

Integrated Cabinet Installation Guide

HP 3000 and HP 9000 Enterprise Servers



Manufacturing Part Number: A2375-96152

HP Part No. A2375-90007

Printed in U.S.A. March 1999

Edition 7, E0399

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Printing History

New editions of this manual incorporate all material updated since the previous edition. The manual printing date and part number indicate its current edition. The printing date changes when a new edition is printed. (Minor corrections and updates which are incorporated at reprint do not cause the date to change.) The manual part number changes when extensive technical changes are incorporated.

January 1995.....	Edition 1
January 1996.....	Edition 2
June 1996.....	Edition 3
February 1997.....	Edition 4
July 1997.....	Edition 5
January 1998.....	Edition 6
March 1999.....	Edition 7

Change Narrative

- Edition 7 includes changes and updates to the entire manual:
 - a. Specific references to cabinet models were removed where they are no longer required.
 - b. Instructions and figures have been updated to reflect the latest version of the cabinet. Previous versions are no longer being manufactured.
- Edition 6 technical changes include the addition of HP9000/K380/K580 information throughout the manual.
- Chapter 3 includes a note about access to the unloading ramp packed in the shipping container.

Minor changes and updates were also incorporated.

NOTE

Reader Comments. We welcome your comments about our documentation. If you have editorial suggestions or recommended improvements for this document, please write to us. You can reach us through e-mail at: *hardwaredocs@cup.hp.com* or by sending your letter to: *Documentation Manager, M/S 5657, Hewlett-Packard Company, 8000 Foothills Blvd., Roseville, CA 95747-6588 USA*. Please include the following information in your message:

- Title of the manual you are referencing.
- Manual part number (from the title page).
- Edition number or publication date (from the title page).
- Your name.
- Your company's name.

SERIOUS ERRORS, such as technical inaccuracies that may render a program or a hardware device inoperative, should be reported to your HP Response Center or directly to a Support Engineer.

Safety Considerations

This edition contains technical information about integrated HP cabinets. These cabinets are designed to accept all HP 3000 and HP 9000 Class Enterprise servers.

This product and related documentation must be reviewed for familiarization with safety markings and instructions before operation. The following information defines **WARNING** and **Caution** statements contained in this manual.

WARNING The **WARNING** sign denotes a hazard. It calls attention to a procedure, practice, or operation, which if not performed correctly or adhered to, could result in serious injury. Do not proceed beyond a **WARNING** sign until the indicated conditions are fully understood and met.

CAUTION The **CAUTION** sign denotes a hazard. It calls attention to an operating procedure, practice, or operation, which if not performed correctly or adhered to, could damage or destroy part or all of the product. Do not proceed beyond a **CAUTION** sign until the indicated conditions are fully understood and met.

Safety and Regulatory Information

For your protection, this product has been tested for conformance to various national and international regulations and standards. The scope of this regulatory testing includes electrical and mechanical safety, electromagnetic emissions, immunity, ESD, acoustics and hazardous materials.

Where required, certifications are obtained from third party test agencies. Certification marks appear on the product label. In addition, various regulatory bodies require some information under the headings noted below.

Acoustics - (Germany)

Laermangabe (Schalldruckpegel LpA) gemessen an Arbeitsplatz bei normalem Betrieb nach DIN 45635, Teil 19: Acoustic Noise (A-weighted Sound Pressure Level LpA) measured at operator's position, normal operation, to ISO7779.

Cabinets with fan accessory: 61 dB (LpA)

SAFETY WARNINGS:

WARNING This product has not been evaluated for connection to an IT power system (an AC distribution system having no direct connection to earth according to IEC 950).

CABINET STABILITY:

CAUTION To reduce the risk of cabinet instability, fully extend the stabilizer before extending any devices. Extend only one device at a time. Do not stand or sit on any extended device. All non-operator servicing should be done by qualified service personnel.

LEAKAGE CURRENT:

WARNING The types of product installed in this cabinet produce a risk of high leakage current (>3.5 mA). Reliable ground circuit continuity is vital for safe operation of this cabinet. To reduce the risk of electric shock, earth connection is essential before connecting the supply. Never operate the cabinet with the ground conductor disconnected.

POWER LIMITATIONS:

CAUTION To reduce the risk of overload, do not load any single PDU with more than a maximum of 16 Amperes. In addition, do not load a single NEMA 5-15 receptacle with more than 15 Amperes and any single IEC 320 receptacle with more than 10 Amperes.

ACCESSORIES:

CAUTION This product has been designed to be used with specific electrical accessories (i.e., PDUs and fans). The use of any other accessory is not supported.

1 Introduction

Both HP 3000/9x9KS and HP 9000/Kxx0 systems can be mounted into a cabinet to consolidate the components of the core computer. Servers installed in a cabinet at the factory are called “factory integrated,” while servers installed in a cabinet at the customer’s site are called “field integrated”. This manual only pertains to factory integrated servers.

Refer to Table 1-1 for the products covered by this manual.

NOTE This Cabinet Installation Guide pertains to the E- series line of computer cabinets that are used when factory integration is ordered.

Cabinet Installation Guides received with the previous version of computer cabinets must be retained for reference in case repackaging is required.

This manual does not provide instructions for previous versions of computer cabinets.

Table 1-1. E-series Cabinets

Product	Description	EIA	W x D x H Dimensions: Centimeters	W x D x H Dimensions: inches
A5134A	Factory Integrated 1.25M for HP3000	25	59.7 x 100.3 x 125.7	23.5 x 39.5 x 49.5
A5135A	Factory Integrated 1.6M for HP3000	33	59.7 x 100.3 x 161.3	23.5 x 39.5 x 63.5
A5136A	Factory Integrated 1.97M for HP3000	41	59.7 x 100.3 x 196.9	23.5 x 39.5 x 77.5
A4900A	Factory Integrated 1.25M for HP3000	25	59.7 x 100.3 x 125.7	23.5 x 39.5 x 49.5
A4901A	Factory Integrated 1.6M for HP3000	33	59.7 x 100.3 x 161.3	23.5 x 39.5 x 63.5
A4902A	Factory Integrated 1.97M for HP3000	41	59.7 x 100.3 x 196.9	23.5 x 39.5 x 77.5

Inspecting the Shipment

When the shipment arrives, make sure the cabinet has been received as specified by the carrier's bill of lading. Inspect the shipping container for evidence of mishandling during transit. If the container is damaged or water-stained, ask that the carrier's agent be present when the cabinet is unpacked. Refer to the instructions described in the *Claims Procedure* section. If everything appears to be in satisfactory condition, proceed with the unpacking instructions.

NOTE Do not discard or destroy the shipping container or the packaging material. If it becomes necessary to repackage the cabinet, these items will be needed. HP also suggests that you keep this manual, in case you later have to repackage the cabinet for shipment.

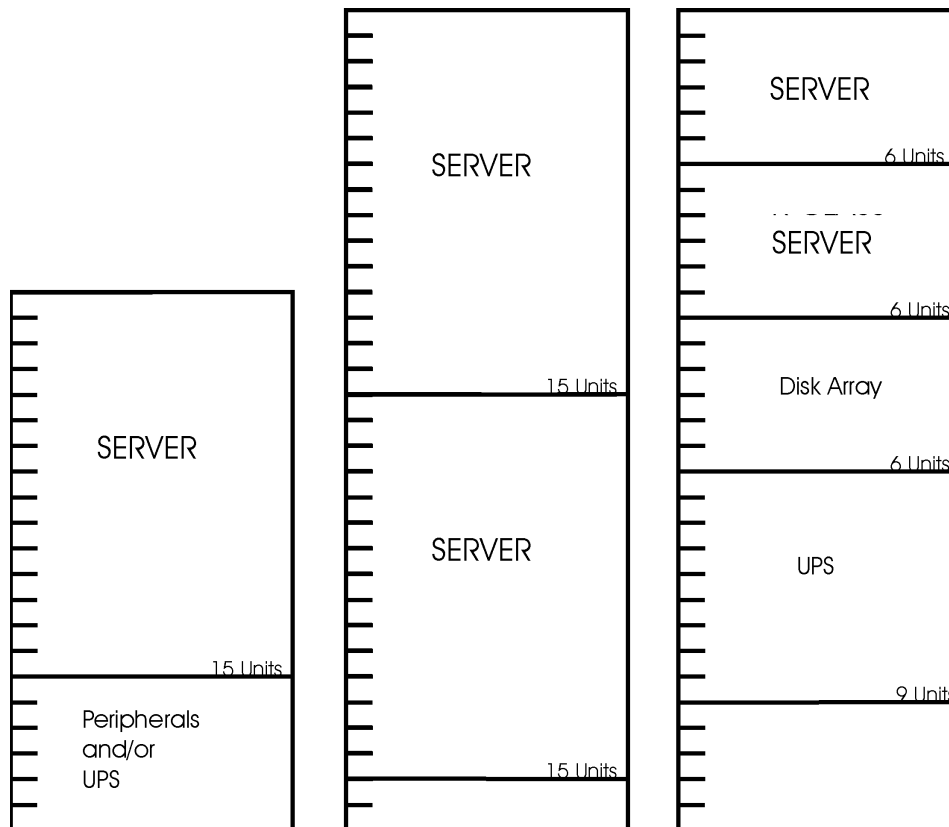
Claims Procedure

If the shipment is incomplete, or if the equipment is damaged or fails to meet specifications, notify the nearest Hewlett-Packard Sales and Support Office. If damage occurred in transit, notify the carrier as well. Hewlett-Packard will arrange for replacement or repair without waiting for settlement of claims against the carrier. If the shipment was damaged in transit, keep the shipping containers and packaging material for inspection.

Cabinet Configurations

Although the cabinets are designed to accommodate a variety of components mounted in just about any configuration, there are some basic rules that apply to mounting a computer system. These rules allow for weight distribution, accessibility of the components, and cable management inside the rack-mount cabinet. Figure 1-1 shows some example configurations.

Figure 1-1 Cabinet Configuration Examples



Required Tools

Before beginning the installation process, make sure you have the necessary tools.

1. Standard hand tools (including Torx-drive set and voltmeter).
2. Flat-blade screwdriver, 3/16-inch by 9 inches long.
3. Open-ended 9/16-inch wrench.

2 Site Requirements

This chapter describes the site requirements for the installation of factory-integrated cabinets.

NOTE There are no HP-required site preparations necessary for installing factory-integrated cabinets, other than those specified for the systems housed in them.

Customer Site Preparation Requirements

There are some customer site preparation requirements. The customer is responsible for having the proper type and amount of electrical outlets at the cabinet site. The customer must also be aware of any system site requirements that the computer in the cabinet may have. Be sure to check all site requirements before installing any equipment. Refer to Table 2-1 for cabinet physical specifications. Figure 2-1 shows the types of receptacles that are needed to match the power cords for specific cabinet power configurations.

NOTE There are no special environmental requirements for factory-integrated cabinets, or the computer systems contained in them.

All cabinet models require 61 cm (24 in) of space behind and in front of the cabinet to allow for access and cooling.

Table 2-1 Cabinet Power Details

Product Number	Power Options	Cord Length	Power Dist.	Max. Current	Phase	Plug Style	IEC-320 C13 Recep.	IEC-320 C19 Recep.	PDU Kit Acc. ¹
A5137AZ (PDU for E-series cabinets)	AW3 (E25 only)	4.5M	100-120V	16A (each PDU string)	Single	5-20P	7	1	N/A
	AW4	4.5M	200-240V			L6-20P			
	AW5	4.5M	200-240V			Undet.			
	A5N	2M	Universal			C-20P			
	AWT	4.5M	240V			CEE717			
	AWU	4.5M	240V			IEC309			
	A5F	4.5M	240V			L6-30P			
	A5G	4.5M	240V			Undet.			
	A5H	4.0M	Universal			C-20P			

¹. For use with HP PowerTrust UPS units.

CAUTION Ensure external power connection matches voltage settings of all products in this cabinet.

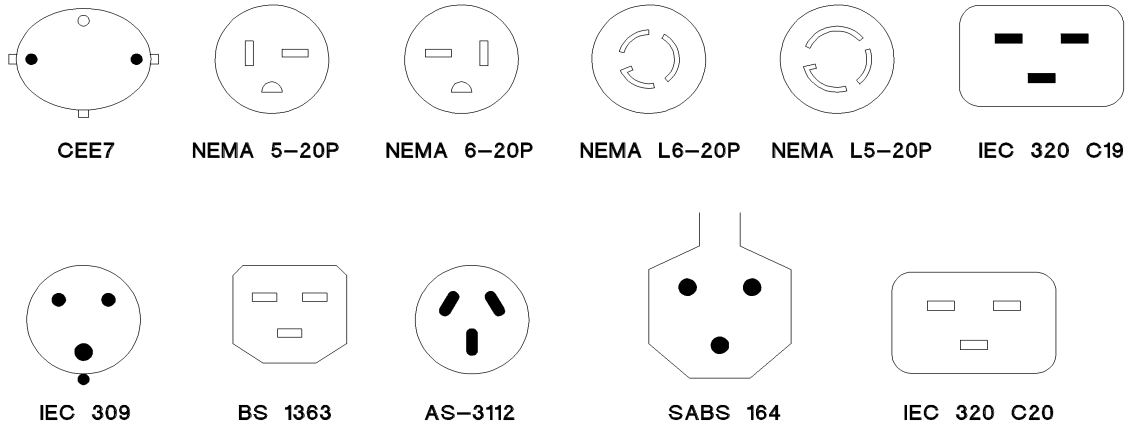
NOTE To verify that servers and peripherals do not exceed the 16 amp capacity of the PDUs:

1. Sum the currents required by each system.
 2. If sum is less than 16 amps, the configuration meets power requirements.
-

NOTE The cabinets that are sold in Europe are shipped without a power plug on the end of the PDU cable. It is the responsibility of the customer to supply the correct plug and receptacle for the particular country and electrical code, or have the power cord wired to the power outlet.

Power plug and receptacle types that can be used with the cabinets are displayed in Figure 2-1.

Figure 2-1 Power Plug/Receptacle Types



bhcl006

Site Requirements
Customer Site Preparation Requirements

3 Unpacking and Installation

This chapter describes how to unpack the cabinet assembly. All cabinets are shipped on a pallet. The instructions for unpacking are the same for all cabinets.

It is the customer's responsibility to inspect the shipping package for shipping damage.

It is the Hewlett-Packard Customer Engineer's responsibility to remove the cabinet assembly from the shipping pallet.

NOTE Do not discard or destroy the shipping container or the packaging material. If it becomes necessary to repackage the cabinet, these items will be needed. HP also suggests that you keep this manual, in case you later have to repackage the cabinet for shipment.

Unpacking the Cabinet Assembly

All cabinet types are packaged the same way. Be sure to read the unpacking instructions before proceeding.

WARNING A fully configured 2.0 meter cabinet (A4902A) can weigh as much as 635 kg (1400 lbs). Be very careful when unpacking the cabinet.

To unpack a cabinet, perform the following steps:

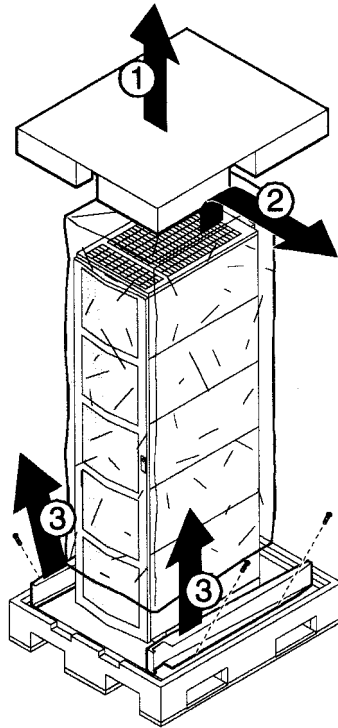
1. Cut the plastic polystrap bands around the shipping container. Remove the corrugated top cover and side walls.

WARNING Wear protective glasses while cutting the plastic bands around the shipping container. These bands are under tension. When cut, they can spring back and cause serious eye injury.

Unpacking and Installation
Unpacking the Cabinet Assembly

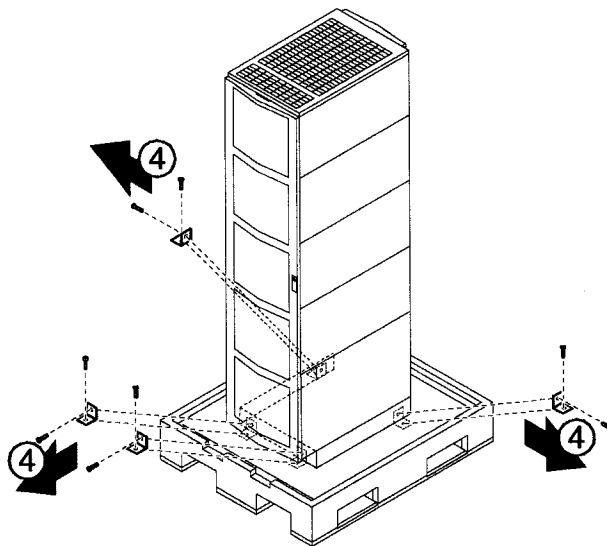
2. Lift the cardboard top cap (callout 1 in Figure 3-1) off of the shipping box. Loosen the screws that secure the steel ramps in place and lift the ramps out (callout 3).

Figure 3-1 Removing the Packing Material and Ramps



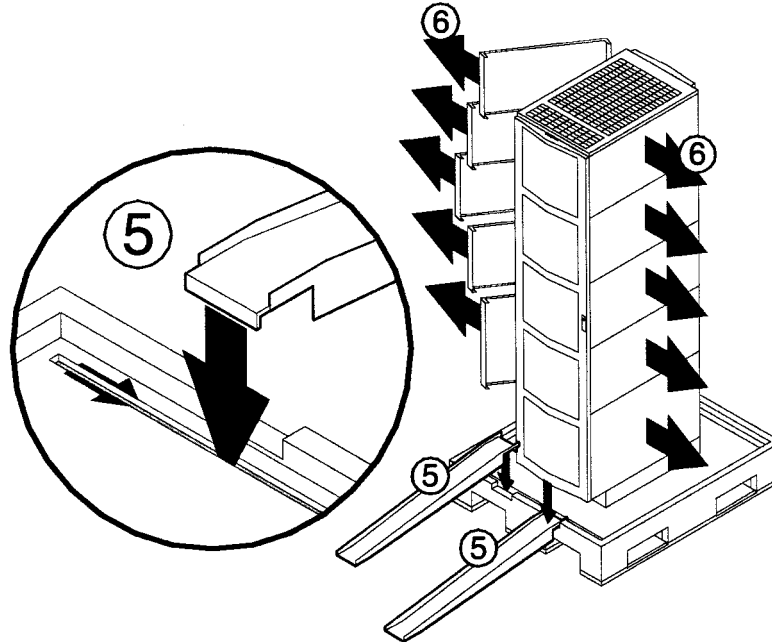
3. Remove the brackets (callout 4 in Figure 3-2) securing the server to the pallet.

Figure 3-2 Removing the Brackets



4. Insert the ramps in the notches provided on the pallet (callout 5 in Figure 3-3). Remove the side panels from the cabinet (callout 6) and set them aside.

Figure 3-3 Attaching the Ramps



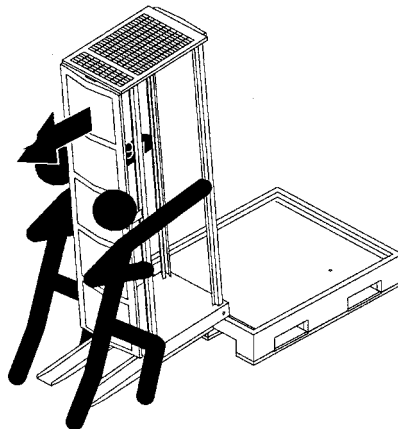
5. Using two people, roll the cabinet off the pallet and down the ramp. See Figure 3-4..

WARNING

Use two or more people to remove the cabinet from the shipping pallet. Otherwise, the cabinet might tip over and cause personal injury or damage to the equipment.



Figure 3-4. Rolling the Cabinet Off the Pallet



Cabinet Inspection

Once the cabinet is off the shipping pallet, but before it is placed in the installation site, inspect the internal and external condition of the cabinet.

Exterior:

Check the cabinet exterior for signs of shipping damage:

1. Look at the top and sides for dents, warpage, or scratches.
2. Check the front bezels for alignment, scratches, and that they open and close normally.
3. Check any filler panels on the front of the cabinet for proper fit.
4. Check the forehead assembly for any signs of damage.
5. Check the rear door for dents, scratches, proper fit, and operation. Also visually inspect the fit of the door when it is closed.

Interior: Open the rear door and inspect the inside of the cabinet.

1. Inspect all cables, make sure they are secure.
2. Inspect all rails for signs of damage.
3. Check all mounting screws for tightness.
4. Check all components for signs of shifting during shipment or any signs of damage.

If any damage is found, follow the claims procedures described in Chapter 1. Some damage may be repaired by replacing a damaged part, if that part is replaceable. Refer to Chapter 5 for a list of field replaceable parts for the cabinet. For internal component damage, refer to the *Service Manual* for replaceable parts and procedures.

If extensive damage is found, it may be necessary to return the entire cabinet to HP. Refer to the Repacking instructions listed in this chapter.

Cabinet Installation

The installation of the pre-loaded cabinets consists of the following steps:

1. Move the cabinet to installation site.
2. Lower the leveling feet. (This will prevent excessive wear on the casters.)

CAUTION It is strongly urged that the cabinet stabilizers also be extended as an additional safeguard against overturning the cabinet during installation. The stabilizer is an extendable slide located at the bottom front of the cabinet.

3. Connect the system console, graphics console, or Remote Web Console to the server (refer to the *System Installation Guide*).
4. Connect all user terminals to the server.
5. Connect all system peripherals to the server.

NOTE Attaching cables while the rails are extended fully forward will ensure sufficient slack for later maintenance.

6. Connect the cabinet power cord to the appropriate wall outlet.

NOTE If the cabinet being installed contains a PowerTrust Uninterruptible Power Supply (UPS) option, perform the steps under *PowerTrust UPS Option*.

7. Be sure all peripherals outside the cabinet are connected to wall outlets.

The cabinet/server system assembly is now ready for the power up process. Refer to Chapter 4 for operating instructions.

PowerTrust UPS Option

Unpack the PowerTrust UPS and read all the installation information in the *PowerTrust System Guide* part number 5961-8383. Once all the procedures listed in the UPS guide are complete, perform the following steps to complete the UPS installation with the cabinet.

1. Position the UPS next to the cabinet on the floor.
2. Remove the jumper cord from the SPU to the PDU.
3. Install one of the convenience cords (output cord) that came with the UPS into the AC receptacle in the back of the SPU.
4. Place the other end of that cord into one of the *Output* outlets in the back of the UPS.
5. The other convenience cord is connected between the UPS and the system console.
6. Locate the appropriate input line cord for the UPS in the supplemental package shipped with the UPS.
7. Plug the UPS into the appropriate wall outlet.
8. The system should now be ready for power up.

Repackaging the Cabinet for Shipment

Use the original packing material to repack the cabinet for shipment. If the packing material is not available, contact your local Hewlett-Packard Sales and Support Office regarding shipment.

Before shipment, place a label tag on the container (or equipment) to identify the owner and the service to be performed. Include the equipment model number and the full serial number, if applicable. The label showing the model number and the full serial number is located on the outside of the rear door.

Due to the weight of a fully loaded cabinet, it may require two people to push the cabinet up the ramps onto the pallet.

WARNING Due to the weight of a loaded cabinet, repackaging can be hazardous. Use caution when moving and positioning the cabinet on the pallet. Check the condition of the loading/unloading ramp before use. If the ramps appear damaged, DO NOT attempt to push the loaded cabinet up the ramps onto the pallet. Contact your local Hewlett-Packard Sales and Support Office regarding shipment.

To repack the cabinet, follow the repacking checklist and refer to the unpacking instructions for detail.

Repacking Checklist:

1. Assemble the HP packing materials that came with the cabinet.
2. Connect the loading ramps to the pallet.
3. Raise the cabinet levelers before moving the cabinet.
4. Push the cabinet up the ramps onto the pallet. Be sure to position the cabinet so the front goes up the ramp first.
5. Secure the cabinet to the pallet with the shipping clamps, shipping block, and rear door support.
6. Secure the steel ramps to the pallet with the screws provided.
7. Place the anti-static bag over the cabinet.
8. Place bezel support packing on the front corners of the cabinet. Secure it with some sort of wrap.
9. Place the top cap packing material and on top of the cabinet.
10. Wrap the clam shell box around the cabinet.
11. Put the box top on the box and secure the assembly to the pallet.

Be sure to follow the labeling instructions mentioned earlier. The cabinet is now ready for shipment.

Unpacking and Installation
Repackaging the Cabinet for Shipment

4 Cabinet Operation

Once you have the computer system installed in the cabinet and all the peripherals connected, you are ready to turn on the system. The power up sequence for the computer in the cabinet is controlled by the ON/OFF switch on the cabinet, unless you have installed a PowerTrust UPS.

Turning On the Computer System (Without UPS)

When turning on the computer in the cabinet, remember that includes all the components mounted in the cabinet turn on at the same time. The basic steps for the power up sequence are listed below, refer to the documentation that comes with the computer for specific details concerning the operating system software for your computer.

CAUTION Ensure external power connection matches voltage setting of all products in this cabinet.

1. Turn on all the external equipment connected to the computer first.
2. Check all READY or ONLINE indicators on the external equipment to be sure that they are powered up and ready.

NOTE If any of the external equipment has been OFF due to environmental problems such as heating or air conditioning failure, or outside storage conditions (such as a loading dock), allow approximately 30 minutes for the temperature of the equipment to stabilize before turning on the computer.

3. Be sure that all the cabinet-mounted component ON/OFF switches are in the ON position.
4. When all external equipment indicate READY or ONLINE, put the cabinet ON/OFF switch in the ON position. All components mounted in the cabinet are going to power up at the same time.

Turning On the Computer System (with UPS)

When turning on the cabinet power, remember that all the components mounted in the cabinet turn on at the same time, except the SPU. The basic steps for the power up sequence are listed below.

1. Turn on all the external equipment connected to the computer.
2. Check all READY or ONLINE indicators on the external equipment to be sure that they are powered up and ready.

NOTE If any of the external equipment has been OFF due to any environmental problem, such as heating or air conditioning failure, or outside storage conditions (such as a loading dock) allow approximately 30 minutes for the temperature of the equipment to stabilize before turning on the computer.

3. Except for the SPU, put all the ON/OFF switches, of the components mounted in the cabinet, in the ON position. Leave the SPU ON/OFF switch in the OFF position.
4. When all external equipment indicates READY or ONLINE, put the cabinet ON/OFF switch in the ON position. All components mounted in the cabinet are going to power up at the same time (except for the SPU).
5. Put the UPS *Output* switch in the ON (I) position. This applies power to the SPU and console line cords.
6. Put the SPU and console switches in the ON position.
7. The computer system should now be powered up and executing the power-on selftests in preparation for a normal bootup procedure.

Turning Off the Computer System (Without UPS)

The computer has no remote turn off sensor for AC power. If the cabinet switch is put in the OFF position before turning off the computer switch, the computer senses that as an AC power fail condition.

1. Put the computer power switch in the OFF position.
2. Put the cabinet power switch in the OFF position. This removes AC from all the components mounted in the cabinet, including the computer.
3. At this point, other components in the cabinet can be turned off, if necessary.

Turning Off the Computer System (With UPS)

If the cabinet ON/OFF switch is put in the OFF position, all components connected to the cabinet PDU will be turned off. This does not turn off the computer.

1. Put the computer power switch in the OFF position.
2. Put the console power switch in the OFF position.
3. Put the UPS *Output* switch in the OFF (O) position. This removes AC from the computer.
4. Put the cabinet power switch in the OFF position. This removes AC from all the components mounted in the cabinet, except the computer.
5. At this point, other components in the cabinet can be turned off if necessary.

Cabinet Operation
Turning Off the Computer System (With UPS)