrush current per 7314-G30 ²		60 A		
Temperature requirements ³				
Operating		10 degrees to 38 degrees C (50 to 100 degrees F)		
Nonoperating		1 degrees to 60 degrees C (33.8 to 140 degrees F)		
Storage		1 degrees to 60 degrees C (33.8 to 140 degrees F)		
Environment requirements		Operating	Nonoperating	Storage
Noncondensing humidity		8% to 80%	8% to 80%	5% to 80 %
Wet bulb temperature ⁴		23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	29 degrees C (84.2 degrees F)
Maximum altitude ^{3, 4}		3048 m (10000 ft.)		
Noise emissions ¹		Operating	Idle	
L _{WAd}		6.2 bels	6.1 bels	
<L _{pA} > _m		44 dB	43 dB	
Service clearances				
Front	Back	Sides		
915 mm	915 mm	915 mm		
36 in.	36 in.	36 in.		
Note:				
1. For a description of noise emission values, see Acoustics.				
2. Inrush currents occur only at initial application of power, no inrush occurs during normal power off-on cycle.				
3. The upper limit of the dry bulb temperature must be derated 1 degree C per 137 m (450 ft.) above 915 m (3000 ft.).				
4. The upper limit of the wet bulb temperature must be derated 1 degree C per 274 m (900 ft.) above 305 m (1000 ft.).				

8079 optional base 1.8 m model 9406-840 I/O rack

Hardware specifications provide detailed information for your rack, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 100. Hardware specifications


<p>Pictured is the 8079 optional base 1.8 m model 9406-840 I/O rack</p> <p>The 8079 consists of a 1.8 m rack with a bottom enclosure (9079 Base I/O Tower with side covers and casters removed) and a top enclosure (5074 PCI expansion unit with side covers and casters removed).</p>			
Dimensions	Width	Depth	Height
Metric	650 mm	1020 mm	1800 mm
English	25.5 in.	40.1 in.	71.0 in.
Maximum configuration weight		726 kg (1600 lb.)	
Electrical¹		8079 (1)	8079 (2)
kVA		1.100	1.100
Rated voltage and frequency		200-240 V ac at 50-60 plus or minus 0.5 Hz	200-240 V ac at 50-60 plus or minus 0.5 Hz
Thermal output (maximum)		3379 Btu/hr	3379 Btu/hr
Power requirements (maximum)		990 W	990 W
Power factor		0.91	0.91
Inrush current		50 A	50 A
Leakage current (maximum)		3.5 mA	3.5 mA
Phase		1	1
Plug type (Canada and U.S.) ²		<p>Type 10 lower unit cord feature 1453 (6 ft. 14F1549) and upper unit cord feature 1458 (9 ft. 12J5119, with only 6 ft. usable length),</p> <p>Type 34 lower unit cord feature 1455 (6 ft. 14F1551) and upper unit cord feature 1459 (9 ft. 55H6644, with only 6 ft. usable length), or</p> <p>Type 5 lower unit cord feature 1451 (6 ft. 14F1547) and upper unit cord feature 1457 (9 ft. 12J5120, with only 6 ft. usable length)</p>	
Power cord length		1.8 m (6 ft.) (U.S. only) 4.3 m (14 ft.)	2.7 m (9 ft.) (U.S. only) 4.3 m (14 ft.)
Temperature requirements			

Table 100. Hardware specifications (continued)

Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)		
Nonoperating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)		
Environment requirements	Operating	Nonoperating	
Noncondensing humidity	8% to 80%	8% to 80%	
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	
Maximum altitude	3048 m (10000 ft.)		
Noise emissions ⁴	Operating	Idle	
L _{WAd} (Category 2D, General business)	7.0 bels	6.9 bels	
L _{pAm} (1-meter bystander)	52 dB	52 dB	
Service clearances ³			
Front	Back	Sides	Top
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Note:			
1. The electrical requirements for the 5074 and 9079 in the 8079 rack need to be planned for individually. The power cords for the 5074 and 9079 must be used to determine the appropriate receptacles.			
2. The usable length of the power cord for the 5074 is reduced by 4 ft. (1.2 m) because of the routing inside the 1.8 m enclosure. Therefore, a 14 ft. (4.3 m) cord results in a usable length of 10 ft. (3 m), and a 9 ft. (2.7 m) cord results in a usable length of 5 ft. (1.5 m).			
3. For information about floor loading, contact your IBM service or Installation Planning representative. Because the thickness of the covers are negligible, the height, width, and depth of the overall dimensions may be used in floor loading calculations.			
4. For a description of noise emission values, see Acoustics.			

8094 and 5097 base I/O expansion unit optional 1.8 m rack

Hardware specifications provide detailed information for your rack, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 101. Hardware specifications


<p>Pictured is the 8094 and 5097 base I/O expansion unit (for servers 9406-870 and 9406-890) optional 1.8 m rack</p> <p>The 8094 base I/O expansion unit consists of a 1.8 m rack with a bottom enclosure (9094 expansion unit with side covers and casters removed) and a top enclosure (5074 PCI-X expansion unit with side covers and casters removed).</p>			
Dimensions	Width	Depth	Height
Metric	650 mm	1020 mm	1800 mm
English	25.5 in.	40.1 in.	71.0 in.
Maximum configuration weight		726 kg (1600 lb.)	
Electrical ¹		8094 base I/O expansion unit (1)	8094 base I/O expansion unit (2)
kVA		1.100 (est.)	1.100 (est.)
Rated voltage and frequency		200-240 V ac at 50-60 plus or minus 0.5 Hz	200-240 V ac at 50-60 plus or minus 0.5 Hz
Thermal output (maximum)		3379 Btu/hr (est.)	3379 Btu/hr (est.)
Power requirements (maximum)		990 W (est.)	990 W (est.)
Power factor		0.91	0.91
Inrush current		50 A (est.)	50 A (est.)
Leakage current (maximum)		3.5 mA	3.5 mA
Phase		1	1
Plug type (Canada and U.S.) ²		<p>Type 10 lower unit cord feature 1453 (6 ft. 14F1549) and upper unit cord feature 1458 (9 ft. 12J5119, with only 6 ft. usable length),</p> <p>Type 34 lower unit cord feature 1455 (6 ft. 14F1551) and upper unit cord feature 1459 (9 ft. 55H6644, with only 6 ft. usable length), or</p> <p>Type 5 lower unit cord feature 1451 (6 ft. 14F1547) and upper unit cord feature 1457 (9 ft. 12J5120, with only 6 ft. usable length)</p>	
Power cord length		1.8 m (6 ft.) (U.S. only) 4.3 m (14 ft.)	2.7 m (9 ft.) (U.S. only) 4.3 m (14 ft.)

Table 101. Hardware specifications (continued)

Temperature requirements			
Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)		
Nonoperating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)		
Environment requirements	Operating	Nonoperating	
Noncondensing humidity	8% to 80%	8% to 80%	
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	
Maximum altitude	3048 m (10000 ft.)		
Noise emissions ⁴	Operating	Idle	
L _{WAd} Category 2E, General business	7.0 bels	6.9 bels	
<L _{pA} > _m (dB)	52 dB	52 dB	
Service clearances ³			
Front	Back	Sides	Top
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Note:			
1. The electrical requirements for the 5094 and 9094 in the 8094 base I/O expansion unit need to be planned for individually. The power cords for the 5094 and 9094 must be used to determine the appropriate receptacles.			
2. The usable length of the power cord for the 5094 is reduced by 4 ft. (1.2 m) because of the routing inside the 1.8 m enclosure. Therefore, a 14 ft. (4.3 m) cord results in a usable length of 10 ft. (3 m), and a 9 ft. (2.7 m) cord results in a usable length of 5 ft. (1.5 m).			
3. For information about floor loading, contact your IBM service or Installation Planning representative. Because the thickness of the covers are negligible, the height, width, and depth of the overall dimensions may be used in floor loading calculations.			
4. For a description of noise emission values, see Acoustics.			

9074 Base I/O Enclosure

The 9074 Base I/O Enclosure is included with models 9406-830 and SB2. The 9074 is the lower part of the system.

9079 base I/O expansion unit or 5074 expansion unit


Hardware specifications provide detailed information for your expansion unit, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 102. Hardware specifications

Pictured is the **9079 base I/O expansion unit or 5074 expansion unit.**

The 9079 base I/O expansion unit is included with models 9406-840 and SB3.

Dimensions are shown for the 9079 base I/O expansion unit or 5074 expansion unit. Measurements DO NOT include models 9406-840 or SB3.



Dimensions	Width	Depth	Height	Height in 0551 rack ²
Metric	485 mm	1075 mm	910 mm	18 EIA
English	19.1 in.	42.3 in.	35.8 in.	18 U

Maximum configuration weight		280 kg (617 lb.)
Electrical		
kVA	1.100	
Rated voltage and frequency	200-240 V ac at 50-60 plus or minus 0.5 Hz	
Thermal output	3379 Btu/hr	
Power requirements (maximum)	990 W	
Power factor	0.9	
Inrush current	42 A	
Leakage current (maximum)	3.5 mA	
Phase	1	
Plug type (Canada and U.S.)	Type 10 (1453 for 6 ft. power cord p/n 14F1549) and (1454 for 14 ft. cord p/n 14F1550), Type 34 (1455 for 6 ft. power cord p/n 14F1551) and (1456for 14 ft. cord p/n 14F1552), or Type 5 (1451 for 6 ft. power cord p/n 14F1547) and (1452 for 14 ft. cord p/n 14F1548	
Power cord length	1.8 m (6 ft.) (U.S. only) 4.3 m (14 ft.)	
Temperature requirements		
Operating	10 to 38 degrees C (50 to 100.4 degrees F)	
Nonoperating	1 to 60 degrees C (33.8 to 140 degrees F)	
Environment requirements	Operating	Nonoperating
Noncondensing humidity	8 to 80%	8 to 80%
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)

Table 102. Hardware specifications (continued)

Maximum altitude		3048 m (10000 ft.)	
Noise emissions¹		Operating	Idle
L _{WAd}		6.7 bels	6.6 bels
L _{pAm} (1-meter bystander)		49 dB	49 dB
Service clearances			
Front	Back	Sides³	Top³
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Note: 1. For a description of noise emission values, see Acoustics. 2. Feature code 0574 is equivalent to the 5074 expansion unit. Feature code 0123 is equivalent to a 5074 lower unit in.rack. 3. Side and top clearances are optional when operating.			

9094 base I/O expansion unit, 9194 I/O expansion unit, or 5094 expansion unit

Hardware specifications provide detailed information for your expansion unit, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 103. Hardware specifications


<p>Pictured is the 9094, 9194 base I/O expansion unit, or the 5094 expansion unit.</p> <p>The 9094, 9194 base I/O expansion unit is included with models 9406-870 and 9406-890. The 5094 is available with models 9406-870 and 9406-890.</p> <p>Dimensions are shown for the 9094 base I/O expansion unit or 5094 expansion unit. Measurements do not include models 9406-870 and 9406-890.</p>				
				
Dimensions	Width	Depth	Height	Height in 0551 rack³
Metric	485 mm	1075 mm	910 mm	18 EIA
English	19.1 in.	42.3 in.	35.8 in.	18 U
Maximum configuration weight				
280 kg (617 lb.)				
Electrical				

Table 103. Hardware specifications (continued)

kVA	1.100		
Rated Voltage/Frequency	200-240 V ac at 50-60 plus or minus 0.5 Hz		
Thermal Output	3379 Btu/hr		
Power requirements (maximum)	990 W		
Power factor	0.9		
Inrush current	42 A		
Leakage current (maximum)	3.5 mA		
Phase	1		
Plug type (Canada and U.S.)	Type 10 (1453 for 6 ft. power cord p/n 14F1549) and (1454 for 14 ft. cord p/n 14F1550), Type 34 (1455 for 6 ft. power cord p/n 14F1551) and (1456for 14 ft. cord p/n 14F1552), or Type 5 (1451 for 6 ft. power cord p/n 14F1547) and (1452 for 14 ft. cord p/n 14F1548		
Power cord length See note 2	1.8 m (6 ft.) (U.S. only) 4.3 m (14 ft.)		
Temperature requirements			
Operating	10 to 38 degrees C (50 to 100.4 degrees F)		
Nonoperating	1 to 60 degrees C (33.8 to 140 degrees F)		
Environment requirements	Operating	Non-Operating	
Noncondensing Humidity	8 to 80%	8 to 80%	
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	
Maximum altitude	3048 m (10000 ft.)		
Noise emissions¹	Operating	Idle	
L _{WAd}	6.7 bels	6.6 bels	
L _{pAm} (1-meter bystander)	49 dB	49 dB	
Service clearances			
Front	Back	Sides⁴	Top⁴
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Notes:			
1. For a description of noise emission values, see Acoustics.			
2. It is strongly recommended that the customer get the dual line cord feature (feature 5114) for this I/O expansion unit. Feature 5114 uses 2 power cords and has 2 AC boxes.			
3. Feature code 0694 is equivalent to the 5094 expansion unit.			
4. Side and top clearances are optional when operating.			

5079 1.8 m storage/PCI expansion unit

Hardware specifications provide detailed information for your expansion unit, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 104. Hardware specifications


<p>Pictured is the 5079 1.8 m storage/PCI expansion unit.</p> <p>There are two 5074 expansions (with side covers and casters removed) in a 5079 1.8 m storage/PCI expansion unit.</p> <p>Dimensions are shown for the 5079 1.8 m Storage/PCI expansion unit only.</p>			
Dimensions	Height	Width	Depth
Metric	1800 mm	650 mm	1020 mm
English	71.0 in.	25.5 in.	40.1 in.
Maximum configuration weight	726 kg (1600 lb.)		
Electrical	5074¹	5074²	
kVA	1.100	1.100	
Rated Voltage/Frequency	200-240 at 50-60 plus or minus 0.5 Hz	200-240 at 50-60 plus or minus 0.5 Hz	
Thermal Output (maximum)	3379 Btu/hr	3379 Btu/hr	
Power requirements (maximum)	990 W	990 W	
Power factor	0.91	0.91	
Inrush current	50 A	50 A	
Leakage current (maximum)	3.5 mA	3.5 mA	
Phase	1	1	
Plug type (Canada and U.S.)	Type 10 lower unit cord feature 1453 (6 ft. 14F1549) and upper unit cord feature 1458 (9 ft. 12J5119, with only 6 ft. usable length), Type 34 lower unit cord feature 1455 (6 ft. 14F1551) and upper unit cord feature 1459 (9 ft. 55H6644, with only 6 ft. usable length), or Type 5 lower unit cord feature 1451 (6 ft. 14F1547) and upper unit cord feature 1457 (9 ft. 12J5120, with only 6 ft. usable length)		
Power cord length (U.S. only)	1.8 m (6 ft.) 2.7 m (9 ft.)	1.8 m (6 ft.) 2.7 m (9 ft.)	
Temperature requirements			

Table 104. Hardware specifications (continued)

Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)		
Nonoperating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)		
Environment requirements	Operating	Nonoperating	
Noncondensing Humidity	8% to 80%	8% to 80%	
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	
Maximum altitude	3048 m (10000 ft.)		
Noise emissions ³	Operating	Idle	
L _{WAd} Category 2E, General Business	7.0 bels	6.9 bels	
<L _{pA} > _m	52 dB	52 dB	
Service clearances			
Front	Back	Sides	Top
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Note:			
1. Because the 5079 1.8 m storage/PCI expansion unit consists of two 5074 storage/PCI expansions, electrical requirements for each 5074 need to be planned for individually. Hence, the (1) and (2) represent the specs for each 5074. The 5074 requires the appropriate receptacle for the power cord included with each 5074.			
2. The usable length of the power cord for the top/upper 5074 is reduced by 1.2 m (4 ft.) because of the routing inside the 1.8 m enclosure. Therefore, a 4.3 m (14 ft.) cord results in a usable length of 3 m (10 ft.), and a 2.7 m (9 ft.) cord results in a usable length of 1.5 m (5 ft.).			
3. For a description of noise emission values, see Acoustics.			

For information about floor loading, contact your IBM service or installation planning representative. Because the thickness of the covers are negligible, the height, width, and depth of the overall dimensions may be used in floor loading calculations.

Planning for IBM rack installation

Select your model to see rack installation instructions for customer-installable servers.

- 7037-A50
- 9111-520 , 9131-52A, or 9406-520
- 9113-550, 9133-55A, or 9406-550
- 9115-505
- 9117-570, 9117-MMA, 9406-MMA, 9406-570, or 9116-561 (Installing this system unit in a rack is not a customer task. Contact your service provider to make arrangements for them to perform this task.)
- 9118-575 (Installing this system unit in a rack is not a customer task. Contact your service provider to make arrangements for them to perform this task.)
- 9119-590, 9119-595, and 9406-595 (Installing this system unit in a rack is not a customer task. Contact your service provider to make arrangements for them to perform this task.)
- 9406-270
- 9406-800
- 9406-810
- 9406-825

For information on System p racks, see the System p Information Center.

Rack specifications

Rack specifications provide detailed information for your rack, including dimensions, electrical, power, temperature, environment, and service clearances.

Select your rack model to view its specifications.

- 0550 iSeries rack
- 0551 iSeries rack
- 0553 rack
- 0554 rack
- 0555 rack
- 5079 1.8 m expansion rack
- 5294 and 8294 1.8 m expansion rack
- 5792 expansion rack
- 7014-S11 rack
- 7014-S25 rack
- 7014-T00 rack
- 7014-T42 rack

For information on previously released pSeries® racks, see the pSeries Information Center.

For information on installing your server in a rack, see Planning for IBM rack installation.

For non-IBM rack specifications, see Specifications for non-IBM rack installation

0550 model 9406-830 rack

Rack specifications provide detailed information for your rack, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 105. Rack specifications


<div><div><div>Pictured is the 0550 iSeries rack.</div><div>When ordered by itself, the 0550 rack provides an empty 1.8 meter tall rack (36 EIA units of total vertical space).</div></div><div></div></div>			
Dimensions	Width	Depth	Height
Metric	650 mm	1020 mm	1800 mm

Table 105. Rack specifications (continued)

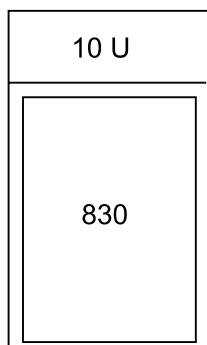
English	25.5 in.	40.0 in.	71.0 in.
Maximum configuration weight ¹		The weight of the rack with the model 830 is 644 kg (1417 lb.).	
Electrical			
kVA (maximum)	1.684		
Rated voltage and frequency	200-240 V ac at 50-60 plus or minus 0.5 Hz		
Thermal output (maximum)	5461 Btu/hr		
Power requirements (maximum)	1600 W		
Power factor	0.95		
Inrush current	80 A		
Leakage current (maximum)	3.5 mA		
Phase	1		
Plug type (Canada and U.S.)	Type 12 (1426 for 14 ft. power cord) Type 40 (1427 for 14 ft. power cord) Type 10 (1453 for 6 ft. power cord p/n 14F1549) and (1454 for 14 ft. cord p/n 14F1550) Type 34 (1455 for 6 ft. power cord p/n 14F1551) and (1456 for 14 ft. cord p/n 14F1552) Type 5 (1451 for 6 ft. power cord p/n 14F1547) and (1452 for 14 ft. cord p/n 14F1548)		
Power cord length	1.8 m (6 ft.)(U.S. only) or 4.3 m (14 ft.)		
High Speed Link (HSL) cable requirements			
Service clearances			
Front	Back	Sides ²	Top ²
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Notes::			
1. The 1.8 meter rack has 10 EIA units of space remaining. This space will be filled with a 5 EIA filler panel, a 3 EIA filler panel, and two of the 1 EIA filler panels. Because the rack does not have power distribution, the model 9406-830 requires a power cord of sufficient length to reach the receptacle. The power cord for the model 9406-830 must be used to determine the appropriate receptacle.			
2. Side and top clearances are optional when operating.			

See 0550 rack configuration for a typical configuration.

0550 rack configuration

The 0550 rack configuration is provided to assist in planning for your 0550 rack.

When ordered by itself, the 0550 provides an empty 1.8 meter rack (36 EIA units of total space). The configuration for the 0551 rack is:



RBAGP815-0

Feature Code	0550 ¹
Top rack specify	none
Bottom rack specify	none
PDU support	0 to 4 ²
Power cords	Model 9406-830 ³ , PDU

Note:

1. Ten EIA units of space not managed by the configurator.
2. Feature codes 5160, 5161, and 5162.
3. Model 9406-830 does not plug into a power distribution unit.

0551 rack

The 0551 rack specifications provide detailed information for your rack.

For information on installing the racks, see Installing the 7014-T00, 7014-T42, 0551, and 0553 racks. For information on installing additional rack features, such as rack doors, heat exchanger doors, security kits, earthquake kits, multiple rack attachment kits, status beacons, and latch brackets, see Installing rack features.

Table 106. Rack specifications

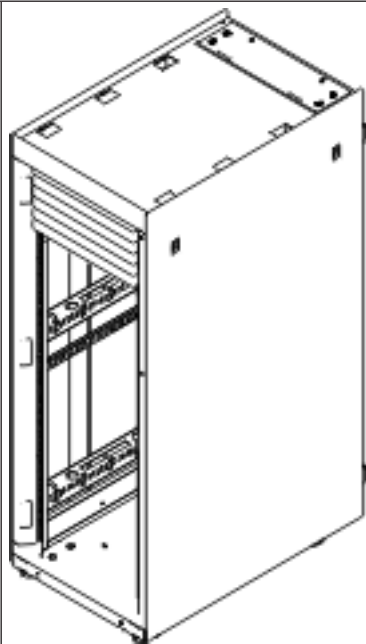
<p>Pictured is the 0551 rack</p> <p>The 0551 provides an empty 1.8 m rack (36 EIA units of total space). See the plug types for specific information on the power distribution units.</p>			
Dimensions	Width	Depth	Height
Metric	650 mm	1020 mm	1800 mm
English	25.5 in.	40.0 in.	71.0 in.
Maximum configuration weight		The weight of the empty rack is 244 kg (535 lb.). Click the appropriate link to see the weight for what is installed. 0123, 0133, 0134, 0578, 0588, 0595, 0137, 0138, 9406-570 and 9117-570,0574, 0694, 7884	
Electrical			
Click the appropriate link to see the electrical characteristics for what is installed. 0123, 0133, 0134, 0578, 0588, 0595, 0137, 0138, 9406-570 and 9117-570,0574, 0694, 7884			
Plug types and power distribution unit.		Power distribution unit (PDU) option. 0123, 0133, 0134, 0578, 0588, 0595, 0137, 0138, 9406-570 and 9117-570,0574, 0694, 7884	
High Speed Link (HSL) cable requirements			
Temperature requirements			
Operating		10 degrees to 38 degrees C (50 degrees to 100.4 degrees)	
Nonoperating		1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)	
Environment requirements		Operating	Nonoperating
Noncondensing humidity		8 to 80%	8 to 80%
Wet bulb temperature		22.8 degrees C (73 degrees F)	27 degrees C (80.6 degrees F)
Maximum altitude		3048 m (10000 ft.)	
Noise emissions ⁴		Rack noise levels are a function of the number and type of drawers installed. See your server or hardware specifications for specific requirements	
Service clearances			
Front	Back	Sides ²	Top ²

Table 106. Rack specifications (continued)

762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Notes: <ol style="list-style-type: none"> 1. The 1.8 meter rack has 10 EIA units of space remaining. This space will be filled with a 5 EIA filler panel, a 3 EIA filler panel, and two of the 1 EIA filler panels. Because the rack does not have power distribution, the model 830 requires a power cord of sufficient length to reach the receptacle. The power cord for model 830 must be used to determine the appropriate receptacle. 2. Side and top clearances are optional during operation. 3. Acoustic doors are available for the IBM racks. Feature code 6248 is available for the 0551 and 7014-T00 racks. Feature code 6249 is available for the 0553 and 7014-T42 racks. The overall sound reduction is approximately 6 dB. The doors add 381 mm (15 in.) to the depth of the racks. 4. For a description of noise emission values, see Acoustics. 			

See 0551 or 7014 rack configurations for typical configurations when the 0551 or 7014 rack is populated with various server models.

Caster and leveler locations

The following diagram provides the caster and leveler locations for the 7014-T00, 7014-T42, 0551, and 0553 racks.

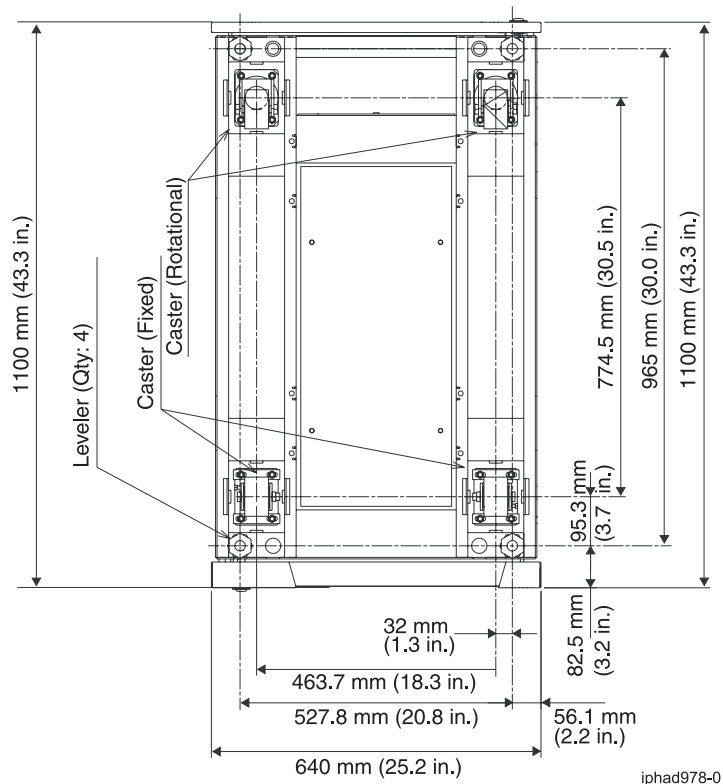


Figure 100. Caster and leveler locations

Model 7014-T42, 7014-B42, and 0553 rack

Hardware specifications provide detailed information for your rack, including dimensions, electrical, power, temperature, environment, and service clearances.

For information on installing the racks, see Installing the 7014-T00, 7014-T42, 0551, and 0553 racks. For information on installing additional rack features, such as rack doors, heat exchanger doors, security kits, earthquake kits, multiple rack attachment kits, status beacons, and latch brackets, see Installing rack features.

Note: Before installing rear door heat exchangers on your 7014-T42 rack, see Planning for the installation of rear door heat exchangers.

Table 107. Rack specifications²

Dimensions		
Height	2015 mm (79.3 in.)	
Capacity	42 usable EIA units	
Height with PDP - DC only	Not applicable	
Width without side panels	623 mm (24.5 in.)	
Width with side panels	644 mm (25.4 in.)	
Depth with back door only	1042 mm (41.0 in.)	
Depth with back door and front door	1098 mm (43.3 in.)	
Depth with sculptured style front door	1147 mm (45.2 in.)	
Weight		
Base rack (empty)	261 kg (575 lb.)	
Full rack	930 kg (2045 lb.) See 7014-T00, 7014-T42 and 0553 rack weight distribution and floor loading	
Electrical ¹	(sum specified values for drawers or enclosures in rack)	
DC rack voltage (nominal)	-48 V dc	
Power source loading maximum in kVa ²	See power cord options for the 7014, 0551, and 0553 racks for details	
Voltage range (V dc)	-40 to -60	
AC rack	683 Btu/hr	
Power source loading maximum in kVa (per PDB) ³	135 W	
Voltage range (V ac)	200 to 240	
Frequency (Hz)	50 or 60	
Temperature requirements	See your server or hardware specifications for specific requirements.	
Humidity requirements	See your server or hardware specifications for specific requirements.	
Noise emissions ³	Rack noise levels are a function of the number and type of drawers installed. See your server or hardware specifications for specific requirements.	
Install or air flow	Rack airflow requirements are a function of the number and type of drawers installed ⁴ . Refer to the individual drawer specifications.	
Service clearances ¹		
Front	Back	Sides
915 mm (36 in.)	915 mm (36 in.)	915 mm (36 in.)

Table 107. Rack specifications² (continued)

Note:

1. Recommended minimum vertical service clearance from floor is 2439 mm (8 ft.)
2. When installing a model 9117-570 or 9406-570 in a 7014-T42 rack, there are restrictions to what height the rack installation can begin so that SMP and FSP flex assemblies are accommodated. The installation configurations are as follows:
 - 16-way configurations (16U) start installation between EIA 1 through EIA 21
 - 12-way configurations (12U) start installation between EIA 1 through EIA 25
 - 8-way configurations (8U) start installation between EIA 1 through EIA 29
 - 4-way configurations (4U) start installation between EIA 1 through EIA 37, EIA 37 through 39 (does not use SMP or SMP flex assemblies)

Associated I/O platforms can be mounted in the upper locations of the rack.
3. Acoustic doors are available for the IBM racks. Feature code 6248 is available for the 0551 and 7014-T00 racks. Feature code 6249 is available for the 0553 and 7014-T42 racks. The overall sound reduction is approximately 6 dB. The doors add 381 mm (15 in.) to the depth of the racks.
4. All rack installations require careful site and facilities planning designed to address both the cumulative drawer heat output and provide the airflow volume rates necessary to comply with drawer temperature requirements.

Caster and leveler locations

The following diagram provides the caster and leveler locations for the 7014-T00, 7014-T42, 0551, and 0553 racks.

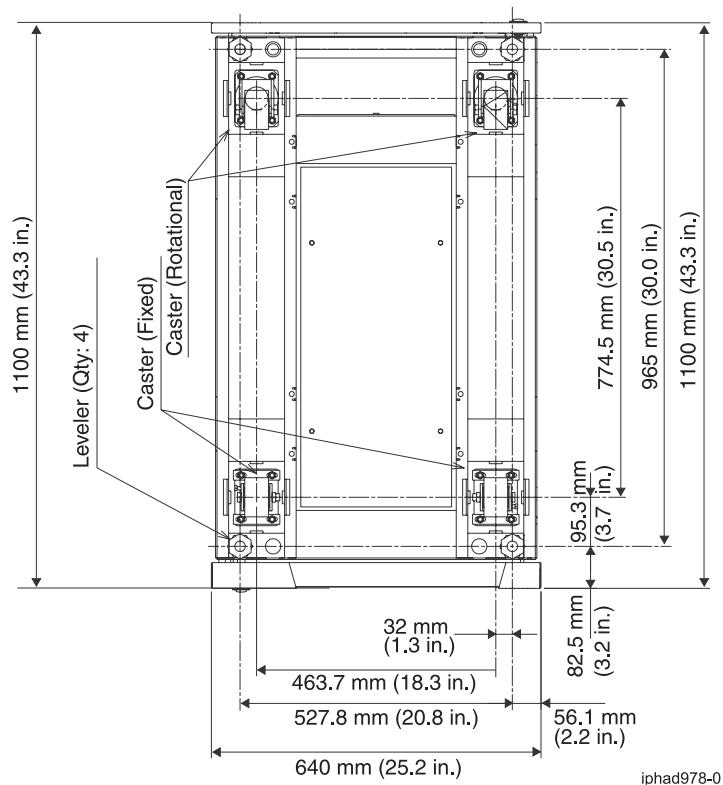


Figure 101. Caster and leveler locations

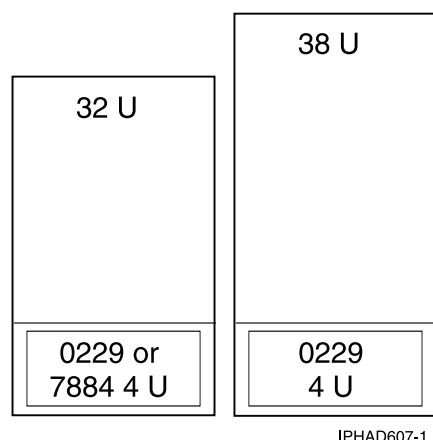
0551, 0553, or 7014 rack configurations

The 0551 or 7014-T00 provide a 1.8 meter rack (36 EIA units of total space). The 7014-T42 or 0553 provides a 2.0 meter rack (42 EIA units of total space).

The various configurations for the 0551, 7014, or 0553 racks are:

- 9406 feature code 7884, 9111 rack content specify code 0229 - 9406-520 and 9111-520 in rack
- 9113 rack content specify code 0230, 9406 rack content specify code 7886
- 9406-570 and 9117-570 in rack, 9117 rack content specify codes 0231, 0232, 0241, 0242
- Feature code 0123 - 5074 lower expansion unit in rack; Feature code 0574 - 5074 equivalent
- Feature code 0694 - 5094 equivalent
- Feature code 0133 - Manufacturing install in rack (models 9406-800 and 9406-810); Feature code 0137 - Field install in rack (models 9406-800 and 9406-810)
- Feature code 0134 - Field install in rack (model 9406-825); Feature code 0138 - Field install in rack (model 9406-825)
- Feature code 0578 - PCI-X expansion unit in rack
- Feature code 0588 - PCI-X expansion unit in rack
- Feature code 0595 - PCI-X expansion unit in rack

9406 feature code 7884, 9111 rack content specify code 0229 - 9406-520 and 9111-520 in rack



IBM rack	0551 ¹ , 0553 ¹ , 7014 ¹³
Top rack, specify code	- -
Bottom rack, specify code	- -
Rack, specify code	7884, 0229
PDU support	0 to 4 ²
Power cords	7884, PDU ³

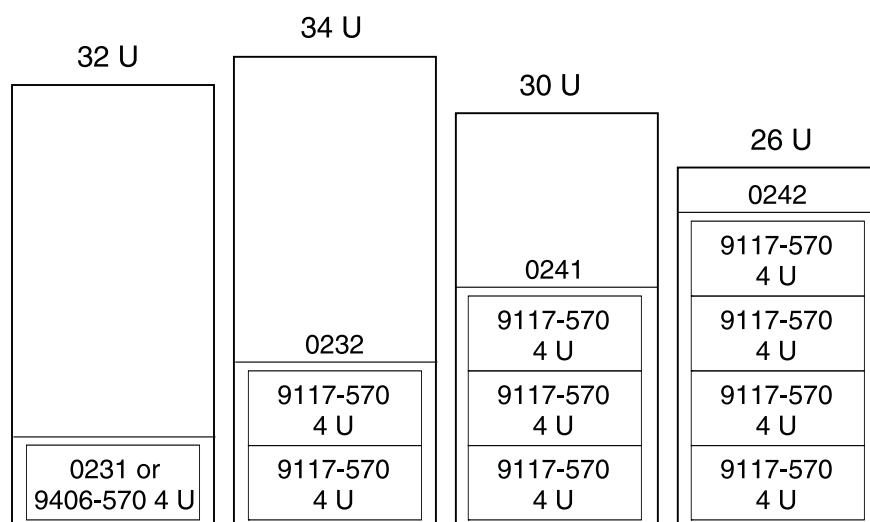
9113 rack content, specify code 0230; 9406 rack content, specify code 7886



IPHAD613-0

IBM rack	7014 ¹³
Top rack, specify code	- -
Bottom rack, specify code	- -
Rack, specify code	0230 (9113-550), 7886 (9406-550)
PDU support	0 to 4 ²
Power cords	PDU ⁴

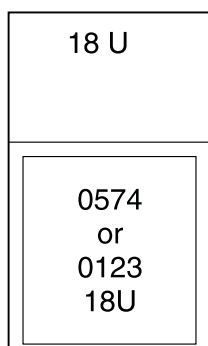
9406-570 in rack, 9117-570 rack content, specify codes 0231, 0232, 0241, 0242



IPHAD608-1

IBM rack	0551 ¹ , 0553 ¹ , 7014 ¹³
Top rack, specify code	- -
Bottom rack, specify code	- -
Rack, specify code	0231, 0232, 0241, 0242
PDU support	0 to 4 ²
Power cords	PDU ⁴

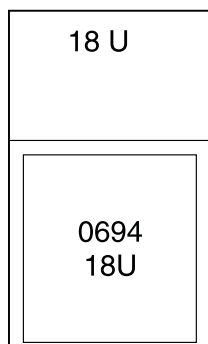
Feature code 0123 - 5074 lower expansion unit in rack; Feature code 0574 - 5074 equivalent



IPHAD600-0

IBM rack	0551 ¹ , 0553 ¹
Top rack, specify code	- -
Bottom rack, specify code	0123
Rack, specify code	0574
PDU support	0 to 4 ²
Power cords	0123, 0574, PDU ⁵

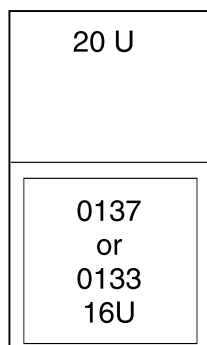
Feature code 0694 - 5094 equivalent



IPHAD601-0

IBM rack	0551 ¹ , 0553 ¹
Top rack, specify code	- -
Bottom rack, specify code	- -
Rack, specify code	0694
PDU support	0 to 4 ²
Power cords	0694, PDU ⁶

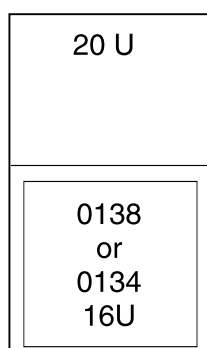
Feature code 0133 - Manufacturing install in rack (models 9406-800 and 9406-810); Feature code 0137 - Field install in rack (models 9406-800 and 9406-810)



IPHAD602-0

IBM rack	0551 ¹ , 0553 ¹
Top rack, specify code	- -
Bottom rack, specify code	- -
Rack, specify code	0133 ⁹ , 0137 ⁹
PDU support	0 to 4 ²
Power cords	0133, 0137, PDU ⁴

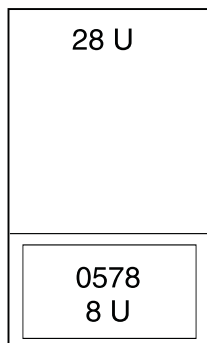
Feature code 0134 - Field install in rack (model 9406-825); Feature code 0138 - Field install in rack (model 9406-825)



IPHAD603-0

IBM rack	0551 ¹ , 0553 ¹
Top rack, specify code	- -
Bottom rack, specify code	- -
Rack, specify code	0134 ¹⁰ , 0138 ¹⁰
PDU support	0 to 4 ²
Power cords	0134, 0138, PDU ⁴

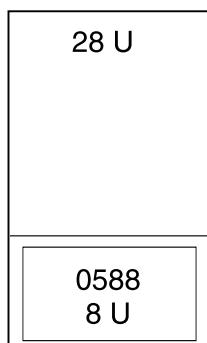
Feature code 0578 - PCI-X expansion unit in rack



IPHAD604-0

IBM rack	0551 ¹ , 0553 ¹
Top rack, specify code	- -
Bottom rack, specify code	- -
Rack, specify code	0578
PDU support	0 to 4 ²
Power cords	PDU ⁸

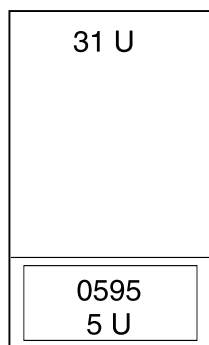
Feature code 0588 - PCI-X expansion unit in rack



IPHAD605-0

IBM rack	0551 ¹ , 0553 ¹
Top rack, specify code	- -
Bottom rack, specify code	- -
Rack, specify code	0588
PDU support	0 to 4 ²
Power cords	PDU ¹²

Feature code 0595 - PCI-X expansion unit in rack



IPHAD606-0

IBM rack	0551 ¹ , 0553 ¹
Top rack, specify code	- -
Bottom rack, specify code	- -
Rack, specify code	0595
PDU support	0 to 4 ²
Power cords	0595, PDU ¹¹

Note:

1. 0551 is an empty 1.8 meter rack with 36 EIA units of total space. 0553 is a 2.0 meter rack with 42 EIA units of total space.
2. 0551 and 0553 feature codes 5160, 5161, 5163, and 7188. 7014 feature codes 7176, 7177, 7178, and 7188.
3. If units plug into a power distribution unit (PDU), power jumper cord feature code 6458, 6459, 6095, or 9911 is required. If redundant power supply (feature code 5158) is ordered, a second power jumper cord feature code is required.
4. If unit plugs into a PDU, two feature code 6458, 6459, 6095, or 9911 power jumper cords are required.
5. Feature code 0123 or 0574 do not plug into a PDU.
6. Feature code 0125 does not plug into a PDU.
7. Supported only on MES orders and includes a rack shelf with rail assembly, adapter plate, and cable-management-arm assembly.
8. 0578 includes two rack power cords that plug into a PDU.
9. Field install in rack feature is used to mount a model 9406-270, 9406-800, or 9406-810 system unit (14 U) with attached expansion unit. This feature provides a rack shelf (2 U) with rail assembly, cable-management-arm assembly, adapter plate, and a pair of lift covers.
10. Field install in rack feature is used to mount a model 9406-825 system unit (14 U). This feature provides a rack shelf (2 U), cable-management-arm assembly, adapter plate, and a pair of lift covers.
11. If unit plugs into a PDU, feature code 1422 is required. If redundant power supply (feature code 5138) is ordered, a second feature code 1422 is required.
12. 0588 comes with two rack power cords that plug into a PDU.
13. 7014-T00 is a 1.8 meter rack with 36 EIA units of total space. 7014-T42 is a 2.0 meter rack with 42 EIA units of total space. The rack includes one PDU, feature code 9188, 9176, 9177, or 9178.

0551 model 9406-270 rack system units

Server specifications provide detailed information for your server, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 108. Server specifications


Pictured is the 0551 model 9406-270 Rack system units . The 0551 consists of two model 9406-270s with 7104 system unit expansions installed in a 1.8 m rack. Specify code 0121 represents the first model 9406-270 in the rack (on the bottom). Specify code 0122 represents the second model 9406-270 in the rack (on the top).			
Dimensions	Height	Width	Depth
Metric	1800 mm	650 mm	1020 mm
English	71.0 in.	25.5 in.	40.0 in.
Maximum configuration weight¹		The weight of the rack with the 0121 and 0122 is 403 kg (885 lb.).	
Electrical - for each model 9406-270 system unit			
kVA (maximum)	0.789		
Rated voltage and frequency	100-127/200-240 V ac at 50-60 plus or minus 0.5 Hz		
Thermal output (maximum)	2560 Btu/hr		
Power requirements (maximum)	750 W		
Power factor	0.95		
Inrush current	41 A		
Leakage current (maximum)	3.5 mA		
Phase	1		
Plug type (Canada and U.S.) ²	4, 5, 10, or 34		
Power cord length	4.3 m (14 ft.)		
High Speed Link (HSL) cable requirements			
Temperature requirements			
Operating	10 degrees to 38 degrees C (50 degrees to 100.4 degrees F)		
Nonoperating	1 degrees to 60 degrees C (33.8 degrees to 140 degrees F)		
Environment requirements	Operating	Nonoperating	
Noncondensing humidity	8 to 80%	8 to 80%	
Wet bulb temperature	23 degrees C (73.4 degrees F)	27 degrees C (80.6 degrees F)	

Table 108. Server specifications (continued)

Maximum altitude		3048 m (10000 ft.)	
Noise emissions ⁵		Operating	Idle
L _{WAd} (Category 2E, General business)		6.6 bels	6.3 bels
<L _{pA} > _m		48 dB	46 dB
Service clearances			
Front	Back	Sides ³	Top ³
762 mm	762 mm	762 mm	762 mm
30 in.	30 in.	30 in.	30 in.
Notes:			
<div>1. The 1.8 meter rack has 6 EIA units of space remaining. This space will be filled with a 3 EIA filler panel and three of the 1 EIA filler panels.</div> <div>2. Only the 4.3 m (14 ft.) power cord features are offered for racked 9406-270 systems. There are a total of four power cords that are routed through cable management arms. Also, there is a cable management device that might be used to restrict the length of the power cord exiting the bottom of the rack (for cities like Chicago). See the model 9406-270 Cable Poster Addendum included with the 0551 model 9406-270 rack.</div> <div>3. Side and top clearances are optional when operating.</div> <div>4. The rack does not have power distribution. Each model 9406-270 and 7104 requires a power cord of sufficient length to reach the receptacle. The power cord feature codes for the model 9406-270s must be used to determine the appropriate receptacles.</div> <div>5. For a description of noise emission values, see Acoustics.</div>			

Model 0554 and 7014-S11 rack

Hardware specifications provide detailed information for your rack, including dimensions, electrical, power, temperature, environment, and service clearances.

For information on installing the racks, see Installing the 0554 and 7014-S11 racks. For information on installing additional rack features, such as rack doors, heat exchanger doors, security kits, earthquake kits, multiple rack attachment kits, status beacons, and latch brackets, see Installing rack features.

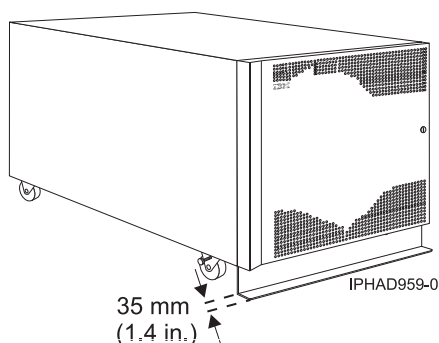
Table 109. Rack specifications

Dimensions	
Height	611 mm (24 in.)
Capacity	11 usable EIA units
Height with PDP - DC only	Not applicable
Width without side panels	Not applicable
Width with side panels	518 mm (20.4 in.)
Depth without doors	820 mm (32.3 in.)
Depth with front door	873 mm (34.4 in.)
Depth with sculptured style front door	Not applicable
Weight	
Base rack (empty)	36 kg (80 lb.)
Full rack ¹	218 kg (481 lb.)
Electrical³	(sum specified values for drawers or enclosures in rack)
DC rack voltage (nominal)	Not applicable
Power source loading maximum in kVa	Not applicable

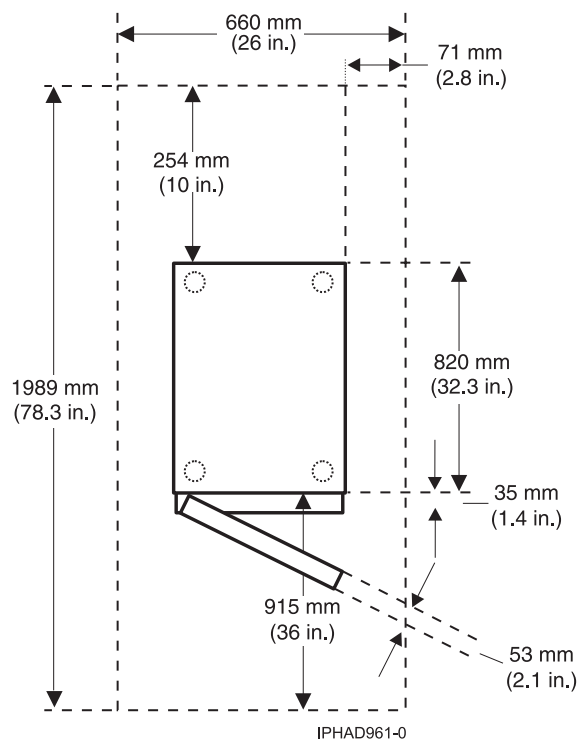
Table 109. Rack specifications (continued)

Voltage range (V dc)	Not applicable	
AC rack	See your server or hardware specifications for specific requirements	
Power source loading maximum in kVa (per PDU)	See your server or hardware specifications for specific requirements	
Voltage range (V ac)	See your server or hardware specifications for specific requirements	
Frequency (Hz)	50 or 60	
Temperature requirements	See your server or hardware specifications for specific requirements	
Humidity requirements	See your server or hardware specifications for specific requirements	
Noise emissions	Rack noise levels are a function of the number and type of drawers installed. See your server or hardware specifications for specific requirements.	
Install or airflow	Rack airflow requirements are a function of the number and type of drawers installed (see Note 5). Refer to the individual drawer specifications.	
Service clearances ²		
Front	Back	Sides
915 mm (36 in.)	254 mm (10 in.)	71 mm (2.8 in.)
Note:		
1. Configuration dependent, base rack weight plus the weight of the drawers mounted in the rack. The rack can support up to a maximum weight of 15.9 kg (35 lb.) per EIA unit.		
2. Recommended minimum vertical service clearance from floor is 2439 mm (8 ft.).		
3. The 7188 power distribution unit used with this rack is mounted horizontally and requires one EIA unit of space.		

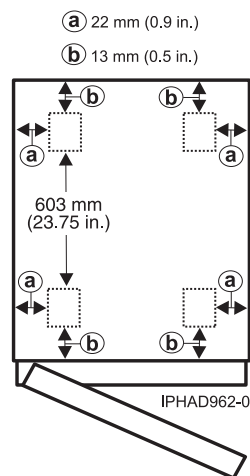
Model 0554 and 7014-S11 rack operational clearances



Model 0554 and 7014-S11 with stabilizer bar



Model 0554 and 7014-S11 plan view



Model 0554 and 7014-S11 caster locations

Model 0555 and 7014-S25 rack

Hardware specifications provide detailed information for your rack, including dimensions, electrical, power, temperature, environment, and service clearances.

For information on installing the racks, see *Installing the 0555 and 7014-S25 racks*. For information on installing additional rack features, such as rack doors, heat exchanger doors, security kits, earthquake kits, multiple rack attachment kits, status beacons, and latch brackets, see *Installing rack features*.

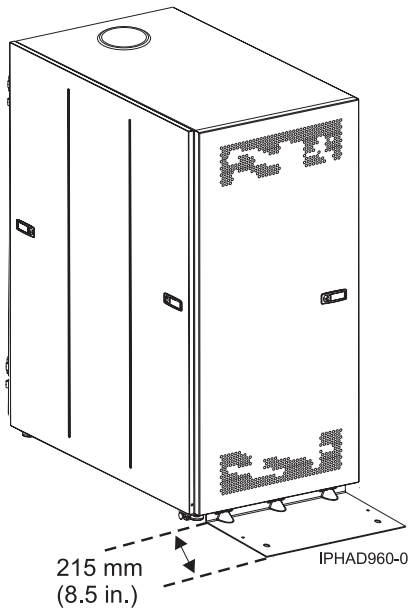
Table 110. Rack specifications

Dimensions	
Height	1240 mm (49 in.)

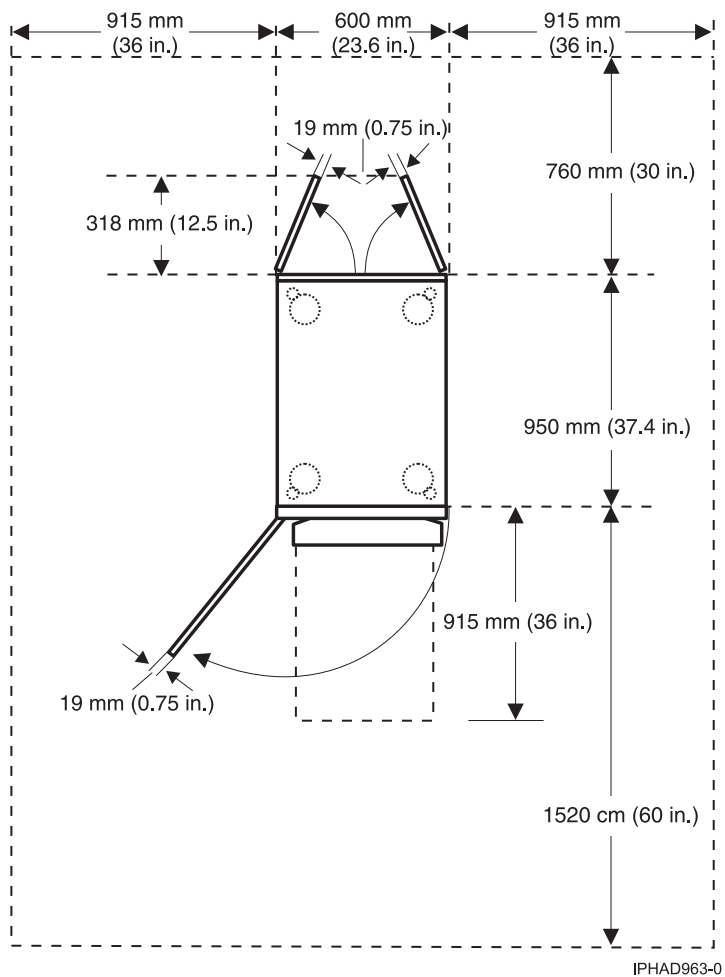
Table 110. Rack specifications (continued)

Capacity	25 usable EIA units	
Height with PDP - DC only	Not applicable	
Width without side panels	590 mm (23.2 in.)	
Width with side panels	610 mm (24 in)	
Depth with back door only	996 mm (39.2 in.)	
Depth with back door and front door	1000 mm (39.4 in.)	
Depth with sculptured style front door	Not applicable	
Weight		
Base rack (empty)	98 kg (217 lb.)	
Full rack ¹	665 kg (1467 lb.)	
Electrical ³	(sum specified values for drawers or enclosures in rack)	
DC rack voltage (nominal)	Not applicable	
Power source loading maximum in kVa	Not applicable	
Voltage range (V dc)	Not applicable	
AC rack	See your server or hardware specifications for specific requirements	
Power source loading maximum in kVa (per PDU)	See your server or hardware specifications for specific requirements	
Voltage range (V ac)	See your server or hardware specifications for specific requirements	
Frequency (Hz)	50 or 60	
Temperature requirements	See your server or hardware specifications for specific requirements	
Humidity requirements	See your server or hardware specifications for specific requirements	
Noise emissions	Rack noise levels are a function of the number and type of drawers installed. See your server or hardware specifications for specific requirements	
Install or airflow	Rack airflow requirements are a function of the number and type of drawers installed. Refer to the individual drawer specifications.	
Service clearances ²		
Front	Back	Sides
915 mm (36 in.)	760 mm (30 in.)	915 mm (36 in.)
Note:		
1. Configuration dependent, base rack weight plus the weight of the drawers mounted in the rack. The rack can support up to a maximum weight of 22.7 kg (50 lb.) per EIA unit.		
2. Recommended minimum vertical service clearance from floor is 2439 mm (8 ft.).		
3. The 7188 power distribution unit used with this rack is mounted horizontally and requires one EIA unit of space.		

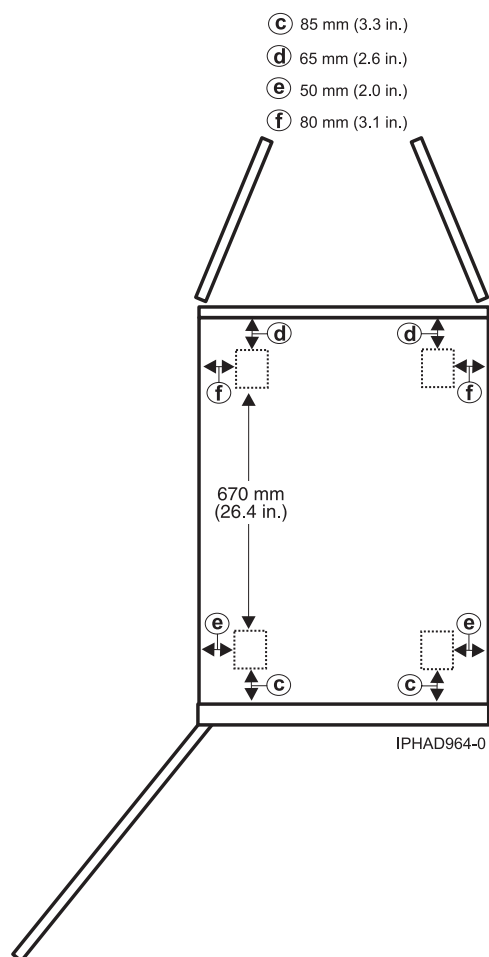
Model 0555 and 7014-S25 rack operational clearances



Model 0555 and 7014-S25 with stabilizer foot



Model 0555 and 7014-S25 plan view



Model 0555 and 7014-S25 caster locations

Planning for the 7014-T00 and 7014-T42 racks

Rack specifications provide detailed information for your rack, including dimensions, electrical, power, temperature, environment, and service clearances.

The following provide specifications for the 7014-T00, and 7014-T42 or 0553 racks.

Model 7014-T00 rack

Hardware specifications provide detailed information for your rack, including dimensions, electrical, power, temperature, environment, and service clearances.

Table 111. Rack specifications

Dimensions	
Height	1804 mm (71.0 in.)
Capacity	36 usable EIA units
Height with PDP - DC only	1926 mm (75.8 in.)
Width without side panels	623 mm (24.5 in.)
Width with side panels	644 mm (25.4 in.)
Depth with rear door only	1042 mm (41.0 in.)
Depth with rear door and front door	1098 mm (43.3 in.)

Table 111. Rack specifications (continued)

Depth with sculptured style front door		1147 mm (45.2 in.)
Weight		
Base rack (empty)		244 kg (535 lb.)
Full rack		816 kg (1795 lb.) See 7014-T00, 7014-T42 and 0553 rack weight distribution and floor loading
Electrical¹		(sum specified values for drawers or enclosures in rack)
DC rack voltage (nominal)		-48 V dc
Power source loading maximum in kVa ²		See Power distribution unit and power cord options for 7014, 0551, or 0553 rack for details
Voltage range (V dc)		-40 to -60
AC rack		683 Btu/hr
Power source loading maximum in kVa (per PDB) ³		135 W
Voltage range (V ac)		200 to 240
Frequency (Hz)		50 or 60
Temperature requirements		See your server or hardware specifications for specific requirements
Humidity requirements		See your server or hardware specifications for specific requirements
Noise emissions⁵		Rack noise levels are a function of the number and type of drawers installed. See your server or hardware specifications for specific requirements
Install or airflow		Rack airflow requirements are a function of the number and type of drawers installed ⁴ . Refer to the individual drawer specifications.
Service clearances		
Front	Back	Sides
915 mm (36 in.)	915 mm (36 in.)	915 mm (36 in.)
Note:		
1. The total rack power should be derived from the sum of the power used by the drawers in the rack.		
2. The power distribution panel (PDP) on the DC-powered rack can hold up to eighteen (nine per power source) 48-volt, 20- to 50-amp circuit breakers (configuration dependent). Each power source supports up to 8.4 kVa.		
3. Each ac power distribution bus (PDB) can supply 4.8 kVa. A rack can have up to four PDBs as required by the drawers mounted in the rack.		
4. All rack installations require careful site and facilities planning designed to both address the cumulative drawer heat output and provide the airflow volume rates necessary to comply with drawer temperature requirements.		
5. Acoustic doors are available for the IBM racks. Feature code 6248 is available for the 0551 and 7014-T00 racks. Feature code 6249 is available for the 0553 and 7014-T42 racks. The overall sound reduction is approximately 6 dB. The doors add 381 mm (15 in.) to the depth of the racks.		

7014-T00, 7014-T42, and 0553 service clearances and caster location

Use the Service clearances and caster location for 7014-T00, 7014-T42 and 0553 racks figure to plan the correct service clearances and caster locations for your rack.

The service clearances and caster locations are shown in the following figure:

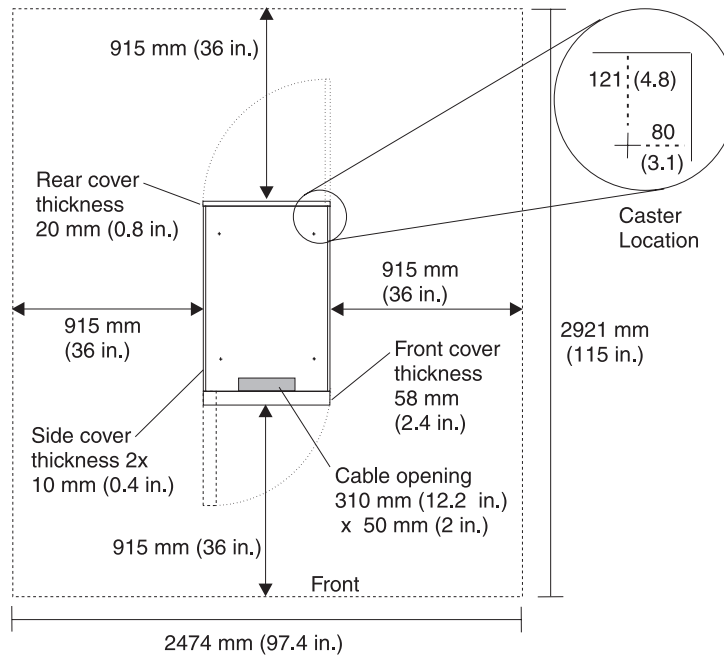
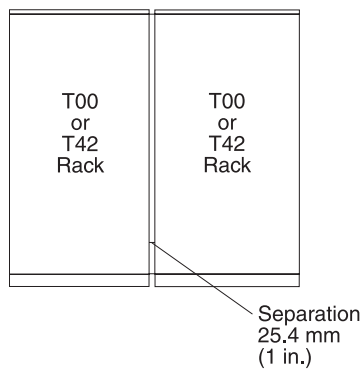


Figure 102. Service clearances and caster location for 7014-T00, 7014-T42, and 0553 racks

Note: Rack units are large and heavy and are not easily moved. Because maintenance activities require access at both the front and back, extra room needs to be allowed. The footprint shows the radius of the swinging doors on the I/O rack. The figure shows the minimum space required.

7014-T00, 7014-T00, and 0553 racks multiple attachment

7014-T00, 7014-T42 or 0553 racks can be bolted together in a multiple rack arrangement. This figure shows that arrangement.



A kit is available including the bolts, spacers, and decorative trim pieces to cover the 25.4mm (1 in.) space. For service clearances, see the service clearances as shown in the table for the “Model 7014-T00 rack” on page 272.

7014-T00, 7014-T42, and 0553 rack weight distribution and floor loading

Racks can be heavy when populated with several drawers. Use the Weight distribution distances for racks when loaded and Floor loading for racks when loaded tables to ensure proper floor loading and weight distribution.

The 7014-T00, 7014-T42, and 0553 racks can be extremely heavy when several drawers are present. The following table shows the necessary weight distribution distances for the 7014-T00, 7014-T42, and 0553

racks when loaded.

Table 112. Weight distribution distances for racks when loaded

Rack	System weight (1) lb (kg)	Width (2) in. (mm)	Depth (2) in. (mm)	Weight distribution distance (3)	
				Front and back in. (mm)	Left and right in. (mm)
7014-T00 (4)	1795 (816)	24.5 (623)	40.2 (1021)	20.3 (515.6), 18.8 (477.5)	18.4 (467.4)
7014-T00 (5)	1795 (816)	24.5 (623)	40.2 (1021)	20.3 (515.6), 18.8 (477.5)	0.0 (0.0)
7014-T00 (6)	1795 (816)	24.5 (623)	40.2 (1021)	20.3 (515.6), 18.8 (477.5)	22 (559)
7014-T42 and 0553 (4)	2045 (930)	24.5 (623)	40.2 (1021)	20.3 (515.6), 18.8 (477.5)	18.4 (467.4)
7014-T42 and 0553 (5)	2045 (930)	24.5 (623)	40.2 (1021)	20.3 (515.6), 18.8 (477.5)	0.0 (0.0)
7014-T42 and 0553(6)	2045 (930)	24.5 (623)	40.2 (1021)	20.3 (515.6), 18.8 (477.5)	27 (686)

The following table shows the necessary floor loading for the 7014-T00, 7014-T42 and 0553 racks when loaded.

Table 113. Floor loading for racks when loaded

Rack	Floor loading			
	Raised kg/m ²	Non-raised kg/m ²	Raised lb/ft ²	Non-raised lb/ft ²
7014-T00 (4)	366.7	322.7	75	66
7014-T00 (5)	734.5	690.6	150.4	141.4
7014-T00 (6)	341	297	70	61
7014-T42 and 0553 (4)	403	359	82.5	73.5
7014-T42 and 0553 (5)	825	781	169	160
7014-T42 and 0553(6)	341.4	297.5	70	61

The following notes are for both of the preceding tables.

Note:

1. Maximum weight of fully populated rack, units are lb. with kg in parentheses.
2. Dimensions without covers, units are inches with mm in parentheses.
3. The weight distribution distance in all four directions is the area around the rack perimeter (minus covers) necessary to distribute the weight beyond the perimeter of the rack. Weight distribution areas cannot overlap with adjacent computer equipment weight distribution areas. Units are inches with mm in parentheses.
4. Weight distribution distance is 1/2 the service clearance values shown in the figure plus cover thickness.
5. No left and right weight distribution distance.
6. Left and right weight distribution distance required for a 70 lb/ft² raised floor loading objective.

Hardware management console specifications

Hardware management console (HMC) specifications provide detailed information for your HMC, including dimensions, electrical, power, temperature, environment, and service clearances.

Select a model to view its specifications.

- 7042-C06 desktop Hardware Management Console
- 7042-CR4 rack-mounted Hardware Management Console
- 7310-C03 desktop Hardware Management Console
- 7310-C04 desktop Hardware Management Console
- 7310-C05 desktop Hardware Management Console
- 7310-C06 desktop Hardware Management Console
- 7310-CR2 rack-mounted Hardware Management Console
- 7310-CR3 rack-mounted Hardware Management Console
- 7310-CR4 Rack-Mounted Hardware Management Console

7310-C03 desktop Hardware Management Console specifications

Hardware specifications provide detailed information for your Hardware Management Console (HMC), including dimensions, electrical, power, temperature, and environment.

The HMC controls managed systems, including the management of logical partitions and the use of Capacity on Demand. Using service applications, the HMC communicates with managed systems to detect, consolidate, and send information to IBM for analysis. The HMC provides service technicians with diagnostic information for systems that can operate in a multiple-partitioned environment.

Dimensions				
	Width	Depth	Height	Weight
Metric	425 mm	425 mm	140 mm	12.0 kg
English	16.7 in.	16.7 in.	5.5 in.	26.5 lb.
Electrical				
Power source loading			0.11 kVa to 0.35 kVa	
Input voltage			100 V ac to 127 V ac 200 V ac to 240 V ac	
Frequency (hertz)			50 Hz to 60 Hz	
Thermal output (minimum)			375 Btu/hr. (110 watts)	
Thermal output (maximum)			1195 Btu/hr. (350 watts)	
Maximum altitude			3048 m (10000 ft.)	
Air temperature requirements				
Operating		Nonoperating		
10 to 35 degrees C (50 to 95 degrees F) at altitude 0 to 914 m (2999 ft.)		10 to 43 degrees C (50 to 109.4 degrees F)		
Humidity requirements				
	Operating		Nonoperating	
Noncondensing humidity	8 to 80%		8 to 80%	
Noise emissions ¹				
	Operating		Nonoperating	
L _{WAd}	6.5 bels		6.5 bels	
Note:				
1. For a description of noise emission values, see Acoustics.				

7310-C04 desktop Hardware Management Console specifications

Hardware specifications provide detailed information for your Hardware Management Console (HMC), including dimensions, electrical, power, temperature, and environment.

The HMC controls managed systems, including the management of logical partitions and use of capacity on demand. Using service applications, the HMC communicates with managed systems to detect, consolidate, and send information to IBM for analysis. The HMC provides service technicians with diagnostic information for systems that can operate in a multiple-partitioned environment.

Dimensions					
	Width	Depth	Height	Weight (minimum configuration as shipped)	Weight (maximum configuration)
Metric	442 mm	401 mm	146 mm	11.0 kg	14.0 kg
English	17.4 in.	15.8 in.	5.7 in.	24 lb.	31 lb.
Electrical ¹					
Power source loading			0.09 kVa to 0.32 kVa		
Input voltage			90 V ac to 100 V ac (low range)		
			137 V ac to 265 V ac (high range)		
Frequency (hertz)			47 Hz to 53 Hz (low range)		
			57 Hz to 63 Hz (high range)		
Thermal output (minimum)			256 Btu/hr. (75 watts)		
Thermal output (maximum)			1058 Btu/hr. (310 watts)		
Maximum altitude			2134 m (7000 ft.)		
Air temperature requirements					
Operating		Nonoperating			
10 to 35 degrees C (50 to 95 degrees F) at altitude 0 to 2134 m (7000 ft.)		10 to 43 degrees C (50 to 109.4 degrees F)			
10 to 32 degrees C (50 to 89.6 degrees F) at altitude 914 m (2999 ft.) to 2133 m (6998 ft.)					
Humidity requirements					
	Operating		Nonoperating		
Noncondensing humidity	8 to 80%		8 to 80%		
Noise emissions ²					
	Operating		Nonoperating		
L _{WAd}	4.4 bels		4.3 bels		
L _{pAm} (1-meter bystander position)	31 dB		29 dB		
L _{pAm} (.5-meter operator postion)	35 dB		33 dB		

Dimensions
Note: <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 IS) 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.

7310-C05 desktop Hardware Management Console specifications

Hardware specifications provide detailed information for your Hardware Management Console (HMC), including dimensions, electrical, power, temperature, and environmental specifications.

The HMC controls managed systems, including the management of logical partitions and use of capacity on demand. Using service applications, the HMC communicates with managed systems to detect, consolidate, and send information to IBM for analysis. The HMC provides service technicians with diagnostic information for systems that can operate in a multiple-partitioned environment.

Use the following specifications to plan for your HMC.

Table 114. Hardware Management Console specifications

Dimensions					
	Width	Depth	Height	Weight (minimum configuration as shipped)	Weight (maximum configuration)
Metric	438 mm	540 mm	216 mm	16.3 kg	20.8 kg
English	17.25 in.	21.25 in.	8.5 in.	36 lb.	45.8 lb.
Electrical ¹					
Power source loading			0.106 kVa to 0.352 kVa		
Input voltage			100 - 127 V ac (low range)		
			200 - 240 V ac (high range)		
Frequency (hertz)			47 Hz to 53 Hz (low range)		
			57 Hz to 63 Hz (high range)		
Thermal output (minimum)			361 Btu/hr. (106 watts)		
Thermal output (maximum)			1201 Btu/hr. (352 watts)		
Maximum altitude			2134 m (7000 ft.)		
Air temperature requirements					
Operating		Nonoperating and shipping			
10 to 35 degrees C (50 to 95 degrees F)		0 to 60 degrees C (-32 to 140 degrees F)			
Humidity requirements					
	Operating		Nonoperating		
Noncondensing humidity	8 to 80%		8 to 80%		
Noise emissions ²					

Table 114. Hardware Management Console specifications (continued)

Dimensions				
Product description	Declared A-weighted sound power level, L_{WAd} (bels)		Declared A-weighted sound pressure level, L_{pAm} (dB)	
	Operating	Nonoperating	Operating	Nonoperating
One hard disk drive configuration	5.2	4.8	37	33
Note: <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 IS) 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. 				

7310-C06 and 7042-C06 desktop Hardware Management Console specifications

Hardware specifications provide detailed information for your Hardware Management Console (HMC), including dimensions, electrical, power, temperature, and environmental specifications.

The HMC controls managed systems, including the management of logical partitions and use of capacity on demand. Using service applications, the HMC communicates with managed systems to detect, consolidate, and send information to IBM for analysis. The HMC provides service technicians with diagnostic information for systems that can operate in a multiple-partitioned environment.

Use the following specifications to plan for your HMC.

Table 115. Hardware Management Console specifications

Dimensions					
	Width	Depth	Height	Weight (minimum configuration as shipped)	Weight (maximum configuration)
Metric	438 mm	540 mm	216 mm	16.3 kg	20.8 kg
English	17.25 in.	21.25 in.	8.5 in.	36 lb.	45.8 lb.
Electrical ¹					
Power source loading			0.106 kVa to 0.352 kVa		
Input voltage			100 - 127 V ac (low range)		
			200 - 240 V ac (high range)		
Frequency (hertz)			47 Hz to 53 Hz (low range)		
			57 Hz to 63 Hz (high range)		
Thermal output (minimum)			361 Btu/hr. (106 watts)		
Thermal output (maximum)			1201 Btu/hr. (352 watts)		
Maximum altitude			2134 m (7000 ft.)		
Air temperature requirements					
Operating		Nonoperating and shipping			
10 to 35 degrees C (50 to 95 degrees F)		0 to 60 degrees C (-32 to 140 degrees F)			

Table 115. Hardware Management Console specifications (continued)

Dimensions				
Humidity requirements				
	Operating		Nonoperating	
Noncondensing humidity	8 to 80%		8 to 80%	
Noise emissions ²				
Product description	Declared A-weighted sound power level, L _{WAd} (bels)		Declared A-weighted sound pressure level, L _{pAm} (dB)	
	Operating	Nonoperating	Operating	Nonoperating
One hard disk drive configuration	5.2	4.8	37	33
Note:				
<div>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.</div> <div>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 IS) 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.</div>				

7310-CR2 rack-mounted Hardware Management Console specifications

Hardware specifications provide detailed information for your Hardware Management Console (HMC), including dimensions, electrical, power, temperature, and environmental specifications.

The Hardware Management Console (HMC) controls managed systems, including the management of logical partitions and use of capacity on demand. Using service applications, the HMC communicates with managed systems to detect, consolidate, and send information to IBM for analysis. The HMC provides service technicians with diagnostic information for systems that can operate in a multiple-partitioned environment.

This HMC mounts in a 19-inch system rack. The 0551 rack is recommended. This rack operates with a voltage range of 200 V ac to 240 V ac. For additional information about this rack, see 0551 rack.

Use the following specifications to plan for your HMC.

Dimensions				
	Width	Depth	Height	Weight
Metric	440 mm	660 mm	43 mm	12.7 kg
English	17.3 in.	25.98 in.	1.69 in.	28.4 lb.
Electrical				
Power source loading			0.11 kVa to 0.35 kVa	
Input voltage			100 V ac to 127 V ac 200 V ac to 240 V ac	
Frequency (hertz)			50 Hz to 60 Hz	
Thermal output (minimum)			375 Btu/hr. (110 watts)	
Thermal output (maximum)			1195 Btu/hr. (350 watts)	

Dimensions		
Maximum altitude		3048 m (10000 ft.)
Air temperature requirements		
Operating		Nonoperating
10 to 35 degrees C (50 to 95 degrees F) at altitude 0 to 914 m (2999 ft.)		10 to 43 degrees C (50 to 109.4 degrees F)
10 to 32 degrees C (50 to 89.6 degrees F) at altitude 914 m (2999 ft.) to 2133 m (6998 ft.)		
Humidity requirements		
	Operating	Nonoperating
Noncondensing humidity	8 to 80%	8 to 80%
Noise Emissions ¹		
	Operating	Nonoperating
L _{WAd}	6.5 bels	6.5 bels
Note:		
1. For a description of noise emission values, see Acoustics.		

7310-CR3 rack-mounted Hardware Management Console specifications

Hardware specifications provide detailed information for your Hardware Management Console (HMC), including dimensions, electrical, power, temperature, and environmental specifications.

The Hardware Management Console (HMC) controls managed systems, including the management of logical partitions and use of capacity on demand. Using service applications, the HMC communicates with managed systems to detect, consolidate, and send information to IBM for analysis. The HMC provides service technicians with diagnostic information for systems that can operate in a multiple-partitioned environment.

This HMC mounts in a 19-inch system rack. The 0551 rack is recommended. This rack operates with a voltage range of 200 V ac to 240 V ac. For additional information about this rack, see 0551 rack.

Use the following specifications to plan for your HMC.

Dimensions					
	Width	Depth	Height	Weight (minimum configuration)	Weight (maximum configuration)
Metric	440 mm	686 mm	43 mm	12.7 kg	15.6 kg
English	17.32 in.	27.0 in.	1.69 in.	28 lb.	35 lb.
Electrical¹					
Power source loading			0.172 kVa to 0.550 kVa		
Input voltage			100 V ac to 127 V ac (low range)		
			200 V ac to 240 V ac (high range)		
Frequency (hertz)			50 Hz to 60 Hz		
Thermal output (minimum)			587 Btu/hr. (172 watts)		
Thermal output (maximum)			1878 Btu/hr. (550 watts)		

Dimensions		
Maximum altitude		2133 m (6998 ft.)
Air temperature requirements		
Operating	Nonoperating	
10 to 35 degrees C (50 to 95 degrees F) at altitude 0 to 2133 m (6998 ft.)	10 to 43 degrees C (50 to 109.4 degrees F)	
Humidity requirements		
	Operating	Nonoperating
Noncondensing humidity	8 to 80%	8 to 80%
Noise emissions ²		
	Operating	Nonoperating
L _{WAd}	6.9 bels	6.9 bels
Note:		
<div>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.</div> <div>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 IS) 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.</div>		

7310-CR4 and 7042-CR4 Hardware Management Console specifications

Hardware specifications provide detailed information for your Hardware Management Console (HMC), including dimensions, electrical, power, temperature, and environmental specifications.

The Hardware Management Console (HMC) controls managed systems, including the management of logical partitions and use of capacity on demand. Using service applications, the HMC communicates with managed systems to detect, consolidate, and send information to IBM for analysis. The HMC provides service technicians with diagnostic information for systems that can operate in a multiple-partitioned environment.

This HMC mounts in a 19-inch system rack. The following IBM racks can be used with this HMC:

- 7014-T00 rack
- 7014-T42 rack
- 7014-S11 rack
- 7014-S25 rack
- 0551 rack
- 0553 rack
- 0554 rack
- 0555 rack .

Use the following specifications to plan for your HMC.

Dimensions				
	Width	Depth	Height	Weight (maximum configuration)
Metric	440 mm	711 mm	43 mm	15.6 kg

Dimensions				
English	17.3 in.	28.0 in.	1.69 in.	34 lb.
Electrical ¹				
Power source loading			0.194 kVa to 0.700 kVa	
Input voltage			100 V ac to 127 V ac (low range)	
			200 V ac to 240 V ac (high range)	
Frequency (hertz)			50 Hz to 60 Hz	
Thermal output (minimum)			662 Btu/hr. (194 watts)	
Thermal output (maximum)			2390 Btu/hr. (700 watts)	
Maximum altitude			2133 m (6998 ft.)	
Air temperature requirements				
Operating		Nonoperating		
10 to 35 degrees C (50 to 95 degrees F) at altitude 0 to 914 m (2998.7 ft.)		-40 to 60 degrees C (-104 to 140 degrees F)		
Humidity requirements				
	Operating		Nonoperating	
Noncondensing humidity	8 to 80%		8 to 80%	
Noise emissions ²				
	Operating		Nonoperating	
L _{WAd}	6.8 bels		6.8 bels	
Note:				
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 IS) 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.				

Uninterruptible power supply

To meet the power protection needs of IBM servers, uninterruptible power supplies are available for System i and System p configurations. The uninterruptible power supply is the IBM type 9910.

The IBM 9910 uninterruptible power supply solutions are compatible with the power requirements for System i and System p and have passed IBM testing procedures. The uninterruptible power supplies are intended to provide a single source for purchase and protection of IBM servers. All 9910 uninterruptible power supplies include a premium warranty package that is designed to enhance the potential for return on investment over the uninterruptible power supplies available on the market today.

Type 9910 uninterruptible power supply solutions are available from Powerware.

1827 service processor communications port to uninterruptible power supply cable for System i⁵ models

The 1827 is a 140 mm (5.5 in.) service processor communications port to uninterruptible power supply cable for 9406-520, 9406-550, and 9406-570 models. The 9406-520, 9406-550, and 9406-570 models no longer

have the J14 uninterruptible power supply connector that has been used on System i models. Instead, uninterruptible power supply communications to the 9406-520, 9406-550, and 9406-570 is supported through a designated service processor communications port via the 1827 cable. See the following figures.

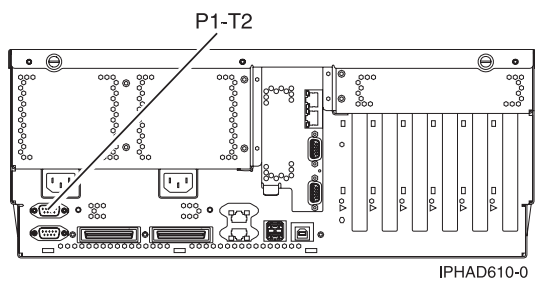


Figure 103. Model 520 rear view with cable installation location

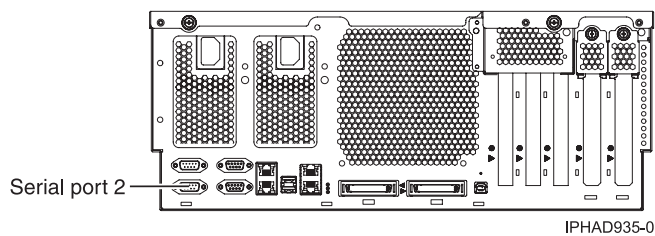


Figure 104. Model 550 rear view with connection port

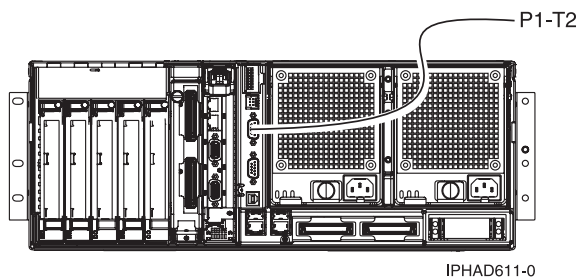


Figure 105. Model 570 rear view with connection port

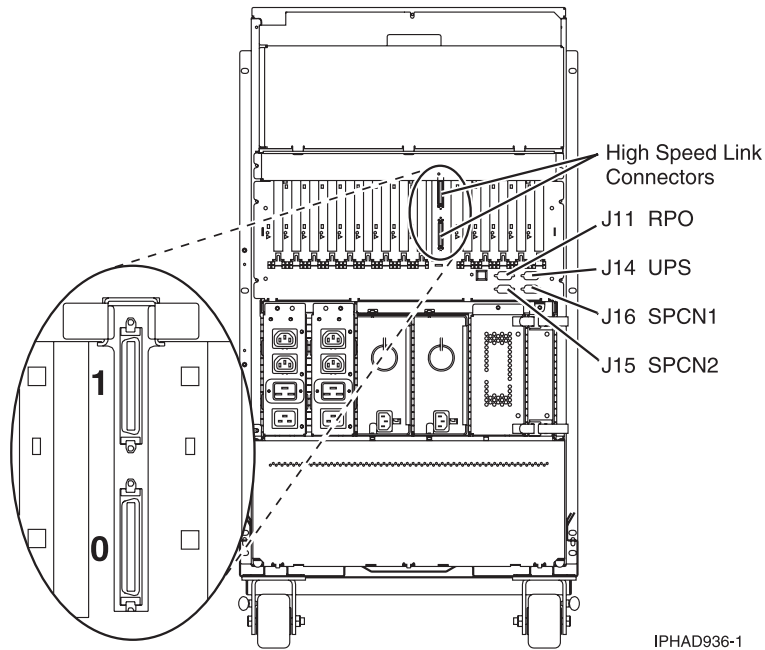
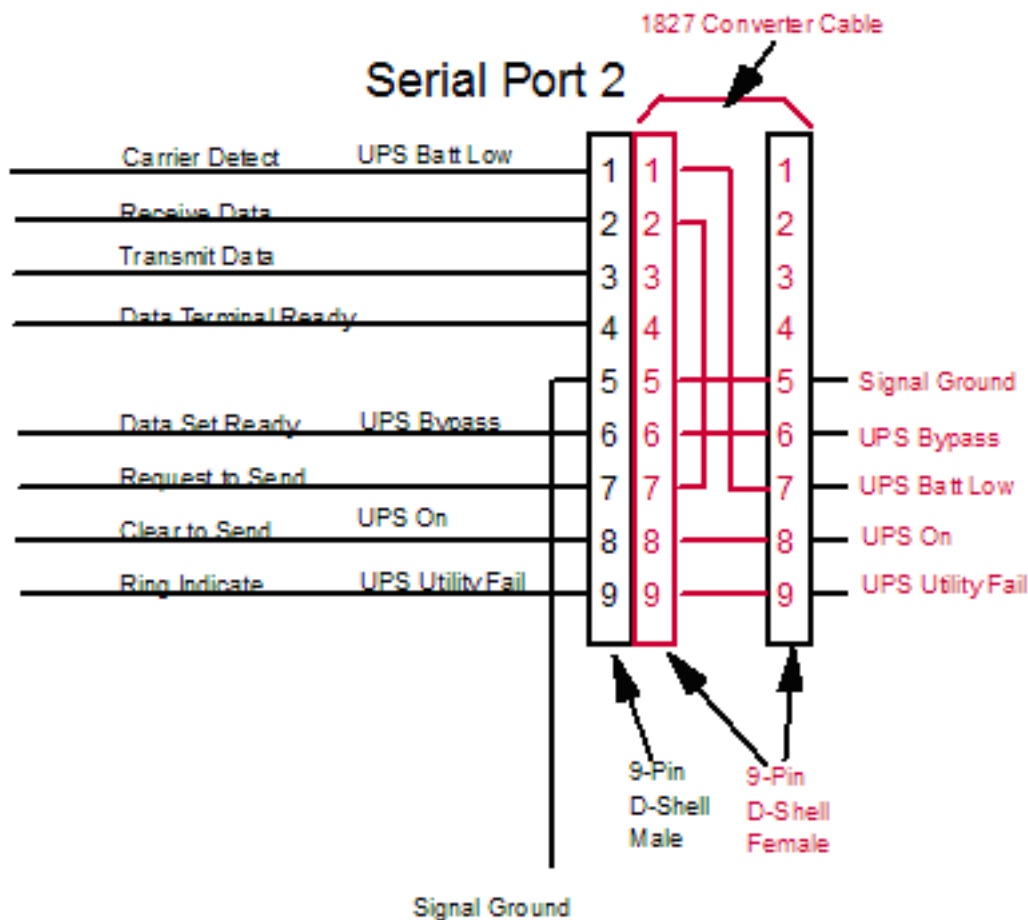


Figure 106. Model 595 and 9194 base PCI-X expansion tower rear view with J14 connection port

Note: The 8-way, 12-way, and 16-way processor configurations for the model 570 consists of several 4-way processors connected together. The uninterruptible power supply converter cable must be connected to the 4-way drawer that has the operator's panel on the front of the unit.

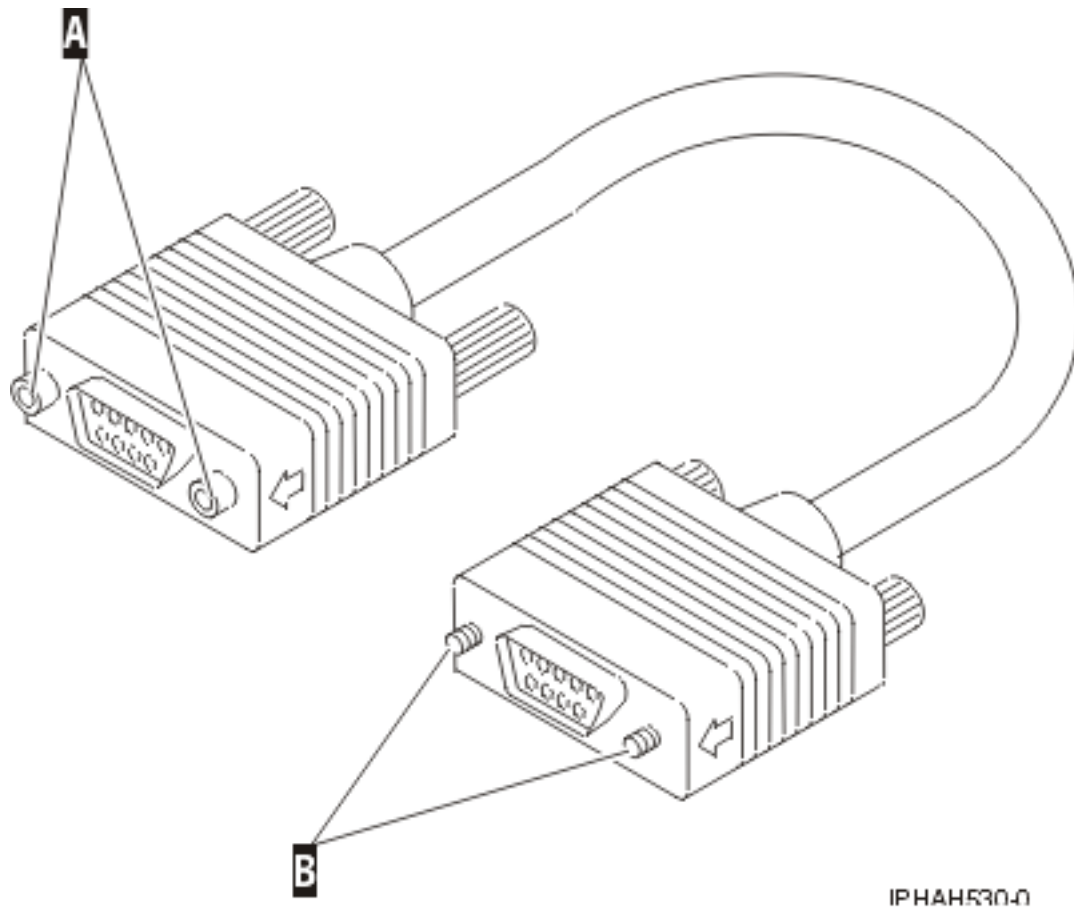
The service processor communications port supports two modes: RS-232 service processor communications port mode and uninterruptible power supply mode. Only one mode is supported at a time. The service processor will detect the presence of a uninterruptible power supply attached through service processor communications port via the 1827 cable when the server is started and set the control hardware to condition the signals for the uninterruptible power supply. The mode cannot be changed unless a the system is started again. The following figure shows the converter cable wiring.

For the 9194, the 1827 convertor cable is not needed. Plug the System i uninterruptible power supply communications cable provided by the uninterruptible power supply supplier into the J14 port.



1827 converter cable schematic for System i5 servers

Both ends of the cable have a female 9-pin D-shell connector. The following figure shows the serial to uninterruptible power supply converter cable end (designated B) that plugs into the service processor communications port on the 9406-520, 9406-550, and the 9406-570. It has external threads that mate with the cable retention on the service processor communications port. The other end of the cable (designated A) plugs into the uninterruptible power supply vendor-supplied cable for System i communications. It has threads that mate with the uninterruptible power supply cable external threads.



uninterruptible power supply connector for the uninterruptible power supply communications cable

Plan for power

Planning the power for your system requires knowledge of your server's power requirements, the power requirements of compatible hardware, and the uninterruptible power supply needs for your server. Use this information to build a complete power plan.

Before you begin your planning tasks, be sure you have completed the items in the following checklist:

Before you begin
<input type="checkbox"/> Know your server power requirements.
<input type="checkbox"/> Know your compatible hardware requirements.
<input type="checkbox"/> Know your uninterruptible power supply needs.

Review power considerations

Use the following resources to build a complete power plan. Refer to the checklist at the bottom of this page for the required elements of your power plan.

- General power information
- Power planning
- Power specifications
- Power cord features, power cords, plugs, and receptacles

When you are finished
__ Consult a qualified electrician regarding power needs.
__ Determine an uninterruptible power supply vendor.
__ Complete your server information form or forms.

Determining your power requirements

Use these guidelines to ensure that your server has the proper power to operate.

Your server can have power requirements different from a PC (such as, different voltage and different plugs). IBM supplies power cords with an attached plug that corresponds to the power outlet most commonly used in the country or region to which the product is being shipped. You, the customer, must supply the proper power outlets.

1. Plan for system electrical service. For information on power requirements for a specific model, refer to the electrical section in the server specifications for that particular server. For information on power requirements for expansion units or peripherals, select the appropriate device from the list of compatible hardware specifications . For equipment not listed, check your equipment documentation (owner's manuals) for specifications.
2. Determine your server's plug and receptacle type so you can have the proper outlets installed. **Tip:** Print a copy of your plug and receptacle table and give it to your electrician. The table contains information needed for installing outlets.
3. Write down power information in your Server Information Form 3A. Include:
 - Plug type
 - Input voltage
 - Power cord length (optional)
4. Plan for power outages. Consider purchasing an uninterruptible power supply to protect your system against power fluctuations and outages. If your company owns a uninterruptible power supply, involve your uninterruptible power supply vendor with any type of uninterruptible power supply modification.
5. Plan an emergency power-off switch. As a safety precaution, you should provide some method for disconnecting power to all equipment in your server area. Put emergency power-off switches in locations readily accessible to your systems operator and at designated exits from the room.
6. Ground your system. Electrical grounding is important both for safety and correct operation. Your electrician should follow your national and local electrical codes when installing the electrical wiring, outlets, and power panels. These codes take precedence over any other recommendations.
7. Contact an electrician. Contact a qualified electrician to take care of your server power requirements and install needed power outlets. Give the electrician a copy of your power information. You can print the recommended power distribution wiring diagram as a reference for your electrician.

Server Information Form 3A

Use this form to record the type and quantity of power cords that you need for your server.

Frame	Device Type	Device Description Feature Code	Plug Type/Input Voltage	Notes

[illegible]

Determine power cord, plug, and receptacle type

To determine what power cord, plug, and receptacle type your server or system requires, you need to know the country or region in which your server or system will reside, your server or system model, and the voltage and amperage of your power supply.

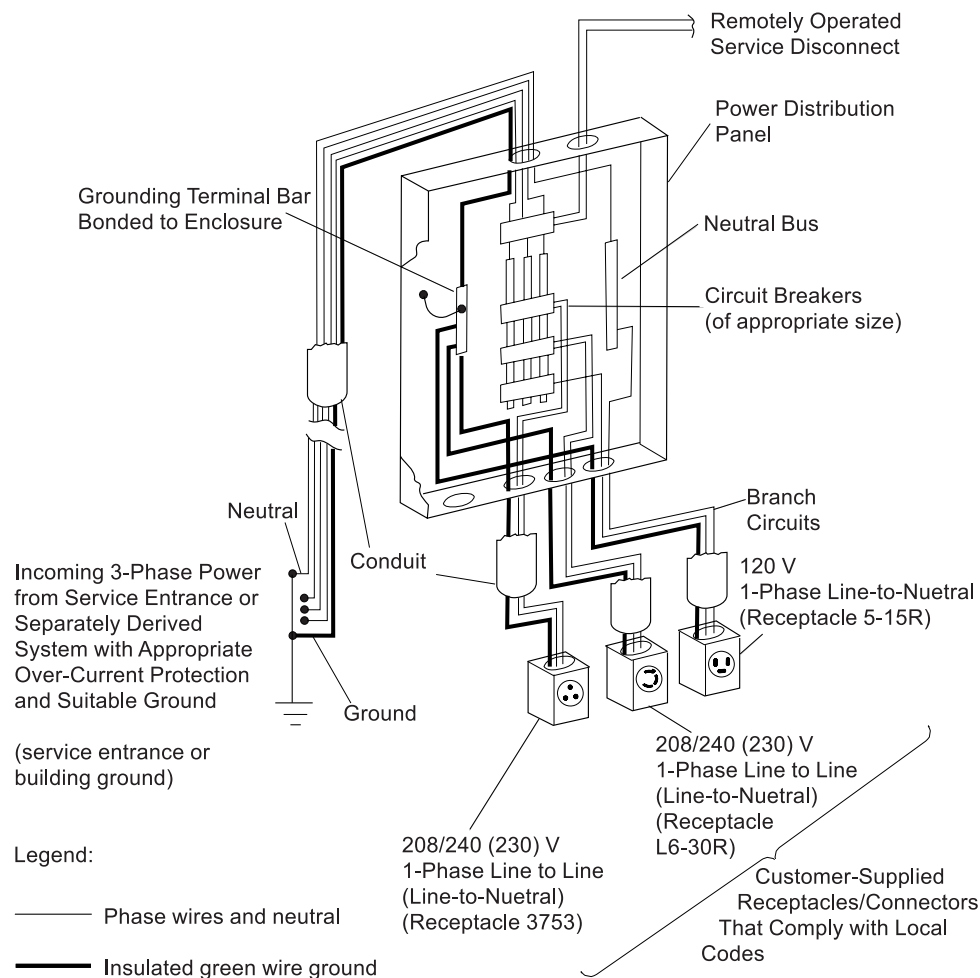
With this information, you can determine your type through these tables:

- Power cords, plugs, and receptacles: By country or region
- Power cords, plugs, and receptacles: By model
- Power cords, plugs, and receptacles: By voltage and amperage
- Power cord features
- Power load calculating for 7188 and 9188 power distribution units

See Modification of IBM Cords for recommendations regarding the alteration of power cords.

Tip: Print the **Plug and receptacle type** table for your server or system and give it to your electrician. The table contains information needed to install the proper receptacle for your system expansion unit.

The server or system and all of the expansion units and attached equipment will require an isolated power supply. This means, it must have its own circuit. Use an uninterruptible power supply to help protect both the server and its data.



Plugs and receptacles: By country or region

Choose the country or region in which your system will be installed to see the plugs and receptacles used.

- Abu Dhabi
- Afghanistan
- Albania
- Algeria
- Andorra
- Angola
- Anguilla
- Argentina
- Armenia
- Aruba
- Australia
- Austria
- Azores

- Bahamas
- Bahrain
- Bangladesh
- Barbados
- Belarus
- Belgium
- Belize
- Benin
- Bermuda
- Bolivia
- Bonaire
- Bosnia
- Botswana
- Brazil
- Brunei
- Bulgaria
- Burkina Faso
- Burundi
- Caicos Islands
- Cambodia
- Cameroon
- Canada
- Canary Islands
- Cape Verde Islands
- Cayman Islands
- Central African Republic
- Chad
- Chile
- China
- Colombia
- Congo
- Costa Rica
- Croatia
- Curacao
- Cyprus
- Czech Republic
- Dahomey
- Denmark
- Djibouti
- Dominica
- Dominican Republic
- Ecuador
- Egypt
- El Salvador
- Equatorial Guinea

- Eritrea
- Estonia
- Ethiopia
- Faero Islands
- Fiji
- Finland
- France
- French Guiana
- French Polynesia
- Gabon
- Gambia
- Georgia
- Germany
- Ghana
- Greece
- Greenland
- Grenada
- Grenadines
- Guadeloupe
- Guam
- Guatemala
- Guinea
- Guinea-Bissau
- Haiti
- Honduras
- Hong Kong S.A.R. of the PRC
- Hungary
- Iceland
- India
- Indonesia
- Iran
- Iraq
- Ireland
- Israel
- Italy
- Ivory Coast
- Jamaica
- Japan
- Jordan
- Kazakhstan
- Kenya
- Kirghizia
- Kuwait
- Laos
- Latvia

- Lebanon
- Lesotho
- Liberia
- Libya
- Liechtenstein
- Lithuania
- Luxembourg
- Macao S.A.R. of the PRC
- Macedonia
- Malagasy Republic
- Malawi
- Malaysia
- Mali
- Malta
- Martinique
- Mauritania
- Mexico
- Moldavia
- Mongolia
- Monaco
- Montserrat
- Morocco
- Mozambique
- Myanmar
- Namibia
- Nepal
- Netherlands
- Netherlands Antilles
- Nevis
- New Caledonia
- New Zealand
- Nicaragua
- Niger
- Nigeria
- North Korea
- Norway
- Oman
- Pakistan
- Panama
- Papua New Guinea
- Paraguay
- People's Republic of China
- Peru
- Philippines
- Poland

- Portugal
- Principe
- Puerto Rico
- Qatar
- Reunion
- Romania
- Russia
- Rwanda
- Sabah
- Samoa, Western
- Sao Tome Island
- Saudi Arabia
- Senegal
- Serbia
- Seychelles
- Sierra Leone
- Singapore
- Slovakia
- Slovenia
- Somalia
- South Africa
- South Korea
- Spain
- Sri Lanka
- St. Kitts
- St. Lucia
- St. Martin
- St. Vincent
- Sudan
- Suriname
- Swaziland
- Sweden
- Switzerland
- Syria
- Tahiti
- Taiwan
- Tanzania
- Thailand
- Tobago
- Togo
- Tortola (BVI)
- Trinidad
- Tunisia
- Turkey
- Turks Islands

- Uganda
- Ukraine
- United Arab Emirates
- United Kingdom
- United States
- Uruguay
- Uzbekistan
- Venezuela
- Vietnam
- Virgin Islands
- Western Samoa
- Yemen
- Zaire
- Zambia
- Zimbabwe

Plug and receptacle types: 2 , 12

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 116. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
200V 10A	<ul style="list-style-type: none"> • Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 • Models 9406-270, 9406-800, 9406-810, 9406-820, and 9406-825 • Expansion units 5075, 5077, 5095, 7104 and 7116 • 5786, 5787, 7031-D24, 7031-T24 • 9115-505, 9111-285, 9131-52A, 9133-55A • 9406-525 • 9407-515 • 9117-MMA • 9406-MMA • 7214-1U2 	Type 2
250V 30A	<ul style="list-style-type: none"> • Models 9406-730, 9406-740 • Models 9406-840, SB3 • 0550 and 0551 racks 	Type 12
Countries or regions		
Paraguay, Uruguay		

Plug and receptacle types: 12, 18

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 117. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 16A	<ul style="list-style-type: none"> • Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 • Expansion units 507x, 508x, 5094, 5095, 7116, 7104, 7316, 9316 • 9406-8xxx base I/O Rack • 9251, 9079 base I/O expansion unit • 9074 and 9094 base I/O enclosure • Models 9406-270, 9406-720, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2 • 5786, 5787, 7031-D24, 7031-T24 • 9115-505, 9111-285, 9131-52A, 9133-55A • 9406-525 • 9407-515 • 9117-MMA • 9406-MMA • 7214-1U2 	Type 18
250V 30A	<ul style="list-style-type: none"> • Models 9406-730, 9406-740 • Models 9406-840, SB3 • 0550 and 0551 racks 	Type 12
Countries or regions		
Afghanistan, Cape Verde Islands, Indonesia, Paraguay, Suriname, Uruguay		

Plug and receptacle types: 12, 22

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 118. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 16A	<ul style="list-style-type: none"> • Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 • Expansion units 507x, 508x, 5094, 5095, 7116, 7104 • 9406-8xxx base I/O Rack • 9251, 9079 base I/O expansion unit • 9074 and 9094 base I/O enclosure • Models 9406-270, 9406-720, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2 • 5786, 5787, 7031-D24, 7031-T24 • 9115-505, 9111-285, 9131-52A, 9133-55A • 9406-525 • 9407-515 • 9117-MMA • 9406-MMA • 7214-1U2 	Type 22
250V 30A	<ul style="list-style-type: none"> • Models 9406-730, 9406-740 • Models 9406-840, SB3 • 0550 and 0551 racks 	Type 12
Countries or regions		
Bangladesh, Sri Lanka		

Plug and receptacle types: 23, 12

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 119. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 13A	<ul style="list-style-type: none"> • Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 • Expansion units 507x, 508x, 5094, 5095, 7116, 7104 • 9406-8xxx base I/O Rack • 9251, 9079 base I/O expansion unit • 9074 and 9094 base I/O enclosure • Models 9406-270, 9406-720, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2 • 5786, 5787, 7031-D24, 7031-T24 • 9115-505, 9111-285, 9131-52A, 9133-55A • 9406-525 • 9407-515 • 9117-MMA • 9406-MMA • 7214-1U2 	Type 23
250V 30A	<ul style="list-style-type: none"> • Models 9406-730, 9406-740 • Models 9406-840, SB3 • 0550 and 0551 racks 	Type 12
Countries or regions		
Brunei, Hong Kong S.A.R. of the PRC, Malaysia (Plug Type 23), Myanmar		

Plug and receptacle types: 18, 46 (P+N+G) [32A]

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 120. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 16A	<ul style="list-style-type: none"> • Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 • Expansion units 507x, 508x, 5094, 5095, 7116, 7104 • 8xxx base I/O Rack • 9251, 9079 base I/O expansion unit • 9074 and 9094 base I/O enclosure • Model 9406-270, 9406-720, 9406-800, 9406-810, 9406-820, 9406-825 • 5786, 5787, 7031-D24, 7031-T24 • 9115-505, 9111-285, 9131-52A, 9133-55A • 7037-A50 • 7047-185 • 9116-561 • 9406-525 • 9407-515 • 9117-MMA • 9406-MMA • 7214-1U2 	Type 18
250V 32A	<ul style="list-style-type: none"> • Models 9406-730, 9406-740 • Models 9406-840, SB3 • 0550 and 0551 rack 	Type 46 (P+N+G) [32A]
Countries or regions		
Albania, Algeria, Andorra, Angola, Armenia, Austria, Azores, Belarus, Belgium, Benin, Bosnia, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Congo, Croatia, Dahomey, Djibouti, Egypt, Equatorial Guinea, Ethiopia, Faero Islands, France, French Guiana, French Polynesia, Gabon, Georgia, Germany, Greece, Greenland, Guadeloupe, Guinea, Guinea-Bissau, Hungary, Iceland, Iran, Ivory Coast, Kazakhstan, Kirghizia, Laos, Lebanon, Luxembourg, Macau S.A.R. of the PRC, Macedonia, Malagasy Republic, Mali, Martinique, Mauritania, Moldavia, Monaco, Mongolia, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Principe, Reunion, Romania, Rwanda, Sao Tome Island, Senegal, Serbia, Slovakia, Slovenia, Somalia, Spain, Syria, Tahiti, Togo, Tunisia, Ukraine, Uzbekistan, Vietnam, Zaire, Zimbabwe		

Plug and receptacle types: 18, 46 (3P+N+G)

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 121. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 16A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 Expansion units 507x, 508x, 5095, 7116, 7104 9251, 9079 base I/O expansion unit 9074 base I/O enclosure Model 9406-250, 9406-270, 9406-720, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 7037-A50 7047-185 9116-561 9406-525 9407-515 9117-MMA 9406-MMA 7214-1U2 	Type 18
250V 16A	<ul style="list-style-type: none"> Models 9406-730, 9406-740 Models 9406-840, SB3 0550 and 0551 racks 	Type 46 (3P+N+G)
Countries or regions		
Czech Republic, Estonia, Ethiopia, Finland, Lithuania, Russia, Sweden, Turkey		

Plug and receptacle types: 22, 46 (P+N+G) [32A]

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 122. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 16A	<ul style="list-style-type: none"> • Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 • Expansion units 507x, 508x, 5094, 5095, 7116, 7104 • 9406-8xxx base I/O Rack • 9251, 9079 base I/O expansion unit • 9074 and 9094 base I/O enclosure • Models 9406-270, 9406-720, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2 • 5786, 5787, 7031-D24, 7031-T24 • 9115-505, 9111-285, 9131-52A, 9133-55A • 9406-525 • 9407-515 • 9117-MMA • 9406-MMA • 7214-1U2 	Type 22
250V 32A	<ul style="list-style-type: none"> • Models 9406-730, 9406-740 • Models 9406-840, SB3 • 0550 and 0551 Racks 	Type 46 (P+N+G) [32A]
Countries or regions		
Swaziland, Uganda		

Plug and receptacle types: 23, 46 (P+N+G) [32A]

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 123. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 13A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 Expansion units 507x, 508x, 5094, 5095, 7116, 7104 8xxx base I/O Rack 9251 base I/O expansion unit 9079 base I/O expansion unit 9074 and 9094 base I/O enclosure Model 9406-250, 9406-270, 9406-720, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 7037-A50 7047-185 9116-561 9406-525 9407-515 9117-MMA 9406-MMA 7214-1U2 	Type 23
250V 32A	<ul style="list-style-type: none"> Models 9406-730, 9406-740 Models 9406-840, SB3 0550 and 0551 Racks 	Type 46 (P+N+G) [32A]
Countries or regions		
Abu Dhabi, Bahrain, Botswana, Cyprus, Dominica, Gambia, Ghana, Grenada, Grenadines, Guyana, India, Iraq, Ireland, Jordan, Kenya, Kuwait, Lesotho, Liberia, Malawi, Malaysia, Malta, Namibia, Nepal, Nigeria, Oman, Qatar, Sabah, Saudi Arabia, Seychelles, Sierra Leone, Singapore, St. Lucia, St. Vincent, Sudan, Tanzania, United Arab Emirates, United Kingdom, Zambia		

Plug and receptacle types: 24, 46 (P+N+G) [16A], 46 (3P+N+G)

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 124. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 10A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 Expansion units 5070, 5071, 5072, 5073, 5075, 5077, 508x, 5095, 7116, 7104 9251 base I/O expansion unit Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 7037-A50 7047-185 9116-561 9406-525 9407-515 9117-MMA 9406-MMA 7214-1U2 	Type 24
250V 16A	<ul style="list-style-type: none"> Models 9406-720 Expansion unit 5074, 5079, 5094 8xxx base I/O Rack 9074 and 9094 base I/O enclosure Model 9406-830, SB2 	Type 46 (P+N+G) [16A]
250V 16A	<ul style="list-style-type: none"> Models 9406-730, 9406-740, SB1 Models 9406-840, SB3 0550 and 0551 racks 	Type 46 (3P+N+G)
Countries or regions		
Liechtenstein, Switzerland		

Plug and receptacle types: 25, 46 (P+N+G) [32A]

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 125. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 16A	<ul style="list-style-type: none"> • Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 • Expansion units 507x, 508x, 5094, 5095, 7116, 7104 • 8xxx base I/O Rack • 9251, 9079 base I/O expansion unit • 9074 and 9094 base I/O enclosure • Models 9406-270, 9406-720, 9406-820, 9406-830, SB2 • 5786, 5787, 7031-D24, 7031-T24 • 9115-505, 9111-285, 9131-52A, 9133-55A • 7037-A50 • 7047-185 • 9116-561 • 9406-525 • 9407-515 • 9117-MMA • 9406-MMA • 7214-1U2 	Type 25
250V 32A	<ul style="list-style-type: none"> • Models 9406-730, 9406-740 • Models 9406-840, SB3 • 0550 and 0551 racks 	Type 46 (P+N+G) [32A]
Countries or regions		
Chile, Eritrea, Italy, Libya		

Plug and receptacle types: 4, 10, 12

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 126. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
125V 15A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 Expansion units 5070, 5072, 5075, 5077, 5080, 5082, 5095, 7104, 7116 Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 7037-A50 7047-185 9406-525 9407-515 7214-1U2 	Type 4
250V 15A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-570, and 9117-570 Expansion units 5070, 5071, 5072, 5073, 5077, 5075, 5074, 5079, 5094, 5095, 508x, 7116, 7104 8xxx base I/O Rack 9251 base I/O expansion unit 9079 base I/O expansion unit 9074 base I/O enclosure Models 9406-270, 9406-720, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2, 9074, 9079 5786, 5787, 7031-D24, 7031-T24 9111-285, 9131-52A, 9133-55A 9116-561 5096 5296 9406-525 9407-515 9117-MMA 9406-MMA 	Type 10
250V 30A	<ul style="list-style-type: none"> Models 9406-730, 9406-740 Models 9406-840, SB3 0550 and 0551 racks 	Type 12
Countries or regions		
Colombia, Mexico		

Plug and receptacle types: 4, 5, 12

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 127. Plug and receptacle types

Voltage and amperage	Models	Plug receptacle type
125V 15A	<ul style="list-style-type: none"> • Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570, and OpenPower 720 • Expansion units 5070, 5072, 5075, 5077, 5080, 5082, 5095, 7104, 7116 • Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825 • 5786, 5787, 7031-D24, 7031-T24 • 9115-505, 9111-285, 9131-52A, 9133-55A • 7037-A50 • 7047-185 • 9406-525 • 9407-515 • 7214-1U2 	Type 4
250V 15A	<ul style="list-style-type: none"> • Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, and OpenPower 720 • Expansion units 5070, 5071, 5072, 5073, 5074, 5075, 5077, 5079, 508x, 5094, 5095, 7116, 7104 • 8xxx base I/O Rack • 9079 base I/O expansion unit • 9074 base I/O enclosure • 9251 base I/O expansion unit • Models 9406-270, 9406-720, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2, 9074, 9079 • 5786, 5787, 7031-D24, 7031-T24 • 9115-505, 9111-285, 9131-52A, 9133-55A • 5096 • 5296 • 9406-525 • 9407-515 • 9117-MMA • 9406-MMA • 7214-1U2 	Type 5
250V 30A	<ul style="list-style-type: none"> • Models 9406-730, 9406-740 • Models 9406-840, SB3 • 0550 and 0551 racks • OpenPower 720 	Type 12
Countries or regions		
Anguilla, Antigua, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Bonaire, Caicos Islands, Cayman Islands, Costa Rica, Curacao, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Montserrat, Netherlands Antilles, Nevis, Nicaragua, Panama, Philippines, Puerto Rico, St. Kitts, St. Martin, Taiwan, Tobago, Tortola (BVI), Trinidad, Turks Islands, Venezuela, Virgin Islands, Yemen		

Plug and receptacle types: 2, 12

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 128. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
200V 10A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 Models 9406-270, 9406-800, 9406-810, 9406-820, and 9406-825 Expansion units 5075, 5077, 5095, 7104 and 7116 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 9406-525 9407-515 9117-MMA 9406-MMA 7214-1U2 	Type 2
250V 30A	<ul style="list-style-type: none"> 53x Processor Side Model SB1 Models 9406-730, 740 Models 9406-840, SB3 0550, 0551 	Type 12
Countries or regions		
Argentina		

Plug and receptacle types: 6, 54, PDL

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 129. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 10A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 Expansion units 507x, 508x, 5095, 7116, 7104 9251 base I/O expansion unit Models 9406-270, 9406-800, 9406-810, 9406-820, 9406-825 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 9406-525 9407-515 9117-MMA 9406-MMA 7214-1U2 	Type 6
250V 15A	<ul style="list-style-type: none"> Models 9406-720 Expansion unit 5065, 5066, 5079(x2), 5074, 5094 8xxx base I/O Rack 9079 base I/O expansion unit 9074 and 9094 base I/O enclosure Models 9406-830, SB2 	Type 54
250V 32A	<ul style="list-style-type: none"> Models 9406-730, 740 Models 9406-840, SB3 0550 and 0551 racks 	Type PDL
Countries or regions		
Australia, Fiji, New Zealand, Papua New Guinea		

Plug and receptacle types: 46 (P+N+G) [32A], 70, 73

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 130. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 25A	<ul style="list-style-type: none"> 0550 and 0551 racks Models 9406-840, SB3 	Type 46 (P+N+G) [32A]

Table 130. Plug and receptacle types (continued)

Voltage and amperage	Models	Plug and receptacle type
100V 10A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 Models 9406-270, 9406-800, 9406-810, and 9406-820 Expansion units 5075, 5077, 5095, 7104, 7116 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 9406-525 9407-515 7214-1U2 	Type 70
200-240 V 10A	<ul style="list-style-type: none"> 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 9406-500, 9406-510, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251 9117-MMA 9406-MMA 7214-1U2 	Type 73
250V 60A 415V 30A	<ul style="list-style-type: none"> Models 9406-870, 9406-890 	No plug, shipped without cord
Countries or regions		
Brazil		

Plug and receptacle types: 4, 7, 51, 5, 10, 34, 40, 12

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 131. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
125V 15A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 Expansion units 5070, 5072, 5075, 5077, 5080, 5082, 5095, 7104, 7116 Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 7037-A50 7047-185 9406-525 9407-515 7214-1U2 	Type 4

Table 131. Plug and receptacle types (continued)

Voltage and amperage	Models	Plug and receptacle type
125V 15A Locking	<ul style="list-style-type: none"> Expansion units 5070, 5072, 5075, 5077, 5080, 5082, 5095, 7104, 7116 Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825 	Type 7
125V 13A/15A Water Resistant	<ul style="list-style-type: none"> Expansion units 5070, 5072, 5075, 5077, 5080, 5082, 5095, 7104, 7116 	Type 51
250V 15A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570, and OpenPower 720 Expansion units 5070, 5071, 5072, 5073, 5074, 5075, 5077, 5079, 508x, 5094, 5095, 7116, 7104 8xxx base I/O Rack 9079 base I/O expansion unit 9074 base I/O enclosure 9251 base I/O expansion unit Models 9406-270, 9406-720, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2, 9074, 9079 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 7037-A50 7047-185 9116-561 5096 5296 9406-525 9407-515 9117-MMA 9406-MMA 7214-1U2 	Type 5

Table 131. Plug and receptacle types (continued)

Voltage and amperage	Models	Plug and receptacle type
250V 15A Locking	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570 9117-570, and OpenPower 720 Models 9406-270, 9406-720, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2 Expansion units 507x, 508x, 5094, 5095, 7116, 7104 8xxx base I/O Rack 9251 base I/O expansion unit 9074 and 9094 base I/O enclosure 5786, 5787, 7031-D24, 7031-T24 9111-285, 9131-52A, 9133-55A 9116-561 5096 5296 9406-525 9407-515 9117-MMA 9406-MMA 	Type 10
250V 10A/15A Water Resistant	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 Models 9406-270, 9406-720, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2 Expansion units 507x, 508x, 5094, 5095, 7116, 7104 8xxx base I/O Rack 9251 base I/O expansion unit 9074 and 9094 base I/O enclosure 5786, 5787, 7031-D24, 7031-T24 9131-52A, 9133-55A 5096 5296 9406-525 9407-515 	Type 34
250V 30A Water Resistant	<ul style="list-style-type: none"> Models 9406-730, 9406-740, 9406-840, SB3 0550 and 0551 racks 	Type 40
250V 30A Locking	<ul style="list-style-type: none"> Models 9406-730, 9406-740, 9406-840, SB3 0550 and 0551 racks 	Type 12
Countries or regions		
Canada		

Plug and receptacle types: 18, 46 (P+N+G) [32A]

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 132. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 16A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 Models 9406-720 Expansion units 507x, 508x, 5094, 5095, 7104, 7116, 8xxx base I/O Rack 9251, 9079 base I/O expansion unit 9074, 9094 base I/O enclosure Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 7037-A50 7047-185 9116-561 9406-525 9407-515 9117-MMA 9406-MMA 7214-1U2 	Type 18
250V 25A	<ul style="list-style-type: none"> 0550 and 0551 racks Models 9406-840 SB3 	Type 46 (P+N+G) [32A]
250V 60A 415V 30A	<ul style="list-style-type: none"> Models 9406-870, 9406-890 	No plug, shipped without cord
Countries or regions		
Canary Islands		

Plug and receptacle types: 25, 12

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 133. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 16A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 Model 9406-720 Expansion units 507x, 508x, 5094, 5095, 7116, 7104 8xxx base I/O Rack 9251, 9079 base I/O expansion unit 9074 and 9094 base I/O enclosure Models 9406-270, 9406-800, 9406-810, 9406-820, 9406-825 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 7037-A50 7047-185 9116-561 9406-525 9407-515 9117-MMA 9406-MMA 7214-1U2 	Type 25
250V 30A	<ul style="list-style-type: none"> 53x Processor Side Model SB1 Models 9406-730, 740 Models 9406-840, SB3 0550, 0551 	Type 12
Countries or regions		
Chile		

Plug and receptacle types: 62, 12, 72

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 134. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 30A	<ul style="list-style-type: none"> Models 9406-730, 9406-740 Models 9406-840, SB3 0550 and 0551 racks 	Type 12

Table 134. Plug and receptacle types (continued)

Voltage and amperage	Models	Plug and receptacle type
250V 10A	<ul style="list-style-type: none"> • Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 • Models 9406-270, 9406-800, 9406-810, 9406-820, 9406-825 • Expansion units 507x, 508x, 5095, 7116, 7104 • 9251 base I/O expansion unit • 5786, 5787, 7031-D24, 7031-T24 • 9115-505, 9111-285, 9131-52A, 9133-55A • 7037-A50 • 7047-185 • 9406-525 • 9407-515 • 9117-MMA • 9406-MMA • 7214-1U2 	Type 62
250V 15A	<ul style="list-style-type: none"> • Models 9406-720 • Expansion unit 5065, 5066, 5079(x2), 5074, 5094 • 8xxx base I/O Rack • 9079 base I/O expansion unit • 9074 and 9094 base I/O enclosure • Models 9406-830, SB2 	Type 72
Countries or regions		
People's Republic of China		

Plug and receptacle types: 19, 46 (3P+N+G), 46 (P+N+G) [16A]

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 135. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 10A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 Models 9406-270, 9406-800, 9406-810, 9406-820, 9406-825 Expansion units 507x, 508x, 5095, 7116, 7104 9251 base I/O expansion unit 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 7037-A50 7047-185 9116-561 9406-525 9407-515 9117-MMA 9406-MMA 7214-1U2 	Type 19
250V 16A	<ul style="list-style-type: none"> Models 9406-720, 9406-830, SB2 Expansion I/O units 5074, 5079, 5094 8xxx base I/O Rack 9079 base I/O expansion unit 9074 and 9094 base I/O enclosure 	Type 46 (P+N+G) [16A]
250V 16A	<ul style="list-style-type: none"> Models 9406-730, 9406-740, 9406-840, SB3 0550 and 0551 racks 	Type 46 (3P+N+G)
Countries or regions		
Denmark		

Plug and receptacle types: 32, 46 (P+N+G) [32A], 46 (3P+N+G)

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 136. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 16A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 Models 9406-720, 9406-270, 9406-800, 9406-810, 9406-820, 9406-825 Expansion units 507x, 508x, 5094, 5095, 7116, 7104 8xxx base I/O Rack 9251, 9079 base I/O expansion unit 9074 and 9094 base I/O enclosure 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 7037-A50 7047-185 9116-561 9406-525 9407-515 9117-MMA 9406-MMA 7214-1U2 	Type 32
250V 16A	<ul style="list-style-type: none"> Models 9406-730, 9406-740, 9406-840, SB3 0550 and 0551 racks 	Type 46 (3P+N+G)
Countries or regions		
Israel		

Plug and receptacle types: 34, 10, 12, 57, 59

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 137. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 10A/15A Water Resistant	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 Models 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2 Model 9406-720 Expansion units 507x, 508x, 5094, 5095, 7116, 7104 8xxx base I/O Rack 9251 base I/O expansion unit 9074 and 9094 base I/O enclosure 5786, 5787, 7031-D24, 7031-T24 9131-52A, 9133-55A 9406-525 9407-515 	Type 34

Table 137. Plug and receptacle types (continued)

Voltage and amperage	Models	Plug and receptacle type
250V 20A Locking	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, and OpenPower 720 Model 9406-720 Expansion units 5070, 5071, 5072, 5073, 5074, 5075, 5077, 5079, 508x, 5094, 5095, 7116, 7104 8xxx base I/O Rack 9079 base I/O expansion unit 9074 base I/O enclosure 9251 base I/O expansion unit Models 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2, 9074, 9079 5786, 5787, 7031-D24, 7031-T24 9111-285, 9131-52A, 9133-55A 9116-561 9406-525 9407-515 9117-MMA 9406-MMA 	Type 10
250V 30A Locking	<ul style="list-style-type: none"> Models 9406-730, 9406-740, 9406-840, SB3 0550 and 0551 racks 	Type 12
200 - 240 V 12 A	<ul style="list-style-type: none"> Model OpenPower 710, 9110-510, OpenPower 720, 5786, 5787, 7031-D24, 9111-520, 9113-550, 9117-570, 9115-505, 9111-285, 9131-52A, 9133-55A 9117-MMA 9406-MMA 7214-1U2 	Type 57
250V 15A	<ul style="list-style-type: none"> Expansion units 5070, 5072, 5080, 5082 Model OpenPower 710, 9110-510, OpenPower 720, 5786, 5787, 7031-D24, 7031-T24, 9115-505, 9111-285, 9131-52A, 9133-55A 7214-1U2 	Type 59
Countries or regions		
Japan		

Plug and receptacle types: 66, KP

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 138. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
200-240 V 10 A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570 and expansion units used with IBM eServer i5 and eServer p5, 5786, 5787, 7031-D24, 7031-T24, 9115-505, 9111-285, 9131-52A, 9133-55A 7311-D11 7037-A50 7047-185 9116-561 9406-525 9407-515 9117-MMA 9406-MMA 7214-1U2 	Type 66
250V 32A	<ul style="list-style-type: none"> Models 9406-730, 9406-740, 9406-840, SB3 0550 and 0551 racks 	Type KP
Countries or regions		
North Korea, South Korea		

Plug and receptacle types: 18, 46 (3P+N+G)

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 139. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 16A	<ul style="list-style-type: none"> • Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 • Models 9406-720 • Expansion units 507x, 508x, 5094, 5095, 7104, 7116, • 8xxx base I/O Rack • 9251, 9079 base I/O expansion unit • 9074 and 9094 base I/O enclosure • Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825 • 5786, 5787, 7031-D24, 7031-T24 • 9115-505, 9111-285, 9131-52A, 9133-55A • 7037-A50 • 7047-185 • 9116-561 • 9406-525 • 9407-515 • 9117-MMA • 9406-MMA • 7214-1U2 	Type 18
250V 16A	<ul style="list-style-type: none"> • Models 9406-730, 9406-740, 9406-840, SB3 • 0550 and 0551 racks 	Type 46 (3P+N+G)
Countries or regions		
Latvia		

Plug and receptacle types: 22, 46 (P+N+G) [32A]

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 140. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 16A	<ul style="list-style-type: none"> • Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 • Models 9406-720 • Expansion units 507x, 508x, 5094, 5095, 7116, 7104 • 8xxx base I/O Rack • 9251, 9079 base I/O expansion unit • 9074 and 9094 base I/O enclosure • Models 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2 • 5786, 5787, 7031-D24, 7031-T24 • 9115-505, 9111-285, 9131-52A, 9133-55A • 7037-A50 • 7047-185 • 9116-561 • 9406-525 • 9407-515 • 9117-MMA • 9406-MMA • 7214-1U2 	Type 22
250V 32A	<ul style="list-style-type: none"> • Models 9406-730, 9406-740, 9406-840, SB3 • 0550 and 0551 rack 	Type 46 (P+N+G) [32A]
Countries or regions		
Pakistan		

Plug and receptacle types: 4, 5, 12

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 141. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
125V 15A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570 9117-570, and OpenPower 720 Expansion units 5070, 5072, 5075, 5077, 5080, 5082, 5095, 7104, 7116 Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 9406-525 9407-515 7214-1U2 	Type 4
250V 15A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570 9117-570, and OpenPower 720 Expansion units 5070, 5071, 5072, 5073, 5074, 5075, 5077, 5079, 508x, 5094, 5095, 7116, 7104 8xxx base I/O Rack 9079 base I/O expansion unit 9074 base I/O enclosure 9251 base I/O expansion unit Models 9406-270, 9406-720, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2, 9074, 9079 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 5096 5296 9406-525 9407-515 9117-MMA 9406-MMA 7214-1U2 	Type 5
250V 30A Locking	<ul style="list-style-type: none"> Models 9406-730, 9406-740, 9406-840, SB3 0550 and 0551 racks 	Type 12
Countries or regions		
Peru		

Plug and receptacle types: 22, 46 (3+N+G)

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 142. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 16A	<ul style="list-style-type: none"> • Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 • Model 9406-720 • Expansion units 507x, 508x, 5094, 5095, 7116, 7104 • 8xxx base I/O Rack • 9251, 9079 base I/O expansion unit • 9074 and 9094 base I/O enclosure • Models 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2 • 5786, 5787, 7031-D24, 7031-T24 • 9115-505, 9111-285, 9131-52A, 9133-55A • 7037-A50 • 7047-185 • 9116-561 • 9406-525 • 9407-515 • 9117-MMA • 9406-MMA • 7214-1U2 	Type 22
250V 32 A	<ul style="list-style-type: none"> • Models 9406-730, 9406-740, 9406-840, SB3 • 0550 and 0551 racks 	Type 46 (P+N+G)
Countries or regions		
South Africa		

Plug and receptacle types: 5, 12

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 143. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 15A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, and OpenPower 720 Model 9406-720 Expansion units 5070, 5071, 5072, 5073, 5074, 5075, 5077, 5079, 508x, 5094, 5095, 7116, 7104 8xxx base I/O Rack 9079 base I/O expansion unit 9074 base I/O enclosure 9251 base I/O expansion unit Models 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2, 9074, 9079 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 7037-A50 7047-185 9116-561 9406-525 9407-515 9117-MMA 9406-MMA 7214-1U2 	Type 5
250V 30A	<ul style="list-style-type: none"> Models 9406-730, 9406-740 Models 9406-840 SB3 0550 and 0551 racks OpenPower 720 	Type 12
Countries or regions		
Thailand		

Plug and receptacle types: 4, 7, 51, 5, 10, 34, 40, 12

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 144. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
125V 15A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550 Expansion units 5070, 5072, 5075, 5077, 5080, 5082, 5095, 7104, 7116 Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 7037-A50 7047-185 9406-525 9407-515 7214-1U2 	Type 4
125V 15A Locking	<ul style="list-style-type: none"> Expansion units 5070, 5072, 5075, 5077, 5080, 5082, 5095, 7104, 7116 Models 9406-270, 9406-800, 9406-820, 9406-825 	Type 7
125V 13A/15A Water Resistant	<ul style="list-style-type: none"> Expansion units 5070, 5072, 5075, 5077, 5080, 5082, 5095, 7104, 7116 	Type 51
250V 15A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, and OpenPower 720 Model 9406-720 Expansion units 5070, 5071, 5072, 5073, 5074, 5075, 5077, 5079, 508x, 5094, 5095, 7116, 7104 8xxx base I/O Rack 9079 base I/O expansion unit 9074 base I/O enclosure 9251 base I/O expansion unit Models 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2, 9074, 9079 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 7037-A50 7047-185 9116-561 5096 5296 9406-525 9407-515 9117-MMA 9406-MMA 7214-1U2 	Type 5

Table 144. Plug and receptacle types (continued)

Voltage and amperage	Models	Plug and receptacle type
250V 15A Locking	<ul style="list-style-type: none"> • Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, and OpenPower 720 • Models 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2 • Model 9406-720 • Expansion units 507x, 508x, 5094, 5095, 7116, 7104 • 8xxx base I/O Rack • 9251 base I/O expansion unit • 9074 and 9094 base I/O enclosure • 5786, 5787, 7031-D24, 7031-T24 • 9111-285, 9131-52A, 9133-55A • 9116-561 • 5096 • 5296 • 9406-525 • 9407-515 • 9117-MMA • 9406-MMA 	Type 10
250V 10A/15A Water Resistant	<ul style="list-style-type: none"> • Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 • Models 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 9406-830, SB2 • Model 9406-720 • Expansion units 507x, 508x, 5094, 5095, 7116, 7104 • 8xxx base I/O Rack • 9251 base I/O expansion unit • 9074 and 9094 base I/O enclosure • 5786, 5787, 7031-D24, 7031-T24 • 9131-52A, 9133-55A • 5096 • 5296 • 9406-525 • 9407-515 	Type 34
250V 30A Water Resistant	<ul style="list-style-type: none"> • Models 9406-730, 9406-740, 9406-840, SB3 • 0550 and 0551 racks 	Type 40
250V 30A Locking	<ul style="list-style-type: none"> • Models 9406-730, 9406-740, 9406-840, SB3 • 0550 and 0551 racks 	Type 12
Countries or regions		

Table 144. Plug and receptacle types (continued)

Voltage and amperage	Models	Plug and receptacle type
United States		

Plug and receptacle types: 6, 54, 46 (P+N+G) [32A]

Use the Plugs and receptacles table to determine the plugs and receptacles available for your country or region.

Table 145. Plug and receptacle types

Voltage and amperage	Models	Plug and receptacle type
250V 10A	<ul style="list-style-type: none"> Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 53x I/O Side Expansion units 5070, 5071, 5072, 5073, 5075, 5077, 508x, 5095, 5094 9251 base I/O expansion unit 5786, 5787, 7031-D24, 7031-T24 9115-505, 9111-285, 9131-52A, 9133-55A 7037-A50 7047-185 9116-561 9406-525 9407-515 9117-MMA 9406-MMA 	Type 6
250V 15A	<ul style="list-style-type: none"> Model SB2 Model 9406-720 Expansion unit 5033, 5034, 5035, 5065, 5066 9251, 9079 base I/O expansion unit 9074 base I/O enclosure 	Type 54
250V 32A	<ul style="list-style-type: none"> 53x Processor Side Models SB1 Models 9406-730, 9406-740 	Type 46 (P+N+G) [32A]
Countries or regions		
Western Samoa		

Plug type 12 Countries or regions

Listed are countries or regions that use plug type 12.

Afghanistan, Anguilla, Antigua, Argentina, Aruba, Bahamas, Bangladesh, Barbados, Belize, Bermuda, Bolivia, Bonaire, Brunei, Caicos Islands, Canada, Cape Verde Islands, Cayman Islands, Chile, Colombia, Costa Rica, Curacao, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong S.A.R. of the PRC, Indonesia, Jamaica, Japan, Mexico, Montserrat, Myanmar, Netherlands Antilles, Nicaragua, Panama, Paraguay, People's Republic of China, Peru, Philippines, Puerto Rico, Sri Lanka, St. Kitts, St. Martin, Suriname, Taiwan, Thailand, Tobago, Tortola (BVI), Trinidad, Turks Island, United States, Uruguay, Venezuela, Virgin Islands

Plug type 18 Countries or regions

Listed are countries or regions that use plug type 18.

Afghanistan, Albania, Algeria, Andorra, Armenia, Austria, Azores, Belarus, Belgium, Benin, Bosnia, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canary Islands, Cape Verde Islands, Central African Republic, Chad, Congo, Croatia, Czech Republic, Dahomey, Djibouti, Egypt, Equatorial Guinea, Estonia, Faero Islands, Finland, France, French Polynesia, French Guyana, Gabon, Georgia, Germany, Greece, Greenland, Guadeloupe, Guinea, Guinea-Bissau, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Kazakhstan, Kirghizia, Laos, Latvia, Lebanon, Liberia, Lithuania, Luxembourg, Macau S.A.R. of the PRC, Macedonia, Malagasy Republic, Mali, Martinique, Mauritania, Moldavia, Monaco, Mongolia, Morocco, Mozambique, Netherlands, New Caledonia, Niger, North Korea, Norway, Peru, Poland, Portugal, Principe, Reunion, Romania, Russia, Rwanda, Sao Tome Island, Saudi Arabia, Senegal, Serbia, Slovenia, Slovakia, South Korea, Spain, Sudan, Suriname, Swaziland, Sweden, Syria, Tahiti, Togo, Tunisia, Turkey, Ukraine, Uzbekistan, Vietnam, Zaire, Zimbabwe

Plug type 46 (P+N+G) [32A] Countries or regions

Listed are countries or regions that use plug type 46.

Abu Dhabi, Albania, Algeria, Andorra, Angola, Armenia, Azores, Bahrain, Belarus, Belgium, Benin, Bosnia, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canary Islands, Central African Republic, Chad, Congo, Croatia, Cyprus, Dahomey, Djibouti, Dominica, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Faero Islands, France, French Guyana, French Polynesia, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Greenland, Grenada, Grenadines, Guadeloupe, Guinea, Guinea-Bissau, Guyana, Hungary, Iceland, India, Iran, Iraq, Ireland, Italy, Ivory Coast, Jordan, Kazakhstan, Kenya, Kirghizia, Kuwait, Laos, Lesotho, Lebanon, Liberia, Libya, Luxembourg, Macedonia, Malagasy Republic, Macau S.A.R. of the PRC, Malawi, Mali, Malta, Martinique, Mauritania, Moldavia, Mongolia, Monaco, Morocco, Mozambique, Namibia, Nepal, Netherlands, New Caledonia, Niger, Nigeria, Norway, Oman, Pakistan, Poland, Principe, Qatar, Reunion, Romania, Rwanda, Sabah, Sao Tome Island, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Somalia, Spain, St. Lucia, St. Vincent, Sudan, Swaziland, Syria, Tahiti, Tanzania, Togo, Tunisia, Uganda, Ukraine, United Arab Emirates, United Kingdom, Uzbekistan, Vietnam, Western Samoa, Zaire, Zambia, Zimbabwe

Plug Type 46 (P+N+G) [16A] Countries or regions

Listed are countries or regions that use plug type 46.

Denmark, Liechtenstein, Switzerland

(J) Only: Abu Dhabi, Bahrain, Botswana, Brazil, Brunei, , Cyprus, Dominica, Gambia, Ghana, Grenada, Grenadines, Guyana, Hong Kong S.A.R. of the PRC, India, Iraq, Ireland, Jordan, Kenya, Kuwait, Lesotho, Malawi, Malaysia, Malta, Namibia, Nepal, Nigeria, Oman, Qatar, Sabah, Seychelles, Sierra Leone, Singapore, St. Lucia, St. Vincent, Tanzania, Uganda, United Arab Emirates, United Kingdom, Zambia

Plug and receptacle type 12 Part Numbers

Use the Plug type 12 part numbers table to determine the part number, countries or regions, and systems that use plug type 12.

Table 146. Plug type 12 part numbers

Part Number	Accommodating Countries or regions
11F0114 (6 ft.) (C) (F) (G)	Anguilla, Antigua, Canada, Cape Verde Islands, Cayman Islands, Honduras, Montserrat, St. Kitts & Nevis, Tortola (BVI), United States
11F0113 (14 ft.) (C) (F) (G) (H)	

Table 146. Plug type 12 part numbers (continued)

Part Number	Accommodating Countries or regions
11F0115 (14 ft.) (C) (F) (H) 11F0113 (14 ft.) (G) (H)	Afghanistan, Argentina, Aruba, Bahamas, Bangladesh, Barbados, Belize, Bermuda, Bolivia, Bonaire, Brunei, Caicos Islands, Chile, Colombia, Costa Rica, Curacao, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Hong Kong S.A.R. of the PRC, Indonesia, Japan, Jamaica, Mexico, Myanmar, Netherland Antilles, Nicaragua, Panama, Paraguay, People's Republic of China, Peru, Philippines, Sri Lanka, St. Martin, Suriname, Taiwan, Thailand, Trinidad/Tobago, Turks Island, Uruguay, Venezuela
Systems and expansion units	
(C) - Model 53x Processor Side (F) - Models 9406-730, 9406-740, SB1 (G) - Models 9406-840 SB3 (H) - 9309 rack	

Plug and receptacle types: By model

Select your model to find its plug and receptacle type and power cord features.

- Model 7037-A50
- Model 7047-185
- Model 9110-510 and OpenPower 710
- Model 9111-285
- Model 9111-520, 9406-520, 9406-525, 9407-515
- Model 9113-550 and 9406-550 and OpenPower 720
- Model 9115-505
- Model 9116-561
- Model 9117-570 and 9406-570
- Model 9117-MMA and 9406-MMA
- Model 9118-575
- Model 9119-590, 9119-595, and 9406-595
- Model 9131-52A
- Model 9133-55A
- Model 9406-250
- Model 9406-270
- Models 9406-800 and 9406-810
- Model 9406-820
- Model 9406-825
- Models 9406-830 and SB2
- Models 9406-840 and SB3
- Models 9406-870 and 9406-890

Expansion units

- 5074

- 5075
- 5094
- 5095 and 0595
- 5096
- 5786 and 5787
- 5790
- 7031-D24 and 7031-T24
- 7116
- 7214-1U2
- 7311-D10
- 7311-D11
- 7311-D20
- 7316
- 8079
- 9316

Base I/O enclosures

- 9074
- 9079
- 9094

Racks

- 0550
- 0551
- 0553
- 0554
- 0555
- 5079
- 5294
- 5296
- 5792
- 7014-S11
- 7014-S25
- 7014-T42
- 8093
- 8094

Plug and receptacle types: Model 7037-A50 and 7047-185

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 147. Plug and receptacle types by voltage and amperage

Voltage and amperage	Plug and receptacle type
250 V, 10 A	Type 2, Type 6, Type 19, Type 24, Type 25, Type 32, Type 62
100-127 V, 10 A	Type 75
100-127 V, 15 A	Type 4, Type 70
100-127 V, 12 A	Type 59

Table 147. Plug and receptacle types by voltage and amperage (continued)

Voltage and amperage	Plug and receptacle type
250 V, 15 A	Type 5
250 V, 16 A	Type 18, Type 22, Type 25, Type 32
250 V, 13 A	Type 23
200-240 V, 10 A	Type 26, Type 66, Type 69, Type 73, Type 76
200-240 V, 12 A	Type 57

To determine the plug and receptacle type your model will need, follow these steps:

1. In the preceding table, find the **Voltage and Amperage** of your power supply.
The **Plug and receptacle type** that is listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your country or region (the country or region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your country or region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your country or region is the type for which you need to plan.

Note: If your country or region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your sales representative.

Plug and receptacle types: Model 7214-1U2

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 148. Plug and receptacle types by voltage and amperage

Voltage and amperage	Plug and receptacle type
100 - 127 V, 10 A	Type 70, Type 75
100 - 127 V, 12 A	Type 59
100 - 127 V, 15 A	Type 4
250 V, 10 A	Type 2, Type 6, Type 19, Type 24, Type 25, Type 32, Type 62
250 V, 15 A	Type 5
250 V, 16 A	Type 18, Type 22, Type 25, Type 32
250 V, 13 A	Type 23
200-240 V, 10 A	Type 66, Type 69, Type 73, Type 76
200-240 V, 12 A	Type 57
100-240 V, 10 A	Type 26

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.

The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: Model 7311-D10, 7311-D11, 5790

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 149. Plug and receptacle types by voltage and amperage

Voltage and amperage	Plug and receptacle type
250 V, 10 A	Type 2, Type 6, Type 19, Type 24, Type 25, Type 32, Type 62
250 V, 15 A	Type 5
250 V, 16 A	Type 18, Type 22, Type 25, Type 32
250 V, 13 A	Type 23
200-240 V, 10 A	Type 66, Type 69, Type 73, Type 76
200-240 V, 12 A	Type 57
100-240 V, 10 A	Type 26

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.

The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: Model 7311-D20

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 150. Plug and receptacle types by voltage and amperage

Voltage and amperage	Plug and receptacle type
250 V, 10 A	Type 2, Type 6, Type 19, Type 24, Type 25, Type 32, Type 62

Table 150. Plug and receptacle types by voltage and amperage (continued)

Voltage and amperage	Plug and receptacle type
250 V, 15 A	Type 5
250 V, 16 A	Type 18, Type 22, Type 25, Type 32
250 V, 13 A	Type 23
200-240 V, 10 A	Type 66, Type 69, Type 73, Type 76
200-240 V, 12 A	Type 57, Type 10
100-240 V, 10 A	Type 26
100-127 V, 10 A	Type 70, Type 75
100-127 V, 10 A	Type 4, Type 59

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: Model 7314-G30 , 5796

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 151. Plug and receptacle types by voltage and amperage

Voltage and amperage	Plug and receptacle type
250 V, 10 A	Type 2, Type 6, Type 19, Type 24, Type 25, Type 32, Type 62
250 V, 15 A	Type 5
250 V, 16 A	Type 18, Type 22, Type 25, Type 32
250 V, 13 A	Type 23
200-240 V, 10 A	Type 66, Type 69, Type 73, Type 76
200-240 V, 12 A	Type 57, Type 10, Type 34 (5796 only)
100-240 V, 10 A	Type 26

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.

2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: Model 9110-510 and OpenPower 710

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 152. Plug and receptacle types by voltage and amperage

Voltage and amperage	Plug and receptacle type
250 V, 10 A	Type 2, Type 6, Type 19, Type 24, Type 25, Type 32, Type 62
100-127 V, 15 A	Type 4, Type 70
100-127 V, 12 A	Type 59
250 V, 15 A	Type 5
250 V, 16 A	Type 18, Type 22, Type 25, Type 32
250 V, 13 A	Type 23
200-240 V, 10 A	Type 66, Type 69, Type 73

To determine the plug and receptacle type your model will need, follow these steps:

1. In the preceding table, find the **Voltage and Amperage** of your power supply.
The **Plug and receptacle type** that is listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your country or region (the country or region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your country or region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your country or region is the type for which you need to plan.

Note: If your country or region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your sales representative.

Plug and receptacle types: Model 9115-505

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 153. Plug and receptacle types by voltage and amperage

Voltage and amperage	Plug and receptacle type
250 V, 10 A	Type 2, Type 6, Type 19, Type 24, Type 25, Type 32, Type 62

Table 153. Plug and receptacle types by voltage and amperage (continued)

Voltage and amperage	Plug and receptacle type
100-127 V, 15 A	Type 4, Type 70
100-127 V, 10 A	Type 75
100-127 V, 12 A	Type 59
100-240 V, 10 A	Type 26
250 V, 15 A	Type 5
250 V, 16 A	Type 18, Type 22, Type 32
250 V, 13 A	Type 23
200-240 V, 10 A	Type 66, Type 69, Type 73, Type 76
200-240 V, 12 A	Type 57

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: Model 9406-520, 9111-520, 9406-550, 9113-550, and OpenPower 720, 9111-285, 9131-52A, 9133-55A, 9406-525, 9407-515

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 154. Plug and receptacle types by voltage and amperage

Voltage and amperage	Plug and receptacle type
250 V, 10 A	Type 2, Type 6, Type 19, Type 24, Type 25, Type 32, Type 34, Type 62
100-127 V, 15 A	Type 4, Type 70
250 V, 15 A	Type 5, Type 10, Type 34, Type 64
250 V, 16 A	Type 18, Type 22, Type 25, Type 32
250 V, 13 A	Type 23
200-240 V, 10 A	Type 66, Type 69

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and Amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.

2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: Model 9116-561

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 155. Plug and receptacle types by voltage and amperage

Voltage and amperage	Plug and receptacle type
250 V, 10 A	Type 2, Type 6, Type 19, Type 24, Type 25, Type 32, Type 62
250 V, 15 A	Type 5, Type 10
250 V, 16 A	Type 18, Type 22, Type 25, Type 32
250 V, 13 A	Type 23
200-240 V, 10 A	Type 26, Type 66, Type 69, Type 73, Type 76
200-240 V, 12 A	Type 57

To determine the plug and receptacle type your model will need, follow these steps:

1. In the preceding table, find the **Voltage and Amperage** of your power supply.
The **Plug and receptacle type** that is listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your country or region (the country or region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your country or region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your country or region is the type for which you need to plan.

Note: If your country or region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your sales representative.

Plug and receptacle types: Model 9406-570 and 9117-570

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 156. Plug and receptacle types by voltage and amperage

Voltage and amperage	Plug and receptacle type
250 V, 10 A	Type 2, Type 6, Type 19, Type 24, Type 25, Type 32, Type 34, Type 62

Table 156. Plug and receptacle types by voltage and amperage (continued)

Voltage and amperage	Plug and receptacle type
250 V, 15 A	Type 5, Type 10, Type 34, Type 64
250 V, 16 A	Type 18, Type 22, Type 25, Type 32
250 V, 13 A	Type 23
200-240 V, 10 A	Type 66, Type 69

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: Model 9117-MMA and 9406-MMA

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 157. Plug and receptacle types by voltage and amperage

Voltage and amperage	Plug and receptacle type
100 - 240 V, 10 A	Type 26
250 V, 10 A	Type 2, Type 6, Type 19, Type 24, Type 25, Type 32, Type 62
250 V, 15 A	Type 5, Type 10
250 V, 16 A	Type 18, Type 22, Type 25, Type 32
250 V, 13 A	Type 23
200-240 V, 10 A	Type 66, Type 69
200-240 V, 12 A	Type 57

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.

2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: Model 9118-575

For a detailed description of the plug and receptacles used with the Model 9118-575, see 9118-575 power cord features.

Plug and receptacle types: Model 9119-590, 9119-595, and 9406-595

For a detailed description of the plug and receptacles used with Models 9119-590, 9119-595, and 9406-595, see 9119-590, 9119-595, and 9406-595 power cord features.

Plug and receptacle types: 8079, 8093 and 9094

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 158. Plug and receptacle types by voltage and amperage

Voltage and amperage	Plug and receptacle type
250 V, 15 A	Type 54, Type 72
250 V, 16 A	Type 25, Type 32, Type 18, Type 22, Type 46 (P+N+G)[16A]
250 V, 20 A	Type 11, Type 29, Type 35
250 V, 13 A	Type 23
250 V, 15 A	Type 5, Type 10, Type 34

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: 0550 and 0551 (1.8 m racks)

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 159. Plug and receptacle type by voltage and amperage

Voltage and amperage	Plug and receptacle type		
250 V, 16 A/phase	Type 46 3P+N+G		
250 V, 30 A	Type 12	Type KP	Type PDL
250 V, 32 A	Type 40	Type 46 P+N+G [32A]	

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: 0553 and 7014-T42 (1.8 m racks)

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 160. Plug and receptacle type by voltage and amperage

Voltage and amperage	Plug and receptacle type		
100 -240 V, 10 (HV), 12 (LV)	Type 26		
250 V, 16 A/phase	Type 46 3P+N+G		
250 V, 30 A	Type 12	Type KP	Type PDL
250 V, 32 A	Type 40	Type 46 P+N+G [32A]	

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: 0554, 0555, 7014-S11, 7014-S25 racks

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 161. Plug and receptacle type by voltage and amperage

Voltage and amperage	Plug and receptacle type
100 -240 V, 10 (HV), 12 (LV)	Type 26

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: Model 9406-250

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 162. Plug and receptacle type by voltage and amperage

Voltage and amperage	Plug and receptacle type
125 V, 15 A	Type 4
250 V, 10 A	Type 6, Type 19, Type 24
250 V, 10 A or 16 A	Type 25, Type 32
250 V, 13 A	Type 23
250 V, 15 A	Type 5, Type 10 (Colombia and Mexico only)
250 V, 16 A	Type 18, Type 22

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.

2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: Model 9406-270

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 163. Plug and receptacle type by voltage and amperage

Voltage and amperage	Plug and receptacle type
100 V, 10 A	Type 70
125 V, 15 A	Type 4
200 V, 10 A	Type 2
250 V, 10 A	Type 6, Type 19, Type 24, Type 62
250 V, 10 A or 16 A	Type 25, Type 32
250 V, 13 A	Type 23
250 V, 15 A	Type 5, Type 34, Type 10
250 V, 16 A	Type 18, Type 22

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: Models 9406-870 and 9406-890

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 164. Plug and receptacle type by voltage and amperage

Voltage and amperage	Plug and receptacle type
200-240 V, 60 A, 3 phase	Type 460 R9W
480 V, 30 A, 3 phase	Type 430 R7W

Table 164. Plug and receptacle type by voltage and amperage (continued)

Voltage and amperage	Plug and receptacle type
380-415 V, 30 A, 3 phase	See 1304 power cord description.

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: Models 9406-800, 9406-810, 9406-825, and 5075, 5095, 0595, 7116, 7316, and 9316

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 165. Plug and receptacle type by voltage and amperage

Voltage and amperage	Plug and receptacle type			
125 V, 15 A (model 800 and 810 only)	Type 4			
250 V, 10 A	Type 6	Type 19	Type 24	Type 62
250 V, 10 A or 16 A	Type 25	Type 32		
250 V, 13 A	Type 23			
250 V, 15 A	Type 5	Type 10	Type 34	
250 V, 16 A	Type 18	Type 22		

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: 5094 and 5294

Voltage and amperage	Plug and receptacle type
250 V, 15 A	Type 54
250 V, 16 A	Type 25, Type 32, Type 18, Type 22, Type 46 (P+N+G)[16A]
250 V, 20 A	Type 11, Type 29
250 V, 13 A	Type 23
250 V, 15 A	Type 5, Type 10, Type 34

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: 5096, 5296

Voltage and amperage	Plug and receptacle type
250 V, 15 A	Type 5, Type 10, Type 34

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: Model 9406-820 and expansion units 5074, 5075, 5077, 5078, and 5079

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 166. Plug and receptacle type by voltage and amperage

Voltage and amperage	Plug and receptacle type
100 V, 10 A	Type 70
125 V, 15 A	Type 4 and Type 7 (Types 4 and 7 are valid only for: Model 9406-820, 5075 & 5077)
200 V, 10 A	Type 2
250 V, 10 A or 15 A	Type 5, Type 10, Type 34
250 V, 10 A or 16 A	Type 25
250 V, 13 A	Type 23
250 V, 16 A	Type 18, Type 22, Type 32
250 V, 10 A	Type 6, Type 19, Type 24, Type 62

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: 0554, 0555, 7014-S11, 7014-S25 racks

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 167. Plug and receptacle type by voltage and amperage

Voltage and amperage	Plug and receptacle type
100 -240 V, 10 (HV), 12 (LV)	Type 26

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: 0554, 0555, 7014-S11, 7014-S25 racks

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 168. Plug and receptacle type by voltage and amperage

Voltage and amperage	Plug and receptacle type
100 -240 V, 10 (HV), 12 (LV)	Type 26

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: 5786, 5787, 7031-D24, 7031-T24 expansion units

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 169. Plug and receptacle types by voltage and amperage

Voltage and amperage	Plug and receptacle type
250 V, 10 A	Type 2, Type 6
100-127 V, 15 A	Type 4
100-240 V, 10 A(HV) 12 A (LV)	Type 4
250 V, 15 A	Type 5, Type 10

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: 5792 rack

For a detailed description of the plug and receptacles used with the 5792 rack, see 5792 power cord features.

Plug and receptacle types: Models 9406-830 and SB2; Base I/O enclosure 9074; and expansion units 5065, 5066, 5074, and 5079

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 170. Plug and receptacle types by voltage and amperage

Voltage and amperage	Plug and receptacle type
200 V, 16 A	Type 64
250 V, 15 A	Type 54, Type 72
250 V, 16 A	Type 25, Type 18, Type 32, Type 22, Type 46 (P+N+G)[16A]
250 V, 20 A	Type 11, Type 29, Type 35 (valid for 5065 & 5066 only)
250 V, 13 A	Type 23
250 V, 15 A	Type 5, Type 10, Type 34 (not valid for 5065 & 5066)

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and Amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: Models 9406-840 and SB3

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 171. Plug and receptacle types by voltage and amperage

Voltage and amperage	Plug and Receptacle Type
250 V, 16 A/phase	Type 46 3P+N+G
250 V, 30 A	Type 12, Type KP, Type PDL
250 V, 32 A	Type 40, Type 46 P+N+G [32A]

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the Voltage and amperage of your power supply.
The Plug and receptacle type listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle Type to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the Plug and receptacles table, look for your Country or Region (the Country or Region where your model will reside) in the Countries or regions column (on the right side of the table).
3. Repeat steps 1 and 2 until you find your Country or region in the Plug and receptacle table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle types: 9079 base I/O expansion unit

Use the Plug and receptacle type by voltage and amperage table to determine the plugs and receptacles available for your system.

Table 172. Plug and receptacle types by voltage and amperage

Voltage and amperage	Plug and receptacle type
250 V, 15 A	Type 54, Type 72
250 V, 16 A	Type 25, Type 32, Type 18, Type 22, Type 46 (P+N+G)[16A]
250 V, 20 A	Type 11, Type 29, Type 35

To determine the plug and receptacle type your model will need, follow these steps:

1. In the table above, find the **Voltage and amperage** of your power supply.
The **Plug and receptacle type** listed in the same row as your voltage and amperage supports your model.
2. Click on the plug and receptacle **Type** to view information about that type.

If more than one plug appears in your row:

1. Click one of the plug and receptacle types.
2. In the **Plug and Receptacles** table, look for your Country or Region (the Country or Region where your model will reside) in the **Countries or regions** column (on the right side of the table).

3. Repeat steps 1 and 2 until you find your Country or Region in the **Plug and Receptacle** table.
The plug and receptacle type that lists your Country or Region is the type for which you need to plan.

Note: If your Country or Region is not listed or, for some reason, you still cannot determine your plug and receptacle type, contact your seller.

Plug and receptacle configurations

Use the Plug type and connectors table to see a graphical representation of your plug type and connector.

Table 173. Plug type and connectors


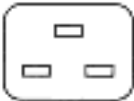







Plug Type	Connector
IEC320-C14/C13	
IEC320-C20/C19	
IEC309 (3 PIN)	
IEC309 (5 PIN)	
NEMA 5-15	
NEMA 6-15	

Table 173. Plug type and connectors (continued)

Plug Type	Connector
L6-30	

Plug and receptacle type 2

Plug type 2 is a 200 - 240 V, 10 A, IEC 83-A5 plug.

<p>Plug</p>  <p>Type 2 200 - 240 V 10A</p>	<p>Receptacle</p>  <p></p>	<p>Countries/Regions <i>International Electrotechnical Commission</i></p> <p><i>IEC 83-A5</i></p> <p>Argentina, Paraguay, Uruguay</p>
<p>Cord Feature</p> <p>2961 (B)</p> <p>(Default) (H)</p> <p>1397 (K) (T)</p> <p>1412 (G) (T)</p> <p>5102dual power cord (Model 9406-820 only)</p> <p>6488 (T)</p> <p>6453(U)</p> <p>9831 (N) (P) (Q) (R) (S)</p> <p>9908 (Q)</p>	<p>Part Number</p> <p>36L8879 and 39M5067¹ - 1.8 m (6 ft.)</p> <p>13F9940 - 2.7 m (9 ft.) (G) (T)</p> <p>36L6881 and 39M5069¹ - 4.3 m (14 ft.) (B) (H) (K) (N) (P) (Q) (R) (S) (T)</p> <p>86G7648 - 1.8 m (6 ft.)(T)</p> <p>36L8880 and 39M5068¹ - 2.7 m (9 ft.)(T)</p> <p>36L8877 and 39M5066¹ - 4.3 m (14 ft.)(U)</p>	
<p>Cord Rating 2.4 kVA cord (B) (G) (H) (K) (T)</p>		

Systems and expansion units

(B) - Models 53x I/O Side, and expansion units 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251

(G) - Models 9406-250, 9910-080

(H) - 9251 base I/O, and expansion units 5071, 5073, 5081, 5083

(K) - Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 9316, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251

(N) - pSeries 640 - B80

(P) - 7025 - pSeries 620 - 6F0, 6F1

(Q) - pSeries 620 (7028) - 6C1

(R) - 7026 - M80, pSeries 660 (7026) - 6H0, 6H1, 6M1

(S) - pSeries 620 (7028) - 6E1

(T) - Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786, 5787, 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, and 7310-C05, 7314-G30, 5796, 9406-MMA, 9406-525, 9407-515, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4, 7214-1U2

(U) - 7311-D11, 7311-D10, 5790

Note:

1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

Plug and receptacle type 4

Plug type 4 is a 100 - 127 V, 15 A, NEMA WD-1: 5-15P plug.

Table 174.


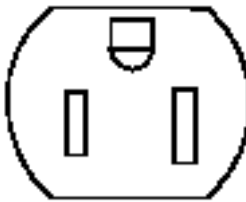

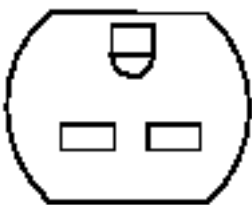
Plug	Receptacle	Countries/Regions <i>National Electrical Manufacturers Association</i>
 <p>Type 4 100-127V 15A</p>		<p>NEMA WD-1: 5-15P</p> <p>Anguilla, Antigua, Aruba, Bahamas, Barbados, Belize, Bermuda, Bonaire, Bolivia, Caicos Islands, Canada, Canary Islands, Cayman Islands, Colombia, Costa Rica, Curacao, Dominican Republic, El Salvador, Ecuador, Guam, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Montserrat, Netherland Antilles, Nevis, Nicaragua, Panama, Peru, Philippines, Puerto Rico, Saudi Arabia, St. Kitts, St. Martin, Taiwan, Tobago, Tortola BVI, Trinidad, Turk Islands, United States, Venezuela, Virgin Islands, Yemen</p>

Table 174. (continued)

Cord Feature	Part Number
2960 (B)	75G2695 - 2.7 m (9 ft.) (G)
2960 + 9082 (B)	86G7648 and 39M5080 ¹ - 1.8 m (6 ft.) (B) (K) (P) (Q) (S) (T)
1412 (I) (G)(K) (T)	87G3880 and 39M5082 ¹ - 4.3 m (14 ft.) (B) (K) (P) (Q) (U)(T)
9800 (P) (Q) (S)	12J5112 and 39M5258 ¹ - 2.7 m (9 ft.) (I)
9900 (Q)	6952301 and 39M5080 ¹ - 1.8 m (6 ft.) (U)
5102 dual power cord (Model 9406-820 only)	
6470 and 6460 (T) (K) (B) (U)	
Cord Rating	
1.6 kVA Cord (B) (G) (K)	
2.0 kVA cord (I)	
Systems and expansion units	
(B) - Models 53x I/O Side, and expansion units 5070, 5072, 5080, 5082	
(G) - Models 9406-250, 9910-080	
(I) - Models 9910-140	
(K) - Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 9316, 7116, 7316, , 5786, , 5787,	
(P) - 7025 - pSeries 620 - 6F0, 6F1, pSeries 640 - B80	
(Q) - pSeries 620 (7028) - 6C1, 7316	
(S) - pSeries 620 (7028) - 6E1	
(T) - Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, and 7310-C05, OpenPower 710, OpenPower 720, 9406-525, 9407-515, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4, 7214-1U2	
(U) - 7310-C04, 7310-C05 and 7310-CR2	
Note:	
1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.	

Plug and receptacle type 5

Plug type 5 is a 250 V, 15 A, NEMA WD-1: 6-15P plug.

<p>Plug</p>  <p>Type 5 250V 15A</p>	<p>Receptacle</p> 	<p>Countries/Regions <i>National Electrical Manufacturers Association</i></p> <p>NEMA WD-1: 6-15P</p> <p>Anguilla, Antigua, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Bonaire, Canada, Caicos Islands, Cayman Islands, Costa Rica, Curacao, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Montserrat, Netherland Antilles, Nicaragua, Panama, Peru, Philippines, Puerto Rico, Saudi Arabia, St. Marten, Taiwan, Thailand, Tobago, Tortola, Turks Island, United States, Venezuela, Virgin Islands</p>
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Cord Feature	Part Number
Migration (J)	1838576 and 39M5094 ¹ - 1.8 m (6 ft.) (B) (H) (K) (P) (Q) (R) (S) (N) (U)(T)
2961 (A) (B)	14F1547 and 39M5261 ¹ - 1.8 m (6 ft.) (C) (J) (D) (L) (M)
2961 + 9082 (B)	1838573 and 39M5096 ¹ - 4.3 m (14 ft.) (B) (H) (K) (N) (P) (Q) (R) (T)
(Default) (D) (H)	6952287 and 39M5093 ¹ - 4.3 m (14 ft.) (T) (W)
9082 (D) (H)	14F1548 and 39M5263 ¹ - 4.3 m (14 ft.) (C) (D) (J) (L) (M)
1412 (G) (I)	1838574 and 39M5095 ¹ - 2.7 m (9 ft.) (G)
1410 (K)	12J5120 and 39M5262 ¹ - 2.7 m (9 ft.) (I) (M)
1451 (L) (M)	25R2573 - 1.8 m (6 ft.) (V)
1452 (L)	25R2575 - 4.3 m (14 ft.) (V)
1457 (M)	
5102 dual power cord (Model 9406-820 only)	
5103 dual power cord (C)	
5105 dual power cord (5074 and top expansion unit in 8079)	
5106 dual power cord (single expansion unit in 5079)	
6469 (T) (K)	
6487 (U) (T)	
6687 (V)	
6669 (V)	
6455 (W)	
9800 (P) (R) (N)	
9833 (Q) (S)	
9909 (Q)	
Cord Rating	
2.4 kVA cord (B) (G) (H) (K) (T)	
3.6 kVA cord (C) (I) (J) (D) (L) (M)	

Systems and expansion units

(B) - Models 53x I/O Side, and expansion units 5070, 5072, 5080, 5082

(C) - Model 9406-830 in a 0550 rack

(D) - Models 9406-720, 9406-830, SB2, and expansion units 5065, 5074

(G) - Models 9406-250, 9910-080

(H) - 9251 base I/O, and expansion units 5071, 5073, 5081, 5083

(I) - Models 9910-140, 9910-180

(J) - Migration expansion units 5033, 5034, 5035

(K) - Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 9316, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251, 7214-1U2

(L) - Model 9406-830, 9406-SB2, 5074, 5094, 9079, 9074, 5294, 8079, 8093, 8094, 9094, 5033, 5034, 5035, 9194, 5096, 5296

(M) - Model Feature 5079, 5294, 8079, 8094, 5296

(N) - pSeries 640 - B80

(P) - 7025 - pSeries 620 - 6F0, 6F1

(Q) - pSeries 620 (7028) - 6C1

(R) - 7026 - M80, pSeries 660 (7026) - 6H0, 6H1, 6M1

(S) - pSeries 620 (7028) - 6E1

(T) (U) - 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, OpenPower 710, OpenPower 720, 7314-G30, 5796 , 9406-MMA, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4, 7214-1U2

(V) - OpenPower 720



(W) - 7311-D11, 7311-D10, 5790

Note:

1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

Plug and receptacle type 6

Plug type 6 is a 250 V, 10 A, IEC 83-A5 plug.

<div>Plug</div> <div></div> <div>Type 6 250V 10A</div>	<div>Plug</div> <div></div> <div></div>	<div>Countries/Regions <i>International Electrotechnical Commission</i></div> <div>IEC 83-A5</div> <div>Australia, Fiji, New Zealand, Papua New Guinea, Western Samoa, Kiribati, Nauru</div>
<div>Cord Feature</div> <div>2961 (B)</div> <div>(Default) (H)</div> <div>1438 (K)</div> <div>5102 dual power cord (Model 9406-820 only)</div> <div>6479 (T)</div> <div>6680 (T)</div> <div>6468 and 6681(U)</div> <div>9831 (N) (P) (Q) (R) (S)</div> <div>9908 (Q)</div>	<div>Part Number</div> <div>13F9939 and 39M5101¹ - 1.8 m (6 ft.)</div> <div>13F9940 and 39M5102¹ - 2.7 m (9 ft.) (T)</div> <div>13F9938 and 39M5100¹ - 4.3 m (14 ft.) (T) (U)</div> <div>13F9941 and 39M5103¹ - 4.3 m (14 ft.) (B) (H)(K) (N) (P) (Q) (R) (S) (T)</div>	
<div>Cord Rating 2.4 kVA cord (B) (G) (H) (K) (T)</div>		

Systems and expansion units

(B) - Models 53x I/O Side, and expansion units 5070, 5072, 5080, 5082

(G) - Models 9406-250, 9910-080

(H) - 9251 base I/O, and expansion units 5071, 5073, 5081, 5083

(K) - Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 9316, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251

(N) - pSeries 640 - B80

(P) - 7025 - pSeries 620 - 6F0, 6F1

(Q) - pSeries 620 (7028) - 6C1

(R) - 7026 - M80, pSeries 660 (7026) - 6H0, 6H1, 6M1

(S) - pSeries 620 (7028) - 6E1

(T) - Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, OpenPower 710, OpenPower 720, 7314-G30, 5796, 9406-MMA, 9406-525, 9407-515, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4, 7214-1U2



(U) - 7311-D11, 7311-D10, 5790

Note:

1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

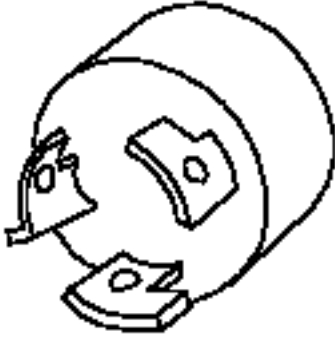
Plug and receptacle type 7

Plug type 7 is a 100 - 127 V, 15 A, NEMA WD-1: L5-15P plug.

<p>Plug</p>  <hr/> <p>Type 7 100-127V 15A Locking</p>	<p>Plug</p>  <hr/>	<p>Countries/Regions <i>National Electrical Manufacturers Association</i></p> <p><i>NEMA WD-1: L5-15P</i></p> <p>Canada, United States</p>
<p>Cord Feature</p> <p>2960 + 9083 (A)</p> <p>2960 + 9083 + 9082(A)</p>	<p>Part Number</p> <p>86G7874 and 39M5108¹ - 1.8 m (6 ft.) (A)</p> <p>87G3881 and 39M5110¹ - 4.3 m (14 ft.) (A)</p>	
<p>Cord Rating 1.6 kVA cord (A)</p>		



Systems and expansion units
(A) - Expansion units 5070, 5072, 5080, 5082
Note: 1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

Plug and receptacle type 10

Plug  Type 10 250V 15A Locking	Receptacle  NEMA L6-15R	Countries/Regions <i>National Electrical Manufacturers Association NEMA WD-5: L6-15P</i> Canada, Colombia, Japan, Mexico, United States, Uruguay Note: Plug Type 10 supports models 9910-080 in Colombia and Mexico. Plug Type 10 is not available in Canada and the United States for these models.
Cord Feature 2961 + 9083 (B) 2961 + 9083 + 9082 (B) 9083 (D) (H) 9083 + 9082 (D) (H) Migration (C) 1414 (I) (J) (M) 1453 (C) (F) (K) (L) 1454 (F) (K) (L) 1458 (C) (K) (L) 5102 dual power cord (Model 9406-820 only) 5103 dual power cord (F) 5105 dual power cord (5074 and top expansion unit in 8079) 5106 dual power cord (single expansion unit in 5079) 6497(J) (M)	Part Number 86G7878 and 39M5115 ¹ (10 A only) - 1.8 m (6 ft.) (B) (H) (J) (M) 14F1549 and 39M5273 ¹ - 1.8 m (6 ft.) (C) (D) (F) (K) (L) 12J5119 and 39M5274 ¹ - 2.7 m (9 ft.) (L) 86G7879 and 39M5117 ¹ (10 A only) - 4.3 m (14 ft.) (B) (H) (J) [outside Canada and United States - (G) (K)] 14F1550 and 39M5275 ¹ - 4.3 m (14 ft.) (C) (D) (F) (I) (K) (L)	



<p>Cord Rating 2.4 kVA cord (B) (H) (J) [<i>outside United States</i> - (G)]</p> <p>3.8 kVA cord (C) (D) (F) (I) (K) (L)</p>
<p>Systems and expansion units</p> <p>(B) - Models 53x I/O Side, and expansion units 5070, 5072, 5080, 5082</p> <p>(C) - Expansion units 5033, 5034, 5035</p> <p>(D) - Models 9406-720, 9406-830, SB2</p> <p>(F) - Model 9406-830 in a 0550 rack</p> <p>(H) - 9251 base I/O, and expansion units 5071, 5073, 5081, 5083</p> <p>(I) - Models 9910-140, 9910-180, 9406-270</p> <p>(J) - Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 9316, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251</p> <p>(K) - Models 9406-830, 940-SB2, 5074, 5094, 9079, 9074, 5065, 5066, 5074, 5079, 5094, 5294, 8094, 9194</p> <p>(L) - Model Feature 5079, 5294, 8079, 8093, 8094</p> <p>(M) - Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7314-G30, 5796, 9406-MMA, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4</p>
<p>Note:</p> <p>1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.</p>

Plug and receptacle type 11

Plug	Receptacle	Countries/Regions
		<p><i>National Electrical Manufacturers Association</i></p> <p>NEMA WD-1: L6-20P</p> <p>Argentina, Cape Verde Islands</p> <p>(K) (L) Only: US, Canada, Japan</p>
<p>Type 11 250V 20A</p>		

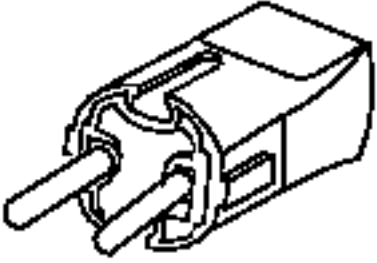

Cord Feature	Part Number
1414 (I)	14F1553 and 39M5279 ¹ - 4.3 m (14 ft.) (C) (I) (J) (M) (K) (L) (N)
1406 (C) (K) (L) (M) (N)	07H0095 and 39M5277 ¹ - 1.8 m (6 ft.)(C) (K) (L) (M) (N)
5103 dual power cord (C)	12J5118 and 39M5278 ¹ - 2.7 m (9 ft.) (N)
5105 dual power cord (5074 and top expansion unit in 8079)	
5106 dual power cord (single expansion unit in 5079)	
Migration (J)	
Cord Rating 4.5 kVA cord (C) (I) (J) (K) (L) (N)	
<p>Systems and expansion units</p> <p>(C) - Model 9406-830 in a 0550 rack</p> <p>(I) - Models 9910-140, 9910-180</p> <p>(J) - Features 5033, 5034, 5035</p> <p>(K) - Feature 5065</p> <p>(L) - Feature 5066</p> <p>(M) - Models 9406-830, SB2, Features 5074, 5094, 9074, 9079</p> <p>(N) - Feature 5079, 5294, 8079, 8094</p>	
<p>Note:</p> <p>1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.</p>	

Plug and receptacle type 12

<p>Plug</p>  <p>Type 12 250V 30A Locking</p>	<p>Receptacle</p> 	<p>Countries/Regions <i>National Electrical Manufacturers Association</i></p> <p>NEMA WD-5: L6-30P</p> <p>Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Bonaire, Calicos Island, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Curacao, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Micronesia, Montserrat, Netherlands Antilles, Nicaragua, Panama, Peru, Phillipines, St Marten, Taiwan, Tortola (BVI), Thailand, United States, Venezuela</p>
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Cord Feature	Part Numbers
4961 + 9183 (C)	11F0113 - 4.3 m (14 ft.) (P) (J) (Q) (G) (R) (S)
1426 (G) (J) (R)	11F0114 - 1.8 m (6 ft.) (P) (J) (R) (S)
9183 (F)	11F0115 - 4.3 m (14 ft.) (Q) (S)
4961 + 9183 + 9182 (C)	25R2555 - 4.3 m (14 ft.) (S)
5104 dual power cord (G)	
8622 dual power cord (P)	
9183 + 9182 (F)	
9081 (H)	
9800 (P)	
9986 (P)	
6654, 6442, 6446, 6449 (S)	
Cord Rating 7.2 kVA cord (C) (F) (G) (P) (J)	
<p>Systems and expansion units</p> <p>(C) - Model 53x Processor Side</p> <p>(F) - Models 9406-730, 9406-740, SB1</p> <p>(G) - Models 9406-840 SB3</p> <p>(H) - 9309 rack</p> <p>(J) - 0550, 0551 racks</p> <p>(P) - 7017 - S85</p> <p>(Q) - 7014 racks</p> <p>(R) - System i 5160 PDU for 0551 rack (System p 7014 racks when ordered with IBM eServer p5)</p> <p>(S) - 7188 and 9188 power distribution units when used with 7014-S11, 7014-S25, 0554, 0555, 7014-T00, 7014-T42, and 0550, 0551 racks</p>	

Plug and receptacle type 18

<p>Plug</p>  <p>Type 18 250V 16A</p>	<p>Receptacle</p> 	<p>Countries/Regions <i>International Rule for the Approval of Electrical Equipment</i></p> <p>CEE 7 VII</p> <p>Afghanistan, Albania, Algeria, Andorra, Armenia, Austria, Azores, Belarus, Belgium, Benin, Bosnia, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canary Islands, Cape Verde Islands, Central African Republic, Chad, Congo, Croatia, Czech Republic, Dahomey, Djibouti, Egypt, Equatorial Guinea, Estonia, Ethiopia, Faero Islands, Finland, France, French Polynesia, French Guyana, Gabon, Georgia, Germany, Greece, Greenland, Guadeloupe, Guinea, Guinea-Bissau, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Kazakhstan, Kirghizia, Laos, Latvia, Lebanon, Lithuania, Luxembourg, Macau S.A.R. of the PRC, Macedonia, Malagasy Republic, Mali, Martinique, Mauritania, Moldavia, Monaco, Mongolia, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Principe, Reunion, Romania, Russia, Rwanda, Sao Tome Island, Senegal, Serbia, Slovenia, Slovakia, Somalia, Spain, Suriname, Sweden, Syria, Tahiti, Togo, Tunisia, Turkey, Ukraine, Uzbekistan, Vietnam, Zaire, Zimbabwe</p>
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Cord Feature	Part Number
2961 (B)	13F9978 and 39M5122 ¹ - 1.8 m (6 ft.)
(Default) (H)	13F9979 and 39M5123 ¹ - 2.7 m (9 ft.) (G) (T)
1420 (C) (L)	13F9980 and 39M5124 ¹ - 4.3 m (14 ft.) (B) (H) (K) (N) (P) (Q) (R) (S) (T)
1439 (K)	14F1554 and 39M5283 ¹ - 4.3 m (14 ft.) (C) (I) (J) (L)
5102 dual power cord (Model 9406-820 only)	13F9977 and 39M5121 ¹ - 4.3 m (14 ft.) (U)
5103 dual power cord (C)	
5105 dual power cord (5074 and top expansion unit in 8079)	
5106 dual power cord (single expansion unit in 5079)	
6472 (T)	
6461 (U)	
9820 (N) (P) (Q) (R) (S)	
9901 (Q)	
Migration (J)	
Cord Rating 2.4 kVA cord (B) (G) (H) (K)	
3.8 kVA (C) (I) (J) (L)	

Systems and expansion units

(B) - Models 53x I/O Side, and expansion units 5070, 5072, 5080, 5082

(C) - Model 9406-830 in a 0550 rack

(G) - Models 9406-250, 9910-080

(H) - 9251 base I/O, and expansion units 5071, 5073, 5081, 5083

(I) - Models 9910-140, 9910-180

(J) - Features 5033, 5034, 5035

(K) - Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 9316, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251

(L) - Model 9406-830, SB2, 5065, 5066(x2), 5074, 5079(x2), 5094, 5294, 9079 , 8079, 8094, 9094, 5033, 5034, 5035, 9194

(N) - pSeries 640 - B80

(P) - 7025 - pSeries 620 - 6F0, 6F1

(Q) - pSeries 620 (7028) - 6C1

(R) - 7026 - M80, pSeries 660 (7026) - 6H0, 6H1, 6M1

(S) - pSeries 620 (7028) - 6E1

(T) - Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, OpenPower 710, OpenPower 720, 7314-G30, 5796, 9406-MMA, 9406-525, 9407-515, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4, 7214-1U2

(U) - 7311-D11, 7311-D10, 5790

Note:

1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

Plug and receptacle type 19 (P+N+G) [10A]

Plug



Type 19 250V 10A

Receptacle



Countries/Regions *International Rule for the Approval of Electrical Equipment*


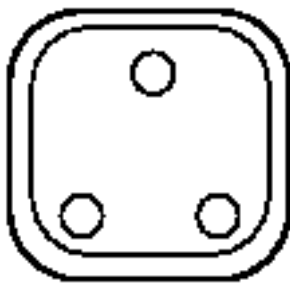
CEE

Denmark

Cord Feature	Part Number
2961 (B)	13F9996 and 39M5129 ¹ - 1.8 m (6 ft.)
(Default) (H)	13F9997 and 39M5130 ¹ - 2.7 m (9 ft.) (G) (T)
1412 (G)	13F9998 and 39M5131 ¹ - 4.3 m (14 ft.) (B) (H) (K) (N) (P) (Q) (R) (S)
1440 (K)	86G7648 - 1.8 m (6 ft.)(T)
5102 dual power cord (Model 9406-820 only)	13F9995 and 39M5128 ¹ - 4.3 m (14 ft.) (U)
6473 (T)	
9821 (N) (P) (Q) (R) (S)	
9902 (Q)	
6462 (U)	
Cord Rating 2.4 kVA cord (B) (G) (H) (K) (T)	
<p>Systems and expansion units</p> <p>(B) - Models 53x I/O Side, and expansion units 5070, 5072, 5080, 5082</p> <p>(G) - Models 9406-250, 9910-080</p> <p>(H) - 9251 base I/O, and expansion units 5071, 5073, 5081, 5083</p> <p>(I) - Models 9910-140, 9910-180</p> <p>(K) - Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 9316, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251</p> <p>(N) - pSeries 640 - B80</p> <p>(P) - 7025 - pSeries 620 - 6F0, 6F1</p> <p>(Q) - pSeries 620 (7028) - 6C1</p> <p>(R) - 7026 - M80, pSeries 660 (7026) - 6H0, 6H1, 6M1</p> <p>(S) - pSeries 620 (7028) - 6E1</p> <p>(T) - Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, 7314-G30, 5796, 9406-MMA, 9406-525, 9407-515, 7214-1U2</p> <p>(U) - 7311-D11, 7311-D10, 5790</p>	
<p>Note:</p> <p>1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.</p>	

Plug and receptacle type 22

Plug type 22 is a 250 V, 16 A, SABS 164 BS 546 plug.

<div>Plug</div> <div></div> <div>Type 22 250V 16A</div>	<div>Receptacle</div> <div></div>	<div>Countries/Regions <i>South African Bureau of Standards</i></div> <div>SABS 164 BS 546</div> <div>Bangladesh, Pakistan, South Africa, Sri Lanka, LeSotho, Maceo, Maldives, Namibia, Nepal, Samoa, South Africa, Swaziland, Uganda</div>
<div>Cord Feature</div> <div>2961 (B)</div> <div>(Default) (H)</div> <div>1418 (J) (K)</div> <div>1441 (K)</div> <div>5102 dual power cord (Model 9406-820 only)</div> <div>5103 dual power cord (C)</div> <div>5105 dual power cord (5074 and top expansion unit in 8079)</div> <div>5106 dual power cord (single expansion unit in 5079)</div> <div>6477 (T)</div> <div>6466 (U)</div> <div>9829 (N) (P) (Q) (R) (S)</div> <div>9906 (Q)</div> <div>Migration (J) (K)</div>	<div>Part Number</div> <div>14F0015 and 39M5144¹ - 2.7 m (9 ft.) (T)</div> <div>14F0014 and 39M5143¹ - 1.8 m (6 ft.)</div> <div>14F0016 and 39M5145¹ - 4.3 m (14 ft.) (B) (H) (K) (N) (P) (Q) (R) (S)</div> <div>14F1557 and 39M5291¹ - 4.3 m (14 ft.) (C) (I) (J) (L)</div> <div>14F0013 and 39M5142¹ - 4.3 m (14 ft.)(U)</div>	
<div>Cord Rating 2.4 kVA cord (B) (G) (H) (K)</div> <div>3.8 kVA cord (C) (I) (J) (L)</div>		

Systems and expansion units

(B) - Models 53x I/O Side, and expansion units 5070, 5072, 5080, 5082

(C) - Model 9406-830 in a 0550 rack

(G) - Models 250, 9910-080

(H) - 9251 base I/O, and expansion units 5071, 5073, 5081, 5083

(I) - Models 9910-140, 9910-180

(J) - Features 5033, 5034, 5035

(K) -Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 9316, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251

(L) - Model 9406-830, SB2, 5065, 5066(x2), 5074, 5079(x2), 5094, 5294, 8079, 8094, 9074, 9079, 8093, 9094

(N) - pSeries 640 - B80

(P) - 7025 - pSeries 620 - 6F0, 6F1

(Q) - pSeries 620 (7028) - 6C1

(R) - 7026 - M80, pSeries 660 (7026) - 6H0, 6H1, 6M1

(S) - pSeries 620 (7028) - 6E1

(T) - Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, 7314-G30, 5796, 9406-MMA, 9406-525, 9407-515, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4, 7214-1U2

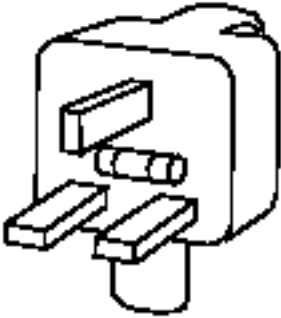
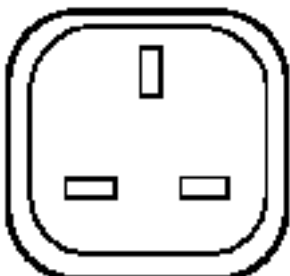
(U) - 7311-D11, 7311-D10, 5790

Note:

1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

Plug and receptacle type 23

Plug type 23 is a 250 V, 13 A, BS 1363A plug.

Plug	Receptacle	Countries/Regions <i>British Standards Institution</i>
 <p>Type 23 250V 13A</p>		<p>BS 1363A</p> <p>Abu Dhabi, Bahrain, Botswana, Brunei, Channel Islands, Cyprus, Dominica, Gambia, Ghana, Grenada, Grenadines, Guyana, Iraq, Ireland, Hong Kong S.A.R. of the PRC, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar, Nevis, Nigeria, Oman, Qatar, Sabah, Seychelles, Sierra Leone, Singapore, St. Lucia, St. Kitts, St. Vincent, Sudan, Tanzania, Trinidad and Tobago, United Arab Emirates, United Kingdom, Yemen, Zambia</p>

Cord Feature	Part Number
2961 (B)	14F0032 and 39M5150 ¹ - 1.8 m (6 ft.)
9082 (H)	14F0033 and 39M5151 ¹ - 2.7 m (9 ft.) (G) (T)
1476 (C) (L)	14F0034 and 39M5152 ¹ - 4.3 m (14 ft.) (B) (H) (K) (N) (P) (Q) (R) (S)(T)
1443 (K)	12J5988 and 39M5295 ¹ - 4.3 m (14 ft.) (C) (I) (J) (L)
5102 dual power cord (Model 9406-820 only)	14F0031 and 39M5149 ¹ - 4.3 m (14 ft.)(U)
5103 dual power cord (C)	
5105 dual power cord (5074 and top expansion unit in 8079)	
5106 dual power cord (single expansion unit in 5079)	
6474 (T)	
6463 (U)	
9825 (N) (P) (Q) (R) (S)	
9903 (Q)	
Migration (J)	
Cord Rating 2.5 kVA cord (B) (G) (H) (K)	
3.2 kVA cord (C) (I) (J) (L)	

Systems and expansion units

(B) - Models 53x I/O Side, and expansion units 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251

(C) - Model 9406-830 in a 0550 rack

(G) - Models 9406-250, 9910-080

(H) - 9251 base I/O, and expansion units 5071, 5073, 5081, 5083

(I) - Models 9910-140, 9910-180

(J) - expansion units 5033, 5034, and 5035

(K) - Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 9316, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251

(L) - Model 830, SB2, 5065, 5066(x2), 5074, 5079(x2), 5094, 5294, 8079, 8094, 9079, 9094, 5033, 5034, 5035, 9194

(N) - pSeries 640 - B80

(P) - 7025 - pSeries 620 - 6F0, 6F1

(Q) - pSeries 620 (7028) - 6C1

(R) - 7026 - M80, pSeries 660 (7026) - 6H0, 6H1, 6M1

(S) - pSeries 620 (7028) - 6E1

(T) - Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, 7314-G30, 5796, 9406-MMA, 9406-525, 9407-515, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4, 7214-1U2



(U) - 7311-D11, 7311-D10, 5790

Note:

1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

Plug and receptacle type 24



Plug type 24 is a 250 V, 10 A, SEV 24507 plug.

Plug 	Receptacle 	Countries/Regions <i>*Schweizerischer Elektrotechnischer Verein</i> SEV 24507 Liechtenstein, Switzerland
Type 24 250V 10A		

Cord Feature	Part Number	Cord Rating
2961 (B) (Default) (H) 1412 (G) (T) 1442 (K) 5102 dual power cord (Model 9406-820 only) 6476 (T) 6465 (U) 9828 (N) (P) (Q) (R) (S) 9905 (Q)	14F0050 - 1.8 m (6 ft.) 14F0051 and 39M5158 ¹ - 2.7 m (9 ft.) (G) (T) 14F0049 and 39M5156 ¹ - 4.3 m (14 ft.) (U) 14F0052 and 39M5159 ¹ - 4.3 m (14 ft.) (B) (H) (K) (N) (P) (Q) (R) (S)	2.4 kVA cord (B) (G) (H) (K) (T)
<p>Systems and expansion units</p> <p>(B) - Models 53x I/O Side, and expansion units 5070, 5072, 5080, 5082</p> <p>(G) - Models 9406-250, 9910-080</p> <p>(H) - 9251 base I/O, and expansion units 5071, 5073, 5081, 5083</p> <p>(K) - Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 9316, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251</p> <p>(N) - pSeries 640 - B80</p> <p>(P) - 7025 - pSeries 620 - 6F0, 6F1</p> <p>(Q) - pSeries 620 (7028) - 6C1</p> <p>(R) - 7026 - M80, pSeries 660 (7026) - 6H0, 6H1, 6M1</p> <p>(S) - pSeries 620 (7028) - 6E1</p> <p>(T) - Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, 7314-G30, 5796, 9406-MMA, 9406-525, 9407-515, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4, 7214-1U2</p> <p>(U) - 7311-D11, 7311-D10, 5790</p> <p>Note:</p> <p>1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.</p>		

Plug and receptacle type 25

Plug type 25 is a 250 V, 10 A or 16 A, CEI 23-16 plug.

<p>Plug</p>  <p>Type 25 250V 10A/16A</p>	<p>Receptacle</p> 	<p>Countries/Regions</p> <p><i>Comitato Elettrotecnico Italiano</i></p> <p>CEI 23-16</p> <p>Chile, Italy, Libya</p>
<p>Cord Feature</p> <p>2961 (B)</p> <p>(Default) (H)</p> <p>1408 (C) (J) (L)</p> <p>1444 (K)</p> <p>5102 dual power cord (Model 9406-820 only)</p> <p>5103 dual power cord (C)</p> <p>5105 dual power cord (5074 and top expansion unit in 8079)</p> <p>5106 dual power cord (single expansion unit in 5079)</p> <p>6478 (T)</p> <p>6467(U)</p> <p>9830 (N) (P) (Q) (R) (S)</p> <p>9907 (Q)</p> <p>Migration (J)</p>	<p>Part Number</p> <p>14F0068 - 1.8 m (6 ft.)</p> <p>14F0069 and 39M5165¹ - 2.7 m (9 ft.) (T)</p> <p>14F0070 and 39M5166¹ - 4.3 m (14 ft.) (B) (H) (K) (N) (P) (Q) (R) (S)(T)</p> <p>14F1560 and 39M5299¹ - 4.3 m (14 ft.) (L)</p> <p>14F0067 and 39M5163¹ - 4.3 m (14 ft.)(U)</p>	<p>Cord Rating</p> <p>2.4 kVA cord (B) (G) (H) (K) (T)</p> <p>3.8 kVA cord (C) (I) (J) (L)</p>

Systems and expansion units

(B) - Models 53x I/O Side, and expansion units 5070, 5072, 5080, 5082

(C) - Model 9406-830 in a 0550 rack

(G) - Models 9406-250, 9910-080

(H) - 9251 base I/O, and expansion units 5071, 5073, 5081, 5083

(I) - Models 9910-140, 9910-180

(J) - Features 5033, 5034, 5035

(K) - Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 9316, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251

(L) - Model 9406-830, SB2, 5065, 5066(x2), 5074, 5079(x2), 5094, 5294, 8079, 8093, 8094, 9074, 9079, 9094

(N) - pSeries 640 - B80

(P) - 7025 - pSeries 620 - 6F0, 6F1

(Q) - pSeries 620 (7028) - 6C1

(R) - 7026 - M80, pSeries 660 (7026) - 6H0, 6H1, 6M1

(S) - pSeries 620 (7028) - 6E1

(T) - Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, 7314-G30, 5796, 9406-MMA, 9406-525, 9407-515, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4, 7214-1U2

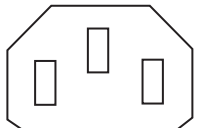
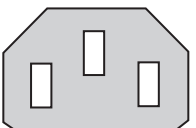
(U) - 7311-D11, 7311-D10, 5790

Note:

1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

Plug and receptacle type 26


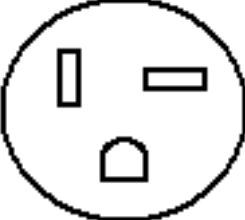
Plug type 26 is a 250 V, 10 A, IEC 320 - C14 plug with a IEC 320 - 13 receptacle.

Plug	Receptacle	Countries/Regions
 <p>IPHAD941-0</p> <p>250V 10A</p>	 <p>IPHAD989-0</p>	<p><i>Worldwide</i></p> <p>IEC 320 - C14 (Plug)</p> <p>IEC 320 - C13 (Receptacle)</p>

Cord Feature	Part Number	Cord Rating
1422 (A)	36L8860 or 36L8913 - 1.8 m (6 ft.)	
6458 (A) (B)	36L8861 or 39M5378 ¹ - 4.3 m (14 ft.)(B)	
6459 (E)	39M5377 - 2.7 m (9 ft.)(C)	
6671 (C)	36L8861 or 39M5375 ¹ - 1.5 m (5 ft.)(D)	
6672 (D)	36L8859 and 39M5374 ¹ - 3.2 m (10.5 ft.)(E)	
<p>Systems and expansion units</p> <p>(A) - 0551 (0121, 0122, 0127 only), 9316, 7116, 7316, 9131-52A, 9133-55A, 7214-1U2</p> <p>(B) - 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, , 5786, , 5787, , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7214-1U2</p> <p>(C) - 0555, 7014-S25 racks, 9131-52A, 9133-55A, 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 9110-510, 7314-G30, 5796, 9406-MMA, 7214-1U2</p> <p>(D) - 0554, 0555, 7014-S11, 7014-S25 racks, 9131-52A, 9133-55A, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 9110-510, 7310-CR3, 7310-C04, 7310-C05, 9406-MMA, 7214-1U2</p> <p>(E) - 7311-D11, 7311-D10, 5790</p>		
<p>Note:</p> <p>1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.</p>		

Plug and receptacle type 29



Plug type 29 is a 250 V, 20 A, NEMA WD-1; 6-20P plug.

Plug	Receptacle	Countries/Regions
 <p>Type 29 250V 20A</p>		<p><i>National Electrical Manufacturers Association NEMA WD-1: 6-20P</i></p> <p>Anguilla, Antigua, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Bonaire, Caicos slands, Canada, Cayman Islands, Colombia, Costa Rica, Curacao, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Japan, Mexico, Netherlands Antilles, Nevis, Nicaragua, Panama, Philippines, Puerto Rico, St. Kitts, St. Martin, Taiwan, Tortola (BVI), Trinidad, Tobago, Turk Islands, United States, Venezuela, Virgin Islands, Yemen</p>

Cord Feature 1401 (J)	Part Number 36L8851 and 39M5301 ¹ - 1.8 m (6 ft.) (J) 36L8852 and 39M5302 ¹ - 2.7 m (9 ft.) (J) 36L8853 and 39M5303 ¹ - 4.3 m (14 ft.) (J)	Cord Rating 3.8 kVA cord (J)
Systems and expansion units (J) - Features 5065, 5066		
Note: 1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.		

Plug and receptacle type 32

Plug type 32 is a 250 V, 10 A or 16 A, SII 32-1971 plug.

Plug  Type 32 250V 10A/16A	Receptacle 	Countries/Regions Standards Institution of Israel SII 32-1971 Israel
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Cord Feature	Part Number	Cord Rating
2961 (B)	14F0086 - 1.8 m (6 ft.)	2.4 kVA cord (B) (G) (H) (K) (T)
(Default) (H)	14F0087 and 39M5172 ¹ - 2.7 m (9 ft.) (G) (T)	3.8 kVA cord (C) (I) (J) (L)
1419 (C) (L)	14F0088 and 39M5173 ¹ - 4.3 m (14 ft.) (B) (H) (K) (N) (P) (Q) (R) (S)(T)	
1445 (K)		
5102 dual power cord (Model 9406-820 only)	14F1561 and 39M5311 ¹ - 4.3 m (14 ft.) (C) (I) (J) (L)	
5103 dual power cord (C)	14F0085 and 39M5170 ¹ - 4.3 m (14 ft.) (U)	
5105 dual power cord (5074 and top expansion unit in 8079)		
5106 dual power cord (single expansion unit in 5079)		
6475 (T)		
6464 (U)		
9827 (N) (P) (Q) (R) (S)		
9904 (Q)		
Migration (J)		

Systems and expansion units

(B) - Models 53x I/O Side, and expansion units 5070, 5072, 5080, 5082

(C) - Model 9406-830 in a 0550 rack

(G) - Models 250, 9910-080

(H) - 9251 base I/O, and expansion units 5071, 5073, 5081, 5083

(I) - Models 9910-140, 9910-180

(J) - Features 5033, 5034, 5035

(K) - Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 9316, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251

(L) - Model 830, SB2, 5065, 5066(x2), 5074, 5079(x2), 5094, 5294, 8079, 8094, 9079, 9094, 5033, 5034, 5035, 9194

(N) - pSeries 640 - B80

(P) - 7025 - pSeries 620 - 6F0, 6F1

(Q) - pSeries 620 (7028) - 6C1

(R) - 7026 - M80, pSeries 660 (7026) - 6H0, 6H1, 6M1

(S) - pSeries 620 (7028) - 6E1

(T) - Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, 7314-G30, 5796, 9406-MMA, 9406-525, 9407-515, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4, 7214-1U2

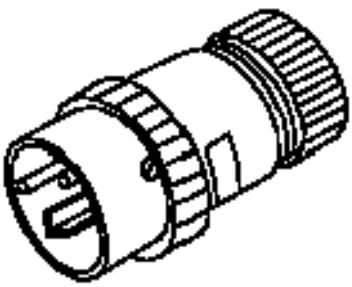

(U) - 7311-D11, 7311-D10, 5790

Note:

1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

Plug and receptacle type 34

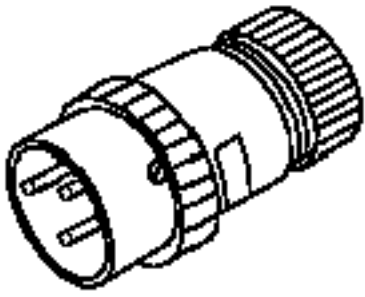
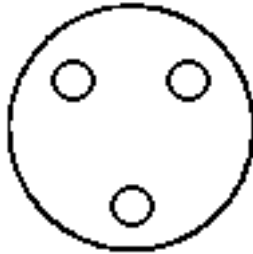
Plug type 34 is a 250 V, 10 A or 15 A, 3720U-2 plug with a 3743U-2 receptacle.

<p>Plug</p> 	<p>Receptacle</p> 	<p>Countries/Regions</p> <p><i>Manufacturer's Number Russel/Stoll</i></p> <p>Plug 3720U-2</p> <p>Connector 3913U-2 (DuraGard 9C23U2)</p> <p>Receptacle 3743U-2 (DuraGard 9R23U2W)</p> <p>Canada, Japan, United States</p>
<p>Type 34 250V 10A/15A Water Resistant</p>		

Cord Feature	Part Number	Cord Rating
1415 (J) (M)	73F4931 - 1.8 m (6 ft.) (B) (H) (J) (M)	2.4 kVA cord (B) (H) (J) (M)
1455 (F) (K) (L)	14F1551 and 39M5313 ¹ - 1.8 m (6 ft.) (D) (F) (K)	3.8 kVA cord (C) (D) (F) (K) (L)
1456 (F) (K) (L)		
1459 (L) (C)	55H6644 and 39M5314 ¹ - 2.7 m (9 ft.) (L)	
2961 + 9080 (B)	73F4932 - 4.3 m (14 ft.) (B) (H) (J)	
2961 + 9080 + 9082 (B)	14F1552 and 39M5315 ¹ - 4.3 m (14 ft.) (C) (D) (F) (K)	
5102 dual power cord (Model 9406-820 only)		
5103 dual power cord (F)		
5105 dual power cord (5074 and top expansion unit in 8079)		
5106 dual power cord (single expansion unit in 5079)		
6498 (M) (J)		
9080 (D) (H)		
9080 + 9082 (D) (H)		
Migration (C)		
<p>Systems and expansion units</p> <p>(B) - Models 53x I/O Side, and expansion units 5070, 5072, 5080, 5082</p> <p>(C) - Expansion units 5033, 5034, 5035</p> <p>(D) - Models 9406-720, 830, SB2</p> <p>(F) - Model 9406-830 in a 0550 rack</p> <p>(H) - 9251 base I/O and expansion units 5071, 5073, 5081, 5083</p> <p>(J) - Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 7316, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251</p> <p>(K) - Models 9406-830, 9406-SB2, 5074, 5094, 9079, 5079, 5294, 8079, 8093, 8094, 9094, 9194, 5096</p> <p>(L) - Model Feature 5079, 5294, 8079, 8094, 5296</p> <p>(M) - Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570 and expansion units used with IBM eServer i5 and eServer p5, 5786, 5787, 7031-D24, 7031-T24, 9131-52A, 9133-55A, 9405-520, 5796, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4</p> <p>Note:</p> <p>1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.</p>		

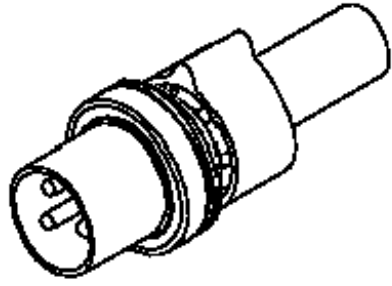

Plug and receptacle type 35

Plug type 35 is a 250 V, 20 A, water resistant, 3720DP plug with a 3743 receptacle.

Plug  Type 35 250V 20A Water Resistant	Receptacle 	Countries/Regions <i>Manufacturer's Number Russel/Stoll</i> Plug 3720DP Connector 3913 (DuraGard 9C23U0) Receptacle 3743 (DuraGard 9R23U0W) US, Canada, Japan
Cord Feature 1407 (J)	Part Number 36L8857 and 39M5319 ¹ - 4.3 m (14 ft.) (J)	Cord Rating 3.8 kVA cord (J)
Systems and expansion units (J) - Features 5065, 5066		
Note: 1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.		

Plug and Receptacle type 40

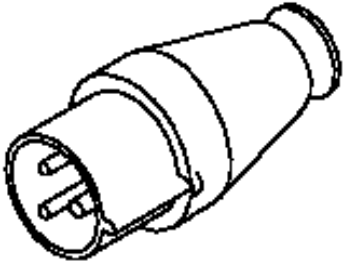

Plug type 40 is a 250 V, 32 A, 3750 plug with a 3753 receptacle.

Plug  Type 40 250V 32A	Receptacle 	Countries/Regions <i>Manufacturer's Number Russel / Stoll</i> Plug 3750 Connector 3933 (DuraGard 9C33U0) Receptacle 3753 (DuraGard 9R33U0W) Canada, United States
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<p>Cord Feature</p> <p>4961 + 9180 (C)</p> <p>4961 + 9180 + 9182 (C)</p> <p>1427(G) (J)</p> <p>5104 dual power cord (G)</p> <p>8622 dual power cord (P)</p> <p>9180 (F)</p> <p>9180 + 9182 (F)</p> <p>9080 (H)</p> <p>9801 (P)</p> <p>9987 (P)</p> <p>6655 (Q)</p>	<p>Part Number</p> <p>46F4593 - 1.8 m (6 ft.) (C) (F) (G) (J) (P)</p> <p>46F4594 - 4.3 m (14 ft.) (C) (F) (G) (H) (J) (P)</p> <p>25R2557 - 4.3 m (14 ft.)(Q)</p>
<p>Cord Rating</p> <p>7.2 kVA cord (C) (F) (G) (J) (P)</p>	
<p>Systems and expansion units</p> <p>(C) - Model 53x Processor Side</p> <p>(F) - Models 9406-730, 9406-740, SB1</p> <p>(G) - Models 9406-840, 9406-SB3</p> <p>(H) - 9309 rack</p> <p>(J) - 0550, 0551, and 7014 racks, 5160</p> <p>(P) - 7017 - S85</p> <p>(Q) - 7188 and 9188 power distribution units</p>	

Plug and receptacle type 46 (P+N+G) [32A]

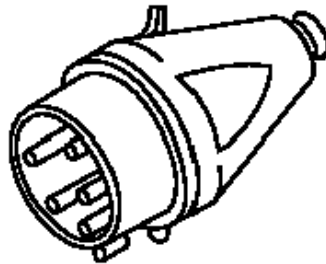
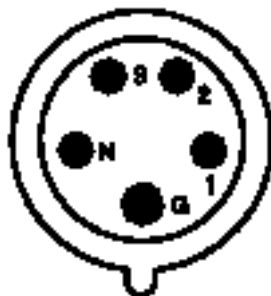
Plug type 46 (P+N+G) is a 250 V, 32 A, IEC 309 plug.

<p>Plug</p>  <p>Type 46 (P+N+G) 250V 32A</p>	<p>Receptacle</p> 	<p>Countries/Regions <i>International Electrotechnical Commission</i></p> <p>IEC 309 (32A)</p> <p>(C) and (F) - Portugal</p> <p>(C) only - Austria, Brazil, Czech Republic, Denmark, Estonia, Ethiopia, Finland, Israel, Latvia, Liberia, Liechtenstein, Lithuania, Malaysia, Russia, Saudi Arabia, Somalia, South Africa, Swaziland, Sudan, Sweden, Switzerland, Turkey, Uganda</p>
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Cord Feature	Part Number
Country Code (F)	76X3559 - 4.3 m (14 ft.) (C)
1449 (J) (G)	21H7693 - 4.3 m (14 ft.) (F) (G) (J) (P)
4961 (C)	
5104 dual power cord (G)	
8622 dual power cord (P)	
9823 (P)	
Cord Rating 7.4 kVA cord (C) (F) (G) (J) (P)	
Systems and expansion units (C) - Model 53x Processor Side (F) - Models 9406-730, 9406-740, SB1 (G) - Models 9406-840 SB3 (J) - 0550, 0551 racks (P) - 7017 - S85	

Plug and receptacle type 46 (3P+N+G)

Plug type 46 (3P+N+G) is a 250 V, 16 A, dual phase, IEC 309 plug.

<div>Plug</div> <div></div>	<div>Receptacle</div> <div></div>	<div>Countries/Regions <i>International Electrotechnical Commission</i></div> <div><i>IEC 309</i></div> <div>Austria, Czech Republic, Denmark, Estonia, Finland, Israel, Latvia, Liechtenstein, Lithuania, Russia, Sweden, Switzerland, Turkey</div>
<div>Type 46 (3P+N+G) 250V 16A, dual phase</div>		
<div>Cord Feature</div> <div>Country Code (F)</div> <div>1450 (G) (J)</div>	<div>Part Number</div> <div>21H7691 - 4.3 m (14 ft.) (F) (G) (J)</div>	
<div>Cord Rating 3.8 kVA cord (F) (G) (J)</div>		

Systems and expansion units

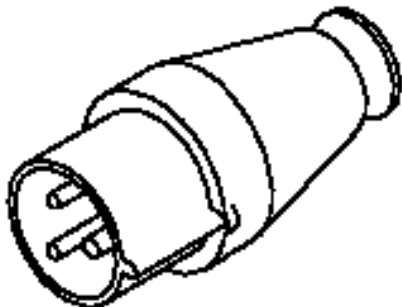

(F) - Models 9406-730, 9406-740, SB1

(G) - Models 9406-840 SB3

(J) - 0550, 0551 racks

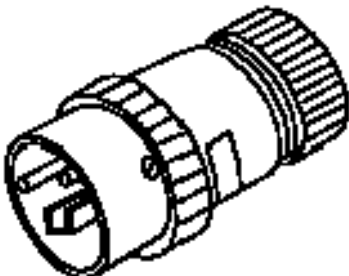

Plug and receptacle type 46 (P+N+G) [16A]

Plug type 46 (P+N+G) is a 250 V, 16 A, IEC 309 plug.

<div>Plug</div> <div></div> <div>Type 46 (P+N+G) 250V 16A</div>	<div>Receptacle</div> <div></div>	<div>Countries/Regions <i>International Electrotechnical Commission</i></div> <div>IEC 309 (16A)</div>
<div>Cord Feature</div> <div>2961 + 9180 + 9182</div> <div>1414 (I)</div> <div>1421 (C) (K)</div> <div>5103 dual power cord (C)</div> <div>5105 dual power cord (5074 and top expansion unit in 8079)</div> <div>5106 dual power cord (single expansion unit in 5079)</div> <div>Migration (J)</div>	<div>Part Number</div> <div>14F1555 - 4.3 m (14 ft.) (C) (I) (J) (K)</div>	
<div>Cord Rating 3.8 kVA cord (C) (I) (J) (K)</div>		
<div>Systems and expansion units</div> <div>(C) - Model 9406-830 in a 0550 rack</div> <div>(I) - Models 9910-140, 9910-180</div> <div>(J) - Features 5033, 5034, 5035</div> <div>(K) - Model 9406-830, SB2, 5065, 5066(x2), 5074, 5079(x2), 5079, 8079, 8094, 9074, 9079</div>		



Plug and receptacle type 51

Plug type 51 is a 125 V, 13 A or 15 A, 3720U-1 plug with a 3743U-1 receptacle.

<p>Plug</p> 	<p>Receptacle</p>  <hr/> <p>Type 51 125V 13A/15A Water Resistant</p>	<p>Countries/Regions</p> <p><i>Manufacturer's Number Russel/Stoll</i></p> <p>Plug 3720U-1</p> <p>Connector (DuraGard 9C23UI)</p> <p>Receptacle 3743U-1 (DuraGard 9R23U1W)</p> <p>Canada, United States</p>
<p>Cord Feature</p> <p>2960 + 9080 (B)</p> <p>2960 + 9080 + 9082 (B)</p>	<p>Part Number</p> <p>46F5893 - 1.8 m (6 ft.) (B)</p> <p>46F5894 - 4.3 m (14 ft.) (B)</p>	
<p>Cord Rating 1.6 kVA cord (B) (A)</p>		
<p>Systems and expansion units</p> <p>(B) - Expansion units 5070, 5072, 5080, 5082</p>		

Plug and receptacle type 54


Plug type 54 is a 250 V, 15 A, SAA-AS 3112 plug.

Plug 	Receptacle  Type 54 250V 15A	Countries/Regions <i>International Electrotechnical Commission</i> SAA-AS 3112 Australia, Fiji, New Zealand, Papua New Guinea, Western Samoa
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Cord Feature 2961 + 9082 1414 (I) 1409 (C) (J) (K) 5103 dual power cord (C) 5105 dual power cord (5074 and top expansion unit in 8079) 5106 dual power cord (single expansion unit in 5079) Migration (J)	Part Number 14F1559 and 39M5331 ¹ - 4.3 m (14 ft.) (C) (I) (J) (K)
Cord Rating 3.8 kVA cord (C) (I) (J) (K)	
Systems and expansion units (C) - Model 9406-830 in a 0550 rack (I) - Models 9910-140, 9910-180 (J) - Features 5033, 5034, 5035 (K) - Model 9406-830, SB2, 5065, 5066(x2), 5074, 5079(x2), 5094, 5294(x2), 8079, 8093, 8094(x2), 9074, 9079, 9094, 9194	
Note: 1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.	

Plug and receptacle type 57


Plug type 57 is a 200 - 240 V, 12 A, NEMA 6-15 plug.

Plug  JIS C-8303-1983 Type 59 nonlocking IPHAD939-0 Type 57 200 - 240 V 12 A	Receptacle Type 57 200 - 240 V 12 A	Countries/Regions NEMA 6-15 Japan
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Cord Feature	Part Number
6687 (A) (B)	25R2576 and 39M5185 ¹ - 1.8 m (6 ft.) (A) (B)
6669 (A) (B)	25R2578 and 39M5187 ¹ - 4.3 m (14 ft.) (A) (B)
6456 (A) (B)	25R2575 and 39M5184 ¹ - 4.3 m (14 ft.) (A) (B)
6691 (C)	25R2573 and 39M5173 ¹ - 1.8 m (6 ft.) (A) (B)
	25R2582 and 39M5335 ¹ - 4.3 m (14 ft.) (A) (B)
	25R2580 and 39M5333 ¹ - 1.8 m (6 ft.) (A) (B)
	25R2581 and 39M5334 ¹ - 2.7 m (9 ft.) (A) (B)
	25R2577 and 39M5186 ¹ - 2.7 m (9 ft.) (A) (B)
	25R2582 and 39M5335 ¹ - 4.3 m (14 ft.) (C)
<p>Systems and expansion units</p> <p>(A) - 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, 7314-G30, 5796, 9406-MMA, 7214-1U2</p> <p>(B) - 7311-D11, 7311-D10, 5790, 7314-G30, 5796, 7214-1U2</p> <p>(C) - Model 9406-830, 9406-SB2, 5074, 5079, 5094, 5294, 8079, 8093, 8094, 9079, 9094, 5033, 5034, 5035, 9194</p>	
<p>Note:</p> <p>1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.</p>	

Plug and receptacle type 59




Plug type 59 is a 125 V, 20 A, JIS C-8303-1983 plug.

<p>Plug</p>  <p>JIS C-8303-1983 Type 59 nonlocking</p> <p>IPHAD939-0</p> <p>Type 59 125V 20A</p>	<p>Receptacle Type 59 250V 15A</p>	<p>Countries/Regions <i>JIS C-8303-1983</i></p> <p>Japan</p>
Cord Feature	Part Number	
2960 (A) (B)	34G0222 and 39M5198 ¹ - 1.8 m (6 ft.) (B) (C)	
2960 + 9082 (B)	34G0223 and 39M5199 ¹ - 2.7 m (9 ft.) (A)	
6670 (C)	34G0224 and 39M5200 ¹ - 4.3 m (14 ft.) (B) (C)	
6660 (C)		

Cord Rating 1.2 kVA cord (A) (B)
<p>Systems and expansion units</p> <p>(A) - Model 9406-270 [<i>plug not available for these models in United States</i>]</p> <p>(B) - Expansion units 5070, 5072, 5080, 5082</p> <p>(C) - Model OpenPower 710, 9110-510, and OpenPower 720, 5786, 5787, 7031-D24, 7031-T24, 9115-505, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 7310-C04, 7310-C05, 7214-1U2</p>
<p>Note:</p> <p>1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.</p>

Plug and receptacle type 62

Plug type 62 is a 250 V, 10 A, CCC certified GB 1053 plug.

<p>Plug</p>  <p>Type 62 250V 10A</p>	<p>Plug</p>  	<p>Countries/Regions <i>International Electrotechnical Commission 320 C13</i></p> <p><i>CCC certified GB 1053</i></p> <p>People’s Republic of China</p>
<p>Cord Feature</p> <p>1395 (K)</p> <p>2961 (B)</p> <p>(Default) (H)</p> <p>1438 (K) (T)</p> <p>1412 (G) (T)</p> <p>5102dual power cord (Model 9406-820 only)</p> <p>6452(U)</p> <p>6493 (T)</p> <p>9831 (N) (P) (Q) (R) (S)</p> <p>9908 (Q)</p>	<p>Part Number</p> <p>02K0547 and 39M5207¹ - 4.3 m (14 ft.) (B) (H) (K) (N) (P) (Q) (R) (S)</p> <p>02K0546 and 39M5206¹ - 2.7 m (9 ft.) (T)</p> <p>02K0544 and 39M5204¹ - 4.3 m (14 ft.)(U)</p>	
<p>Cord Rating 2.4 kVA cord (B) (G) (H) (K) (K) (T)</p>		

Systems and expansion units

(B) - Models 53x I/O Side, and expansion units 5070, 5072, 5080, 5082

(G) - Models 9406-250, 9910-080

(H) - 9251 base I/O, and expansion units 5071, 5073, 5081, 5083

(K) - Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 9316, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251, 7311-D20

(N) - pSeries 640 - B80

(P) - 7025 - pSeries 620 - 6F0, 6F1

(Q) - pSeries 620 (7028) - 6C1

(R) - 7026 - M80, pSeries 660 (7026) - 6H0, 6H1, 6M1

(S) - pSeries 620 (7028) - 6E1

(T) - Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, 7314-G30, 5796, 9406-MMA, 9406-525, 9407-515, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4, 7214-1U2



(U) - 7311-D11, 7311-D10, 5790

Note:

1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

Plug and receptacle type 64

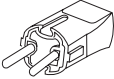

Plug type 64 is a 250 V, 15 A, iNMETRO plug.

<p>Plug</p> 	<p>Receptacle</p>  <p>Type 64 250V 15A</p>	<p>Countries/Regions <i>International Electrotechnical Commission</i></p> <p><i>iNMETRO</i></p>
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<p>Cord Feature</p> <p>2961 + 9082</p> <p>1414 (I) (A)</p> <p>1399 (C) (K) (J)</p> <p>1394 (A)</p> <p>5103 dual power cord (C)</p> <p>5105 dual power cord (5074 and top expansion unit in 8079)</p> <p>5106 dual power cord (single expansion unit in 5079)</p> <p>6495 (L)</p> <p>Migration (J)</p>	<p>Part Number</p> <p>36L8885 and 39M5343¹ - 4.3 m (14 ft.) (C) (K) (J)</p> <p>74P4393 and 39M5240¹ - 2.7 m (9 ft.) (A) (L)</p> <p>36L8884 and 39M5342¹ - 2.7 m (9 ft.) (C) (K)</p>
<p>Cord Rating</p> <p>2.5 kVA cord (A)</p> <p>3.8 kVA cord (C) (I) (J) (K) (L)</p>	
<p>Systems and expansion units</p> <p>(A) - Models 9406-270, 9406-800, 9406-810, 9406-820, 9406-825</p> <p>(C) - Model 9406-830 in a 0550 rack</p> <p>(I) - Models 9910-140, 9910-180</p> <p>(J) - Features 5033, 5034, 5035</p> <p>(K) - Model 9406-830, 9406-SB2, 5065, 5066(x2), 5074, 5079(x2), 5094, 5294(x2), 8079, 8093, 8094(x2), 9074, 9079, 9094, 5033, 5034, 5035, 9194</p> <p>(L) - Models 9406-520, 9111-520, , 9406-525, 9407-515, 9406-550, 9113-550, 9406-570, and 9117-570 and expansion units used with IBM eServer i5 and eServer p5, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4</p>	
<p>Note:</p> <p>1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.</p>	

Plug and receptacle type 66



Plug type 66 is a 200 - 240 V, 10 A, KETI plug.

<p>Plug</p> 	<p>Receptacle</p>  <p>Type 66 200-240 V 10 A</p>	<p>Countries/Regions <i>International Electrotechnical Commission</i></p> <p>KETI</p> <p>North Korea, South Korea</p>
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Cord Feature 6496 (A) (when ordered with IBM eServer i5 and eServer p5) 6454 (B)	Part Number 24P6873 and 39M5219 ¹ - 2.7 m (9 ft.) (A) 24P6877 and 39M5217 ¹ - 4.3 m (14 ft.) (B)
Cord Rating 2.5 kVA cord (A)	
Systems and expansion units (A) - Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, 7314-G30, 5796, 9406-MMA, 9406-525, 9407-515, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4, 7214-1U2 (B) - 7311-D11, 7311-D10, 5790	
Note: 1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.	



Plug and receptacle type 68

Plug type 68 is a 200 - 240 V, 10 A, IS6538 plug.

	 Type 68 200-240 V 10 A	Countries/Regions <i>International Electrotechnical Commission</i> IS6538 India
Cord Feature 6494 (A) (when ordered with IBM eServer i5 and eServer p5) 6451 (B)	Part Number 74P4424 - 2.8 m (9 ft.) (A) 74P4422 - 4.3 m (14 ft.) (B)	
Cord Rating 2.5 kVA cord (A)		
Systems and expansion units (A) - Models 9110-510, 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570, OpenPower 710, OpenPower 720 (B) - 5786, 5787, 7031-D24, 7031-T24, 7311-D10, 7311-D11		

Plug and receptacle type 69

Plug type 69 is a 200 - 240 V, 10 A, IS6538 plug.

<p>Plug</p> 	<p>Receptacle</p>  <p>Type 69 200-240 V 10 A</p>	<p>Countries/Regions <i>International Electrotechnical Commission</i></p> <p>IS6538</p> <p>India</p>
<p>Cord Feature</p> <p>6494 (A) (when ordered with IBM eServer i5 and eServer p5)</p> <p>6451 (B)</p>	<p>Part Number</p> <p>74P4424 and 39M5226¹ - 2.7 m (9 ft.) (A)</p> <p>74P4422 and 39M5224¹ - 4.3 m (14 ft.)(B)</p>	
<p>Systems and expansion units</p> <p>(A) - Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, 7314-G30, 5796, 9406-MMA, 9406-525, 9407-515, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4, 7214-1U2</p> <p>(B) - 7311-D11, 7311-D10, 5790</p>		
<p>Note:</p> <p>1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.</p>		

Plug and receptacle Type 70

Plug type 70 is a 100 - 127 V, 15 A, iNMETRO NBR 6147 plug.

Table 175.


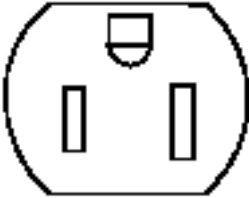


Plug  Type 70 100-127V 15A	Receptacle 	Countries/Regions <i>National Electrical Manufacturers Association</i> iNMETRO NBR 6147 Brazil
Cord Feature 2960 (B) 2960 + 9082 (B) 1398 (B) (K) (U) 6471 (T) 9800 (P) (Q) (S) 9900 (Q) 5102 dual power cord (Model 9406-820 only)	Part Number 75G2695 - 2.7 m (9 ft.) (G) 49P2109 - 1.8 m (6 ft.) (B) (K) (P) (Q) (S) 49P2111 and 39M5234 ¹ - 4.3 m (14 ft.) (B) (K) (P) (Q) (U) 12J5112 - 2.7 m (9 ft.) (I) 86G7648 - 1.8 m (6 ft.) (T) 49P2110 and 39M5233 ¹ - 2.7 m (9 ft.) (T)	

Table 175. (continued)

<p>Cord Rating</p> <p>1.6 kVA Cord (B) (G) (K) (T)</p> <p>2.0 kVA cord (I)</p>
<p>Systems and expansion units</p> <p>(B) - Models 53x I/O Side, and expansion units 5070, 5072, 5080, 5082</p> <p>(G) - Models 9406-250, 9910-080</p> <p>(I) - Models 9910-140</p> <p>(K) - Model 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116</p> <p>(P) - 7025 - pSeries 620 - 6F0, 6F1, pSeries 640 - B80</p> <p>(Q) - pSeries 620 (7028) - 6C1</p> <p>(S) - pSeries 620 (7028) - 6E1</p> <p>(T) - Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, 9406-525, 9407-515, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4, 7214-1U2</p> <p>(U) - 7311-D20</p>
<p>Note:</p> <p>1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.</p>

Plug and receptacle type 72


Plug type 72 is a 250 V, 15 A, CCC certified GB 1053 plug.

<p>Plug</p> 	<p>Receptacle</p>  <p>Type 72 250V 15A</p>	<p>Countries/Regions <i>International Electrotechnical Commission 320 C19</i></p> <p><i>CCC certified GB 1053</i></p> <p>People's Republic of China</p>
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Cord Feature 1396 (J) (K) 2961 + 9082 1414 (I) 1409 (C) (K) 5103 dual power cord (C) 5105 dual power cord (5074 and top expansion unit in 8079) 5106 dual power cord (single expansion unit in 5079) Migration (J)	Part Number 01K9852 and 39M5355 ¹ - 4.3 m (14 ft.) (C) (I) (J) (K)
Cord Rating 3.8 kVA cord (C) (I) (J) (K)	
Systems and expansion units (C) - Model 9406-830 in a 0550 rack (I) - Models 9910-140, 9910-180 (J) - Features 5033, 5034, 5035 (K) - Model 9406-830, SB2, 5065, 5066(x2), 5074, 5079(x2), 5094, 5294(x2), 8079, 8093, 8094(x2), 9079, 9094, 9194	
Note: 1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.	

Plug and receptacle type 73

Plug type 73 is a 250 V, 15 A plug.

Plug  UNIAO CERTIFICADORA Type 73 nonlocking IPHAD940-0	Receptacle Type 73 250V 15A	Countries/Regions Brazil
Cord Feature 1394 (D) 6495 (A) (C) 6499 (D) (B)	Part Number 74P4393 and 39M5240 ¹ - 2.7 m (9 ft.) (A) 25R2584 and 39M5240 ¹ - 2.7 m (9 ft.) (A) (C) 25R2585 and 39M5241 ¹ - 4.3 m (14 ft.) (B) (D)	

Systems and expansion units

(A) - Model 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, OpenPower 710, OpenPower 720, 7314-G30, 5796, 9406-MMA

(B) - 7311-D10, 7311-D11 expansion units, , 5786, 5787, 7031-D24, 7031-T24

(C) - 7310-CR3, 7310-C04, 7310-C05, 7314-G30, 5796, 9406-MMA


(D) - Model 7311-D20, 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 9316, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251

Note:

1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.


Plug and receptacle type 74

Plug type 74 is a 250 V, 15 A plug.

<div>Plug</div> <div></div> <div>UNIAO CERTIFICADORA Type 73 nonlocking</div> <div>IPHAD940-0</div>	<div>Receptacle Type 74 250V 15A</div>	<div>Countries/Regions</div> <div>Brazil</div>
<div>Cord Feature</div> <div>6690(A)</div>	<div>Part Number</div> <div>25R2585 and 39M5241¹ - 4.3 m (14 ft.) (A)</div>	
<div>Systems and expansion units</div> <div>(A) - 7311-D10, 7311-D11 expansion units</div>		

Plug and receptacle type 75


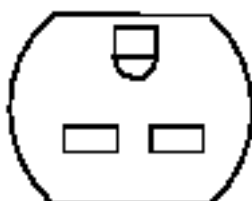
Plug type 75 is a 100 - 127 V, 10 A, NEMA 5-15P plug.

Plug  UNIAO CERTIFICADORA Type 73 nonlocking IPHAD940-0	Receptacle Type 75 100 - 127 V 10A	Countries/Regions NEMA 5-15P Taiwan
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Cord Feature	Part Number
6651 (A)	39M5247 - 2.7 m (9 ft.) (A)
	39M5246 - 1.8 m (6 ft.) (A)
<p>Systems and expansion units</p> <p>(A) - 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, OpenPower 710, OpenPower 720 , 9406-525, 9407-515, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4, 7214-1U2, 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 9316, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251</p>	
<p>Note:</p> <p>1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.</p>	

Plug and receptacle type 76

Plug type 76 is a 200 - 240 V, 15 A plug.

<div>Plug</div> <div></div> <div>Type 76 200 - 240 V 15A</div>	<div>Receptacle</div> <div></div> <div>Type 76 200-240 V 15A</div>	<div>Countries/Regions</div> <div>Taiwan</div>
<div>Cord Feature</div> <div>6659 (A)</div> <div>6663 (B)</div>	<div>Part Number</div> <div>39M5254¹ - 2.7 m (9 ft.) (A)</div> <div>39M5252¹ - 4.3 m (14 ft.) (B)</div>	
<div>Systems and expansion units</div> <div>(A) - 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, 9117-570, 9115-505, 5786 , 5787 , 7031-D24, 7031-T24, 9111-285, 9131-52A, 9133-55A, 7037-A50, 7047-185, 9116-561, 9110-51A, 9110-510, 9405-520, 7310-CR3, 7310-C04, 7310-C05, 9406-270, 9406-800, 9406-810, 9406-820, 9406-825, 5075, 5077, 5095, 7104, 7116, 9316, 5070, 5071, 5072, 5073, 5080, 5081, 5082, 5083, 9251, 7314-G30, 5796, 9406-MMA, 9406-525, 9407-515, 7310-C06, 7310-CR4, 7042-C06, 7042-CR4, 7214-1U2</div> <div>(B) - 7311-D11, 7311-D10, 5790</div>		
<div>Note:</div> <div>1. This part meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.</div>		

Power cords: Plugs and receptacles



Note: When you select a plug and receptacle type, you will see a *Plug and receptacle type* table. Look for your Country or Region (where your system or server will reside) in the *Countries or regions* section

(right side of table) and your model type in the *Systems and expansion units* section (bottom of table). You will find the plug type that supports your system or server in the table that lists both your model and your Country or Region.

Voltage and amperage	Plug and receptacle type
100 - 127 V 10 A	Type 75
100 - 127 V 10A/15A	Type 70
100 - 127 V 12A/16A	Type 51
100 - 127V 15A	Type 4 , Type 7
100 - 127 V 12A	Type 59
100 - 240 V (maximum 12A @ 100 - 127 V ac, maximum 10A @ 200 - 240 V ac)	Type 26
200 - 240 V 10A	Type 2, Type 66, Type 68, Type 69
200 - 240 V 15A	Type 64
200 - 240V 10A	Type 6, Type 19, Type 24, Type 62, Type 76
200 - 240 V 12 A	Type 57
200 - 240 V 10A/15A	Type 34, Type 73
200 - 240 V 10A/16A	Type 25, Type 32
200 - 240 V 10A/13A	Type 23
200 - 240 V 15A	Type 5, Type 54, Type 10, Type 72, Type 74, Type 76
200 - 240 10A/16A	Type 18, Type 22, Type 46 P+N+G, Type 46 3P+N+G
200 - 240 V 20A	Type 11, Type 29, Type 35
200 - 208, 240 V 30A	Type 12 Type 40
250V 32A	Type 46 P+N+G
220V 30 A	Type KP
230 - 240 V 30 A	Type PDL

Plug and receptacle type KP

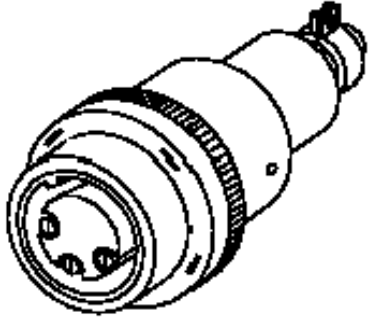
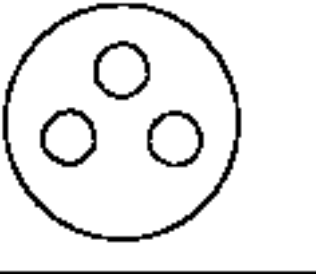
Plug type KP is a 250 V, 30 A plug.

Plug	Receptacle	Countries/Regions
 <p>Type KP 250V 30A</p>		<p>North Korea, South Korea</p>

Cord Feature	Part Number	Cord Rating
4961 + 9180 + 9182 (C) 1446 (G) (J) 5104 dual power cord (G) 6658 (R) 8622 dual power cord (P) 9835 (P) Country Code (F)	87G6067 - 4.3 m (14 ft.) (C) (F) (G) (J) (P) 25R2559 - 4.3 m (14 ft.)(R)	7.5 kVA cord (C) (F) (G) (J) (P)
<p>Systems and expansion units</p> <p>(C) - Model 53x Processor Side</p> <p>(F) - Models 9406-730, 9406-740, SB1</p> <p>(G) - Models 9406-840 SB3</p> <p>(J) - 0550, 0551 racks</p> <p>(P) - 7017 - S85</p> <p>(R) - 7188 and 9188 power distribution units</p>		

Plug and receptacle type PDL



Type PDL is a 250 V, 30 A plug.

<p>Plug</p>  <p>Type PDL 250V 30A</p>	<p>Receptacle</p> 	<p>Countries/Regions Australia, Fiji, New Zealand, Papua New Guinea</p>
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Cord Feature	Part Number
4961 + 9180 + 9182 (C)	11F0106 - 4.3 m (14 ft.) (C) (F) (G) (J) (R)
1447 (G) (J)	• <i>(Australia)</i>
1448 (G) (J)	11F0107 - 4.3 m (14 ft.) (C) (F) (G) (J)
5104 dual power cord (G)	• <i>(New Zealand)</i>
6657 (Q)	
6444 (R)	
8622 dual power cord (P)	
9822 (P)	
9826 (P)	
Country Code (F)	
Cord Rating 6.0 kVA cord (C) (F) (G) (J) (P)	
Systems and expansion units (C) - Model 53x Processor Side (F) - Models 9406-730, 9406-740, SB1 (G) - Models 9406-840 SB3 (J) - 0550, 0551 racks (P) - 7017 - S85 (Q) - 7188 and 9188 power distribution units (R) - System i 5160 PDU for 0551 rack (System p 7014 racks when ordered with IBM eServer p5)	



Plug type 430 P7W and receptacle type 430 R7W

Plug type 430 P7W is a 480 V, 30 A, three phase plug with a 430 R7W receptacle.

Plug	Receptacle	Countries or regions
		Canada, Japan, United States of America
480V, 30A, 3 phase		
Cord Feature	Part Number	
1302 (H)	11P0914 - 1.8 m (6 ft.) (H)	
1303 (H)	11P0916 - 4.3 m (14 ft.) (H)	
Cord Rating		
Systems and expansion units		
(H) - Models 9406-870 and 9406-890		

Plug type 460 P9W and receptacle type 460 R9W

Plug type 460 P9W is a 200 - 240 V, 60 A, three phase plug with a 460 R9W receptacle.

Plug	Receptacle	Countries or regions
		Canada, Japan, United States of America
200-240V, 60A, 3 phase		
Cord Feature	Part Number	
1300 (H)	11P0365 - 1.8 m (6 ft.) (H)	
1301 (H)	11P0367 - 4.3 m (14 ft.) (H)	
Cord Rating		
Systems and expansion units		
(H) - Model 9406-890		

Power cord features

Use the Power cord features table to find the specifications for your power cords.

When ordering power cords (also known as power cables), use power cord options to specify features like length and general plug type.

You can use some of the option numbers in conjunction with each other. For example, 9182 specifies a 4.3 m (14 ft.) cord, and 9183 specifies a locking power cord.

The following lists the power cords and a *general* description of the power cord. Select the option number for a full description, including requirements.

Note: Some features are not available in all Countries or Regions, for all systems, or with all other options. Select the option number and check the full descriptions of the power cord for these prohibitions.

Table 176. Power cord features

Feature or option code	Voltage	Amperage	Length	System connector	Plug	Comments
1300	200-240 V ac	60 A, 3-phase	1.8 m (6 ft.)	04N1868	460P9W wall plug	(9406-870 and 9406-890 only)
1301	200-240 V ac	60 A, 3-phase	4.3 m (14 ft.)	04N1868	460P9W wall plug	(9406-870 and 9406-890 only)
1302	480 V ac	30 A, 3-phase	1.8 m (6 ft.)	11P0767	430P5W wall plug	(9406-870 and 9406-890 only)
1303	480 V ac	30 A, 3-phase	4.3 m (14 ft.)	11P0767,	430P5W wall plug	(9406-870 and 9406-890 only)
1304	380-415 V ac	30 A, 3-phase	4.3 m (14 ft.)	11P0918	no wall plug	(9406-870 and 9406-890 only)
1394	200-240 V ac	16 A	4.3 m (14 ft.)	IEC320-C13	IEC60083 non-locking wall plug	
1395	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	CCC certified GB 1053 non-locking plug	
1396	200-240 V ac	15 A	4.3 m (14 ft.)	IEC320-C19	CCC certified GB 1053 plug	
1397	200 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	IRAM 2073 non-locking wall plug	
1398	100 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	INMETRO NBR 6147 non-locking wall plug	
1399	200 V ac	16 A	4.3 m (14 ft.)	IEC320-C19	IEC60083 wall plug	
1401	200-240 V ac		4.3 m (14 ft.)	IEC320-C19	NEMA 6-20P wall plug	
1406	200-240 V ac	16 A	4.3 m (14 ft.)	IEC320-C19	NEMA L6-20P locking plug	

Table 176. Power cord features (continued)

1407	200-240 V ac	16 A	4.3 m (14 ft.)	IEC320-C19	water-resistant plug	
1408	200-240 V ac	16 A	4.3 m (14 ft.)	IEC320-C19	CEI-16 non-locking wall plug	
1409	200-240 V ac	15 A	4.3 m (14 ft.)	IEC320-C19	AS3112 non-locking plug	
1410	200-240 V ac	12 A	1.8 m (6 ft.)	IEC320-C13	NEMA 6-15P non-locking wall plug	
1411	200-240 V ac	12 A	4.3 m (14 ft.)	IEC320-C13	NEMA 6-15P non-locking wall plug	
1412	100-127 V ac	12 A	1.8 m (6 ft.)	IEC320-C13	NEMA 5-15P non-locking wall plug	
1414	200-240 V ac	12 A	1.8 m (6 ft.)	IEC320-C13	NEMA L6-15P locking wall plug	
1415	200-240 V ac	12 A	1.8 m (6 ft.)	IEC320-C13	water-resistant plug	
1418	200-240 V ac	16 A	4.3 m (14 ft.)	IEC320-C19	SABS 164 non-locking wall plug	
1419	200-240 V ac	16 A	4.3 m (14 ft.)	IEC320-C19	SII-32 wall plug	
1420	200-240 V ac	16 A	4.3 m (14 ft.)	IEC320-C19	Schuko non-locking wall plug	
1421	200-240 V ac	16 A	4.3 m (14 ft.)	IEC320-C19	IEC309 non-locking wall plug	
1422	1. 100-127 V ac 2. 200-240 V ac	1. 12 A 2. 10 A	4.3 m (14 ft.)	IEC320-C13	IEC320-C14	Inside the rack, this cord goes from the 516x PDU to the rack drawer
1426	200-240 V ac	24 A	4.3 m (14 ft.)	L6-30R	NEMA L6-30P locking plug	This connects the 5160 PDU to the wall power source
1427	200-240 V ac	24 A	4.3 m (14 ft.)	L6-30R	Water-resistant plug	This connects the 5160 PDU to the wall power source
1438	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	AS3112 non-locking wall plug	This connects the 5160 PDU to the wall power source

Table 176. Power cord features (continued)

1439	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	Schuko non-locking wall plug	
1440	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	Denmark non-locking wall plug	
1441	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	SABS 164 non-locking wall plug	
1442	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	SEV 24507 non-locking wall plug	
1443	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	BS1363A non-locking wall plug	
1444	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	CEI 23-16 non-locking wall plug	
1445	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	SII-32 non-locking wall plug	
1446	200-240 V ac	30 A	4.3 m (14 ft.)	L6-30R	Korean 32 A non-locking wall plug	This cord connects PDU to wall power source
1447	200-240 V ac	30 A	4.3 m (14 ft.)	L6-30R	Australian 32 A non-locking wall plug	This cord connects PDU to wall power source
1448	200-240 V ac	30 A	4.3 m (14 ft.)	L6-30R	New Zealand 32 A non-locking wall plug	This cord connects PDU to wall power source
1449	200-240 V ac	32 A	4.3 m (14 ft.)	IEC309	IEC 309 3-pin non-locking wall plug	This cord connects PDU to wall power source
1450	200-240 V ac	16 A per phase	4.3 m (14 ft.)	IEC309	IEC 309 5-pin non-locking wall plug	This cord connects PDU to wall power source (2 of 3 phases)
1451	200-240 V ac	12 A	1.8 m (6 ft.)	IEC320-C19	NEMA 6-15P non-locking wall plug	
1452	200-240 V ac	12 A	4.3 m (14 ft.)	IEC320-C19	NEMA 6-15P non-locking wall plug	
1453	200-240 V ac	12 A	1.8 m (6 ft.)	IEC320-C19	NEMA L6-15P locking wall plug	

Table 176. Power cord features (continued)

1454	200-240 V ac	12 A	4.3 m (14 ft.)	IEC320-C19	L6-15P locking wall plug	
1455	200-240 V ac	12 A	1.8 m (6 ft.)	IEC320-C19	Water-resistant wall plug	
1456	200-240 V ac	12 A	4.3 m (14 ft.)	IEC320-C19	Water-resistant wall plug	
1457	200-240 V ac	12 A	2.7 m (9 ft.)	IEC320-C19	NEMA 6-15P non-locking wall plug	
1458	200-240 V ac	12 A	2.7 m (9 ft.)	IEC320-C19	NEMA L6-15P locking wall plug	
1459	200-240 V ac	12 A	2.7 m (9 ft.)	IEC320-C19	Water-resistant wall plug	
1476	200-240 V ac	13 A	4.3 m (14 ft.)	IEC320-C19	BS 1363A non-locking wall plug	
1477	200-240 V ac	16 A per phase	4.3 m (14 ft.)	IEC309R	IEC309 5-pin wall plug	This cord connects the 5163 PDU to wall power source (3 of 3 phases)
2960	100-127 V ac	12 A				Low voltage cord feature
2961	200-240 V ac	10 A				High voltage cord feature
4961	200-240 V ac	30 A				Cord feature
6451	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	IS 6538	
6452	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	GB 1053 (CCC Cert)	
6453	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	IRAM 2073	
6454	200-240 V ac	16 A	4.3 m (14 ft.)	IEC320-C13	KSC 8305	
6455	200-240 V ac	15 A	4.3 m (14 ft.)	IEC320-C13		
6456	200-240 V ac	12 A	4.3 m (14 ft.)	IEC320-C13	NEMA 6-15	
6458	100-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	IEC320-14	Inside the rack, this cord connects a drawer to the PDU for power
6459	200-240 V ac	10 A	3.66 m (12 ft.)	IEC320-C13	IEC320-C14	Inside the rack, this cord connects a drawer to the PDU for power

Table 176. Power cord features (continued)

6460	120-127 V ac	12 A	4.3 m (14 ft.)	IEC320-C13	NEMA 5-15 non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6461	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	CEE 7 VII	
6462	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	DK2-5e	
6463	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	BS1364A	
6464	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	SII 32-1971	
6465	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	SEV 24507	
6466	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	SABS 1661	
6467	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	CEI 23-16	
6468	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	AS3112-1964, NZS 198	
6469	200-240 V ac	12 A (15 A derated)	4.3 m (14 ft.)	IEC320-C13		
6470	100-127 V ac	12 A	1.8 m (6 ft.)	IEC320-C13	NEMA 5-15 non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6471	100-127 V ac	15 A	2.7 m (9 ft.)	IEC320-C13	INMETRO NBR 6147 (NEMA 5-15) non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6472	200-240 V ac	10 A	2.7 m (9 ft.)	IEC320-C13	Schucko non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6473	200-240 V ac	10 A	2.7 m (9 ft.)	IEC320-C13	CEE Danish non-locking plug	This cord connects a deskside or rack drawer to its power source
6474	200-240 V ac	10 A	2.7 m (9 ft.)	IEC320-C13	BS1364A non-locking wall plug	This cord connects a deskside or rack drawer to its power source

Table 176. Power cord features (continued)

6475	200-240 V ac	10 A	2.7 m (9 ft.)	IEC320-C13	SII 32 non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6476	200-240 V ac	10 A	2.7 m (9 ft.)	IEC320-C13	SEV 24507 non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6477	200-240 V ac	10 A	2.7 m (9 ft.)	IEC320-C13	SABS 164 non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6478	200-240 V ac	10 A	2.7 m (9 ft.)	IEC320-C13	CEI 23-16 non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6479	200-240 V ac	10 A	2.7 m (9 ft.)	IEC320-C13	AS3112	This cord connects a deskside or rack drawer to its power source
6487	200-240 V ac	12 A	1.8 m (6 ft.)	IEC320-13	NEMA 6-15 non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6488	200-240 V ac	10 A	2.7 m (9 ft.)	IEC320-13	IRAM 2073 non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6489	380-415 V ac	24 A, 3-phase	4.3 m (14 ft.)	Souriau UTG (32A)	IEC309 (32 A, 3P+N+G) non-locking wall plug	This cord connect the 7188 or 9188 PDU to the wall for power
6491	200-240 V ac	63 A, 1-phase	4.3 m (14 ft.)	Souriau UTG	IEC309 (63 A, P+N+G) non-locking wall plug	This cord connect the 7188 or 9188 PDU to the wall for power

Table 176. Power cord features (continued)

6492	200-240 V ac	48 A, 1-phase	4.3 m (14 ft.)	Souriau UTG	IEC309 (60 A, 2P+G) non-locking wall plug	This cord connect the 7188 or 9188 PDU to the wall for power
6493	200-240 V ac	10 A	2.7 m (9 ft.)	IEC320-C13	GB53 non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6494	200-240 V ac	10 A	2.7 m (9 ft.)	IEC320-C13	IS6538 non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6495	200-240 V ac	10 A	2.7 m (9 ft.)	IEC320-C13	IEC60083-A5 non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6496	200-240 V ac	10 A	2.7 m (9 ft.)	IEC320-C13	KETI non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6497	200-240 V ac	12 A	1.8 m (6 ft.)	IEC320-13	NEMA L6-15 locking wall plug	This cord connects a deskside or rack drawer to its power source
6498	200-240 V ac	12 A	1.8 m (6 ft.)	IEC320-C13	RS37204-2 water-resistant	This cord connects a deskside or rack drawer to its power source
6499	200-240 V ac	15 A	4.3 m (14 ft.)	IEC320-C19		
6651	100 - 127 V ac	10 A	2.7 m (9 ft.)	IEC320-C13	NEMA 5-15P non-locking wall plug	
6653	380-415 V ac	16 A, 3-phase	4.3 m (14 ft.)	Souriau UTG	IEC309 (16 A, 3P+N+G) non-locking wall plug	This cord connect the 7188 or 9188 PDU to the wall for power

Table 176. Power cord features (continued)

6654	200-240 V ac	24 A, 1-phase	4.3 m (14 ft.)	Souriau UTG	NEMA L6-30P locking wall plug	This cord connect the 7188 or 9188 PDU to the wall for power
6655	200-240 V ac	24 A	4.3 m (14 ft.)	Souriau UTG	Water-resistant	This cord connect the 7188 or 9188 PDU to the wall for power
6656	200-240 V ac	32 A	4.3 m (14 ft.)	Souriau UTG	IEC309 (32 A, P+N+G) non-locking wall plug	This cord connect the 7188 or 9188 PDU to the wall for power
6657	200-240 V ac	24 A	4.3 m (14 ft.)	Souriau UTG	Plug type PDL non-locking wall plug	This cord connect the 7188 or 9188 PDU to the wall for power
6658	200-240 V ac	24 A	4.3 m (14 ft.)	Souriau UTG	Plug type KP non-locking wall plug	This cord connect the 7188 or 9188 PDU to the wall for power
6659	200 - 240 V ac	10 A	2.7 m (9 ft.)	IEC320-C13	NEMA 6-15P	
6660	120-127 V ac	15 A	4.3 m (14 ft.)	IEC320-C13	NEMA 5-15 non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6663	200-240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13 right angle	NEMA 6-15P	
6669	200-240 V ac	12 A (15 A derated)	4.3 m (14 ft.)	IEC320-C13		
6670	100-127 V ac	15 A	1.8 m (6 ft.)	IEC320-C13	NEMA 5-15 non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6671	100-240 V ac	10 A (HV), 12 A (LV)	2.7 m (9 ft.)	IEC320-C13	IEC320-C14 wall plug	
6672	100-240 V ac	10 A (HV), 12 A (LV)	1.5 m (5 ft.)	IEC320-C13	IEC320-C14 wall plug	
6673	100-240 V ac	10 A	1 m (3.2 ft.)	IEC320-C13	IEC320-C14 wall plug	
6680	200 - 240 V ac	10 A	2.7 m (9 ft.)	IEC320-C13	AS3112-1964, NZS 198	
6681	200 - 240 V ac	10 A	4.3 m (14 ft.)	IEC320-C13	AS3112-1964, NZS 198	

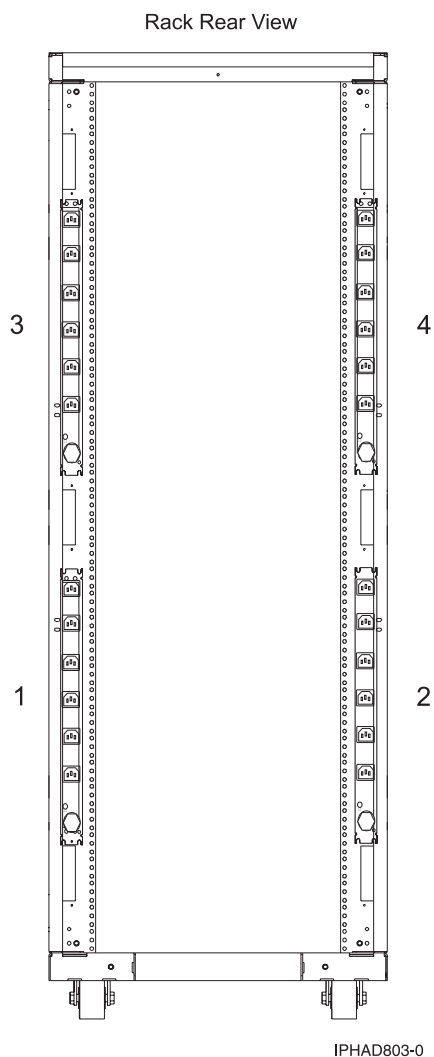
Table 176. Power cord features (continued)

6687	200-240 V ac	15 A	1.8 m (6 ft.)	IEC320-13	NEMA 6-15 non-locking wall plug	This cord connects a deskside or rack drawer to its power source
6690	200-240 V ac	16 A	4.3 m (14 ft.)	IEC320-C19		
6691	200-240 V ac	15 A	4.3 m (14 ft.)	IEC320-C19	NEMA 6-15P Denan	
6692	250 V ac	15 A	4.3 m (14 ft.)	C19	SAA-AS 3112	
8677	380-415 V ac	30 A	4.3 m (14 ft.)		No wall plug provided	
8686	200-240 V ac		4.3 m (14 ft.)		IEC309 wall plug	
8687	200-240 V ac		1.8 m (6 ft.)		IEC309 wall plug	
8688	200-240 V ac		4.3 m (14 ft.)		IEC309 wall plug	
8689	200-240 V ac		1.8 m (6 ft.)		IEC309 wall plug	
8694	380-415 V ac		4.3 m (14 ft.)		No wall plug provided	
8697	480 V ac		4.3 m (14 ft.)		IEC309 wall plug	
8698	480 V ac		1.8 m (6 ft.)		IEC309 wall plug	
9080	200-240 V ac					Water-resistant power cord
9081	200-240 V ac	30 A			NEMA L6-30R	Locking power cord
9180	200-240 V ac					Water-resistant power cord
9182	200-240 V ac		4.3 m (14 ft.) power cord			
9183	200-240 V ac					Locking power cord

Power distribution unit and power cord options for 7014, 0551, or 0553 rack

Power distribution units (PDUs) can be used with the 7014 , 0551, and 0553 racks. The various configurations and specifications are provided.

The following figure shows the four vertical PDU locations in a rack.



Power distribution units (PDUs) are required with 7014-T00, 7014-T42 IBM racks and optional with 7014-B42, 0551, and 0553 IBM racks, except with a 0578 or 0588 expansion unit. If a PDU is not defaulted or ordered, a power cord is provided with each individual rack-mounted drawer for connection to a country-specific utility mains receptacle or uninterruptible power supply. See the individual rack-mounted drawer specifications for the appropriate power cords.

PDU features

The following table describes the PDU features and the racks on which they are used.

Table 177. PDU features

PDU Number	Racks usage
"9188 or 7188 universal PDU" on page 407	7014, 0551, and 0553 IBM racks.
"9176 or 7176 single phase PDU" on page 408	7014 IBM racks
"9177 or 7177 single phase PDU " on page 408	7014 IBM racks
"9178 or 7178 three phase wye PDU" on page 409	7014 IBM racks
"5160 single phase PDU" on page 409	0551 and 0553 IBM racks
"5161 single phase PDU" on page 410	0551 and 0553 IBM racks

Table 177. PDU features (continued)

PDU Number	Racks usage
"5163 three phase wye PDU" on page 410	0551 and 0553 IBM racks
"Power distribution unit plus specifications" on page 411	7014 IBM racks

9188 or 7188 universal PDU

The 9188 or 7188 PDU is available for the 7014-T00, 7014-T42, 0551, and 0553 racks.

The following power cords are supported on the 9188 or 7188:

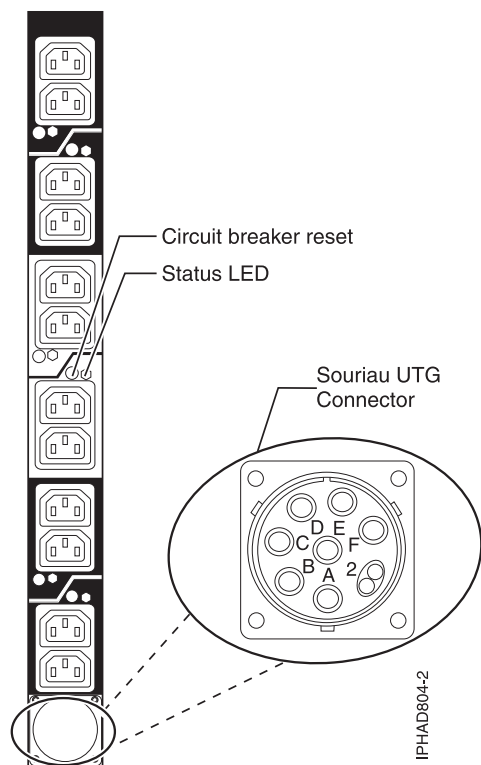
- 6489 - 4.3 m (14 ft.) 3-phase IEC309 3P+N+G 32 A plug (PDU rated 24 A per phase)
- 6491 - 4.3 m (14 ft.) 1-phase IEC309 P+N+G 63 A plug (PDU rated 48 A)
- 6492 - 4.3 m (14 ft.) 1-phase IEC309 2P+G 60 A plug (PDU rated 48 A)
- 6653 - 4.3 m (14 ft.) 3-phase IEC 309 3P+N+G 16 A plug (PDU rated 16 A per phase)
- 6654 - 4.3 m (14 ft.) 1-phase NEMA L6-30 plug (PDU rated 24 A)
- 6655 - 4.3 m (14 ft.) 1-phase Russell Stoll 3750DP plug (PDU rated 24 A)
- 6656 - 4.3 m (14 ft.) 1-phase IEC 309 P+N+G 32A plug (PDU rated 24 A)
- 6657 - 4.3 m (14 ft.) 1-phase PDL 250 V ac; 30 A plug (PDU rated 24 A)
- 6658 - 4.3 m (14 ft.) 1-phase 250 V ac, 30 A Korean plug (PDU rated 24 A)

The amperage rating of the PDU is either 16 A, 24 A, or 48 A, single phase or three phase, depending on the power cord.

Note: All power cords are 4.3 m (14 ft.). For installation in Chicago, only 2.8 m (6 ft.) of the 4.3 m (14 ft.) power cord can extend beyond the perimeter of the rack frame. If more than 2.8 m (6 ft.) can exit the rack, retain any additional cordage within the rack frame via Velcro ties in the cable management space until 2.8 (6 ft.) or less exits the rack.

The PDU has twelve customer-usable IEC 320-C13 outlets rated at 200-240 V ac. There are six groups of two outlets fed by six circuit breakers. Each outlet is rated up to 10 A, but each group of two outlets is fed from one 20 A circuit breaker derated to 16 A. The following IEC 320-C13 to IEC 320-C14 power cords are available to supply power from the PDU outlet to the rack-mounted device:

- 1422 - 3.0 m (10 ft.)
- 6458 - 4.3 m (14 ft.)
- 6459 - 3.7 m (12 ft.)
- 6095 - 3.0 m - 4.3 m (10 ft. - 14 ft.)
- 9911 - 4.3 m (14 ft.)



To calculate the power loading requirements and proper loading sequence for the 7188 and 9188 PDU, see Power load calculating for 7188 or 9188 power distribution units.

9176 or 7176 single phase PDU

The 9176 or 7176 PDU is available for the 7014 racks.

The following power cords are supported on the 9176 or 7176:

- 6442, 9800, or 9824 - 200 V ac; 4.3 m (14 ft.) locking line cord (L6-30P)
- 6443 or 9801 - 200 V ac; 4.3 m (14 ft.) watertight line cord (3750DP)
- 6444 or 9822 - 200 V ac; 4.3 m (14 ft.) PDL 250 V ac; 30 A plug
- 6447 or 9826 - 200 V ac; 4.3 m (14 ft.) PDL 250 V ac; 30 A plug Right Angle
- 6448 or 9835 - 200 V ac; 4.3 m (14 ft.) 250 V ac, 30 A Korean plug
- 6449 or 9986 - 200 V ac; 1.8 m (6 ft.) locking line cord (L6-30P) Chicago
- 6450 or 9987 - 200 V ac; 1.8 m (6 ft.) watertight line cord (3750DP) Chicago

9177 or 7177 single phase PDU

The 9177 or 7177 PDU is available for the 7014 racks.

The following power cord is supported on the 9177 or 7177:

- 6445 or 9823 - 200 V ac; 4.3 m (14 ft.) (IEC 309, 3-pin, 32 A; plug type 46)

9178 or 7178 three phase wye PDU

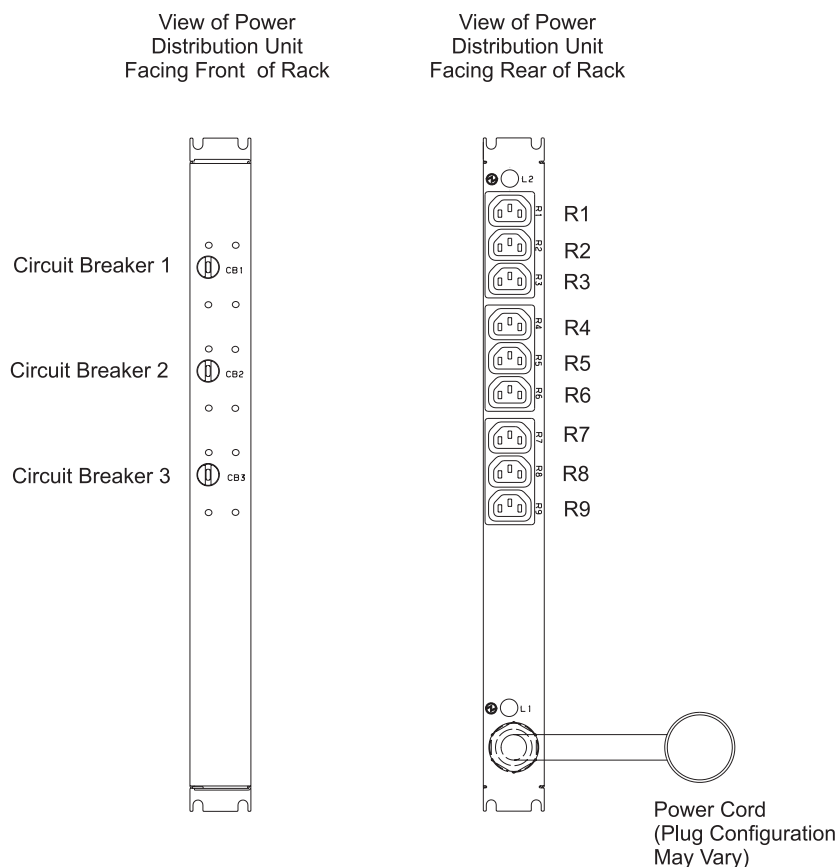
The 9178 or 7178 PDU is available for the 7014 racks.

The following power cord is supported on the 9178 or 7178:

- 400 V ac; 4.3 m (14 ft.) (IEC 309, 5-pin, 16 A; plug type 46)

The PDUs have nine customer-usable IEC 320-C13 outlets rated at 200-240 V ac. There are three groups of three outlets fed by three circuit breakers. Each outlet is rated up to 10 A, but each group of three outlets is fed from one 15 A circuit breaker. The following IEC 320-C13 to IEC 320-C14 power cords are available to supply from the PDU outlet to the rack-mounted device:

- 6095 - 3.0 m – 4.3 m (10 ft. – 14 ft.)
- 9911 - 4.3 m (14 ft.)



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5160 single phase PDU

The 5160 PDU is available for the 0551 and 0553 racks.

The following power cords are supported on the 5160:

- 1426 - 200 V ac; 4.3 m (14 ft.) locking power cord (L6-30P)
- 1427 - 200 V ac; 4.3 m (14 ft.) watertight power cord (3750DP)
- 1446 - 200 V ac; 4.3 m (14 ft.) 30 A Korean (250 V ac, 30 A Korean plug)
- 1447 - 200 V ac; 4.3 m (14 ft.) 30 A AU (PDL 250 V ac; 30 A plug)

- 1448 - 200 V ac; 4.3 m (14 ft.) 30 A NZ (PDL 250 V ac; 30 A plug)

5161 single phase PDU

The 5161 PDU is available for the 0551 and 0553 racks.

The following power cord is supported on the 5161:

- 1449 - 200 V ac; 4.3 m (14 ft.) (IEC 309, 3-pin, 32 A; plug type 46)

5163 three phase wye PDU

The 5163 PDU is available for the 0551 and 0553 racks.

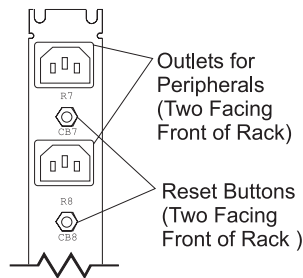
The following power cord is supported on the 5163:

- 1477 - 400 V ac; 4.3 m (14 ft.) (IEC 309, 5-pin, 16 A; plug type 46)

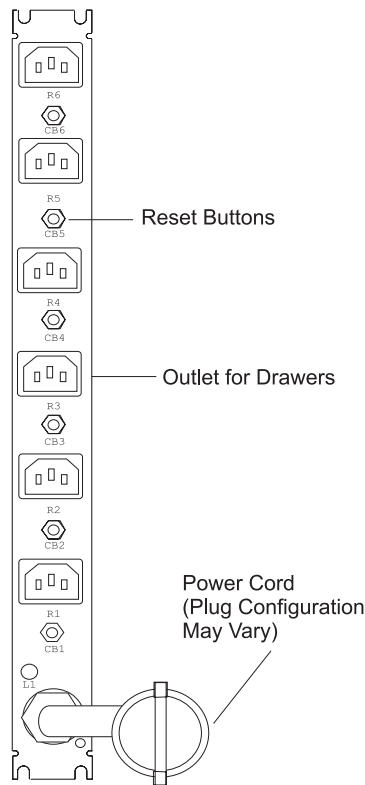
The PDUs have six customer-usable IEC 320-C13 outlets rated at 200-240 V ac. Each outlet is rated 8 A and is protected by a circuit breaker. The following IEC 320-C13 to IEC 320-C14 power cords are available to supply from the PDU outlet to the rack-mounted device:

- 1422 - 3.0 m (10 ft.)
- 6458 - 4.3 m (14 ft.)
- 6459 - 3.7 m (12 ft.)

View of Power
Distribution Unit
Facing Front of Rack



View of Power
Distribution Unit
Facing Rear of Rack



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Typical rack and PDU configurations

See 0551, 0553, or 7014 rack configurations for typical configurations and PDUs when the 0551, 0553, or 7014 rack is populated with various server models.

Power distribution unit plus specifications

The power distribution unit plus (PDU+) has power-monitoring capabilities. The PDU+ is an intelligent ac power distribution unit (PDU+) that monitors the amount of power being used by the devices that are plugged into it. The PDU+ provides twelve C13 power outlets and receives power through a Souriau UTG connector. The PDU+ can be used in many geographies and for many applications by varying the PDU-to-wall power cord, which must be ordered separately. Each PDU+ requires one PDU-to-wall power cord. When the PDU+ is connected to a dedicated power source, it conforms to UL60950, CSA C22.2-60950, EN-60950, and IEC-60950 standards.

The following feature codes are available for the PDU+.

- 5889 - First PDU+ (with 12 IEC 320-C13 outlets) installed on a 7014-S25, 7014-T00, or 7014-T42 rack
- 7109 - Additional PDU+ (with 12 IEC 320-C13 outlets) installed on a 7014-S25, 7014-T00, or 7014-T42 rack
- 7189 - PDU+ (with six IEC 320-C19 outlets) installed on a 7014-B42 rack
- 7196 - PDU+ (with six IEC320-C19 outlets with an attached power cord) installed on a 7014-B42 rack

Table 178. PDU+ specifications

Height	43.9 mm (1.73 in.)
Width	447 mm (17.6 in.)
Depth	350 mm (13.78 in.)
Additional clearance	25 mm (0.98 in.) for circuit breakers 3 mm (0.12 in.) for outlets
Weight (not including power cord)	6.3 kg (13.8 lb.)
Weight of power cord (approximate)	5.4 kg (11.8 lb.)
Operating temperature at 0 - 914 m (0 - 3000 ft) (room ambient)	10 - 35 degrees C (50 - 95 degrees F)
Operating temperature at 914 - 2133 m (3000 - 7000 ft) (room ambient)	10 - 32 degrees C (50 - 90 degrees F)
Operating humidity	8 - 80 % (noncondensing)
Localized air temperature in PDU	60 degrees C (140 degrees F) maximum
Rated voltage for 5889, 7109 and 7189 PDU+	<ul style="list-style-type: none">• 220 - 240 or 380 - 415 V, three phase, Wye, 32 A• 220 - 240 or 380 - 415 V, three phase, Wye, 16A• 220 - 240 V, single phase, 32 A• 220 - 240 V, single phase, 63 A• 200 - 208 V, single phase, 24 A• 200 - 208 V, single phase, 48 A
Rated voltage for 7196 PDU+	200 - 208 V, three phase, Delta, 48 A
Rated frequency (all feature codes)	50 - 60 Hz
Circuit breakers	Six double-pole branch rated circuit breakers rated at 20 A
Power cord features for 5889 and 7109 PDU+	6489, 6491, 6492, 6653, 6654, 6655, 6656, 6657, and 6658
Power cord features for 7189 PDU+	6489, 6491, 6492, 6653
Power cord features for 7196 PDU+	Fixed power cord with IEC 309, 3P+G, 60 A plug

Table 178. PDU+ specifications (continued)

Power outlets for feature codes 7189 and 7196	Six IEC 320-C19 outlets rated at 16 A (VDE) or 20 A (UL/CSA)
Power outlets for feature codes 5889 and 7109	12 IEC 320-C13 outlets rated at 10 A (VDE) or 15 A (UL/CSA)

To use the power-monitoring capabilities of the PDU+, see [Setting up power monitoring using the PDU+](#)

Power load calculating for 7188 or 9188 power distribution units

Learn how to calculate the power load for power distribution units.

Rack-mounted 7188 or 9188 power distribution unit

This topic provides the power loading requirements and proper loading sequence for the 7188 or 9188 power distribution unit.

The IBM 7188 or 9188 rack-mounted power distribution unit (PDU) contains 12 IEC 320-C13 outlets connected to six 20 A circuit breakers (two outlets per circuit breaker). The PDU employs an inlet current that allows a variety of power cord options that are listed in the following chart. Based on the power cord that is used, the PDU can supply from 4.8 kVa to 19.2 kVa.

Table 179. Power cord options

Feature code	Power cord description	KVa available
6489	Power cord, PDU to wall, 4.3 m (14 ft.), 3-phase, Souriau UTG, IEC309 32 A 3P+N+G plug	21.0
6491	Power cord, PDU to wall, 4.3 m (14 ft.), 200 - 240 V ac, Souriau UTG, IEC309 63 A P+N+G plug	9.6
6492	Power cord, PDU to wall, 4.3 m (14 ft.), 200 - 240 V ac, Souriau UTG, IEC309 60 A 2P+G plug	9.6
6653	Power cord, PDU to wall, 4.3 m (14 ft.), 3-phase, Souriau UTG, IEC309 16A 3P+N+G plug	9.6
6654	Power cord, PDU to wall, 4.3 m (14 ft.), 200 - 240 V ac, Souriau UTG, Plug type 12 plug	4.8
6655	Power cord, PDU to wall, 4.3 m (14 ft.), 200 - 240 V ac, Souriau UTG, Plug type 40 plug	4.8
6656	Power cord, PDU to wall, 4.3 m (14 ft.), 200 - 240 V ac, Souriau UTG, IEC309 32 A P+N+G plug	4.8
6657	Power cord, PDU to wall, 4.3 m (14 ft.), 200 - 240 V ac, Souriau UTG, Plug type PDL plug	4.8
6658	Power cord, PDU to wall, 4.3 m (14 ft.), 200 - 240 V ac, Souriau UTG, Plug type KP plug	4.8

Loading requirements

The power loading of the 7188 or 9188 PDU must follow these rules:

1. Total power load connected to the PDU must be limited to below the kVa listed in the table.
2. Total power load connected to any one circuit breaker must be limited to 16 A (derating of circuit breaker).
3. Total power load connected to any one IEC320-C13 outlet must be limited to 10 A.

Note: The load on the PDU when a dual line configuration is used will only be half the total load of the system. When calculating the power load on the PDU, you must include the total power load of each drawer even if the load is distributed over two PDUs.

Proper loading sequence

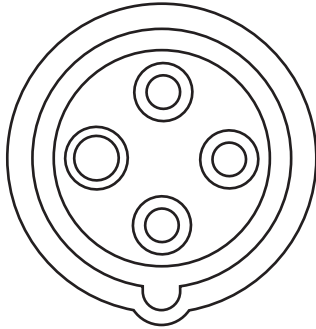
1. Collect power requirements for all units that will be connected to the 7188 or 9188 PDU. See Server specifications for specific power requirements.
2. Sort list by total power required from highest power draw to lowest power draw.
3. Connect highest power drawer to outlet 1 on circuit breaker 1.
4. Connect next highest power drawer to outlet 3 on circuit breaker 2.
5. Connect next highest power drawer to outlet 5 on circuit breaker 3.
6. Connect next highest power drawer to outlet 7 on circuit breaker 4.
7. Connect next highest power drawer to outlet 9 on circuit breaker 5.
8. Connect next highest power drawer to outlet 11 on circuit breaker 6.
9. Connect next highest power drawer to outlet 12 on circuit breaker 6.
10. Connect next highest power drawer to outlet 10 on circuit breaker 5.
11. Connect next highest power drawer to outlet 8 on circuit breaker 4.
12. Connect next highest power drawer to outlet 6 on circuit breaker 3.
13. Connect next highest power drawer to outlet 4 on circuit breaker 2.
14. Connect next highest power drawer to outlet 2 on circuit breaker 1.

Following these rules will allow the load to be distributed more evenly across the six PDU circuit breakers. Ensure that your total power load is below the maximum listed in the table and that each circuit breaker is not loaded above 15 A.

Power cord 1301 for models 9406-870 and 9406-890

This option is the 3-phase, 200-240 V ac, 60 A, 4.3 m (14 ft.) power cord with part number 04N1868 machine input connector, and a 460R9W plug on the wall side.

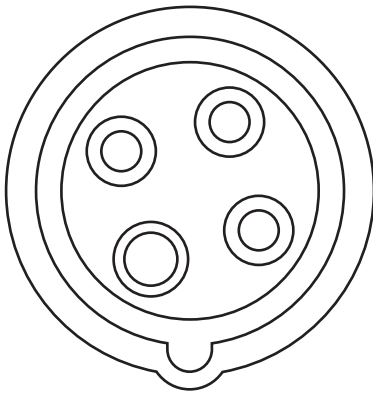
Install the IEC309 receptacle in a metal-backed box with the green wire ground-connected to the grounding lug within the box. Ensure continuity between the box and the metallic shielding of the conduit.



Power cord 1302 for models 9406-870 and 9406-890

This option is the 3-phase, 480 V ac, 30 A, 1.8 m (6 ft.) power cord with part number 11P0767 machine input connector, and a 430R5W plug on the wall side.

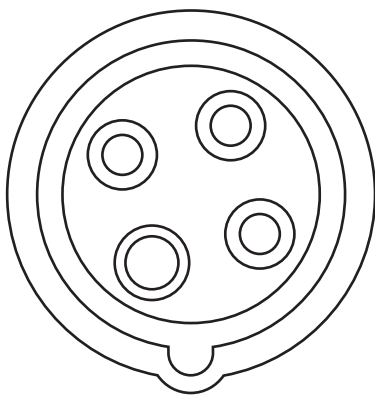
Install the IEC309 receptacle in a metal-backed box with the green wire ground-connected to the grounding lug within the box. Ensure continuity between the box and the metallic shielding of the conduit.



Power cord 1303 for models 9406-870 and 9406-890

This option is the 3-phase, 480 V ac, 30 A, 4.3 m (14 ft.) power cord with part number 11P0767 machine input connector, and a 430R5W plug on the wall side.

Install the IEC309 receptacle in a metal-backed box with the green wire ground-connected to the grounding lug within the box. Ensure continuity between the box and the metallic shielding of the conduit.



Power cord 1304 description

This option is the 3-phase, 380-415 V ac, 30 A, 4.3 m (14 ft.) power cord with part number 11P0918 machine input connector, and no plug on the wall side.

Power cord 1394 description

This option is the 200-240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and an IEC60083 plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-570, and 9117-570570, 9406-270, and 9406-820
- 5075 PCI expansion unit
- 7104 attached expansion unit
- Model 9406-800 or 9406-810
- Model 9406-825
- 5095 PCI-X expansion unit

Power cord 1395 description

This option is the 200-240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and a CCC certified GB 1053 plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-570, and 9117-570, models 9406-270 and 9406-820
- 5075 PCI expansion unit
- 7104 attached expansion unit
- Model 9406-800 or 9406-810
- Model 9406-820
- Model 9406-825
- 5095 PCI-X expansion unit

Power cord 1396 description

This option is the 200-240 V ac, 15 A, 4.3 m (14 ft.) power cord with an IEC 320-C19 machine input connector and a CCC certified GB 1053 plug

This option is used on the following:

- Models 9406-830 and SB2
- 9079 I/O unit and 5074 PCI expansion unit
- 5079 1.8M I/O rack
- 5094 PCI-X expansion unit

- 5294 1.8M I/O rack
- 8094 1.8M I/O rack

Power cord 1397 description

This option is the 200 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC320-C13 system connector and an IRAM 2073 wall plug

This option is used on the following:

- Models 9406-520, 9111-520, 9406-570, 9117-570, 9406-270, 9406-800, 9406-810, and 9406-820
- 5075, 5077, 5095, 7104, and 7116 expansion units

Power cord 1398 description

This option is the 100 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC320-C13 system connector and iNMETRO NBR 6147 wall plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-570, 9117-570, 9406-270, 9406-800, 9406-810, and 9406-820
- 5075, 5095, 7104, and 7116 expansion units

Power cord 1399 description

This option is the 200 V ac, 16 A, 4.3 m (14 ft.) power cord with an IEC320-C19 system connector and IEC60083 wall plug.

This option is used on the following:

- Models 9406-830 and SB2
- 5074 and 5094 expansion units

Power cord 1401 description

This option is the 200-240 V ac, 4.3 m (14 ft.) power cord with an IEC320-C19 machine input connector and a NEMA 6-20P plug on the wall side for the 5065 and 5066 (two cords needed).

Power cord 1406 description

This option is the 200-240 V ac, 16 A, 4.3 m (14 ft.) twist lock/locking power cord with an IEC320-C1 machine input connector and L6-15 wall plug

This option is used on the following:

- Models 9406-830 and SB2
- the 5065, 5066 (two cords needed), 5074 PCI expansion unit, and 5079 (two cords needed) the 1.8M I/O rack
- the 9079 Base I/O Tower in Argentina and Cape Verde Islands only, but worldwide for just the 5065, 5066 (two cords needed).
- 5094 PCI-X expansion unit
- 5294 1.8M I/O rack
- 8094 1.8M I/O rack

Power cord 1407 description

This option is the 200-240 V ac, 16 A, 4.3 m (14 ft.) water-resistant power cord with an IEC320-C19 machine input connector and water-resistant wall plug for just the 5065 and 5066 (two cords needed).

Power cord 1408 description

This option is the 200-240 V ac, 16 A, 4.3 m (14 ft.) power cord with an IEC 320-C19 machine input connector and a CEI16 plug.

This option is used on the following:

- Models 9406-830 and SB2
- 9079 I/O unit and 5074 PCI expansion unit
- 5079 1.8M I/O rack
- 5094 PCI-X expansion unit
- 5294 1.8M I/O rack
- 8094 1.8M I/O rack

Power cord 1409 description

This option is the 200-240 V ac, 15 A, 4.3 m (14 ft.) power cord with an IEC 320-C19 machine input connector and an AS3112 plug.

This option is used on the following:

- Models 9406-830 and SB2
- 9079 I/O unit and 5074 PCI expansion unit
- 5079 1.8M I/O rack
- 5094 PCI-X expansion unit
- 5294 1.8M I/O rack
- 8094 1.8M I/O rack

Power cord 1410 description

This option is the 200-240 V ac, 12 A, 1.8 m (6 ft.) power cord with an IEC 320-C13 machine input connector and NEMA 6-15P wall plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-570, 9117-570, 9406-270 and 9406-820
- 5075 PCI expansion unit
- 7104 attached expansion unit
- Model 9406-800 or 9406-810
- Model 9406-825
- 5095 PCI-X expansion unit

Power cord 1411 description

This option is the 200-240 V ac, 12 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and NEMA 6-15P wall plug.

This option is used on the following:

- Models 9406-270, 9406-810, 9406-820, and 9406-825
- 5075 PCI expansion unit, 5077 migration tower, and 5095 PCI-X expansion unit
- 7104 system unit expansion sidecar

Power cord 1412 description

This option is the 100-127 V ac, 12 A, 1.8 m (6 ft.) power cord with an IEC 320-C13 machine input connector and NEMA 5-15P wall plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-570, 9117-570, 9406-270 and 9406-820
- 5075 PCI expansion unit
- 7104 attached expansion unit
- Model 9406-800 or 9406-810

- Model 9406-825
- 5095 PCI-X expansion unit

Power cord 1414 description

This option is the 200-240 V ac, 12 A, 1.8 m (6 ft.) power cord with a twist-lock and an IEC 320-C13 machine input connector.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-570, 9117-570, 9406-270 and 9406-820
- 5075 PCI expansion unit
- 7104 attached expansion unit
- Model 9406-800 or 9406-810
- Model 9406-825
- 5095 PCI-X expansion unit

Power cord 1415 description

This option is the 200-240 V ac, 12 A, 1.8 m (6 ft.) water-resistant power cord with an IEC320-C13 machine input connector.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-570, 9117-570, 9406-270 and 9406-820
- 5075 PCI expansion unit
- 7104 attached expansion unit
- Model 9406-800 or 9406-810
- Model 9406-825
- 5095 PCI-X expansion unit

Power cord 1418 description

This option is the 200-240 V ac, 16 A, 4.3 m (14 ft.) power cord with an IEC320-C19 machine input connector and SABS164 wall plug.

This option is used on the following:

- Models 9406-830 and SB2
- 5074 PCI expansion unit
- 5079 1.8M I/O rack
- 9079 I/O unit
- 5094 PCI-X expansion unit
- 5294 1.8M I/O rack
- 8094 1.8M I/O rack

Power cord 1419 description

This option is the 200-240 V ac, 16 A, 4.3 m (14 ft.) power cord with an IEC320-C19 machine input connector and SII-32 plug.

This option is used on the following:

- Models 9406-830 and SB2
- 5074 PCI expansion unit
- 5079 1.8M I/O rack
- 9079 I/O unit
- 5094 PCI-X expansion unit

- 5294 1.8M I/O rack
- 8094 1.8M I/O rack

Power cord 1420 description

This option is the 200-240 V ac, 16 A, 4.3 m (14 ft.) power cord with an IEC320-C19 machine input connector and Schuko plug.

This option is used on the following:

- 5074 PCI expansion unit
- 5079 1.8M I/O rack
- 9079 I/O unit
- 5094 PCI-X expansion unit
- 5294 1.8M I/O rack
- 8094 1.8M I/O rack

Power cord 1421 description

This option is the 200-240 V ac, 16 A, 4.3 m (14 ft.) power cord with an IEC320-C19 machine input connector and IEC309 plug.

This option is used on the following:

- Models 9406-830 and SB2
- 5074 PCI expansion unit
- 5079 1.8M I/O rack
- 9079 I/O unit
- 5094 PCI-X expansion unit
- 5294 1.8M I/O rack
- 8094 1.8M I/O rack

Power cord 1422 description

This option is the 100-240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC320-C13 that connects to IEC320-C14, and requires 5160, 5161, or 5162.

Power cord 1426 description

This option is the 200-240 V ac, 24 A, 4.3 m (14 ft.) locking power cord with a NEMA L6-30P wall plug and L6-30R machine input connector for the models 9406-840, SB3, and 0550 and 0551.

Power cord 1427 description

This option is the 200-240 V ac, 4.3 m (14 ft.) water-resistant power cord with a RS 3570 wall plug and a L6-30R machine input connector for the models 9406-840, SB3, and 0550 and 0551.

Power cord 1438 description

This option is the 200-240 V ac, 30 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and an AS3112 plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-570, 9117-570, 9406-270 and 9406-820
- 5075 PCI expansion unit
- 7104 attached expansion unit
- Model 9406-800 or 9406-810
- Model 9406-825
- 5095 PCI-X expansion unit

Power cord 1439 description

This option is the 200-240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and Schuko plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-570, 9117-570, 9406-270 and 9406-820
- 5075 PCI expansion unit
- 7104 attached expansion unit
- Model 9406-800 or 9406-810
- Model 9406-825
- 5095 PCI-X expansion unit

Power cord 1440 description

This option is the 200-240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and a Denmark wall plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-570, 9117-570, 9406-270 and 9406-820
- 5075 PCI expansion unit
- 7104 attached expansion unit
- Model 9406-800 or 9406-810
- Model 9406-825
- 5095 PCI-X expansion unit

Power cord 1441 description

This option is the 200-240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and an SABS164 plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-570, 9117-570, 9406-270 and 9406-820
- 5075 PCI expansion unit
- 7104 attached expansion unit
- Model 9406-800 or 9406-810
- Model 9406-825
- 5095 PCI-X expansion unit

Power cord 1442 description

This option is the 200-240 V ac, 10 A, 4.3 m (14 ft.) power cord.

This option is used on the following:

- Model 9406-520
- Model 9111-520
- Model 9406-570
- Model 9117-570
- 9406-270
- 9406-820
- 7104 expansion unit
- 5077 migrated rack

Power cord 1443 description

This option is the 200-240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and a BS 1363 A plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-570, 9117-570, 9406-270 and 9406-820
- 5075 PCI expansion
- 7104 attached expansion unit
- Model 9406-800 or 9406-810
- Model 9406-825
- 5095 PCI-X expansion unit

Power cord 1444 description

This option is the 200-240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and a CEI23-16 plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-570, 9117-570, 9406-270 and 9406-820
- 5075 PCI expansion unit
- 7104 attached expansion unit
- Model 9406-800 or 9406-810
- Model 9406-825
- 5095 PCI-X expansion unit

Power cord 1445 description

This option is the 200-240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and an SII-32 plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-570, 9117-570, 9406-270 and 9406-820
- 5075 PCI expansion unit
- 7104 attached expansion unit
- Model 9406-800 or 9406-810
- Model 9406-825
- 5095 PCI-X expansion unit

Power cord 1446 description

This option is the 200-240 V ac, 30 A, 4.3 m (14 ft.) power cord with an IEC-309 machine input connector and 32 A Korean plug.

This option is used on the following:

- model 9406-840
- model SB3

Power cord 1447 description

This option is the 200-240 V ac, 30 A, 4.3 m (14 ft.) power cord with an IEC-309 machine input connector and 32 A Australian plug.

This option is used on the following:

- model 9406-840
- model SB3

Power cord 1448 description

This option is the 200-240 V ac, 30 A, 4.3 m (14 ft.) power cord with an IEC-309 machine input connector and 32 A New Zealand plug.

This option is used on the following:

- model 9406-840
- model SB3

Power cord 1449 description

This option is the 200-240 V ac, 32 A, 4.3 m (14 ft.) power cord with an IEC-309 machine input connector and 3-pin, IEC-309 plug.

This option is used on the following:

- model 9406-840
- model SB3

Power cord 1450 description

This option is the 200-240 V ac, 16 A, 4.3 m (14 ft.) power cord with an IEC-309 machine input connector and 5-pin, IEC-309 plug.

This option is used on the following:

- model 9406-840
- model SB3

Power cord 1451 description

This option is the 200-240 V ac, 12 A, 1.8 m (6 ft.) power cord with an IEC320-C19 machine input connector and NEMA 6-15P plug.

This option is used on the following:

- Models 9406-830 and SB2
- 5074 PCI expansion unit
- 5079 1.8M I/O rack
- 9079 I/O unit
- 5094 PCI-X expansion unit
- 5294 1.8M I/O rack
- 8094 1.8M I/O rack
- 5096
- 5296

Power cord 1452 description

This option is the 200-240 V ac, 12 A, 4.3 m (14 ft.) power cord with an IEC320-C19 machine input connector and NEMA 6-15P plug.

This option is used on the following:

- Models 9406-830 and SB2
- 5074 PCI expansion unit
- 5079 1.8M I/O rack
- 9079 I/O unit
- 5094 PCI-X expansion unit
- 5294 1.8M I/O rack
- 5096

- 5296

Power cord 1453 description

This option is the 200-240 V ac, 12 A, 1.8 m (6 ft.) power cord with an IEC320-C19 machine input connector and a NEMA L6-15P twist-lock plug.

This option is used on the following:

- Models 9406-830 and SB2
- 5074 PCI expansion unit
- 5079 1.8M I/O rack
- 9079 I/O unit
- 5094 PCI-X expansion unit
- 5294 1.8M I/O rack
- 8094 1.8M I/O rack
- 5096
- 5296

Power cord 1454 description

This option is the 200-240 V ac, 12 A, 4.3 m (14 ft.) power cord with an IEC320-C19 machine input connector and NEMA L6-15P twist-lock plug.

This option is used on the following:

- Models 9406-830 and SB2
- 5074 PCI expansion unit
- 5079 1.8M I/O rack
- 9079 I/O unit
- 5094 PCI-X expansion unit
- 5294 1.8M I/O rack
- 8094 1.8M I/O rack
- 5096
- 5296

Power cord 1455 description

This option is the 200-240 V ac, 12 A, 1.8 m (6 ft.) power cord with an IEC320-C19 machine input connector and water-resistant plug.

This option is used on the following:

- Models 9406-830 and SB2
- 5074 PCI expansion unit
- 5079 1.8M I/O rack
- 9079 I/O unit
- 5094 PCI-X expansion unit
- 5294 1.8M I/O rack
- 8094 1.8M I/O rack
- 5096
- 5296

Power cord 1456 description

This option is the 200-240 V ac, 12 A, 4.3 m (14 ft.) power cord with an IEC320-C19 machine input connector and water-resistant plug.

This option is used on the following:

- Models 9406-830 and SB2
- 5074 PCI expansion unit
- 5079 1.8M I/O rack
- 9079 I/O unit
- 5094 PCI-X expansion unit
- 5294 1.8M I/O rack
- 8094 1.8M I/O rack
- 5096
- 5296

Power cord 1457 description

This option is the 200-240 V ac, 12 A, 2.7 m (9 ft.) upper power cord with an IEC320-C19 machine input connector and NEMA 6-15P plug.

This option is used on the following:

- 5079 1.8M I/O rack
- 8094 1.8M I/O rack
- 5096
- 5296

Power cord 1458 description

This option is the 200-240 V ac, 12 A, 2.7 m (9 ft.) upper power cord with an IEC320-C19 machine input connector and NEMA 6-15P twist-lock plug.

This option is used on the following:

- 5079 1.8M I/O rack
- 8094 1.8M I/O rack
- 5096
- 5296

Power cord 1459 description

This option is the 200-240 V ac, 12 A, 2.7 m (9 ft.) upper power cord with an IEC320-C19 machine input connector and a water-resistant plug.

This option is used on the following:

- 5079 1.8M I/O rack
- 8094 1.8M I/O rack
- 5096
- 5296

Power cord 1476 description

This option is the 200-240 V ac, 13 A, 4.3 m (14 ft.) power cord with an IEC320-C19 machine input connector and BS 1363 A non-locking plug.

This option is used on the following:

- Models 9406-830 and SB2
- 5074 PCI expansion unit
- 5079 1.8M I/O rack
- 9079 I/O unit

- 5094 PCI-X expansion unit
- 5294 1.8M I/O rack
- 8094 1.8M I/O rack

Power cord 1477 description

This option is the 200-240 V ac, 16 A per phase, 4.3 m (14 ft.) power cord with an IEC309R machine input connector that connects the 5163 PDU to the wall power source.

Power cord 2960 description

This option specifies all power cords for the ordered system unit to be low voltage (100-127 V ac).

The following conditions apply to the use of this option.

- The 2960 option affects the power cord for the models 200, 20S, and 4xx System Units; the 3xx, 5xx, 600, and S10 System Towers; and the 5060, 5061, 5062, 5063, 5070, 5072, 5080, and 5082 expansion units.
- This voltage feature is **not used by** the models 620, 640, 650, 7xx, and 9406-8xx; the models S20, S30, S40, SB1, SB2, and SB3; the 5071, 5073, 5074, 5079, 5065, 5066, 5075, 5081, 5083, and Expansion Units; and the 5033, 5034, 5035, and 5077 Migration Units.
- **You can add the specification codes** 9080, 9082, and 9083 in addition to 2960 to specify other attributes of the line-cord such as length and plug type.
- **You must specify** the I/O side of 530 and 53S system towers separately, using either 2960 or 2961.
- 2961 is **not allowed** on the same power cord as 2960.

Power cord 2961 description

This option specifies all power cords for the ordered system unit to be high voltage (200-240 V ac).

The following conditions apply to the use of this option.

- The 2961 option affects the power cord for the models 200, 20S, and 4xx System Units; the models 3xx, 5xx, 600, and S10 System Towers; and the 5060, 5061, 5062, 5063, 5070, 5072, 5080, and 5082 expansion units.
- This voltage feature is **not used by** the models 620, 640, 650, 7xx, and 9406-8xx; the models S20, S30, S40, SB1, SB2, and SB3; the 5071, 5073, 5074, 5079, 5065, 5066, 5075, 5081, 5083, and Expansion Units; and the 5033, 5034, 5035, and 5077 Migration Units.
- **You can add the specification codes** 9080, 9082, and 9083 in addition to 2961 to specify other attributes of the line-cord such as length and plug type.
- **You must specify** the I/O side of 530 and 53S system towers separately, using 2960 or 2961.
- 2960 is **not allowed** on the same power cord as 2961.

Power cord 4961 description

This option specifies that the power cord for the processor side of the model 53x System Tower is 30 A and 200-240 V ac.

The following conditions apply to the use of this option.

- Models 640, 650, 9406-730, 9406-740, and 9406-840 and models S30, S40, SB1, and SB3 **do not use this power cord**.
- 4961 does not affect other power cords of the system.
- There is **no 120 Volt option** on the processor side of the 53x System Tower; the models 640, 650, 9406-730, 9406-740, and 9406-840; or the models S30, S40, SB1, and SB3.
- **You can add the specification codes** 9180, 9182, and 9183 in addition to 4961 to specify other attributes of the power cord such as length and plug type for the processor side.

Power cord 5102 description

This option is for a dual power cord.

This option is for a model 9406-820. Two 14xx power cords must be ordered for each 5102 on a model 9406-820 initial order.

Power cord 5103 description

This option is for a dual power cord.

This option is for a model 9406-830 or SB2. Two 14xx power cords must be ordered for each 5103 on a model 9406-830 or SB2 initial order.

Power cord 5104 description

This option is the dual power cord.

This option is for a model 9406-840 or SB3. Two 14xx power cords must be ordered for each 5104 on a model 9406-840 or SB3 initial order.

Power cord 5105 description

This option is the dual power cord.

This option is for a 5074 expansion unit and for the top unit in a 8079 expansion unit.

- Two 14xx power cords must be ordered for each 5074 expansion unit with a 5101 when a 5101 is ordered on a 5074 initial order. Batteries are not included and two 840 W power supplies are included.
- When ordering a 5105 for an existing 5074 expansion unit, one additional 14xx power cord must be ordered. The batteries are removed and the 765 W power supplies are replaced with two 840 W power supplies. A 5074 expansion unit installed in a 0551 rack is supported with this feature.

Note: If the 5074 expansion unit has 5101 installed, 5105 must be converted to 5111 (no parts included).

Power cord 5106 description

This option is for a dual power cord.

This option provides dual power cord capability for a single unit in a 5079 expansion unit.

- Two 14xx power cords must be ordered for each 5106 when a 5106 is ordered on a 5079 initial order. Batteries are not included and two 840 W power supplies are included.
- When ordering a 5106 for an existing 5079 expansion unit, one additional 14xx power cord must be ordered. The batteries are removed and the 765 W power supplies are replaced with two 840 W power supplies.

The configurator will default a quantity of two 5106s for each 5079 expansion unit on a server that has dual power cords.

Power cord 6451 description

This option is the 200 - 240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and IS 6538 wall plug.

This option is used on the following:

- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit

Power cord 6452 description

This option is the 200 - 240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and GB 1053 (CCC Cert) wall plug.

This option is used on the following:

- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit

Power cord 6453 description

This option is the 200 - 240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and IRAM 2073 wall plug.

This option is used on the following:

- 7311-D10
- 7311-D11

Power cord 6454 description

This option is the 200 - 240 V ac, 16 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and KSC 8305 wall plug.

This option is used on the following:

- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit

Power cord 6455 description

This option is the 200-240 V ac, 15 A, 4.3 m (14 ft.) power cord with an IEC320-C13 machine input connector.

This option is used on the following:

- 7311-D11
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit

Power cord 6456 description

This option is the 200-240 V ac, 12 A, 4.3 m (14 ft.) power cord with an IEC320-C13 machine input connector.

This option is used on the following:

- 7311-D11

Power cord 6458 description

This option is the 100-240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and an IEC 320-14 plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5095 PCI-X expansion unit
- 9115-505
- 9111-285

- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 7214-1U2

Power cord 6459 description

This option is the 200-240 V ac, 10 A, 3.66 m (12 ft.) power cord with an IEC 320-C13 machine input connector and an IEC 320-14 plug.

This option is used on the following:

- 5790, 7311-D10, 7311-D11 expansion units

Power cord 6460 description

This option is the 120-127 V ac, 12 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and an NEMA 5-15 plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, and 9113-550
- 5786, 5787, 7031-D24, 7031-T24
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6461 description

This option is the 200 - 240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and CEE 7 VII wall plug.

This option is used on the following:

- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit

Power cord 6462 description

This option is the 200 - 240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and DK2-5e wall plug.

This option is used on the following:

- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit

- 7031-T24 expansion unit

Power cord 6463 description

This option is the 200 - 240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and BS1364A wall plug.

This option is used on the following:

- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit

Power cord 6464 description

This option is the 200 - 240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and SII 32-1971 wall plug.

This option is used on the following:

- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit

Power cord 6465 description

This option is the 200 - 240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and SEV 24507 wall plug.

This option is used on the following:

- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit

Power cord 6466 description

This option is the 200 - 240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and SABS 1661 wall plug.

This option is used on the following:

- 7311-D10
- 7311-D11
- 5790

Power cord 6467 description

This option is the 200 - 240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and CEI23-16 wall plug.

This option is used on the following:

- 7311-D10
- 7311-D11
- 5790

Power cord 6468 description

This option is the 200 - 240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and AS3112-1964, NZS 198 wall plug.

This option is used on the following:

- 7311-D10, 7311-D11

Power cord 6469 description

This option is the 200-240 V ac, 12 A (15 A derated), 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector.

This option is used on the following:

- pSeries Models 9111-520, 9113-550, and 9117-570
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6470 description

This option is the 100-127 V ac, 12 A, 1.8 m (6 ft.) power cord with an IEC 320-C13 machine input connector and NEMA 5-15 wall plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, and 9113-550
- 5095 PCI-X expansion unit
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A

- 7037-A50
- 7047-185
- 9406-525
- 9407-515

Power cord 6471 description

This option is the 100-127 V ac, 15 A, 2.7 m (9 ft.) power cord with an IEC320-C13 system connector and an iNMETRO NBR 6147 non-locking wall plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6472 description

This option is the 200-240 V ac, 10 A, 2.7 m (9 ft.) power cord with an IEC 320-C13 machine input connector and Schuko plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6473 description

This option is the 200-240 V ac, 10 A, 2.7 m (9 ft.) power cord with an IEC 320-C13 machine input connector and a CEE wall plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6474 description

This option is the 200-240 V ac, 10 A, 2.7 m (9 ft.) power cord with an IEC 320-C13 machine input connector and a BS 1364 A plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6475 description

This option is the 200-240 V ac, 10 A, 2.7 m (9 ft.) power cord with an IEC 320-C13 machine input connector and an SII-32 plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6476 description

This option is the 200-240 V ac, 10 A, 2.7 m (9 ft.) power cord with an IEC 320-C13 machine input connector and an SEV24507 wall plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6477 description

This option is the 200-240 V ac, 10 A, 2.7 m (9 ft.) power cord with an IEC 320-C13 machine input connector and an SABS164 plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5095 PCI-X expansion unit

- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6478 description

This option is the 200-240 V ac, 10 A, 2.7 m (9 ft.) power cord with an IEC 320-C13 machine input connector and a CEI23-16 plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5095 PCI-X expansion unit
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6479 description

This option is the 200-240 V ac, 10 A, 2.7 m (9 ft.) power cord with an IEC 320-C13 machine input connector and an AS3112 plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5095 PCI-X expansion unit when ordered with IBM eServer i5 and eServer p5
- 5786 expansion unit

- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 7037-A50
- 7047-185
- 9116-561
- 9406-525
- 9407-515

Power cord 6487 description

This option is the 200-240 V ac, 12 A, 1.8 m (6 ft.) power cord with an IEC 320-C13 machine input connector and NEMA 6-15 wall plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5095 PCI-X expansion unit
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515

Power cord 6488 description

This option is the 200-240 V ac, 10 A, 2.7 m (9 ft.) power cord with an IEC320-C13 system connector and an IRAM 2079 wall plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5095 PCI-X expansion unit when ordered with IBM eServer i5 and eServer p5
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 9131-52A

- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6489 description

This option is the 380-415 V ac, 24 A, 3-phase, 24 A, 4.3 m (14 ft.) power cord with a Souriau UTG (32A) system connector and an IEC309 (32 A, 3P+N+G) non-locking wall plug.

This option is used on the following:

- FC 7188 and 9188



Power cord 6491 description

This option is the 200-240 V ac, 63 A, 1-phase, 4.3 m (14 ft.) power cord with a Souriau UTG system connector and an IEC309 (63 A, P+N+G) non-locking wall plug.

This option is used on the following:

- FC 7188 and 9188

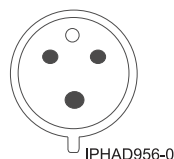


Power cord 6492 description

This option is the 200-240 V ac, 48 A, 1-phase, 4.3 m (14 ft.) power cord with a Souriau UTG system connector and an IEC309 (60 A, 2P+G) non-locking wall plug.

This option is used on the following:

- FC 7188 and 9188



Power cord 6493 description

This option is the 200-240 V ac, 10 A, 2.7 m (9 ft.) power cord with an IEC 320-C13 machine input connector and a GB 53 plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5095 PCI-X expansion unit
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6494 description

This option is the 200-240 V ac, 10 A, 2.7 m (9 ft.) power cord with an IEC 320-C13 machine input connector and a IS 6538 plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5095 PCI-X expansion unit
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6495 description

This option is the 200-240 V ac, 10 A, 2.7 m (9 ft.) power cord with an IEC 320-C13 machine input connector and an IEC 60083-AS plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570

- 5095 PCI-X expansion unit
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6496 description

This option is the 200-240 V ac, 10 A, 2.7 m (9 ft.) power cord with an IEC 320-C13 machine input connector with a KETI wall plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5095 PCI-X expansion unit
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6497 description

This option is the 200-240 V ac, 12 A, 1.8 m (6 ft.) power cord with a twist-lock and an IEC 320-C13 machine input connector and a NEMA L6-15 locking wall plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5095 PCI-X expansion unit

- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9111-285
- 9131-52A
- 9133-55A
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515

Power cord 6498 description

This option is the 200-240 V ac, 12 A, 1.8 m (6 ft.) water-resistant power cord with an IEC320-C13 machine input connector and RS37204-2 water-resistant plug.

This option is used on the following:

- Models 9406-520, 9111-520, 9406-550, 9113-550, 9406-570, and 9117-570
- 5095 PCI-X expansion unit
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9406-525
- 9407-515

Power cord 6499 description

This option is the 200-240 V ac, 15 A, 4.3 m (14 ft.) non-locking power cord with an IEC320-C19 machine input connector.

This option is used on the following:

- 7311-D10, 7311-D11
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit

Power cord 6651 description

This option is the 100-127 V ac, 10 A, 2.7 m (9 ft.) power cord with an IEC 320-C13 machine input connector and NEMA 5-15P wall plug.

This option is used on the following:

- 9113-550
- 9406-520
- 9406-550
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A

- 7037-A50
- 7047-185
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6653 description

This option is the 380-415 V ac, 16 A, 3-phase, 4.3 m (14 ft.) power cord with a Souriau UTG system connector and an IEC309 (16 A, 3P+N+G) non-locking wall plug.

Power cord 6654 description

This option is the 200-240 V ac, 24 A, 1-phase, 4.3 m (14 ft.) power cord with a Souriau UTG system connector and a NEMA L6-30P locking wall plug.

Power cord 6655 description

This option is the 200-240 V ac, 24 A, 4.3 m (14 ft.) power cord with a Souriau UTG system connector and a water-resistant wall plug.

Power cord 6656 description

This option is the 200-240 V ac, 32 A, 4.3 m (14 ft.) power cord with a Souriau UTG system connector and an IEC309 (32 A, P+N+G) non-locking wall plug.

Power cord 6657 description

This option is the 200-240 V ac, 24 A, 4.3 m (14 ft.) power cord with a Souriau UTG system connector and an plug type PDL non-locking wall plug.

Power cord 6658 description

This option is the 200-240 V ac, 24 A, 4.3 m (14 ft.) power cord with a Souriau UTG system connector and a plug type KP non-locking wall plug.

Power cord 6659 description

This option is the 200 - 240 V ac, 10 A, 2.7 m (9 ft.) power cord with an IEC 320-C13 machine input connector and NEMA 6-15P wall plug.

This option is used on the following:

- 9110-510
- 9111-520
- 9113-550
- 9115-505
- 9117-570
- 9406-520
- 9406-550
- 9406-570
- 9406-270
- 9406-800
- 9406-810
- 9406-820
- 9406-825
- OpenPower 705
- OpenPower 710
- OpenPower 720

- 7031-D24
- 7031-T24
- 7311-D20
- 5095
- 5786
- 5787
- 7310-CR3
- 9114-275
- 9114-285
- 7028-6C1/6E1
- 9112-265
- 7029-6C3/6E3
- 7025-6F0/6F1
- 7028-6C4
- 7028-6E4
- 7026-B80
- 7038-6M2
- 5075
- 5077
- 5095
- 7104
- 7116
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6660 description

This option is the 120-127 V ac, 15 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and an NEMA 5-15 plug.

This option is used on the following:

- Model OpenPower 720
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285

- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 7214-1U2

Power cord 6663 description

This option is the 200-240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 right-angle machine input connector.

This option is use on the following:

- 7311-D11, 7311-D10, 5790 expansion units

Power cord 6669 description

This option is the 200-240 V ac, 12 A (15 A derated), 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector.

This option is used on the following:

- OpenPower 720
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 7214-1U2

Power cord 6670 description

This option is the 100-127 V ac, 15 A, 1.8 m (6 ft.) power cord with an IEC 320-C13 machine input connector and NEMA 5-15 wall plug.

This option is used on the following:

- OpenPower 720
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185

Power cord 6671 description

This option is the 100 - 240 V ac, 10 A (HV), 12 A (LV), 2.7 m (9 ft.) power cord with an IEC 320-C13 machine input connector and IEC 320-C14 wall plug.

This option is used on the following:

- 7014-S25 rack
- 0555 rack
- 9131-52A
- 9133-55A
- 9406-MMA
- 7214-1U2

Power cord 6672 description

This option is the 100 - 240 V ac, 10 A (HV), 12 A (LV), 1.5 m (5 ft.) power cord with an IEC 320-C13 machine input connector and IEC 320-C14 wall plug.

This option is used on the following:

- 7014-S11 rack
- 7014-S25 rack
- 0554 rack
- 0555 rack
- 9131-52A
- 9133-55A
- 9406-MMA
- 7214-1U2

Power cord 6673 description

This option is the 100 - 240 V ac, 10 A 1 m (3.2 ft.) power cord with an IEC 320-C13 machine input connector and IEC 320-C14 wall plug.

This option is used on the following:

- 9110-51A
- 9111-520
- 9113-550
- 9115-505
- 9110-510
- 9117-570
- 9406-MMA
- 9131-52A
- 9133-55A
- 9405-520
- 9406-520
- 9406-550
- 9406-570
- 0555 rack

Power cord 6680 description

This option is the 200 - 240 V ac, 10 A, 2.7m (9 ft.) power cord with an IEC 320-C13 machine input connector and AS3112-1964 and NZS 198 wall plug.

This option is used on the following:

- 9110-510
- 9111-520

- 9113-550
- 9115-505
- 9117-570
- 9406-520
- 9406-550
- 9406-570
- 5786
- 5787
- 0595
- 7310-CR3
- 7310-C04
- 5786 expansion unit
- 5787 expansion unit
- 7031-D24 expansion unit
- 7031-T24 expansion unit
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561
- 9406-MMA
- 9406-525
- 9407-515
- 7214-1U2

Power cord 6681 description

This option is the 200 - 240 V ac, 10 A, 4.3 m (14 ft.) power cord with an IEC 320-C13 machine input connector and AS3112-1964 and NZS 198 wall plug.

This option is used on the following:

- 7311-D10
- 7311-D11

Power cord 6687 description

This option is the 200-240 V ac, 15 A, 1.8 m (6 ft.) power cord with an IEC 320-C13 machine input connector and NEMA 6-15 wall plug.

This option is used on the following:

- OpenPower 720
- 9115-505
- 9111-285
- 9131-52A
- 9133-55A
- 7037-A50
- 7047-185
- 9116-561

- 9406-MMA

Power cord 6690 description

This option is the 200-240 V ac, 16 A, 4.3 m (14 ft.) power cord with an IEC 320-C19 machine input connector.

This option is used on the following:

- 7311-D10, 7311-D11 expansion units

Power cord 6691 description

This option is the 200-240 V ac, 15 A, 4.3 m (14 ft.) power cord with an IEC 320-C19 machine input connector and NEMA 6-15P wall plug.

This option is used on the following:

- Expansion units 5074, 5079, 5094, 5294, 8079, 8093, 8094, 9079, 9094, 9194

Power cord 6692 description

This option is the 250 V ac, 15 A, 4.3 m (14 ft.) power cord with an SAA-AS 3112 wall plug with a C19 system connector.

This option is used on the following:

- 9910-P30 uninterruptible power supply
- 9910-P33 uninterruptible power supply

Power cord 8677 description

This option is for the 380-415 V ac, 30 A, 4.3 m (14 ft.) power cord.

This option is used on the following:

- Model 9119-590
- Model 9406-595
- 9119-595

No wall plug is shipped with this power cord.

Power cord 8686 description

This option is the 200-240 V ac, 100 A, 4.3 m (14 ft.) power cord with a IEC309 wall plug.

This option is used on the following:

- Model 9119-590
- 9406-595
- 9119-595

Power cord 8687 description

This option is the 200-240 V ac, 100 A, 1.8 m (6 ft.) power cord with a IEC309 wall plug.

This option is used on the following:

- Model 9119-590
- 9406-595
- 9119-595

Power cord 8688 description

This option is the 200-240 V ac, 60 A, 4.3 m (14 ft.) power cord with a IEC309 wall plug.

This option is used on the following:

- Model 9119-590
- 9406-595
- 9119-595

Power cord 8689 description

This option is the 200-240 V ac, 24 A, 1.8 m (6 ft.) power cord with a IEC309 wall plug.

This option is used on the following:

- Model 9119-590
- 9406-595
- 9119-595

Power cord 8694 description

This option is the 380-415 V ac, 60 A, 4.3 m (14 ft.) power cord.

This option is used on the following:

- Model 9119-590
- 9406-595
- 9119-595

No wall plug is shipped with this power cord.

Power cord 8697 description

This option is the 480 V ac, 30 A, 4.3 m (14 ft.) power cord with an IEC309 wall plug.

This option is used on the following:

- Model 9119-590
- 9406-595
- 9119-595

Power cord 8698 description

This option is the 480 V ac, 30 A, 1.8 m (6 ft.) power cord with an IEC309 wall plug.

This option is used on the following:

- Model 9119-590
- 9406-595
- 9119-595

Power cord 9002 description

This option is specified when a dual power cord is required.

The following conditions apply to this option.

- This specific code is used to determine that the 9406-820 power subsystem is enabled to support dual power cords.
- The 9002 specific code is added to all model 9406-820 servers regardless of the operating system level ordered.

Power cord 9080 description

This option is specified when a water resistant power cord is required.

The following conditions apply to this option.

- **You can add the specification code 9082**, which specifies the length of the power cord.

- 9083 is **not allowed** on the same power cord as 9080.
- Option 9080 is **only available** in Canada, Japan, and the United States.

Power cord 9081 description

This option is specified when a locking power cord is required on the processor side of your rack.

This option is specified when a locking power cord is required on the processor side of the 9309 rack.

- The voltage and amperage rating is: 250V 30A.
- The receptacle number is NEMA L6-30R.

Power cord 9082 description

This option is specified when a 14 ft (4.3 m) power cord is required.

The following conditions apply to this option.

- The **prerequisite** is either 2960 or 2061.
- Option 9082 is **only available** in Canada, Japan, and the United States.

Power cord 9083 description

This option is specified when a locking power cord is required.

The following conditions apply to this option.

- The prerequisite is either 2960 or 2961.
- You can add specification code 9082 in addition to 9083 to specify length of the power cord.
- 9080 is not allowed on the same power cord as 9083.
- Option 9083 is only available in Canada, Japan, and the United States.

Power cord 9180 description

This option is specified when a water-resistant power cord is required.

This option is specified when a water-resistant power cord is required on the processor side of models 53x, 640, 650, S30, S40, and SB1. The following conditions apply to this option.

- The **prerequisite** for the processor side of the 53x System is 4961.
- **You can add specification code 9182** in addition to 9180 to specify length of the power cord.
- 9183 is **not allowed** on the same power cord as 9180.
- Option 9180 is **only available** in Canada, Japan, and the United States.

Power cord 9182 description

This option is specified when a 14 ft (4.3 m) power cord is required.

This option is specified when a 14 ft (4.3 m) power cord is required on the processor side of models 53x, 640, 650, S30, S40, and SB1. The following conditions apply to this option.

- The **prerequisite** for the processor side of the 53x System is 4961.
- **You can add specification codes 9180 or 9183** in addition to 9182 to specify other attributes of the power cord such as length and plug type.

Power cord 9183 description

This option is specified when a locking power cord is required.

This option is specified when a locking power cord is required on the processor side of models 53x, 640, 650, S30, S40, and SB1. The following conditions apply to this option.

- The **prerequisite** for the processor side of the 53x System is 4961.
- **You can add the specification code 9182** in addition to 9183 to specify length of the power cord.

- 9180 is **not allowed** on the same power cord as 9183.

IBM position on modification of IBM-provided power cords

Modification of IBM-provided power cords should only be done in rare circumstances, since the power cords provided with IBM systems meet stringent design and manufacturing specifications.

IBM encourages the use of an IBM released power cord because of the specifications that must be met for both the design and manufacture of our IBM power cords. The specifications, the components used in the design, and the manufacturing process is an external safety agency approved process that is audited by safety agencies on a periodic and ongoing basis to ensure quality and compliance with design requirements.

When a server leaves the manufacturing site, it is safety agency listed, therefore, **IBM does not recommend modifying IBM-provided power cords**. In the rare circumstance where modification of an IBM provided power cord is deemed essential, the customer should:

- Discuss the modification with their insurance provider to assess the effect, if any, on insurance coverage
- Consult with a professional electrician regarding compliance with local codes

The following excerpts from the Services Reference Manual (SRM) explains IBM policy on power cord alteration and the liabilities involved.

SRM EXCERPTS - A cable group associated with a purchased IBM machine, and bearing an IBM label, is the property of the IBM machine owner. All other IBM furnished cable groups (except those for which specific purchase invoices have been paid) are the property of IBM.

Customers assume all risks associated with turning a machine over to others for the performance of technical work such as, but not limited to, the installation or removal of features, alterations or attachments.

IBM will advise the customer of any limitation, resulting from the alteration, affecting IBM's ability to provide Warranty Service or Maintenance after review by the appropriate Service Delivery and Field Marketing Practices personnel.

Definition of an alteration?

An alteration is any change to an IBM machine that deviates from IBM physical, mechanical, electrical, or electronic design (including microcode) whether or not additional devices or parts are used. An alteration is also an interconnection at some place other than an IBM defined interface. See the Multiple Supplier Systems Bulletin for more detail.

For an altered machine, service will be confined to the unaltered portions of the IBM machine.

After inspection, IBM will continue to make Warranty Service or Maintenance available, as appropriate, for the unaltered portion of an IBM machine.

IBM will not maintain the altered portion of an IBM machine under either an IBM Agreement or on an Hourly Service basis.

If you have more questions about power cord modification, contact an IBM service representative.

Plan for cables

Learn how to develop plans for cabling your server and devices.

This topic helps you plan your layout by presenting planning information on some cables used to interconnect the system units and devices. This topic includes information on cable length and measuring techniques and some sample cable planning charts.

You must plan the type of cable, cable path, and cable length, considering not only your current needs, but also your anticipated growth and the relocation of personnel.

To assist with the installation of your system, you should note cable paths on your office layout.

You are responsible for planning for the installation of interconnecting cables, including the proper lightning and surge protection as necessary and should contact the appropriate contractor for guidance and assistance, as required. If the cables specified herein do not meet your needs, talk to your IBM representative or cabling vendor about custom cabling alternatives.

Cabling considerations

- General cabling considerations
- Measuring cables
- Special considerations for model 595 cabling
- Determining cable requirements and ordering cables
- High-speed link
- Serial Attached SCSI cable planning
- Cable connectors
- Twinaxial cables
- Operations Console cables
- Optical cable fiber
- Labels for cabling
- All cables
- Workstation cabling configurations

General cabling considerations

Cabling your server can be fairly complex. Use these guidelines to ensure proper cable installation.

You have to purchase, install, label, and test all your own workstation cables. These are cables to your server, PCs, display stations, and printers. Without cables, however, a server cannot exist. What you really have is a system of cables, connecting everything together. And, if your cables cause problems, your server goes down. Because cables are critical to your business, you should purchase pre-assembled cables rather than assemble the cables yourself.

If you ordered a Total System Package with one or more display stations, you will get one 6 m (20 ft.) cable with your server. If you ordered one or more printers, you will get one 6 m (20 ft.) cable. You have to order any additional cables.

When you map out where your cables will run:

- **Do not create a safety hazard.** Do not route cables where they can harm personnel and equipment. For instance, make sure people can not trip over cables.
- **Do not expose a cable to damage.** Do not route cables near a heat source or where they can be pinched (like under a door).
- **Avoid sources of electrical interference.** Do not route cables near electric motors or transformers.
- **Be careful not to exceed the bend radius** of the cable. This is especially true for the high-speed link cables.

- **Do not lay cables over sharp edges**, the weight of the cable along with vibrations will eventually wear through the cable.

Measuring cables

Accurate measuring of cables is critical to a successful and efficient installation. Do not guess or estimate your cable lengths.

To determine the cable lengths that you need, be sure to consider the following:

- Length allowed for service access, on both server and device ends
- Length from server to floor
 - Tabletop to floor for desktop models
 - 460 mm (1.5 ft.) for desktside models
- Horizontal and vertical cable runs. Be sure to route cables around furniture to avoid tripping hazards.
- Distance from floor to device. (This can include distance between floors, between buildings, and so on, depending on the complexity of the installation.)

For the model 595, the length of the RIO-G cable is a limiting factor in determining the distance between the server and a separately powered I/O frame. For details, see Special considerations for model 595 cabling.

Special requirements for model 595 cabling

The distance between the server frame and the I/O frame is limited by the RIO-G cable length.

The 8 m (26 ft.) RIO-G cable is a limiting factor in determining the distance between the server frame and a separately powered I/O frame. The RIO-G cables are the communication cables that connect the server to the I/O drawers. Up to 2 m (6.5 ft.) of the cable length is needed to exit the server frame. An additional 2 m (6.5 ft.) may be required to connect the I/O drawer in the I/O frame, depending on the position of the drawer in the frame. The additional cable length to go horizontally between the two frames is approximately 1 m (3.2 ft.) even with the frames touching. This leaves approximately 3 m (9.8 ft.) to use under a raised floor or to space the server frame and I/O frame further apart.

Determining cable requirements and ordering cables

Follow these guidelines to select and order the correct cables for your server.

You will need to order, install, label, and test all your own workstation cables. These are cables to your servers, towers, PCs, display stations, and printers. Since assembling cables can be complex, it is recommended that you purchase pre-assembled cables.

For information on high-speed link cabling, see High speed link information.

If you ordered a package with one or more display stations, you will get one 6 m (20 ft.) cable with your server. If you ordered one or more printers, you will get one 6 m (20 ft.) cable. You must order any additional cables separately.

Follow this procedure to order your cables:

1. From the site plan that you drew, determine how much cable you need. See “Measuring cables” to determine the length of cables that you will need.
2. Select the types of cables to view specifications and part numbers:
 - High speed link cables
 - Operations Console cables
 - Twinaxial cables (workstations, remote workstation controllers, host servers)
3. Write down the type and quantity of cables you need in the Workstation Information Form 3B.

4. Using the information you entered in the form, order your cables. Make sure you specify:

- Type of cable (for instance, twinaxial)
- Lengths and quantity of cable (such as, ten 6-foot cables, and so on)
- Type of covering if applicable (like vinyl covered twinaxial cables)

Remember to order any necessary cable accessories, such as adapters and T-connectors.

Note: If you are ordering cables from IBM, you must specify part numbers and, in some cases, length or feature number. Verify the cable part tables (twinaxial cables).

For more details on cables, contact an authorized service provider.

High speed link information

High speed link (HSL) cables connect system units to I/O towers, IXA cards in xSeries® towers and other system units.

High speed link OptiConnect Loop is the designation for an HSL loop which connects multiple systems. It provides system-to-system connectivity and switch disk environments.

Plan for HSL cabling

“High speed link cable options and loop maximums” Contains HSL cables and lists the maximum loops for each server.

“High-speed link terminology” on page 458 Provides definitions for some of the common terms used in HSL cabling information.

HSL and SPCN cable planning guide Lists cables and also contains cable planning diagrams.

For IBM eServer i5 and eServer p5 HSL example configurations, see Examples: RIO/HSL connections.




For IBM eServer i5 and eServer p5 SPCN example configurations, see Examples: SPCN connections.

IBM eServer i5 and eServer p5 HSL configuration and installation

For IBM eServer i5 and eServer p5 HSL configuration and installation information, see Setting up expansion units.

System i HSL configuration and installation

For System i models 9406-270 and 9406-8xx HSL configuration and installation information see:

- Setting Up Your 5088, 5094, or 5095 Expansion Unit 
HSL installation and configuration instructions.
- Setting Up Your 0578, 5074, 5078, or 5079 Expansion Unit 
HSL installation instructions.
- Setting Up Your 5075 Expansion Unit 
HSL installation instructions.

High speed link cable options and loop maximums

Use the Cable options tables to determine the high speed link (HSL) cables available for your servers, expansion units, and the maximum number of expansion units on an HSL loop.

Use the following table to identify the cables for the model numbers and machine types identified.

Table 180. Cable options for the model 270, 800, 810, 820, 825, 830, 840, 870, and 890

Cable feature	Cable name	270	800 and 810	820	825	830 and 840	870 and 890
Copper							
1307	1.75 m (5.7 ft.) HSL-2 cable				X		X
1460	3 m (9.8 ft.) HSL copper cable	X	X	X		X	
1461	6 m (19.7 ft.) HSL copper cable	X	X	X		X	
1462	15 m (49.2 ft.) HSL copper cable			note 2		X	
1474	6 m (19.7 ft.) HSL to HSL-2 cable	X	X	X	X	X	X
1475	10 m (32.8 ft.) HSL to HSL-2 cable			note 2	X	X	X
1481	1.2 m (3.9 ft.) HSL-2 cable				X		X
1482	4 m (13.1 ft.) HSL-2 cable				X		X
1483	10 m (32.8 ft.) HSL-2 cable				X		X
1485	15 m (49.2 ft.) HSL-2 cable				X		X
Fiber Optic	see note 1						
1470	6 m (19.7 ft.) HSL fiber optic cable				X	X	X
1471	30 m (98.4 ft.) HSL fiber optic cable				X	X	X
1472	100 m (328 ft.) HSL fiber optic cable				X	X	X
1473	250 m (820.2 ft.) HSL fiber optic cable				X	X	X
SPCN							
0369	250 m (820.2 ft.) Fiber Optic SPCN cable				X	X	X
1463	2 m (6.6 ft.) SPCN cable	X	X	X	X	X	X
1464	6 m (19.7 ft.) SPCN cable	X	X	X	X	X	X
1465	15 m (49.2 ft.) SPCN cable	X	X	X	X	X	X
1466	30 m (98.4 ft.) SPCN cable	X	X	X	X	X	X
1468	100 m (328 ft.) Fiber Optic SPCN cable				X	X	X

Note:

1. Fiber optic cable requires a base or feature optical HSL port card in the system.
2. 15 m (49.2 ft.) HSL copper cables are not supported on the A1 port of model 820. They can be used on the A0 port of model 820.

Use the following table to identify the RIO/HSL cables for the model numbers and machine types identified.

Table 181. System unit RIO/HSL cable options

Cable feature	9111-520	9405-520 or 9406-520	9113-550 or 720	9406-550	9117-570	9406-570	9118-575	9119-590 or 9119-595	9406-595 or 9411-100 ²
1307 (copper)		X ¹		X ¹		X ¹			X
1308 (copper)		X		X		X			X

Table 181. System unit RIO/HSL cable options (continued)

Cable feature	9111-520	9405-520 or 9406-520	9113-550 or 720	9406-550	9117-570	9406-570	9118-575	9119-590 or 9119-595	9406-595 or 9411-100 ²
1460 (copper)		X		X		X			X
1461 (copper)		X		X		X			X
1462 (copper)				X		X			X
1470 (fiber optic)				X		X			X
1471 (fiber optic)				X		X			X
1472 (fiber optic)				X		X			X
1473 (fiber optic)				X		X			X
1474 (copper)		X		X		X			X
1475 (copper)		X		X		X			X
1481 (copper)		X ¹		X ¹		X ¹			X
1482 (copper)		X		X	X	X			X
1483 (copper)		X		X		X			X
1485 (copper)	X	X		X		X			X
1487 (copper)		X		X		X			X
3146 (copper)	X ¹		X ¹		X		X		
3147 (copper)	X		X		X			X	
3148 (copper)	X		X		X				
3156 (copper)	X ¹		X ¹		X ¹				
3168 (copper)	X				X		X		
3170 (copper)								X	
7924 (copper)							X	X	X

Notes:

1. This cable can be used only for stand-alone system units due to its length.
2. For more information about 9411-100, go to Model 9411-100 features and parts.

Table 182. Cable options for the expansion units available with iSeries servers

Cable feature	Cable name	5074	5075	5078 0578	5079 8079	IXA card	0694 5094 9094	5095 0595	5088 0588	5294 8094
Copper										
1460	3 m (9.8 ft.) HSL copper cable	X	X	X	X	X				
1461	6 m (19.7 ft.) HSL copper cable	X	X	X	X	X				
1462	15 m (49.2 ft.) HSL copper cable	X	X	X	X	X				
1474	6 m (19.7 ft.) HSL to HSL-2 cable	X	X	X	X	X	X	X	X	X
1475	10 m (32.8 ft.) HSL to HSL-2 cable	X	X	X	X	X	X	X	X	X
1482	4 m (13.1 ft.) HSL-2 cable						X	X	X	X
1483	10 m (32.8 ft.) HSL-2 cable						X	X	X	X
1485	15 m (49.2 ft.) HSL-2 cable						X	X	X	X
Optical	see notes									
1470	6 m (19.7 ft.) HSL fiber optic cable	X		X	X		X	X	X	X
1471	30 m (98.4) HSL fiber optic cable	X		X	X		X	X	X	X
1472	100 m (328 ft.) HSL fiber optic cable	X		X	X		X	X	X	X
1473	250 m (820.2 ft.) HSL fiber optic cable	X		X	X		X	X	X	X
SPCN										
0369	250 m (820.2 ft.) Fiber Optic SPCN cable	X		X	X	X	X	X	X	X
1463	2 m (6.6 ft.) SPCN cable	X	X	X	X	X	X	X	X	X
1464	6 m (19.7 ft.) SPCN cable	X	X	X	X	X	X	X	X	X
1465	15 m (49.2 ft.) SPCN cable	X	X	X	X	X	X	X	X	X
1466	30 m (98.4 ft.) SPCN cable	X	X	X	X	X	X	X	X	X
1468	100 m (328 ft.) Fiber Optic SPCN cable	X		X	X	X	X	X	X	X
Note: <ul style="list-style-type: none"> Optical cable requires a base or feature optical HSL port card in the expansion unit. Fiber optic cable requires a base or feature optical HSL port card in the system. 15 m (49.2 ft.) HSL copper cables are not supported on the A1 port of model 820. They can be used on the A0 port of model 820. 										

Table 183. Cable options for the expansion units available with IBM eServer hardware

Cable feature	Cable name	5078 0578	5079 8079	5095 0595	5088 0588	5294 8094
Copper						
1460	3 m (9.8 ft.) HSL copper cable	X	X			
1461	6 m (19.7 ft.) HSL copper cable	X	X			
1462	15 m (49.2 ft.) HSL copper cable	X	X			
1474	6 m (19.7 ft.) HSL to HSL-2 cable	X	X	X	X	X
1475	10 m (32.8 ft.) HSL to HSL-2 cable	X	X	X	X	X
1482	4 m (13.1 ft.) HSL-2 cable			X	X	X
1483	10 m (32.8 ft.) HSL-2 cable			X	X	X

Table 183. Cable options for the expansion units available with IBM eServer hardware (continued)

Cable feature	Cable name	5078 0578	5079 8079	5095 0595	5088 0588	5294 8094
1485	15 m (49.2 ft.) HSL-2 cable			X	X	X
Optical	see notes					
1470	6 m (19.7 ft.) HSL fiber optic cable	X	X	X	X	X
1471	30 m (98.4 ft.) HSL fiber optic cable	X	X	X	X	X
1472	100 m (328 ft.) HSL fiber optic cable	X	X	X	X	X
1473	250 m (820.2 ft.) HSL fiber optic cable	X	X	X	X	X
SPCN						
0369	250 m (820.2 ft.) Fiber Optic SPCN cable	X	X	X	X	X
1463	2 m (6.6 ft.) SPCN cable	X	X	X	X	X
1464	6 m (19.7 ft.) SPCN cable	X	X	X	X	X
1465	15 m (49.2 ft.) SPCN cable	X	X	X	X	X
1466	30 m (98.4 ft.) SPCN cable	X	X	X	X	X
1468	100 m (328 ft.) Fiber Optic SPCN cable	X	X	X	X	X
Note: <ul style="list-style-type: none"> Optical cable requires a base or feature optical HSL port card in the expansion unit. Fiber optic cable requires a base or feature optical HSL port card in the system. 						

Table 184. Maximum expansion units on an HSL Loop for iSeries servers

System Maximums	270	800	810	820	825	830	840	870	870	890	890	520	570
								2489	2486	2487	2488		
HSL loops	1	1	1	1	3	4	8	4	8	12	14	1	2
HSL loops supporting fiber optic cables	0	0	0	0	2	1	2	2	6	10	12	0	1
I/O expansion units	1	1	4	5	18	13	23	23	47	47	47	6	12
IXA cards in xSeries expansion units	2	3	7	8	18	16	60	48	60	60	60	8	16
I/O expansion units and IXA cards	3	4	8	9	27	21	60	48	60	60	60	9	18
HSL OptiConnect loops	1	1	1	1	2	2	4	3	7	11	13	1	2
Fiber optic HSL OptiConnect loops	0	0	0	0	1	1	2	2	6	10	12	0	1
HSL migration expansion unit	0	0	0	1	0	1	1	0	0	0	0	0	0
HSL Loop Maximums													
I/O expansion units	1	1	4	5	6	6	6	6	6	6	6	6	6
IXA cards in xSeries expansion units	2	3	7	8	5*	8	8	8	8	8	8	8	8
I/O expansion units and IXA cards	3	4	8	9	9	9	9	9	9	9	9	9	9
HSL OptiConnect Loop - 2 systems													
I/O expansion units and IXA cards	4	4	4	4	4	4	4	4	4	4	4	4	4
HSL OptiConnect Loop - 3 systems													
I/O expansion units and IXA cards					0	0	0	0	0	0	0	0	0
Note: <ul style="list-style-type: none"> Optical cable requires a base or feature optical HSL port card in the expansion unit. Fiber optic cable requires a base or feature optical HSL port card in the system. 15 m (49.2) HSL copper cables are not supported on the A1 port of model 9406-820. They can be used on the A0 port of model 9406-820. 													

Table 185. RIO/HSL configuration rules for expansion units

Configuration	Maximum number of ports	Maximum number of loops	Maximum number of expansion units per loop	Maximum number of supported expansion units
9111-520 or 9111-285	2	1	4	4
9405-520 or 9406-520	2	1	6	6
9113-550	4	2	4	8
p5 550Q, or 720	4	2	6	12
9406-550	4	2	6	12
9117-570	16	8	4 (7 with a 9411-100 attachment ¹)	14 (20 with a 9411-100 attachment)
9406-570	16	8	6	48
9118-575	2 per node	1 per node	1	1
9119-590	24	12	1 (7 with a 9411-100 attachment ²)	8 (14 with a 9411-100 attachment)
9119-595	48	24	1 (7 with a 9411-100 attachment ²)	12 (18 with a 9411-100 attachment)
9406-595	62	31	6	96
Notes: 1. A model 9117-570 with a 9411-100 attachment cannot be mixed on the same loop as a 7040-61D, 7311-D10, 7311-D11, or 7311-D20 expansion unit. 2. A model 9119-590 or 9119-595 with a 9411-100 attachment cannot be mixed on the same loop as a 5791, 5794, or 7040-61D expansion unit.				

Table 186. RIO/HSL and InfiniBand configuration rules for expansion units for System i

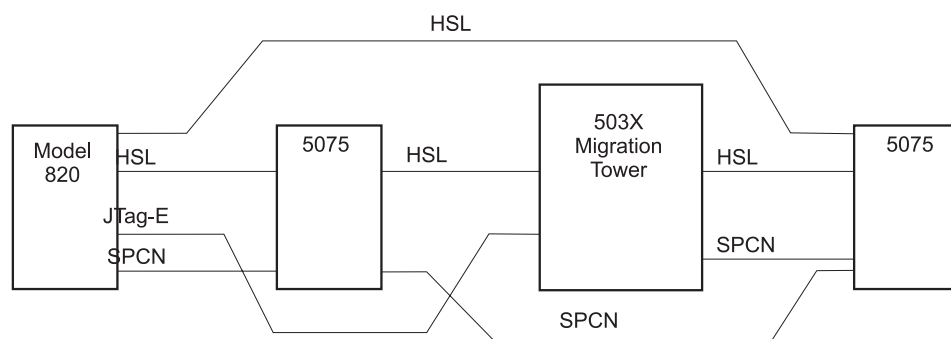
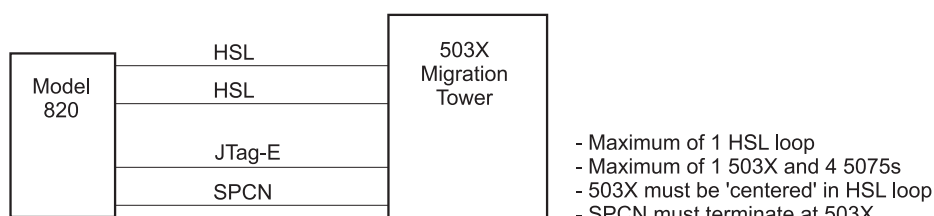
Configuration	Maximum number of ports	Maximum number of loops	Maximum number of expansion units per loop	Maximum number of supported expansion units
9406-MMA (RIO/HSL)	16	8	6	48
5790				
5095				
0595				
9406-MMA (12x adapter)	16	8	4	32
5796				

Table 187. RIO/HSL and InfiniBand configuration rules for expansion units for System p

Configuration	Maximum number of ports	Maximum number of loops	Maximum number of expansion units per loop	Maximum number of supported expansion units
9117-MMA(RIO/HSL) 7311-D11 7311-D20	16	8	4	20
9117-MMA (12x adapter) 7314-G30	16	8	4	32

HSL loop configuration

Use this figure to set up an HSL loop for your Model 820.



psi001

High-speed link terminology

Use this information to familiarize yourself with basic high-speed link cable terminology.

The following list provides the terminology used for high-speed link cabling.

- **Alternate server:** For a given tower, the server to which a tower can be switched.
- **Base tower:** Same as power-controlled tower.
- **Central electronics complex (CEC) node:** A node that is the hub for a server.
- **External tower:** An I/O tower that is contained within a physical package separate from a CEC. Note that more than one external tower might be contained within a single physical package (for example, a 5079 tower is actually two external towers).
- **Home server:** Same as power-controlling server.
- **HSL:** High-speed link technology. A high-speed connection mechanism that takes advantage of the I/O bus structure or the memory to connect multiple systems or partitions.

- **HSL loop segment:** A portion of an HSL loop whose endpoints are defined by two CEC nodes (servers) and which contains only I/O nodes.
- **HSL OptiConnect:** The System i system area network that provides high-speed interconnectivity between multiple System i systems in a local environment. Along with WAN and LAN technologies, OptiConnect provides the high-speed connectivity between cluster nodes in System i cluster environments.
- **Internal tower:** An I/O tower that is contained within the same physical package as a server.
- **I/O node:** A node that is the bridge to an I/O tower (internal or external) or IXS tower.
- **IXS tower:** Integrated xSeries^(TM) Server tower (cannot be switchable, such as, an IXS tower is always a private tower).
- **Managing server:** Same as owning server.
- **Node:** An addressable entity on an HSL loop.
- **Owning server:** The server that is currently responsible for accessing and controlling a tower.
- **Power-controlling server:** For a given tower, the server that has system power control network (SPCN) control over that tower.
- **Power-controlled tower:** For a given system, a tower over which that system has SPCN control.
- **Private tower:** A tower that is not switchable.
- **Switchable tower:** A tower that has been configured to allow it to be owned by an alternate system.
- **Switched tower:** A tower that is currently owned by the alternate system.

HSL, SPCN, RIO and InfiniBand cable planning

Use these tables to select your HSL, SPCN, RIO and InfiniBand cables.

The following table shows the high speed link (HSL) cable descriptions and feature code numbers available for your servers and expansion units.

Table 188. HSL cables

Cable	Number
HSL - 3 m (9.8 ft.)	1460
HSL - 6 m (19.7 ft.)	1462
HSL - 15 m (49.2 ft.)	1462
HSL - 6 m (19.7 ft.)	1470
HSL - 30 m (98.4 ft.)	1471
HSL - 100 m (328 ft.)	1472
HSL - 250 m (820.2 ft.)	1473
HSL to HSL2 - 6 m (19.7 ft.)	1474
HSL to HSL2 - 10 m (32.8 ft.)	1475
HSL2 - 1 m (3.28 ft.)	1481
HSL2 - 3.5 m (11.5 ft.)	1482
HSL2 - 10 m (32.8 ft.)	1483
HSL2 - 15 m (49.2 ft.)	1485

The following table shows the InfiniBand cable descriptions and feature code numbers available for your servers and expansion units.

Table 189. InfiniBand cables

Cable feature	Cable type	Length	Part number
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Table 189. InfiniBand cables (continued)

1829	12x InfiniBand cable	0.6 m (2 ft.)	41V0226
1830	12x InfiniBand cable	1.5 m (5 ft.)	41V0227
1834	12x InfiniBand cable	8 m (26 ft.)	39J5642
1840	12x InfiniBand cable	3 m (9.8 ft.)	42V2132

The following table shows the SPCN cable descriptions and feature code numbers available for your servers and expansion units.

Table 190. SPCN cables

Cable	Number
SPCN - 2 m (6.6 ft.)	1463
SPCN - 6 m (19.7 ft.)	1464
SPCN - 15 m (49.2 ft.)	1465
SPCN - 30 m (98.4 ft.)	1466
SPCN - 2 m (6.6 ft.)	6001
SPCN - 3 m (9.8 ft.)	6006
SPCN - 6 m (19.7 ft.)	6008
SPCN - 15 m (49.2 ft.)	6007
SPCN - 30 m (98.4 ft.)	6029

The following table shows the RIO cable descriptions and feature code numbers available for your servers and expansion units.

Table 191. RIO cables

Cable	Number
RIO - 1.2 m (3.9 ft.)	3146
RIO - 3.5 m (11.5 ft.)	3147
RIO - 1.75 m (5.7 ft.)	3156
RIO - 10 m (32.8 ft.)	3148
RIO - 2.5 m (8.2 ft.)	3168

HSL handling requirements

The cables are included with protective coverings (end caps) over the connectors. The purpose of these end caps is to protect the cable ends from mechanical damage and contact contamination. Keep the end caps on while routing cables, etc. until it is time to plug the connectors into the equipment.

Excess cable may be coiled. The recommended bend radius is 152.4 mm (6 in.); however, the minimum bend radius is 76.2 mm (3 in.). If cable ties or other restraining devices are used to hold the coiled cable in place, make sure these fit loosely on the cable jacket. In general, do not compress or crush the cables. This might result in mechanical damage to the wires and insulation.

Note:

1. The 15 m (49.2 ft.) HSL cable (1462) is not supported on the 9406-270.

2. A 15 m (49.2 ft.) HSL cable should not be used to directly connect the system unit port A1 on the model 9406-820 to a 5075, 5074, or 5079. It can be used for all other connections on the model 9406-820. For the 9406-830 and 9406-840, 1462 can be used for all connections.

Serial attached SCSI cable planning

Serial attached SCSI (SAS) cables provide serial communication for transfer of data for directly attached devices, such as hard drives and CD-ROM drives.

SAS cable overview

Serial attached SCSI (SAS) is an evolution of the parallel SCSI device interface into a serial point-to-point interface. SAS physical links (phys) are a set of four wires used as two differential signal pairs. One differential signal transmits in one direction while the other differential signal transmits in the opposite direction. Data may be transmitted in both directions simultaneously. Phys are contained in ports. A port contains one or more phys. A port is a wide port if there are more than one phy in the port. Wide ports are designed to enhance performance and provide redundancy should an individual phy fail.

Each SAS cable contains four SAS phys that are typically organized into either a single 4x SAS port or two 2x SAS ports. Each end of the cable uses a mini SAS 4x connector. Review the following design and installation criteria before installing your SAS cables:

- Only specific cabling configurations are supported. Many configurations could be constructed that are not supported and will either not function correctly or will generate errors. Refer to “SAS cabling configurations” on page 464 for diagrams of the supported cabling configurations.
- Each mini-SAS 4x connector is keyed to help prevent cabling an unsupported configuration.
- Each cable end has a label that graphically describes the correct component port to which it is connected, such as:
 - SAS adapter
 - Expansion drawer
 - System external SAS port
 - Internal SAS disk slots connection.
- Cable routing is extremely important. For example, YO, YI, and X cables must be routed along the right side of the rack frame (as viewed from the rear) when connecting to a disk expansion drawer. Additionally, X cables must be attached to the same numbered port on both SAS adapters to which it connects.
- When a choice of cable lengths is available, select the shortest cable that will provide the needed connectivity.
- Always use care when inserting or removing a cable. The cable should slide easily into the connector. Forcing a cable into a connector can cause damage to the cable or connector.

Supported SAS cable information

The following table contains a list of the supported SAS cable types and their designed usage.

Table 192. Functions for supported SAS cables

Cable type	Function
AI cable - 1 m (3.2 ft.)	This cable is used to connect from a SAS adapter to internal SAS disk slots using a FC3650 or FC3651 cable card.
AE cable - 3 m (9.8 ft.) and 6 m (19.6 ft.)	These cables are used to connect a SAS adapter to a media expansion drawer. These cables can also be used to connect two SAS adapters to a disk expansion drawer in a JBOD configuration.

Table 192. Functions for supported SAS cables (continued)

Cable type	Function
EE cable	This cable is used to connect one disk expansion drawer to another in a cascaded configuration. Disk expansion drawers may only be cascaded one level deep, and only in certain configurations.
YO cable	This cable is used to connect a SAS adapter to a disk expansion drawer. The cable must be routed along the right side of the rack frame (as viewed from the rear) when connecting to a disk expansion drawer.
YI cable	This cable is used to connect a system external SAS port to a disk expansion drawer. The cable must be routed along the right side of the rack frame (as viewed from the rear) when connecting to a disk expansion drawer.
X cable	This cable is used to connect two SAS adapters to a disk expansion drawer in a RAID configuration. The cable must be routed along the right side of the rack frame (as viewed from the rear) when connecting to a disk expansion drawer.

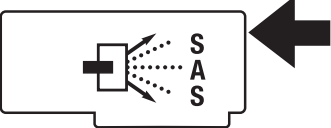
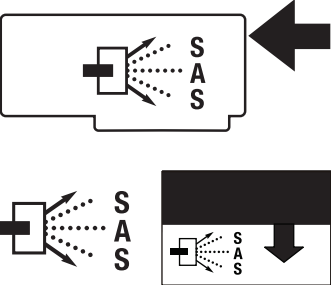
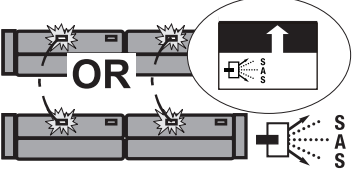
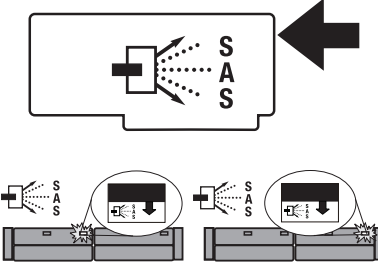
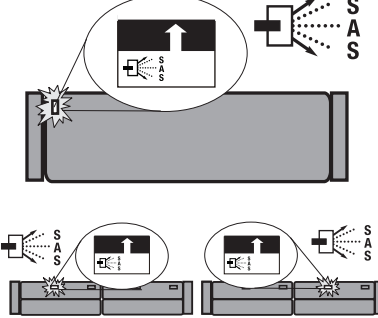
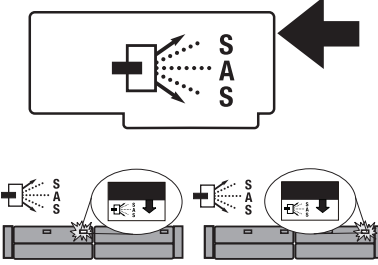
The following table contains specific information about each supported SAS cable.

Table 193. Supported SAS cables

Name	Length	IBM part number	Feature code
SAS 4x AI cable	1 m (3.2 ft.)	42R6751	3679
SAS 4x AE cable	3 m (9.8 ft.)	42R8118	3684
	6 m (19.6 ft.)	42R8120	3685
SAS 4x EE cable	1 m (3.2 ft.)	42R6726	3652
	3 m (9.8 ft.)	42R6727	3653
	6 m (19.6 ft.)	42R6728	3654
SAS YO cable	1.5 m (4.9 ft.)	42R6788	3691
	3 m (9.8 ft.)	42R6789	3692
	6 m (19.6 ft.)	42R6790	3693
	15 m (49.2 ft.)	42R6791	3694
SAS YI cable	1.5 m (4.9 ft.)	42R6792	3686
	3 m (9.8 ft.)	42R6793	3687
SAS X cable	3 m (9.8 ft.)	42R6742	3661
	6 m (19.6 ft.)	42R6743	3662
	15 m (49.2 ft.)	42R6744	3663

The following table contains cable label information. The graphic labels are designed to match the correct component port to which the cable end is to be attached.

Table 194. SAS cable labeling

Name	Connects	Label
SAS 4x AI cable - 1 m (3.2 ft.)	SAS adapter to internal SAS disk slots through a FC3650 or FC3651 cable card	
SAS 4x AE cable - 3 m (9.8 ft.) and 6 m (19.6 ft.)	SAS adapter to a media expansion drawer or two SAS adapters to a disk expansion drawer in a JBOD configuration	
SAS 4x EE cable	One disk expansion drawer to another in a cascaded configuration	
SAS YO cable	SAS adapter to a disk expansion drawer	
SAS YI cable	System external SAS port to a disk expansion drawer	
SAS X cable	Two SAS adapters to a disk expansion drawer in a RAID configuration	

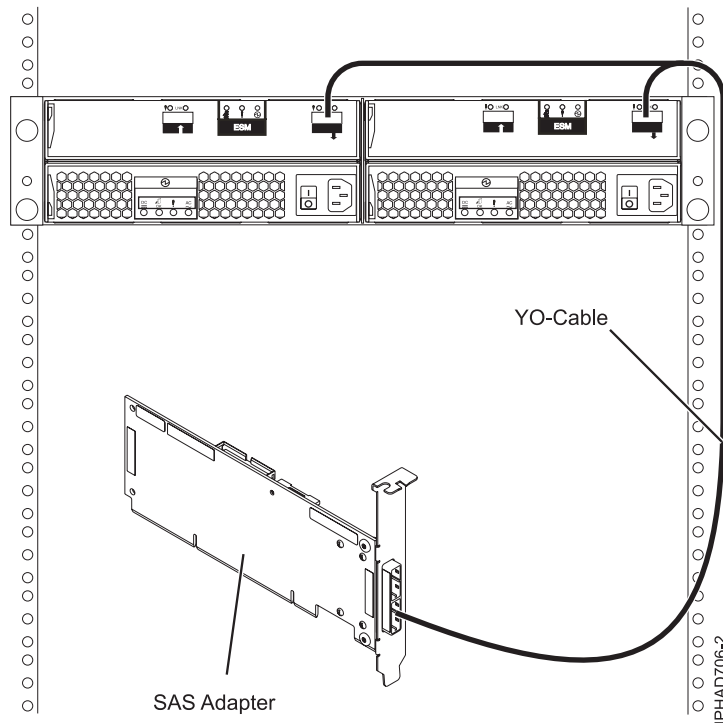
SAS cabling configurations

The following sections provide the typical supported SAS cabling configurations. Many configurations could be constructed that are not supported and will either not function correctly or will generate errors. To avoid problems, restrict cabling to only the general types of configurations shown in the following sections.

- “SAS adapter to disk expansion drawers”
- “SAS adapter to media expansion drawer” on page 466
- “SAS adapter to expansion drawer combinations” on page 467
- “System external SAS port to disk expansion drawer” on page 468
- “SAS adapter to internal SAS disk slots” on page 469
- “Two SAS adapters to disk expansion drawer - RAID” on page 472
- “Two SAS adapters to disk expansion drawer - JBOD” on page 474

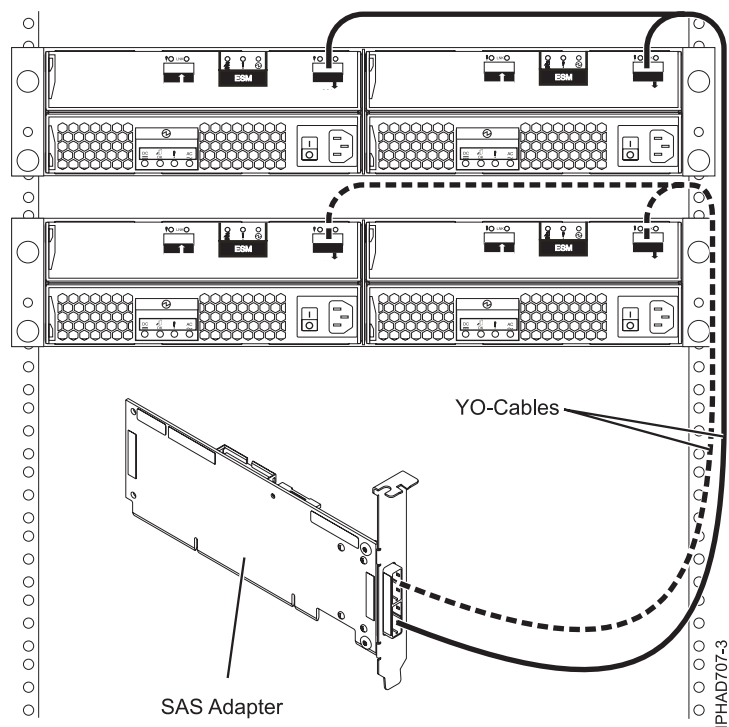
SAS adapter to disk expansion drawers

Figure 107, Figure 108 on page 465, and Figure 109 on page 466 illustrate connecting a SAS adapter to one, two, or four disk expansion drawers. It is also possible to connect three disk expansion drawers by omitting one of the cascaded drawers shown in Figure 109 on page 466. Note that disk expansion drawers may be cascaded only one level deep.



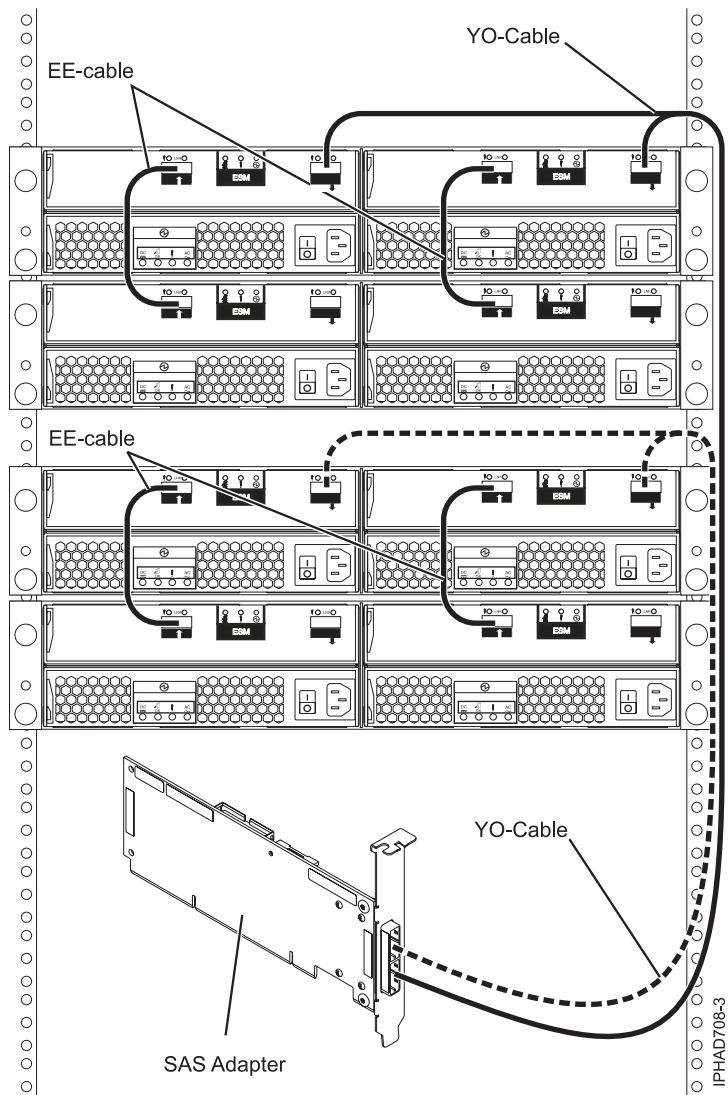
Note: The YO cable must be routed along the right side of the rack frame.

Figure 107. SAS adapter to a disk expansion drawer



Note: The YO cable must be routed along the right side of the rack frame.

Figure 108. SAS adapter to two disk expansion drawers



Note: The YO cable must be routed along the right side of the rack frame.

Figure 109. SAS adapter to four disk expansion drawers

SAS adapter to media expansion drawer

Figure 110 on page 467 illustrates connecting a SAS adapter to a media expansion drawer. It is also possible to connect a second media expansion drawer to the second port of the SAS adapter.

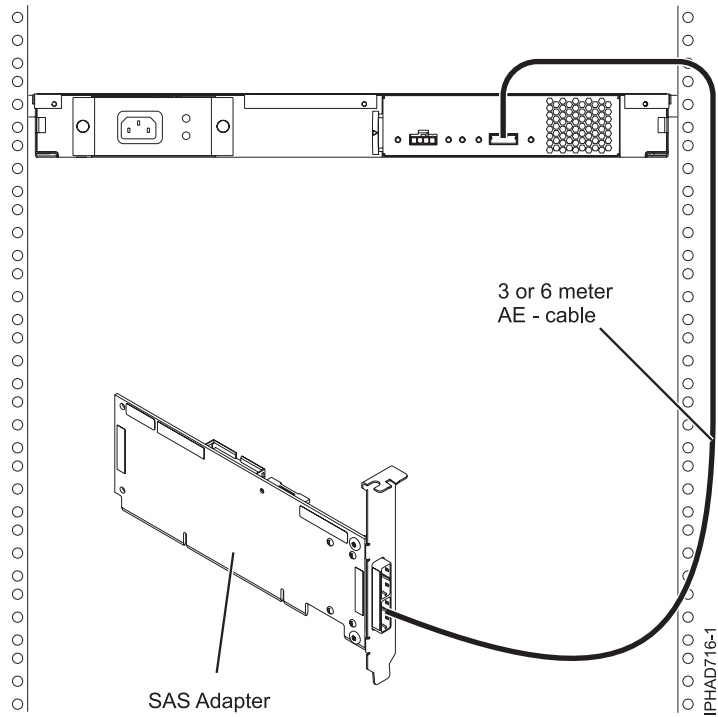
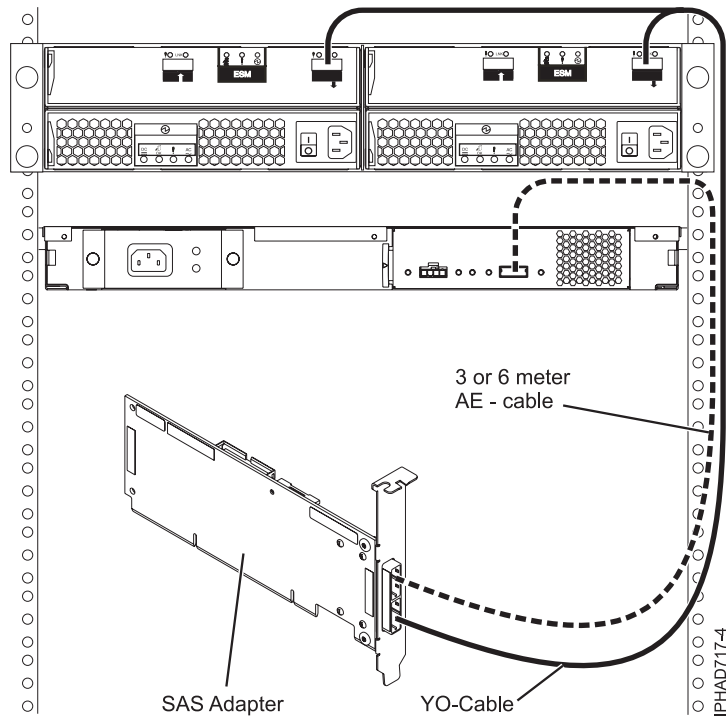


Figure 110. SAS adapter to a media expansion drawer

SAS adapter to expansion drawer combinations

Figure 111 on page 468 illustrates connecting a SAS adapter to both a disk expansion drawer and a media expansion drawer on separate adapter ports. It is also possible to cascade a second disk expansion drawer (refer to Figure 109 on page 466).

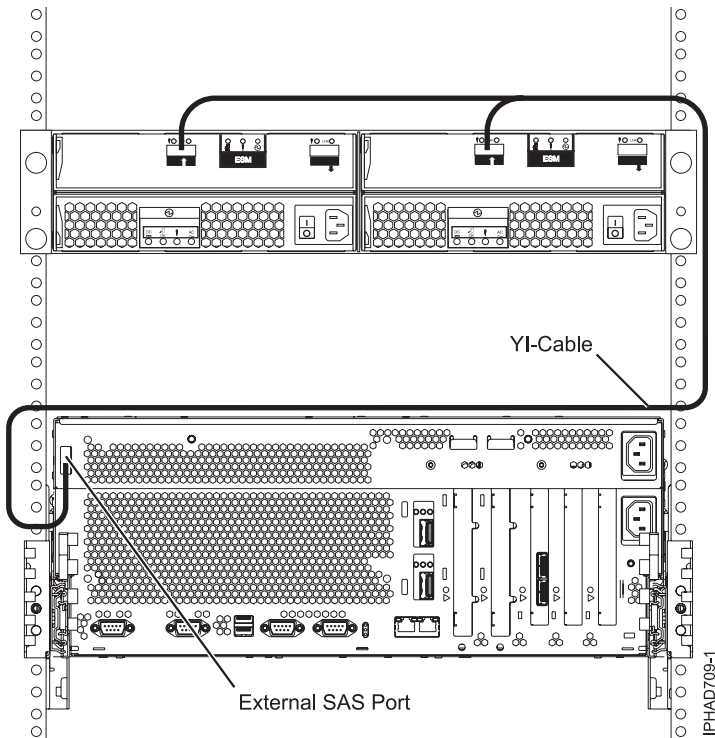


Note: The YO cable must be routed along the right side of the rack frame.

Figure 111. SAS adapter to both a disk expansion drawer and a media expansion drawer

System external SAS port to disk expansion drawer

Figure 112 on page 469 illustrates connecting a system external SAS port to a disk expansion drawer. Note that disk expansion drawers cannot be cascaded.



Note: The YI cable must be routed along the right side of the rack frame.

Figure 112. System external SAS adapter port to a disk expansion drawer

SAS adapter to internal SAS disk slots

Figure 113 on page 470 and Figure 114 on page 470 illustrate connecting a SAS adapter to internal SAS disk slots through one or two FC3650 or FC3651 cable cards.

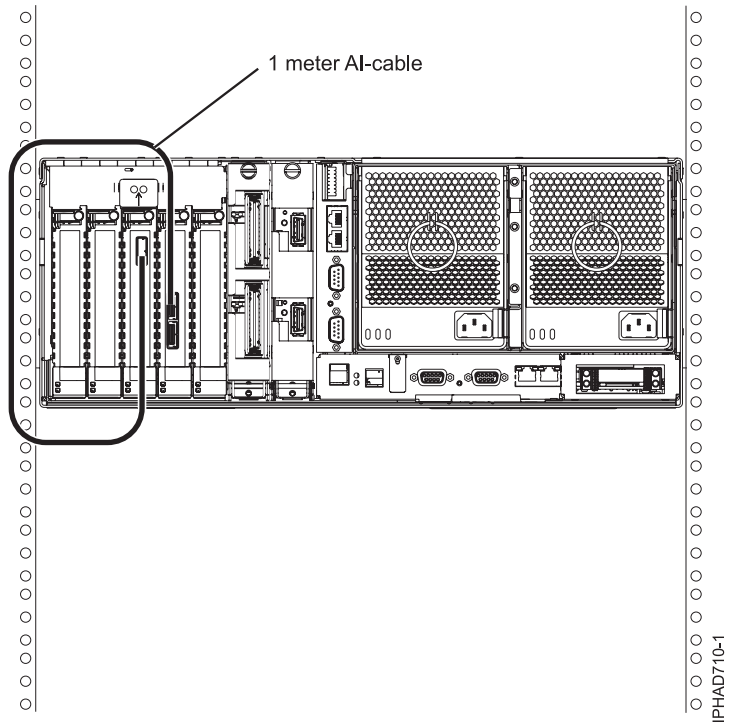


Figure 113. SAS adapter to internal SAS disk slots through a FC3650 or FC3651 cable card

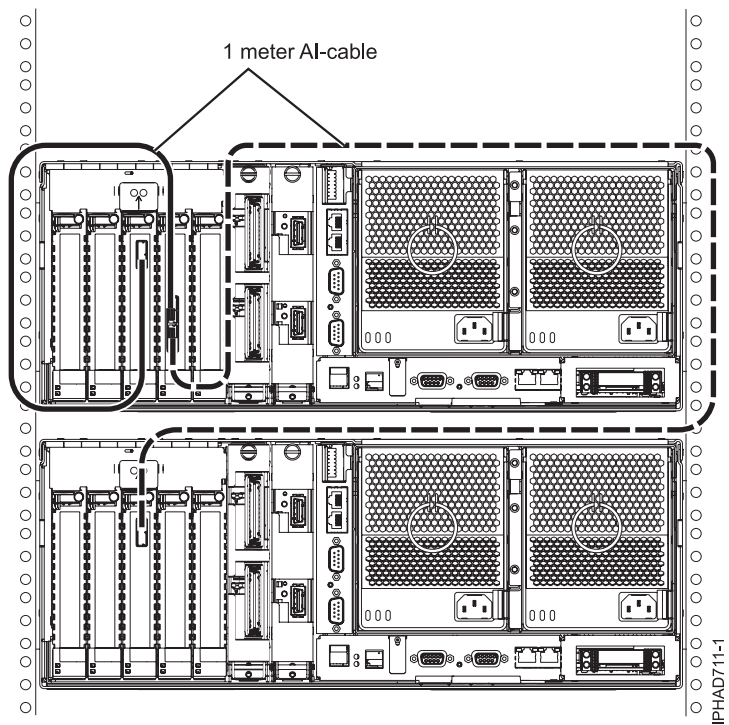


Figure 114. SAS adapter to internal SAS disk slots through two FC3650 or 3651 cards

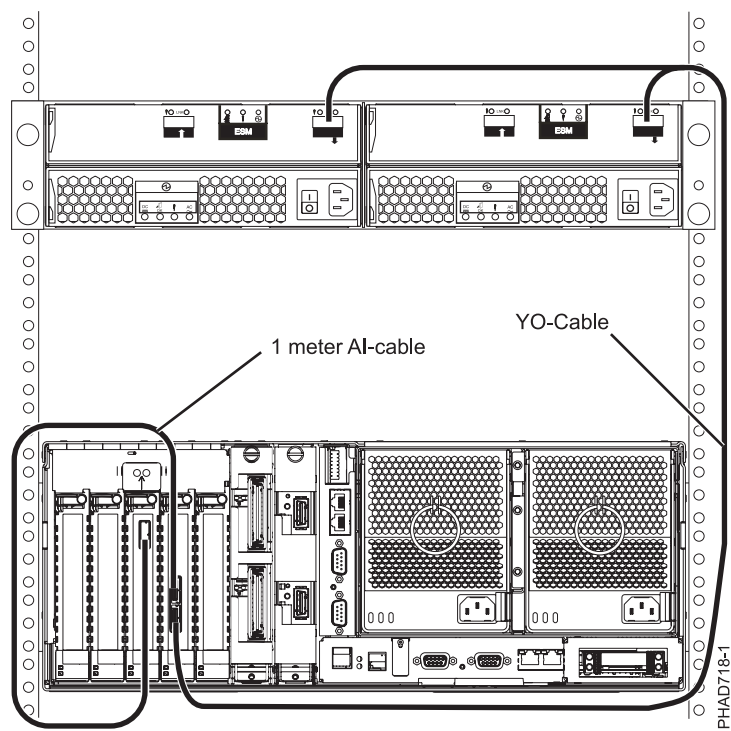


Figure 115. SAS adapter to disk expansion drawer and internal SAS disk slots through a FC3650 or FC3651 cable card

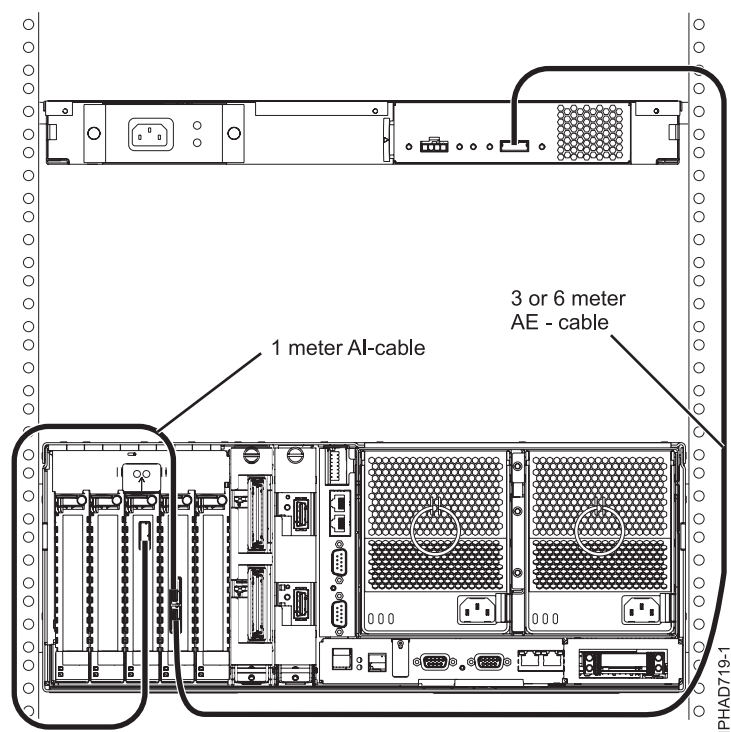
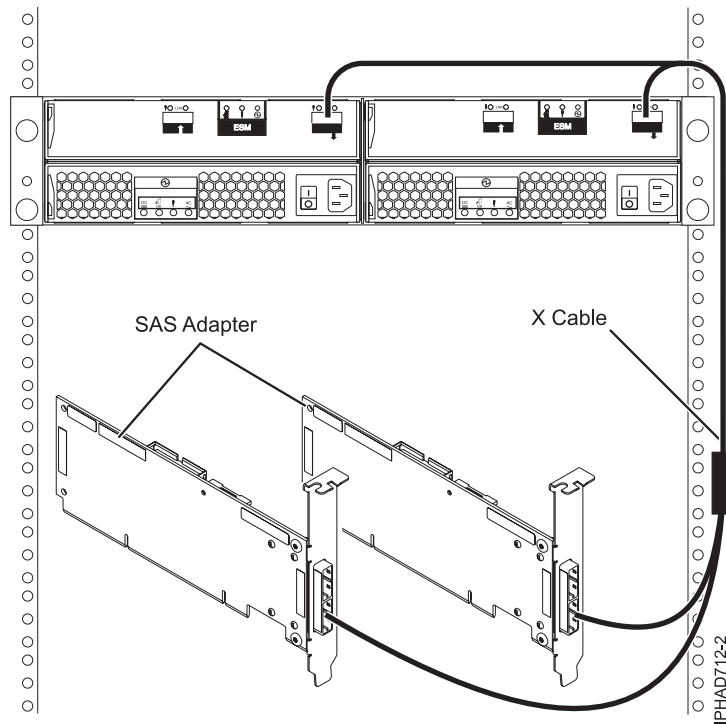


Figure 116. SAS adapter to media expansion drawer and internal SAS disk slots through a FC3650 or FC3651 cable card

Two SAS adapters to disk expansion drawer - RAID

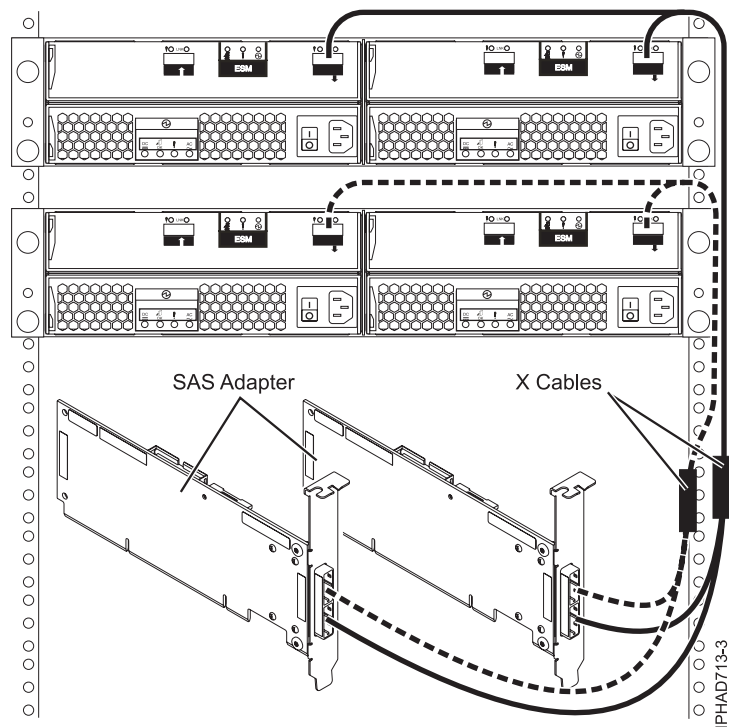
Figure 117, Figure 118 on page 473, and Figure 119 on page 474 illustrate connecting two SAS adapters to one, two, or four disk expansion drawers in a RAID configuration. It is also possible to connect three disk expansion drawers by omitting one of the cascaded drawers shown in Figure 119 on page 474. Note that disk expansion drawers can be cascaded only one level deep.



Note:

1. The X cable must be routed along the right side of the rack frame.
2. The X-cable must be attached to the same numbered port on all adapters.

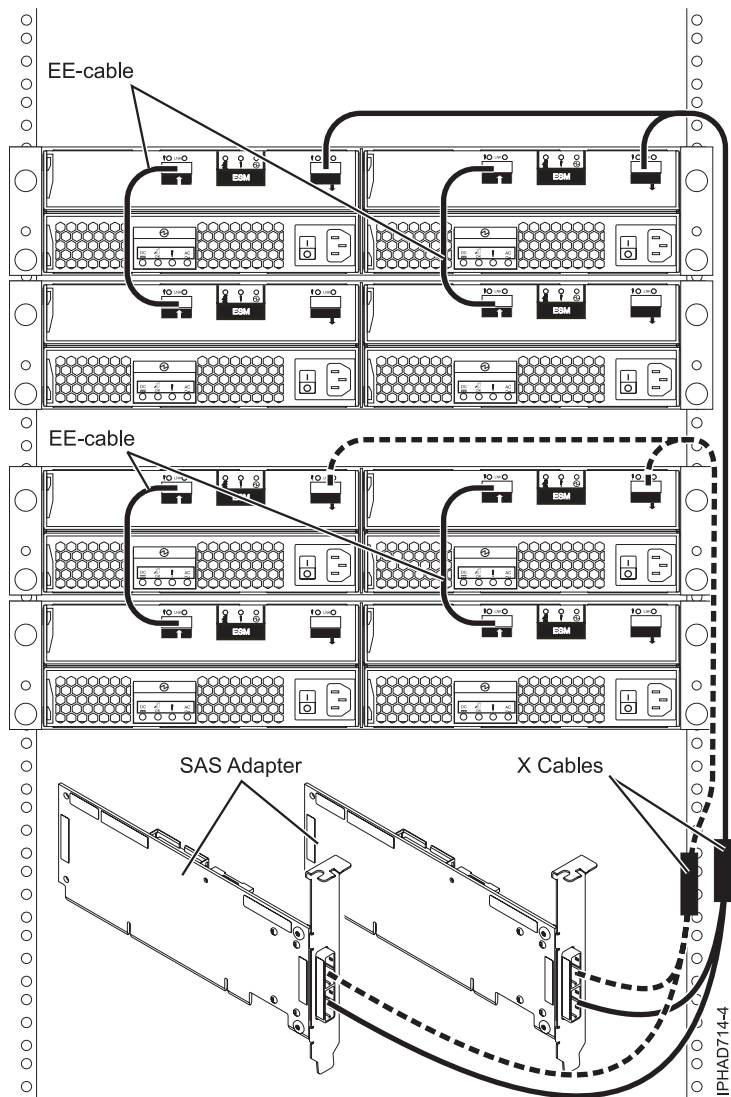
Figure 117. Two SAS adapters to a disk expansion drawer in a RAID configuration



Note:

1. The X cable must be routed along the right side of the rack frame.
2. The X-cable must be attached to the same numbered port on all adapters.

Figure 118. Two SAS adapters to two disk expansion drawers in a RAID configuration



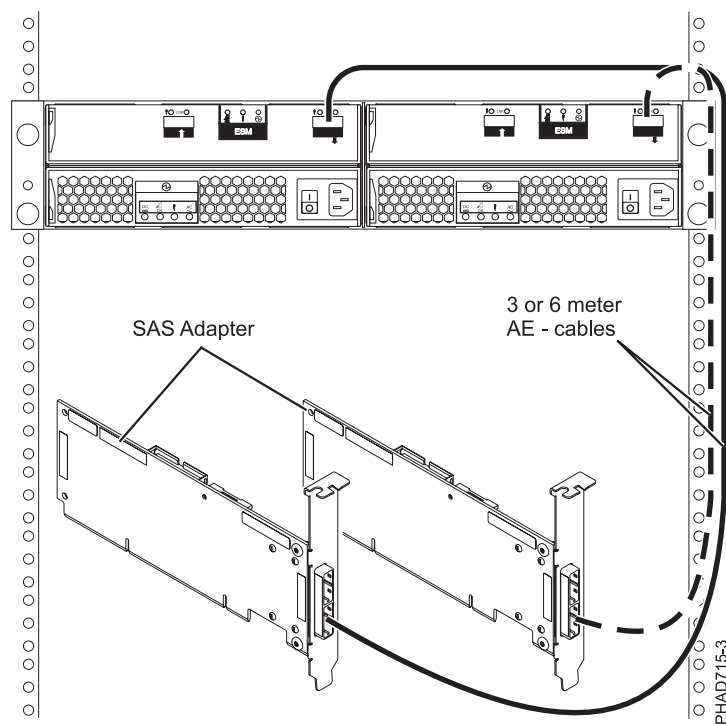
Note:

1. The X cable must be routed along the right side of the rack frame.
2. The X-cable must be attached to the same numbered port on all adapters.

Figure 119. Two SAS adapters to four disk expansion drawers in a RAID configuration

Two SAS adapters to disk expansion drawer - JBOD

Figure 120 on page 475 illustrates connecting two SAS adapters to a disk expansion drawer in a JBOD configuration.



Note: This configuration is only supported by AIX and Linux with specific SAS adapters. Refer to the *IBM SAS RAID Controller Reference Guide for AIX* or the *IBM SAS RAID Controller Reference Guide for Linux* for additional information.

Figure 120. Two SAS adapters to a disk expansion drawer in a JBOD configuration

Cable connectors

Use the Cable connectors table to select a cable connector for your server.

Table 195. Cable connectors

Number	Description	iSeries connector	Network connector
2811	25 Mbps (UTP-3) I/O Adapter Card	RJ-45	
2812	45 Mbps (DS-3) I/O Adapter Card	BNC	
2815	155 Mbps (UTP-5) I/O Adapter Card	RJ-45	
2816	155 Mbps (MMF) I/O Adapter Card	SC	
2818	155 Mbps (SMF) I/O Adapter Card	SC	
2819	34 Mbps (E-3) I/O Adapter Card	BNC	

Twinaxial console requirements

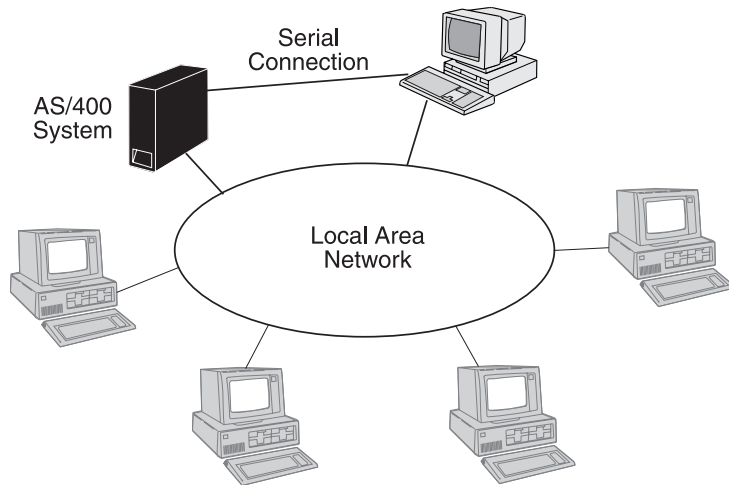
A twinaxial console allows you to use a basic command line interface and does not require you to use a personal computer as a system console.

A twinaxial console requires:

- A console monitor and keyboard.
- A twinaxial console cable (supplied by the customer). The twinaxial console cable must be ordered separately. See **Twinaxial cables** to verify the correct part number required for the console.

Local console directly attached to the server

Use this diagram to directly attach your server to a local console.



Ordering server cables

Follow these steps to order cables for your server.

To order your server cables, follow these steps:

1. Check out General Cabling Considerations.
2. Figure out how much cable you need by consulting the site plan you drew.
3. Click types of cable to view specifications and part numbers.
 - Twinaxial cables (workstations, remote workstation controllers, host servers)
 - Operations Console Cables
4. Write down the type and quantity of cables you need in the Workstation Information Form 3B.
5. Using the information you entered in the form, order your cables. Make sure you specify:
 - Type of cable (for instance, twinaxial)
 - Lengths and quantity of cable (as in, ten 1.8 m (6 ft.) cables, and so on)
 - Type of covering if applicable (like vinyl- or Teflon-covered twinaxial cables)

Remember to order any necessary cable accessories, such as **adapters** and **T connectors**.

Note: If you are ordering cables from IBM, you must specify part numbers and, in some cases, length or feature number. Verify the cable part tables (twinaxial cables and iSeries Access Console cables).

For more details on cables, contact an IBM service representative.

Twinaxial cables

Use this information to plan for devices that require twinaxial cables.

- General twinaxial considerations
- Workstation configuration
- Cable distance
- Twinaxial cables you can order from IBM

General twinaxial cabling considerations

Use these guidelines when planning your twinaxial cables.

- **Cable types:** To connect twinaxial devices (that is, workstations) to your server, you can use vinyl-covered cables, Teflon-covered cables, or both. The only major difference between vinyl- and Teflon-covered cables is that Teflon-covered cables should be used for installation in an air plenum.
- **Adapters:** If you plan to connect two or more lengths of cable, order cable-to-cable adapters for the type of cable you are using. *Do not splice cables.*
- **Maximum workstation distance:** The last workstation in your series can be no more than 1525 m (5000 ft.) in cable distance away from your host server or remote workstation controller.
- **Cable junctions:** A cable junction occurs when a cable attaches to a workstation or when an adapter which joins two cables. (Each pair of connections to a device is considered one junction.) *Do not make more than 11 cable junctions per line.*
- **Outdoor cables:** If you plan to install cables outside a building, consult a qualified service representative.
- **Cabling configurations:** See diagrams of how to arrange twinaxial workstations.
- **Cable placement and electrical equipment:** Do not install workstation cables near any power lines (transmitting more than 440 volts) or electrical equipment (using more than 440 volts). You can install cables near equipment of less than 440 volts if you follow distance guidelines.
- **Workstation connections:** Workstations have two sockets each for cable connections. Workstations are connected in a series. Your server can have up to seven workstation addresses on each twinaxial port. The last workstation in each of your series must have a cable terminator. Most workstations have this feature built in. Older workstations might need an external terminating plug. Review your workstation documentation.

Workstations

- Twinaxial workstations
- iSeries Access for Windows®

Twinaxial workstations cabling configurations for model 9406-7xx and 9406-8xx 8-port Attachment

Use the Cabling twinaxial workstations to the twinaxial 8-port workstation attachment figure to cable your server.

This figure shows the cabling for twinaxial workstations to the twinaxial 8-port workstation attachment. Your unit might look different, but the same cabling concepts still apply.

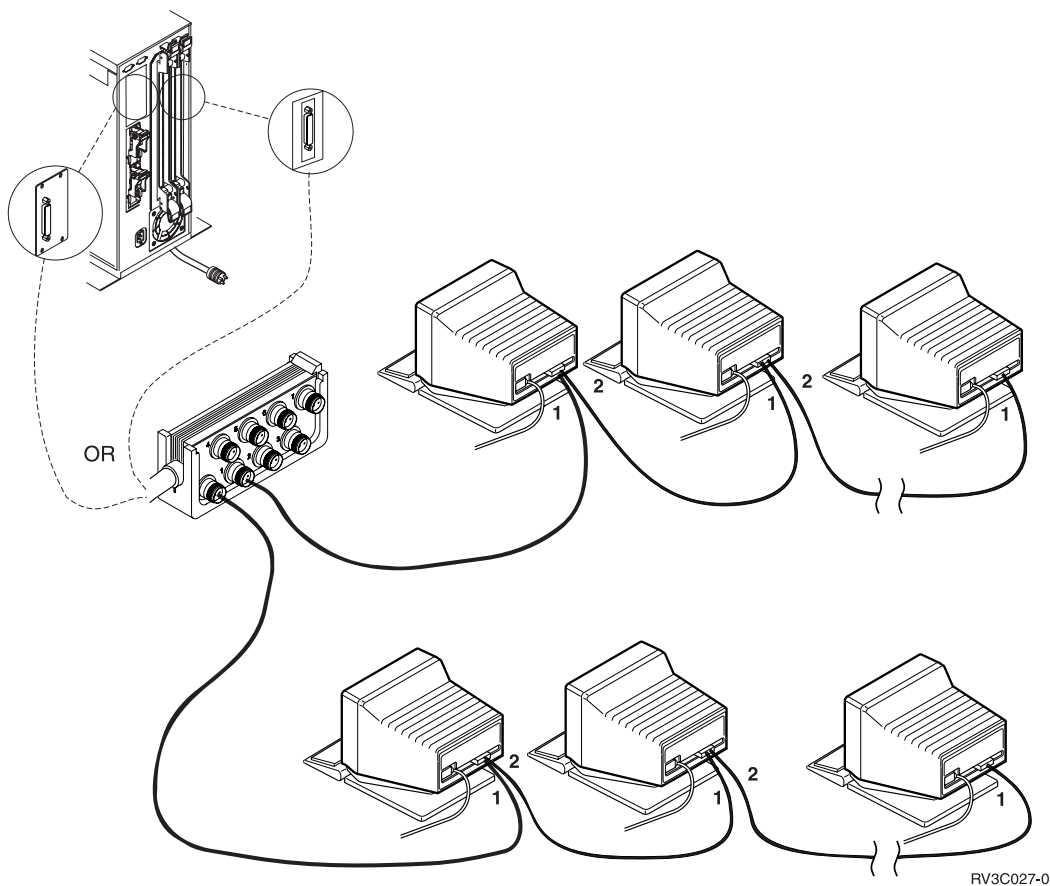


Figure 121. Cabling twinaxial workstations to the twinaxial 8-port workstation attachment

Distance guidelines for workstation cabling

Use these distance guidelines to cable your workstation with various equipment.

When using the following equipment, it must be the minimum distance listed from workstation cables.

Fluorescent, Neon, or Incandescent lighting fixtures	Minimum distance from workstation cables 127 mm (5 in.)
Unshielded Power Lines or Electrical Equipment 0 - 2 kVA 2 - 5 kVA 5+ kVA	Minimum distance from workstation cables 127 mm (5 in.) 305 mm (12 in.) 610 mm (24 in.)

With Workstation Cable Enclosed in Metallic Conduit

Unshielded Power Lines or Electrical Equipment 0 - 2 kVA 2 - 5 kVA 5+ kVA	Minimum distance from workstation cables 63.5 mm (2.5 in.) 152 mm (6 in.) 305 mm (12 in.)
---	---

With Workstation Cable Enclosed in Grounded Metallic Conduit

Power Lines Enclosed in Grounded Metallic Conduit 0 - 2 kVA 2 - 5 kVA 5+ kVA	Minimum distance from workstation cables 30.5 mm (1.2 in.) 76 mm (3 in.) 152 mm (6 in.)
--	---

Twinaxial cables from IBM

Use the Twinaxial cables table to choose a cable for your server.

When ordering cables from IBM, remember to specify the total length of each cable.

Table 196. Twinaxial cables

Part name	Part number
Cable Assembly (cable in specified length with connectors at both ends)	IBM part 4236482 (with vinyl covering)
	IBM part 7362062 (with Teflon covering)
Adapter (cable-to-cable)	IBM part 7362230 Amphenol 82-5588
Bulk Cable (cable in specified length, without connectors)	IBM part 7362211 (with vinyl covering) AWM
	IBM part 7362061 (with Teflon covering) CL2P
	IBM part 483699 (tubing used with Teflon-covered cables) CL2P
Connector (single plug connector)	IBM part 7362229 82-5589 Amphenol AMP 22724-1
Terminator Plug	IBM part 7362188 AMP 227504-1, 110 Ohms (twinaxial cabling)
	IBM part 6091068 AMP 227504-2, 150 Ohms (IBM cabling server)
T Connector	IBM part 94X3678 or 81X5387
Station Protector	IBM part 7362426 (single station protector)
	IBM part 7361807 (pair of station protectors)
Twinaxial Connector Shield	Twinaxial Connector Shield Kits: IBM part 94X3698
Connector Kit (two plug connectors)	IBM part 7362268 (for vinyl-covered cables)
	IBM part 7362063 (for Teflon-covered cables)

Operations console and remote control panel cables

Use the Operations console cables and Remote control panel cables tables to determine the cable specifications for your server.

You can connect a personal computer to your server as an operations console. The PC is attached through a serial connection to a communications input/output adapter (IOA) installed on the server. You can then use the PC as your operations console. Use a special operations console cable to do this.

Table 197. Operations console cables

Operations console cables			
Model	Part number	Cable length	Number
Models 9406-730 and 9406-740 (#36-pin, square)	97H7556	6 m (19.7 ft.)	2699
Models 9406-170, 9406-250, and 9406-720	97H7557 or 39J5835	6 m (19.7 ft.)	2721, 2742, 2745, 2771, 2793
Models 9406-270, 9406-8xx, SBx, 9406-520, 9111-520, 9406-550, 9406-570, and 9117-570, 9406-595	97H7557 or 39J5835	6 m (19.7 ft.)	2742, 2745, 2771, 2793
9406-MMA	97H7557 or 39J5835	6 m (19.7 ft.)	2742, 2793, 576C

Table 198. Remote control panel cables

Remote control panel cables	
Model	Part number
Models 9406-270, 9406-8xx, and SB3	53P5704 (substitute for 04N5592)
All other servers, except Power5 and later systems	97H7591

Notes:

1. All Power5 and later models do not support a directly attached remote control panel. To get remote control panel functions on the PC, you must use either the LAN-connected configuration or the virtual control panel function in the console's serial cable.
2. For a local console directly attached to the server the console and the remote control panel functions each need a special cable.
3. If you are currently using electronic customer support (ECS), you must move the electronic customer support cabling to another communications port before trying to install Operations Console directly attached. Note: You might need to reassign your ECS resources.
4. Any supported adapter might be used in a logical partition. There are cases where the Multi-function Input/Output Processor (MFIOP) might not support certain Input/Output Adapter (IOA) types in a logical partition. When in doubt, contact your sales representative. For more information, see Install the operations console cable.
5. Part number 39J5835 meets the European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

Optical cable fiber specifications

Learn about the optical fiber cable specifications for your server.

The preferred optical fiber for the server is 50/125 multimode fiber. This is because its bandwidth is a factor of three higher than 62.5/125 at the 780 nm wavelength at which the system operates. The 62.5/125 multimode fiber is also supported but at reduced distances. For 3xx systems at 220 Mbps and 5xx, 6x0, Sx0, and SB1 servers at 266 Mbps, a 50/125 fiber will support a distance of 2000 meters. A 62.5/125 fiber will support a distance of 700 meters.

For 5xx, 6x0, Sx0, and SB1 systems that use the higher speed 1063 Mbps link, optical technology with 50/125 fiber will support a distance of 500 meters. A 62.5/125 fiber will support a distance of 175 meters.

Care should be taken so that optical fiber cables are not coiled to a diameter less than 16 cm (6.3 in) and not bent to a radius less than 3 cm (1.2 in). Do not grip optical cables with mechanical tools.

More information about optical cable installation can be found in *940x Installation and Upgrade*, SY44-5950.

Note: Although optical technology will support these distances, not all functions can operate at those distances in all cases. Review disk unit and tape unit operation functions before supporting distances beyond 100 meters.

Cable specifications for 50/125:

Bandwidth:

400 MHz-km at 780 nm. This is equivalent to 500 MHz-km at 850nm.

Attenuation:

4.0 dB/km at 780 nm. This is equivalent to 3.0 dB/km at 850nm.

Cable specification for 62.5/125:

Bandwidth:

160 MHz-km at 850 nm.

Attenuation:

4.0 dB/km at 850 nm wavelength.

Depending on the data rate, the allowable link loss available to the user varies from 6 to 12 dB. Typical optical fiber connectors have a loss of 0.2 dB with a 0.5 dB maximum loss, and splices run 0.1 to 0.3 dB loss.

Connectors for 3xx systems:

The connections to the optical ports of I/O Bus Expansion are SC duplex connectors. The jumper cables available with the server when shipped are duplex cables. These cables terminate with SC duplex connectors with a PC polish. Use the simplex ST connectors for the system power control network (SPCN).

Connectors for 5xx, 6x0, Sx0, and SB1 systems:

The connector used for the 266 and 1063 data rate is slightly different than that used on the 220 Mbps links. For 3xx, a duplex SC connector is used. The 5xx, 6x0, Sx0, and SB1 machines have been changed to conform to industry standard Fiber Channel Support (FCS) duplex SC connector. The FCS SC connector is similar in appearance to the 3xx duplex SC connector but the keying orientation is different. The FCS duplex connector used for 5xx, 6x0, Sx0, and SB1 also employs two SC connectors joined together but the two SC connectors are rotated 90 degrees from the connectors used on 3xx systems.

- 2618/8664 Fiber Distributed Data Interface (FDDI) Adapter
- 2665/8665 Shielded Twisted-Pair Distributed Data Interface (SDDI) Adapter
- 2666 High Speed Communications Adapter
- Wireless LAN Communications
- Integrated FAX Adapter

Labeling cables

Labeling the cables you install helps you keep track the location of all your cables.

You can use these label templates to label your cables. Print them, fill in the information, and tape a label to each end of each cable. The label contains all the information you need to know about the cable and where it should be connected. For an example of the information on a label, see Label templates.

Label templates

Use the label template to clearly identify the cables used on your server.

Connect this end to:	Other end connects to:
Device type/name	
Location	
Device address	
Socket/port	

	SX21-9920
--	-----------

Connect this end to:	Other end connects to:
Device type/name	
Location	
Device address	
Socket/port	
	SX21-9920

Connect this end to:	Other end connects to:
Device type/name	
Location	
Device address	
Socket/port	
	SX21-9920

Cables available from IBM

Use the Cables available from IBM table to find IBM-supplied cables.

Note: Some parts might be labeled with part numbers different from the ones specified in your order. Check to make sure your parts match the parts in this table.

Table 199. Cables available from IBM

Description	Length	Part number	CIN	Fire-resistance characteristics
<i>For racks attached to model B</i>				
Bus Cable	4.0 m (13.1 ft.)	62X3427	9984	—
Bus Cable	8.0 m (26.2 ft.)	62X3428	9985	—
Power Sequence Cable	3.0 m (10.0 ft.)	89X2926	—	—
Power Sequence Cable	6.0 m (19.7 ft.)	89X2925	—	—
Power Sequence Cable	12.0 m (39.3 ft.)	93X2000	9120	CL2, FT4
Power Sequence Cable	30.0 m (98.4 ft.)	93X2147	9117	CL2, FT4
Power Sequence Cable (plenum)	30.0 m (98.4 ft.)	21F5135	9117	CL2P, FT6

Table 199. Cables available from IBM (continued)

Description	Length	Part number	CIN	Fire-resistance characteristics
Power Sequence Cable	60.0 m (196.8 ft.)	93X2148	9118	CL2, FT4
Power Sequence Cable (plenum)	60.0 m (196.8 ft.)	21F5136	9117	CL2P, FT6
SPD Communications Cable Non-Enhanced				
RS232 Cable Germany	15.2 m (50 ft.)	21F9353	9836	CL2, FT4
RS232 Cable Japan	15.5 m (50 ft.)	21F9349	9836	CL2, FT4
RS232 Cable	6.1 m (20 ft.)	22F0149	9022	CL2, FT4
RS232 Cable	15.2 m (50 ft.)	22F9348	9836	CL2, FT4
RS232 Cable Germany	6.1 m (20 ft.)	22F0150	9022	CL2, FT4
RS232 Cable Japan	6.1 m (20 ft.)	22F0151	9022	CL2, FT4
RS366 Cable	6.1 m (20 ft.)	72X5643	9840	CL2, FT4
RS366 Cable Japan	6.1 m (20 ft.)	21F4415	9840	CL2, FT4
SPD Communications Cable Enhanced				
V.24 Cable	6.1 m (20 ft.)	22F0152	9203	CL2, FT4
V.24 Cable Germany	6.1 m (20 ft.)	22F0153	9023	CL2, FT4
V.24 Cable Japan	6.1 m (20 ft.)	22F0154	9023	CL2, FT4
V.24 Cable	15.2 m (50 ft.)	21F9350	9835	CL2, FT4
V.24 Cable Japan	15.2 m (50 ft.)	21F9351	9835	CL2, FT4
V.24 Cable Germany	15.2 m (50 ft.)	21F9352	9835	CL2, FT4
V.24 Cable	24.2 m (80 ft.)	74F1837	9869	CL2, FT4
Other SPD Communications Cables				
X.21 Cable	6.1 m (20 ft.)	72X5640	9021	CL2, FT4
X.21 Cable	15.2 m (50 ft.)	21F9356	9839	CL2, FT4
V.35 Cable	6.1 m (20 ft.)	72X5641	9020	CL2, FT4
V.35 Cable	15.2 m (50 ft.)	21F9357	9838	CL2, FT4
V.35 Cable	24.4 m (80 ft.)	74F1839	9870	CL2, FT4
2 Port Comm Cable	3 m (9.8 ft.)	21F9345	9843	CL2, FT4
SPD and PCI Twinaxial Workstation Attachment Cables				
Twinaxial 8 Port Cable	6.1 m (20 ft.)	21F5093	9842	CL2, FT4
Removable Media Device Attachment (2621)				
SCSI 1 Cable	2.6 m (8.5 ft.)	17G4142	9826	CL2, FT4
SCSI 1 Cable	4 m (13.1 ft.)	6495268	9826	CL2, FT4
SCSI 1 Cable	12 m (39.3 ft.)	6495269	9827	CL2, FT4
SCSI 1 Cable	20 m (65.6 ft.)	21F4980	9846	CL2, FT4
Direct Access Storage Device Controller (6500)				
SCSI 2 Cable	2 m (6.6 ft.)	21F9043	9870	CL2, FT4
SCSI 2 Cable	4 m (13.1 ft.)	21F9044	9871	CL2, FT4

Table 199. Cables available from IBM (continued)

Description	Length	Part number	CIN	Fire-resistance characteristics
SCSI 2 Cable	64 m (19.7 ft.)	56F0382	9872	CL2, FT4
SCSI 2 Cable	24 m (78.7 ft.)	21F9045	9873	CL2, FT4
<i>Tape and Disk Device Controller (6501)</i>				
SCSI P Cable	2 m (6.6 ft.)	17G2007	9875	CL2, FT4
SCSI P Cable	4 m (13.1 ft.)	21F9047	9876	CL2, FT4
SCSI P Cable	6 m (19.7 ft.)	56F0381	9877	CL2, FT4
SCSI P Cable	24 m (78.7 ft.)	21F9048	9878	CL2, FT4
<i>Tape Device Controller (6534, 2729)</i>				
3490 model Fxx and 3570 Cables				
SCSI 2 Cable	0.5 m (2 ft.)	49G6456	5205	CL2, FT4
SCSI 2 Cable	4.5 m (15 ft.)	49G6457	5245	CL2, FT4
SCSI 2 Cable	12 m (39 ft.)	49G6458	5212	CL2, FT4
SCSI 2 Cable	18 m (59 ft.)	49G6459	5218	CL2, FT4
3590 Cables				
SCSI 2 Cable	4.5 m (15 ft.)	05H4648	5145	CL2, FT4
SCSI 2 Cable	12 m (39 ft.)	05H4649	5112	CL2, FT4
SCSI 2 Cable	18 m (59 ft.)	05H4650	5118	CL2, FT4
SCSI 2 Cable	25 m (82 ft.)	05H4651	5125	CL2, FT4
<i>Tape and Disk Feature Device Controller (6112)</i>				
DFCI Cable	.6 m (2 ft.)	6495253	9801	CL2, FT4
DFCI Cable	1.5 m (5 ft.)	6495254	9802	CL2, FT4
DFCI Cable	2.5 m (8.2 ft.)	6495250	9803	CL2, FT4
DFCI Cable	4 m (13.1 ft.)	6495252	9804	CL2, FT4
DFCI Cable	6 m (19.7 ft.)	6495251	9805	CL2, FT4
DFCI Cable	10 m (32.8 ft.)	6495255	9806	CL2, FT4
DFCI Cable	20 m (65.6 ft.)	6495256	9807	CL2, FT4
DFCI Cable	30 m (98.4 ft.)	6495257	9808	CL2, FT4
DFCI Cable (plenum)	30 m (98.4 ft.)	6495275	9811	CL2P, FT6
DFCI Cable	40 m (131.2 ft.)	6495258	9809	CL2, FT4
DFCI Cable (plenum)	40 m (131.2 ft.)	6495276	9812	CL2P, FT6
DFCI Cable	60 m (196.8 ft.)	6495264	9810	CL2, FT4
DFCI Cable (plenum)	60 m (196.8 ft.)	6495277	9813	CL2P, FT6
<i>SPD High-Speed Communications Adapter (2666)</i>				
X.21 Cable	6.1 m (20 ft.)	17G3987	9885	CL2, FT4
V.35 Cable	6.1 m (20 ft.)	17G3991	9879	CL2, FT4
V.35 Cable	24.4 m (80 ft.)	17G3992	9880	CL2, FT4

Table 199. Cables available from IBM (continued)

Description	Length	Part number	CIN	Fire-resistance characteristics
RS449 Cable	6.1 m (20 ft.)	17G4000	9882	CL2, FT4
RS449 Cable	24.4 m (80 ft.)	17G4001	9883	CL2, FT4
RS449 Cable	45.7 m (150 ft.)	17G4002	9884	CL2, FT4
<i>PCI and SPD Miscellaneous server cables</i>				
Diskette Cable	2.4 m (7.9 ft.)	46G3658	9886	CL2, FT4
Diskette/Twinaxial Cable	2.4 m (7.9 ft.)	46G3585	9887	CL2, FT4
BBU cable	2.4 m (7.9 ft.)	86G7712	5144	AWM, FT1
Ethernet	3.0 m (9.8 ft.)	86G7691	9025	CL2, FT4
Token Ring	2.44 m (8 ft.)	6339098	9024	CL2
<i>For model 9406 and Expansion Units</i>				
SPCN Cable (plenum)	0.6 m (1.96 ft)	21F9362	9216	CL2P, FT6
SPCN Cable (plenum)	1.2 m (3.9 ft.)	17G2017	9220	CL2P, FT6
SPCN Cable (plenum)	2.0 m (6.6 ft.)	87G6235	9206	CL2P, FT6
SPCN Cable (plenum)	6.0 m (19.7 ft.)	21F9469	9219	CL2P, FT6
SPCN Cable (plenum)	15.0 m (49.2 ft.)	21F9358	9213	CL2P, FT6
SPCN Cable (plenum)	30.0 m (98.4 ft.)	21F9359	9214	CL2P, FT6
SPCN Cable (plenum)	60.0 m (196.8 ft.)	21F9360	9215	CL2P, FT6
SPCN Cable (plenum)	60.0 m (196.8 ft.)	21F9414	9211	OFNP, OFN FT6
SPCN Cable (plenum)	100 m (328 ft.)	21F9415	9212	OFNP, OFN FT6
BUS Cable	4.0 m (13.1 ft.)	62X3427	9984	AWM(VW-1)
BUS Cable	8.0 m (26.2 ft.)	62X3428	9985	AWM(VW-1)
BUS Cable (plenum)	6.0 m (19.7 ft.)	46F2440	9851	OFNP, OFN FT6
BUS Cable (plenum)	10.0 m (32.8 ft.)	46F2441	9852	OFNP, OFN FT6
BUS Cable (plenum)	20.0 m (65.6 ft.)	46F2442	9853	OFNP, OFN FT6
BUS Cable (plenum)	6.0 m (19.7 ft.)	54G3385		Copper
BUS Cable (plenum)	10.0 m (32.8 ft.)	54G3386		Copper
BUS Cable (plenum)	20.0 m (65.6 ft.)	54G3387		Copper
BUS Cable	2.4 m (8 ft.)	72X5638	—	—
BUS Cable	3 m (9.8 ft.)	72X5638	—	—
ISDN Cable	7.0 m (22.9 ft.)	72X6348	9844	AWM(VW-1)
ISDN Cable (France)	7.0 m (22.9 ft.)	17G2528	9844	AWM(VW-1)

Table 199. Cables available from IBM (continued)

Description	Length	Part number	CIN	Fire-resistance characteristics
ISDN Cable (Switzerland)	7.0 m (22.9 ft.)	8191781	9844	AWM(VW-1)
ISDN Cable (Europe NIA)	7.0 m (22.9 ft.)	8191822	9844	AWM(VW-1)
Data Encryption Cable	6.1 m (20.0 ft.)	85F8109	9848	CL2, FT4
Operations Console Cables				
Operations Console serial remote control panel cable for models 9406-170, 9406-250, 9406-720, 9406-730, and 9406-740	6.1 m (20.0 ft.)	97H7591	0381	CL, FT4
Operations Console (P for 2721 and 2745) for models 9406-170, 9406-250 and 9406-720	6.1 m (20.0 ft.)	97H7557	0367	CL2, FT4, or CMG
Operations Console (D for 2699) for models 9406-730 and 9406-740	6.1 m (20.0 ft.)	97H7556	0328	CL2, FT4
Operations Console for models 9406-8xx, SBx, 9406-270, 9406-520, 9111-520, 9406-550, 9406-570, 9117-570, 9406-595, 9406-MMA	6.0 m (20.0 ft.)	97H7557 or 39J5835	0367	CL2, FT4, or CMG
Operations Console parallel remote control panel cable for models 9406-270, 9406-8xx, and SBx	TBD	53P5704	TBD	TBD
PCI Communications Cables for models 15X, 170, 600, 620, S10, and S20				
RS232	6.1 m (20.0 ft.)	44H7480	0348	CL2, CMG
RS232, Germany	6.1 m (20.0 ft.)	44H7482	0348	CL2, CMG
RS232, Japan	6.1 m (20.0 ft.)	44H7484	0348	CL2, CMG
V.24	6.1 m (20.0 ft.)	44H7486	0350	CL2, CMG
V.24, Germany	6.1 m (20.0 ft.)	44H7489	0350	CL2, CMG
V.24, Japan	6.1 m (20.0 ft.)	44H7492	0350	CL2, CMG
V.35	6.1 m (20.0 ft.)	44H7495	0353	CL2, CMG
V.36	6.1 m (20.0 ft.)	44H7498	0356	CL2, CMG
X.21	6.1 m (20.0 ft.)	44H7501	0359	CL2, CMG
PCI Communications Cables for models 600, S10, 620, and S20				
RS232 Cable	15.2 m (50 ft.)	44H7481	0349	CL2, FT4

Table 199. Cables available from IBM (continued)

Description	Length	Part number	CIN	Fire-resistance characteristics
RS232 Cable	15.2 m (50 ft.) Germany	44H7483	0349	CL2, FT4
RS232 Cable	15.5 m (50 ft.)	44H7485	0349	CL2, FT4
V.24 Cable	15.2 m (50 ft.)	44H7487	0351	CL2, FT4
V.24 Cable	15.2 m (50 ft.) Germany	44H7490	0351	CL2, FT4
V.24 Cable	15.5 m (50 ft.)-JAPAN	44H7493	0351	CL2, FT4
V.24 Cable	24.4 m (80 ft.)	44H7488	0352	CL2, FT4
V.24 Cable	24.4 m (80 ft.)-GERMANY	44H7491	0352	CL2, FT4
V.24 Cable	24.4 m (80 ft.)-JAPAN	44H7494	0352	CL2, FT4
V.35 Cable	15.2 m (50 ft.)	44H7496	0354	CL2, FT4
V.35 Cable	24.4 m (80 ft.)	44H7497	0355	CL2, FT4
V.36 Cable	15.2 m (50 ft.)	44H7499	0357	CL2, FT4
V.36 Cable	45.7 m (150 ft.)	44H7500	0358	CL2, FT4
X.21 Cable	15.2 m (50 ft.)	44H7502	0360	CL2, FT4
SPD Book Type Communications Cables for models 6x0, Sx0, and SB1				
RS232 Cable	24.4 m (80 ft.)	97H7389	0329	
RS232 Cable Germany	24.4 m (80 ft.)	97H7390	0329	
RS232 Cable Japan	24.4 m (80 ft.)	97H7391	0329	
RS232 Cable	6.1 m (20 ft.)	21H3764	0330	CL2, FT4
RS232 Cable Germany	6.1 m (20 ft.)	21H3765	0330	CL2, FT4
RS232 Cable Japan	6.1 m (20 ft.)	21H3766	0330	CL2, FT4
RS232 Cable	15.2 m (50 ft.)	21H3767	0331	CL2, FT4
RS232 Cable Germany	15.2 m (50 ft.)	21H3768	0331	CL2, FT4
RS232 Cable Japan	15.2 m (50 ft.)	21H3769	0331	CL2, FT4
V.24 Cable	6.1 m (20 ft.)	21H3770	0332	CL2, FT4
V.24 Cable	6.1 m (20 ft.)-Germany	21H3771	0332	CL2, FT4
V.24 Cable	6.1 m (20 ft.)-JAP	21H3772	0332	CL2, FT4
V.24 Cable	15.2 m (50 ft.)	21H3773	0333	CL2, FT4
V.24 Cable	15.2 m (50 ft.)-GERM	21H3774	0333	CL2, FT4
V.24 Cable	15.5 m (50 ft.)-JAP	21H3775	0333	CL2, FT4
V.24 Cable	24.4 m (80 ft.)	21H3776	0334	CL2, FT4
V.24 Cable	24.4 m (80 ft.)-GERM	21H3777	0334	CL2, FT4

Table 199. Cables available from IBM (continued)

Description	Length	Part number	CIN	Fire-resistance characteristics
V.24 Cable	24.4 m (80 ft.)-JAP	21H3778	0334	CL2, FT4
V.36 Cable	6.1 m (20 ft.)	21H3787	0335	CL2, FT4
V.36 Cable	15.2 m (50 ft.)	21H3788	0336	CL2, FT4
V.36 Cable	45.7 m (150 ft.)	21H3789	0337	CL2, FT4
V.35 Cable	6.1 m (20 ft.)	21H3792	0338	CL2, FT4
V.35 Cable	15.2 m (50 ft.)	21H3785	0339	CL2, FT4
V.35 Cable	24.4 m (80 ft.)	21H3786	0340	CL2, FT4
X.21 Cable	6.1 m (20 ft.)	21H3782	0341	CL2, FT4
X.21 Cable	15.2 m (50 ft.)	21H3783	0342	CL2, FT4
<i>Fax Coupler Cables</i>				
Fax Coupler Cable Belgium		21H4903		
Fax Coupler Cable Israel		21H4905		
Fax Coupler Cable South Africa		21H4904		
Fax Coupler Cable Italy		75G3802		
Fax Coupler Cable France		75G3803		
Fax Coupler Cable Germany		75G3804		
Fax Coupler Cable United Kingdom		75G3805		
Fax Coupler Cable Sweden		75G3806		
Fax Coupler Cable Australia		75G3807		
Fax Coupler Cable China (Hong Kong S.A.R.)		75G3808		
Fax Coupler Cable Finland		75G3809		
Fax Coupler Cable Netherlands		75G3810		
Fax Coupler Cable Switzerland		75G3811		
Fax Coupler Cable Denmark		75G3812		
Fax Coupler Cable US/Canada		87G6236		
<i>Miscellaneous Cables for models 9406-640, S30, 9406-730, 9406-650, S40, 9406-740, and SB1</i>				
HSL Cable	15 m (32.8 ft.)	21H7377	0346	CL2, CMG, or FT4
<i>Cables for servers 9406-270, 9406-820, 9406-830, 9406-840, SB2, and SB3</i>				

Table 199. Cables available from IBM (continued)

Description	Length	Part number	CIN	Fire-resistance characteristics
VS COM Cable	6 m (19.8 ft.)	44L0007	031A	
HSL Cable 250/500	3 m (10 ft.)	44L0005	0343	
HSL Cable 250/500	6 m (19.8 ft.)	97H7490	0361	
HSL Cable 250/500	15 m (32.8 ft.)	04N7014	0368	
ISDN PRI Cable WT	10 m (32.8 ft.)	97H7698	984B	
ISDN PRI Cable BRI	10 m (32.8 ft.)	97H7699	984C	
ISDN PRI Cable US	10 m (32.8 ft.)	97H7697	984A	
JTAG A Cable	6 m (19.8 ft.)	97H7468	033A	
JTAG E Cable	6 m (19.8 ft.)	97H7604	033C	
JTAG C Cable	6 m (19.8 ft.)	97H7487	033B	
SPCN 2 Port Cable	3 m (9.8 ft.)	04N2652	036A	
RS232 Cable	24.4 m (80 ft.)	97H7386	0365	
RS232 Cable Germany	24.4 m (80 ft.)	97H7387	0365	
V.24 Cable Japan	24.4 m (80 ft.)	97H7388	0365	
High-Speed Link Cables for models 9406-650, 9406-740, S40, SB1, 9406-820, 9406-830, and 9406-840				
HSL Cable	6 m (19.7 ft.)	21H7643	0347	CL2, CMG or FT4
System Interconnect Cables for models 65X				
OP Panel	5 m (16.4 ft.)	21H7374	9819	CL2, CMG
JTAG Cable	3 m (9.8 ft.)	21H7375	9817	CL2, CMG
Cables for models 9406-870 and 9406-890				
HSL (copper)	3.0 m	44L0005	1460	
HSL (copper)	6.0 m	97H7490	1461	
HSL (copper)	15.0 m	97H7491	1462	
HSL (optical)	6.0 m	21P5014	1470	
HSL (optical)	30.0 m	21P5015	1471	
HSL (optical)	100.0 m	21P5016	1472	
HSL (optical)	250.0 m	21P6326	1473	
HSL to HSL2 (copper)	6.0 m	21P5477	1474	
HSL to HSL2 (copper)	10.0 m	21P5458	1475	
HSL2 (copper)	1.0 m	21P5454	1481	
HSL2 (copper)	3.5 m	53P2676	1482	
HSL2 (copper)	10.0 m	21P5456	1483	
HSL2 (copper)	15.0 m	21P5457	1485	
IPCS video extension cables for NT	4.5 m (15.0 ft.)	44H8676	0325	CL2, CL2, CMG or FT4
IPCS mouse or keyboard extension cables for NT	5.0 m (16.0 ft.)	44H8677	0325	AWM (VW-1)
RS232	6.0 m (20.0 ft.)	44H7480	0348	CL2, CMG or FT4

Table 199. Cables available from IBM (continued)

Description	Length	Part number	CIN	Fire-resistance characteristics
RS232, Germany	6.0 m (20.0 ft.)	44H7482	0348	CL2, CMG or FT4
RS232, Japan	6.0 m (20.0 ft.)	44H7484	0348	CL2, CMG or FT4
RS232	15.0 m (50.0 ft.)	44H7481	0349	CL2, CMG or FT4
RS232, Germany	15.0 m (50.0 ft.)	44H7483	0349	CL2, CMG or FT4
RS232, Japan	15.0 m (50.0 ft.)	44H7485	0349	CL2, CMG or FT4
V.35	6.0 m (20.0 ft.)	44H7495	0353	CL2, CMG or FT4
V.36	6.0 m (20.0 ft.)	44H7498	0356	CL2, CMG or FT4
X.21	6.0 m (20.0 ft.)	44H7501	0359	CL2, CMG or FT4
X.21	15.0 m (50.0 ft.)	44H7502	0360	CL2, CMG or FT4
RS232	24.5 m (80.0 ft.)	97H7386	0365	CL2, CMG or FT4
RS232, Germany	24.5 m (80.0 ft.)	97H7387	0365	CL2, CMG or FT4
RS232, Japan	24.5 m (80.0 ft.)	97H7388	0365	CL2, CMG or FT4
LC-SC adapter kit (50um)	0.2 m (0.7 ft.)	11P1373	0371	OFNR, FT4
LC-SC adapter kit (62.5um)	0.2 m (0.7 ft.)	11P1374	0372	OFNR, FT4
Remote control panel cable	6.0 m (20.0 ft.)	53P5704	0382	CL2, CMH
Modem cable - Austria	10.0 m (33.0 ft.)	21H4902	1010	AWM (VW-1)
Modem cable - Belgium	10.0 m (33.0 ft.)	21H4903	1011	AWM (VW-1)
Modem cable - Africa	10.0 m (33.0 ft.)	21H4904	1012	AWM (VW-1)
Modem cable - Israel	10.0 m (33.0 ft.)	21H4905	1013	AWM (VW-1)
Modem cable - Italy	10.0 m (33.0 ft.)	75G3802	1014	AWM (VW-1)
Modem cable - France	10.0 m (33.0 ft.)	75G3803	1015	AWM (VW-1)
Modem cable - Germany	10.0 m (33.0 ft.)	75G3804	1016	AWM (VW-1)
Modem cable - UK	10.0 m (33.0 ft.)	75G3805	1017	AWM (VW-1)
Modem cable - Iceland/Sweden	10.0 m (33.0 ft.)	75G3806	1018	AWM (VW-1)
Modem cable - Australia	10.0 m (33.0 ft.)	75G3807	1019	IEC 60950 (V2)
Modem cable - China (Hong Kong S.A.R.) and New Zealand	10.0 m (33.0 ft.)	75G3808	1020	AWM (VW-1)
Modem cable - Finland and Norway	10.0 m (33.0 ft.)	75G3809	1021	AWM (VW-1)
Modem cable - Netherlands	10.0 m (33.0 ft.)	75G3810	1022	AWM (VW-1)
Modem cable - Switzerland	10.0 m (33.0 ft.)	75G3811	1023	AWM (VW-1)

Table 199. Cables available from IBM (continued)

Description	Length	Part number	CIN	Fire-resistance characteristics
Modem cable - Denmark	10.0 m (33.0 ft.)	75G3812	1024	AWM (VW-1)
Modem cable - US/Canada	10.0 m (33.0 ft.)	87G6236	1025	AWM (VW-1)
Note: Fire-resistance characteristics are defined in <i>National Electrical Code</i> , UL 1950/IEC 950/CSA 22.2-950.				

Specifications for non-IBM rack installation

Learn the requirements and specifications for installing IBM systems into non-IBM racks.

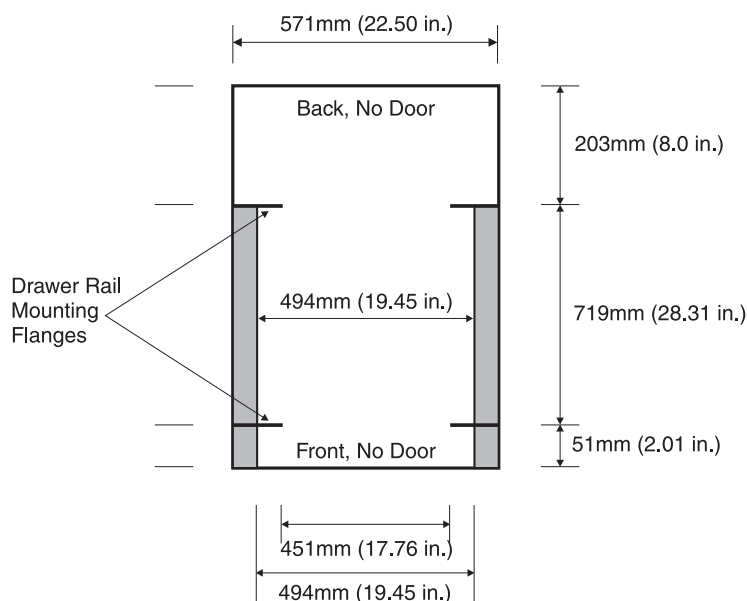
This topic provides requirements and specifications for 19-inch racks used by certain systems. These requirements and specifications are provided as an aid to help you understand the requirements to install certain IBM systems into non-IBM racks. It is your responsibility, working with your rack manufacturer, to ensure that the rack chosen meets the requirements and specifications listed here.

Rack specifications

The general non-IBM rack specifications are:

1. The rack or cabinet must meet the EIA Standard EIA-310-D for 19-inch racks published August 24, 1992. The EIA-310-D standard specifies internal dimensions, for example, the width of the rack opening (width of the chassis), the width of the module mounting flanges, the mounting hole spacing, and the depth of the mounting flanges. The EIA-310-D standard does not control the overall external width of the rack. There are no restrictions on the location of side walls and corner posts relative to the internal mounting space.

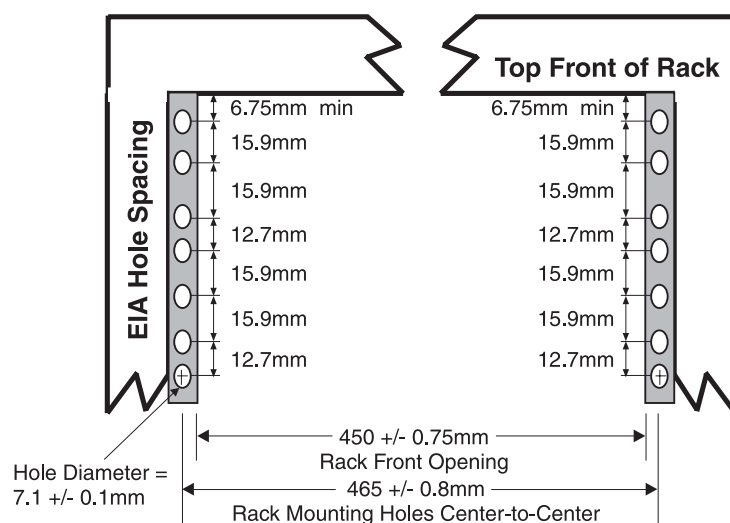
The front rack opening must be 451 mm wide + 0.75 mm (17.75 in. + 0.03 in.), and the rail-mounting holes must be 465 mm + 0.8 mm (18.3 in. + 0.03 in.) apart on center (horizontal width between vertical columns of holes on the two front-mounting flanges and on the two rear-mounting flanges). Rail-mounting holes must be 7.1 mm + 0.1 mm (0.28 in. + 0.004 in.) in diameter.



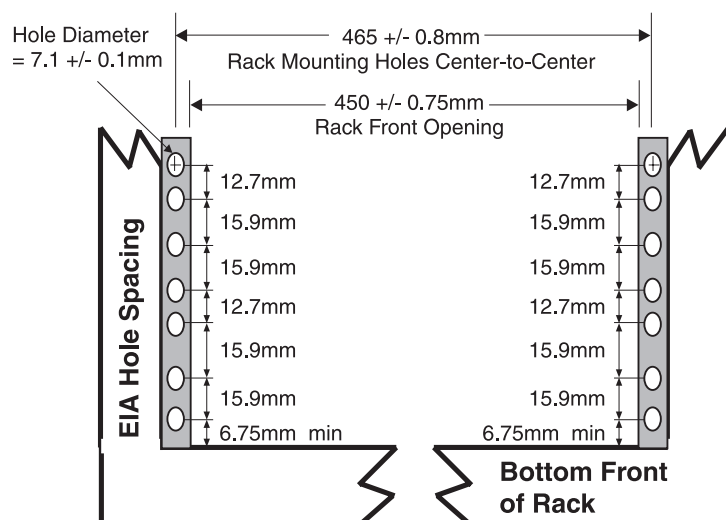
Top view of non-IBM rack specifications dimensions

Figure 122. Top View of non-IBM Rack Specifications Dimensions

The vertical distance between mounting holes must consist of sets of three holes spaced (from bottom to top) 15.9 mm (0.625 in.), 15.9 mm (0.625 in.), and 12.67 mm (0.5 in.) on center (making each three hole set of vertical hole spacing 44.45 mm (1.75 in.) apart on center). The front and rear mounting flanges in the rack or cabinet must be 719 mm (28.3 in.) apart and the internal width bounded by the mounting flanges at least 494 mm (19.45 in.), for the IBM eServer rails to fit in your rack or cabinet (see Figure 122).



Rack specifications dimensions, top front view



Rack specifications dimensions, bottom front view

- The rack or cabinet must be capable of supporting an average load of 15.9 kg (35 lb.) of product weight per EIA unit.
For example, a four EIA drawer will have a maximum drawer weight of 63.6 kg (140 lb.).
- Only ac power drawers are supported in the rack or cabinet. It is strongly recommended to use a power distribution unit that meets the same specifications as IBM power distribution units to supply rack power (for example, feature code 7188). Each power distribution unit installed in a rack requires

a dedicated power line of 200 to 240 V ac and 30 A. Rack or cabinet power distribution device(s) must meet the drawer power requirements, as well as that of any additional products that will be connected to the same power distribution device.

The rack or cabinet power receptacle (power distribution unit, uninterruptible power supply, or multi-outlet strip) must have a compatible plug type for your drawer or device.

Note: Refer to the sales manual for 0551, 0553, or 7014 racks if you want to use power distribution units that are designed for 7014 racks. The customer is responsible for ensuring the power distribution unit is compatible with the rack or cabinet and assumes responsibility for any and all agency certifications required.

4. The rack or cabinet must be compatible with drawer mounting rails, including a secure and snug fit of the rail-mounting pins and screws into the rack or cabinet rail mounting holes. It is strongly recommended that the IBM mounting rails that are shipped with the product be used to install it in the rack. The mounting rails that ship with IBM products have been designed and tested to safely support the product during operation and service activities as well as to safely support the weight of your drawer or device. The rails must facilitate service access by allowing the drawer to be safely extended, if necessary, forwards, backwards, or both. Some rails, with eServer features for non-IBM racks, provide drawer specific anti-tip brackets, rear lock-down brackets, and cable management guides that require clearance on the rear side of the rails.

Note: If the rack or cabinet has square holes on the mounting flanges, a plug-in hole adapter may be required.

If non-IBM rails are used, the rails must be product safety certified for use with the IBM products. At a minimum, mounting rails must be able to support four times the maximum rated product weight in its worst-case position (fully-extended front and rear positions) for one full minute without catastrophic failure.

5. The rack or cabinet must have stabilization feet or brackets installed both in the front and rear of the rack, or have another means of preventing the rack/cabinet from tipping while the drawer or device is pulled into its extreme front or rear service positions.

Examples of some acceptable alternatives: The rack or cabinet may be securely bolted to the floor, ceiling or walls, or to adjacent racks or cabinets in a long and heavy row of racks or cabinets.

6. There must be adequate front and rear service clearances (in and around the rack or cabinet).

The rack or cabinet must have sufficient horizontal width clearance in the front and rear to allow the drawer to be fully slid into the front and, if applicable, the rear service access positions (typically this requires 914.4 mm (36 in.) clearance in both the front and rear).

If present, front and rear doors must be able to open far enough to provide unrestrained access for service or be easily removable. If doors must be removed for service, it is the customer's responsibility to remove them prior to service.

7. The rack or cabinet must provide adequate clearance around the rack drawer.

There must be adequate clearance around the drawer bezel so that it can be opened and closed, according to the product specifications.

Front or rear doors must also maintain a minimum of 51 mm (2 in.) front, 203 mm (8 in.) rear, door to mounting flange clearance, and 494 mm (19.4 in.) front, 571 mm (22.5 in.) rear, side-to-side clearance for drawer bezels and cables (see Figure 122 on page 492).

8. The rack or cabinet must provide adequate front-to-back ventilation.

For optimum ventilation, it is recommended the rack or cabinet not have a front door. If the rack or cabinet has doors, the doors must be fully perforated so that there is proper front-to-back airflow to maintain the required drawer ambient inlet temperature as specified in the server specifications. The perforations should yield at least 34 percent minimum open area per square inch.

IBM features

IBM features adjustable rails for non-IBM racks are available in the product configurators as follows:

- System i
 - 7883 - model 9406-520 non-IBM rack-mount drawer rail kit and hardware
 - 7798 - model 9406-550 non-IBM rack-mount drawer rail kit and hardware
- System p
 - 7161 - model 9111-520 non-IBM rack-mount drawer rail kit
 - 7162 - model 9113-550 IBM or non-IBM rack-mount drawer rail kit
 - 7163 - model 9113-550 non-IBM rack-mount drawer rail kit
 - 7165 - model 9117-570 non-IBM rack-mount drawer rail kit
 - 7166 - model 9110-510 IBM or non-IBM rack-mount drawer rail kit
- OpenPower
 - 7162 - OpenPower 720 IBM or non-IBM rack-mount drawer rail kit
 - 7163- OpenPower 720 non-IBM rack-mount drawer rail kit
 - 7166 - OpenPower 710 IBM or non-IBM rack-mount drawer rail kit

Additional features for non-IBM racks are as follows:

- System p
 - 7969 - model 9117-570 non-IBM chassis/bezel
 - 7873 - model 9111-520 non-IBM rack-mount drawer bezel and hardware
 - 7874 - model 9113-550 non-IBM rack-mount drawer bezel and hardware
 - 7999 model 9110-510 non-IBM rack-mount drawer bezel and hardware
 -
- OpenPower
 - 7999 - OpenPower 710 non-IBM rack-mount drawer bezel and hardware
 - 7915 - OpenPower 720 OEM rack-mount drawer bezel and hardware

Special considerations for mounting a model 570 into a non-IBM rack

The following graphics show the routing path of the model 570 flex assembly in an IBM Enterprise rack. The front flex assembly extends outside of the rail mounting flanges by 70 mm (2.75 in.). The rear flex assembly extends outside of the rail mounting flanges by 25 mm (1.0 in.). A non-IBM rack must have this additional space to properly install the flex assembly and to adequately protect the assembly from physical damage.

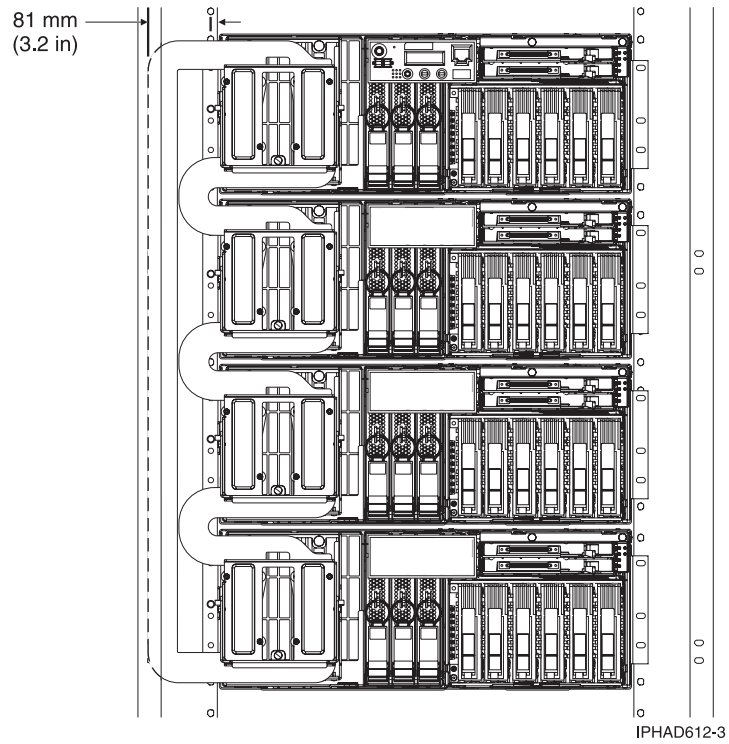


Figure 123. Routing path for model 570 flex assembly (front view)

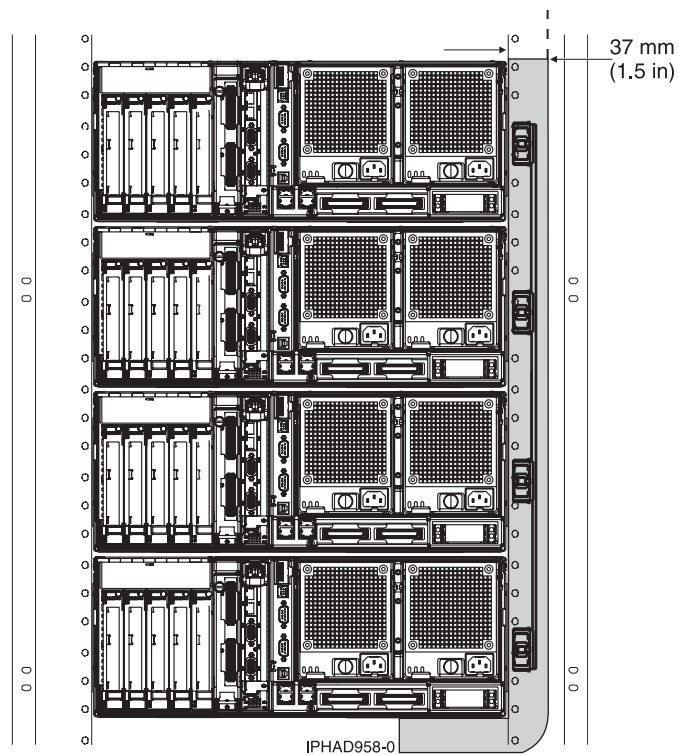


Figure 124. Routing path for model 570 flex assembly (rear view)

General safety requirements for IBM products installed in a non-IBM rack or cabinet

The general safety requirements for IBM products installed in non-IBM racks are:

1. Any product or component that plugs into either an IBM power distribution unit or mains power (via a power cord), or uses any voltage over 42 V ac or 60 V dc (considered to be hazardous voltage) must be Safety Certified by a Nationally Recognized Test Laboratory (NRTL) for the country in which it will be installed.

Some of the items that require safety certification may include: the rack or cabinet (if it contains electrical components integral to the rack or cabinet), fan trays, power distribution unit, uninterruptible power supplies, multi-outlet strips, or any other products installed in the rack or cabinet that connect to hazardous voltage.

Examples of OSHA-approved NRTLs for the U.S.:

- UL
- ETL
- CSA (with CSA NRTL or CSA US mark)

Examples of approved NRTLs for Canada:

- UL (ULc mark)
- ETL (ETLc mark)
- CSA

The European Union requires a CE mark and a Manufacturer's Declaration of Conformity (DOC).

Certified products should have the NRTL logos or marks somewhere on the product or product label. However, proof of certification must be made available to IBM upon request. Proof consists of such items as copies of the NRTL license or certificate, a CB Certificate, a Letter of Authorization to apply the NRTL mark, the first few pages of the NRTL certification report, Listing in an NRTL publication, or a copy of the UL Yellow Card. Proof should contain the manufacturers name, product type and model, standard to which it was certified, the NRTL name or logo, the NRTL file number or license number, and a list of any Conditions of Acceptance or Deviations. A Manufacturer's Declaration is not proof of certification by an NRTL.

2. The rack or cabinet must meet all electrical and mechanical safety legal requirements for the country in which it is installed.

The rack or cabinet must be free of exposed hazards (such as voltages over 60 V dc or 42 V ac, energy over 240 VA, sharp edges, mechanical pinch points, or hot surfaces).

3. There must be an accessible and unambiguous disconnect device for each product in the rack, including any power distribution unit.

A disconnect device may consist of either the plug on the power cord (if the power cord is no longer than 1.8 m (6 ft.)), the appliance inlet receptacle (if the power cord is of a detachable type), or a power on/off switch, or an Emergency Power Off switch on the rack, provided all power is removed from the rack or product by the disconnect device.

If the rack/or cabinet has electrical components (such as fan trays or lights), the rack must have an accessible and unambiguous disconnect device.

4. The rack or cabinet, power distribution unit and multi-outlet strips, and products installed in the rack or cabinet must all be properly grounded to the customer facility ground.

There must be no more than 0.1 Ohms between the ground pin of the power distribution unit or rack plug and any touchable metal or conductive surface on the rack and on the products installed in the rack. Grounding method must comply with applicable country's electric code (such as NEC or CEC). Ground continuity can be verified by your IBM service personnel, after the installation is completed, and should be verified prior to the first service activity.

5. The voltage rating of the power distribution unit and multi-outlet strips must be compatible with the products plugged into them.

The power distribution unit or multi-outlet strips current and power ratings are rated at 80 percent of the building supply circuit (as required by the National Electrical Code and the Canadian

Electrical Code). The total load connected to the power distribution unit must be less than the rating of the power distribution unit. For example, a power distribution unit with a 30 A connection will be rated for a total load of 24 A (30 A x 80 percent). Therefore, the sum of all equipment connected to the power distribution unit in this example must be lower than the 24 A rating.

If an uninterruptible power supply is installed, it must meet all the above electrical safety requirements as described for a power distribution unit (including certification by an NRTL).

6. The rack or cabinet, power distribution unit, uninterruptible power supply, multi-outlet strips and all products in the rack or cabinet must be installed according to the manufacturer's instructions, and in accordance with all national, state or province, and local codes and laws.

The rack or cabinet, power distribution unit, uninterruptible power supply, multi-outlet strips and all products in the rack or cabinet must be used as intended by the manufacturer (per manufacturer's product documentation and marketing literature).

7. All documentation for use and installation of the rack or cabinet, power distribution unit, uninterruptible power supply, and all products in the rack or cabinet, including safety information, must be available on-site.
8. If there is more than one source of power in the rack cabinet, there must be clearly visible safety labels for "Multiple Power Source" (in the languages required for the country in which the product is installed).
9. If the rack or cabinet or any products installed in the cabinet had safety or weight labels applied by the manufacturer, they must be intact and translated into the languages required for the country in which the product is installed.
10. If the rack or cabinet has doors, the rack becomes a fire enclosure by definition and must meet the applicable flammability ratings (V-0 or better). Totally metal enclosures at least 1 mm (0.04 in.) thick are considered to comply.

Nonenclosure (decorative) materials must have a flammability rating of V-1 or better. If glass is used (such as in rack doors) it must be safety glass. If wood shelves are used in the rack/cabinet, they must be treated with a UL Listed flame-retardant coating.

11. The rack or cabinet configuration must comply with all IBM requirements for "safe to service" (contact your IBM Installation Planning Representative for assistance in determining if the environment is safe).

There must be no unique maintenance procedures or tools required for service.

Elevated service installations, where the product(s) to be serviced are installed between 1.5 m and 3.7 m (5 ft. and 12 ft.) above the floor, require the availability of an OSHA- and CSA-approved nonconductive step ladder. If a ladder is required for service, the customer must supply the OSHA- and CSA- approved nonconductive step ladder (unless other arrangements have been made with the local IBM Service Branch Office). Products installed over 2.9 m (9 ft.) above the floor require a Special Bid to be completed before they can be serviced by IBM service personnel.

For products not intended for rack-mounting to be serviced by IBM, the products and parts that will be replaced as part of that service must not weigh over 11.4 kg (25 lb.) (contact your Installation Planning Representative if in doubt).

There must not be any special education or training required for safe servicing of any of the product(s) installed in the racks (contact your Installation Planning Representative if in doubt).

Packaging dimensions

Use the Packaging dimensions table to determine the width, depth, and height of packaging materials for your server.

This table lists the dimensions of the shipping container for your model.

Table 200. Packaging dimensions

Model	Width	Depth	Height
9406-250 without 7101 or 7102	650 mm (25.59 in.)	1150 mm (45.27 in.)	830 mm (32.67 in.)
9406-250 with 7101 or 7102	630 mm (24.8 in.)	800 mm (31.5 in.)	1047 mm (43.1 in.)
9406-250 (included to China with or without 7101)	665 mm (26.2 in.)	899 mm (35.4 in.)	1202 mm (47.3 in.)
9406-270	590 mm (23.22 in.)	985 mm (38.77 in.)	>885 mm (34.84 in.)
53x	1257 mm (49.5 in.)	1300 mm (51.2 in.)	1473 mm (58 in.)
600, S10	540 mm (21.3 in.)	1107 mm (43.6 in.)	919 mm (36.2 in.)
S20 without 5064	727 mm (28.6 in.)	992 mm (39.1 in.)	1193 mm (47 in.)
620, 9406-720, and S20 with 5064	727 mm (28.6 in.)	992 mm (39.1 in.)	1485 mm (58.5 in.)
640, 9406-730, and S30	788 mm (31 in.)	1500 mm (59 in.)	1778 mm (70 in.)
650, 9406-740, and S40, SB1	788 mm (31 in.)	1500 mm (59 in.)	1778 mm (70 in.)
9251 for 650, 9406-740, and S40	711 mm (28 in.)	1105 mm (43.5 in.)	1181 mm (46.5 in.)
9251 for SB1	711 mm (28 in.)	1105 mm (43.5 in.)	991 mm (39 in.)
9406-820	850 mm (33.46 in.)	1050 mm (41.33 in.)	780 mm (30.70 in.)
9406-830	692 mm (27.25 in.)	1099 mm (43.25 in.)	1276 mm (50.25 in.)
SB2	787 mm (31 in.)	1499 mm (59 in.)	1784 mm (70.25 in.)
9406-840 and SB3	565 mm (22.3 in.)	1320 mm (52.0 in.)	1577 mm (62.0 in.)
9079 for 9406-840 and SB3	485 mm (19.1 in.)	1075 mm (42.3 in.)	910 mm (35.8 in.)
9406-800 or 9406-810	650 mm (25.59 in.)	830 mm (32.67 in.)	1150 mm (45.27 in.)
9406-825	610 mm (24.0 in.)	1016 mm (40.0 in.)	1016 mm (40.0 in.)
9406-870 and 9406-890	937 mm (36.87 in.)	1334 mm (52.51 in.)	2304 mm (90.70 in.)
9094 for 9406-870, 9406-890 and SB3	485 mm (19.1 in.)	1075 mm (42.3 in.)	910 mm (35.8 in.)

Multiple server installation considerations

Learn about the installation requirements for a multiple server installation.

In a multiple server installation, it is possible that a floor tile with cable cutouts will bear two concentrated static loads up to 900 lb. (per caster or leveler). The total concentrated load can be as high as 1800 lb. Contact the floor tile manufacturer or consult a structural engineer to ensure that the raised floor assembly can support this load.

When you are integrating an iSeries 9406-870 or 9406-890 into an existing multiple server environment, or when adding additional servers to an iSeries 9406-870 or 9406-890, consider the following requirements:

- Minimum aisle width

For multiple rows of servers containing one or more iSeries 9406-870 or 9406-890, the minimum aisle width in the front of the server is 1041 mm (41 in.) and 838 mm (33 in.) in the rear of the server to allow room to perform service operations. The minimum aisle width is in addition to the front and rear service clearances of 1143 mm (45 in.) and 914 mm (36 in.) respectively. Service clearances are measured from the edges of the frame (with doors open) to the nearest obstacle.

- Thermal interactions

The minimum aisle width between rows on the computer room floor is 33 or 41 inches for optimal cooling. In addition, servers should be faced front to front and rear to rear to create "cool" and "hot" aisles to maintain effective server thermal conditions.

Cool aisles need to be of sufficient width to support the airflow requirements of the installed servers. The airflow per tile will be dependent on the under floor pressure and perforations in the tile. A typical under floor pressure of 0.025 in. of water will supply 300-400 cfm through a 25% open 2 ft. x 2 ft. floor tile.

- Floor loading

The server can induce a concentrated load of 900 lb. per caster. It is possible that a panel structure has to sustain a total load as high as 1800 lb. Consult the panel manufacturer and obtain the services of a qualified consultant or structural engineer to insure the concrete floor and the structure panel can support these loads.

Service clearance for multiple server installations

The service clearance area is the area around the server that is needed for IBM service representatives to service the server.

The minimum service clearance measurements for the 9406-870 or 9406-890 server unit are:

- Back 1143 mm (45.0 in)
- Front 914 mm (36.0 in)
- Right side 660 mm (26.0 in)
- Left side 66 mm (2.6 in)

The service clearance measurements for the left and right side can be reversed depending on the availability of space and the location of the expansion unit.

Cooling requirements for multiple server installations

The iSeries 9406-870 and 9406-890 require air for cooling. The use of a raised floor is recommended to provide air through perforated floor panels placed in rows between the fronts of servers.

Sites with multiple servers must use the floor layout explained in "Multiple server installation considerations" on page 498.

Note: Do not place perforated tiles in the hot aisles. Heated exhaust air must exit the computer room through the ceiling air return system.

The following tables provide server cooling requirements based on server configuration. The letters in the table correspond to the letters in the following graph.

1.1 GHz 8-way modules (cooling chart reference)

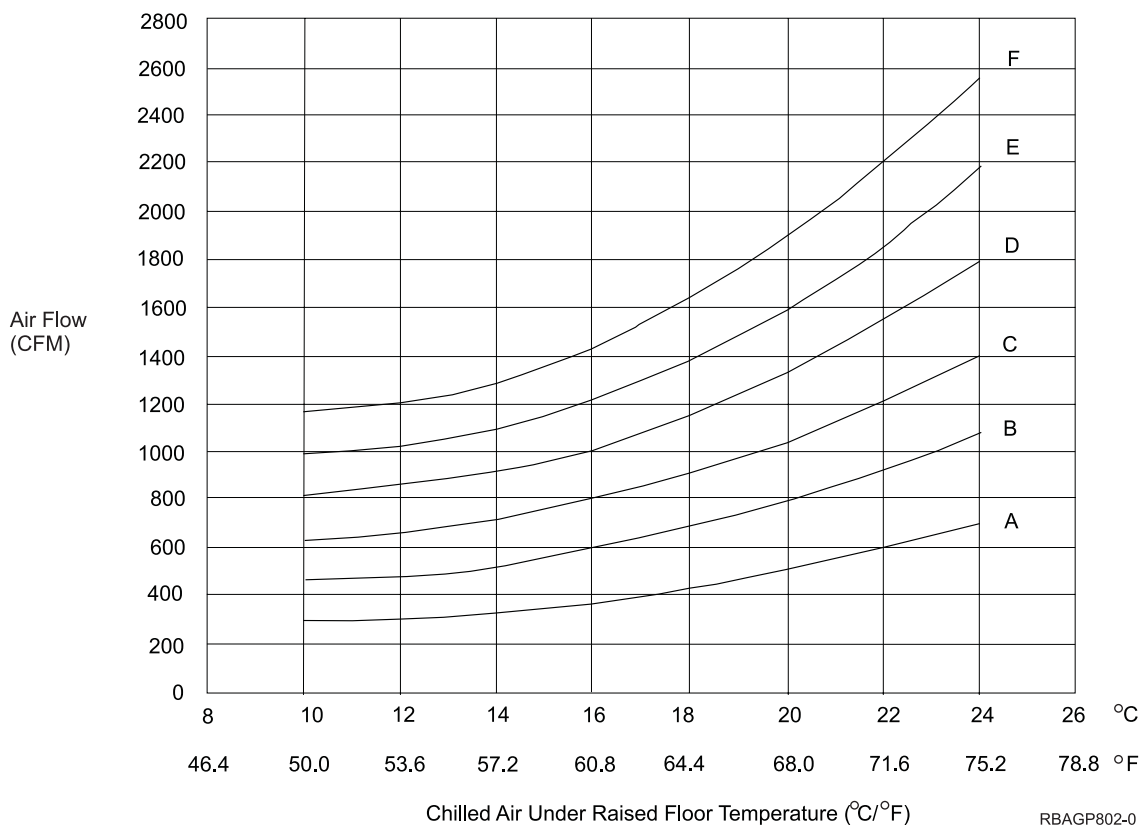
Number of expansion units (9094, 5094, 5074, 9079, 8079, 8093)	8-way	16-way
1	A	B
2	B	B
3		C
4		C
5		
6		
7		

Number of expansion units (9094, 5094, 5074, 9079, 8079, 8093)	8-way	16-way
8		

1.3 GHz 8-way modules (cooling chart reference)

Number of expansion units (9094, 5094, 5074, 9079, 8079, 8093)	24-way	32-way
1	C	C
2	C	D
3	C	D
4	D	D
5	D	E
6	D	E
7		F
8		F

Cooling Requirements Graph



Chilled airflow area requirements

Use the server cooling requirements tables and the cooling requirements graph to determine the area of floor tiles to supply chilled air to the server.

Related information for planning

Product manuals, IBM Redbooks™ (in PDF format), Web sites, and information center topics contain information related to the Planning topic. You can view or print any of the PDF files.

Web sites

- **Migrating or upgrading your server** - Use this information to plan for a data migration or a server upgrade.
- **Data migration for IBM eServer i5 servers** - Use this information to plan a data migration for your IBM eServer i5 servers.
- **Upgrades for IBM eServer i5 servers** - Use this information to plan IBM eServer i5 upgrades.
- **pSeries Hardware Information Center** - Use this link to find planning information for System p 6xx servers.
- **Installing features** - View or print installation instructions for IBM eServer hardware features.
- **Installing IBM eServer i5 features** - View or print installation instructions for IBM eServer i5 hardware features.

Appendix. Accessibility features

Accessibility features help users who have a physical disability, such as restricted mobility or limited vision, to use information technology products successfully.

The following list includes the major accessibility features:

- Keyboard-only operation
- Interfaces that are commonly used by screen readers
- Keys that are tactilely discernible and do not activate just by touching them
- Industry-standard devices for ports and connectors
- The attachment of alternative input and output devices

IBM and accessibility

See the IBM Accessibility Center at <http://www.ibm.com/able/> for more information about the commitment that IBM has to accessibility.

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Related concepts

"Trademarks"

"Electronic emission notices" on page 507

"Terms and conditions" on page 513

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Electronic emission notices

Related concepts

“Class A Notices”

“Class B Notices” on page 510

Class A Notices

The following Class A statements apply to the IBM System i models and IBM System p servers with the exception of those that are specifically identified as Class B.

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 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 respecte est conforme à la norme NMB-003 du Canada.

European Community Compliance Statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to 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.

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

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The following is a summary of the VCCI Japanese statement in the box above.

This product is a Class A Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Electromagnetic Interference (EMI) Statement - People's Republic of China

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。

Declaration: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may need to perform practical action.

Electromagnetic Interference (EMI) Statement - Taiwan

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。

The following is a summary of the EMI Taiwan statement above.

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

IBM Taiwan Contact Information:

台灣IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

Electromagnetic Interference (EMI) Statement - Korea

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이점을 주의하시기 바라며, 만약 잘못 판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

Please note that this equipment has obtained EMC registration for commercial use. In the event that it has been mistakenly sold or purchased, please exchange it for equipment certified for home use.

Germany Compliance Statement

Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse A ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung der IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der IBM gesteckt/eingebaut werden.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:

"Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse A.

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Konformitätserklärung nach des EMVG ist die IBM Deutschland GmbH, 70548 Stuttgart.

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse A.

Electromagnetic Interference (EMI) Statement - Russia

ВНИМАНИЕ! Настоящее изделие относится к классу А.
В жилых помещениях оно может создавать
радиопомехи, для снижения которых необходимы
дополнительные меры

Class B Notices

The following Class B statements apply to model 9111-520 (stand-alone version), 9131-52A (stand-alone version), 7047-185 and the 9111-285.

Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM authorized dealers. IBM is not responsible for any radio or television interference caused by using other than recommended cables or 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 interferences, and (2) this device must accept any interferences received, including interference that may cause undesired operation.

Industry Canada Compliance Statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

European Community Compliance Statement

This product is in conformity with the protection requirements of EC Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

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

Properly shielded and grounded cables and connectors must be used in order to reduce the potential for causing interference to radio and TV communications and to other electrical or electronic equipment. Such cables and connectors are available from IBM authorized dealers. IBM cannot accept responsibility for an interference caused by using other than recommended cables and connectors.

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

VCCI Statement - Japan

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B情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

The following is a summary of the VCCI Japanese statement in the box above.

This is a Class B product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

IBM Taiwan Product Service Contact Information

台灣IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

Electromagnetic Interference (EMI) Statement - Korea

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Radio Protection for Germany

Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse B EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse B ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung der IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der IBM gesteckt/eingebaut werden.

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse B.

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Konformitätserklärung nach des EMVG ist die IBM Deutschland GmbH, 70548 Stuttgart.

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse B.

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