CHAPTER 2

Preparing the Storage Array 12

This chapter describes important information to consider before you begin to install the Storage Array 12, and includes the following sections:

Safety Recommendations

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free during and after installation.
- Keep tools away from walk areas where you and others could fall over them.
- Do not wear loose clothing that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.

Warning **Read the installation instructions before you connect the system to its power source.**

Warning **Ultimate disposal of this product should be handled according to all national laws and regulations.**

Warning **This unit is intended for installation in restricted access areas. A restricted access area is where access can only be gained by service personnel through the use of a special tool, lock and key, or other means of security, and is controlled by the authority responsible for the location.**

Warning **Only trained and qualified personnel should be allowed to install, replace, or service this equipment.**

Warning **The safety cover is an integral part of the product. Do not operate the unit without the safety cover installed. Operating the unit without the safety cover in place will invalidate the safety approvals and pose a risk of fire and electrical hazards.**

Warning **Blank face plates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment: and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.**

Warning **Keep hands and fingers out of the power supply bays. High voltage is present on the power backplane when the system is running.**

Warning **Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.**

Warning **This equipment is intended to be grounded. Ensure that the host is connected to earth ground during normal use.**

Warning **Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.**

Warning **Do not stack the chassis on any other equipment. If the chassis falls, is can cause severe bodily injury and equipment damage.**

Warning **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or a circuit breaker no larger than 120 VAC, 15 A U.S. (240 VAC, 10 A international) is used on the phase conductors (all current-carrying conductors).**

Warning **This unit might have more than one power cord. To reduce the risk of electrical shock, disconnect all power supply cords before servicing the unit.**

Warning **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

Maintaining Safety with Electricity

Follow these guidelines when working on equipment powered by electricity.

Warning **Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or can weld the metal object to the terminals.**

Warning **Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units.**

Warning **Do not touch the power supply when the power cord is connected. For systems with a power switch, line voltages are present within the power supply even when the power switch is OFF and the power cord is connected. For systems without a power switch, line voltages are present within the power supply when the power cord is connected.**

- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit. **Always check**.

Warning **Read the installation instructions before you connect the system to its power source.**

- Locate the emergency power off switch for the room in which you are working. Then, if an electrical accident occurs, you can act quickly to turn off the power.
- Power off the Storage Array 12 and unplug the power cord before doing the following:
  - Installing or removing a chassis
  - Working near power supplies
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, frayed power cords, and missing safety grounds.
- If an electrical accident occurs, proceed as follows:
  - Use caution; do not become a victim yourself.
  - Turn off power to the system.
  - If possible, send another person to get medical aid. Otherwise, assess the condition of the victim and then call for help.
  - Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. It occurs when electronic components are improperly handled and can result in complete or intermittent failures.

Always follow ESD-prevention procedures when removing and replacing components. Ensure that the chassis is electrically connected to earth ground. Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the chassis frame to safely channel unwanted ESD voltages to ground. To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively. If no wrist strap is available, ground yourself by touching the metal part of the chassis.

Caution For safety, periodically check the resistance value of the antistatic strap, which should be between 1 to 10 megohms (Mohms).

General Site Requirements

This section describes the requirements your site must meet for safe installation and operation of your system. Ensure that your site is properly prepared before beginning installation.

Site Environment

The Storage Array 12 can be mounted in a rack or on a wall. The location of the chassis and the layout of your equipment rack or wiring room are extremely important for proper system operation. Equipment placed too close together, inadequate ventilation, and inaccessible panels can cause system malfunctions and shutdowns, and can make system maintenance difficult.

When planning your site layout and equipment locations, remember the precautions described in the next section, “Preventive Site Configuration,” to help avoid equipment failures and reduce the possibility of environmentally caused shutdowns. If you are experiencing shutdowns or unusually high errors with your existing equipment, these precautions may help you isolate the cause of failures and prevent future problems.

Preventive Site Configuration

The following precautions will help you plan an acceptable operating environment for your Storage Array 12 and will help you avoid environmentally caused equipment failures.

- Electrical equipment generates heat. Ambient air temperature might not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Ensure that the room in which you operate your system has adequate air circulation.
- Always follow the ESD-prevention procedures described in the section "Preventing Electrostatic Discharge Damage" earlier in this chapter to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.
- Ensure that the chassis cover is secure. The chassis is designed to allow cooling air to flow effectively within it. An open chassis allows air leaks, which may interrupt and redirect the flow of cooling air from internal components.

Configuring Equipment Racks

Warning **Before working on a system that has a standby/off switch, turn off the power by pressing the power switch to standby and unplug the power cord.**

Warning **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable.The following guidelines are provided to ensure your safety.**

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

The following information will help you plan an acceptable equipment rack configuration.

- Enclosed racks must have adequate ventilation. Ensure that the rack is not overly congested, because each unit generates heat. An enclosed rack should have louvered sides and a fan to provide cooling air.
- When mounting a chassis in an open rack, ensure that the rack frame does not block the intake or the exhaust ports. If the chassis is installed on slides, check the position of the chassis when it is seated all the way into the rack.
- In an enclosed rack with a ventilation fan in the top, excessive heat generated by equipment near the bottom of the rack can be drawn upward and into the intake ports of the equipment above it in the rack. Ensure that you provide adequate ventilation for equipment at the bottom of the rack.
- Baffles can help to isolate exhaust air from intake air, which also helps to draw cooling air through the chassis. The best placement of the baffles depends on the airflow patterns in the rack, which are found by experimenting with different arrangements.

Recommendations for Rack-Mounting a Storage Array 12

You must comply with the following guidelines to ensure the safe and efficient operation of the Storage Array 12. The Storage Array 12 can be installed in closed or open equipment racks by observing the environmental, electrical, and mechanical precautions listed in the following paragraphs.

Ambient Temperature

The installation of a Storage Array 12 in a standard 19-inch (48.26-cm) equipment rack can lead to a differential between the room ambient temperature and the ambient temperature of the surrounding environment. The maximum operating temperature of the Storage Array 12 is 35ºC (90ºF); however, it is not recommended that the Storage Array 12 be continuously run at these elevated temperatures. Ensure that the room ambient temperature is compatible with these specifications.

Airflow

To ensure that the internal heat buildup is adequately dissipated into the room environment, airflow must not be restricted. It is essential that no vents are blocked, and that the system is a minimum of 1 meter (3.3. feet) away from a solid surface such as a wall or partition. Airflow through the Storage Array 12 is from front to rear.

Mechanical Loading

Take care when loading the equipment rack. To maintain a low center of gravity (thus reducing the likelihood of instability), install equipment racks (where possible) from the bottom of the equipment rack upward. This is essential to ensure personal safety.

Electrical Considerations

Ensure that the current does not exceed the rating of the power source circuitry. This includes cabling, power distribution units, filters and any other components through which the main AC flows. The power requirements of the Storage Array 12 are 2.7A at 240 VAC or 5.1A at 100 VAC for single power supply and 1.4A at 240 VAC or 2.9A at 100 VAC for each power supply in power sharing configuration. These power requirements must be added to the power demands of any other electrical devices installed in the equipment rack to arrive at a total power consumption figure. These requirements may vary slightly depending on the redundancy mechanism incorporated, the number of device slots occupied, and the device type occupying the slots.

In addition, surge currents must be accommodated. Disk drives normally consume twice the amount of current at startup as they do during steady-state operation.

Power Supply Considerations

Check the power at your site to ensure that you are receiving "clean" power (free of spikes and noise). Install a power conditioner if necessary.

Warning **The device is designed to work with TN power systems.**

The Storage Array 12 power supply includes the following features:

- It autoselects either 110V or 220V operation.
- All units include a 6-foot (1.8-meter) electrical power cord. (A label near the power cord indicates the correct voltage, frequency, current draw, and power dissipation for the unit.)

Input Power Ratings

Each power supply of the Storage Array 12 has an input power rating of 100–240 VAC, 5.0–2.1A, and 50/60 Hz.

Mounting a Storage Array 12 in a Four-Post Rack

To mount the Storage Array 12 in a standard 19-inch (48.26-cm) equipment rack, complete the following procedure:

Step 1 Assemble the side rails, as shown in Figure 2-1. Each rail has a front and a rear component.

For each rail, slide the rear component into the front component. Fasten the front and rear components together with two Phillips panhead 10-32 x .31 large screws with cagenuts. Do not tighten the screws.

Step 2 Install the side rails on the equipment rack.

a. On all four posts of the equipment rack, mark the positions where you plan to install the right and the left side rails.

b. Fit both side rail assemblies to the rack posts in the marked positions and secure each end to the posts with the appropriate screws.

Note There are four screw holes on the front side rail flange. Use the two inside screw holes.

- For cabinet posts with tapped holes, use two Phillips panhead 10-32 x .38 large screws on each end.
- For cabinet posts with through holes, use two Phillips panhead 10-32 x .38 large screws with speed nut retainers and nut plates on each end.
- For cabinet posts with square holes, use two Phillips panhead 10-32 x .38 large screws with 10-32 cagenuts on each end.

c. Tighten the four screws that fasten together the front and rear rail components.

Step 3 Install a rack-mounting flange on each side of the Storage Array 12 enclosure.

There is a different flange for the right and the left side of the enclosure. Attach each flange to the enclosure with two flat head 6-32 x .38 large screws.

Step 4 Slide the Storage Array 12 enclosure between the side rails, as shown in Figure 2-1.

Caution To prevent personal injury, do not attempt to lift the Storage Array 12 by yourself.

Figure 2-1 Sliding the Storage Array 12 Between the Side Rails

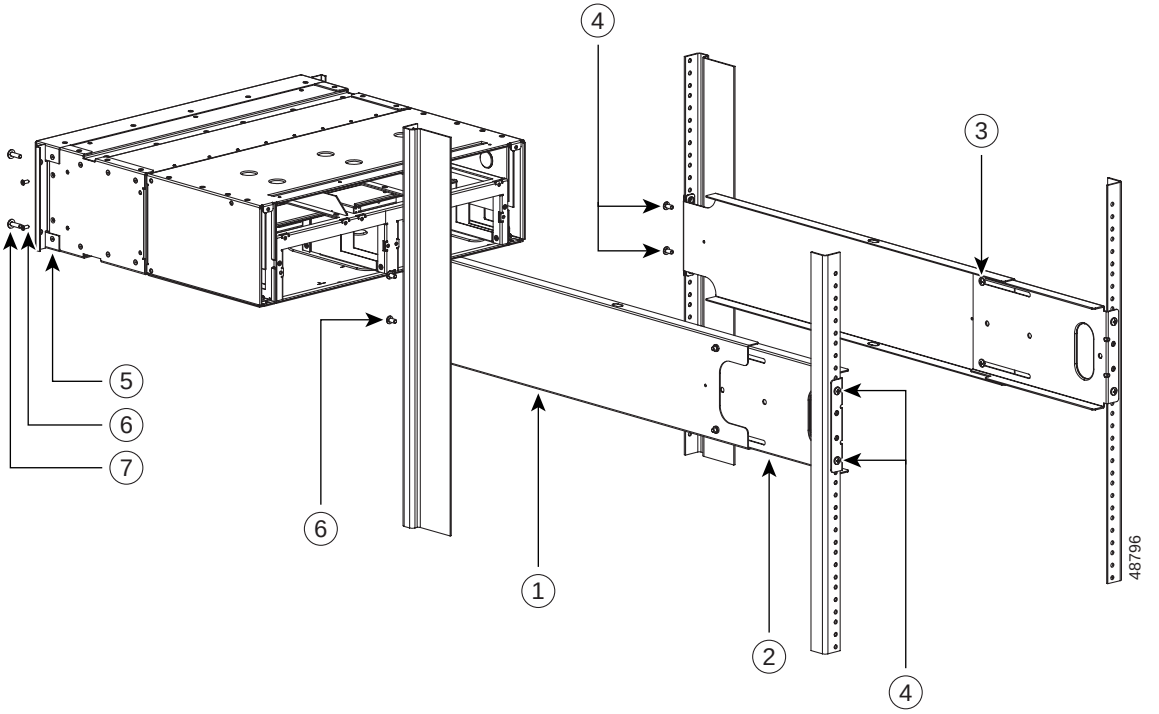


Table 2-1 Illustration Legend for Figure 2-1

Callout Item	Description
1	Side rail front component
2	Side rail rear component
3	Phillips panhead 10-32 x .31 large screws with cagenuts
4	• For cabinet posts with tapped holes, use two Phillips panhead 10-32 x .38 large screws. • For cabinet posts with through holes, use two Phillips panhead 10-32 x .38 large screws with speed nut retainers and nut plates. • For cabinet posts with square holes, use two Phillips panhead 10-32 x .38 large screws with 10-32 cagenuts.

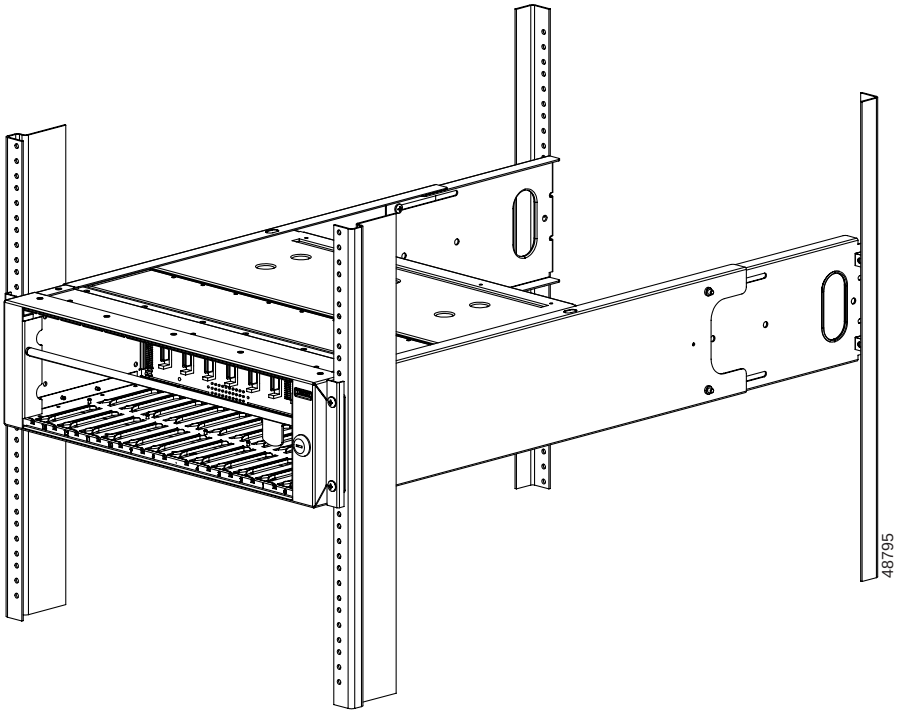
Table 2-1 Illustration Legend for Figure 2-1 (continued)

Callout Item	Description
5	Rack-mounting flange (right side flange)
6	Flat head 6-32 x .38 large screws to attach flange to enclosure
7	Phillips truss head 10-32 x .75 large screws (teal or black)

Step 5 Secure each Storage Array 12 rack-mount flange to the rack posts with two Phillips truss head 10-32 x .75 large screws (teal or black).

Figure 2-2 shows the Storage Array 12 in a four-post rack.

Figure 2-2 Storage Array 12 Enclosure Mounted in a 19-Inch Four-Post Rack



Mounting a Storage Array 12 in a Two-Post Rack

The Storage Array 12 can be mounted on the front or on the back of the posts of a two-post rack.

To mount the Storage Array 12 on a two-post equipment rack, complete the following procedure:

Step 1 Secure the right and left rack-mounting flanges to the sides of the Storage Array 12 enclosure with four flat-head 6-32 x .38 large screws.

Note Torque indicated fasteners to 7.5–8.5 in-lb (0.85–0.96 newton-meters).

The flanges can be attached at either the front or center on the enclosure and can be fitted in front mount and back mount orientations, as shown in Figure 2-3 and Figure 2-4.

Step 2 Position the Storage Array 12 on the rack, and secure each Storage Array 12 rack-mounting flange to the posts with two Phillips panhead 12-24 x .38 large screws, as shown in Figure 2-3 and Figure 2-4.

Figure 2-3 Storage Array 12 Mounted to the Front of a Two-Post Rack

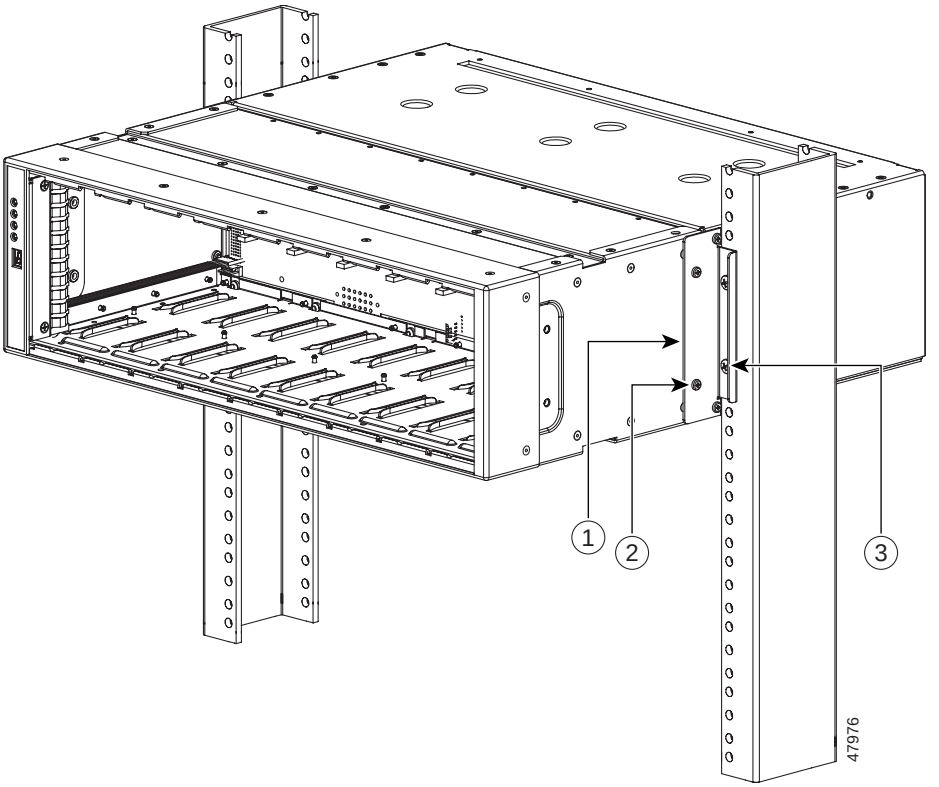
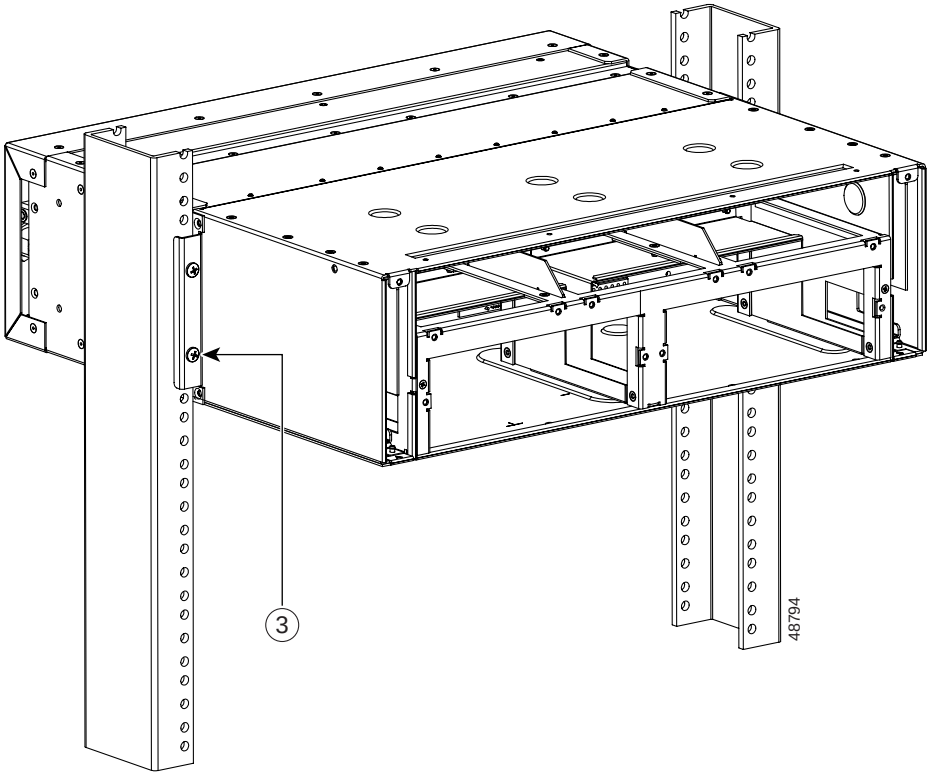


Table 2-2 Illustration Legend for Figure 2-3 and Figure 2-4

Callout Item	Description
1	Rack-mounting flange (right-side flange)
2	Flat-head 6-32 x .38 large screws to attach flange to enclosure
3	Phillips panhead 12-24 x .38 large screws

Figure 2-4 Storage Array 12 Mounted to the Back of a Two-Post Rack



Grounding the Storage Array 12

We recommend that all rack mount shelves be grounded to a common point in the cabinet in a radial topology, as shown in Figure 2-5.

Figure 2-5 Grounding Shelves Within an Equipment Rack