



VR Rack

Installer/User Guide

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Technical Support Site

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures.

Visit <https://www.vertiv.com/en-us/support/> for additional assistance.

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1 Important Safety Instructions

Save These Instructions

This manual contains important instructions that must be closely followed during installation of this unit to maintain compliance with agency listings. Read all safety and operating instructions. Adhere to all warnings on the unit and in this manual. Follow all operating and user instructions.



WARNING! Risk of handling heavy unit. Can cause equipment damage, injury or death. Read all instruction before beginning.



WARNING! Risk of top-heavy unit falling over. Improper handling can cause equipment damage, injury or death. Only properly trained and qualified personnel wearing appropriate OSHA-approved personal protection equipment (PPE) should attempt to move, lift, remove packaging from or prepare unit for installation. Read all instructions before attempting to move, lift, remove packaging from or prepare the unit for installation.

This product is designed for commercial/industrial use only. This product is not intended for use with life support or other U.S. FDA designated "critical" devices. Maximum loads must not exceed those specified in this manual. The maximum load rating for the Vertiv™ DCF is found in the "Vertiv™ DCF Guide Specifications," SL-11425GS. Do not exceed the static load rating.

Install and operate in a clean environment, free from moisture, flammable liquids, gases and corrosive substances. The Vertiv™ DCF must be installed on a flat, level surface for proper assembly and operation.

Ensure that the rack has proper ventilation. Never block or insert objects into the ventilation holes or other openings. Maintain minimum clearances as specified in this manual.

Provide the minimum space between the accessories/components and the housing. This spacing shall be maintained for safe operation of the equipment when installed in accordance with the National Electric Code, ANSI/NFPA 70. As appropriate, all wiring and equipment should be installed in accordance with NFPA 70, "National Electrical Code," and the applicable sections of ANSI C2, "National Electrical Safety Code."

We recommend that casters only be used to move empty racks.

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2 Vertiv™ VR Rack

The highly-versatile Vertiv™ DCF provides an organized, secure, controlled environment in a single system for sensitive electronic equipment.

Table 2.1 below, lists the racks described in this guide.

Table 2.1 Vertiv™ VR Rack Models, Types, Nominal Dimensions, and Weights

Part Number	Type	Height, RU	Height, mm (in.)	Width, mm (in.)	Depth, mm (in.)	Unit Weight, kg (lb)	Shipping Weight, kg (lb)
VR3100	Server	42	1998 (78.67)	600 (23.62)	1100 (43.31)	127 (280)	163 (359.4)
VR3100TAA*							186 (410.1)
VR3100SP*							
VR3300	Server	42	1998 (78.67)	600 (23.62)	1200 (47.24)	137 (302)	173 (381.4)
VR3300TAA*							196 (432.1)
VR3300SP*							
VR3150	Networking	42	1998 (78.67)	800 (31.5)	1100 (43.31)	162 (357.1)	202 (445.3)
VR3150TAA*							224 (493.8)
VR3150SP*							
VR3350	Networking	42	1998 (78.67)	800 (31.5)	1200 (47.24)	166 (366)	206 (454.2)
VR3350TAA*							228 (502.7)
VR3350SP*							
VR3105	Server	45	2132 (83.9)	600 (23.6)	1100 (43.3)	154 (339.5)	194 (427.6)
VR3107	Server	48	2265 (89.17)	600 (23.62)	1100 (43.31)	162 (357.1)	199 (438.7)
VR3107TAA*							222 (489.4)
VR3107SP*							
VR3305	Server	45	2132 (83.9)	600 (23.6)	1200 (47.8)	162 (357.1)	202 (445.3)
VR3307	Server	48	2265 (89.17)	600 (23.62)	1200 (47.24)	166 (366)	203 (447.5)
VR3307TAA*							225 (496)
VR3307SP*							
VR3157	Networking	48	2265 (89.17)	800 (31.5)	1100 (43.31)	175 (385.8)	216 (476.2)
VR3157TAA*							238 (524.7)
VR3157SP*							
VR3357	Networking	48	2265 (89.17)	800 (31.5)	1200 (47.24)	180 (396.8)	220 (485)
VR3357TAA*							242 (533.5)
VR3357SP*							
VR3407SP*	Server	48	2251 (88.62)	600 (23.62)	1400 (55.12)	188 (414.5)	253 (557.8)

*Availability of SKUs varies by global region.

2.1 What's Included with Your Vertiv™ VR Rack

- Vertiv™ DCF assembled rack
- Door and side-panel keys
- (50) M6 cage nuts and M6 screws
- Baying hardware
- Edge grommet
- Cage-nut install tool
- T30 extension drive

3 Pre-installation Preparation

3.1 Equipment Inspection

Upon receiving a Vertiv™ DCF rack system, inspect the packaging for any signs of mishandling or damage. If any damage is noted, notify your local Vertiv representative and your carrier immediately.

3.2 Unloading the Rack and Moving to Installation Location

Before unloading, note the weight of the model in [Table 21](#) on page 3.

The following tools/equipment are required to un-pack and move the rack:

- pallet jack or forklift
- utility knife or scissors
- 13-mm socket and ratchet or 13-mm wrench
- 14-mm socket and ratchet or 14-mm wrench



WARNING! Only trained service personnel should be used to remove the rack from the pallet. Also, be sure you have a sufficient number of service personnel. Do not attempt to move racks by yourself.



WARNING! Be careful when moving racks before installation. Sudden stops and starts, excessive force, obstructed routes, and uneven floor surfaces may cause the rack to topple over.

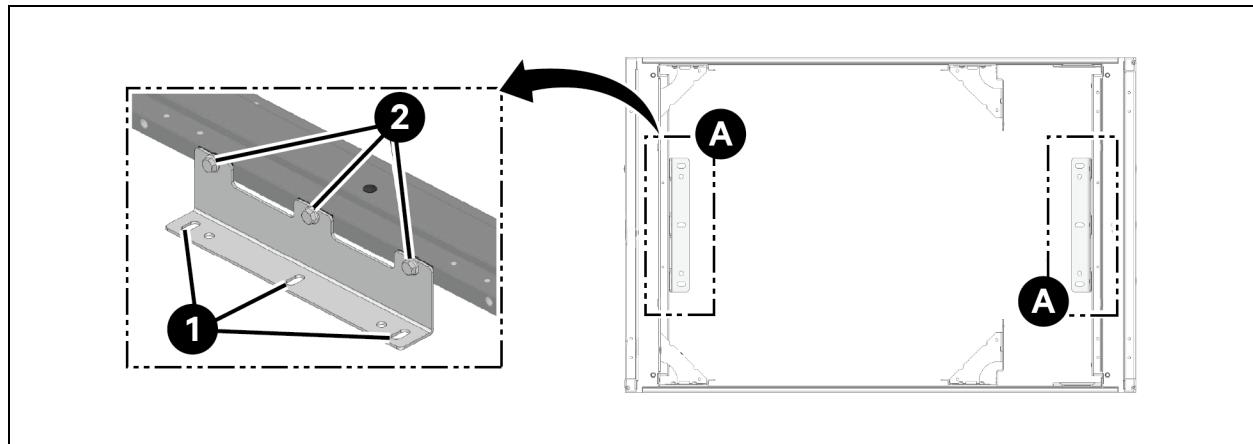


CAUTION: Use at least two people when moving the unit.

1. Using a pallet jack or forklift, move the rack on its pallet to the installation location.
2. Cut the shrink wrap and remove all packaging.
3. Use a 13-mm socket or a 13-mm wrench to remove the anchor-bracket hardware that secure the 2 anchor brackets to the shipping pallet, one in the front and one at the rear of the rack. Each bracket is secured by four bolts.
 - If the brackets will be used to anchor the rack to the floor, and set aside for attachment when the rack is in its final location.
4. Make sure that the leveling feet are in the raised position, see [Leveling Feet Adjustment](#) on page 7.
5. Use a pallet jack or forklift to raise the rack off the shipping pallet.
6. Slide the shipping pallet out from under the rack.

7. Position the rack in the installation location using the forklift, with a pallet jack, or with 2 or more people rolling the rack on its casters.
 - If using the casters to move the rack, make sure that the leveling feet are raised before moving, see [Leveling Feet Adjustment](#) on the facing page.
8. Position the rack, lower the leveling feet using the T30 Torx tool or 14-mm wrench, and level the rack.
 - If using the shipping/anchoring brackets to bolt the rack to the floor, make sure that the rack is level before tightening all the anchor-bracket hardware, see [Leveling Feet Adjustment](#) on the facing page.

Figure 3.1 Anchor brackets inside front/rear of rack



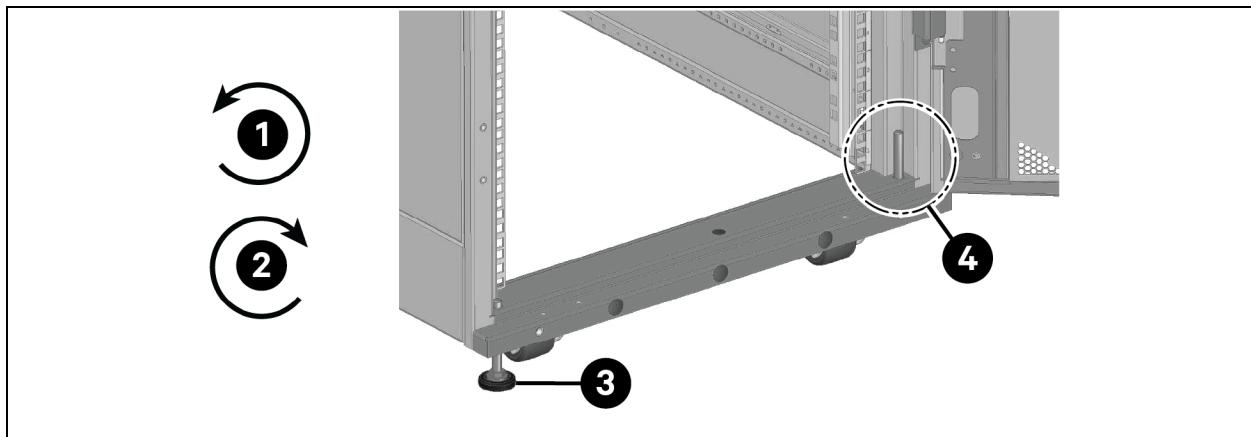
Item	Description
1	Bolt holes for securing anchor bracket to pallet and/or floor
2	Bolt holes for securing anchor bracket to rack (3 typical)

3.2.1 Leveling Feet Adjustment

Leveling feet are preinstalled at the factory. They are easily accessible in the front and rear of the rack frame.

- If necessary, use the T30 Torx tool or 14-mm wrench to raise/lower the levelers.

Figure 3.2 Adjusting the leveling-feet



Item	Description
1	Counter-clockwise rotation to adjust feet up
2	Clockwise rotation to adjust feet down
3	Adjusting feet beneath rack
4	Adjusting feet from inside the rack

3.3 Equipment Clearance Requirements

When planning the position and location of the rack, refer to **Figure 3.3** below, for the required clearances for installation and service of the rack and installed equipment.

Figure 3.3 Required clearance

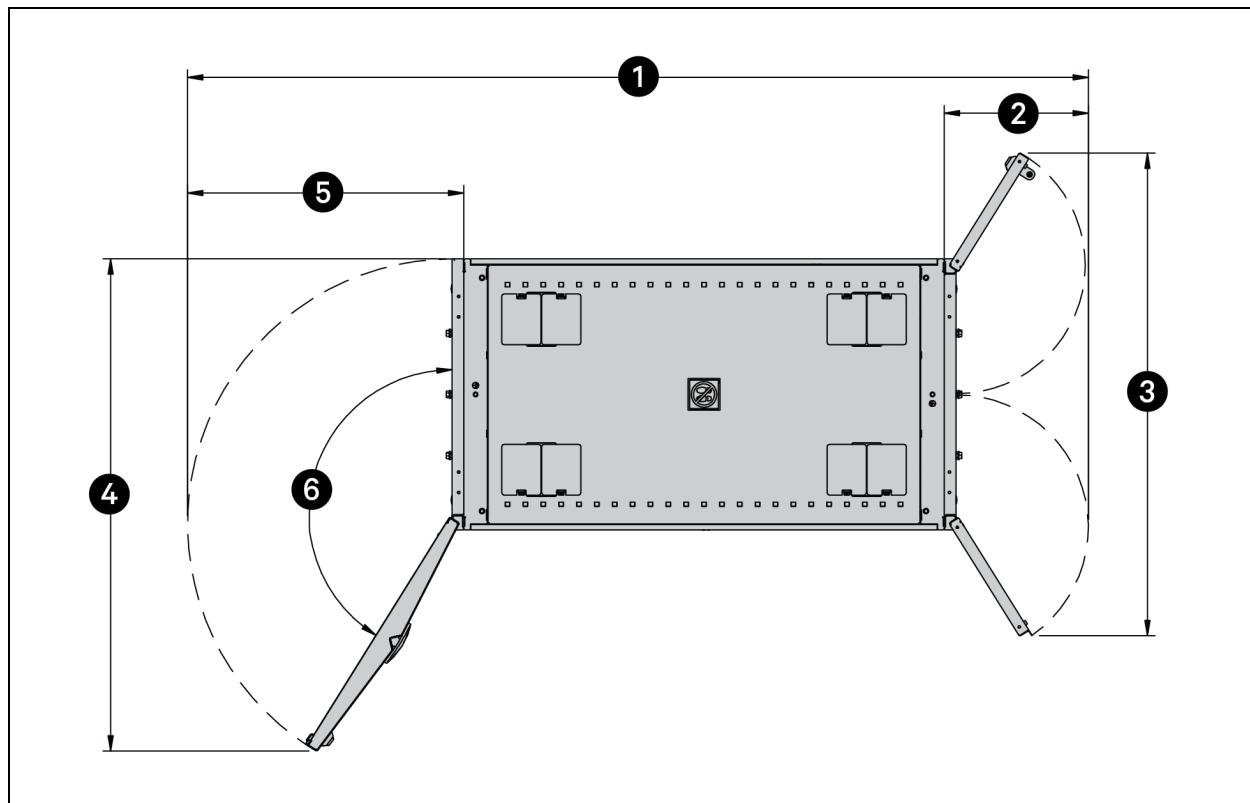


Table 3.1 Clearance Distances

Item	600-mm (23.62 in.) wide, mm (in.)			800-mm (31.5 in.) wide, mm (in.)	
	x 1100 mm (43.31 in.)	x 1200 mm (47.24 in.)	x 1400 mm (55.12 in.)	x 1100 mm (43.31 in.)	x 1200 mm (47.24 in.)
1	1992 (78.43)	2092 (82.36)	2292 (90.24)	2280 (89.76)	2393 (94.21)
2	319 (12.54)			421 (16.57)	
3	1066 (41.97)			1434 (56.46)	
4	1087 (42.79)			1456 (57.32)	
5	610 (24.02)			809 (31.85)	
6	148° maximum door swing, 3 places				

4 Installation and Assembly Procedures

Once your rack is in its final location, refer to the following procedures to install accessories, adjust components, and load equipment into the rack.

The following tools ship with the rack for installation assembly:

- cage-nut install tool
- T30 extension drive

4.1 Removing and Reversing Doors

Rack doors are removable for convenience when installing or maintaining equipment. The front door is also reversible, so that the single door may be opened in a more convenient direction if the rack is near a wall or other equipment.

To remove a door:

Doors are supported by two hinges and held in place by gravity. They can be lifted off and reinstalled without tools.

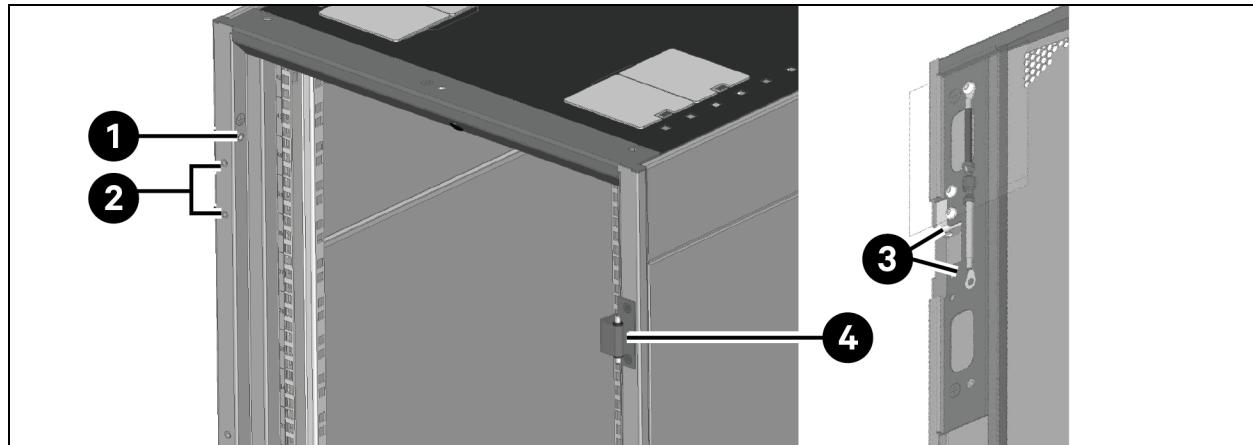
NOTE: Doors are easier to remove if they are open at a 90° angle to the rack.

To reverse the front door:

1. Disconnect the ground wire that is attached to the door and frame.
2. Lift the door off the rack, then loosen and remove screws from both the top and bottom hinges, shown in **Figure 4.1** on the next page.
3. Remove the hinges and place them on the opposite side of the frame in the slots provided.
4. Reinsert and tighten the screws.
5. Remove the hardware from the door catch and install the catch on the opposite side of the frame.
6. Flip the door.
The hinge pin assemblies are now at the bottom of the hinge-pin attachment point.
7. Remove the hardware, flip the hinge pin and reinsert it in the hinge-pin attachment point.

8. Reattach the hinge pin with hardware.
9. Hang the door on the newly positioned hinges.
10. Reconnect the ground wire to the door and frame.

Figure 4.1 Removing hinges and reversing the door

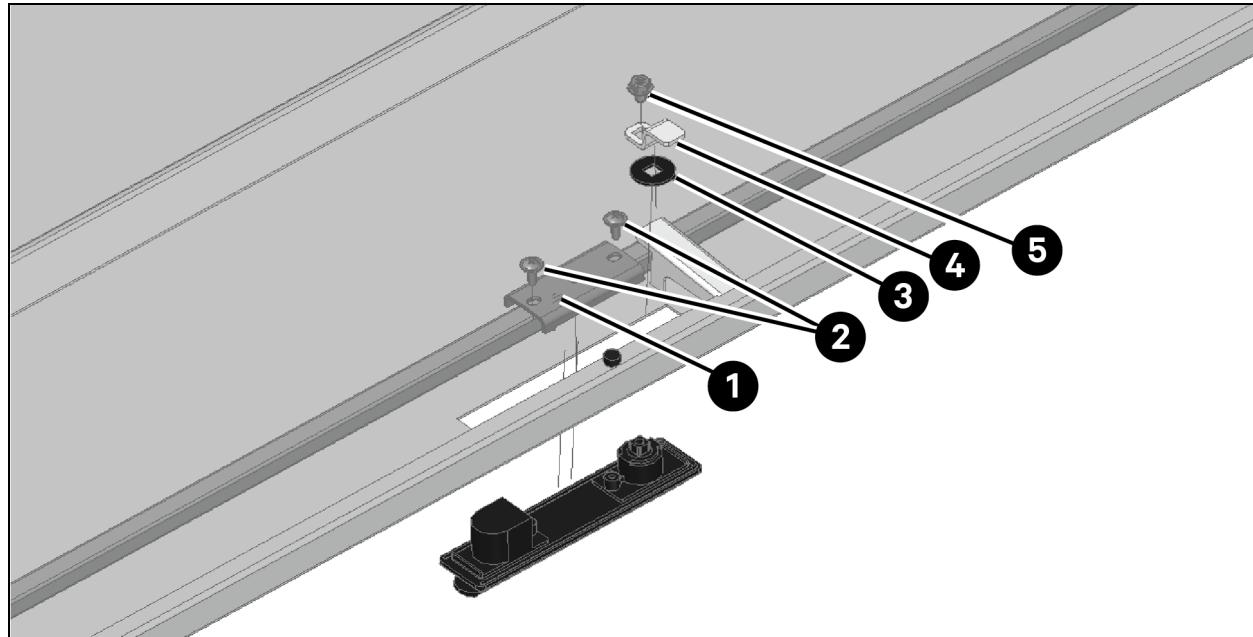


Item	Description
1	Ground-wire connection on frame, same on both sides of frame
2	Screw holes for hinge attachment, same on both sides of frame
3	Hinge
4	Hinge-pin bracket hardware in door, flip when reversing door.

4.2 Reversing the door handle

1. Remove the Phillips-head bolt from the swing-handle retainer on the inside of the door.
2. Tilt the handle outward and lift up to remove it from the door.
3. Remove the Phillips-head cam retaining bolt, rotate the cam 180° and re-install cam retaining bolt.
4. After reversing the door, reinstall the swing handle by sliding downward into door and tilting inward.
5. Re-install swing-handle retainer and Phillips head bolt.

Figure 4.2 Door handle components



Item	Description
1	Retaining bracket for handle
2	Screws
3	Paw spacer
4	Handle paw
5	Paw screw

4.2.1 Operating Door Handle

The door swing handles have been installed at the manufacturer. No additional assembly is required. To operate the swing handle, lift up at the bottom of the handle then swing the handle to the right to open. The handle must be kept in this position to close the door. Return the handle to the initial position and use the key provided to lock the handle. The lock on the side panels will accept the same key.

The swing handles and doors are reversible. See [Reversing the door handle](#) above.

4.3 Removing and Replacing Side Panels

The rack uses dual split-side panels fashioned from sheet metal. Both panels rest on a frame member and are secured to the frame by a slam latch. The locking latch makes the panels simple to remove and replace when installing equipment and performing maintenance.

To remove a side panel:

1. To remove a panel, insert the key in the side-panel lock and turn clockwise to unlock it.
2. Press on the latch, lean the panel away from the frame, then lift the panel up and away from the rack and set it aside, see **Figure 4.3** below.
3. Repeat steps for other panels being removed.

NOTE: Do not remove the protective-earth bonding clip from the side panels. If the clip is missing, contact your Vertiv sales representative for instruction on how to proceed.

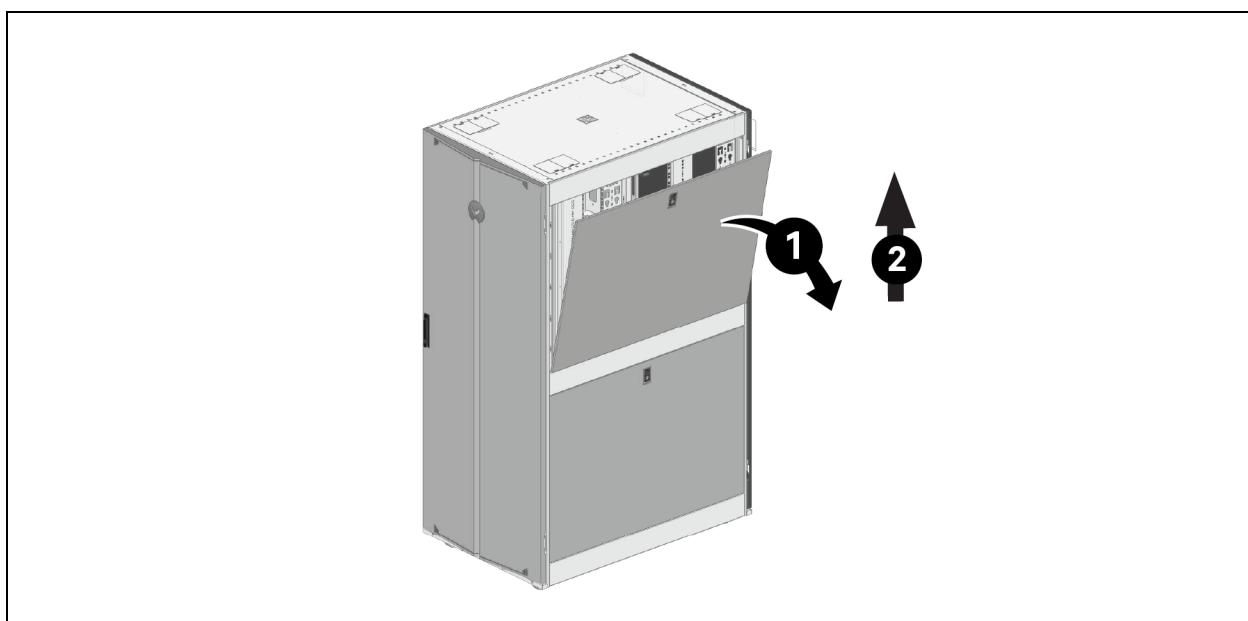
NOTE: Do not leave the side panel off of the rack for extended periods of time. Always inspect the channel and remove debris or contaminates before installing the side panel. The ground-bond path requires a solid metal to metal contact between the panel clip and the enclosure rail.

To replace a side panel:

NOTE: Before replacing a side panel, Make sure there is free area and clearance to reinstall the side panel and that the ground clip is properly engaged in side panel and frame.

1. Set the bottom of the panel onto the frame member.
2. Move the top of the panel toward the rack and slam the latch.
3. Turn the key counterclockwise until the latching mechanism engages to lock the panel in place.
4. Repeat steps for other panels being replaced.

Figure 4.3 Removing side panel



Item	Description
1	Lean panel away from frame.
2	Lift up and away, then set aside.

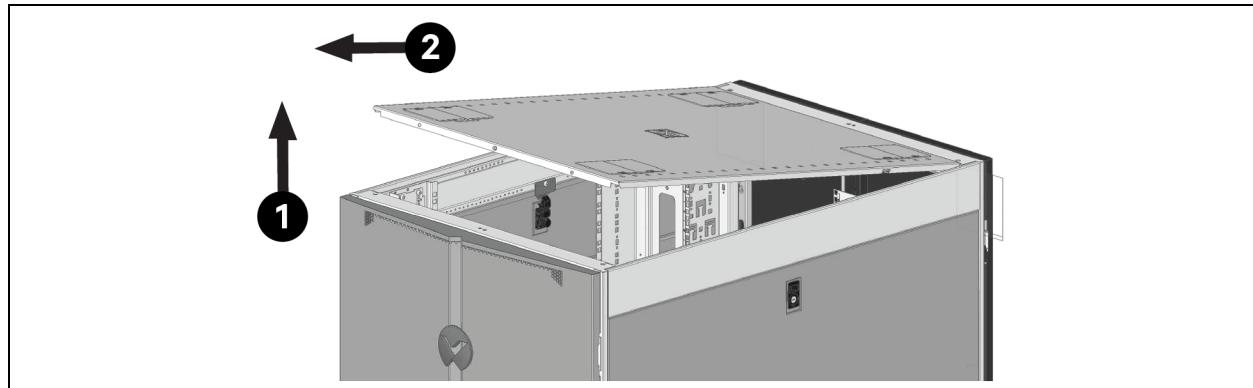
4.4 Removing and Replacing the Top Panel

The rack uses a tool-less, removable top panel for simple removal and replacement.

To remove the top panel:

1. Pull the pin located in the front of the rack.
2. Lift the front of the top panel, then pull the panel away from the frame member and set it aside.

Figure 4.4 Removing the top panel

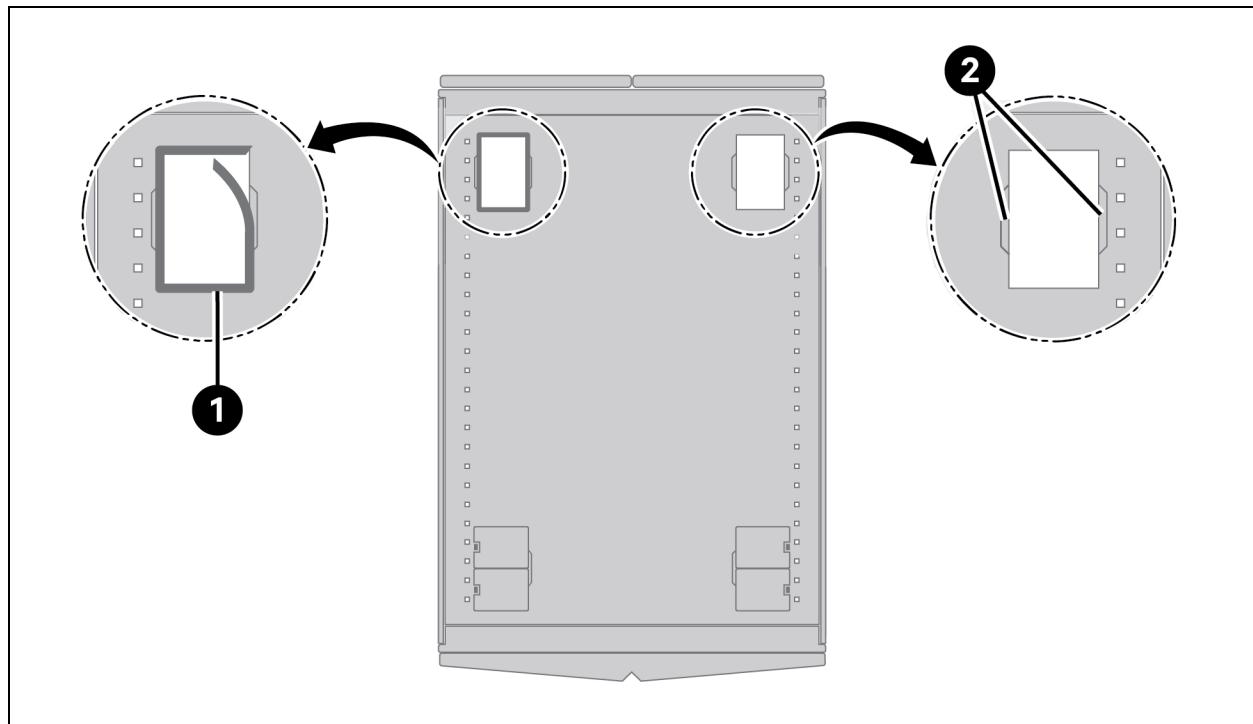


Item	Description
1	Lift the front of the panel.
2	Pull the panel away from frame, then set aside.

4.5 Installing the Edge Guard

1. Press edge guard to the top-cover cut outs by pressing along the edge of the cut out opening as shown in the following figure.
2. Trim excess edge guard with a pair of scissors after the edge guard after completely applied around the opening.
3. Repeat steps 1 and 2 for remaining cut outs.

Figure 4.5 Applying the edge guard



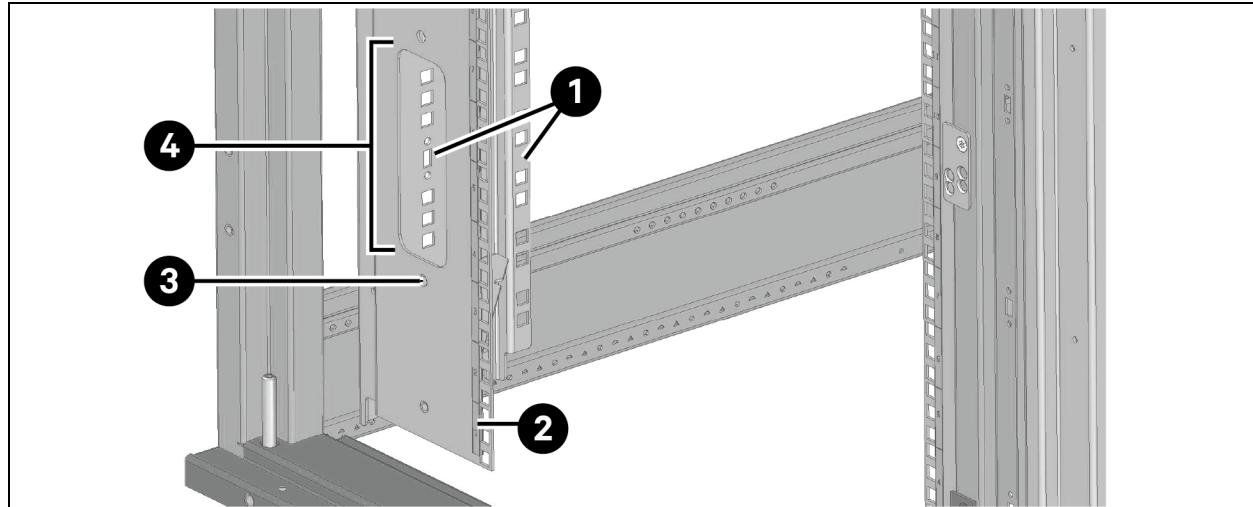
Item	Description
1	edge guard
2	Break-away tabs to accommodate the pass-through of large-diameter rack-PDU plugs

4.6 Positioning and Attaching Front- and Rear-Mount 19-in. EIA Rails

Front- and rear-mount, 19-in., EIA rails are installed in racks at the factory at 29.13 in. (740 mm) or 37.01 in. (940 mm) for 1400 mm deep rack. They attach to the rack frame at the top, bottom, and in the center using M6x12 Torx-head screws into a rail-adjustment bracket.

The EIA rails use universal (M6) cage nuts and are marked with rack-mount units (RU) on the front and rear, see **Figure 4.6** below. The rails also include accessory-mounting holes (AMH), cable pass-through holes, and cable tie-down slots.

Figure 4.6 EIA-rail Features



Item	Description
1	Cable-accessory mounting locations
2	U-mark label
3	Cable-trough and air-flow brush-strip attachment (on 800W models only)
4	Cable pass-through cut-out (on 800W models only)

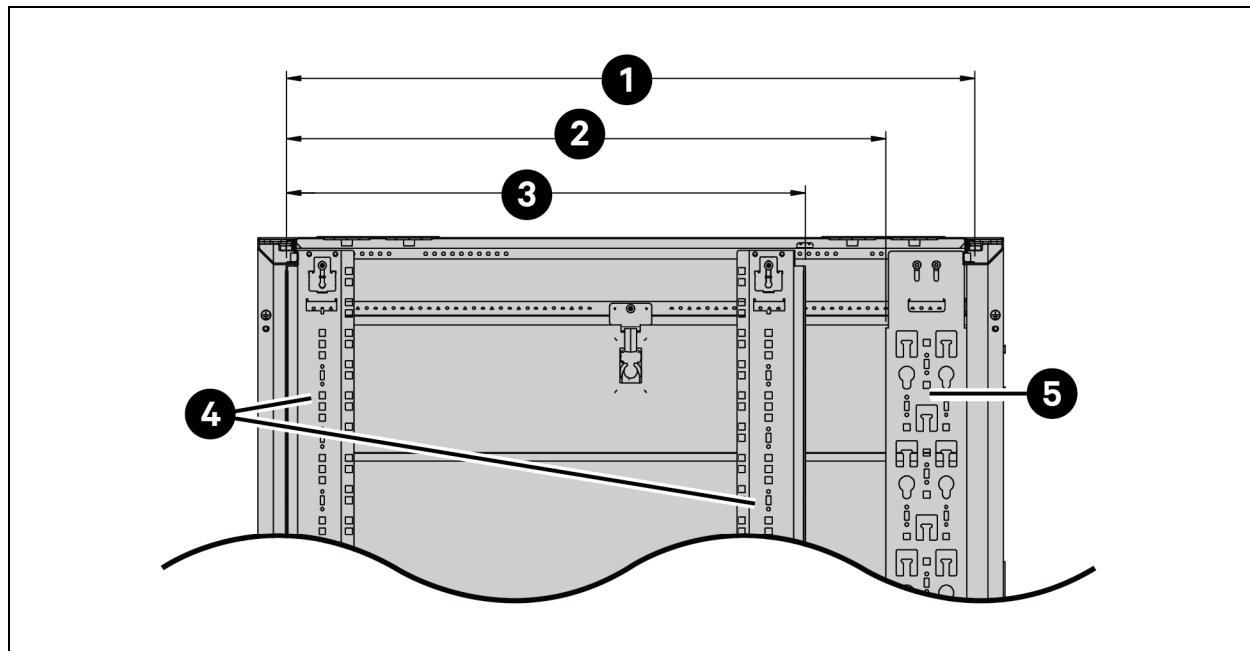
To position the EIA rails in the rack:



CAUTION: Do not attempt to adjust rail position after equipment is loaded.

1. Determine the installation location of the EIA rails. See **Figure 4.7** below, for available depth of position in the rack.

Figure 4.7 EIA rail spacing in the rack



Depth			
Item	1100 mm (43.31 in.)	1200 mm (47.24 in.)	1400 mm (55.12 in.)
1	982 mm (38.64 in.)	1082 mm (42.6 in.)	1282 mm (50.47 in.)
2	854 mm (33.62 in.)	954 mm (37.56 in.)	1154 mm (45.43 in.)
3	740 mm (29.11)		940 mm (37.01 in.)
4	EIA rails		
5	PDU bracket		

2. Loosen the M6x12 screws in the rail-adjustment brackets that secure the EIA rails to the frame member, see **Figure 4.8** on the facing page.

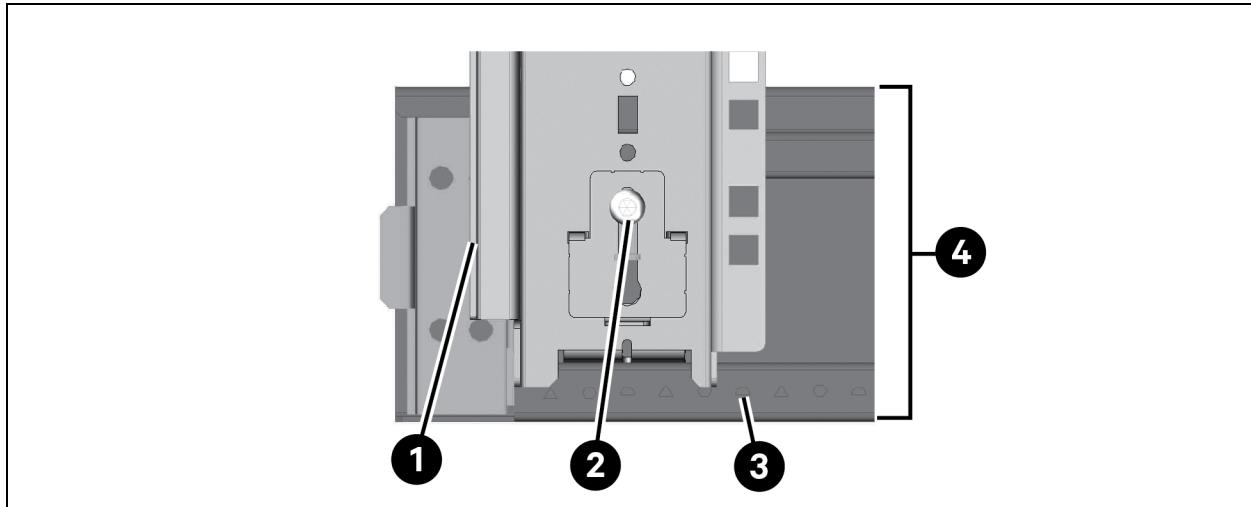
NOTE: Rails are attached at the top, center and bottom.

3. Slide the rail-adjustment brackets down.
4. Slide the EIA rail to the desired position, making sure to keep it square. The frame member and support have a feature pattern spaced on 6.35-mm centers to help properly position the rails.

NOTE: The front and rear 19-in. EIA rails must be kept at a 90-degree angle to the upper and lower frame members. The left- and right-front vertical rails must be the same distance from the front of the rack. The left- and right-rear vertical rails must be the same distance from the rear of the rack. If these conditions are not met, equipment and optional features will be difficult to install.

5. Hold the rail in position, then install the M6x12 screws into the rail-adjustment brackets.
6. Repeat steps 2 to 5 for each rail.

Figure 4.8 EIA rail-adjustment components in rack



Item	Description
1	Face of EIA rail
2	Rail-adjustment screw
3	EIA rail-alignment features on all frame members
4	Frame member

4.7 Mounting Power Distribution Units

Power distribution units may be mounted on the rails or attached to mounting brackets in the rack. Two PDU mounting brackets are standard in each rack. They are mounted in the rear of the rack, one on each side.

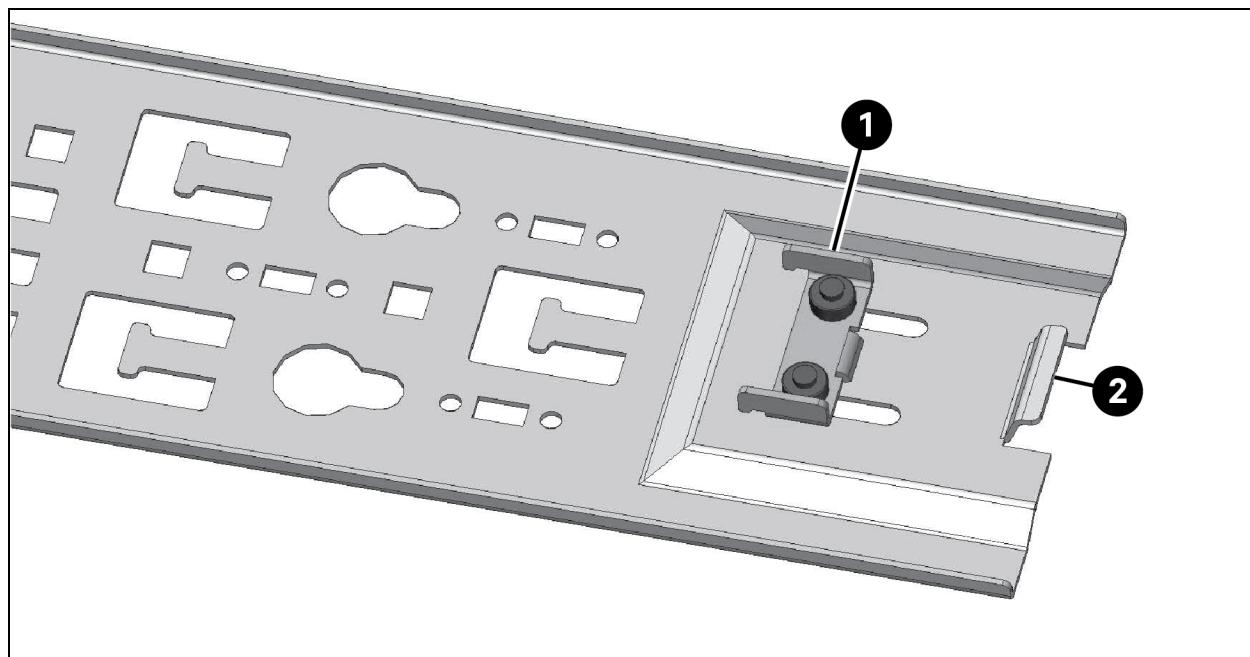
4.7.1 Installing and Positioning a Full-height PDU/Cable-Management Bracket

The top and bottom of the 4-in. wide brackets are identical for use on either side of the rack. [Figure 4.10](#) on the facing page, shows the mounting and cable-management features of the bracket.

To install a full-height bracket:

1. Position the full-height bracket for installation with the inside bottom flange of the PDU resting on the flange of the frame member at the top and bottom. See the flange in [Figure 4.9](#) below.
2. Hold the PDU bracket in place, then insert and tighten the screws.

Figure 4.9 Full-height bracket end



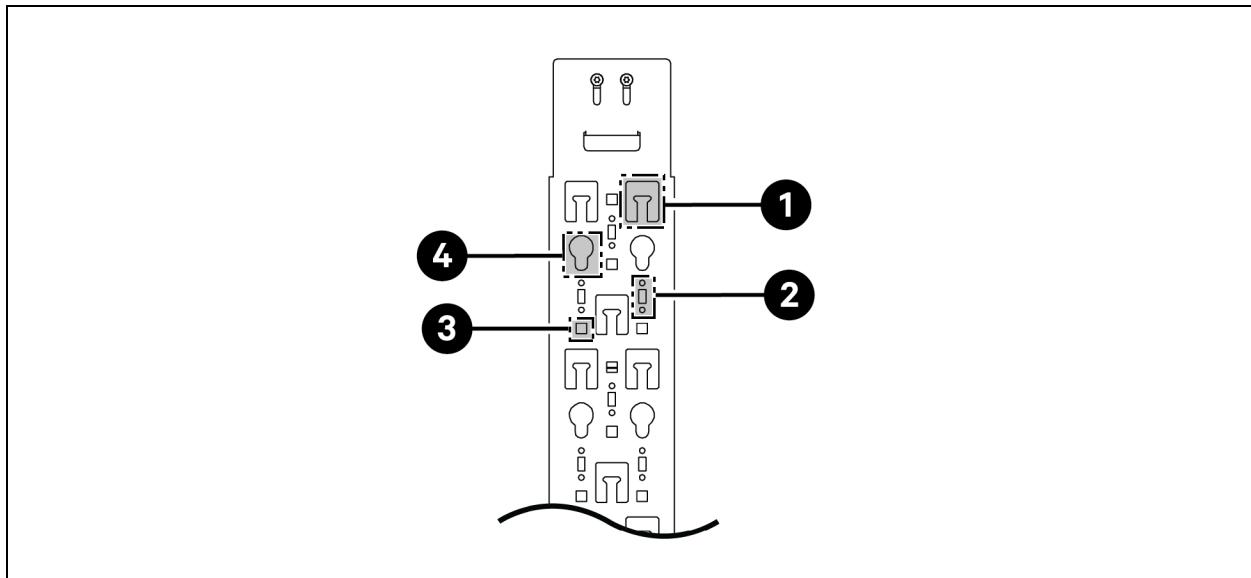
Item	Description
1	Bracket clip
2	Bracket flange

To reposition a full-height bracket:

1. Loosen the screws in the top and bottom PDU hanging bracket.
2. Slide the bracket along the frame member to the desired location and tighten the screws.

To remove a full-height bracket:

1. Loosen the screws in the top and bottom PDU hanging bracket.
2. Lift the bracket up until the hanging bracket clears the frame member and remove the bracket from the rack.

Figure 4.10 PDU-bracket Features

Item	Description
1	Velcro or cable-tie features
2	Tool-less accessory mounting holes
3	Tool-less accessory mounting holes
4	Rack-PDU mounting keyholes

4.8 Baying the Racks

Two or more racks of the same height can be bayed with the supplied baying brackets. The brackets have three hole locations (shown in [Figure 4.12](#) on page 22):

- The single hole connects to the rack
- The outer holes bay the racks on 24 in. (609.6 mm) centers for floor-tile placement. When bayed on 24-in. centers, there is a gap between the frames that must be sealed with a baying-gasket kit, part VRA5003, to maintain proper airflow.
- The center holes put the racks on metric centers.

Connecting the racks is easier if they are in their final installation position before baying.



WARNING! The rack-baying brackets and hardware are not a ground-bond method. For more details on properly grounding, see [Grounding the Rack](#) on page 22.

NOTE: The kit is for 24-in. wide spacing only.

When baying racks together on 24-in. centers, use a Baying Gasket Kit (part VRA5003) to seal the gap between the racks to maintain proper hot-aisle/cold-aisle best practices. The gasket must be installed before baying racks.

To install the gasket:

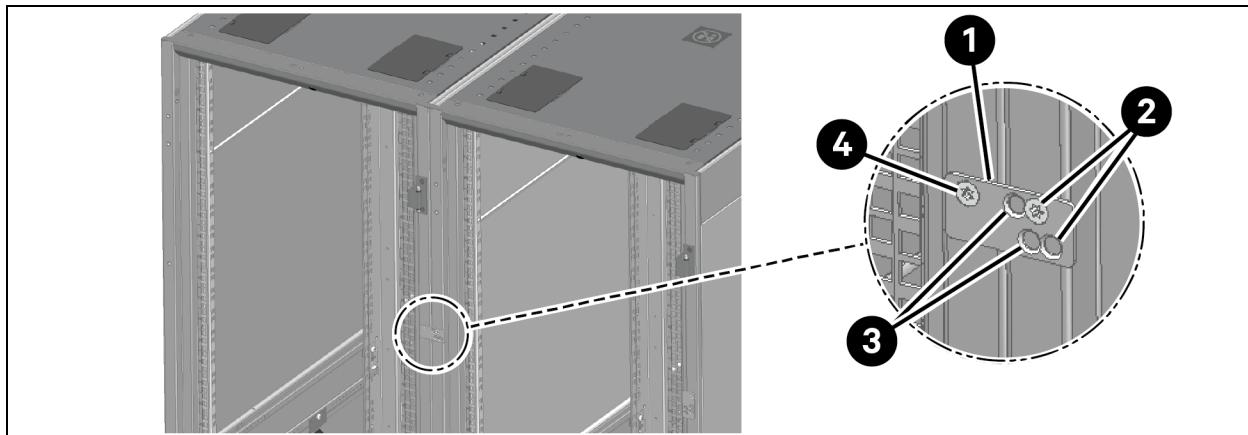
1. Measure and cut gasket to length.
2. peel adhesive backing from the gasket, and place the gasket around side perimeter of one of the racks.
3. Position the racks next to each other with the gasket between them.
The racks are ready for baying.

Figure 4.11 Baying gasket location



To install the racks in a bay configuration:

1. Place racks in a row and open or remove doors for easy access to frame holes.
2. Decide spacing between rack centers, 24 in. or 600 mm, which determines the screw holes used in the bracket, see the following figure.
3. Install 2 brackets at front and 2 at rear per the rack's mating planes, as shown in the figure.

Figure 4.12 Installing baying brackets

Item	Description
1	Baying bracket
2	Screw hole for 24-in./32-in. centers
3	Screw hole for 600-mm/800-mm centers
4	Screw hole for cabinet connection

4.9 Grounding the Rack

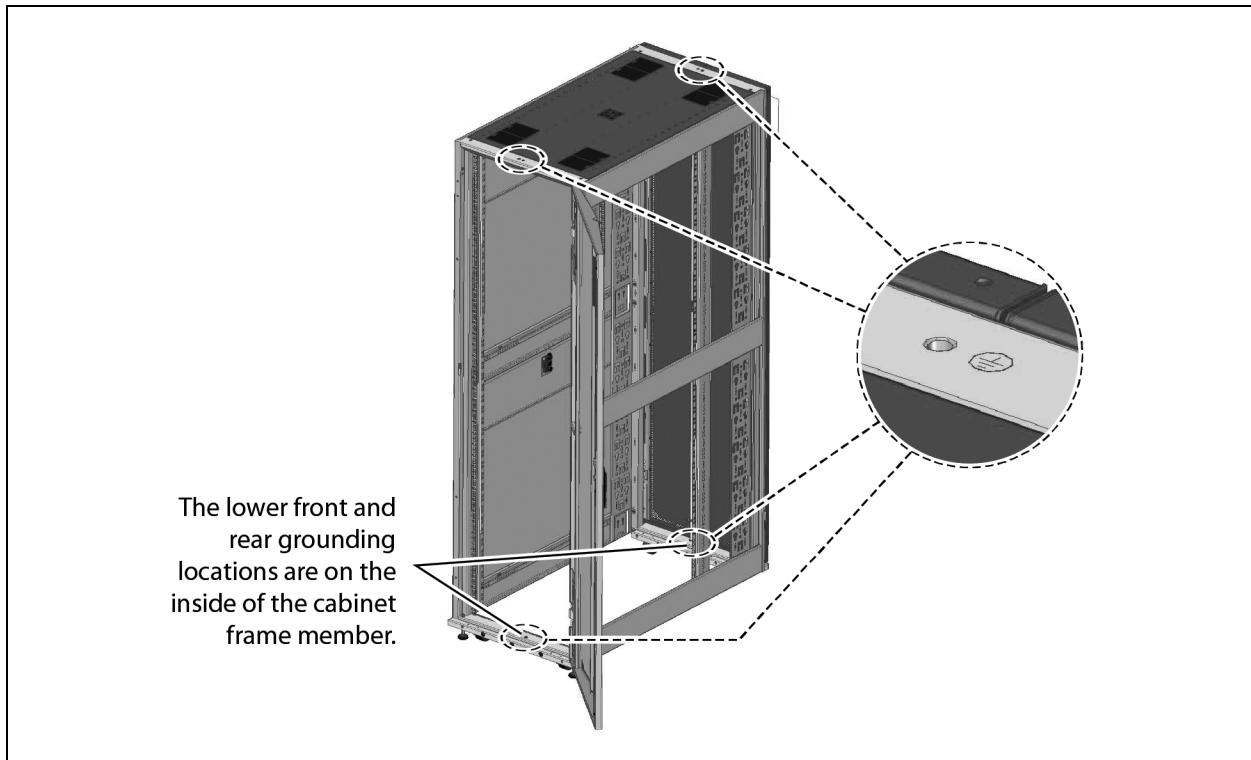


WARNING! Each rack must have its own protective-earth conductor. Do not daisy-chain the protective-earth circuit using the multiple protective-earthing connection points. Protective-earthing connections shall be such that disconnection of a protective earth at one point in a unit or a system does not break the protective-earthing connection to other parts or units in a system, unless the relevant hazard is removed at the same time.

Each rack shall be connected to the grounding electrode conductor using one of the dedicated grounding locations, see **Figure 4.13** on the facing page. Each location is identified with a ground symbol and has a M8 threaded insert in the frame.

- Install in accordance with national and local electrical codes. Select protective earth grounding conductor size using the guidance from national and local electrical codes.
- Use a star washer between the ground-terminal fitting and the rack frame to pierce the paint to provide a good protective-earth-ground circuit. Alternatively, remove paint on the frame ground-terminal installation location. See NFPA 70 Article 250.
- Torque hardware to 10 N·m (90 lb-in).

Figure 4.13 Dedicated grounding locations on the rack frame



4.10 Loading Equipment into the Rack



WARNING! To prevent the rack from tipping over, secure the rack to the floor before installing equipment.

Once in place at the desired location, install equipment starting in the bottom of the rack with the heaviest equipment.

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5 Periodic Maintenance

The rack requires no special maintenance. Clean the rack periodically, or more frequently if the air in the vicinity is not filtered for particulates.

Clean dust from installed equipment according to the manufacturer's recommendations. Clean the interior of the rack with a dry cloth.

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Appendices

Appendix A: Technical Support and Contacts

A.1 Technical Support/Service in the United States

Vertiv Group Corporation

24x7 dispatch of technicians for all products.

1-800-543-2378

Liebert® Thermal Management Products

1-800-543-2378

Liebert® Channel Products

1-800-222-5877

Liebert® AC and DC Power Products

1-800-543-2378

A.2 Locations

United States

Vertiv Headquarters

505 N Cleveland Ave

Westerville, OH 43082

Europe

Via Leonardo Da Vinci 8 Zona Industriale Tognana

35028 Piove Di Sacco (PD) Italy

Asia

7/F, Dah Sing Financial Centre

3108 Gloucester Road, Wanchai

Hong Kong

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