

Site Preparation Guide
for HP A3764A and HP A3765A Cabinets
HP 9000 D Class Enterprise Servers



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Contents

1. Introduction

How to Use This Manual	1-1
Hewlett-Packard Service Organization.	1-2
Sales Representative.	1-2
Customer Engineer (CE).	1-2
Application Engineer (AE)	1-2
HP Site Preparation Services	1-4
Site Planning Visit	1-4
Site Verification Visit	1-4
Third Party Service.	1-4
Customer Responsibilities	1-5
Local Codes	1-5
Data Communications Equipment.	1-6
Selection of Site personnel	1-6
Site Coordinator	1-6
Principal Operator	1-6
Site Planning Team.	1-7

2. Site Preparation Guidelines

Site Planning Time Table	2-1
Preparing For Installation.	2-2
Computer Site Safety Considerations	2-2
Floor Plan	2-2
Computer Room Construction	2-3
Power Requirements.	2-4
Line Voltage.	2-5
Frequency	2-5
Dedicated Circuits.	2-5
Safety and Dedicated Grounds.	2-5
Receptacles	2-5
Power Line Transients and Noise	2-6
Sources of Electrical Interference	2-6
Convenience Wall Outlets.	2-6
Lightning	2-6
Vibration	2-7
Electromagnetic Interference	2-7
Environmental Considerations	2-7
Miscellaneous Requirements	2-8
Computer Supplies	2-8
Media Storage	2-9
Protection of Valuable Records.	2-9
Telephone.	2-9

3. Receiving the A3764A or A3765A Cabinet

Equipment Arrivals	3-1
Checking for Shipping Shortage and Damage.	3-1
Unpacking of Cartons	3-2

Contents

A. Site Preparation Kit

- Pre-Installation WorksheetA-1
- Space Planning KitA-3
- Tables and WorksheetsA-6

B. Specifications

- IntroductionB-1
- Regulatory StandardsB-2
- SpecificationsB-3

Figures

Figure 2-1 . 20 Amp wall Receptacle (US Only) 2-4
Figure 1 . Space Planning Grid Sheet A-4
Figure 2 . System Cutouts A-5

Tables

Table 1-1. Site Preparation Technical Tasks	1-3
Table 2-1. Cabinet Power Requirements	2-4
Table 1. Pre-Installation Activities	A-1
Table 2. Ship Schedule	A-2
Table 3. Worksheet for Power Requirement Calculations	A-6
Table 4. Worksheet for Heat Dissipation Calculations by Machine Type	A-7
Table 5. System Heat Dissipation Worksheet	A-8
Table 1. Regulatory Listings	B-2
Table 2. Environmental Specifications	B-3
Table 3. Electrical Specifications for D2xx and D3xx Computers	B-4
Table 4. Electromagnetic and Electrostatic Specifications.	B-4
Table 5. A3764A and A3765A Physical Specifications	B-5

Printing History

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Manual updates may be issued between editions to correct errors or document product changes. To ensure that you receive the updated or new editions, you should subscribe to the appropriate product support service. See your HP sales representative for details.

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NOTE

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- Title of the manual you are referencing.
- Manual part number (from the title page).
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- 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 product and related documentation must be reviewed for familiarization with safety markings and instructions before operation. The following defines the **WARNING** and the **Caution** statements contained in this manual.

WARNING	The WARNING sign denotes a hazard. It calls attention to a procedure, practice, of the like, which if not done correctly or adhered to, could result in injury. Do not proceed beyond a WARNING sign until the indicated conditions are fully understood and met.
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CAUTION	The CAUTION sign denotes a hazard. It calls attention to an operating procedure, practice, of the like, which if not done 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.
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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.

A3764A series cabinets: 49.8 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).
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CABINET STABILITY:

CAUTION	To reduce the risk of cabinet instability, only one D Class computer can be extend at a time. Do not stand or sit on any extended device. All non-operator servicing should be done by qualified service personnel.
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LEAKAGE CURRENT:

WARNING Due to the types of products able to be installed in this product there is a risk of high leakage current (>3.5 mA). Reliable ground circuit continuity is vital for safe operation of this product. To reduce the risk of electric shock, earth connection is essential before connecting the supply. Never operate product 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. PDU's). The use of any other accessory is not recommended or supported.

1 Introduction

How to Use This Manual

This manual contains site preparation information for Hewlett-Packard A3764A and A3765A D Class Enterprise Server Rackmount Cabinet. Other site preparation resources may also be available to you. Consult with a Hewlett-Packard Sales representative or Customer Engineer (CE) specializing in computer site preparations.

Proper site preparation and maintenance is vital to the reliability of any computer system. As our customer, it is your responsibility to ensure that the proper facility resources and conditions are maintained. This will allow HP to provide support services in accordance with the “Customer Support Services Agreement.” The content of this manual is arranged as follows:

- **Chapter 1** - Is an introduction to HPs services organization, site planning services. It also outlines the HP responsibilities and those of the customers.
- **Chapter 2** - Contains site preparation and planning information specifically for HP 9000 D Class Servers installed in an A3764A rackmount cabinet. It also suggests topics that must be considered for larger computer system sites.
- **Chapter 3** - Contains information on the receipt and installation of the A3764A and A3765A Cabinet.
- **Chapter A** - Contains worksheets for space and installation planning.
- **Chapter B** - Contains the specifications for the A3764A/A3765A Cabinets, and D Class Enterprise Servers.

Hewlett-Packard Service Organization

All members of the HP service organization are dedicated to making sure that each customer realizes the maximum benefit from their computer. Brief descriptions of HP service representatives and how they can assist the customer are contained in the following sections. Table 1-1 summarizes a number of site preparation technical tasks and lists the personnel who are responsible for completing each task. It is very important for the customer to understand which responsibilities are theirs and that the defined tasks must be complete in order to install the purchased equipment.

Sales Representative

The HP Sales Representative is the customer's primary point of contact. Each Sales Representative coordinates all of the HP resources required to ensure a successful delivery and installation. The Sales Representative is also responsible for arranging additional computer system capabilities (options) and staff training.

Customer Engineer (CE)

The HP CE is trained and experienced in computer equipment and peripherals service. They have the tools, parts, and knowledge to install and maintain HP computer systems. The CE will assist you in determining your computer site preparation requirements.

Application Engineer (AE)

The HP AE is a technical specialist for HP computer systems and programming languages. The AE organization provides a host of training courses and technical consulting services in support of the computer systems languages, utility programs, data base management, and system performance.

Table 1-1 Site Preparation Technical Tasks.

Technical Tasks	Responsible Personnel
Line voltage measurement	Electrician and CE
Power line frequency measured (if required)	Electrician and CE
Power line noise levels measured (if required)	CE
Neutral or ground noise/voltage levels measured	CE
Safety and ground connections verified	Electrician and CE
Advice on correct circuit breaker and wire size	Electrician and CE
Verification that maintenance power outlets (those used for floor cleaning, etc.) are on separate circuits from the computer system	Electrician and CE
Recommendations for lightning protection	CE
Measurements and recommendations on radiated interference	CE
Answers to questions concerning modems and modem options	AE
Thermal load of HP equipment	CE
Thermal load of non-HP equipment	Customer and Equipment Vendor
Modifications to existing electrical service	Electrician and Customer
Modifications to existing air conditioning	A/C Contractor and Customer
Environmental contaminants	CE and Environmental Engineer
Placement of equipment (for service access)	CE

HP Site Preparation Services

The following sections outline HP's site planning and verification services.

Site Planning Visit

Upon receipt of a purchase order or a Service/Site Planning Agreement, an HP Customer Engineer will make arrangements for an on-site meeting with your principal operator and electrician. As a part of this meeting, the CE will discuss site planning and preparation needs including electrical, mechanical, and physical system requirements. If required, an HP Site Preparation Specialist Engineer will be available for consultation. The forms in Section 2 of the *Computer Products Site Preparation Resources Guide* will be completed at this time.

As a result of this visit, a site layout plan agreeable to you and HP will be created. All of the necessary requirements and specifications are contained in this manual or the *Computer Products Site Preparation Resources Guide*.

Site Verification Visit

An HP CE or Site Preparation Specialist Engineer will verify that your site meets or exceeds the equipment requirements and specifications prior to and during installation. Sites failing to meet the stated requirements and specifications may incur additional service charges.

HP provides service under the conditions of the *Computer Products Warranty and Installation Terms, Customer Support Service Agreement, Installation Support Plan*, and on a time and materials basis. Refer to Section 1 of the *Computer Products Site Preparation Resources Guide* for more information.

Third Party Service

If any HP product is purchased from a third party vendor, that third party vendor is responsible for providing consultation services for that product. In the situation of a third party purchase, a maintenance agreement for hardware and an Account Management Service (AMS) for software are available directly from HP.

Customer Responsibilities

The customer is responsible for scheduling, planning, and preparing a suitable environment for the installation and operation of a complete computer system. The HP CE will be available to assist throughout the planning and preparation for the installation of the system.

Read the Site Planning and Warranty Information (Section 1) and the On-Site Customer Documents (Section 2) in the *Computer Products Site Preparation Resources Guide*. Pay particular attention to the contents of the Customer Responsibilities page in Section 1 and the forms contained in Section 2 of the *Computer Products Site Preparation Resources Guide*. The forms in Section 2 will be completed as the site planning/preparation and equipment installation progresses.

The equipment purchased is primarily designed to be installed and operated in a computer room (controlled) environment. If computers are new to your site, you will need to pay particular attention to the following items:

- Local building codes
- Local electrical codes
- Local safety codes
- Space and weight limitations and system accessibility
- Environmental requirements (temperature, humidity, etc.)
- Electrical and grounding requirements

If your HP equipment is to be installed in an existing computer room, you should analyze and integrate the following items into the site plan.

- Available space
- Additional environmental requirements
- Additional electrical requirements

Local Codes

Special local codes exist in some locations regulating the installation of computer equipment. The customer is responsible for making sure their computer system installation is in compliance with all local laws, regulations, and codes for mechanical, building, and electrical distribution systems prior to installation. The HP CE can assist in determining your local regulations.

Data Communications Equipment

The customer is responsible for ordering and installing all required data communications equipment, such as:

- Any hardware or cables for connection or installation of data communications equipment
- Network links
- Telephone equipment
- Modems (consult with the CE for HP requirements)
- Equipment supplied by companies other than HP

NOTE Communications equipment at the computer site is not part of the computer and must be considered separately for power, space, interface cables, and cooling requirements.

Selection of Site personnel

Depending on the complexity of the system, the customer is responsible for selecting a Site Coordinator, Principal Operator, and a Site Planning Team. Depending on customer requirements, the Principal Operator may or may not perform all these tasks. In some cases there may be two or three people assigned to the various operator responsibilities.

Site Coordinator

The Site Coordinator is responsible for the following tasks:

- Establishing and maintaining site preparation schedules
- Coordinating construction efforts
- Primary liaison with HP representative

Principal Operator

The Principal Operator is responsible for the following tasks:

- System operation
- Monitoring site preparation
- Ordering computer supplies
- Scheduling user training
- Maintaining maintenance schedules

Site Planning Team

The Site Planning Team is responsible for the following tasks:

- Determining site location and size
- Reviewing construction requirements
- Reviewing local codes
- Reviewing insurance requirements
- Scheduling all events related to site completion

Members of the Site Planning Team should include the Site Coordinator, Principal Operator, HP CE, electrical contractor, a site construction coordinator (familiar with local codes), and an air conditioning specialist.

2 Site Preparation Guidelines

This chapter provides specific site preparation guidelines for HP A3764A and A3765A Rackmount Cabinet. The HP CE will assist you in advance as the Site Planning Summary is completed.

Site Planning Time Table

The guidelines listed are a summary of the Pre-Installation Worksheet in Appendix A of this document. The worksheet should be used to monitor the progress of the pre-installation preparation. Since the time from placing an order to actual delivery can vary, it is suggested that you confer with the HP Sales Representative and HP CE, your site electrician, and others to determine the best estimated delivery dates for preparations of your site.

The following are items that may require several weeks lead time to complete:

- Arranging for an electrician
- Adding or modifying air conditioning
- Building alterations
- Placing orders for data communications equipment

Due to potential delays, HP recommends that the suppliers of the listed services be contacted as soon as possible after the computer system has been ordered.

There are three items that may require up to six weeks lead time:

1. Assigning the Principal Operator and scheduling the site planning visit with the HP CE to answer your questions concerning site preparation.
2. Selecting an appropriate location and planning the physical arrangement of the equipment, including related furniture.
3. Ordering consumable supplies, including appropriate storage mediums (i.e. flexible disks, tape cartridges, magnetic tapes, etc.).

NOTE To schedule a site planning visit, three days notice is required.

Preparing For Installation

The following sections contain information to help you properly plan for the arrival and installation of your HP equipment.

Computer Site Safety Considerations

The two major safety considerations for any computer site are fire safety and emergency power shut-off (electrical). When considering safety precautions, emphasis should be exercised on all matters concerning personnel and equipment. The HP CE, your insurance carrier, and local building inspectors can advise you on these matters.

Fire Safety

When considering fire safety, the customer's insurance carrier should be consulted for suggestions and recommendations as to the adequacy of existing or proposed fire control systems. If a new site is to be built, or an existing structure modified, consult local building codes for fire prevention and protection guidelines. Also, consult with the HP CE and local fire inspector for additional information.

Emergency Power Shut-Off

The computer equipment power panel should include a shunt-trip wired to an emergency shut-off switch and a thermostat device. This would be used for deactivating all equipment power in case of an emergency or in case room temperature exceeds safe operating conditions. Refer to Section 3 of the *Computer Products Site Preparation Resource Guide* for additional information.

Floor Plan

HP recommends that a floor plan be prepared showing the overall location and arrangement of all computer system components. Enough space should be provided for people to work effectively on a daily basis and for periodic servicing of equipment. A three foot clearance in front and in back of each major computer system component usually satisfies this requirement.

Select a location that can accommodate the addition of more equipment as your requirements increase. Be sure to consider interconnecting cable and power cord lengths when planning the layout. Identify the location of all power outlets on the floor plan. Plan to keep cables away from traffic paths to help prevent accidents and equipment failures. HP strongly discourages the use of power extension cords with computer system components.

CAUTION HP strongly discourages the use of carpeting, including anti-static varieties, within 20 feet (6.0 meters) of the computer system. If this advice is not followed, you should place static discharge mats where computer operators and/or service personnel must walk across them before touching any part of the computer system. Failure to comply with this precaution can result in equipment damage through static discharge.

The space planning kit in Appendix A of this manual, can be used to help plan the physical layout. The kit contains scaled views of the A3764A and A3765A cabinet and typical HP computer system peripherals. It also contains additional computer room equipment and furniture representations. Remember to plan the layout to satisfy both the current and future system requirements.

Computer Room Construction

If you are planning to construct a new computer room or modify an existing site, first consult with your HP representative and local contractors. It is important to plan the site with future expansion in mind so that equipment can be added without disturbing the computer systems operation.

The computer room floor must be able to support the total weight of the equipment as well as localized weight at each caster or foot of the equipment cabinets. A common method of preparing an adequate floor for a computer room is to construct a raised floor over the building floor. This method spreads weight evenly, provides an area through which interconnecting cables can be run conveniently and unobtrusively, and allows optimum distribution of conditioned air. Raised floor access ramps should not exceed 10° slope.

To estimate floor strength requirements, the following items should be considered:

- Total weight of the cabinet (the packaged and unpackaged weights of the cabinet are listed in Appendix B).
- Total weight of the computer systems peripherals. The System Configuration Table in Section 2 of the *Computer Products Site Preparation Guide* contains a list of your systems peripherals. Your HP Sale Representative and CE can assist you in determining peripheral weights.
- Total weight of furniture such as desks, chairs, tables, storage cabinets, etc.
- Total approximate weight of computer room personnel.
- Weight of moving equipment (i.e. forklifts, transport dollies, etc.).

Office building floors are usually rated at 50 pounds per square foot (244 kilograms per square meter) with an additional allowance of 20 pounds per square foot (98 kilograms per square meter) for partitions. If you are planning for a large computer system, your computer room floor and/or raised floor must be able to support 100 pounds per square foot (488 kilograms per square meter). Any questions regarding the adequacy of floor construction should be referred to and evaluated by a qualified structural engineer.

CAUTION	In addition to determining the adequacy of the computer site floor, ensure that all floors, stairs, and elevators which might be used when the computer equipment is moved to its destination can support the weight and size. Failure to comply can result in damage to the computer equipment.
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If you are planning to construct a raised floor, first consult with the HP CE. The preferred height for a raised floor above the main floor is 12 inches (30 centimeters) and the height should not be less than 4.5 inches (11 centimeters).

WARNING If metal is used to construct the raised floor, ensure that there is a common ground connection between the raised floor and main floor to avoid possible build up of different voltage potentials. Failure to comply can result in serious injury to personnel and damage to equipment.

Power Requirements

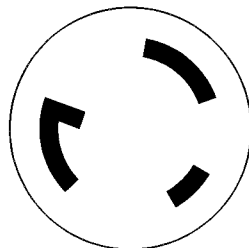
The most important installation considerations are for power requirements. The basic power requirements for the rackmount cabinet are listed in Table 2-1 and Appendix B. Also refer to Section 3 of the *Computer Products Site Preparation Resources Guide*. Your HP Sales Representative and CE can assist you in determining peripheral power requirements. Figure 2-1 shows the US 220 Volt, 20 Amp receptacle required to accommodate the cabinet PDU power cable.

Table 2-1 Cabinet Power Requirements

Line Voltage	200-240 VAC
Line Frequency	50-60 Hz + or - 5%
Voltage Waveform Harmonic Distortion	<5%
Recommended Circuit Breaker rating (per power cord)	30 A
Wall Receptacle Type ¹	L6-20R (US) N/A (Europe) C20 (UPS option)

NOTE ¹ One wall receptacle is required for each PDU in the cabinet. A fully loaded cabinet can have 2 PDUs.

Figure 2-1 20 Amp wall Receptacle (US Only)



L6-20R

The L6-20R receptacle is for the US 220 Volt PDU only. The European 220 Volt PDU has a pigtail with no plug on the end. The plug and receptacle are country dependent, and need to be installed by a qualified electrician for that country. The C20 is an internal power cord for us with 220 Volt Uninterruptable Power Source (UPS) equipment.

Line Voltage

The AC line voltage available from the wall outlet is determined by the local electrical power provider and the building power distribution network. Voltages outside the operating range of the system can cause system errors, or a system shutdown. If required, the HP CE along with your electrician can determine the line voltage and make recommendations.

NOTE	Make sure that there are enough wall outlets at the correct voltage and receptacle type to support the entire system including the PowerTrust UPS, if so equipped.
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Frequency

AC line frequency is normally determined by the local power provider. In some cases, electrical power is supplied to a customer's motor-generators. Shifts in AC line frequency can cause system errors or terminal display jitter. Your HP CE can monitor the frequency of the input AC line power and make recommendations, if required.

Dedicated Circuits

HP computer equipment requires dedicated power circuits or individual branch circuits (separate circuit breakers). This ensures that there are no other devices that could trip the system circuit breaker and that there is sufficient power available to the system.

The ampere load of each circuit breaker should be designed to allow a margin for system start-up surge current. Refer to Section 3 of the *Computer Products Site Preparation Resources Guide* and consult with the HP CE to determine the circuit breaker requirements for your installation.

Safety and Dedicated Grounds

The primary reason for grounding electrical systems is for safety. The safety ground is required by the National Electrical Code (USA) and most other local, regional, and national codes. In addition to the safety ground, HP requires that a dedicated (earth reference) ground be installed as a common reference point for all system components.

Basic principals of safe and effective grounding for any for any HP computer system are illustrated in Section 2 of the *Computer Products Site Preparation Resources Guide*. Consult with the HP CE and electrician to ensure that your power system meets all national and local codes.

Receptacles

When receptacles are used to connect system components to AC power, the receptacle must include a dedicated ground connection that is insulated from the receptacle box. It is important that the receptacle box be grounded with an additional ground connection that is non-dedicated. The additional ground can be a hard metal conduit.

When installing receptacles, ensure that each receptacle has its own neutral (if required) and ground. Using the same neutral or ground for more than one circuit will cause voltage loss, heat problems, and can result in a fire hazard. A shared neutral conductor that fails open-circuit will result in possible over-voltage damage to the equipment.

The cabinet power cord and plug requirements also vary from country to country. Unusual power cords and plugs that cannot be ordered must be fabricated by a qualified electrician to meet local safety codes and requirements. Refer to the *Power Requirements* section for detailed information regarding cabinet receptacles.

Power Line Transients and Noise

Heavy electrical loads from nearby machinery or equipment (i.e. elevators, electric welders, etc.) can cause power transients and line noise which can induce system errors. This can occur even if the other equipment is on a separate circuit breaker. Under these conditions, you should provide a separate (completely independent) power panel. This panel should have isolated ground and separate circuit breakers and be fed directly from the main building power source, or a secondary source.

Your HP CE can monitor the power lines for electrical transients and noise. If found, the HP CE can make appropriate recommendations concerning the use of line conditioning devices.

Sources of Electrical Interference

Convenience Wall Outlets

Power outlets for building maintenance equipment (i.e. vacuum cleaners, floor buffers, etc.) must be wired from circuit breakers on a power panel **completely separate** from the computer system panel. The ground connections from these outlets must be connected to a building power distribution panel, **not** the computer system ground. Your electrician can verify whether maintenance outlets are on separate panels and ground.

NOTE If a separate power source and ground are not provided, operation of janitorial equipment can induce electrical noise and cause abnormal operation of the computer system.

Lightning

In geographical areas, it may be advisable to install lightning protection for the safety of personnel and to protect the computer systems. In the United States, the installation of lightning or surge arrestors on power and communication lines is described in the National Electrical Code, Article 280.

The principals of lightning protection and personnel safety are outlined in detail in the lightning protection code contained in the National Fire Protection Association (NFPA) handbook. The HP CE can make lightning protection equipment recommendations.

Vibration

Continuous vibration can cause a degradation of mechanical parts. Vibration can cause data losses on disk devices. Mechanical connections on printed circuit assemblies, connectors, cables, and backplane wiring can also be adversely affected by vibration.

If you suspect that vibration may be a problem at the computer site, contact your HP Sales Representative or CE for assistance.

Electromagnetic Interference

HP computer equipment is specifically designed to reduce susceptibility to radiated and conducted interference. Electromagnetic interference can cause a variety of computer system problems. The HP CE can advise you regarding many of the most common causes of this type of interference.

Environmental Considerations

NOTE	There are different environmental requirements for each peripheral that can be used in the HP computer system. When you add peripherals to the system (external to the cabinet), refer to the peripherals associated data sheet to determine its individual environmental specifications.
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Flammable Materials

Fundamental safeguards for computer systems should include a site well away from any sources of potential damage. The system should not be installed or operated in an environment where there is a risk of fire or explosion due to the presence of highly flammable gases, volatile liquids, or combustible dust.

Airborne Contaminants

Airborne contaminants and particles of a certain size and hardness can damage your computer system, particularly disk devices. Corrosive gases and/or solvent vapors such as those from liquid spirit duplicating equipment and wet-process photo copiers can also cause damage. Some of the most common contaminants are dust, smoke, ash, eraser debris, food crumbs, and salty air.

The HP CE can assist you in determining whether or not you need be concerned about airborne contaminants.

Temperature and Humidity

Temperature and humidity specifications for the HP computer equipment are listed in Appendix B of this manual. HP recommends a stable environment for the computer equipment, temperature and humidity extremes should be avoided.

Temperature. The computer cabinet is air cooled with fans bringing cool room air into the equipment, circulating it, then exhausting the internal heat back into the room. To ensure that air flow is not impeded, do not install the cabinet closer than three feet (1 meter) to any walls or other obstructions.

The computer system operates most reliably if ambient room temperature is maintained between 68 to 77 degrees F (20 to 25 degrees C). Appendix B of this manual contains the computer heat dissipation information to assist with determining air conditioning requirements. The HP CE can aid in determining the additional air conditioning requirements for HP peripherals. Refer to Section 3 of the *Computer Products Site Preparation Resources Guide* for additional air conditioning information.

Humidity. The computer system humidity subsections are listed in Appendix A of this manual. High humidity levels can cause improper system operation and affect paper reliant devices such as printers or copiers. Extremely low humidity levels aggravate problems caused by static electricity. Refer to Section 3 of the *Computer Products Site Preparation Resources Guide* for additional information.

Electrostatic Discharge

If there is an abnormally high level of static electricity at the computer site (15Kv or higher), static discharge can occur with contact to computer equipment. Carpeting and/or low humidity could be the source of static electricity, especially in dry and cold climates. Static electricity can often be significantly reduced by using a humidifier. HP recommends a heat evaporating type humidifier and strongly recommends against using a cold water atomizer humidifier.

Other ways to minimize electrostatic discharge are by using specially grounded mats in front of the computer system or by treating carpeting with anti-static spray. Anti-static spray is not recommended because it finds its way into system intake filters and tends to settle on circuitry. If spray is used, it should be applied while the system is turned off. Refer to Section 3 of the *Computer Products Site Preparation Resources Guide* for additional information.

Miscellaneous Requirements

The following sections contain information not directly related to the computer systems installation process, but each subject should be considered in the planning. Your HP Sales Representative can help you determine what supplies you will require and the CE can help with the decisions concerning storage, record protection, and telephone support.

Computer Supplies

Ask your HP Sale Representative for a catalog of available supplies such as printer paper, printer ink or cartridges, plotter paper, tape cartridges, flexible disks, etc..

Media Storage

You should make provisions for storing disk packs, tape cartridges, magnetic tapes, and flexible disks in or around the area where the work is to be performed. The magnetic media storage environment should be similar to that of the computer; clean, dust free, and without exposure to extreme temperatures.

Extreme humidity and temperature differences between the work and storage areas can alter the size of the media when it is moved from one area to the other. This rapid change can result in warping, which is the most common media related computer system problem.

If the working and storage areas cannot be kept at the same humidity and temperature, allow ample time (usually one hour or longer) for the media to achieve humidity and temperature balance before using. The maximum rate of temperature change for the media must not exceed 36 degrees F (20 degrees C) per hour.

Data on magnetic media can be erased by magnetic fields. These magnetic fields are found in power generating equipment such as motors, alternators, transformers, and data processing equipment. Do not place magnetic media in close proximity of this type of equipment.

Protection of Valuable Records

Safeguards should be taken to protect business records and any other information that is either very expensive or impossible to duplicate. Duplicate or master records should be maintained so that vital information can be retrieved quickly in case of an accident. Copies of vital data should be stored well away from the computer area; normally in some type of fireproof storage device.

A regular updating process should be put in place to ensure that the value of the stored information is maintained. Electronic data processing insurance is also available to cover both hardware and software. Contact your local HP Sales and Service office for details.

Telephone

You should plan to install a telephone with a long cord near the computer system to expedite consultations with HP representatives. Additional phone lines appropriately placed, should be planned if a remote support modem is to be installed with your computer system. Remote support allows system problems to be diagnosed from a remote location via the telephone lines.

NOTE	Check with your local telephone company to be sure the telephone service at the site can accommodate modem/data quality transmission.
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3 Receiving the A3764A or A3765A Cabinet

Equipment Arrivals

All Hewlett-Packard equipment is delivered directly from its point of manufacture. HP coordinates the shipment of equipment from all locations so that it arrives at your site at approximately the same time.

In some cases, factors beyond the control of HP may cause delivery delays. If all equipment is not received within a two week period, notify your HP Sales Representative. The HP Sales Representative will trace your order and expedite delivery completion.

CAUTION The A3764A or A3765A cabinets are large and heavy. Be sure to allow for size and weight in regards to placing the cabinet at its installation site. Refer to Appendix B for specific size and weight numbers.

Checking for Shipping Shortage and Damage

As shipments arrive, check the carriers *Bill of Lading* carefully to ensure that every item shipped by HP is delivered. Notify the carrier immediately if there are any discrepancies or items missing.

Inspect all of the shipping containers for signs of damage before actually unpacking any of the equipment. Some typical signs of shipping damage are dents, scratches, cuts, or water marks. If any damage is found, note on the *Bill of Lading* that there is apparent damage subject to inspection. Then arrange for both the carrier's representative and the HP CE to be present when the item in question is unpacked.

Regardless of the circumstances, the HP CE will take immediate action to replace any damaged components without waiting for the settlement of claims.

Unpacking of Cartons

The equipment cartons can be unpacked at your convenience, but it is the customers responsibility to have the equipment unpacked and moved to its proper installation location prior to the actual day of installation. You should consider providing additional insurance to cover moving the system equipment from the receiving area to its installation site.

Locate the packing list (invoice) for each carton that is to be unpacked and ensure that each item on the list can be accounted for. Contact your HP Sales Representative immediately if there are any missing items, or if the items received are not the same as you ordered.

Leave the sealed cartons containing system tapes, CDs, cables, and installation hardware intact for the HP CE.

Locate and refer to the *A3764A and A3765A Cabinet Installation Guide* for specific unpacking and inspection procedures and information.

Locate the installation documentation associated with each system peripheral for specific unpacking and inspection procedures.

A Site Preparation Kit

This appendix contains the following information:

- Pre-installation Worksheet
- Space Planning Kit
- System power requirements and heat dissipation worksheets

Hewlett-Packard recommends that you copy the worksheets before you begin using them. Then, if more copies are needed in the future, you will have an unmarked copy of the worksheets available.

Pre-Installation Worksheet

Table A-1 Pre-Installation Activities

Timing	Activity	Done	Date
6 weeks before installation	Select the location for the system. Use the Site Preparation Guide to satisfy any requirements to ensure the site is ready when the system arrives.		
	Assign a person the responsibility of system principal operator.		
	Plan the physical arrangement of the system and its peripherals. The space planning kit allows you to plan details before the system arrives.		
	Order supplies that are required for uninterrupted operation of the system (consumable supplies).		
At system delivery	Inspect each shipment as it is delivered. Note comments and dates in shipment schedule.		
	When all equipment arrives, contact the CE to schedule the installation and verify that the site meets the system requirements. Installation will be scheduled within three working days after Hewlett-Packard has been contacted.		
System installation	System installation		

Table A-2 Ship Schedule

Equipment Type	Schedule Ship Date	Arrival Date	Comments
Computer			
Printer			
Terminal			
Disk Drive			
Tape Drive			
Peripherals or other equipment			

Space Planning Kit

The top view of the system components are drawn to scale and can be used for designing the floor plan for the system. When cut out and used on a scaled drawing of the computer site, the cutouts can be arranged to help determine the best room arrangement. The next page is a sheet of grid paper drawn to the same scale. It can be used to prepare the scale drawing of the proposed system. Use the grid and cutouts as follows:

- On the grid sheet, draw the room (walls, electrical outlets, immovable objects, floor vents, etc.) where the computer will be located.

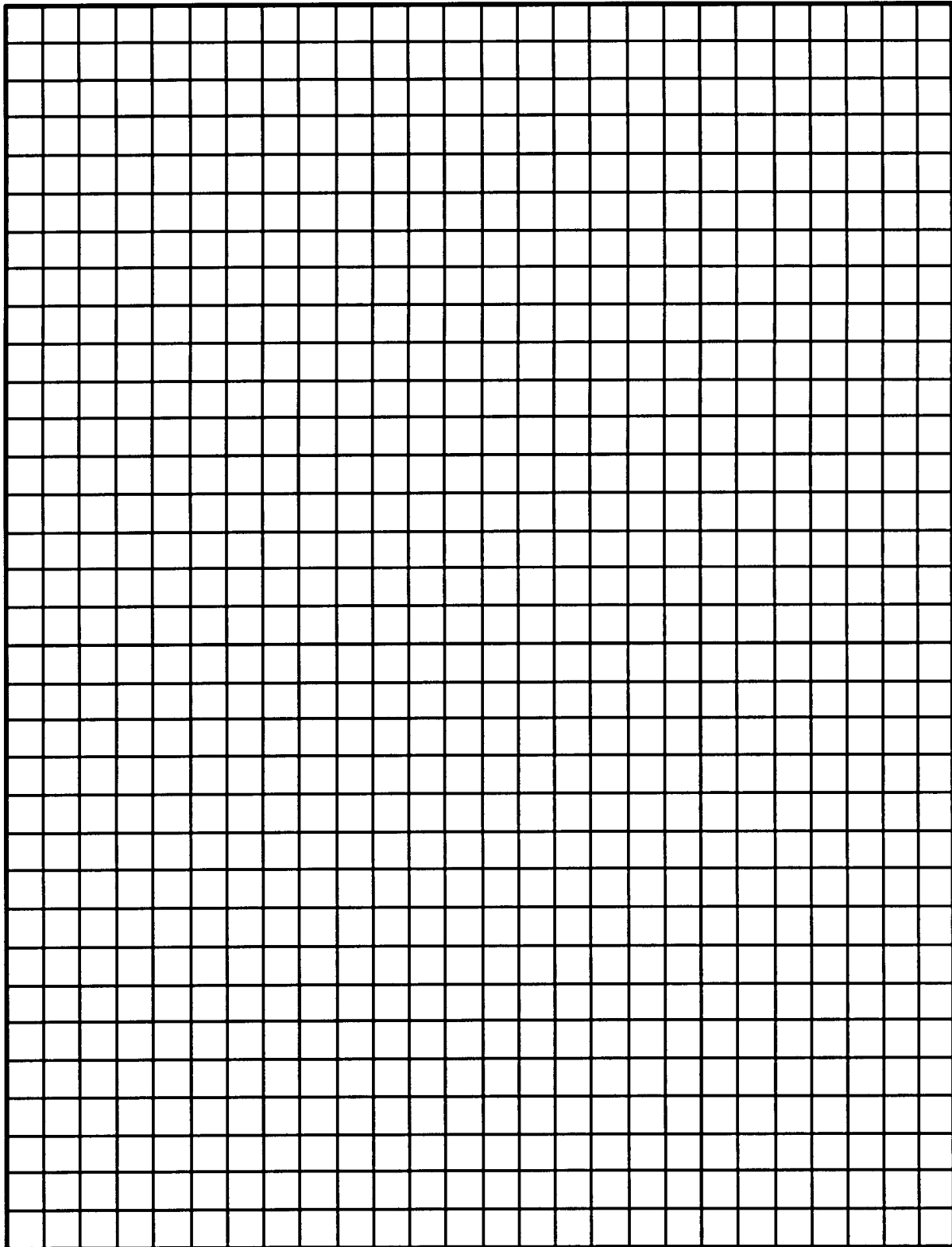
NOTE The grid is 0.25 inch = 1 foot (6.35 mm = 30.48cm) scale.

- Cut out the models required to represent the system ordered. Include any office furniture that will be used.
- Move the cutouts about on the grid to determine the best room arrangement.

NOTE Be sure to allow room for maintenance in the front and back of the equipment and cabinets. Avoid placing the computer system cabinets over floor vents. Air flow from such vents could interfere with the cooling arrangement of the computer system.

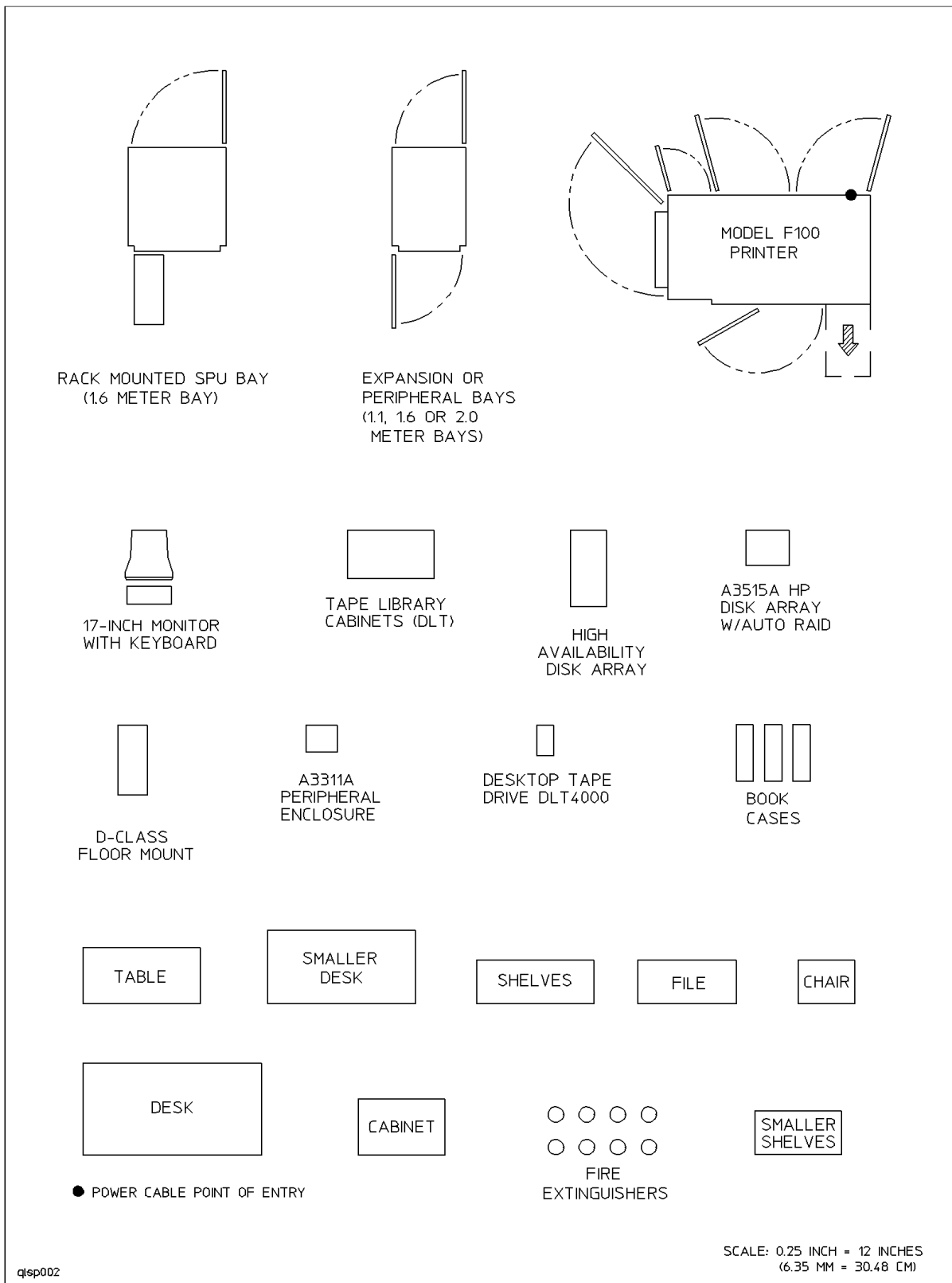
- Cabling is required between the computer and each peripheral. Mark each cables path and indicate its necessary length.

Figure A-1 Space Planning Grid Sheet



LG200001_008

Figure A-2 System Cutouts



Tables and Worksheets

Use Table A-3 to calculate the system's power requirements. Depending on the component combination used, the power requirements differ between systems. Have an electrician double check the calculations. The specifications in the following tables should be taken directly from the service manual of each specific equipment

Table A-3 Worksheet for Power Requirement Calculations

Equipment Type	Product Number	Voltage (V)	Amperage (A)	Number of Machines (B)	Total Amperage (A x B)
Computer					
Expansion Cabinet					
Disk Drive					
Mag Tapes					
Printers					
Terminals					
Other					

Use Table A-4 to calculate the system's heat dissipation. Depending on the component combination used, the air conditioning requirements differ between systems.

Table A-4 Worksheet for Heat Dissipation Calculations by Machine Type

Equipment Type	Product Number	Watts (W)	BTU/hr.	Number of Machines (B)	Total Heat Dissipation
Computer					
Expansion Cabinet					
Disk Drive					
Mag Tapes					
Printers					
Terminals					
Other					

To account for the heat dissipation by accessory equipment, lights, and people, complete Table A-5 using the following guidelines:

- Consider the heat dissipated by special interface equipment (supplied by other vendors) as well as that produced by auxiliary equipment such as electric typewriters or any other electronic instruments. For these values, consult the appropriate vendors documentation.
- Estimate the heat produced by the lights used to illuminate the facility.
- Calculate the heat dissipation of all individuals working within the site. A reasonable estimate is approximately 176 Watts/hr (600 BTU/hr) per person.
- Make allowances for heat dissipation by equipment to be added during any planned future expansion.
- Calculate the heat dissipated by any other factors not considered above. These factors include situations particular to the site and room loss factors.

Table A-5 System Heat Dissipation Worksheet

Factor	BTUs/Hour (Watts)
System Heat Dissipation	
Site Variables	
Interface Auxiliary Equipment:	
Lights	
Personnel	
Future Expansion	
Other Factors	
Total Heat Dissipated	
Total Heat Dissipation in tons of AC (1 ton = 12,000 BTU)	

B Specifications

Introduction

This appendix contains regulatory, electrical, physical, and environmental specifications and information for HP 9000 D Class Enterprise Servers, the A3764A and A3765A Rack Mount Cabinet.

- Regulatory Standards
- D Class Computer Electrical Specifications
- D Class Computer Environmental Specifications
- A3764A and A3765A Cabinet Electrical Specifications
- A3764A and A3765A Cabinet Physical Specifications

NOTE The HP 9000 D Class Enterprise Computer specifications are listed in this manual because that is the only computer system supported in the A3764A and A3765A Cabinet at this time.

Regulatory Standards

The HP 9000 D Class Enterprise Servers supported in the A3764A or A3765A Cabinet comply with the regulatory standards listed in Table B-1.

Table B-1 Regulatory Listings

Specifications		Certification	Country
Safety	CSA C22.2 No. 950	CSA Certified	Canada
	IEC 950	HP Verified	International
	EN 60 950	HP Verified	European Community
	EMKO-TUE(74)203/91	HP Verified	Nordic Countries
	UL 1950	UL Listed	U.S.
EMI	FCC Part 15, Class A	HP Verified	U.S.
	EN 55 022 Class A	HP Verified	European Community
	CISPR 22 Class A	HP Verified	International
	VCCI Type 1	VCCI Registered	Japan
EM Immunity to EN 50082-1:1992 as indicated:	IEC 801-2:1991/pr EN 55024-2:1992 Air Discharge 8 kV Contact Discharge 4 kV	HP Verified	European Community
	IEC 801-3:1984 pr EN 55024-3:1991 <i>Radiated Immunity</i> 3 V/m	HP Verified	European Community
	IEC 801-4:1988/pr EN 55024-4:1992 <i>Electrical Fast Transients:</i> 1 kV Power Line 0.5kV Signal Line	HP Verified	European Community

Specifications

The following tables in this section list the environmental, electrical, and physical specifications for the A3764A, A3765A, and the HP D Class computers supported in the rack mount cabinets.

Table B-2 Environmental Specifications

Description	Specification
Operating Temperature	D2xx: 5° to 35° C (41° to 95° F) with no internal tape media device. D3xx: 5° to 40° C (41° to 104° F) with internal tape media device.
Non-Operating Temperature	-40° to 70° C (-40° to 158° F) with no internal tape media device. -40° to 45° C (-40° to 113° F) with internal tape media device.
Temperature Rate of Change	20° C (36° F) with no internal tape media device. 10° C (18° F) with internal tape media device.
Operating Humidity	15% to 80% RH non-condensing, max wet bulb at 26° C (29° F) with internal tape media device.
Non-operating Humidity	5% to 90% RH non-condensing at 65° C (149° F) rate of change, 30% RH/hr.
Operating Altitude	0 to 3.0 KM (0 to 10,000 ft.) above sea level
Non-operating Altitude	0 to 4.5 KM (0 to 15,000 ft.) above sea level
Acoustics (D Class computer)	<ul style="list-style-type: none"> • Deskside (LwA) = 5.4 B @ 25°C (77°F) • Operator Post = 45dB-LpA @ 25°C (77°F), no prominent tone • Racked System (LwA) = 5.9 B

Table B-3 Electrical Specifications for D2xx and D3xx Computers

Description	Specification	
	D2xx	D3xx
AC Input Voltage Range ¹	198 to 264 VAC	198 to 264 VAC
AC Input Line Frequency	50 or 60 Hz	
AC Input Current	4.0A (max load at 200VAC)	5.0A (max load at 200VAC)
AC Inrush Current	115A peak @ 230VAC, 1.8ms	60A peak @ 230VAC, 1 ms
AC Input power	420 watts max.	480 watts max
Power Supply Output rating	350 watts DC continuous	450 watts DC continuous

¹ The A3764A and A3765A come in 220VAC power only. Be sure that the voltage select switch on the D Class computer(s) is set to the 220 Volt position (does not apply to Dx70 or Dx80 models).

Table B-4 Electromagnetic and Electrostatic Specifications

Description	Specification
Radiated Field Immunity	3V/meter, 26MHz to 1GHz
Magnetic Field Immunity	1 gauss, 47.5Hz to 198Hz
Electrostatic Discharge Immunity	15kV air discharge max, with no loss of function. 25kV air discharge max, with no component damage.
Electrostatic Contact Discharge	4kV, no effect.

Table B-5 A3764A and A3765A Physical Specifications

Description	Specification
Height	1.6 M (63.36 in.)
Width	71.88 cm (28.75 in.)
Depth	89.38 cm (35.75 in.)
Weight ¹	191.25 kg (425 lbs.)
Packaged Height	1.8 M (73.5 in.)
Packaged Width	95.9 cm (37.75 in.)
Packaged Depth	108.6 cm (42.75 in.)
Packaged Weight ²	2-way: 229.5 kg (510 lbs.) 4-way: 261.0 kg (580 lbs.)

¹ This weight is for the A3765A cabinet with no D Class computers installed. Each D Class computer can weight up to 49.5 kg (110 lbs.). Add the weight for each D Class computer installed in the cabinet for a total weight number. The weight of an A3764A would be the combination of the listed weight with the added weight for each D Class computer mounted inside the cabinet.

² This weight is for the A3765A cabinet with no D Class computers installed. The A3764A cabinet will have additional weight for each D Class computer that was ordered integrated into the cabinet. A fully integrated 4-way cabinet could weight up to 441 kg (980 lbs.)

CAUTION The rear access door of the rack cabinet requires 71.25 cm (28.5 in.) of clearance for opening and cable access. To fully extend a D Class computer from the front of a cabinet requires 55.1 cm (22.0 in.) of clearance.
