PS4000 Storage Arrays

Rack Mount Instructions

Part Number: F464T Rev. A00

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Introduction

For proper operation, a PS4000 storage array must be installed in a rack. See your PS Series support provider for information about supported racks.

Before You Begin

Before you begin to mount an array in a rack, you must:

- Read the installation safety precautions. See *Installation Safety Precautions*.
- Make sure the rack location meets the array's environmental requirements. See *Installation Environmental Requirements*.
- Make sure your rack meets the rack requirements. See *Rack Requirements*.
- Unpack the rail kit and make sure you have all the necessary parts and tools. The rail kit is located in the array shipping box. You must supply your own tools. See *Rail Kit Parts* and *Tool Requirements*.

Installation Safety Precautions

Follow these safety precautions:

- It is recommended that only individuals with rack mounting experience install a PS4000 array in a rack.
- Make sure the array is fully grounded at all times to prevent damage from electrostatic discharge.
- When handling the array hardware, you must use the electrostatic wrist guard shipped with the array or a similar form of protection.
- You need at least two people to lift the array chassis from the shipping box.

Installation Environmental Requirements

The rack location must meet the following environmental requirements:

- Only operate an enclosure from a power source with a voltage range of 100 to 240 VAC.
- Make sure your power source has sufficient electrical overload protection.
- In North America, connect the enclosure to a source of power with over-current protection provided by a double pole 20A or less device (UL 489 circuit breakers). In Europe, the over-current protection must be provided by a 20A or less device (IEC circuit breakers).
- Make sure there is sufficient space for air flow in front of and behind the array.
- Make sure the location is properly vented.
- Make sure the rack installation meets the array technical specifications in Table 1.

Table 1: PS4000 Array Specifications

Specification	Value
Weight of fully loaded array	35 kg (77.6 lb)
Operating temperature	5 to 35 °C (41 to 95 °F)
Storage temperature	-30 to 60 °C (-22 to 140 °F)
Maximum operating altitude	3048 meters (10,000 feet)
Operational relative humidity	20% to 80% noncondensing
Storage relative humidity	5% to 80% noncondensing
Thermal output (fully-loaded array)	1700 BTU/hour (SAS disks) 1550 BTU/hour (SATA disks)
Operational shock	5*g* peak 1/2 sin, for 10ms
Operational vibration	.21 G_{rms} 5 to 500 Hz Random
Input voltage	100 to 240 VAC (auto-sensing)
Input frequency	48 – 62 Hz
System input power	530 VA (maximum)
Each power supply	450 watts DC output Maximum input power: 0.7 KVA Input current: 7 – 3.5A
Chassis dimensions	13 cm by 48.26 cm by 55.1 cm (5.12 in. by 19 in. by 21.7 in.)

Rack Requirements

Make sure the rack and the array installation meet the following requirements:

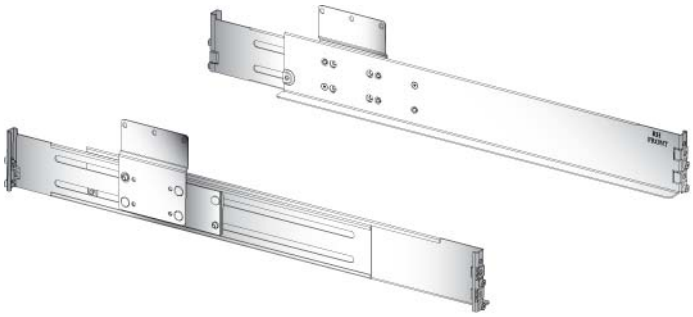
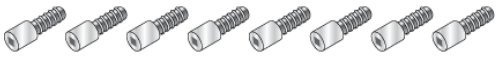
- Use an industry-standard (for example, CEA-310-E), four-pole, 19 inch (48.3 cm) rack.
- The rack must be rated for 540 kg (1200 pounds) static load or greater.
- The minimum rack depth is 100 cm (40 inches) from the front of the rack to the rear of the rack.
- The distance between the *inside* of the front and rear rack poles (the mounting surfaces) must be 61 cm (24 inches) to 90 cm (36 inches).
- Secure the rack to the floor for added stability.
- Load a rack with arrays from the bottom to the top.
- There must be at least 4.1 cm (1.6 inches) between the rack door and the front of the array to accommodate the array front bezel.
- The rack (with installed arrays) must meet the safety requirements of UL 60950-1 and IEC 60950-1.
- Mount the array in a horizontal position, or you will void your array warranty and support contract.

Rail Kit Parts

The rail kit includes the parts described in Table 2. Not all parts are used in all racks.

- Parts for round racks are included in bag labeled ROUND.
- Parts used in multiple racks are included in the bag labeled COMMON.
- No additional parts are required for tapped racks.

Table 2: Rail Kit Parts (Images Not to Scale)

Item	Graphic	Quantity	Description
1		1 each	LH Rail Assembly RH Rail Assembly
2		2	M5 x 8 Posi pan head screw with patchlock (COMMON bag)
3		4	Large O/D plain washer (COMMON bag)
4		4	Spring washer (COMMON bag)
5		4	#10-32 x 25 Phillips head NO2 pan head screw (COMMON bag)
7		8	Locator pins for round hole rack (ROUND bag)

Tool Requirements

You need the following tools to mount an array in a rack. These tools are not provided in the array shipping box.

- #2 Phillips screwdriver
- #2 pozidriv® screwdriver
- (Optional) Torque wrench. The torque specification for the supplied screws is 5.69 N m (4.2 foot pounds).

Steps for Mounting an Array in a Rack

Follow these steps to mount a PS4000 array in a rack:

1. Change the mounting rail hardware, if necessary.
2. Determine where to place the mounting rails in the rack.
3. Attach the mounting rails to the rack.
4. Slide the chassis into the rack.
5. Attach the chassis to the brackets on the mounting rails and to the front of the mounting rails.
6. Install the bezel.

These steps are described in detail in the following sections. After you mount the array in the rack, see the *Installation and Setup* manual for information about completing the array hardware installation.

Step 1: Change the Mounting Rail Hardware

The mounting rails are shipped with hardware pre-installed for mounting in a rack with square holes. If you have a square-hole rack, no changes are necessary. Proceed with *Step 2: Determine Where to Place the Mounting Rails in the Rack*.

If your rack has round or tapped holes, change the hardware as follows.

- For round hole racks:
  - On the front and back of both mounting rails, remove the pre-installed locator pins and replace them with the locator pins from the bag labeled ROUND. Insert the locator pins from the front, using the same orientation as the pre-installed pins.
- For tapped hole racks:
  1. On the front and back of both mounting rails, remove the pre-installed locator pins.
  2. Re-install the same locator pins from the opposite side of the holes you removed them from, so that the pin protrudes from the front and rear of the mounting rail flanges.

Step 2: Determine Where to Place the Mounting Rails in the Rack

Make sure there is enough space in the rack for a 3U chassis. In a standard rack, the height of a 3U chassis will span 9 holes.

Figure 1 shows the location of the top and bottom of the chassis relative to the location of the screws used to attach the rail and the array to the rack's front right and left poles.

Figure 1 Front Pole Screw Locations

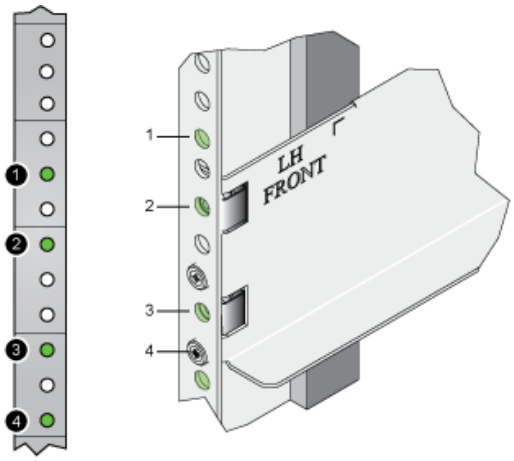


Figure 1 Description	
1	Indicates the top of the PS4000 array chassis.
2	Location of the upper mounting rail screw.
3	Location of the captive chassis thumbscrew (between the two locator pins).
4	Indicates the bottom of the PS4000 array chassis. The array rests on the lip of the mounting rails.

Step 3: Attach the Mounting Rails to the Rack Poles

The rail kit includes two mounting rails, one for the left rack pole and one for the right rack pole when viewed from the *front* of the rack.

Guidelines for Attaching the Mounting Rails

Follow these guidelines when attaching the mounting rails to the rack poles:

- Attach the mounting rail flanges to the *inside* of the rack pole flanges.
- Insert the screws from the *outside* of the rack.
- Use the markings on the rack poles (if present) to make sure the rails are level, or use a level.

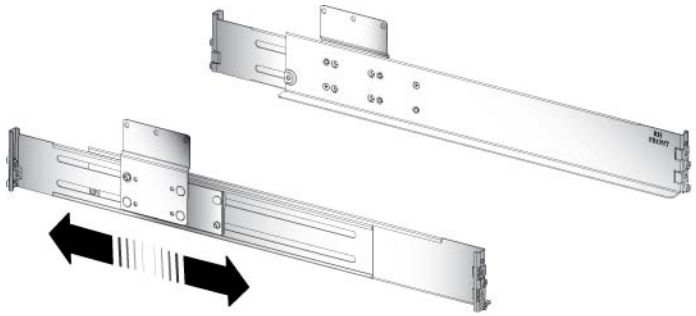
Attaching the Mounting Rails to the Rack Poles

To attach the mounting rails to the rack poles:

1. Collect the necessary hardware and tools:
   - One #2 Phillips screwdriver and one #2 pozidriv screwdriver. See *Tool Requirements*.
   - The left and right rails.
   - For all rack types, the contents of the COMMON BAG.

2. Orient the mounting rail in its proper position. Each rail is stamped with either “LH Front” or “RH Front.” When the rails are properly positioned, the brackets are closer to the rear of the rack and pointing up. See Figure 2.

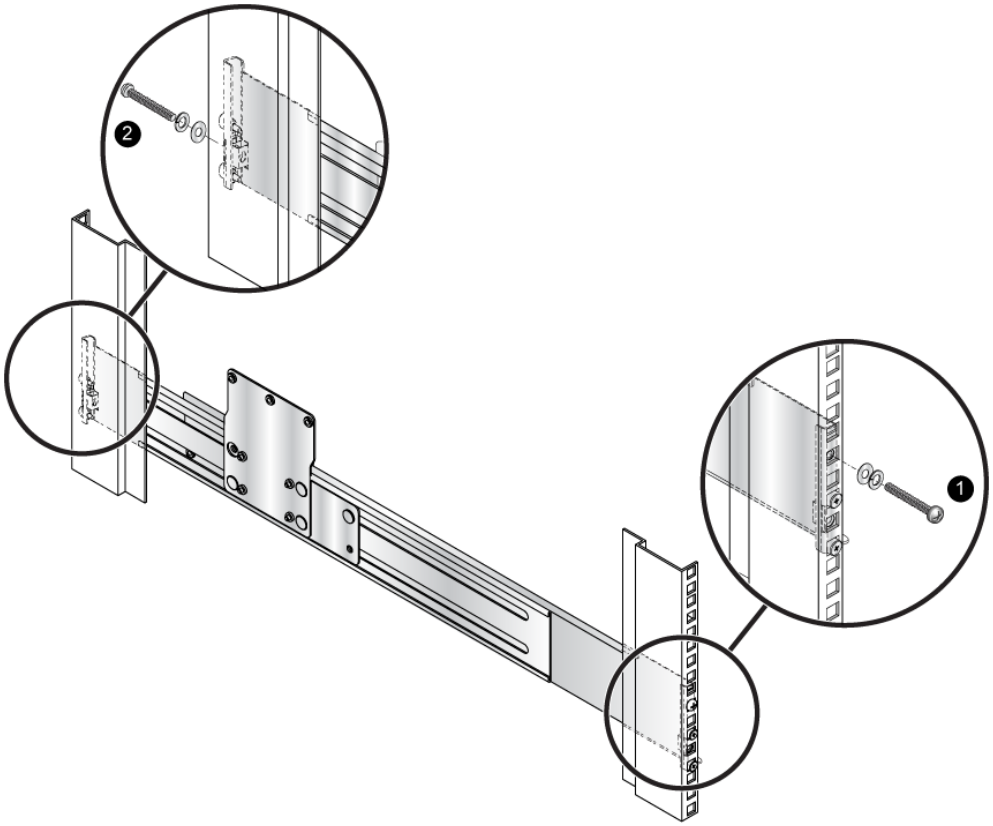
Figure 2 Adjusting the Length of a Mounting Rail



3. Attach the front of the rail to the inside of the front pole (Figure 3, callout ❶) using one Phillips head screw, one spring washer, and one plain washer from the COMMON bag.
4. Pull the rear flange until it meets the inside surface of the rear rack pole. See Figure 2.

   Make sure the locator pins go through the rack holes at the same height (in the same relative holes on the front and rear poles), according to the pole markings, if present. Use a level to make sure the rails are level.
5. Attach the rear of the rail to the rear pole (Figure 3, callout ❷) using one Phillips head screw, one spring washer, and one plain washer from the COMMON bag.

Figure 3 Attaching a Mounting Rail to the Front and Rear Poles



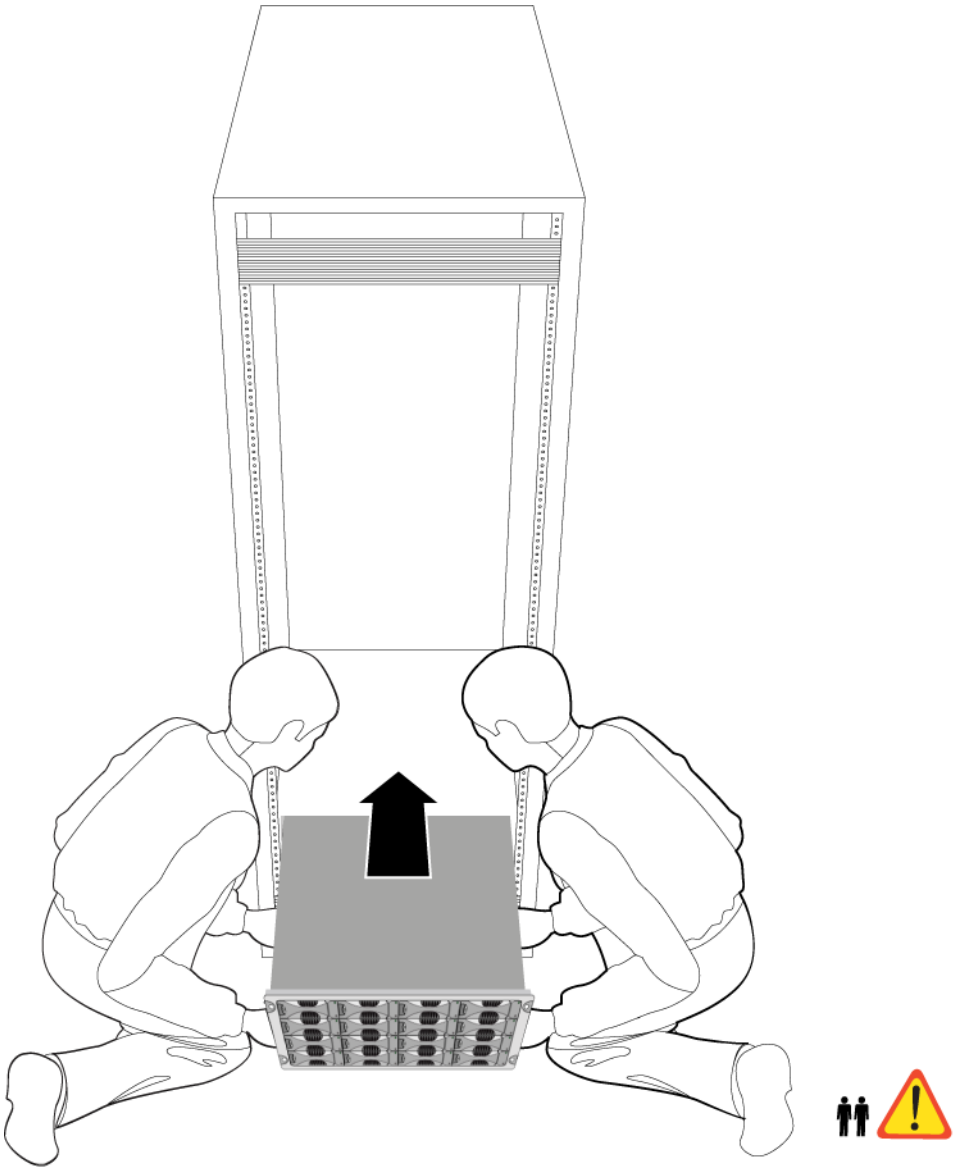
Step 4: Slide the Chassis into the Rack

Caution: Be careful when lifting the chassis.

1. With assistance, lift the chassis and slide it into the mounting rails. Keep the chassis level. See Figure 4.

2. Make sure the chassis captive fasteners on the front of the array line up with the lower clip nuts in the front of the mounting rails.

Figure 4 Sliding the Chassis into the Rack



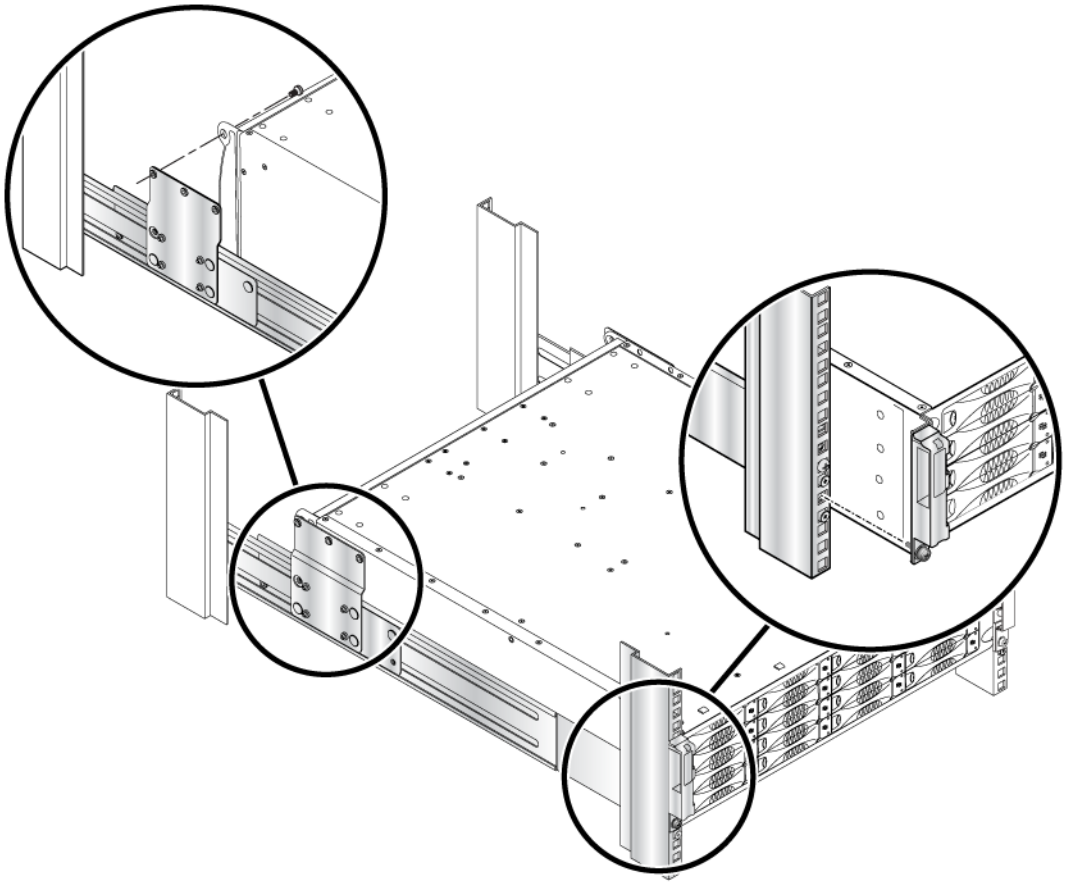
Step 5: Attach the Chassis to the Mounting Rails

Secure the chassis to the mounting rails as follows:

1. On both sides, tighten the captive fasteners on the front of the chassis into the lower clip nuts. See Figure 5.
2. On both sides, attach the rear of the chassis to the brackets on the left and right rails using the Posi screws from the COMMON bag. Insert the screws from the inside of the rack, as shown in Figure 5 (shows only one side for clarity). You *must* secure the array to the rear brackets.

Caution: Failure to attach the array to the brackets can affect the stability of the array and reduce the life of the drives.

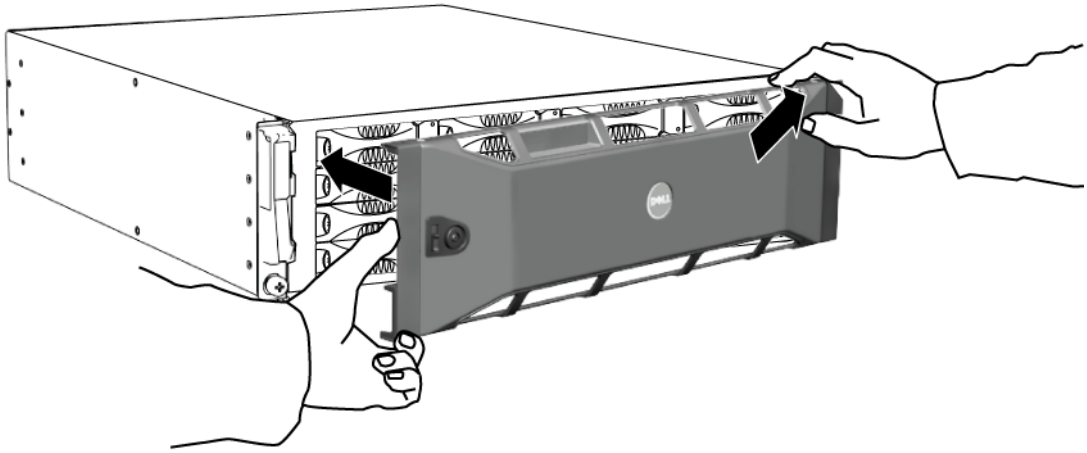
Figure 5 Attaching the Chassis to the Mounting Rails



Step 6: Install the Bezel

1. Facing the front of the rack, fit the right side of the bezel into the right side of the chassis. See Figure 6.

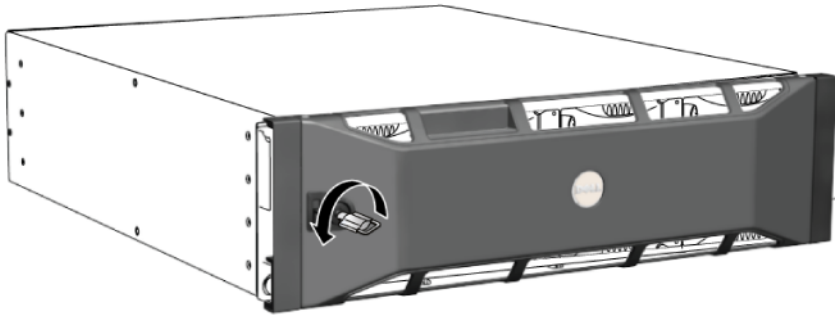
Figure 6 Attaching the Bezel to the Chassis



2. Push the bezel toward the chassis until the left side of the bezel engages with the chassis.

3. Insert the bezel key (attached to the bezel) and turn it counter-clockwise to lock the bezel to the chassis. See Figure 7. Make sure you store the key in a safe location.

Figure 7 Locking the Bezel



Where to Go Next

See the *Installation and Setup* manual for information about completing the array hardware installation.

Technical Support

Dell's support service is available to answer your questions about PS Series arrays. If you have an Express Service Code, have it ready when you call. The code helps Dell's automated-support telephone system direct your call more efficiently.

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area.

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