



# ThinkSystem Heavy Duty Full Depth 42U Rack Cabinet User Guide



**Machine Type:** 7D6D

**Sixth Edition (March 2025)**

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## Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安装本产品之前，请仔细阅读 Safety Information（安全信息）。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας (safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

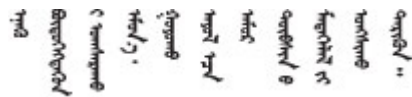
A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.



Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

ཐོན་ཐུང་འདི་བདེ་སྤྱད་མ་བྱས་གོང་། སྐྱོར་གྱི་ཡིད་གཟབ་  
བྱ་འདྲ་མིན་ཡིད་པའི་འོད་ཟེར་བལྟ་དགོས།

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

مەزكۇر مەھسۇلاتنى ئورنىتىشتىن بۇرۇن بىخەتەرلىك ئۇچۇرلىرىنى ئوقۇپ چىقىڭ.

Youq mwngz yungh canjbinj neix gaxgonq, itdingh aeu doeg aen  
canjbinj soengq cungj vahgangj ancien siusik.

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## Safety inspection checklist

Use the information in this section to identify potentially unsafe conditions with your server. As each machine was designed and built, required safety items were installed to protect users and service technicians from injury.

**Note:** The product is not suitable for use at visual display workplaces according to §2 of the Workplace Regulations.

**Note:** The set-up of the server is made in the server room only.

### CAUTION:

**This equipment must be installed or serviced by trained personnel, as defined by the IEC 62368-1, the standard for Safety of Electronic Equipment within the Field of Audio/Video, Information Technology and Communication Technology. Lenovo assumes you are qualified in the servicing of equipment and trained in recognizing hazards energy levels in products. Access to the equipment is by the use of a tool, lock and key, or other means of security, and is controlled by the authority responsible for the location.**

**Important:** Electrical grounding of the server is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Use the following checklist to verify that there are no potentially unsafe conditions:

1. Make sure that the power is off and the power cord is disconnected.
2. Check the power cord.
  - Make sure that the third-wire ground connector is in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
  - Make sure that the power cord is the correct type.

To view the power cords that are available for the server:

- a. Go to:

<http://dcsc.lenovo.com/#/>

- b. Click **Preconfigured Model** or **Configure to order**.
  - c. Enter the machine type and model for your server to display the configurator page.
  - d. Click **Power → Power Cables** to see all line cords.
- Make sure that the insulation is not frayed or worn.
3. Check for any obvious non-Lenovo alterations. Use good judgment as to the safety of any non-Lenovo alterations.
4. Check inside the server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
5. Check for worn, frayed, or pinched cables.
6. Make sure that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.



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## Chapter 1. Introduction

See this topic for information about ThinkSystem Heavy Duty Full Depth 42U Rack Cabinet.

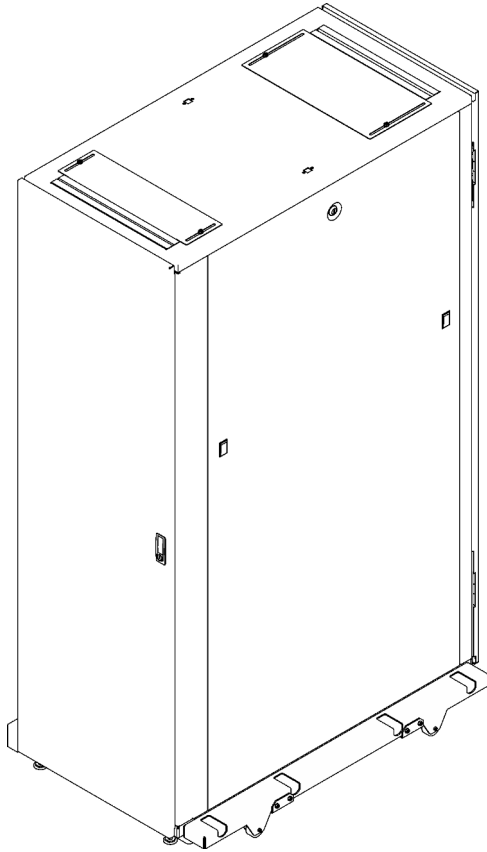


Figure 1. ThinkSystem Heavy Duty Full Depth 42U Rack Cabinet

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## Features and specifications

See this topic for features and specifications of ThinkSystem Heavy Duty Full Depth 42U Rack Cabinet.

### Features

Optional device capacity	<ul style="list-style-type: none"><li>0U PDU:<ul style="list-style-type: none"><li>Without rack extension kit: Four units</li><li>With rack extension kit: Six units</li></ul></li><li>1U optional devices rack side/side pocket: six units</li></ul>
Extension capacity	Up to two units of rack extension kit are supported.
Cooling enhancement	ThinkSystem Rear Door Heat eXchanger V2

## Dimension and weight

Table 1. Dimension

	mm	inches
<b>Without package</b>		
<b>Height</b>	2011	79
<b>Width</b> (with outriggers)	770	31
<b>Width</b> (without outriggers)	600	24
<b>Depth</b>	1200	47
<b>With package</b>		
<b>Height</b>	2205	87
<b>Width</b>	1100	43
<b>Depth</b>	1760	69

Table 2. Weight

	KG	lbs
<b>Empty rack cabinet with front door</b>	184	406
<b>Rear door</b>	11	24
<b>Outriggers</b>	8	18
<b>Stabilizer</b>	7	15
<b>Empty rack with one unit of extension</b>	202	445
<b>side panels</b>	23	51
<b>Empty rack with two units of extension</b>	248	547
<b>Maximal load</b>	1588	3501
<b>Packaging</b>	244	538
<b>Anchor shipping brackets</b>	6	13
<b>Maximal loaded shipping weight</b>	2086	4599
<b>Rear Door Heat eXchanger V2 (empty)</b>	39	86
<b>One unit of extension</b>	16	35
<b>Maximal empty rack cabinet weight</b>	292	644
<b>Rear Door Heat eXchanger V2 (filled)</b>	48	106
<b>Maximal deployed weight</b>	1829	4032

## Chapter 2. Rack cabinet components

See this topic for components of ThinkSystem Heavy Duty Full Depth 42U Rack Cabinet.

### Parts listing

See this topic to learn about parts of ThinkSystem Heavy Duty Full Depth 42U Rack Cabinet.

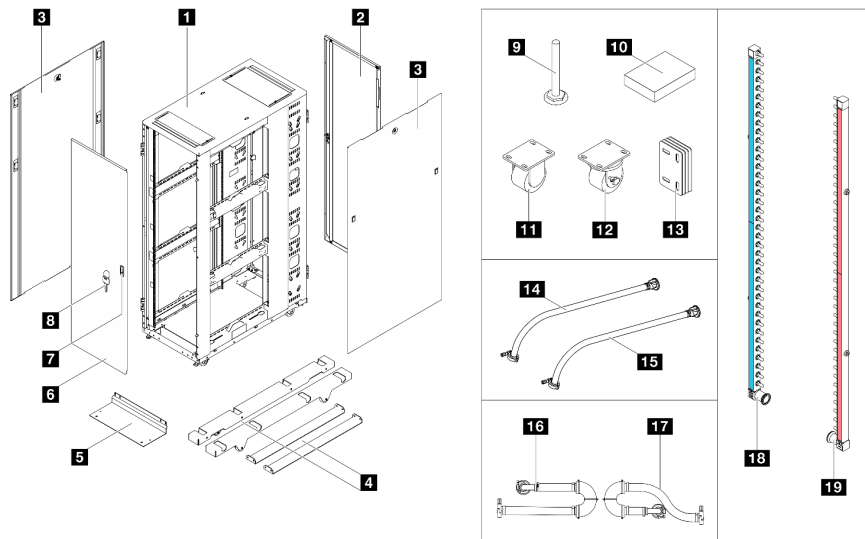











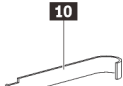
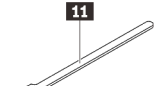

Figure 2. Parts listing

Table 3. Heavy Duty Full Depth 42U Rack Cabinet components

<b>1</b> Rack cabinet frame	<b>11</b> Fixed caster
<b>2</b> Rear door	<b>12</b> Swivel caster
<b>3</b> Side covers	<b>13</b> Baying kit
<b>4</b> Outriggers (side stabilizers)	<b>14</b> In-row hose supply side
<b>5</b> Front stabilizer	<b>15</b> In-row hose return side
<b>6</b> Front door	<b>16</b> In-rack connection set supply side
<b>7</b> Door latch	<b>17</b> In-rack connection set return side
<b>8</b> Keys (doors and side covers)	<b>18</b> Manifold supply side
<b>9</b> Leveling pad	<b>19</b> Manifold return side
<b>10</b> Tools	

### Tool box

Figure 3. Tool box

 (20)	<b>1</b> 20 M6 C type caged nuts
 (30)	<b>2</b> 30 M6 G type caged nuts
 (20)	<b>3</b> 20 M5 C type caged nuts
 (10)	<b>4</b> 10 M6 flanges
 (20)	<b>5</b> 20 M5 screws
 (20)	<b>6</b> 20 M6 screws
 (1)	<b>7</b> Wrench for 10, 14, 5, 18, 26
 (1)	<b>8</b> Wrench for 8, 9, 2
 (1)	<b>9</b> Wrench for 10, 13
 (1)	<b>10</b> Nut insertion tool
 (15)	<b>11</b> 15 Velcro cable ties
	<b>12</b> Grounding kit

**Note:** Make sure to use the nuts and screws that come in the tool box.

## Neptune DWC RM100 in-rack Coolant Distribution Unit (CDU) configuration

See this topic for the rack configuration when Neptune® DWC RM100 in-rack CDU is installed.

**Attention:** There is some residual water remaining in the CDU secondary circuit after Lenovo manufacturing integration, test, and draining. Before filling the CDU secondary circuit and rack for the first time, be sure to flush/rinse the entire secondary loop with clean, bacteria free water (distilled or deionized preferred). After draining the rinsing fluid, proceed with filling the CDU secondary circuit and rack with water which complies with the Lenovo Water Quality Specification and comes with the appropriate concentrations of corrosion inhibitor and biocide.

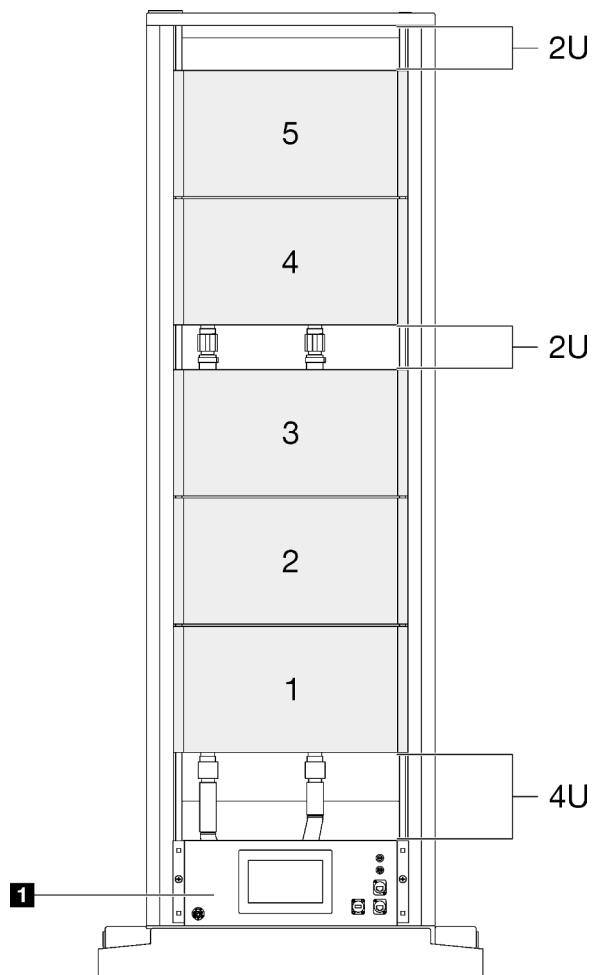


Figure 4. In-rack coolant distribution layout - front view

Table 4. In-rack coolant distribution layout - front view

<b>1</b> Neptune DWC RM100 in-rack CDU
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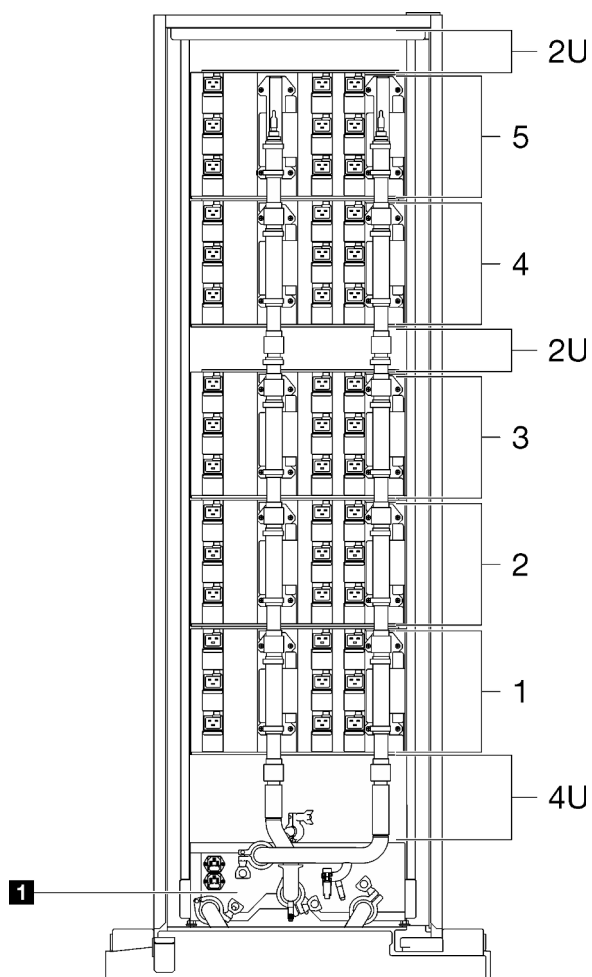


Figure 5. In-rack coolant distribution layout - rear view

Table 5. In-rack coolant distribution layout - rear view

<b>1</b> Neptune DWC RM100 in-rack CDU
--

## Rack cabinet options

See this topic to learn about optional components that are supported by ThinkSystem Heavy Duty Full Depth 42U Rack Cabinet.

### DWC 38 Port Rack Manifold

See this topic to learn about parts of ThinkSystem Neptune® DWC 38 Port Rack Manifold.

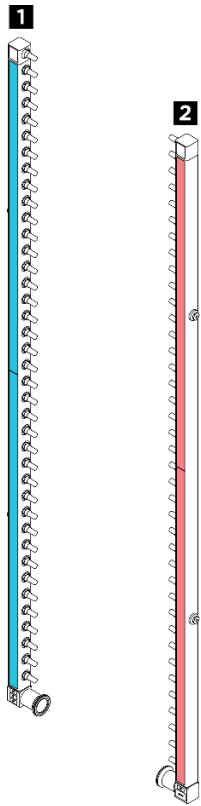


Figure 6. DWC 38 Port Rack Manifold

Table 6. DWC 38 Port Rack Manifold components

<b>1</b> Manifold supply side	<b>2</b> Manifold return side
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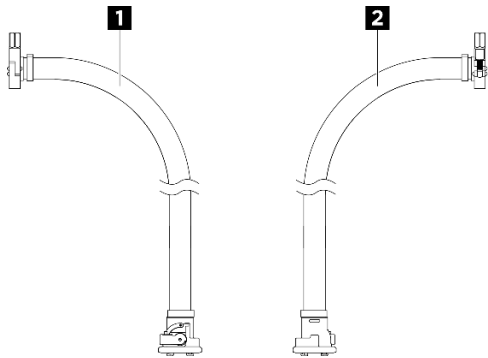


Figure 7. In-row hose kit components (1.3m)

Table 7. In-row hose kit components (1.3m)

<b>1</b> In-row hose supply side	<b>2</b> In-row hose return side
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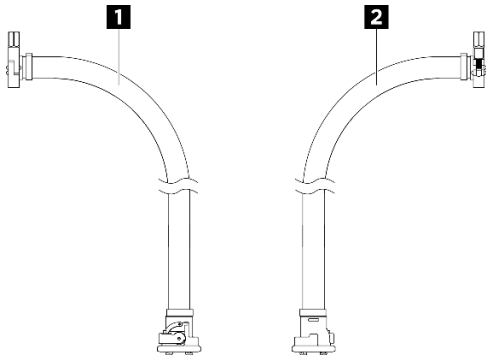


Figure 8. In-row hose kit components (2.3m)

Table 8. In-row hose kit components (2.3m)

<b>1</b> In-row hose supply side	<b>2</b> In-row hose return side
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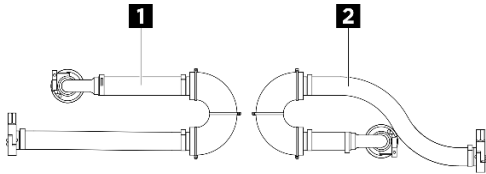


Figure 9. 42U in-rack connection set

Table 9. 42U in-rack hose kit components

<b>1</b> In-rack connection set supply side	<b>2</b> In-rack connection set return side
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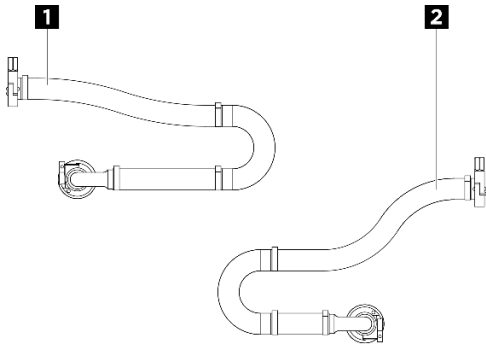


Figure 10. 48U in-rack hose kit

Table 10. 48U in-rack connection set components

<b>1</b> In-rack connection set supply side	<b>2</b> In-rack connection set return side
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# 42U Advanced Rack Extension Kit

See this topic to learn about parts of ThinkSystem 42U Advanced Rack Extension Kit.

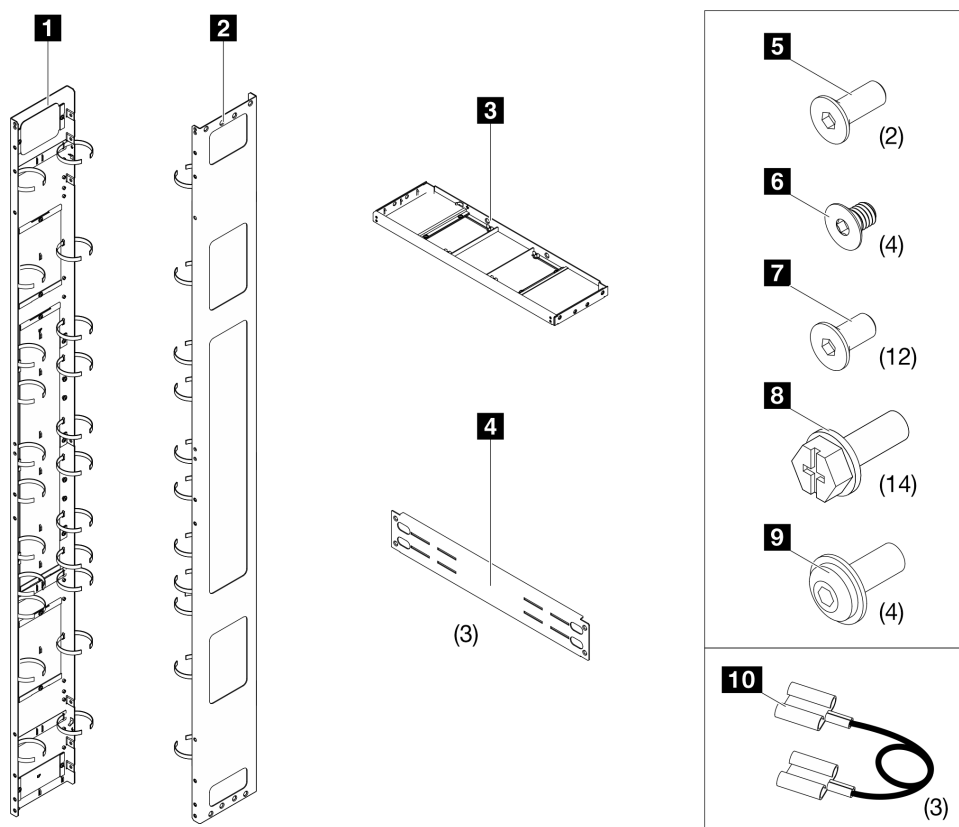


Figure 11. 42U Advanced Rack Extension Kit

Table 11. Rack extension kit components

<b>1</b> One left extension panel	<b>6</b> Four M4 x 6 mm flat head socket cap screws (for extension top cover)
<b>2</b> One right extension panel	<b>7</b> Twelve M6 x 12 mm flat head socket cap screws (for support brackets)
<b>3</b> One extension top cover	<b>8</b> Fourteen M6 x 16 mm hex head flange screws (for extension panels)
<b>4</b> Three support brackets	<b>9</b> Four M6 x 16 mm round head flange screws *
<b>5</b> Two M6 x 16 mm flat head socket cap screws (for extension top cover)	<b>10</b> Three grounding wires

**Note:** \* This screw type is only needed to replace the ones on the extension panels when installing the 0U PDU mounting bracket(s) in certain locations. For more information, see [“Install 42U Advanced Rack Extension Kit” on page 64](#) or [“Install 42U Advanced Rack Extension Kit with RDHX” on page 87](#).

## Specifications

Table 12. Rack extension kit specifications

<b>Extension depth</b>	180 mm / 7 inches
<b>Weight</b>	22.7 kg / 50 lbs
<b>Cable management</b>	<p>There are five openings on each extension panel:</p> <ul style="list-style-type: none"><li>• U0.5 to U1.5</li><li>• U7 to U11</li><li>• U14 to U29</li><li>• U31 to U35</li><li>• U40 to U42</li></ul>

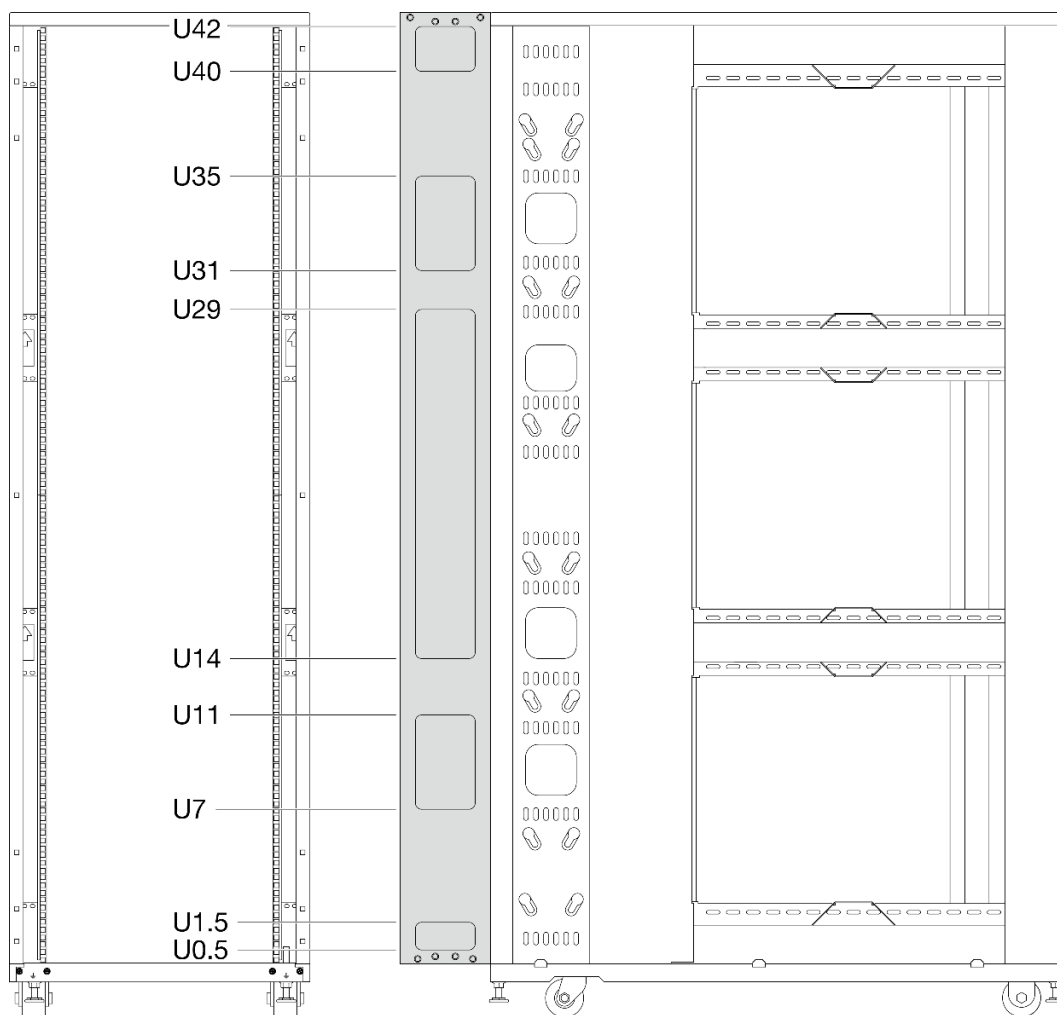


Figure 12. Openings on an extension panel

For installation procedure, see [“Install 42U Advanced Rack Extension Kit” on page 64](#) or [“Install 42U Advanced Rack Extension Kit with RDHX” on page 87](#).

## 42U Standard Rack Extension Kit

See this topic to learn about parts of ThinkSystem 42U Standard Rack Extension Kit.

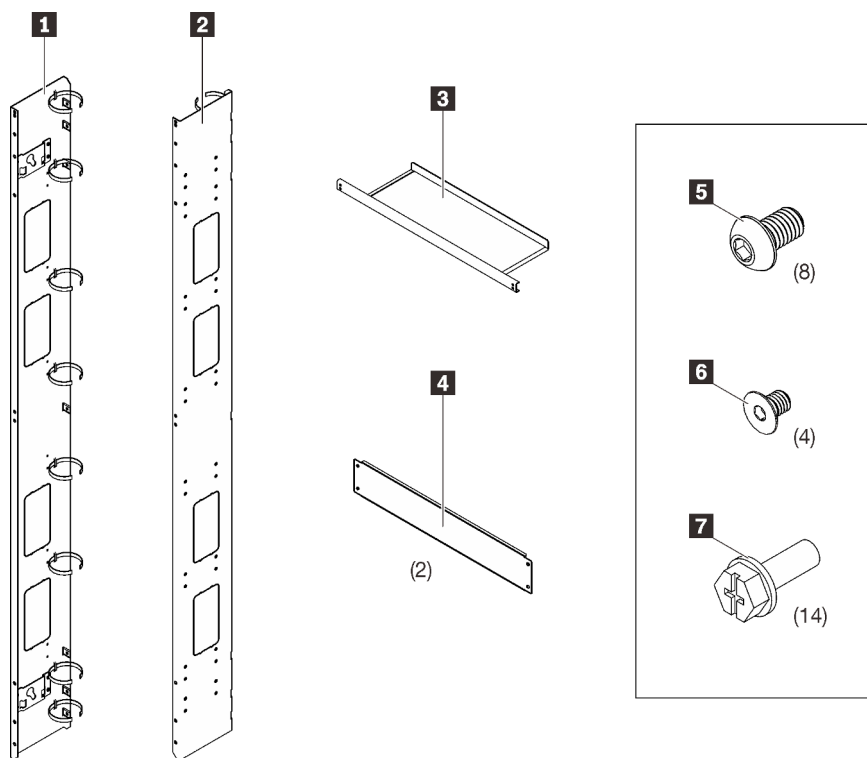


Figure 13. 42U Standard Rack Extension Kit

Table 13. Rack extension kit components

<b>1</b> One left extension panel	<b>5</b> Eight support bracket screws
<b>2</b> One right extension panel	<b>6</b> Four extension top cover screws
<b>3</b> One extension top cover	<b>7</b> Fourteen extension panel screws
<b>4</b> Two support brackets	

## Specifications

Table 14. Rack extension kit specifications

<b>Extension depth</b>	180 mm / 7 inches
<b>Weight</b>	16 kg / 35.3 lbs
<b>Cable management</b>	<p>There are four 89 (width) x 178 (height) mm openings on each extension panel:</p> <ul style="list-style-type: none"> <li>• U7 to U11</li> <li>• U13 to U17</li> <li>• U25 to U29</li> <li>• U32 to U36</li> </ul>

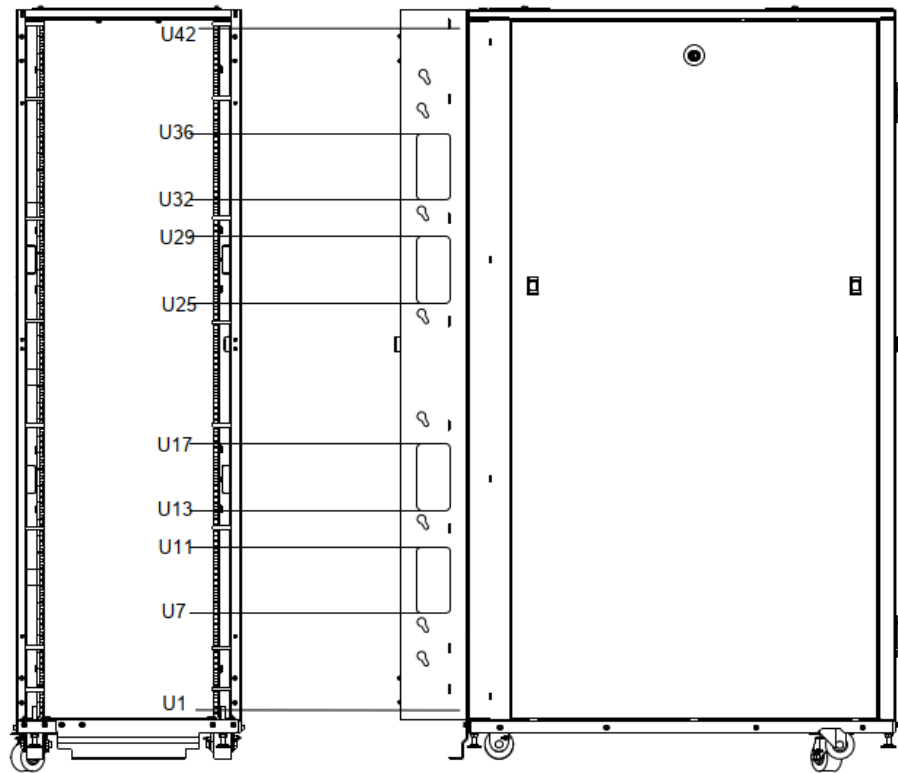


Figure 14. Openings on an extension panel

For installation procedure, see [“Install 42U Standard Rack Extension Kit”](#) on page 116.

## Cable management brackets

See this topic to learn about the cable management brackets.

21U front cable management bracket

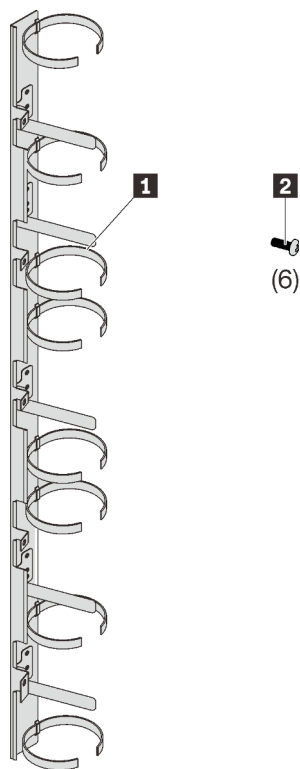


Figure 15. 21U front cable management bracket components

<b>1</b> 21U front cable management bracket	<b>2</b> Six screws
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Rear cable management bracket

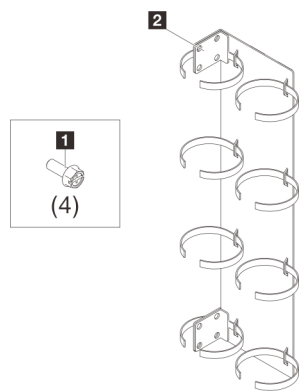


Figure 16. Rear cable management bracket components

<b>1</b> Four screws	<b>2</b> Rear cable management bracket
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For installation procedure, see [“Install a cable management bracket” on page 362](#).

## Power distribution units and console switches

See this topic to learn about the power distribution units and console switches that are supported by the rack cabinet.

This cabinet supports the following PDUs/switches:

- 0U PDU:
  - Without rack extension kit: Four units
  - With rack extension kit: Six units
- 1U optional devices rack side/side pocket: six units

For a complete list of supported power distribution units, go to

- Power distribution units: <https://lenovopress.com/servers/options/pdu>
- Console switches: <https://lenovopress.com/servers/options/kvm>

## Rear Door Heat eXchanger V2

See this topic to learn about parts of ThinkSystem Rear Door Heat eXchanger V2.

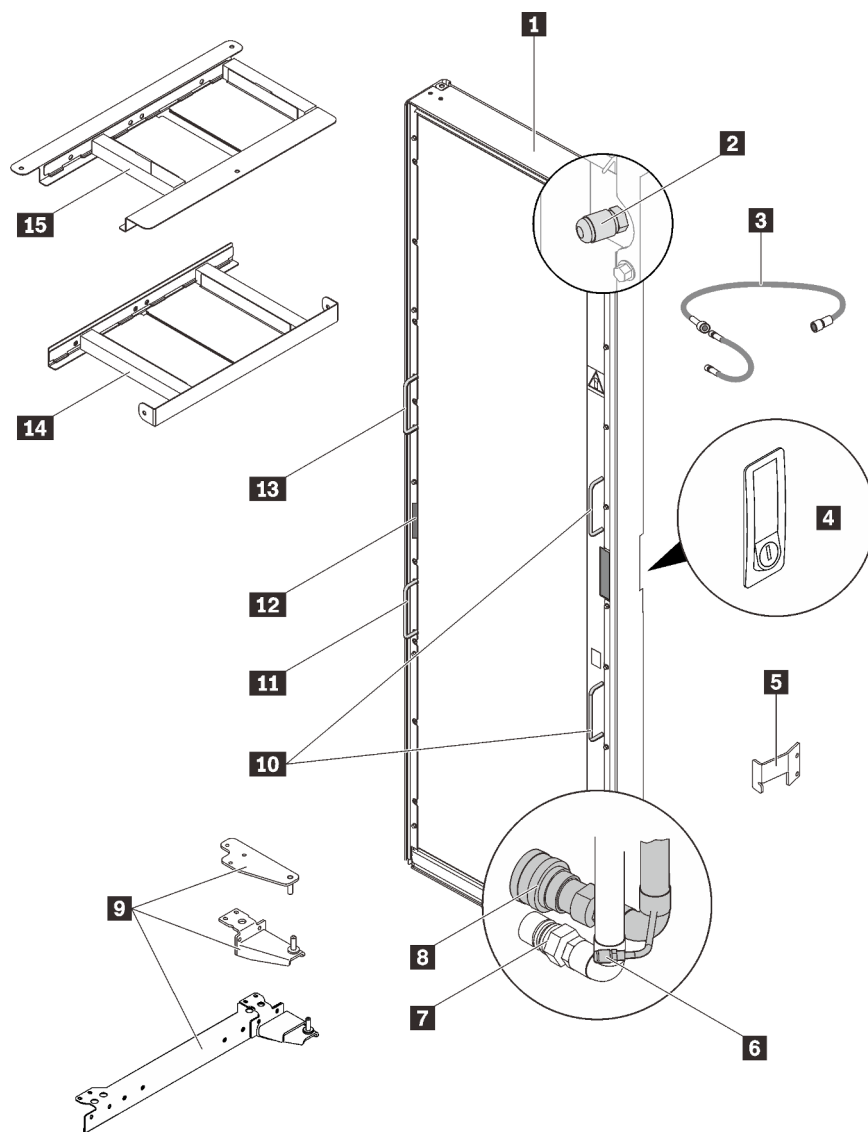


Figure 17. ThinkSystem Rear Door Heat eXchanger V2 components

Table 15. Rear Door Heat eXchanger components

<b>1</b> Rear Door Heat eXchanger assembly	<b>9</b> Hinge kit
<b>2</b> Air-purging valve	<b>10</b> Lift handles
<b>3</b> Air-purging tool	<b>11</b> Lift handle
<b>4</b> Door latch	<b>12</b> Serial number
<b>5</b> Latch plate	<b>13</b> Lift handle
<b>6</b> Drain valve	<b>14</b> Lower air baffle
<b>7</b> Return manifold coupling	<b>15</b> Upper air baffle
<b>8</b> Supply manifold coupling	

## Rear Door Heat eXchanger V2 specifications

Dimension	<ul style="list-style-type: none"><li>• Depth: 129 mm / 5.0 inches</li><li>• Height: 1950 mm / 76.8 inch</li><li>• Width: 600 mm / 23.6 inch</li></ul>
Weight	Empty: 39 kg / 121 lbs
Air movement	Provided by servers and other devices in the rack
Air temperature drop	With high-heat-load devices, up to 25°C (45°F) between the air exiting the rack devices and the air exiting the heat exchanger.
Water	<ul style="list-style-type: none"><li>• <b>Source</b> User-supplied, compliant with specifications in this document</li><li>• <b>Pressure</b><ul style="list-style-type: none"><li>– Normal operation: &lt;137.93 kPa (20 psi)</li><li>– Maximum: 689.66 kPa (100 psi)</li></ul></li><li>• <b>Volume</b> Approximately 9 liters (2.4 gallons)</li><li>• <b>Temperature</b><ul style="list-style-type: none"><li>– Above dew point</li><li>– 18°C ±1°C (64.4°F ±1.8°F) for ASHRAE Class 1 Environment</li><li>– 22°C ±1°C (71.6°F ±1.8°F) for ASHRAE Class 2 Environment</li></ul></li></ul> <p><b>Note:</b> See “Heat exchanger performance” for more information.</p> <ul style="list-style-type: none"><li>• <b>Required water flow rate</b> (as measured at the supply entrance to the heat exchanger)<ul style="list-style-type: none"><li>– Minimum: 22.7 liters (6 gallons) per minute</li><li>– Maximum: 56.8 liters (15 gallons) per minute</li></ul></li></ul>

For setup and installation, see [“Set up Rear Door Heat eXchanger V2” on page 152](#).

## Heat exchanger performance

Expected performance of the heat exchanger is illustrated in the following figure for a typical inlet air temperature of 27°C (80.6°F), with a fully populated rack, near uniform power dissipation, and a 30-40 kW heat load. By selecting the correct water inlet temperature and water flow rate, you can achieve the necessary heat removal. A heat removal of 100% indicates that an amount of heat equivalent to that generated by the devices has been removed by the heat exchanger and the average air temperature leaving the heat exchanger is identical to that entering the rack (27°C /80.6°F in this example). Heat removal in excess of 100% indicates that the heat exchanger not only removed all of the heat generated by the devices but further cooled the air so that the average air temperature leaving the rack is actually lower than that entering the rack.

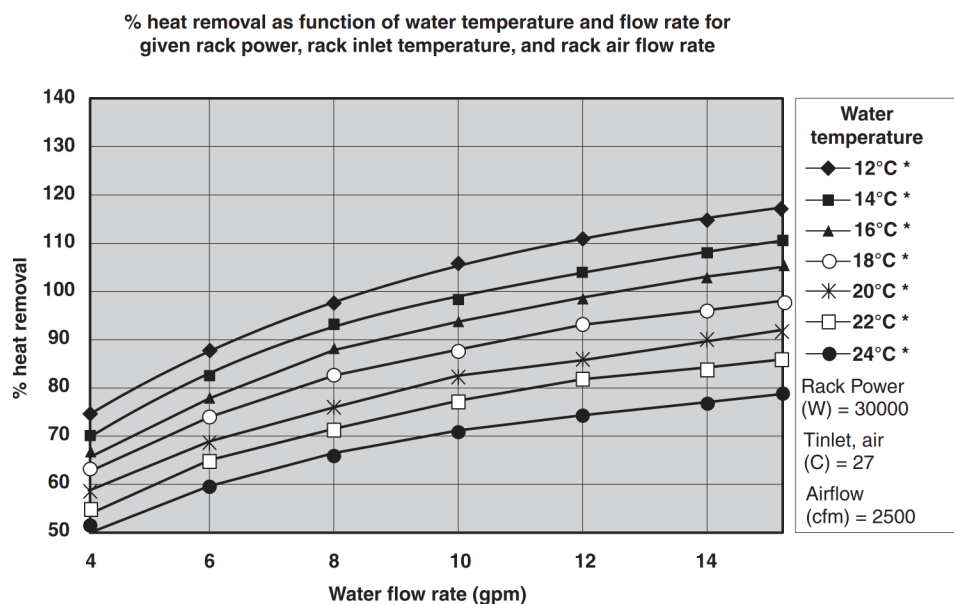


Figure 18. Typical performance of the heat exchanger, 30 kW heat load

As described in [“Water specifications for the secondary cooling loop” on page 165](#), a given water temperature may be used only if the system that is supplying the water is able to measure the room dew point and automatically adjust the water temperature accordingly. Otherwise, the water temperature must be above the maximum dew point that is allowed at that data center installation.

Performance data is shown in the following figure for a 20 kW heat load. Because of the lower heat load, a specific level of cooling can be achieved with warmer water, a lower flow rate, or both.

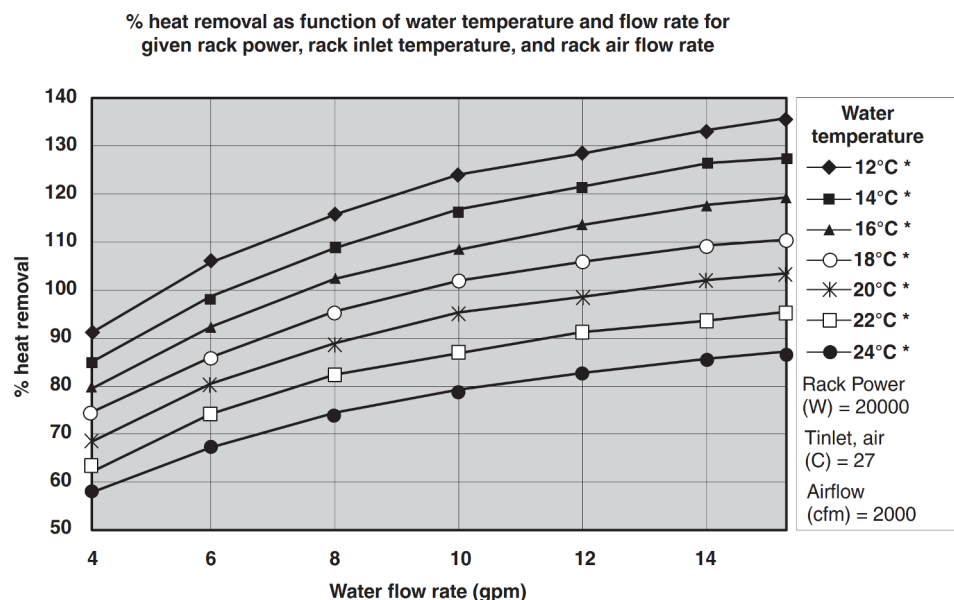


Figure 19. Typical performance of the heat exchanger, 20 kW heat load

## Rear Door Heat Exchanger Support Kit

See this topic to learn about parts of Rear Door Heat Exchanger Support Kit.

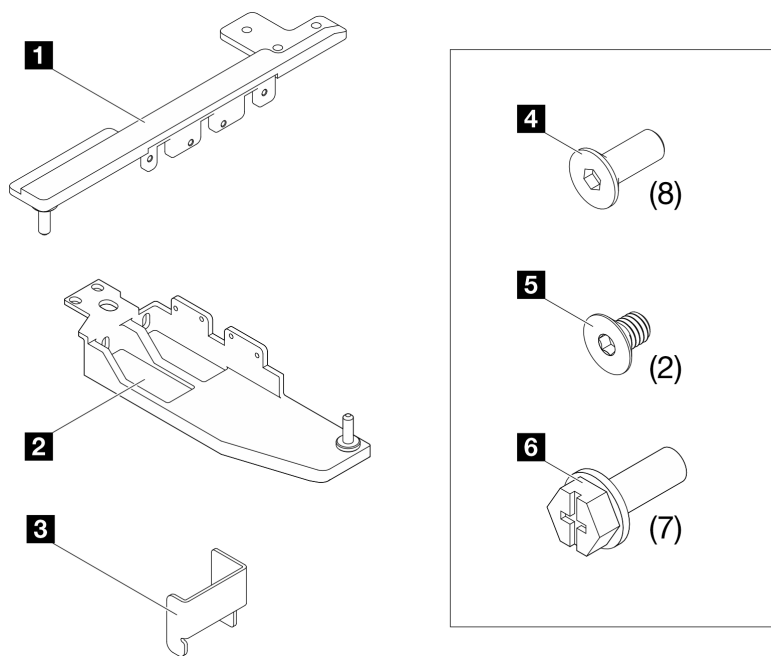


Figure 20. Rear Door Heat Exchanger Support Kit

Table 16. Support kit components

<b>1</b> One top hinge	<b>4</b> <ul style="list-style-type: none"> <li>Four top hinge screws</li> <li>Four bottom hinge screws</li> </ul>
<b>2</b> One bottom hinge	<b>5</b> Two latch plate screws
<b>3</b> One latch plate	<b>6</b> <ul style="list-style-type: none"> <li>Three top hinge screws</li> <li>Four bottom hinge screws</li> </ul>

For installation procedure, see [“Install 42U Advanced Rack Extension Kit with RDHX” on page 87](#).

---

## Chapter 3. Rack cabinet setup

Follow instructions in this topic to setup the rack cabinet.

### **CAUTION:**

The raised floor or slab on which the system will be installed must be capable of supporting the system's weight. Contact the raised floor tile manufacturer, a structural engineer, or both to verify that the complete raised floor structure and sub-floor are safe to support the concentrated and distributed load of the racks and its contents. The evaluation of the slab and any raised floor structure should consider both the static weight of the rack and its contents, as well as the installed weight with any additional infrastructure such as racks attached cable trays, additional cables, Rear Door Heat Exchangers, containment structures that rest on the racks, personnel in the space, etc... Depending on the type of raised floor tile, additional supports, such as pedestals or custom support frames, might be necessary to maintain the structural integrity of an uncut tile or to restore the integrity of a tile that is cut for cable or hose entry/exit. Contact the raised floor tile manufacturer, a structural engineer, or both to ensure that the raised floor tiles and pedestals can support the concentrated loads.

Special consideration should be given to the dynamic/rolling weight of the rack and its contents to ensure the integrity of the raised floor or slab is not compromised when rolling loaded racks across the floor. In some cases, load distribution plates may be required to better distribute the dynamic load of a rolling rack at various points from the loading dock to the data center and on to the data center floor. Other things to consider are ramps, lifts/elevator ratings, hallways, transitions between different types of flooring or sub-floors, elevation differences between floors, gaps between elevator entry points and the main floors.

---

## Space planning

Follow the guidelines in this topic to make plans for the space that will contain the rack cabinet.

Dimensions of the 42U rack cabinet:

- Height: 2011 mm (79.2 in)
- Width (without outriggers): 600 mm (23.6 in)
- Depth (without extensions): 1200 mm (47.2 in)

See the following illustration for distances between various components on the bottom of the rack cabinet, and make plans accordingly.

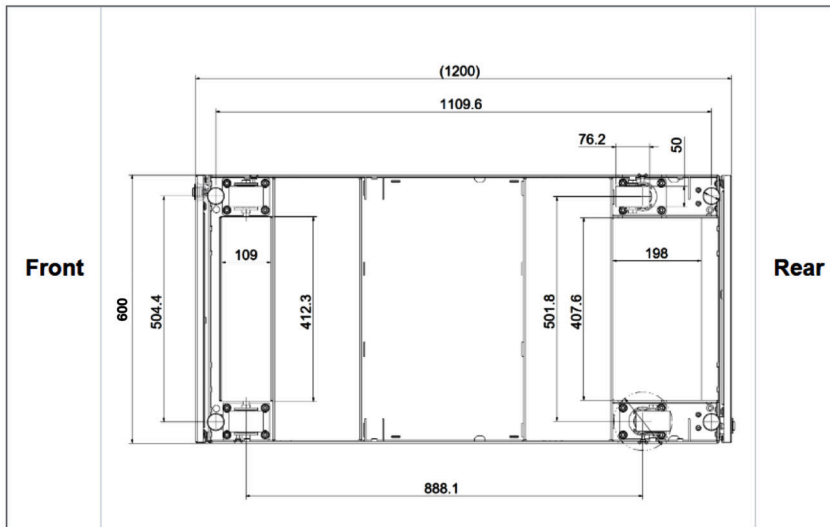


Figure 21. Space planning (mm)

## Unpack the rack cabinet

See this topic to learn how to unpack the rack cabinet.

### S037



#### CAUTION:

The weight of this part or unit is more than 200 kg (441 lb). It takes specially trained persons, a lifting device, or both to safely lift this part or unit.

Make sure to follow fork-lift truck operating regulations to prevent overturning of the rack cabinet.

#### Notes:

- **Space requirement:** You will need minimum of 2885 mm (113.6 inch) on the rear side of the pallet to unpack the rack cabinet.
- **Tool requirement:** You will need one sharp tool.
- **Forklift requirements:**

**Note:** Only the front side of the pallet is available for the forklift.

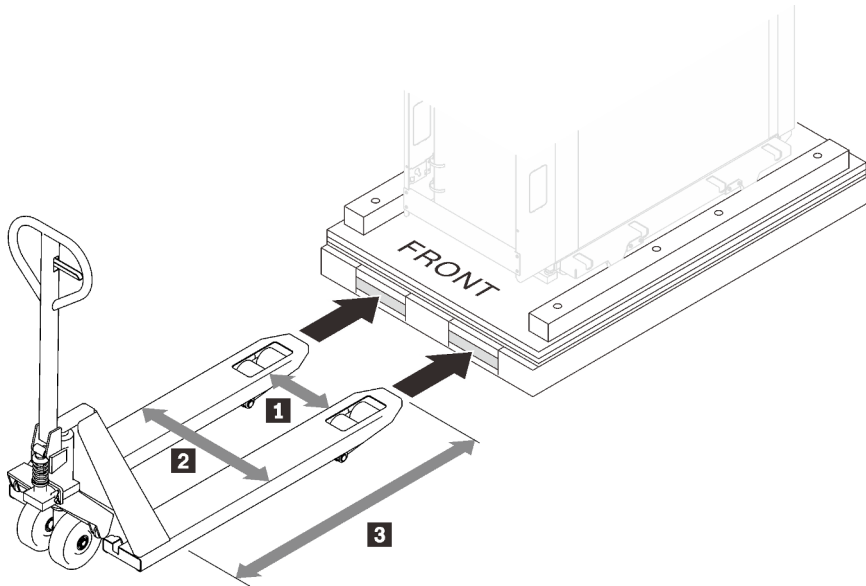


Figure 22. Forklift

- **1** must be longer than 350 mm.
- **2** must be shorter than 700 mm.
- **3** must be between 1450 to 1650 mm.
- Loading capacity must be larger than 3000 kg.

Step 1. Cut the four straps with a sharp tool.

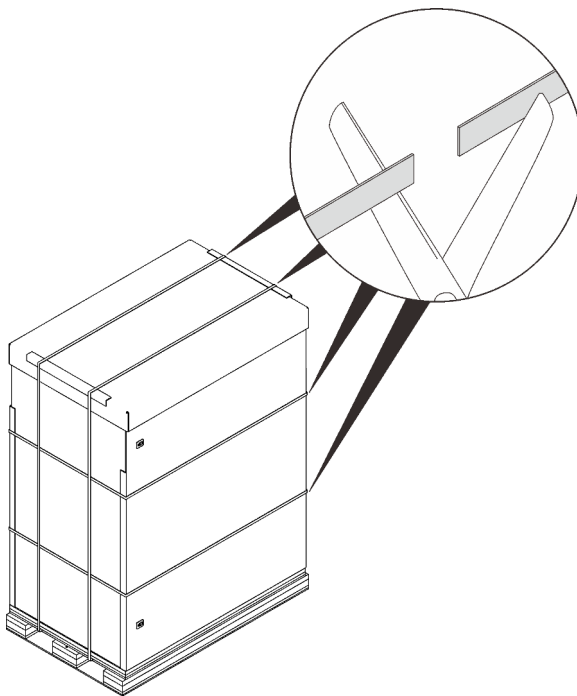
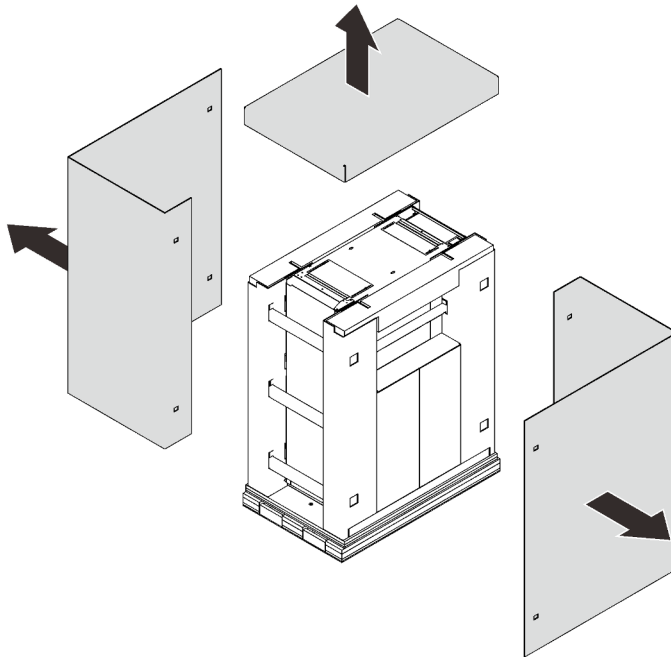


Figure 23. Cutting the straps

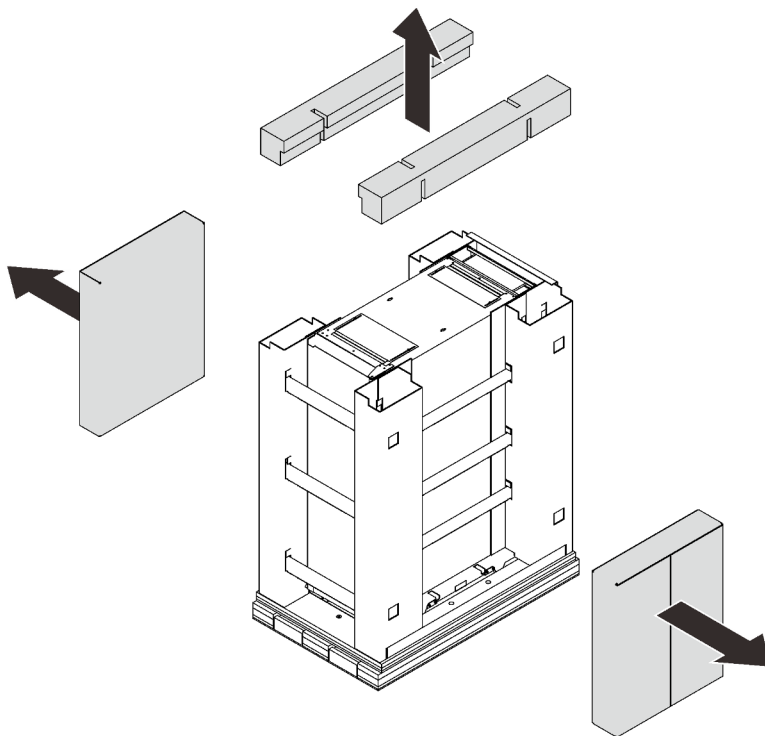
Step 2. Remove the top cover and side cardboards.



*Figure 24. Removing the cardboards*

Step 3. Remove the top bars and side boxes.

**Note:** One of the side cartons contains the ramps and is quite heavy. Lifting it requires two people.



*Figure 25. Removing the top bars and side boxes*

Step 4. Release and remove the side frames.

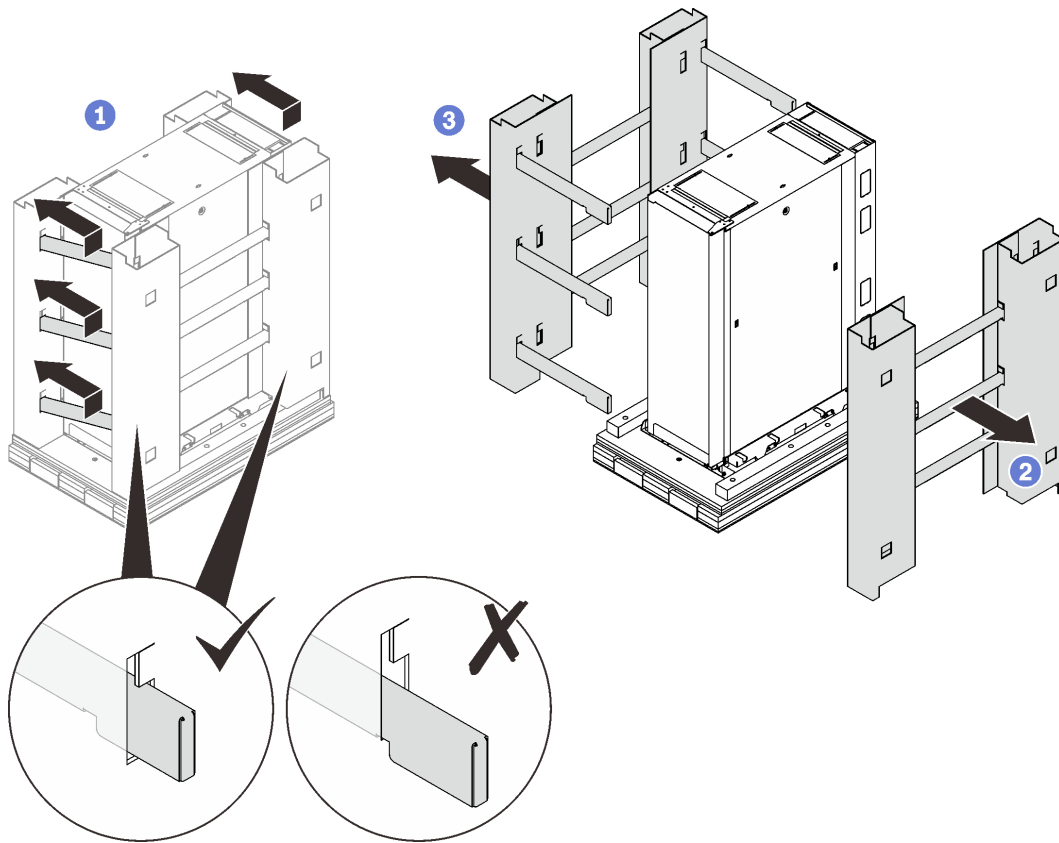
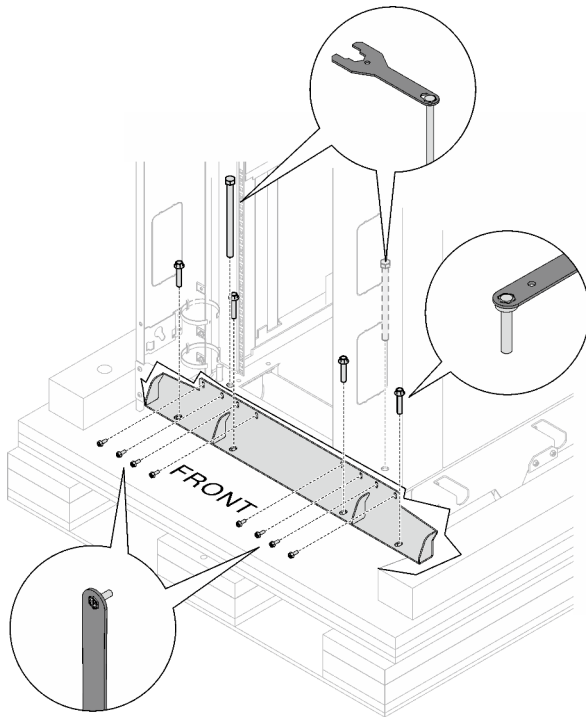


Figure 26. Removing the side frames

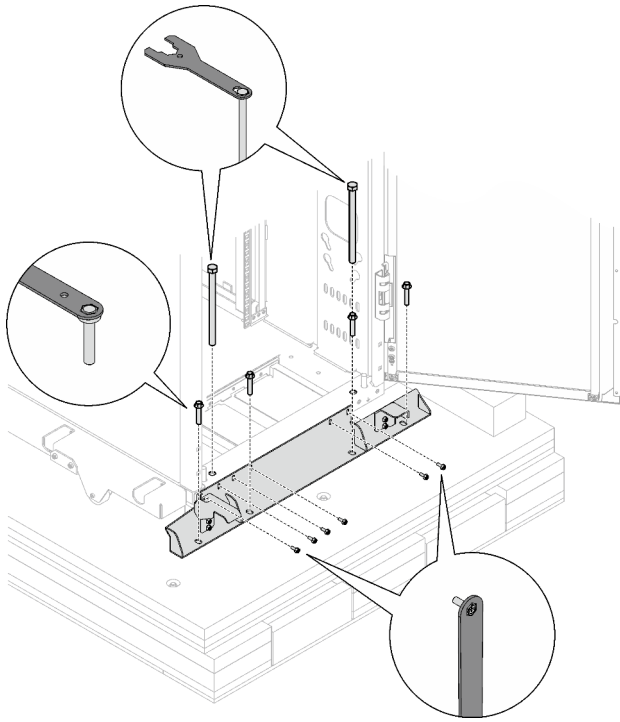
- 1 Slightly lift and slide the six horizontal bars left to disengage their right ends from the slots on the right frame.
- 2 Remove the right frame along with the three horizontal bars.
- 3 Remove the left frame along with the nine horizontal bars.

- Step 5. Open the front door, and remove the following:
- Remove the two bolts with wrench for 10, 14, 5, 18, 26.
  - Remove the four M6 screws with wrench for 8, 9, 2
  - Remove the eight M10 screws with wrench for 8, 9, 2.



*Figure 27. Removing the front shipping bracket*

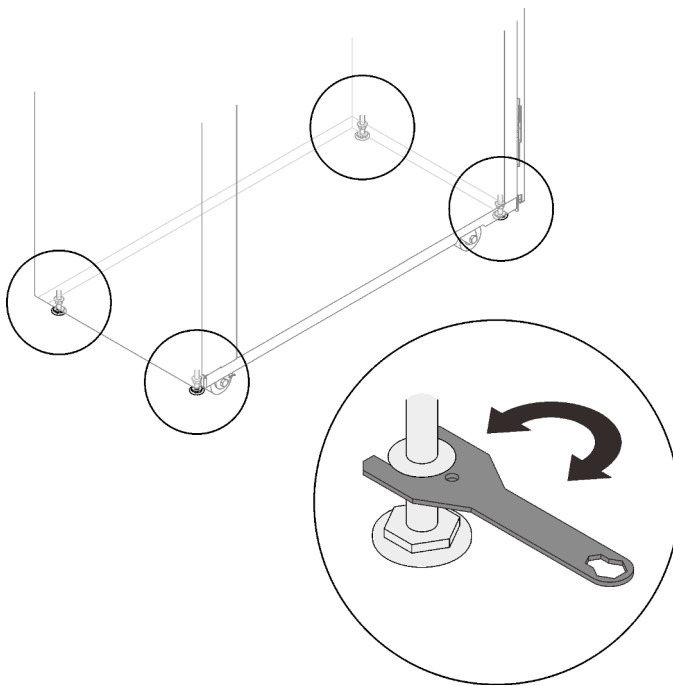
- Step 6. Open the rear door, and remove the following:
- Remove the two bolts with wrench for 10, 14, 5, 18, 26.
  - Remove the four M6 screws with wrench for 8, 9, 2
  - Remove the six M10 screws with wrench for 8, 9, 2.



**Note:** Keep at least one bolt for later use.

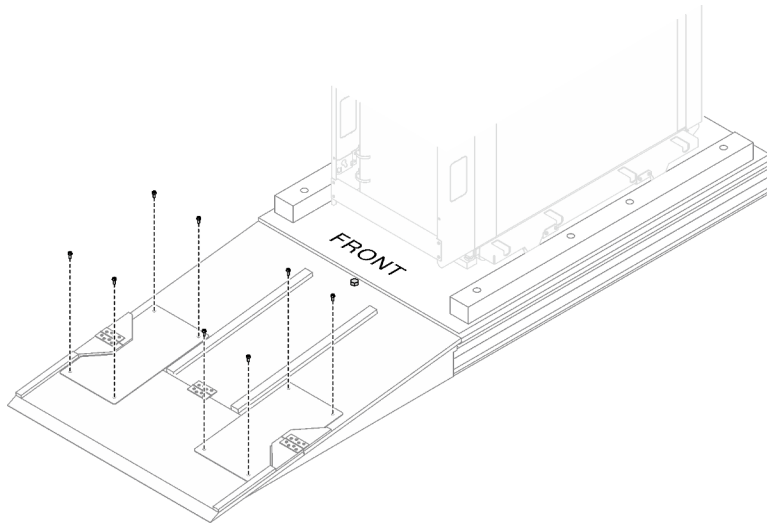
*Figure 28. Removing the rear shipping bracket*

- Step 7. Rise each of the four leveling pads with wrench for 10, 14, 5, 18, 26 in turns until they no longer bear the weight of the rack cabinet.



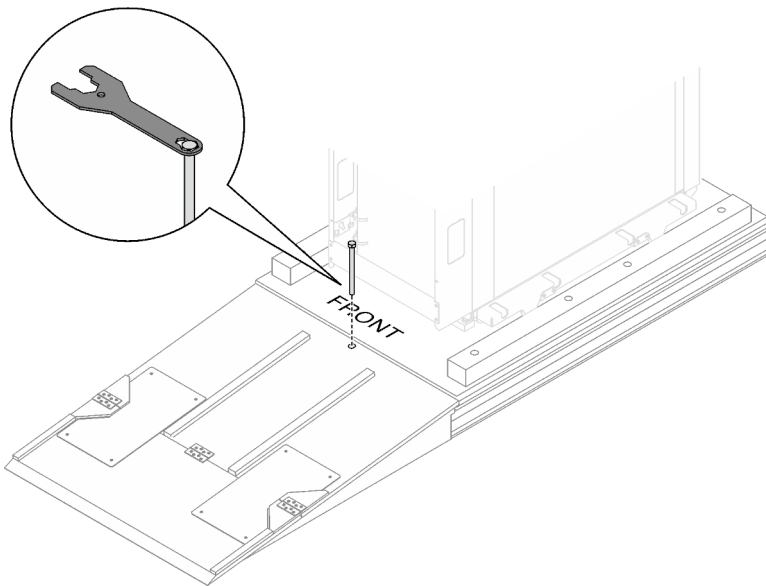
*Figure 29. Rising the leveling pads*

- Step 8. Secure the two metal plates to the ramp with the eight screws that come in a small bag attached to the plates.



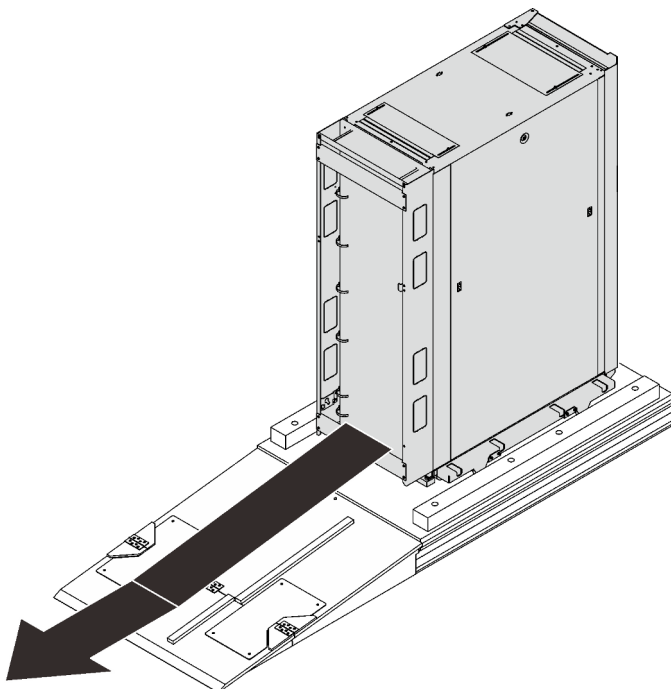
*Figure 30. Securing the two plates to the ramp*

Step 9. Secure the ramp to the pallet with one of the bolts that have been removed previously with wrench for 10, 14, 5, 18, 26.



*Figure 31. Securing the ramp to the pallet*

Step 10. Place the ramp next to the cabinet front door, and slowly slide the rack cabinet down from the pallet to the designated location.



*Figure 32. Moving the cabinet*

---

## Install the baying kit

More than one rack cabinets could be connected into a suite. See this topic to learn how to attach rack cabinets into a suite with the baying kit.

### About this task

**Notes:** To maintain balance of the rack cabinet, **do not** remove the outriggers except the following situations:

- when two or more rack cabinets are connected with the baying kit.
- when the rack cabinet is secured to the floor with stabilizer.

#### R002



- **Always lower the leveling pads on the rack cabinet.**
- **Always install stabilizer brackets on the rack cabinet.**
- **Always install the heaviest devices in the bottom of the rack cabinet.**
- **Always install servers and optional devices starting from the bottom of the rack cabinet.**

### Procedure

- Step 1. Extend each of the four leveling pads in turns until they firmly contact the floor and support the rack cabinet. Make sure the cabinet is balanced by gently pushing the cabinet. If it tilts, adjust the length of the leveling pads until the cabinet is well balanced.

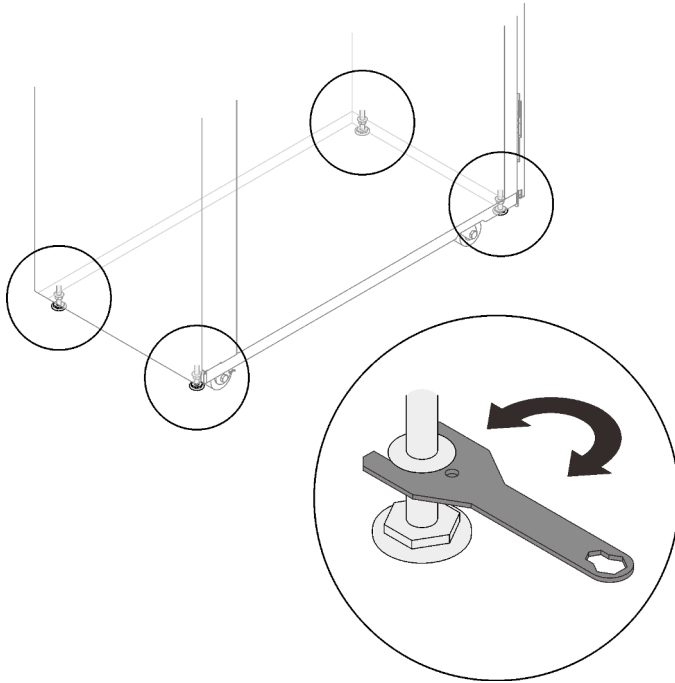


Figure 33. Lowering the leveling pads

Step 2. Remove the outrigger stabilizing bars, and remove them.

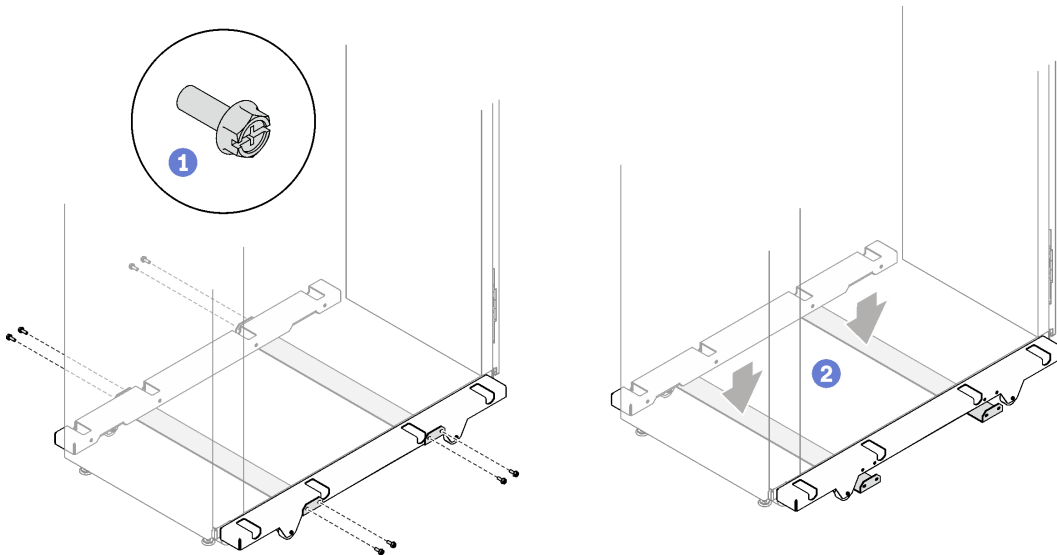
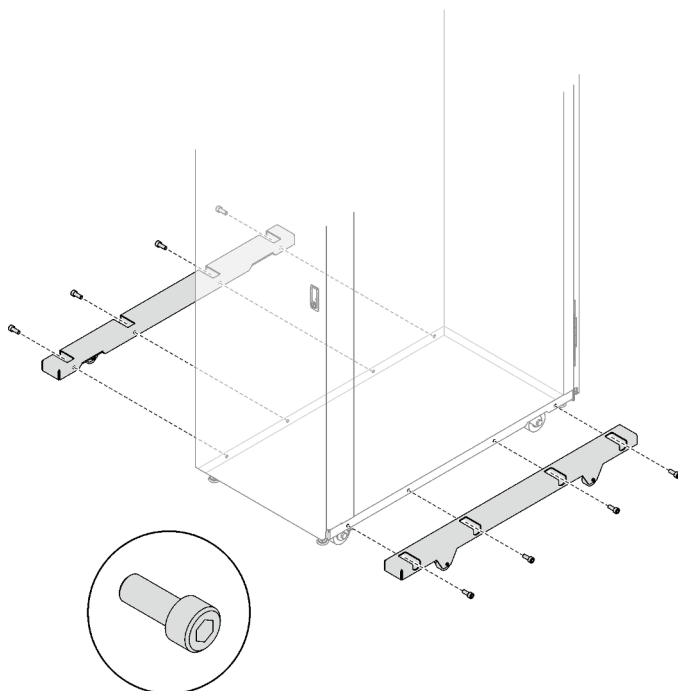


Figure 34. Removing the outrigger stabilizing bars

- 1 Remove the eight screws that secure the two bars to the rack cabinet.
- 2 Place the two stabilizing bars on the ground, and remove the bars.

Step 3. Remove the four screws that secure each of the outriggers, and remove the outriggers.



*Figure 35. Removing the outriggers*

Step 4. Remove the front and rear doors of every rack cabinet that is to be part of the suite.

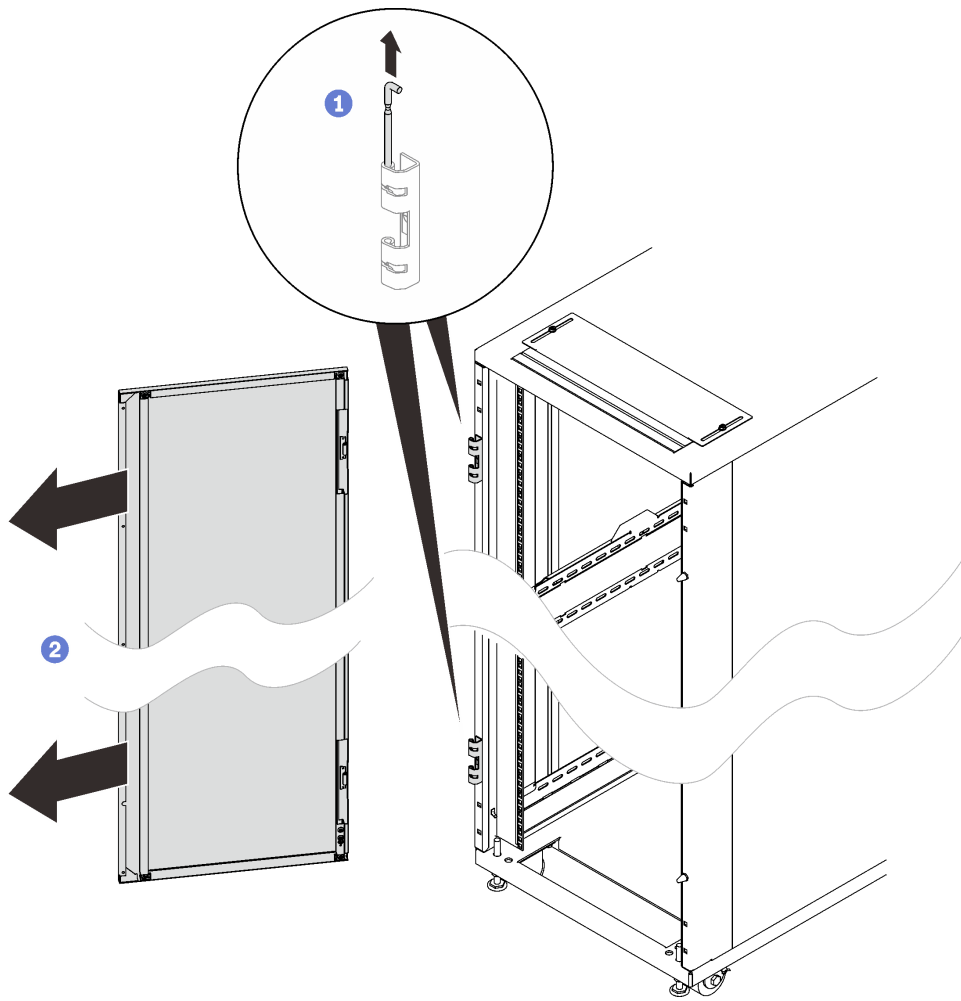


Figure 36. Removing a door

- 1 Hold the door in place, and lift both hinge pins until they lock in the open position so that the door is disengaged.
- 2 Remove the door from the rack cabinet frame.

Step 5. (Optional) Remove all the sides covers that will contact each other in the suite.

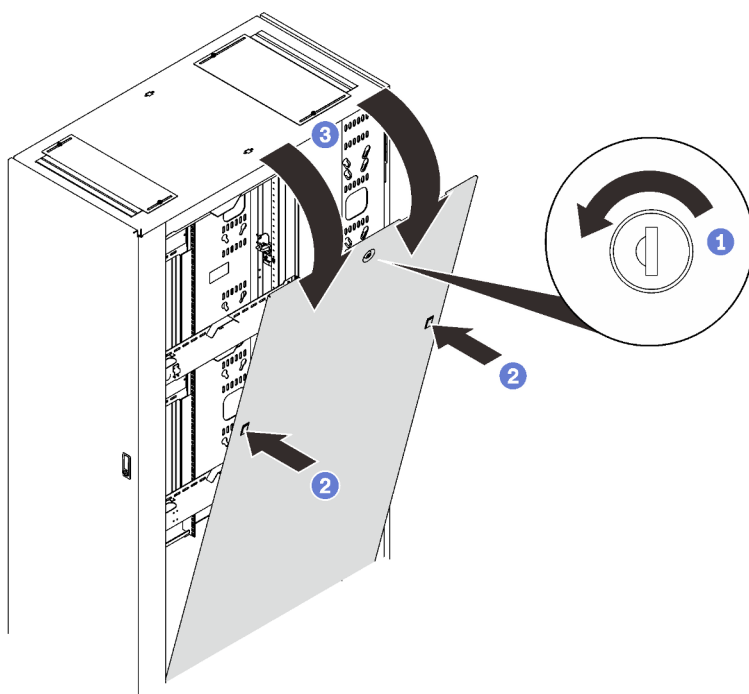


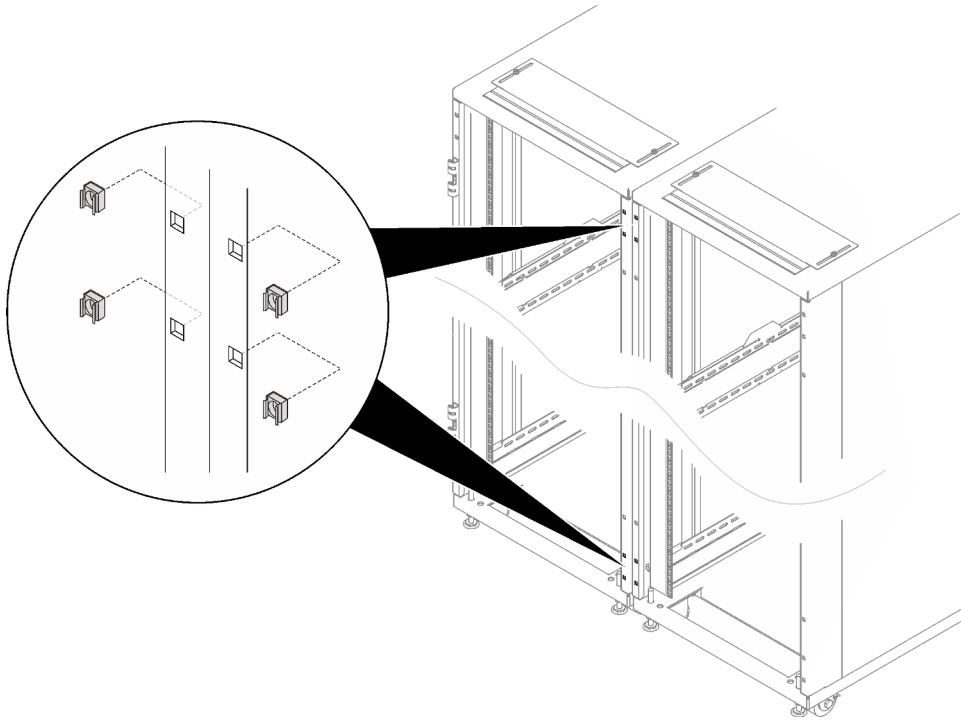
Figure 37. Removing a side cover

- 1 Unlock the side cover with the key.
- 2 Press on the two latches on both sides of the cover to disengage it from the rack.
- 3 Rotate the top of the side cover away from the rack, and remove it.

Step 6. If there are plans of installing devices in the side pockets, do it now and complete all the required cable connection and setup (see [“Install a 1U device into the side pocket” on page 184](#)).

Make sure to complete all the required cable connection and device setup before installing baying kits to the cabinets, as these tasks will be hard to operate afterwards.

Step 7. Install four cage nuts on upper and lower locations on the side of adjacent cabinets as preparation for baying kit installation. Use the cage nuts that come with the baying kit.



*Figure 38. Installing the cage nuts*

See [“Install nuts on the mounting flanges” on page 147](#) for details.

Step 8. Align the four screw holes of two attachment brackets with the holes in the adjacent cabinets, and secure each bracket to the racks with four screws.

**Note:** Do not fully tighten the screws on the first bracket until securing the second bracket.

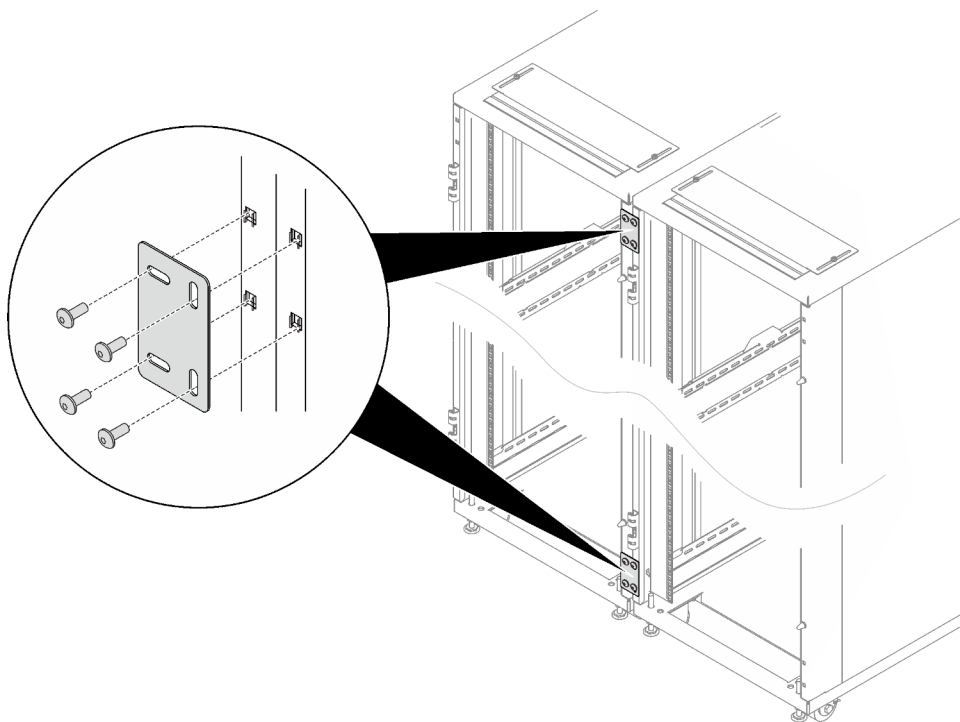


Figure 39. Installing attachment brackets

- Step 9. If there is a plan to install extension kit on only one of the cabinets, remove the two screws from the upper and lower side of the cabinet that will be installed with the extension kit. Then, proceed with the actual extension kit installation procedure. See [“Install 42U Standard Rack Extension Kit” on page 116](#).

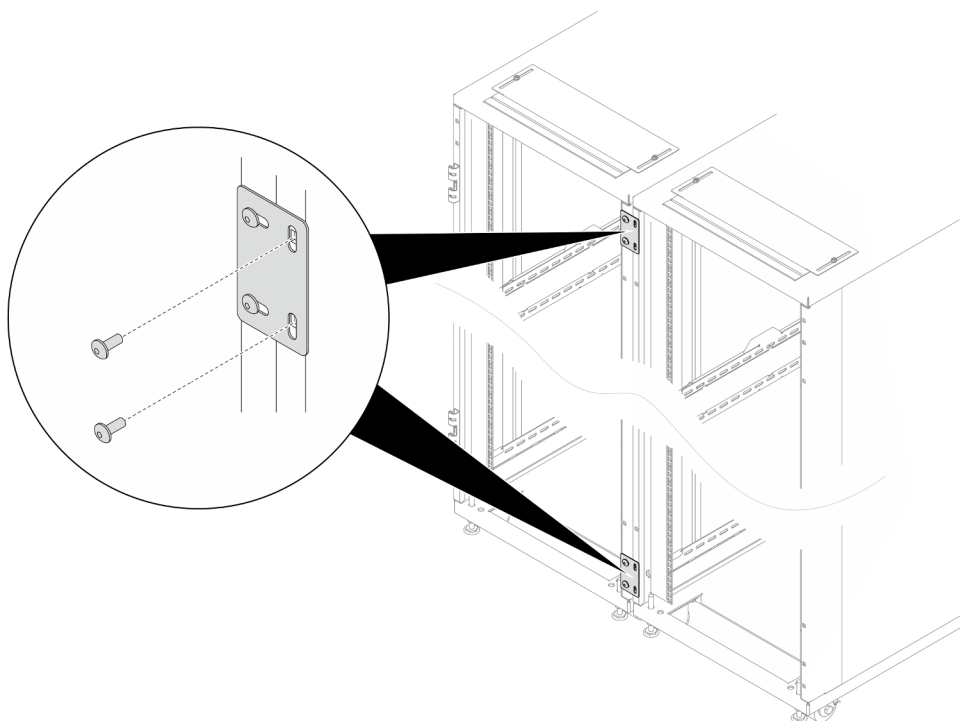


Figure 40. Removing screws to prepare for extension installation

Otherwise, reinstall all the doors that have been removed.

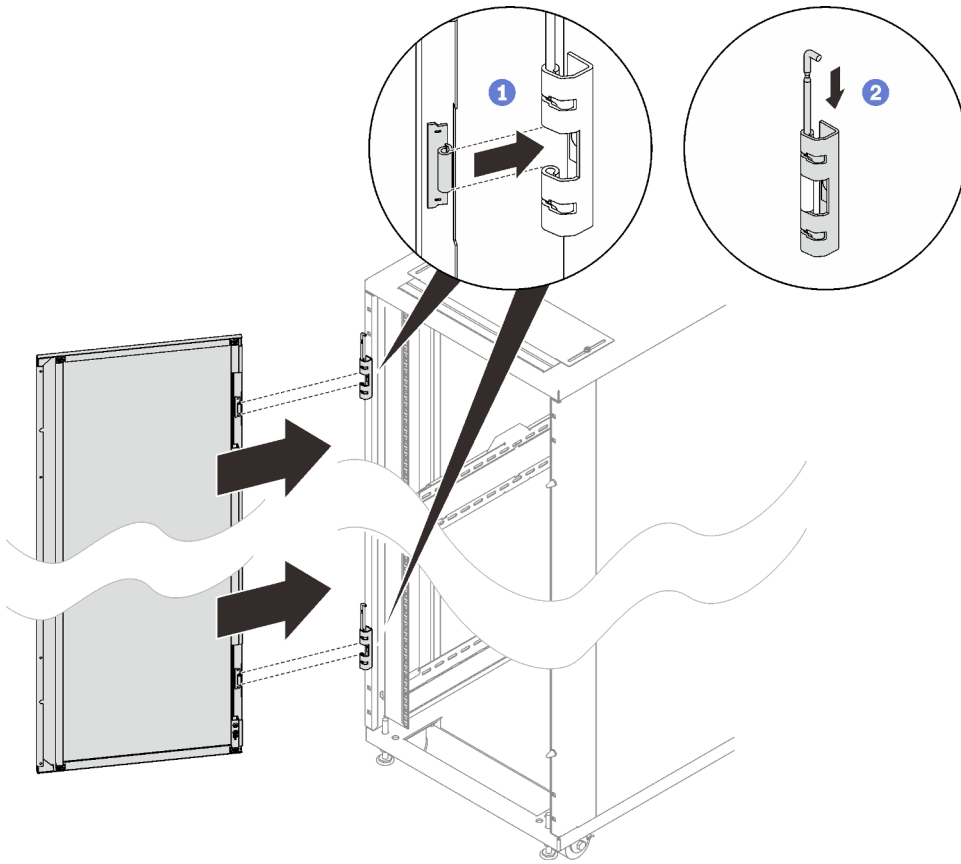


Figure 41. Installing a door

- 1 Align the door with the hinges, and hold the door in place.
- 2 Push the hinge pins down to the closed position so that the door is secured.

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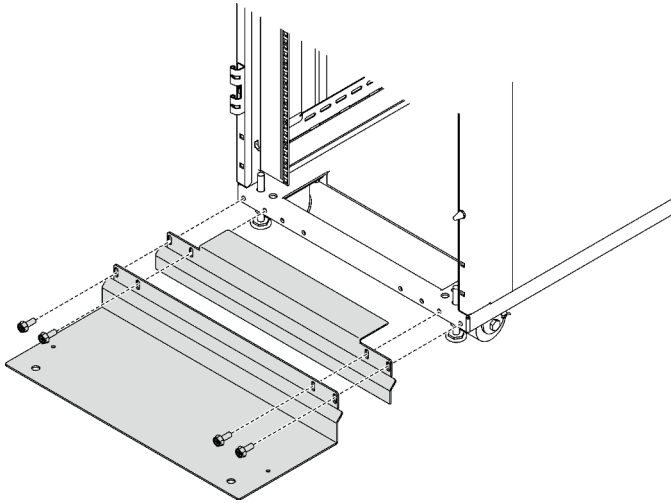
## Install the front stabilizer and recirculation prevention plate

See this topic to learn how to enhance rack cabinet balance with the front stabilizer.

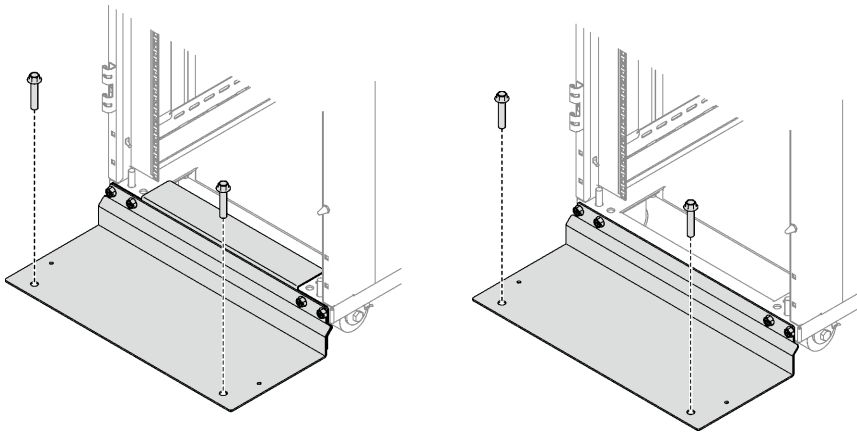
### Procedure

- Step 1. Unlock and open the front door.
- Step 2. Secure the stabilizer and recirculation prevention plate to the front of the rack cabinet with four screws.

Figure 42. Installing the front stabilizer and recirculation prevention plate



**Step 3. Secure the stabilizer to the floor with two screws.**



*Figure 43. Securing the stabilizer to the floor*

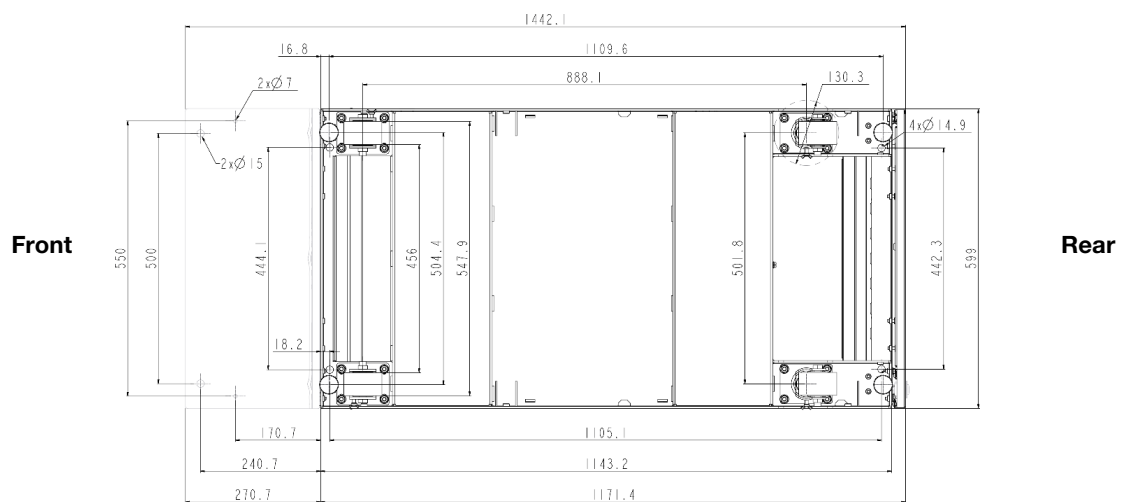


Figure 44. Rack cabinet with stabilizer installed

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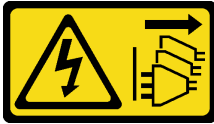
## Install DWC 38 Port Rack Manifold (in-rack system)

Use this information to install the manifold in an in-rack direct water cooling system.

### CAUTION:

The coolant might cause irritation to the skin and eyes. Avoid direct contact with the coolant.

#### S002



### CAUTION:

The power-control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

#### S011



### CAUTION:

Sharp edges, corners, or joints nearby.

#### S038



### CAUTION:

Eye protection should be worn for this procedure.

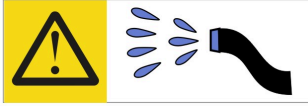
#### S040



### CAUTION:

Protective gloves should be worn for this procedure.

## L016



خطر: قد يتم التعرض لخطر الصدمة الكهربائية بسبب الماء أو المحلول المائي الذي يوجد بهذا المنتج.  
تجنب العمل في أو بالقرب من أي جهاز فعال بأيدي مبللة أو عند وجود تسرب للماء. (L016)

**AVISO: Risco de choque elétrico devido à presença de água ou solução aquosa no produto. Evite trabalhar no equipamento ligado ou próximo a ele com as mãos molhadas ou quando houver a presença de água derramada. (L016)**

**ОПАСНО:** Риск от токов удар поради вода или воден разтвор, присъстващи в продукта.  
Избягвайте работа по или около оборудване под напрежение,  
докато сте с мокри ръце или когато наоколо има разляна вода.  
(L016)

**DANGER : Risque de choc électrique lié à la présence d'eau ou d'une solution aqueuse dans ce produit. Évitez de travailler avec ou à proximité d'un équipement sous tension avec des mains mouillées ou lorsque de l'eau est renversée. (L016)**

危险: 由于本产品中存在水或者水溶液, 因此存在电击风险。请避免使用潮湿的手在带电设备或者有水溅出的环境附近工作。 (L016)

危險: 本產品中有水或水溶液, 會造成電擊的危險。手濕或有潑濺的水花時, 請避免使用或靠近帶電的設備。 (L016)

OPASNOST: Rizik od električnog udara zbog vode ili tekućine koja postoji u ovom proizvodu.  
Izbjegavajte rad u  
blizini opreme pod naponom s mokrim rukama ili kad je u blizini prolivena  
tekućina.  
(L016)

**NEBEZPEČÍ:** Riziko úrazu elektrickým proudem v důsledku vody nebo vodního roztoku přítomného v tomto produktu. Dejte pozor, abyste při práci s aktivovaným vybavením nebo v jeho blízkosti neměli mokré ruce a vyvarujte se potřísnění nebo polití produktu vodou. (L016)

**Fare!** Risiko for stød på grund af vand eller en vandig opløsning i produktet. Undgå at arbejde med eller i nærheden af strømførende udstyr med våde hænder, eller hvis der er spildt vand. (L016)

**GEVAAR:** Risico op elektrische schok door water of waterachtige oplossing die aanwezig is in dit product. Vermijd werken aan of naast apparatuur die onder spanning staat als u natte handen hebt of als gemorst water aanwezig is. (L016)

**DANGER:** Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present.  
(L016)



**ОПАСНО: Риск поражения электрическим током вследствие присутствия в этом продукте воды или водного раствора. Избегайте выполнения работ на оборудовании, находящемся под напряжением, или рядом с таким оборудованием влажными руками или при наличии пролитой воды. (L016)**

NEBEZPEČENSTVO: Riziko úrazu elektrickým prúdom v dôsledku prítomnosti vody alebo vodného roztoku v tomto produkte. Vyhnite sa práci na zapnutom zariadení alebo v jeho blízkosti s vlhkými rukami, alebo keď je prítomná rozliata voda. (L016)

NEVARNOST: Nevarnost električnega udara zaradi vode ali vodne raztopine, prisotne v izdelku. Ne delajte na opremi ali poleg opreme pod energijo z mokrimi rokami ali ko je prisotna razlita voda. (L016)

**PELIGRO: Existe riesgo de choque eléctrico por agua o por una solución de agua que haya en este producto. Evite trabajar en equipos bajo tensión o cerca de los mismos con las manos húmedas o si hay agua derramada. (L016)**

**Fara: Risk för elektriska stötar på grund av vatten eller vattenbaserat medel i denna produkt. Arbeta inte med eller i närheten av elektriskt laddad utrustning om du har våta händer eller vid vattenspill. (L016)**

ཉེན་བརྒྱུ: རྩིས་འདིའི་ནང་དུ་ཆུ་འཕྲ་ཆུ་འཕྲ་གཤེར་གཟུགས་འདུས་ཡོད་པ་སྟེ། དེ་ལས་སློག་ཆུག་པའི་ཉེན་ཁ་ཡོད། ལག་པའི་སློག་ཆུ་ཡོད་པའམ་ཆུ་ཐིག་མར་བཞུར་བའི་གནས་ཚུལ་འདི་གསློག་ཆུ་ཡོད་པའི་སློག་ཆས་ལ་བཞག་སྟེ་བྱེད་མི་ཉེན་པོ་ཡོད། (L016)

خەتەرلىك: بۇ مەھسۇلاتتا سۇ ياكى ئېرىتمە بولغاچقا، شۇڭا توك سوقۇۋېتىش خەۋپى مەۋجۇتدۇر. قول ھۆل ھالەتتە ۋە ياكى سۇ سىرغىپ چىققان ھالەتتە، توكلۇق ئۇسكۇنىگە قارىتا ۋە ياكى توكلۇق ئۇسكۇنىنىڭ ئەتراپىدا مەشغۇلات ئېلىپ بارغىلى بولمايدۇ. (L016)

Yungyiemy: Youzyiz aen canjbinj miz raemx roxnaeuz raemx yungzyiz, sojyij miz yungyiemy bungqden. Mboujndaej fwngz miz raemx seiz youq ndaw sezbi roxnaeuz youq henzgyawj guhhong. (L016)

#### Attention:

- Ensure proper handling procedures are followed when working with any chemically treated coolant used in the rack cooling system. Ensure that material safety data sheets (MSDS) and safety information are provided by the coolant chemical treatment supplier and that proper personal protective equipment (PPE) is available as recommended by the coolant chemical treatment supplier. Protective gloves and eyewear may be recommended as a precaution.
- This task requires two or more people.

#### Procedure

- Step 1. Make sure that the in-rack CDU and other devices are not powered on, and that all external cables are disconnected.
- Step 2. Install the server into the rack.
- Step 3. Install the manifold.

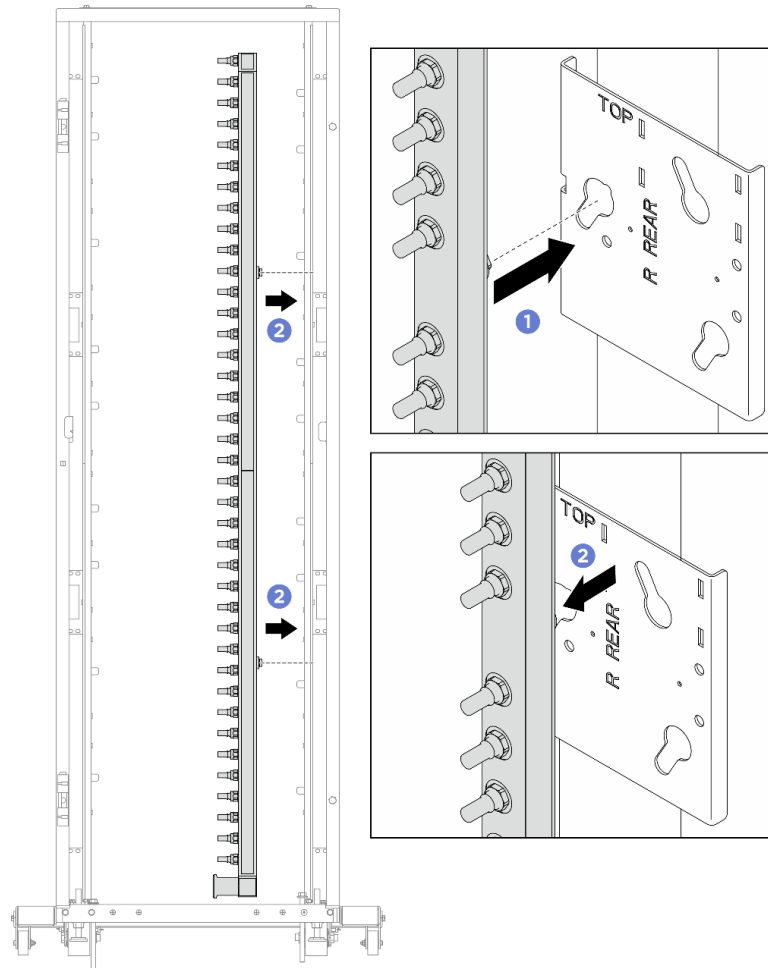


Figure 45. Installing the manifold

- a. ① Hold the manifold with both hands, and mount it onto the rack cabinet.
- b. ② Align the spools with holes, and clutch the cabinet.

Step 4. Repeat the last step to install the other manifold.

Step 5. Install ball valves to CDU.

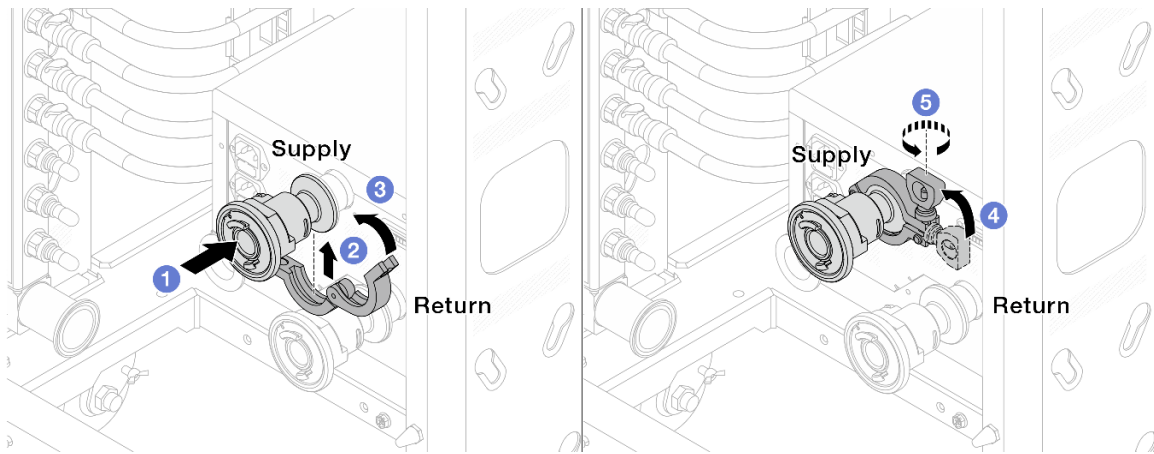


Figure 46. Installing ball valves

- a. ① Connect the ball valves to **Supply** and **Return** ports.
- b. ② Wrap the interface around with the clamp.
- c. ③ Close the clamp.
- d. ④ Lift the screw upright.
- e. ⑤ Tighten the screw and make sure that it is secured.

Step 6. Install the connection set to manifolds.

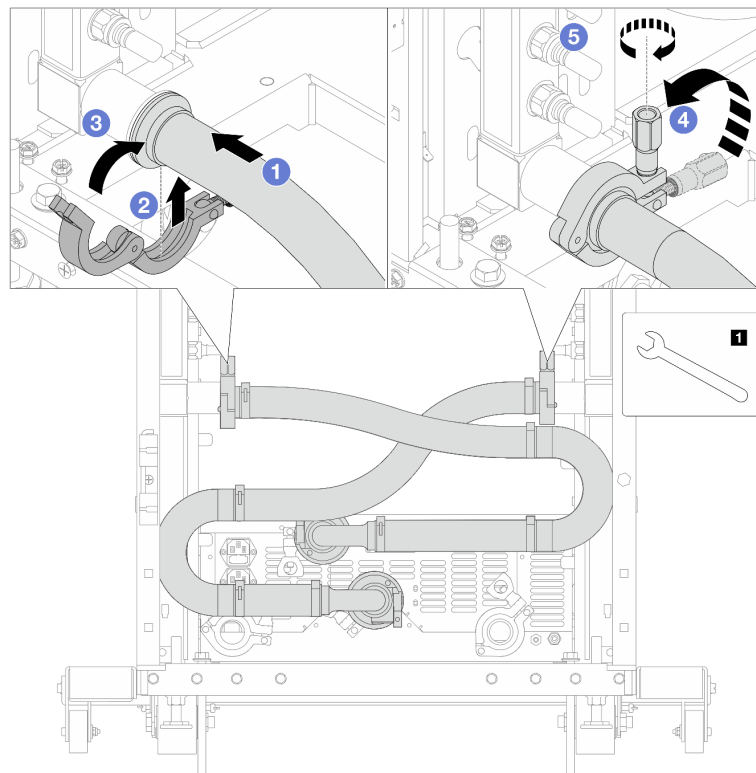


Figure 47. Installing the connection set

**1** 17 mm wrench

- a. **1** Connect the connection set to both manifolds.
- b. **2** Wrap the interface around with the clamp.
- c. **3** Close the clamp.
- d. **4** Lift the screw upright.
- e. **5** Tighten the screw and make sure that it is secured.

Step 7. Install the connection set to ball valves.

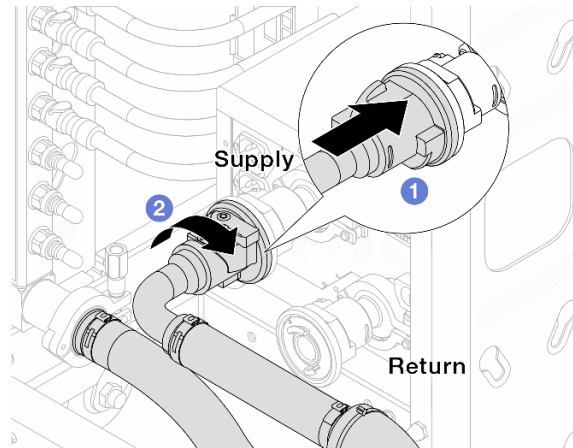


Figure 48. Connecting ball valves

- a. **1** Connect ball valves.
- b. **2** Rotate to the right to lock the two valves.

Step 8. Prepare the in-rack CDU.

- a. Connect the feed hose to inlet port on the front.

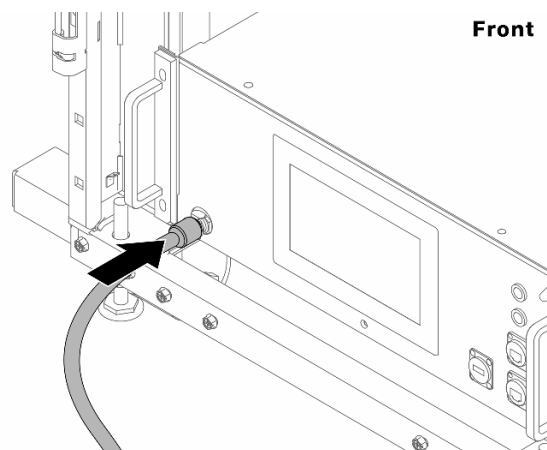


Figure 49. The front of CDU

- b. Connect hoses to the drain port and bleeder port on the rear.

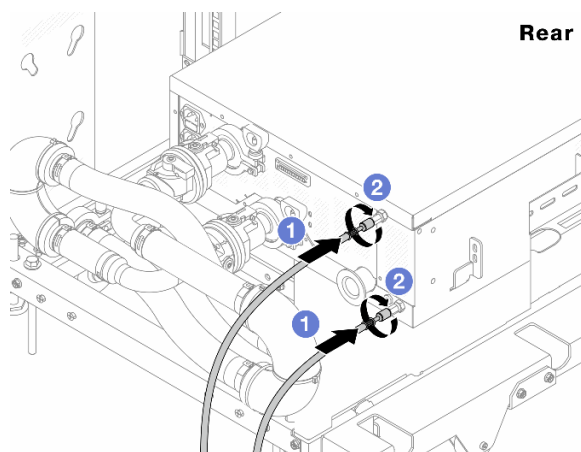


Figure 50. The rear of CDU

- 1 Connect both drain and bleeder hoses to CDU.
- 2 Rotate the connectors to the right to secure the connection.

**Important:**

- For more operation and maintenance guidelines, see [Lenovo Neptune DWC RM100 in-rack Coolant Distribution Unit \(CDU\) Operation & Maintenance Guide](#).
- For service support, associated warranty and maintenance sizing, contact Lenovo Professional Services team at [cdusupport@lenovo.com](mailto:cdusupport@lenovo.com).

Step 9. Install the quick connect plug to the manifolds.

**Note:** Depending on the model, your server might look different from the illustrations in this topic.

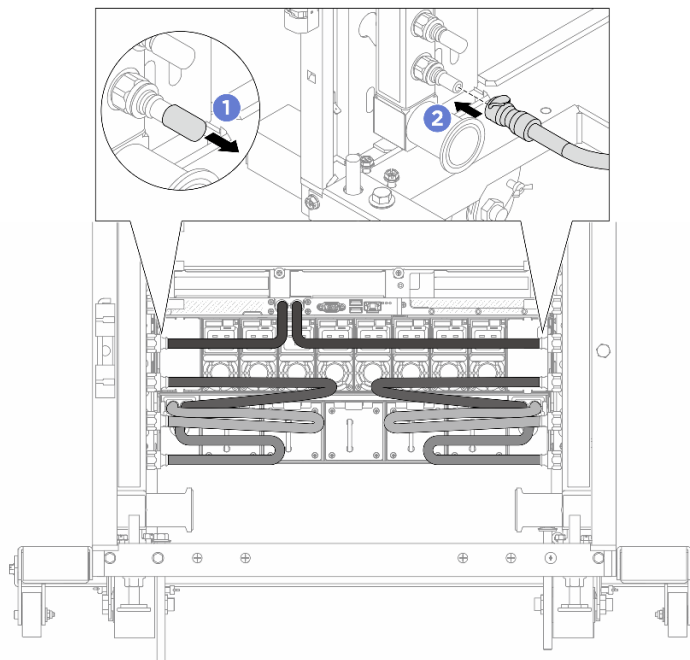


Figure 51. Installing the quick connect plug

- a. ① Remove the rubber quick connect plug covers from the ports on the manifold.
- b. ② Connect the plug to the manifold port.

Step 10. Install the bleeder kit to the manifold supply side.

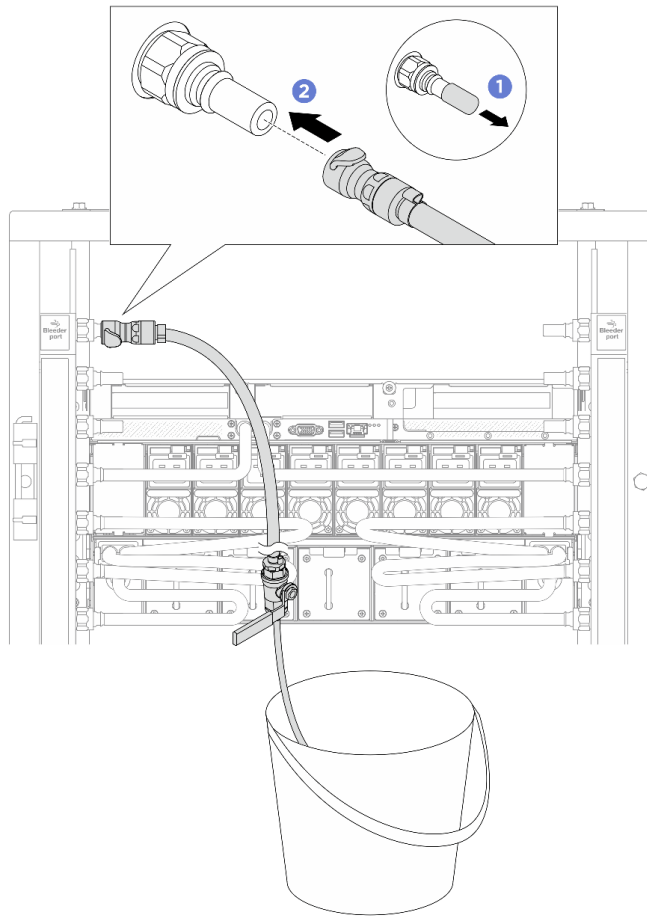


Figure 52. Installing the bleeder kit to the supply side

- a. ① Remove the rubber quick connect plug covers from the ports on the manifold.
- b. ② Plug the bleeder kit to the manifold.

Step 11. To push the air out of the manifolds, open ball valve switches to let coolant fill the system.

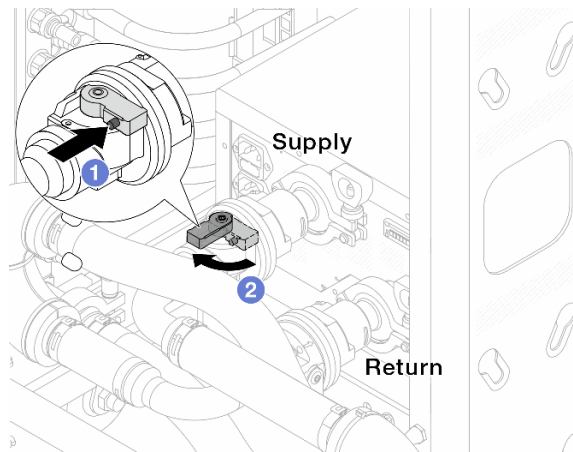


Figure 53. Opening ball valves

- a. ① Press the button on the ball valve switch.
- b. ② Rotate the switch to fully open the valves as illustrated above.

**Attention:**

- Pay close attention to the front display of CDU and maintain the system pressure at **one bar**.
- For more information about coolant temperature and system pressure requirements, see the water requirements section of your server.

Step 12. Slowly open the bleeder valve to conduct the air out of the hose. Close the bleeder valve once a steady stream of water flows into the bucket or there are only minimal bubbles in the bleeder hose.

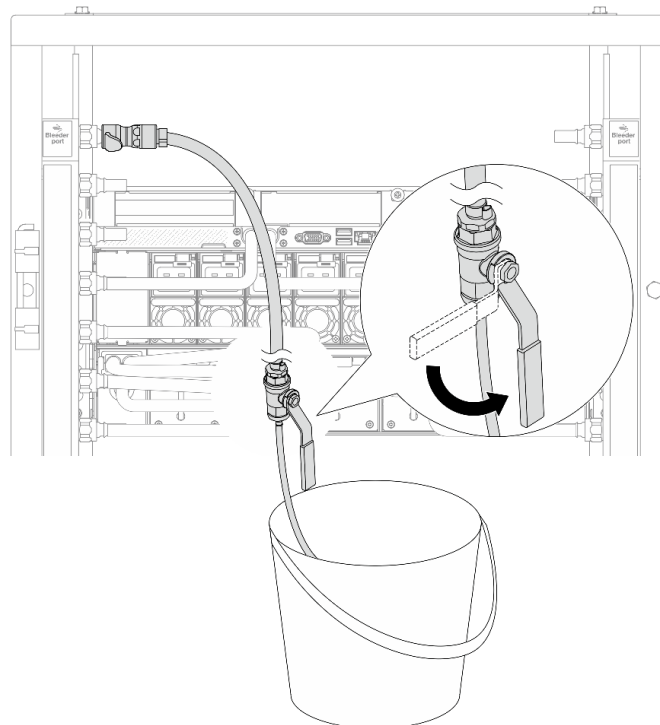


Figure 54. Opening the bleeder valve on the supply side

Step 13. Install the bleeder kit to the manifold return side.

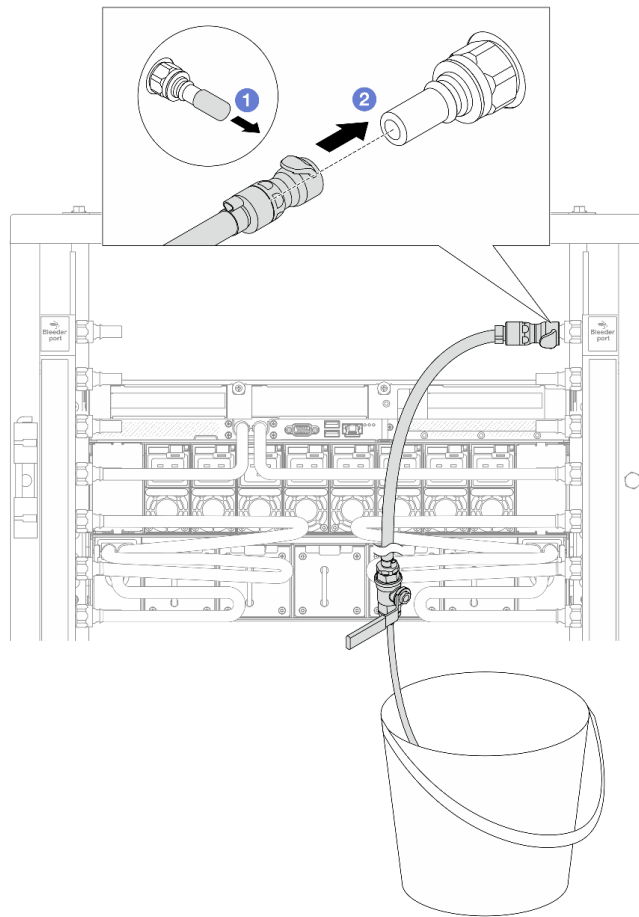
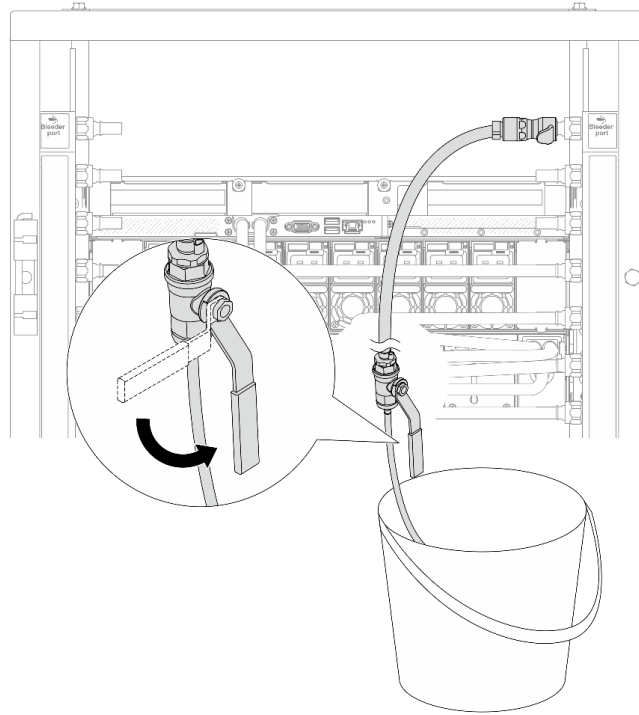


Figure 55. Installing the bleeder kit on the return side

- a. ① Remove the rubber quick connect plug covers from the ports on the manifold.
- b. ② Plug the bleeder kit to the manifold.

Step 14. Slowly open the bleeder valve to conduct the air out of the hose. Close the bleeder valve once a steady stream of water flows into the bucket or there are only minimal bubbles in the bleeder hose.



*Figure 56. Opening the bleeder valve on the return side*

Step 15. (For precaution) To make sure that the air inside is as little as possible, re-install the bleeder kit back to manifold supply side and do it one more time. Close the bleeder valve once a steady stream of water flows into the bucket or there are only minimal bubbles in the bleeder hose.

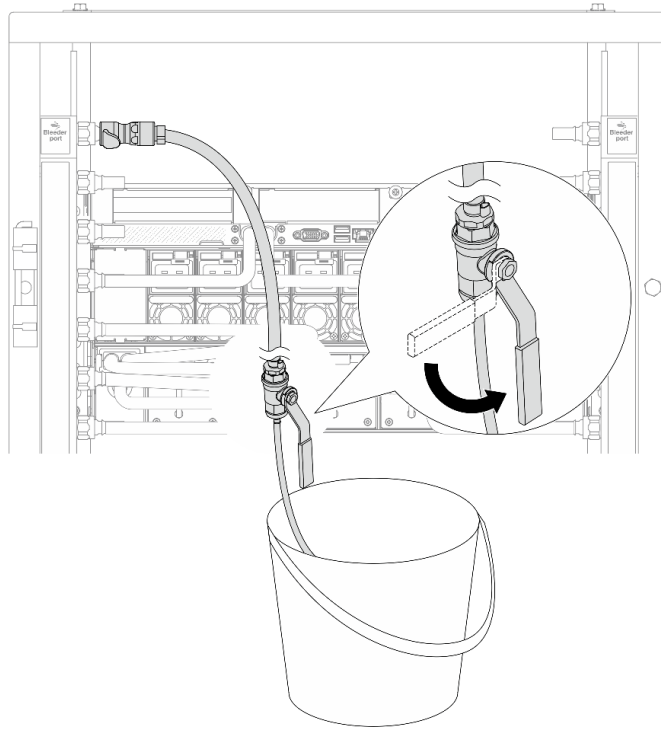


Figure 57. Opening the bleeder valve on the supply side

Step 16. Once completed, pay close attention to the front display of CDU and maintain the system pressure at **one bar**. For more information about coolant temperature and system pressure requirements, see the water requirement section for your server.

## Install DWC 38 Port Rack Manifold (in-row system)

Use this information to install the manifold in an in-row direct water cooling system.

### CAUTION:

The coolant might cause irritation to the skin and eyes. Avoid direct contact with the coolant.

### S002



### CAUTION:

The power-control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

### S011



**CAUTION:**  
Sharp edges, corners, or joints nearby.

**S038**



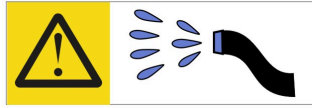
**CAUTION:**  
Eye protection should be worn for this procedure.

**S040**



**CAUTION:**  
Protective gloves should be worn for this procedure.

## L016



خطر: قد يتم التعرض لخطر الصدمة الكهربائية بسبب الماء أو المحلول المائي الذي يوجد بهذا المنتج.  
تجنب العمل في أو بالقرب من أي جهاز فعال بأيدي مبللة أو عند وجود تسرب للماء. (L016)

**AVISO: Risco de choque elétrico devido à presença de água ou solução aquosa no produto. Evite trabalhar no equipamento ligado ou próximo a ele com as mãos molhadas ou quando houver a presença de água derramada. (L016)**

**ОПАСНО:** Риск от токов удар поради вода или воден разтвор, присъстващи в продукта.  
Избягвайте работа по или около оборудване под напрежение,  
докато сте с мокри ръце или когато наоколо има разляна вода.  
(L016)

**DANGER : Risque de choc électrique lié à la présence d'eau ou d'une solution aqueuse dans ce produit. Évitez de travailler avec ou à proximité d'un équipement sous tension avec des mains mouillées ou lorsque de l'eau est renversée. (L016)**

危险：由于本产品中存在水或者水溶液，因此存在电击风险。请避免使用潮湿的手在带电设备或者有水溅出的环境附近工作。(L016)

危險：本產品中有水或水溶液，會造成電擊的危險。手濕或有潑濺的水花時，請避免使用或靠近帶電的設備。(L016)

**OPASNOST:** Rizik od električnog udara zbog vode ili tekućine koja postoji u ovom proizvodu.  
Izbjegavajte rad u  
blizini opreme pod naponom s mokrim rukama ili kad je u blizini prolivena  
tekućina.  
(L016)

**NEBEZPEČÍ:** Riziko úrazu elektrickým proudem v důsledku vody nebo vodního roztoku přítomného v tomto produktu. Dejte pozor, abyste při práci s aktivovaným vybavením nebo v jeho blízkosti neměli mokré ruce a vyvarujte se potřísnění nebo polití produktu vodou. (L016)

**Fare!** Risiko for stød på grund af vand eller en vandig opløsning i produktet. Undgå at arbejde med eller i nærheden af strømførende udstyr med våde hænder, eller hvis der er spildt vand. (L016)

**GEVAAR:** Risico op elektrische schok door water of waterachtige oplossing die aanwezig is in dit product. Vermijd werken aan of naast apparatuur die onder spanning staat als u natte handen hebt of als gemorst water aanwezig is. (L016)

**DANGER:** Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present. (L016)

**Gefahr:** Aufgrund von Wasser oder wässriger Lösung in diesem Produkt besteht die Gefahr eines elektrischen Schlags. Nicht mit nassen Händen oder in der Nähe von Wasserlächen an oder in unmittelbarer Nähe von Bauteilen arbeiten, die unter Strom stehen. (L016)

**VESZÉLY:** A víz vagy a termékben lévő vizes alapú hűtőfolyadék miatt fennáll az elektromos áramütés veszélye. Ne dolgozzon áram alatt lévő berendezésen és közelében nedves kézzel, illetve amikor folyadék kerül a berendezésre.  
(L016)

危険：この製品内に存在する水または水溶液によって、電気ショックの危険があります。手が濡れている場合やこぼれた水が周囲にある場合は、電圧が印加された装置またはその周辺での作業は行わないでください。(L016)

**ОПАСНОСТ:** Опасност од струен удар поради присаство на вода или на воден раствор во овој производ. Избегнувајте работење на опрема вклучена во струја или во близина на опрема вклучена во струја со влажни раце или кога има истурено вода.  
(L016)

[illegible]

**NIEBEZPIECZEŃSTWO:** Ryzyko porażenia prądem elektrycznym z powodu występowania w produkcie wody lub roztworu wodnego. Nie należy pracować przy podłączonym do źródła zasilania urządzeniu lub w jego pobliżu z mokrymi dłońmi lub kiedy rozlano wodę.  
(L016)

52 ThinkSystem Heavy Duty Full Depth 42U Rack Cabinet User Guide

**ОПАСНО: Риск поражения электрическим током вследствие присутствия в этом продукте воды или водного раствора. Избегайте выполнения работ на оборудовании, находящемся под напряжением, или рядом с таким оборудованием влажными руками или при наличии пролитой воды. (L016)**

NEBEZPEČENSTVO: Riziko úrazu elektrickým proudem v důsledku přítomnosti vody alebo vodného roztoku v tomto produkte. Vyhnite sa práci na zapnutom zariadení alebo v jeho blízkosti s vlhkými rukami, alebo keď je prítomná rozliata voda. (L016)

NEVARNOST: Nevarnost električnega udara zaradi vode ali vodne raztopine, prisotne v izdelku. Ne delajte na opremi ali poleg opreme pod energijo z mokrimi rokami ali ko je prisotna razlita voda. (L016)

**PELIGRO: Existe riesgo de choque eléctrico por agua o por una solución de agua que haya en este producto. Evite trabajar en equipos bajo tensión o cerca de los mismos con las manos húmedas o si hay agua derramada. (L016)**

**Fara: Risk för elektriska stötar på grund av vatten eller vattenbaserat medel i denna produkt. Arbeta inte med eller i närheten av elektriskt laddad utrustning om du har våta händer eller vid vattenspill. (L016)**

ཉེན་བརྒྱུ: རྩིས་འདིའི་ནང་ཏུ་ཆུ་འཕྲ་ཆུའི་གཤེར་གཟུགས་འདུས་ཡོད་པས། རྟེ་ལས་སློག་ཆུག་པའི་ཉེན་ཁ་ཡོད། ལག་པའི་རྩིས་ཆུ་ཡོད་པའཕྲ་ཆུ་ཐིག་མར་བཞུར་བའི་གནས་ཚུལ་འོག་སློག་ཡོད་པའི་སློག་ཆས་ལ་བཞོལ་སྤྱོད་བྱེད་མི་ཉེན་པོ། (L016)

خەتەرلىك: بۇ مەھسۇلاتتا سۇ ياكى ئېرىتمە بولغاچقا، شۇڭا توك سوقۇۋېتىش خەۋپى مەۋجۇتدۇر. قول ھۆل ھالەتتە ۋە ياكى سۇ سىرغىپ چىققان ھالەتتە، توكلۇق ئۇسكۇنىگە قارىتا ۋە ياكى توكلۇق ئۇسكۇنىنىڭ ئەتراپىدا مەشغۇلات ئېلىپ بارغىلى بولمايدۇ. (L016)

Yungyiemi: Youzyiz aen canjbinj miz raemx roxnaeuz raemx yungzyiz, sojyij miz yungyiemi bungqden. Mboujndaej fwngz miz raemx seiz youq ndaw sezbi roxnaeuz youq henzgyawj guhhong. (L016)

#### Attention:

- Ensure proper handling procedures are followed when working with any chemically treated coolant used in the rack cooling system. Ensure that material safety data sheets (MSDS) and safety information are provided by the coolant chemical treatment supplier and that proper personal protective equipment (PPE) is available as recommended by the coolant chemical treatment supplier. Protective gloves and eyewear may be recommended as a precaution.
- This task requires two or more people.

#### Procedure

Step 1. Install the server into the rack.

Step 2. Install the manifold.

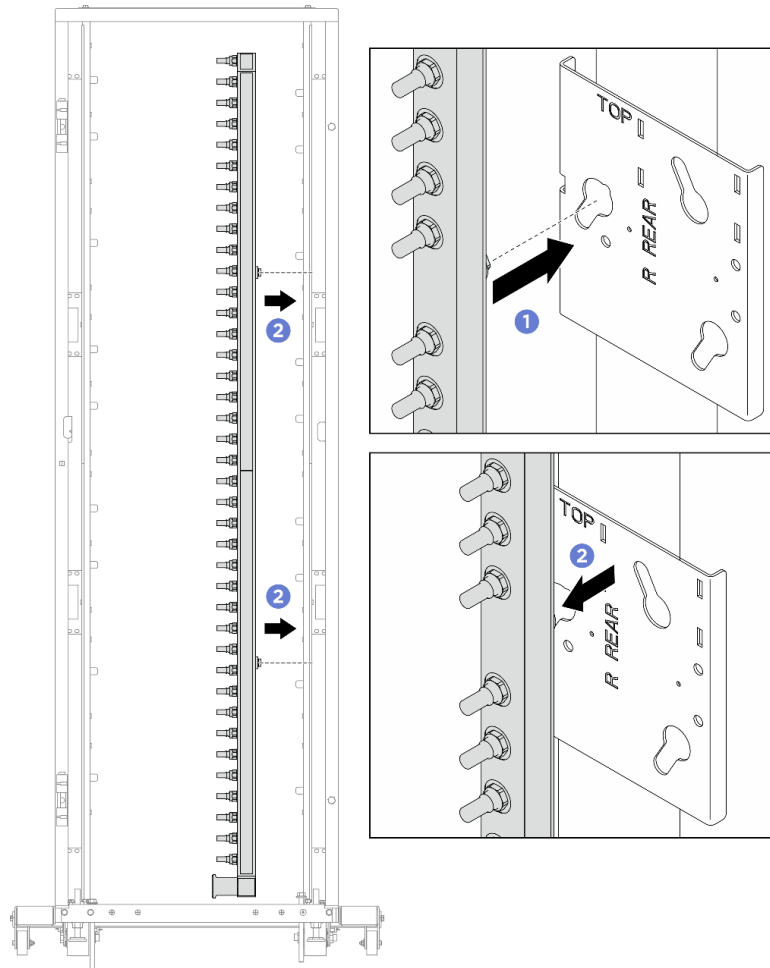


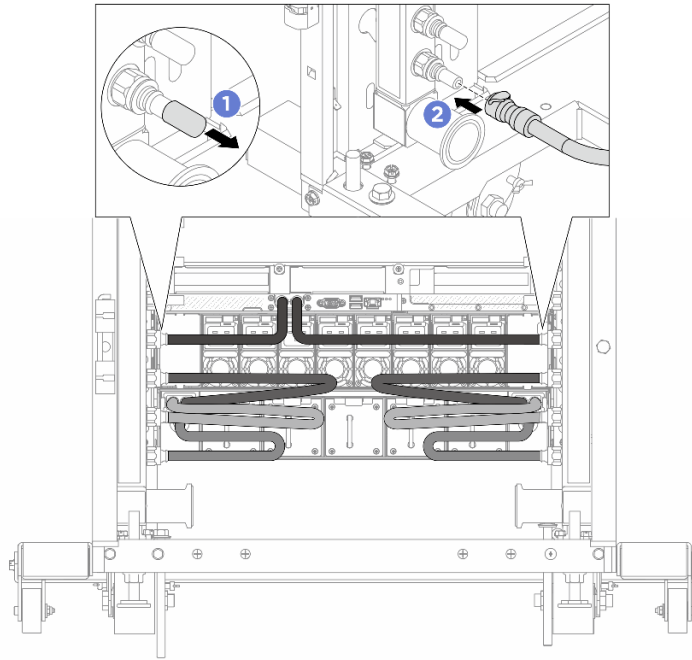
Figure 58. Installing the manifold

- a. ① Hold the manifold with both hands, and mount it onto the rack cabinet.
- b. ② Align the spools with holes, and clutch the cabinet.

Step 3. Repeat the last step to install the other manifold.

Step 4. Install the quick connect plug to the manifolds.

**Note:** Depending on the model, your server might look different from the illustrations in this topic.



*Figure 59. Installing the quick connect plug*

- a. ① Remove the rubber quick connect plug covers from the ports on the manifold.
- b. ② Connect the plug to the manifold port.

Step 5. Install the hose kit to the manifold.

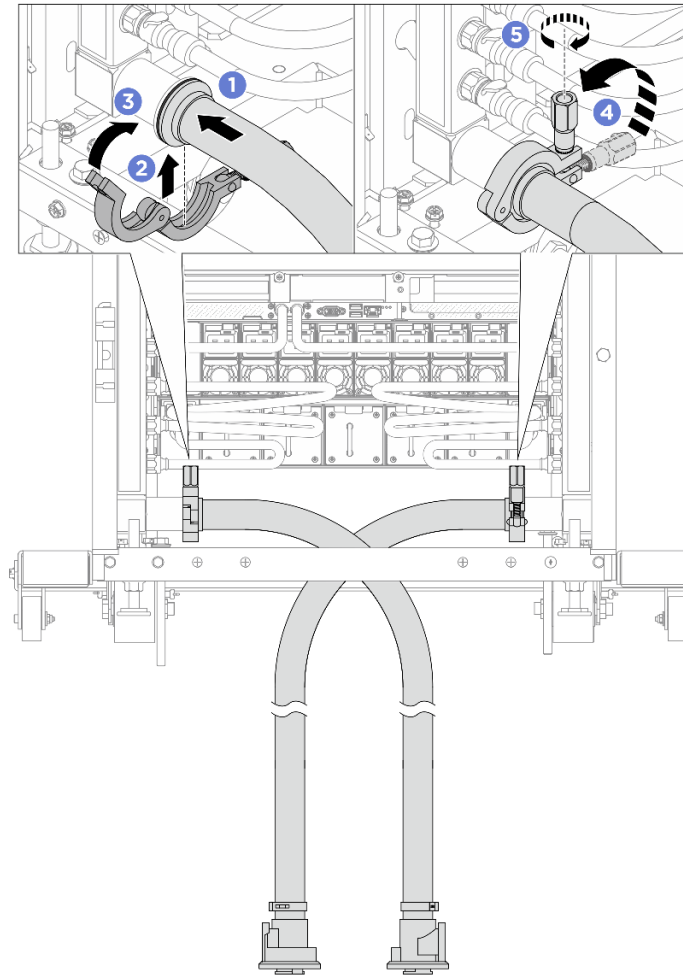


Figure 60. Installing the hose kit

**1** 17 mm wrench

- a. **1** Connect the hose kits to both manifolds.
- b. **2** Wrap the interface around with the clamp.
- c. **3** Close the clamp.
- d. **4** Lift the screw upright.
- e. **5** Tighten the screw and make sure that it is secured.

Step 6. Install the bleeder kit to the manifold supply side.

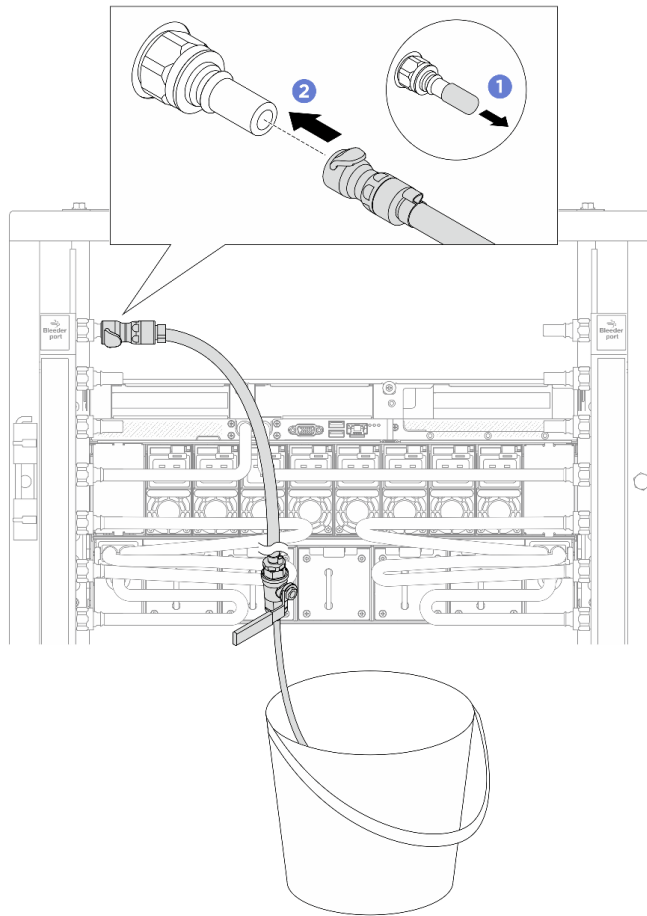


Figure 61. Installing the bleeder kit to the supply side

- a. ① Remove the rubber quick connect plug covers from the ports on the manifold.
- b. ② Plug the bleeder kit to the manifold.

Step 7. To push the air out of the manifold supply side, connect **facility supply** to **manifold return**.

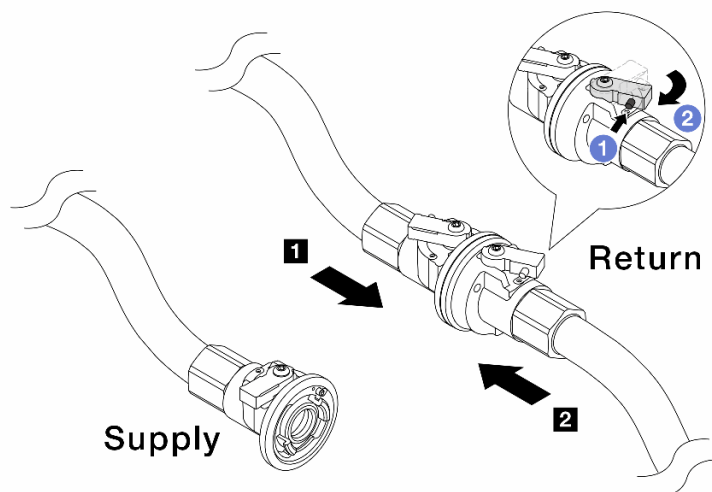


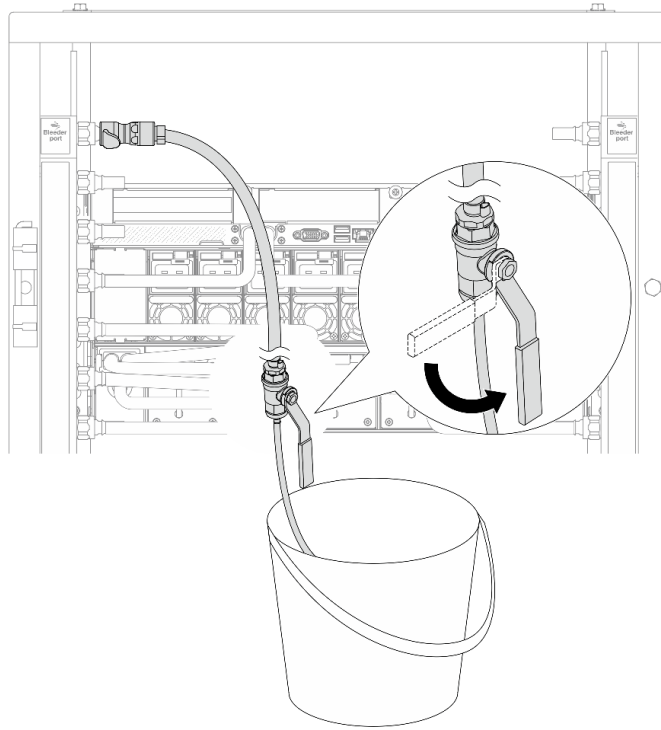
Figure 62. Facility supply to manifold return

- a. ① Press the button on the ball valve switch.
- b. ② Rotate both switches open and stop at around 1/4 of 90 degrees.

**Attention:**

- Open the ball valves on ① manifold return side and ② facility supply side, while keep manifold supply side closed.
- Do not fully open the ball valves, or the water flow gets too rapid to contain.

Step 8. Slowly open the bleeder valve to conduct the air out of the hose. Close the bleeder valve once a steady stream of water flows into the bucket or there are only minimal bubbles in the bleeder hose.



*Figure 63. Opening the bleeder valve on the supply side*

Step 9. Install the bleeder kit to the manifold return side.

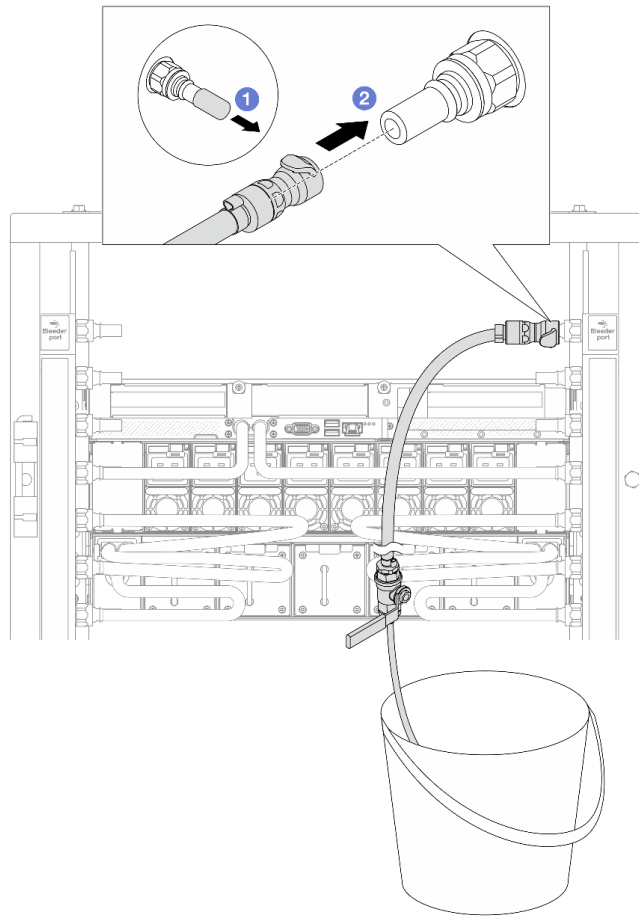


Figure 64. Installing the bleeder kit on the return side

- a. 1 Remove the rubber quick connect plug covers from the ports on the manifold.
- b. 2 Plug the bleeder kit to the manifold.

Step 10. To push the air out of the manifold return side, connect **facility supply** to **manifold supply**.

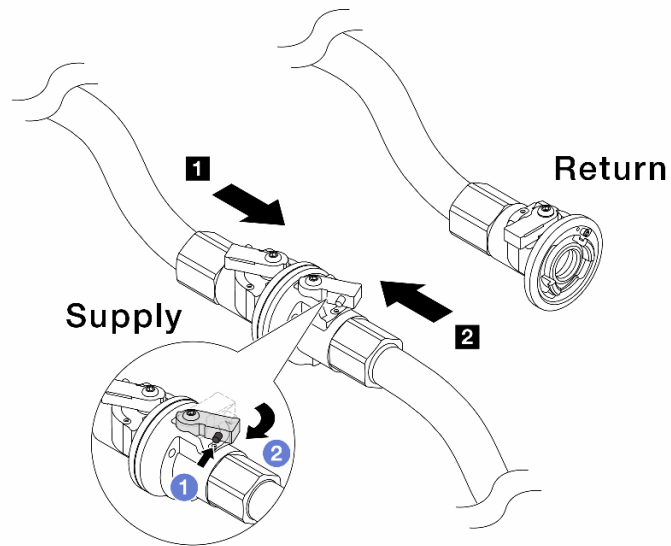


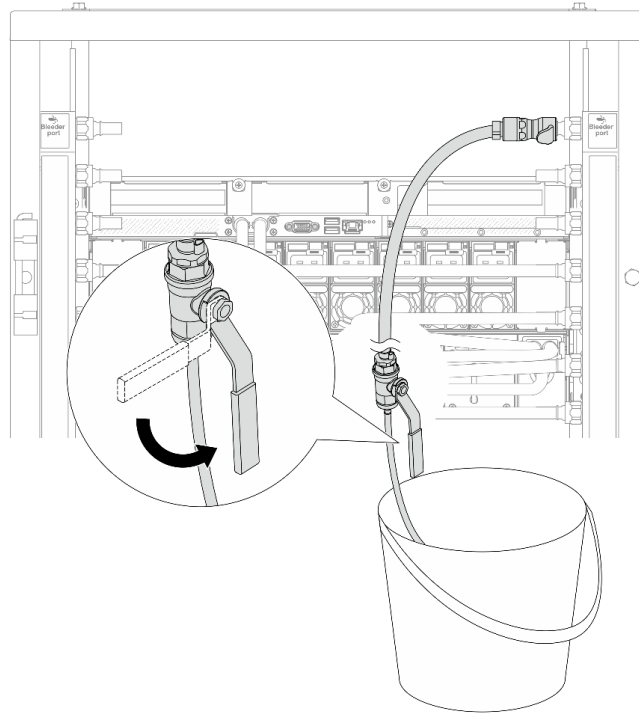
Figure 65. Facility supply to manifold supply

- a. ① Press the button on the ball valve switch.
- b. ② Rotate both switches open and stop at around 1/4 of 90 degrees.

**Attention:**

- Open the ball valves on ① manifold supply side and ② facility supply side, while keep manifold return side closed.
- Do not fully open the ball valves, or the water flow gets too rapid to contain.

Step 11. Slowly open the bleeder valve to conduct the air out of the hose. Close the bleeder valve once a steady stream of water flows into the bucket or there are only minimal bubbles in the bleeder hose.



*Figure 66. Opening the bleeder valve on the return side*

Step 12. (For precaution) To make sure that the air inside is as little as possible, re-install the bleeder kit back to manifold supply side and do it one more time. Close the bleeder valve once a steady stream of water flows into the bucket or there are only minimal bubbles in the bleeder hose.

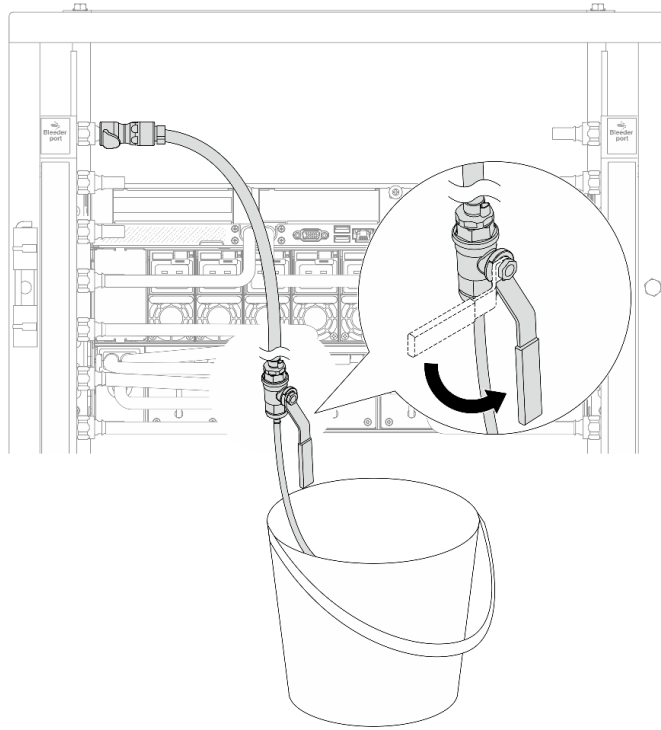


Figure 67. Opening the bleeder valve on the supply side

Step 13. Once completed, connect the supply and return of manifold and facility correspondingly. Fully open all connections on both supply and return sides.

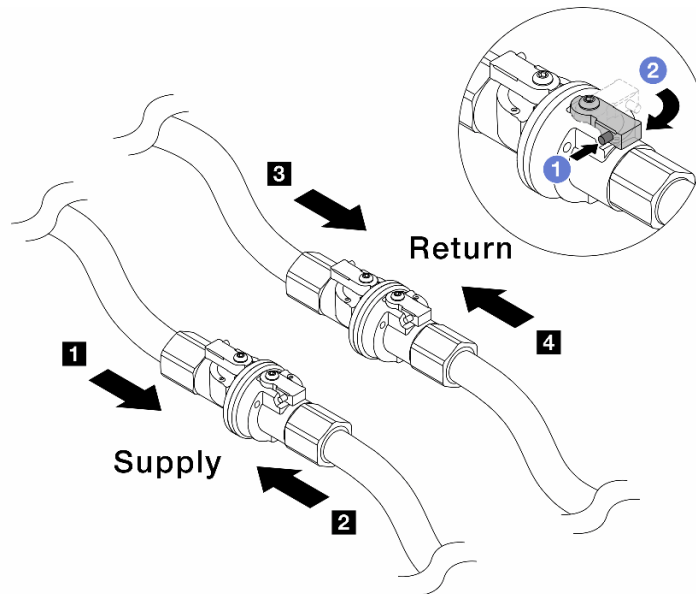


Figure 68. Opening ball valves

**Note:**

**1** Manifold supply connects to **2** facility supply

**3** Manifold return connects to **4** facility return

- a. 1 Press the button on the ball valve switch.
- b. 2 Rotate the switch to fully open the valves as illustrated above.

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## Install rack extension kit

See this topic to learn how to install extension kit.

### Install 42U Advanced Rack Extension Kit

See this topic to learn how to install 42U Advanced Rack Extension Kit.

#### Notes:

- Each unit of rack extension kit comes with additional capacity for up to two 0U PDUs, or one 0U PDU and one manifold, on each side of the rack.
- Each rack cabinet supports up to two units of rack extension kit (one to the front and one to the rear side).
- If there is a plan to install baying kit while only one of the adjacent cabinets will be installed with extension, make sure to install the baying kit first (see [“Install the baying kit” on page 28](#)). Then, as preparation for this procedure, remove the two screws from the upper and lower part of the cabinet that will be installed with the extension kit, and jump to [Step 5 on page 70](#).

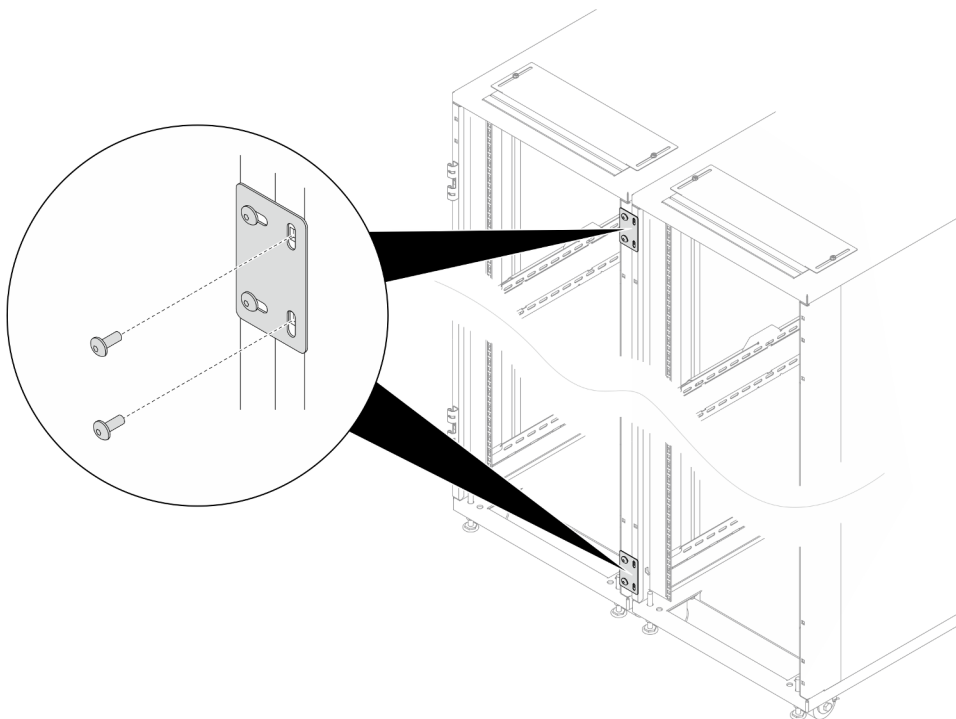


Figure 69. Removing screws to prepare for extension installation

- **Required tools**
  - One tool with plastic blade/scissors to open the packaging
  - One rubber hammer to align the extension panels with the side of the rack
  - One Screwdriver with No. 3 Phillips bit to tighten the M6 screws (9 in the next bullet point)
  - One Nut-driver with holding hex bit 10 mm to tighten the M6 screws (9 in the next bullet point)
  - One 2.5 mm Hex bit socket to tighten the M4 screws (15 in the next bullet point)

- One 3 mm Hex bit socket to tighten the M5 screws (PDU/manifold brackets, opening covers on the extension panels)
- One 4 mm Hex bit socket to tighten the M6 screws (**3** and **12** in the next bullet point)
- The extension kit comes with a miscellaneous bag, which contains the following components:

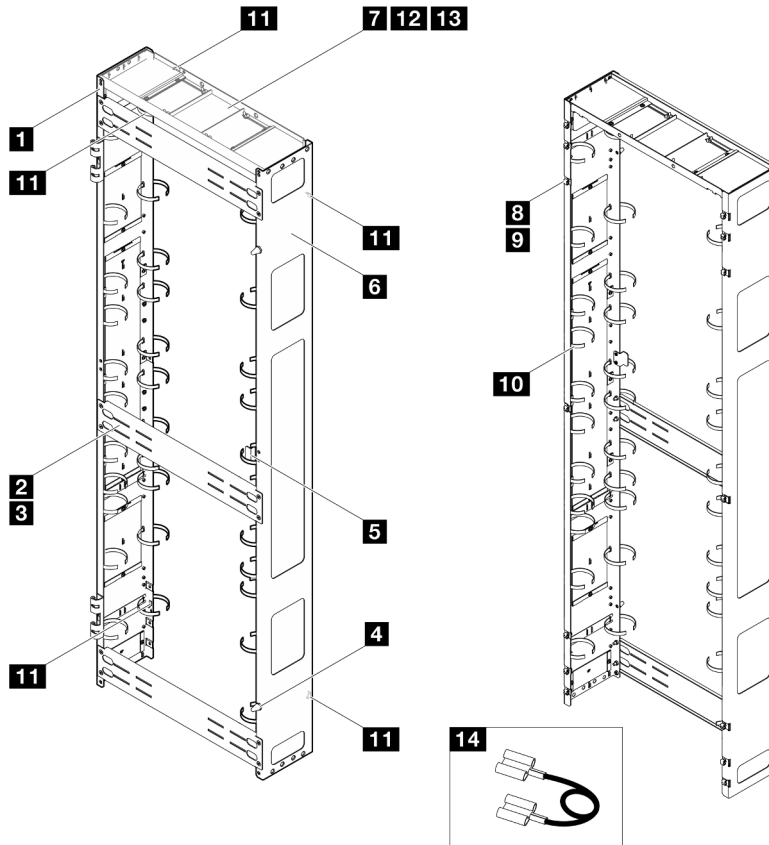


Figure 70. Parts

No.	Description	Quantity	No.	Description	Quantity
<b>1</b>	Left extension panel	1	<b>8</b>	M6 cage nut	14
<b>2</b>	Support bracket	3	<b>9</b>	M6 x 16 mm hex head flange screw	14
<b>3</b>	M6 x 12 mm flat head socket cap screw	12	<b>10</b>	Cable strap module <sup>123</sup>	2
<b>4</b>	Doorstop	2	<b>11</b>	Grounding plate	5
<b>5</b>	Door latch	1	<b>12</b>	M6 x 16 mm flat head socket cap screw	2
<b>6</b>	Right extension panel	1	<b>13</b>	M4 x 6 mm flat head socket cap screws	4
<b>7</b>	Extension top cover	1	<b>14</b>	Grounding wire <sup>4</sup>	3

- <sup>1</sup> Cable straps are removable, remove the straps from the extension panels if needed.
- <sup>2</sup> Cable straps can be lengthened by connecting two or more straps together.

- <sup>3</sup> Use cable straps to secure PDUs and manifolds prior to shipping.
- <sup>4</sup> Connect one end of the grounding wire to the grounding plate on the extension panel and the other end to the nearest grounding plate on the rack.

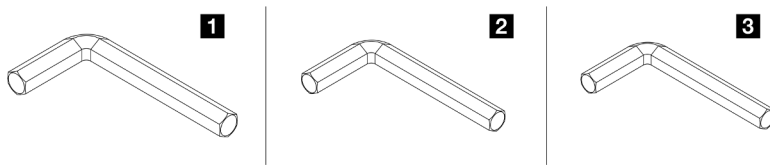


Figure 71. Hex Allen wrenches

No.	Description
<b>1</b>	Hex Allen wrench, 4 mm
<b>2</b>	Hex Allen wrench, 3 mm
<b>3</b>	Hex Allen wrench, 2.5 mm

## Procedure

Step 1. Remove the door.

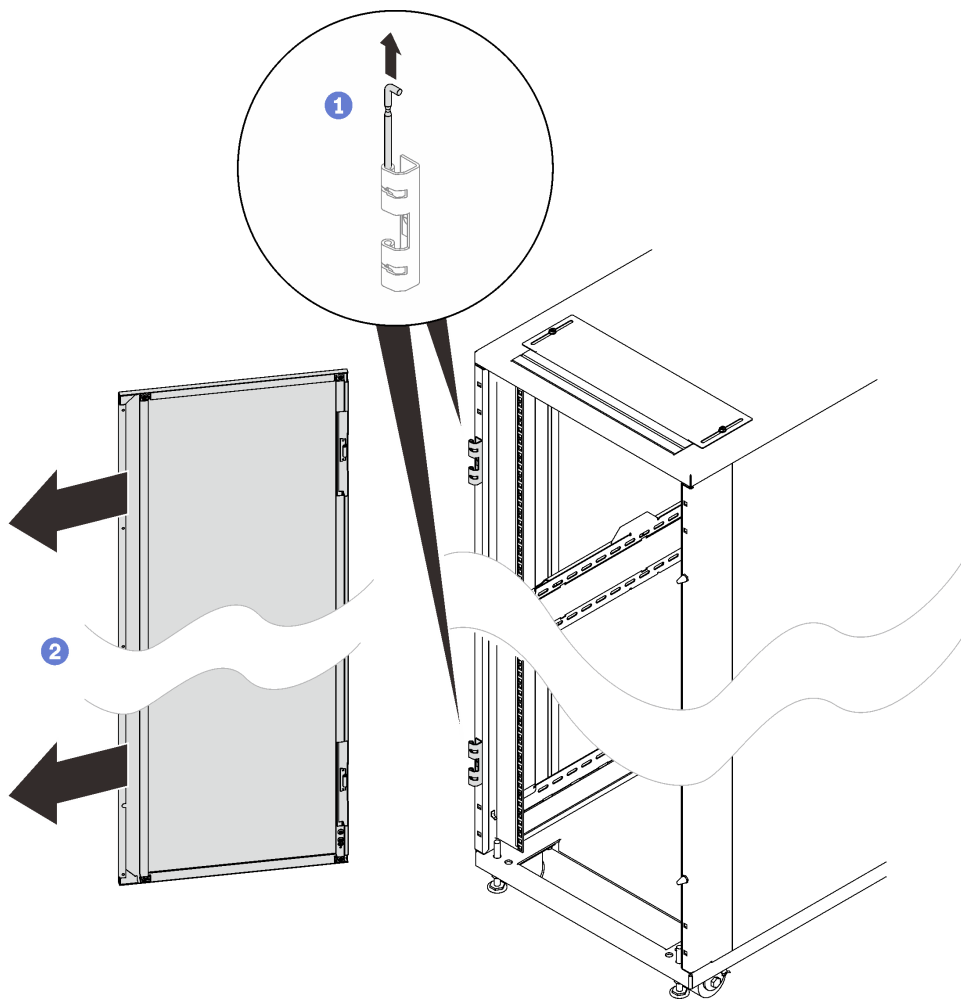


Figure 72. Removing a door

- 1 Hold the door in place, and lift both hinge pins until they lock in the open position so that the door is disengaged.
- 2 Remove the door from the rack cabinet frame.

Step 2. Remove the two hinges and the two doorstops.

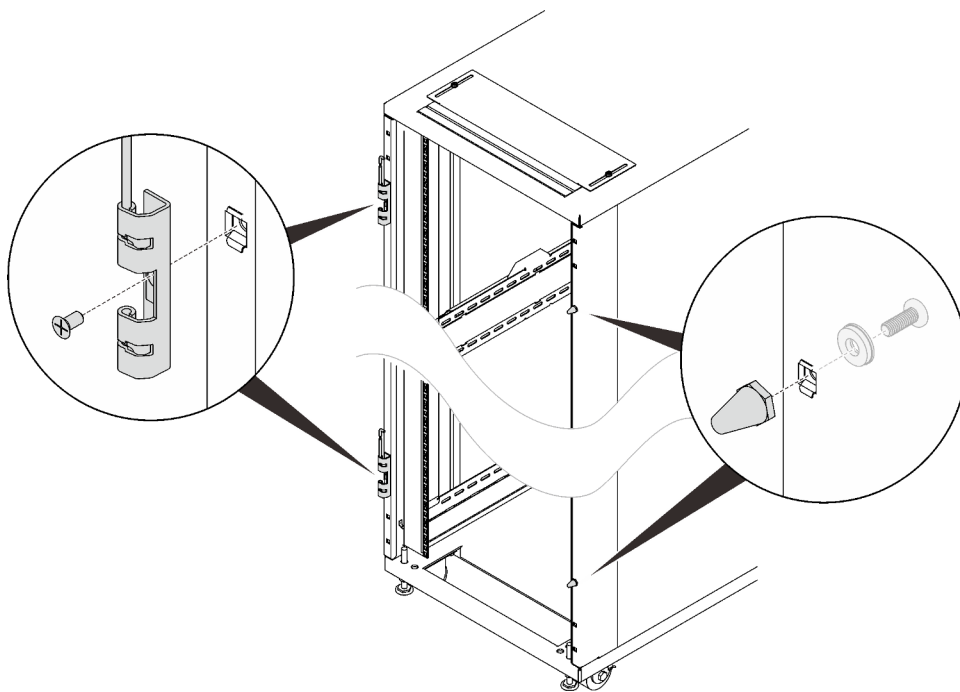


Figure 73. Removing the door hinges and doorstops

Step 3. Remove the door latch.

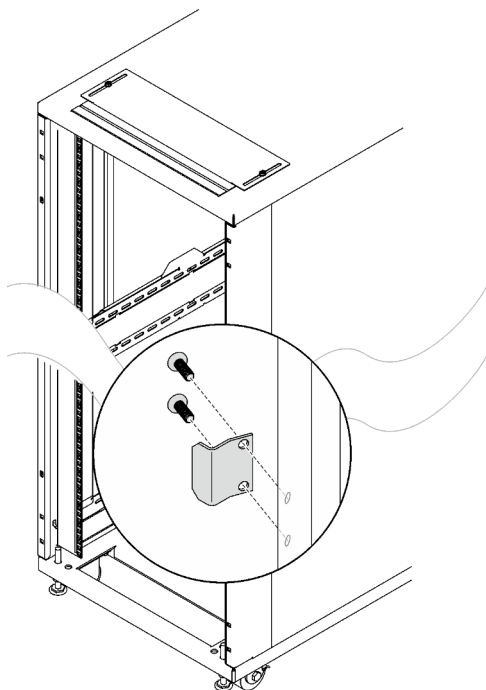


Figure 74. Removing the door latch

Step 4. Install fourteen M6 cage nuts to the rack frame with [cage nut insertion tool](#) or a [flat-blade screwdriver](#).

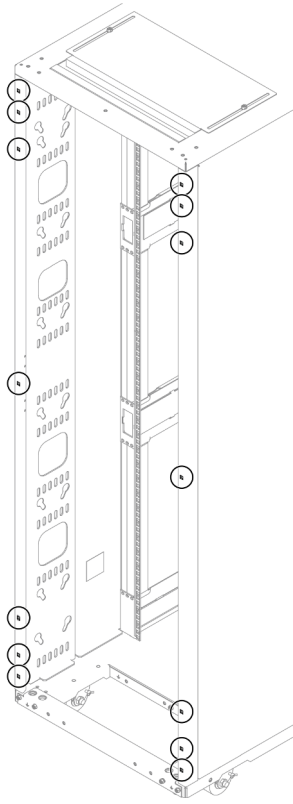


Figure 75. Cage nut installation location

### With cage nut insertion tool

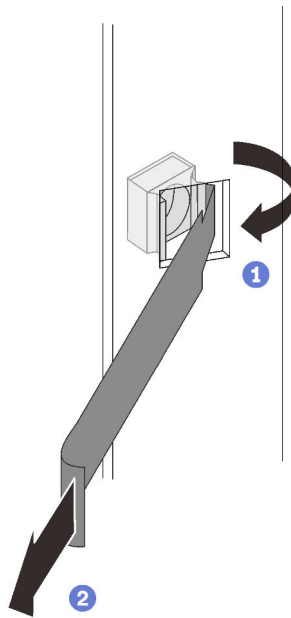


Figure 76. Installing cage nuts with cage nut insertion tool

- 1 Insert one edge of the cage nut into the target mounting flange hole, and hook the other edge with the insertion tool through the flange hole.
- 2 Rotate and pull the tool to force the other nut edge into the flange hole, and thus secure the nut.

### With flat blade screwdriver

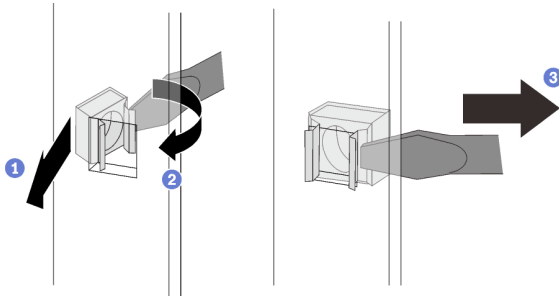
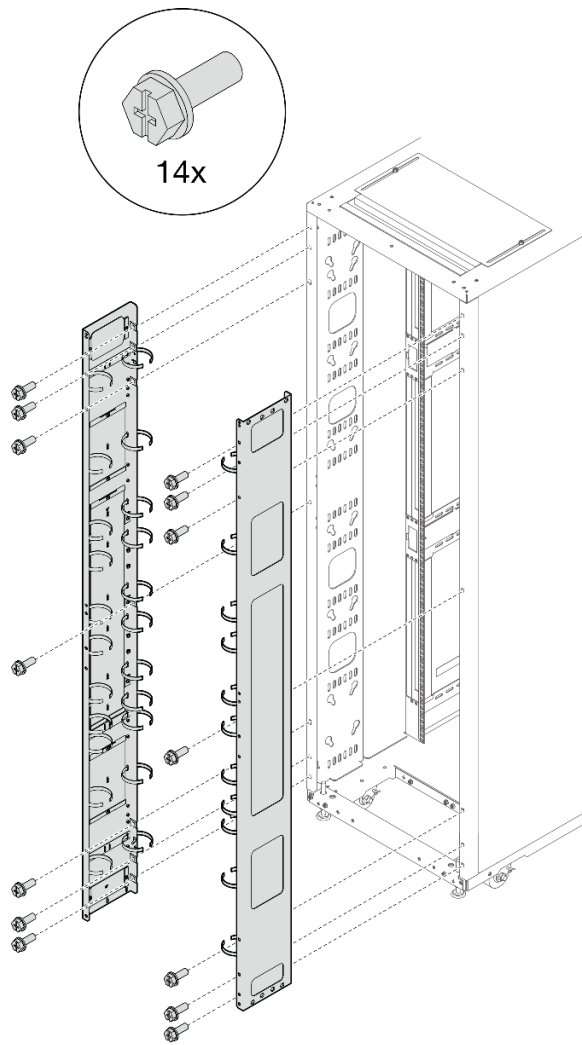


Figure 77. Installing cage nuts with flat blade screwdriver

- 1 Insert one edge of the cage nut into the target mounting flange hole.
- 2 Press and compress the other nut edge with a flat-blade screwdriver, and rotate the screwdriver towards the flange hole until the nut edge goes in the hole.
- 3 Release the screwdriver to secure the nut in the mounting flange hole.

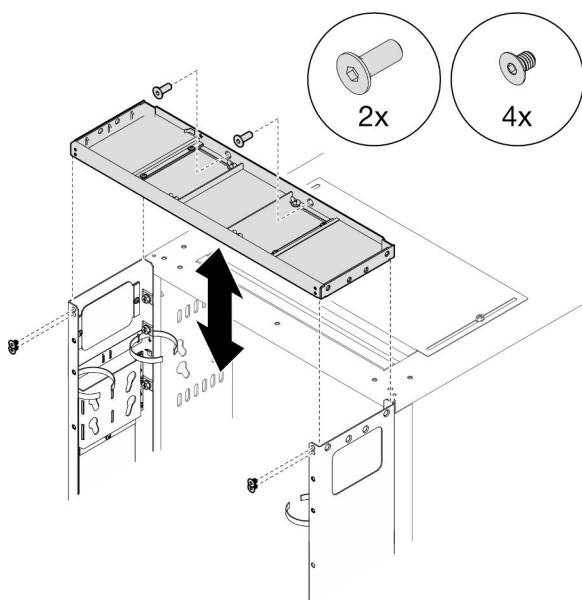
Step 5. Tighten the fourteen screws to secure the two extension panels to the rack.

**Note:** If baying kit has been installed previously, make sure to remove the two screws from top and bottom of the cabinet first. Then, secure the screws through the panel and the baying kit.



*Figure 78. Installing the extension panels*

- Step 6. Align the extension top cover with the screw holes on the extension panels, and secure it with six screws.



*Figure 79. Installing the extension top cover*

Step 7. Depending on the requirements, remove the filler(s) from the extension panels to route cables.

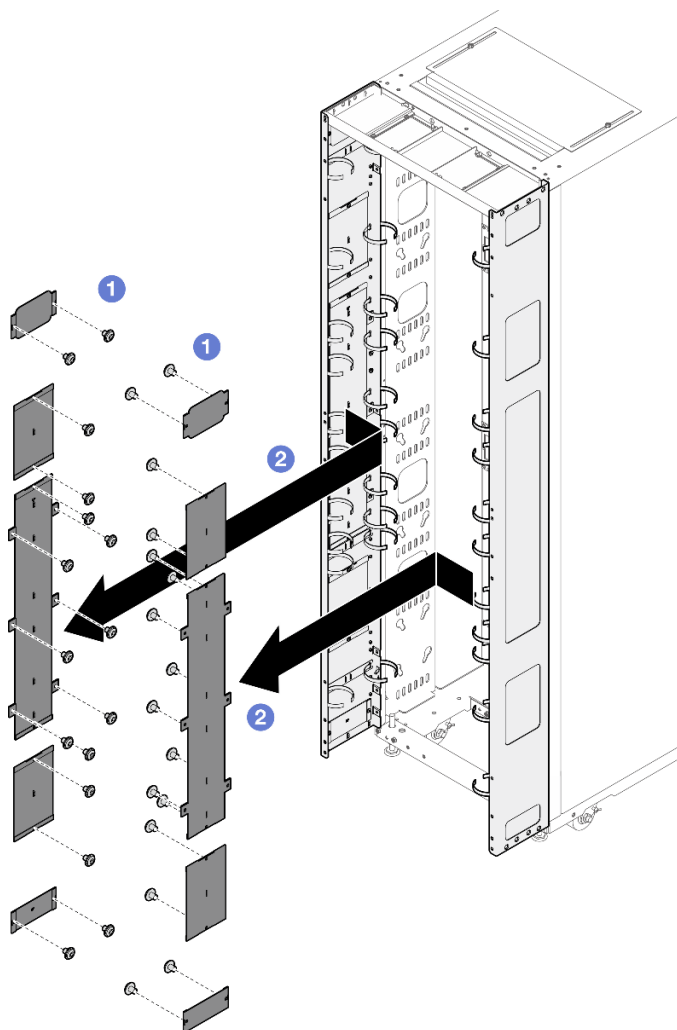


Figure 80. Removing the fillers

1. **1** Loosen the screws that secure the filler to the extension panel.
2. **2** Remove the filler.

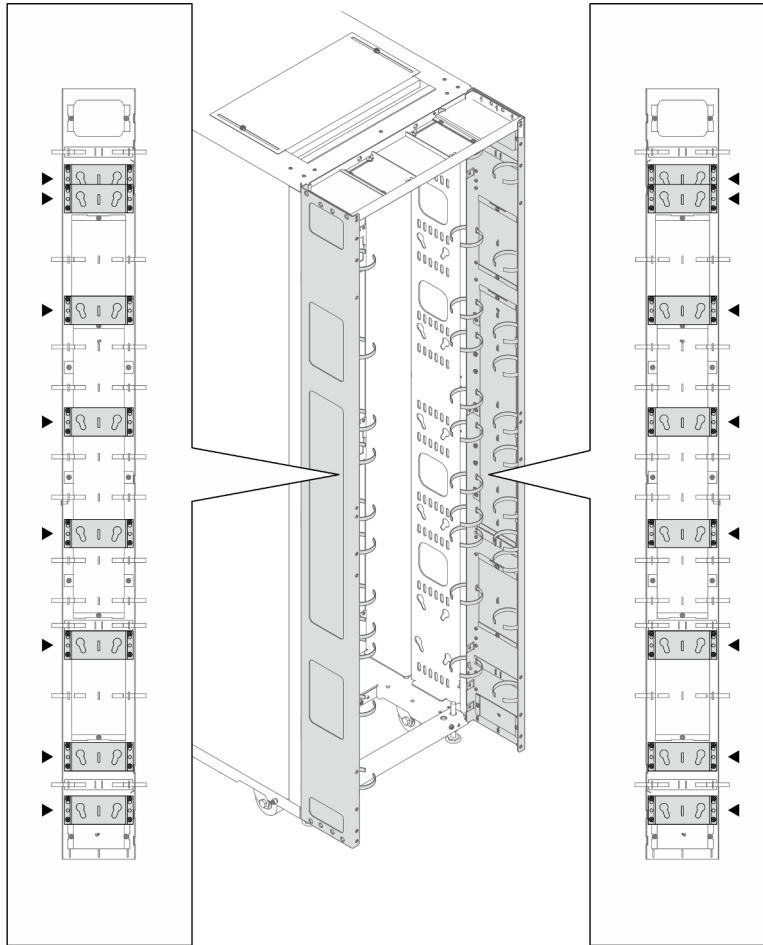
Step 8. If there is a plan to install 0U PDU to the extension panel, complete the following steps.

Depending on the requirements, select the corresponding installation procedures.

- **Bracket with two keyhole slots (up to two PDUs, or one PDU and one manifold)**

**Notes:**

- Below illustration shows the locations for installing the brackets.



*Figure 81. Locations for installing the brackets with two keyhole slots*

- If one or two brackets are installed in the locations indicated in the illustration below, the M6 hex head flange screw must be replaced with an M6 round head flange screw.

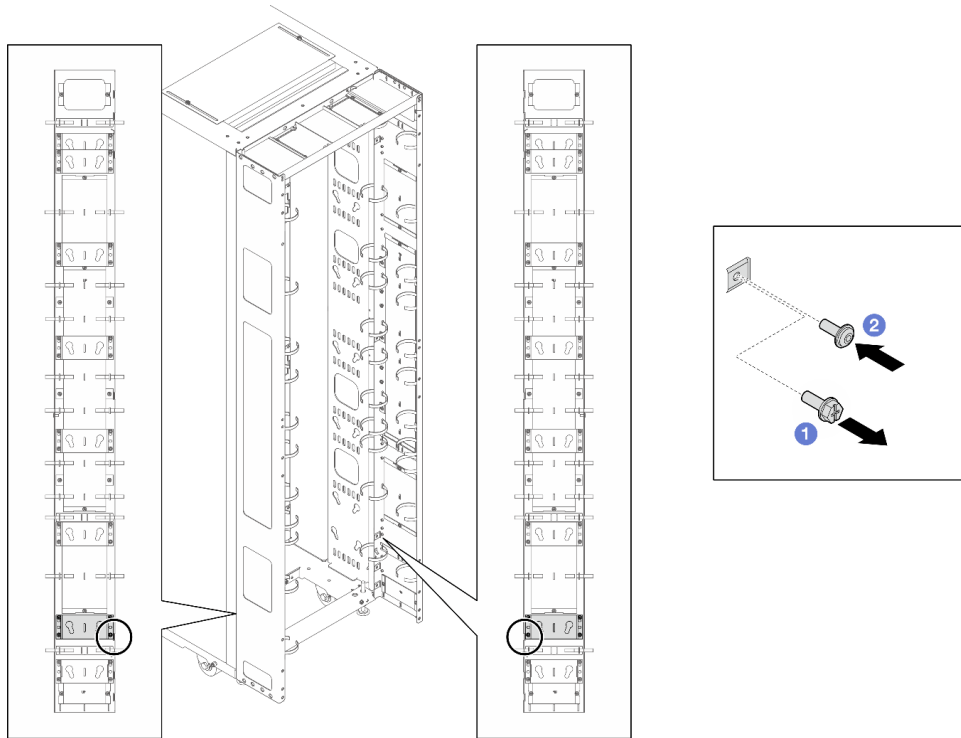
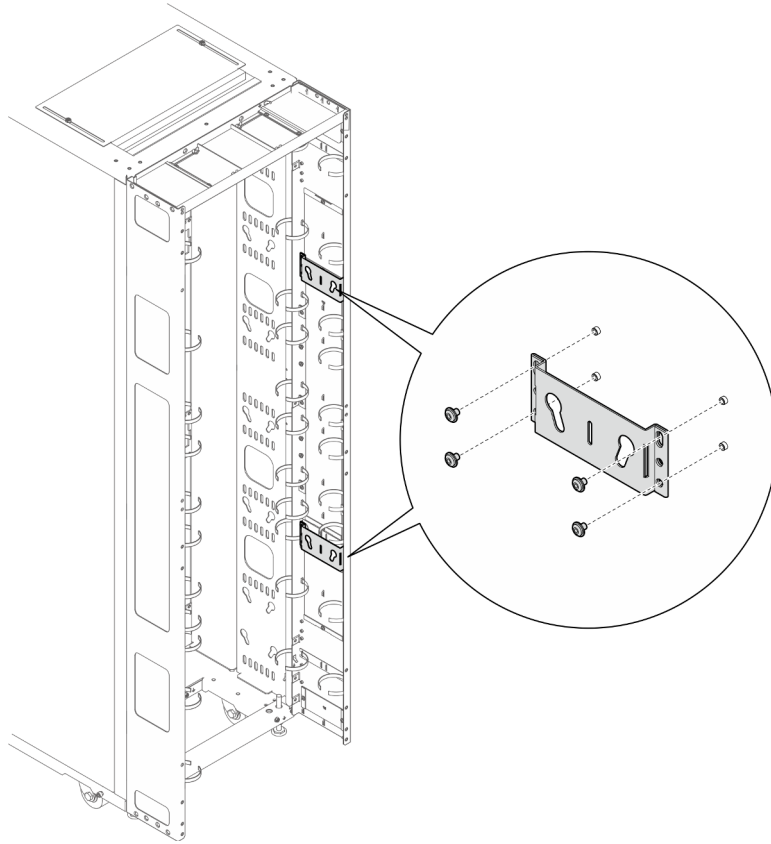


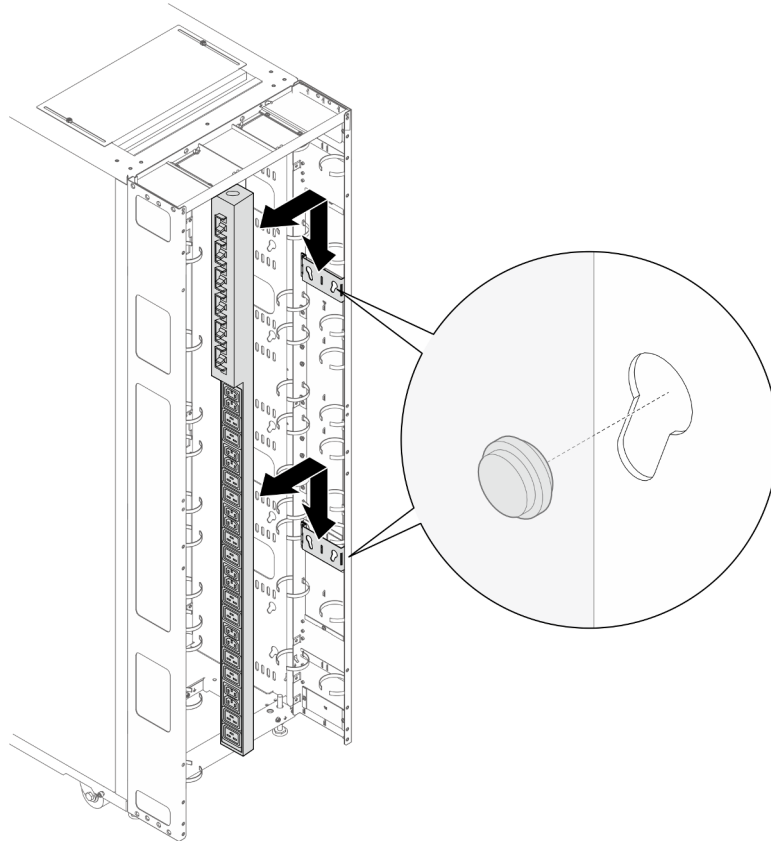
Figure 82. Replacing the screws

1. **1** Remove the M6 hex head flange screw.
  2. **2** Install the M6 round head flange screw.
1. Align the bracket with the extension panel, and secure it with four screws.



*Figure 83. Installing the bracket with two keyhole slots*

2. Insert the two PDU pegs into the keyhole slots on the brackets, and push down the PDU to secure it to the brackets. Choose the left or right slot for PDU installation based on the requirements.



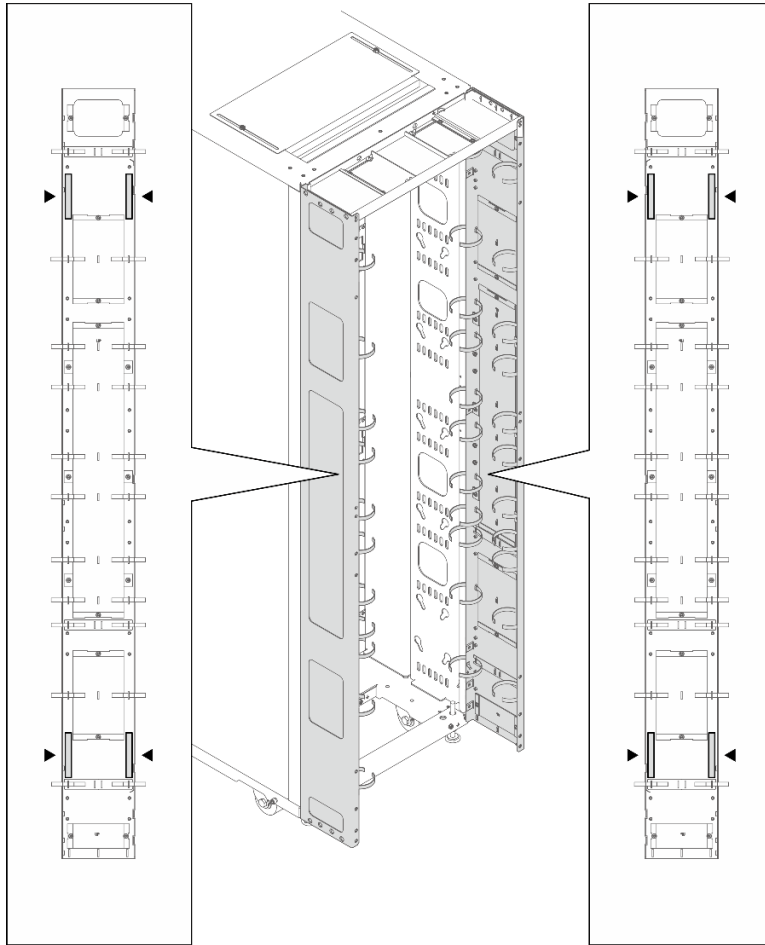
*Figure 84. Installing the PDU*

**Note:** PDU can be rotated 180 degrees for installation with the input cable at the bottom.

- **L-shaped bracket (up to two PDUs, or one PDU and one manifold)**

**Notes:**

- Below illustration shows the locations for installing the brackets.



*Figure 85. Locations for installing the L-shaped brackets*

- If one or two brackets are installed in the locations indicated in the illustration below, the M6 hex head flange screw must be replaced with an M6 round head flange screw.

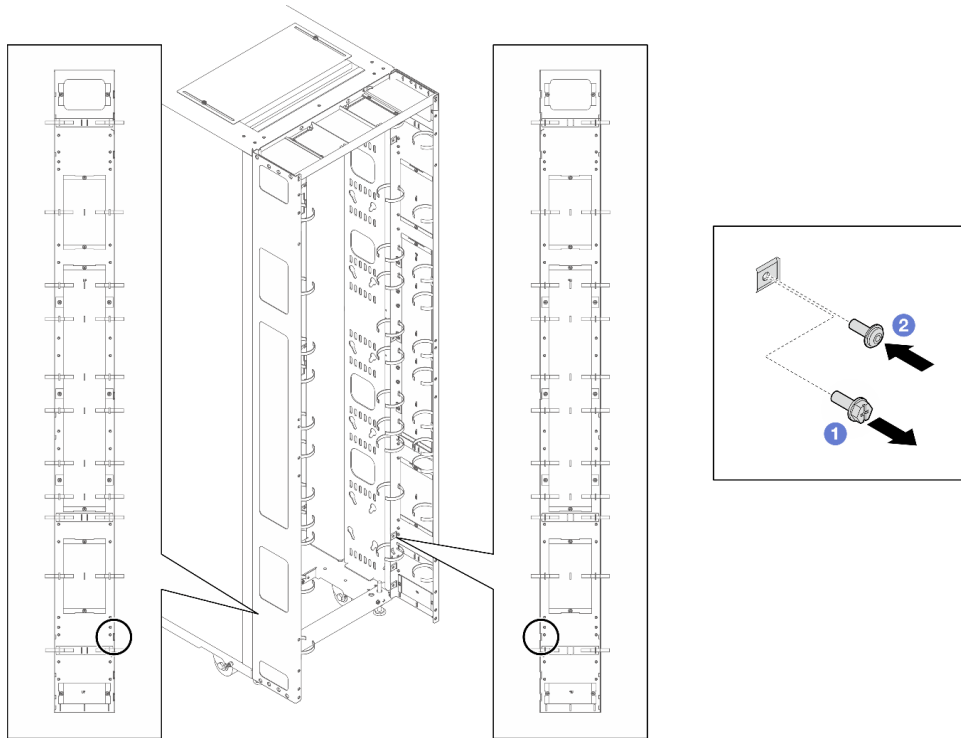
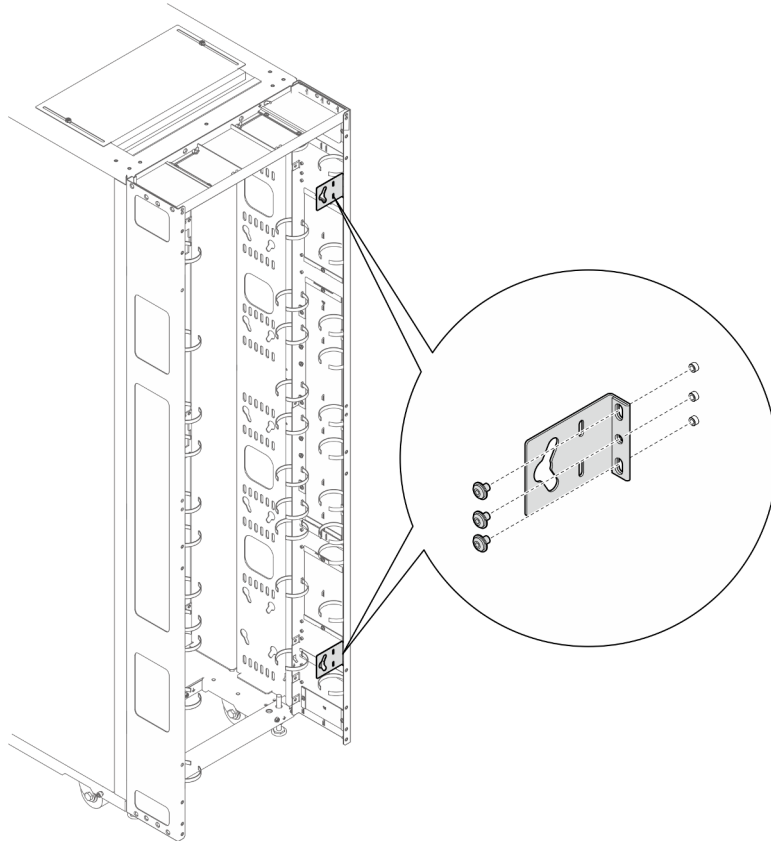
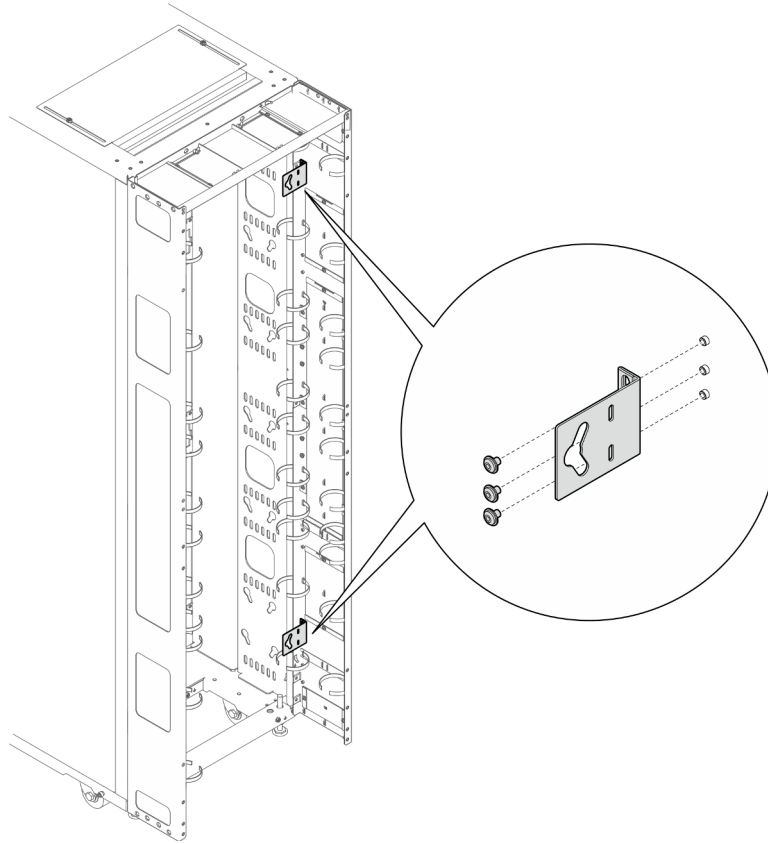


Figure 86. Replacing the screw

1. **1** Remove the M6 hex head flange screw.
  2. **2** Install the M6 round head flange screw.
1. Align the bracket with the extension panel, and secure it with three screws. Choose the installation location for the bracket based on the orientation of the PDU.

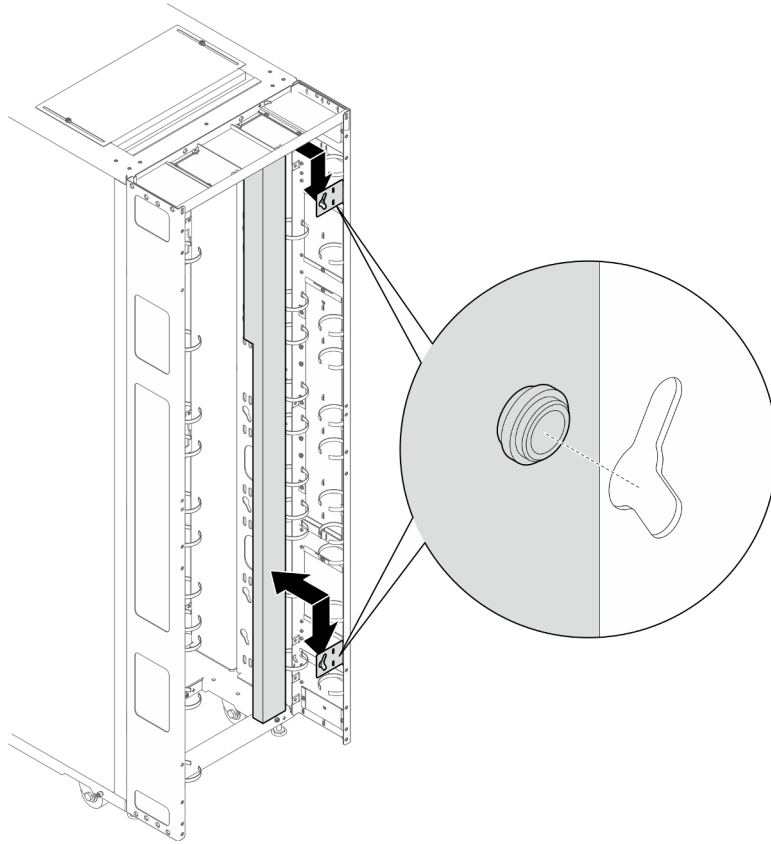


*Figure 87. Installing the L-shaped bracket with the PDU facing the front of the rack cabinet*

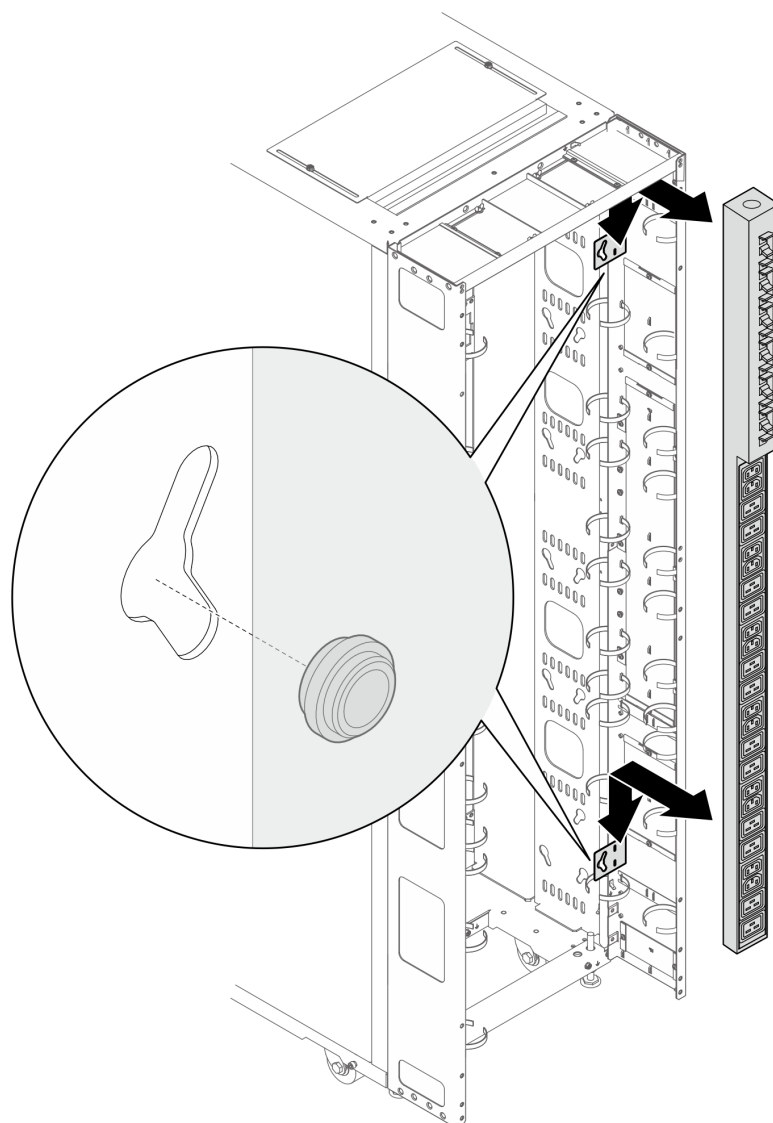


*Figure 88. Installing the L-shaped bracket with the PDU facing the front of the rack cabinet*

2. Insert the two PDU pegs into the keyhole slots on the brackets, and push down the PDU to secure it to the brackets.



*Figure 89. Installing the PDU with the PDU facing the front of the rack cabinet*



*Figure 90. Installing the PDU with PDU facing the rear of the rack cabinet*

Step 9. Depending on the requirements, select one of the following methods to ensure there is sufficient space for routing cables.

- **Slide the brush panel**

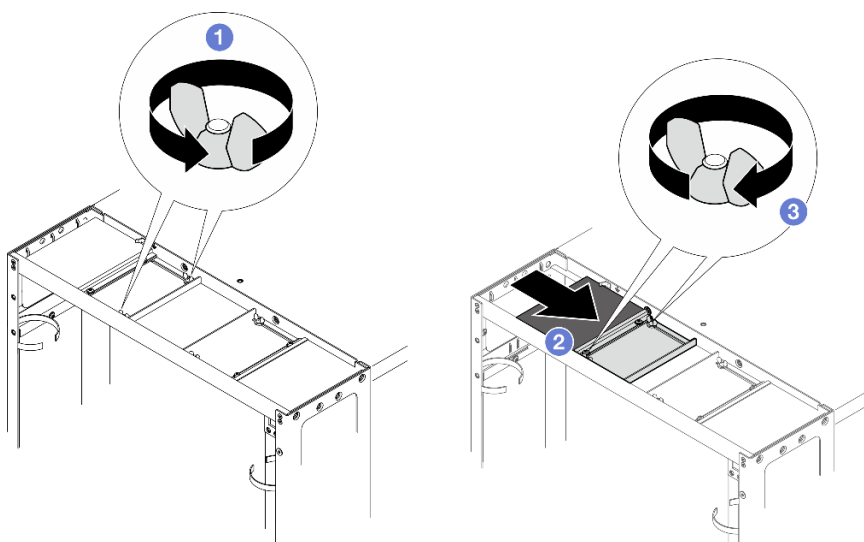


Figure 91. Sliding the brush panel

1. **1** Loosen the two screws that secure the baffle to the top cover.
2. **2** Slide the baffle and brush panel toward the center of the top cover.
3. **3** Tighten the two screws to secure the baffle.

- **Remove the brush panel**

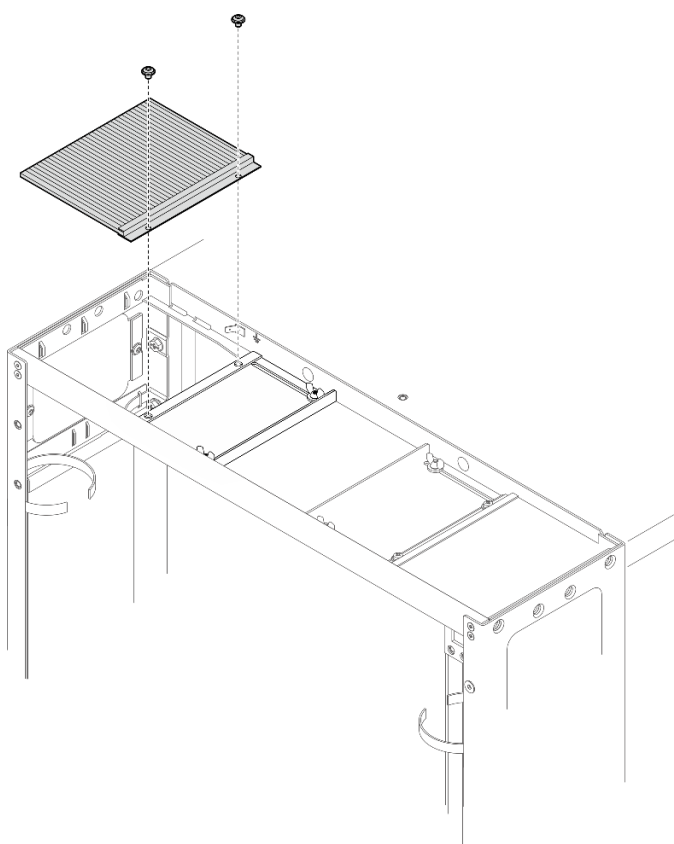
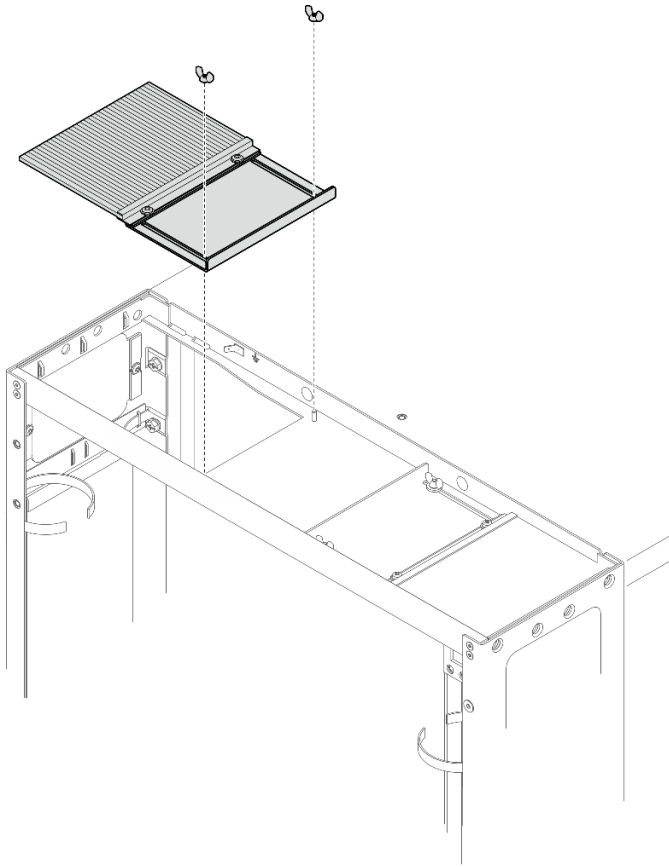


Figure 92. Removing the brush panel

Loosen the two screws to remove the brush panel from the top cover.

- **Remove the brush panel and baffle**



*Figure 93. Removing the brush panel and baffle*

Loosen the two screws to remove the brush panel and baffle from the top cover.

Step 10. Install the two door hinges and the door latch to the extension panels.

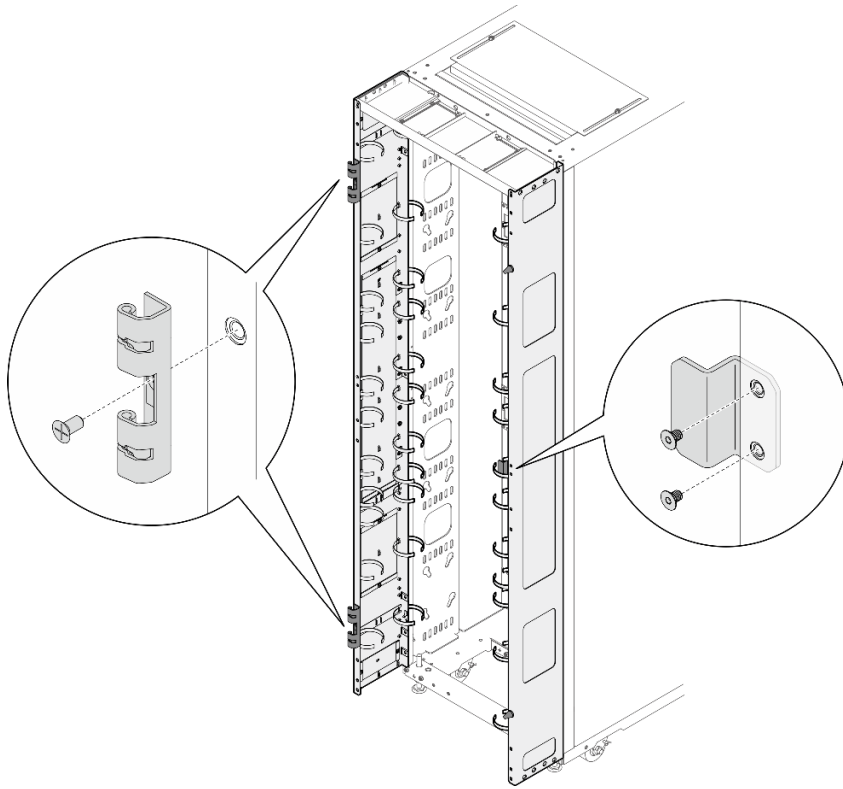


Figure 94. Installing the door hinges and door latch

Step 11. If the rack needs to be shipped, install the three support brackets.

**Note:** Depending on the requirement, remove the support brackets upon arrival at the site.

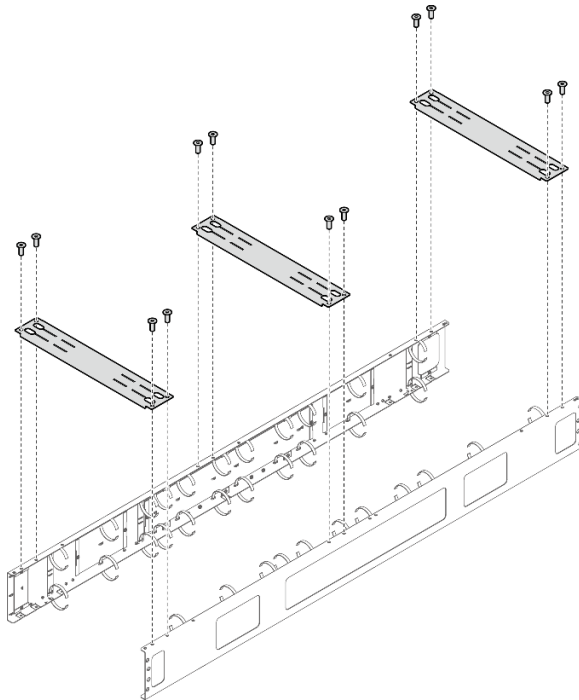


Figure 95. Installing the support brackets

Step 12. Install the door back to the rack.

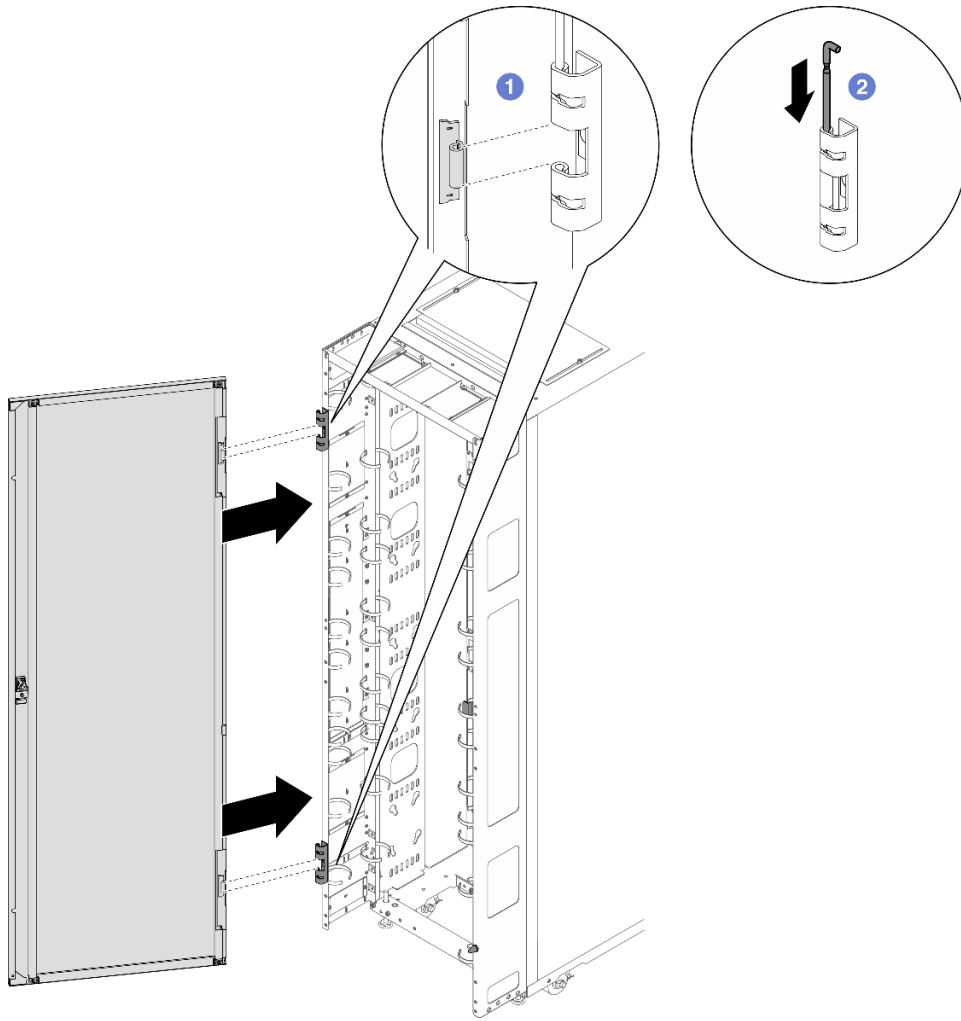


Figure 96. Installing the door

- 1 Align the door with the hinges, and hold the door in place.
- 2 Push the hinge pins down to the closed position so that the door is secured.

## Install 42U Advanced Rack Extension Kit with RDHX

See this topic to learn how to install 42U Advanced Rack Extension Kit and RDHX.

### Notes:

- Each unit of rack extension kit comes with additional capacity for up to two 0U PDUs, or one 0U PDU and one manifold, on each side of the rack.
- Each rack cabinet supports up to two units of rack extension kit (one to the front and one to the rear side).
- If there is a plan to install baying kit while only one of the adjacent cabinets will be installed with extension, make sure to install the baying kit first (see [“Install the baying kit” on page 28](#)). Then, as preparation for this procedure, remove the two screws from the upper and lower part of the cabinet that will be installed with the extension kit, and skip to [Step 5 on page 94](#).

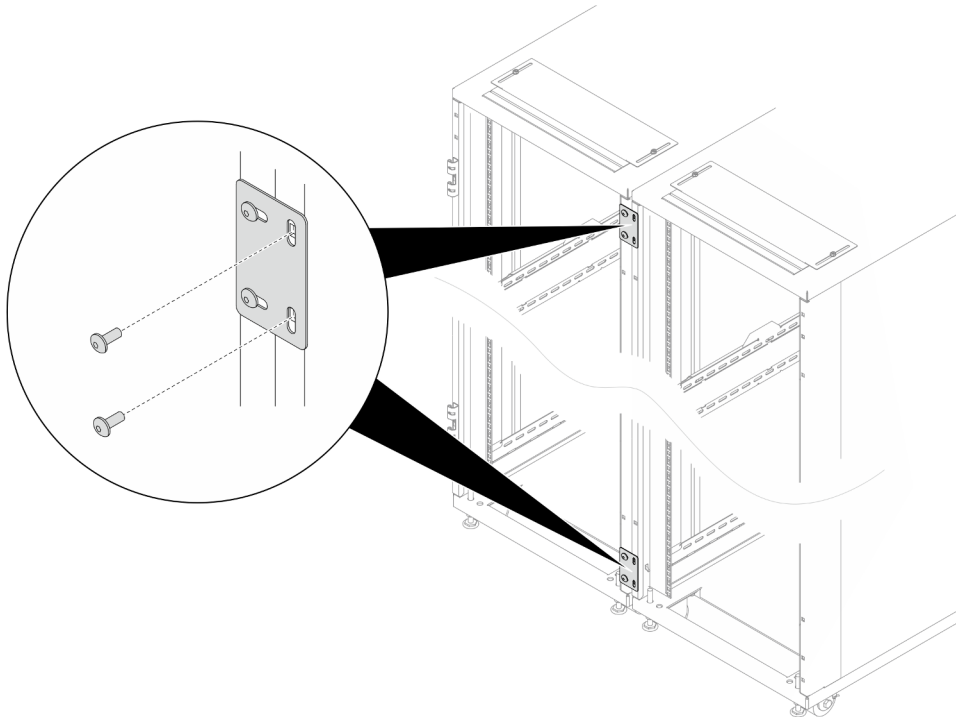


Figure 97. Removing screws to prepare for extension installation

- **Required tools**
  - One tool with plastic blade/scissors to open the packaging
  - One rubber hammer to align the extension panels with the side of the rack
  - One Screwdriver with No. 3 Phillips bit to tighten the M6 screws (9 in the next bullet point)
  - One Nut-driver with holding hex bit 10 mm to tighten the M6 screws (9 in the next bullet point)
  - One 2.5 mm Hex bit socket to tighten the M4 screws (13 in the next bullet point)
  - One 3 mm Hex bit socket to tighten the M5 screws (PDU/manifold brackets, opening covers on the extension panels)
  - One 4 mm Hex bit socket to tighten the M6 screws (4 and 14 in the next bullet point)
- The extension kit comes with a miscellaneous bag, which contains the following components:

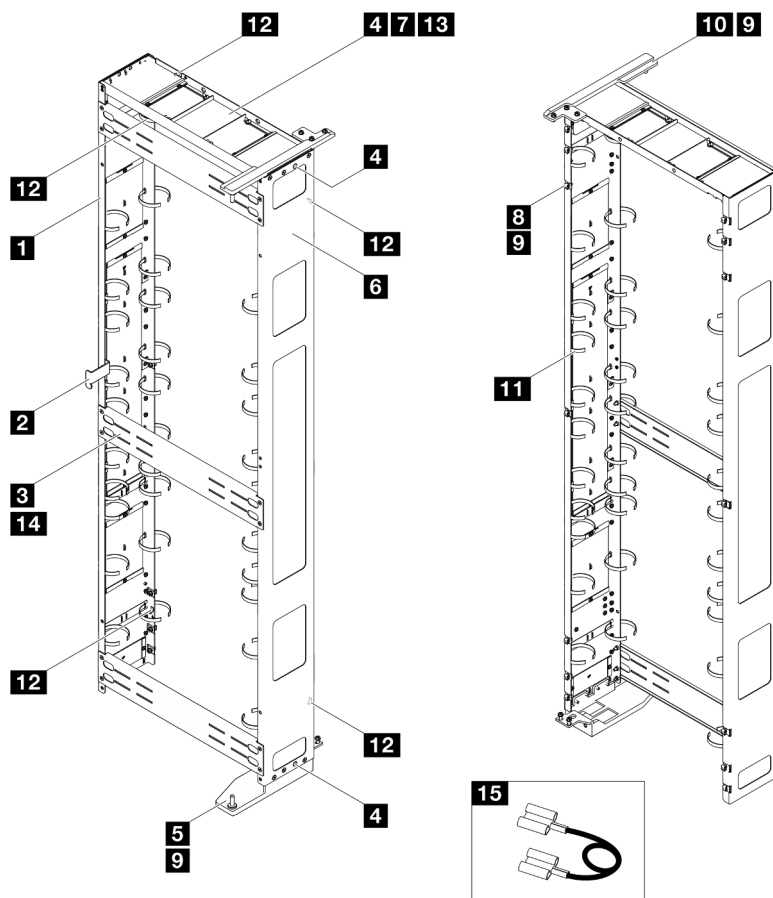


Figure 98. Parts

No.	Description	Quantity	No.	Description	Quantity
<b>1</b>	Left extension panel	1	<b>9</b>	M6 x 16 mm hex head flange screw	21
<b>2</b>	Latch plate	1	<b>10</b>	Top hinge for RDHX	1
<b>3</b>	Support bracket	3	<b>11</b>	Cable strap module <sup>1, 2, 3</sup>	2
<b>4</b>	M6 x 16 mm flat head socket cap screw	10	<b>12</b>	Grounding plate	5
<b>5</b>	Bottom hinge for RDHX	1	<b>13</b>	M4 x 6 mm flat head socket cap screws	4
<b>6</b>	Right extension panel	1	<b>14</b>	M6 x 12 mm flat head socket cap screw	12
<b>7</b>	Extension top cover	1	<b>15</b>	Grounding wire <sup>4</sup>	3
<b>8</b>	M6 cage nut	14			

– <sup>1</sup> Cable straps are removable, remove the straps from the extension panels if needed.

– <sup>2</sup> Cable straps can be lengthened by connecting two or more straps together.

– <sup>3</sup> Use cable straps to secure PDUs and manifolds prior to shipping.

- <sup>4</sup> Connect one end of the grounding wire to the grounding plate on the extension panel and the other end to the nearest grounding plate on the rack.

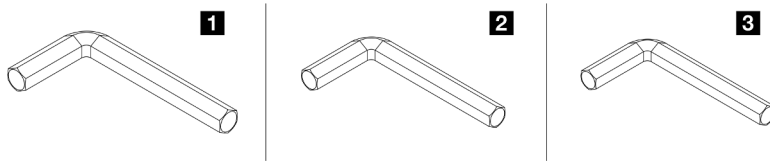


Figure 99. Hex Allen wrenches

No.	Description
<b>1</b>	Hex Allen wrench, 4 mm
<b>2</b>	Hex Allen wrench, 3 mm
<b>3</b>	Hex Allen wrench, 2.5 mm

## Procedure

Step 1. Remove the door.

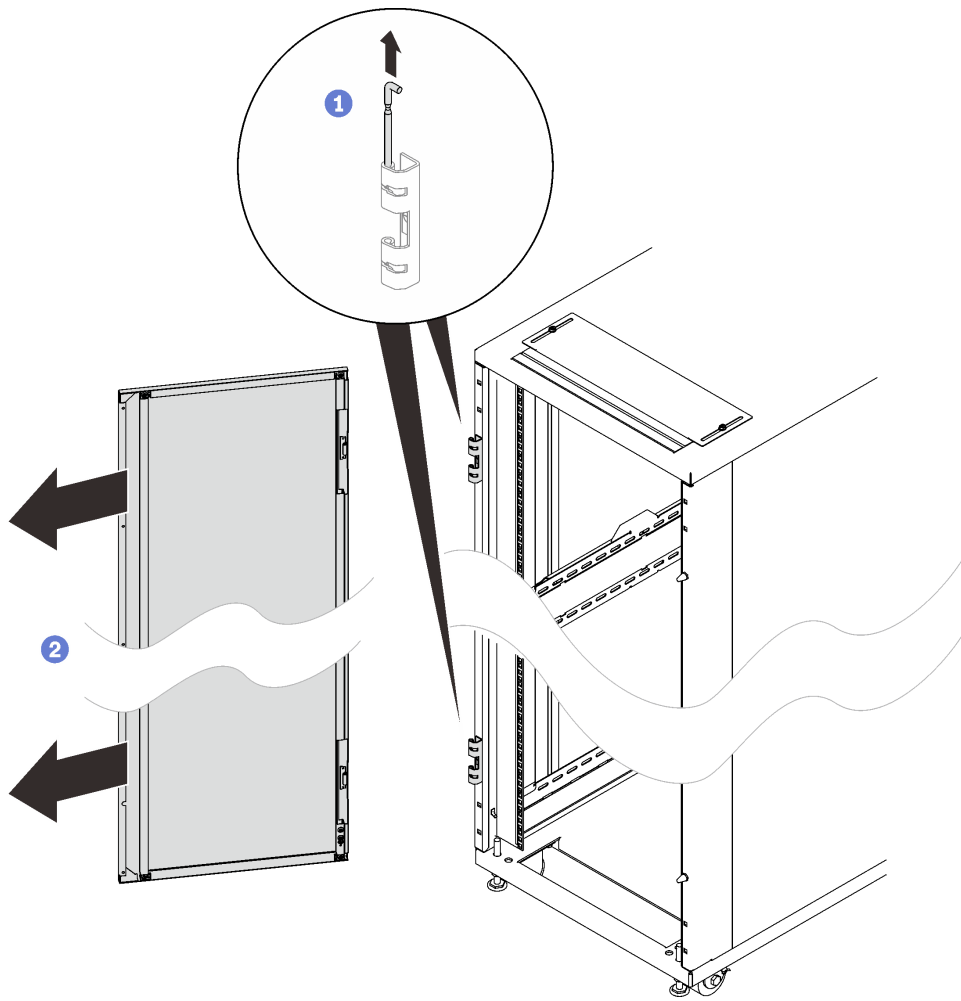


Figure 100. Removing a door

- 1 Hold the door in place, and lift both hinge pins until they lock in the open position so that the door is disengaged.
- 2 Remove the door from the rack cabinet frame.

Step 2. Remove the two hinges and the two doorstops.

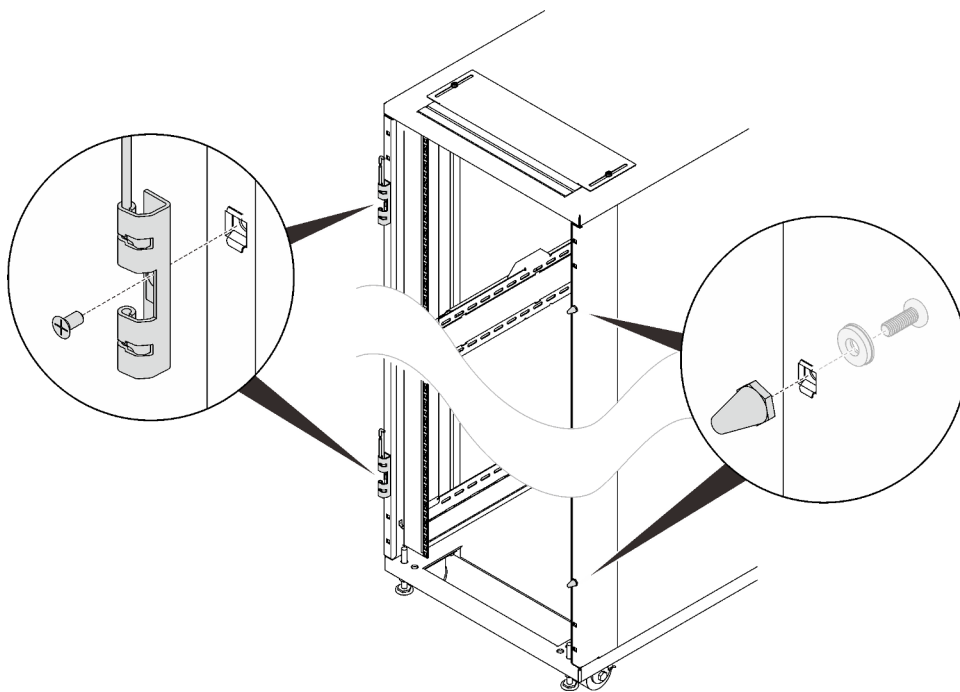


Figure 101. Removing the door hinges and extension bottom covers

Step 3. Remove the door latch.

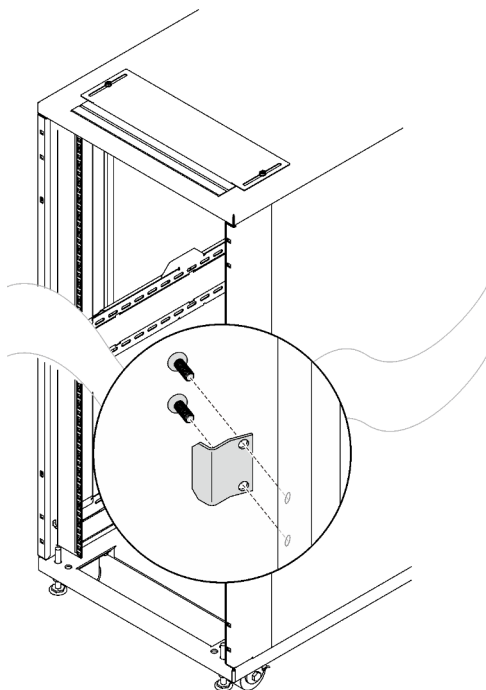


Figure 102. Removing the door latch

Step 4. Install fourteen M6 cage nuts to the rack frame with [cage nut insertion tool](#) or a [flat-blade screwdriver](#).

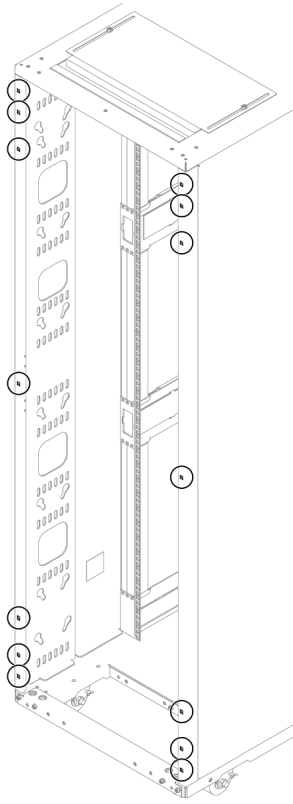


Figure 103. Cage nut installation location

### With cage nut insertion tool

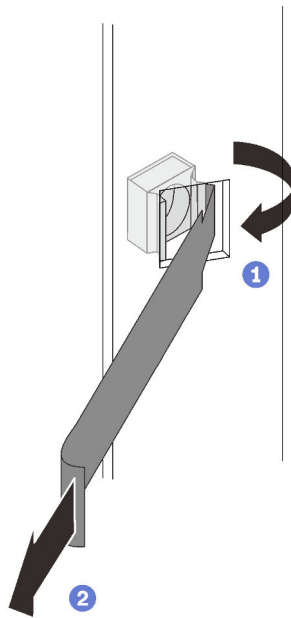


Figure 104. Installing cage nuts with cage nut insertion tool

- 1 Insert one edge of the cage nut into the target mounting flange hole, and hook the other edge with the insertion tool through the flange hole.
- 2 Rotate and pull the tool to force the other nut edge into the flange hole, and thus secure the nut.

### With flat blade screwdriver

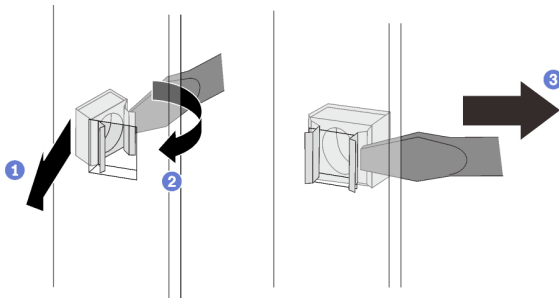


Figure 105. Installing cage nuts with flat blade screwdriver

- 1 Insert one edge of the cage nut into the target mounting flange hole.
- 2 Press and compress the other nut edge with a flat-blade screwdriver, and rotate the screwdriver towards the flange hole until the nut edge goes in the hole.
- 3 Release the screwdriver to secure the nut in the mounting flange hole.

Step 5. Install the bottom hinge.

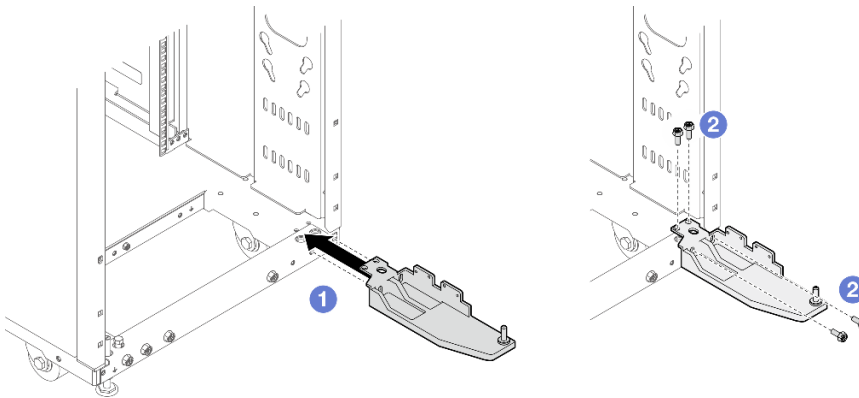


Figure 106. Securing the bottom hinge

**Note:** Do not fully tighten the four screws in this step.

- 1 Align the hinge with the rack.
- 2 Secure the hinge to the rack with four screws.

Step 6. Secure the two extension panels to the rack with fourteen screws.

#### Notes:

- Do not fully tighten the fourteen screws in this step.
- If baying kit has been installed previously, make sure to remove the two screws from top and bottom of the cabinet first. Then, secure the screws through the panel and the baying kit.

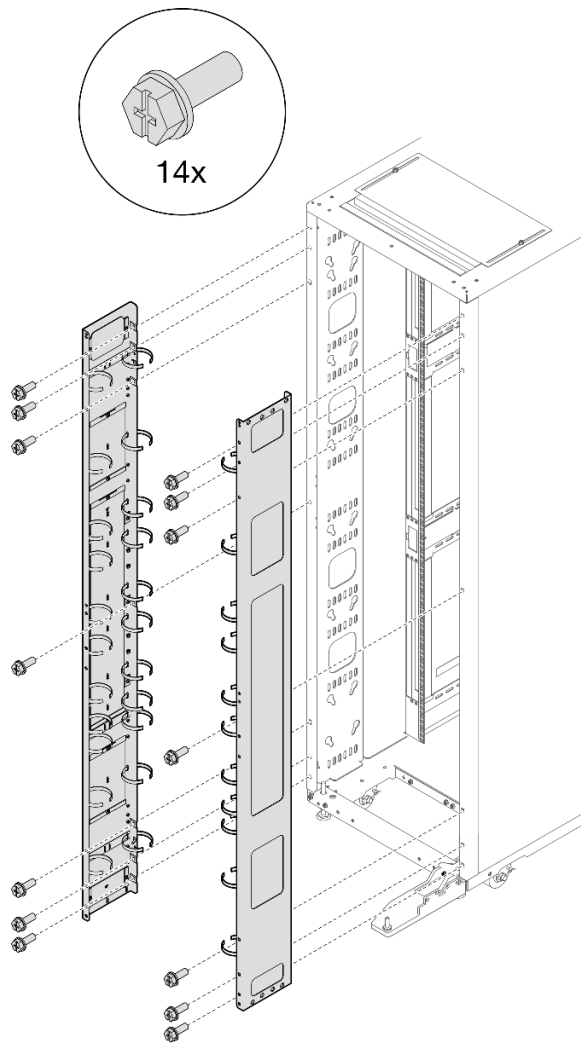
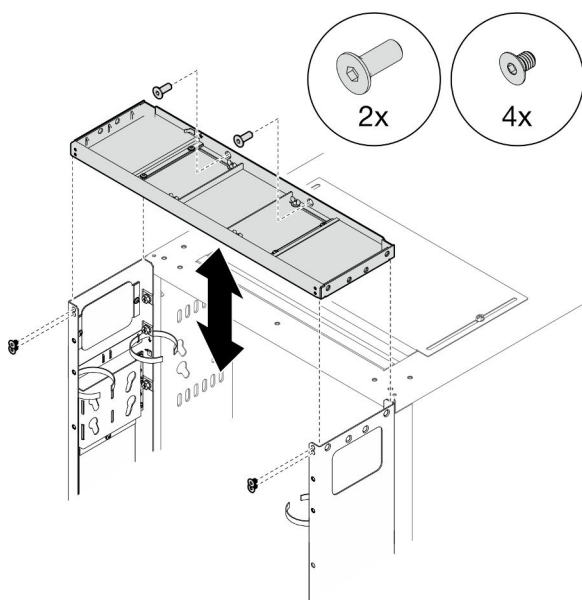


Figure 107. Installing the extension panels

- Step 7. Align the extension top cover with the screw holes on the extension panels, and secure it with six screws.



*Figure 108. Installing the extension top cover*

Step 8. Depending on the requirements, remove the filler(s) from the extension panels to route cables.

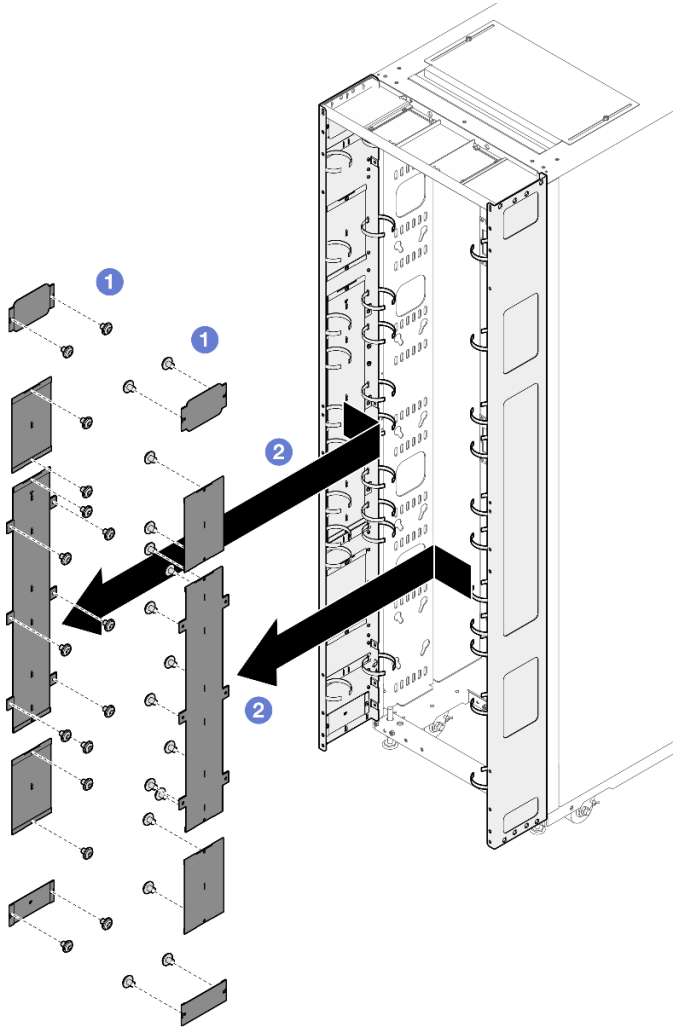


Figure 109. Removing the fillers

1. **1** Loosen the screws that secure the filler to the extension panel.
2. **2** Remove the filler.

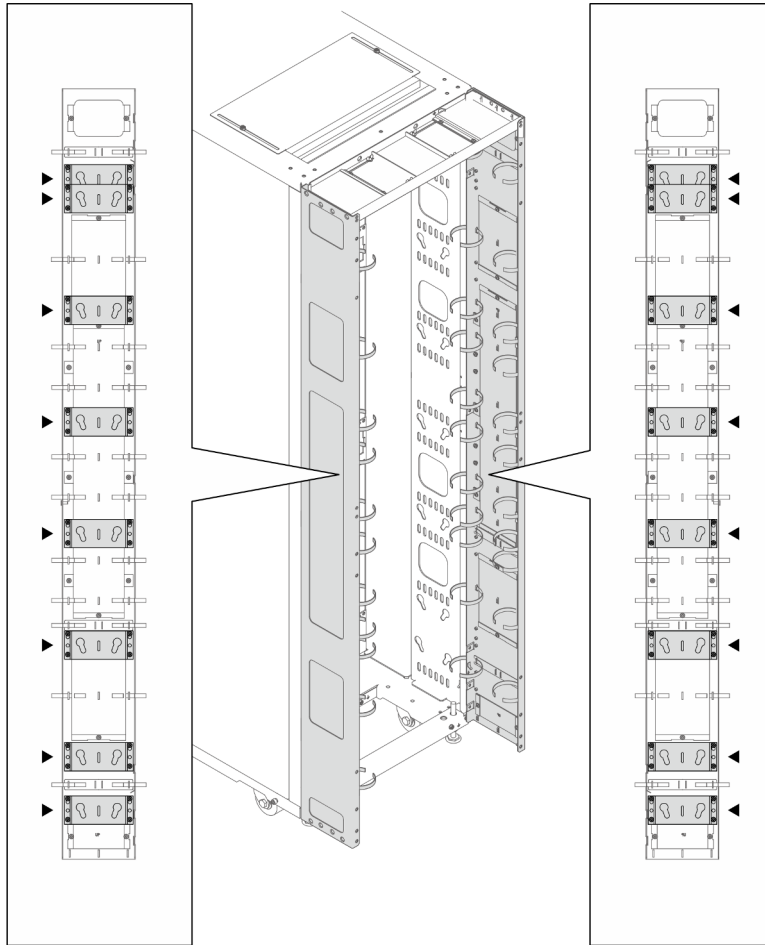
Step 9. If there is a plan to install 0U PDU to the extension panel, complete the following steps.

Depending on the requirements, select the corresponding installation procedures.

- **Bracket with two keyhole slots (up to two PDUs, or one PDU and one manifold)**

**Notes:**

- Below illustration shows the locations for installing the brackets.



*Figure 110. Locations for installing the brackets with two keyhole slots*

- If one or two brackets are installed in the locations indicated in the illustration below, the M6 hex head flange screw must be replaced with an M6 round head flange screw.

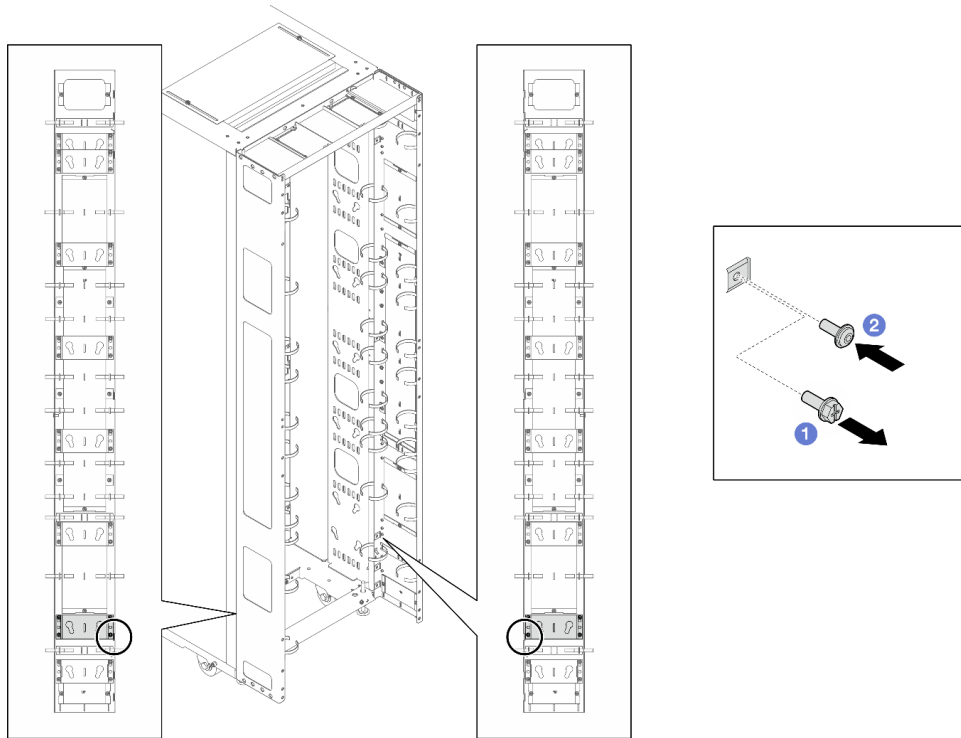
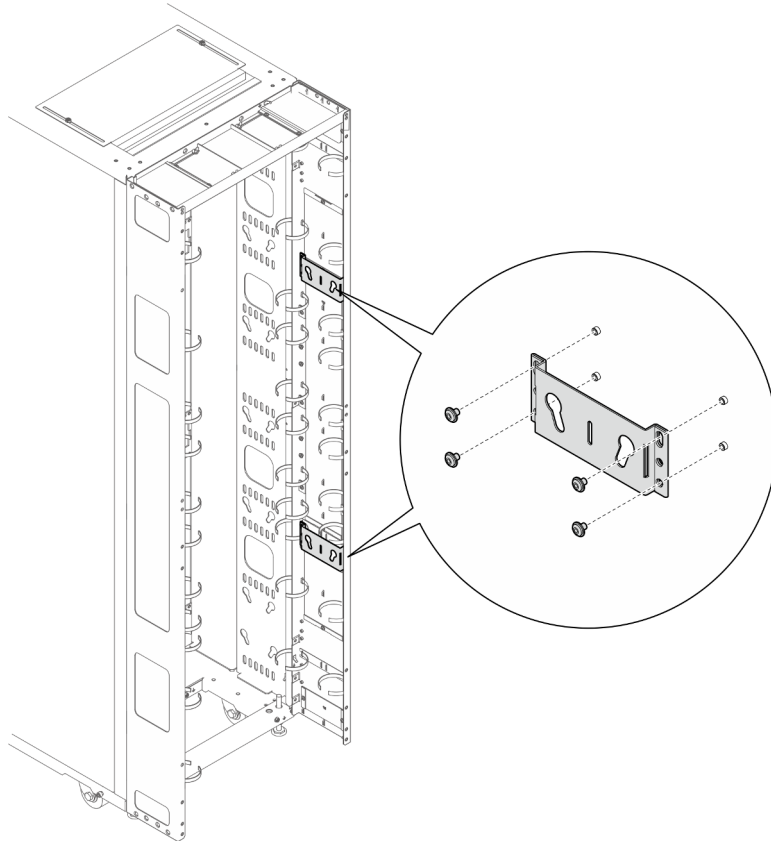


Figure 111. Replacing the screws

1. **1** Remove the M6 hex head flange screw.
  2. **2** Install the M6 round head flange screw.
1. Align the bracket with the extension panel, and secure it with four screws.



*Figure 112. Installing the bracket with two keyhole slots*

2. Insert the two PDU pegs into the keyhole slots on the brackets, and push down the PDU to secure it to the brackets. Choose the left or right slot for PDU installation based on the requirements.

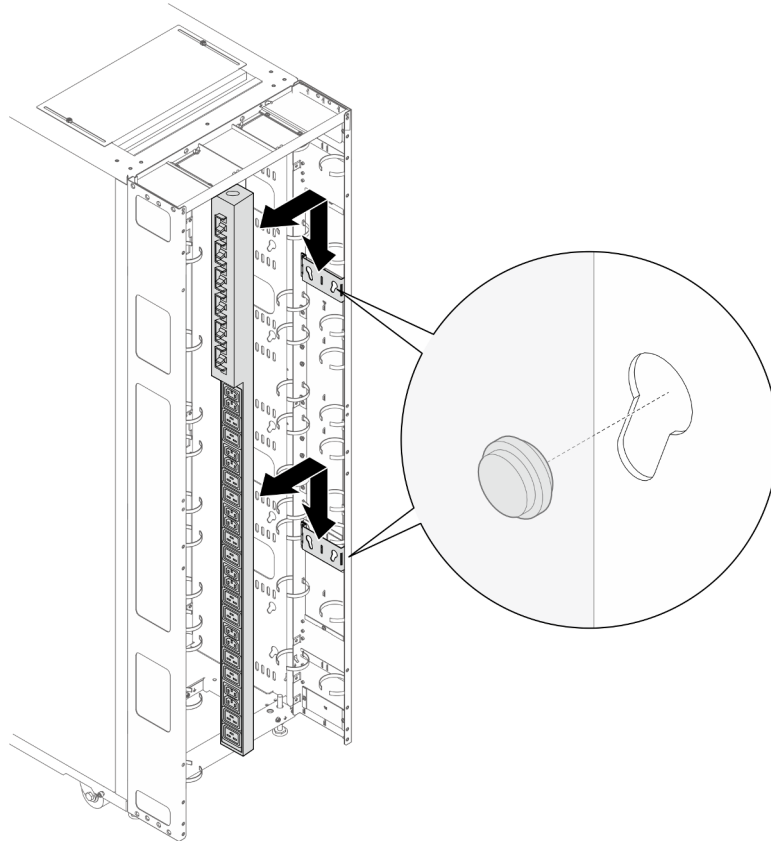


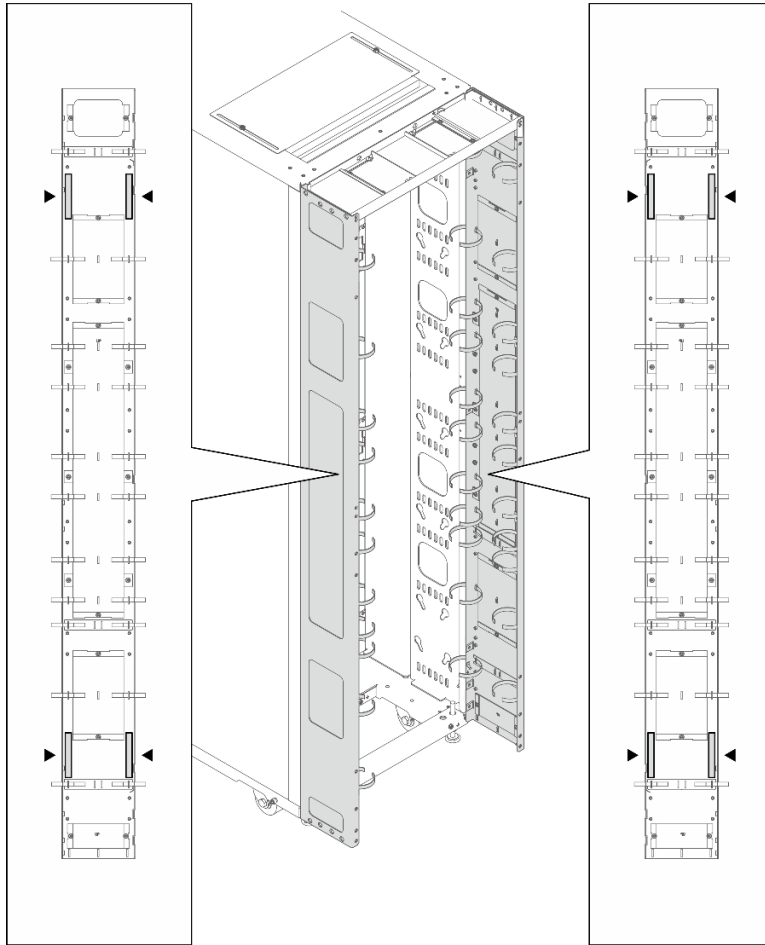
Figure 113. Installing the PDU

**Note:** PDU can be rotated 180 degrees for installation with the input cable at the bottom.

- **L-shaped bracket (up to two PDUs, or one PDU and one manifold)**

**Notes:**

- Below illustration shows the locations for installing the brackets.



*Figure 114. Locations for installing the L-shaped brackets*

- If one or two brackets are installed in the locations indicated in the illustration below, the M6 hex head flange screw must be replaced with an M6 round head flange screw.

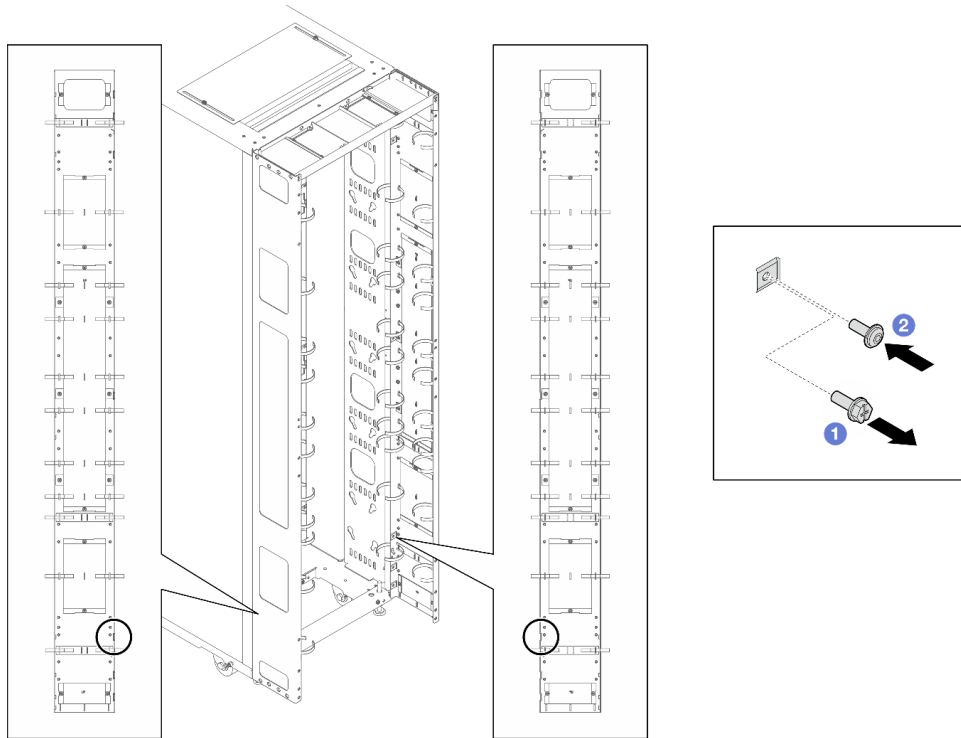
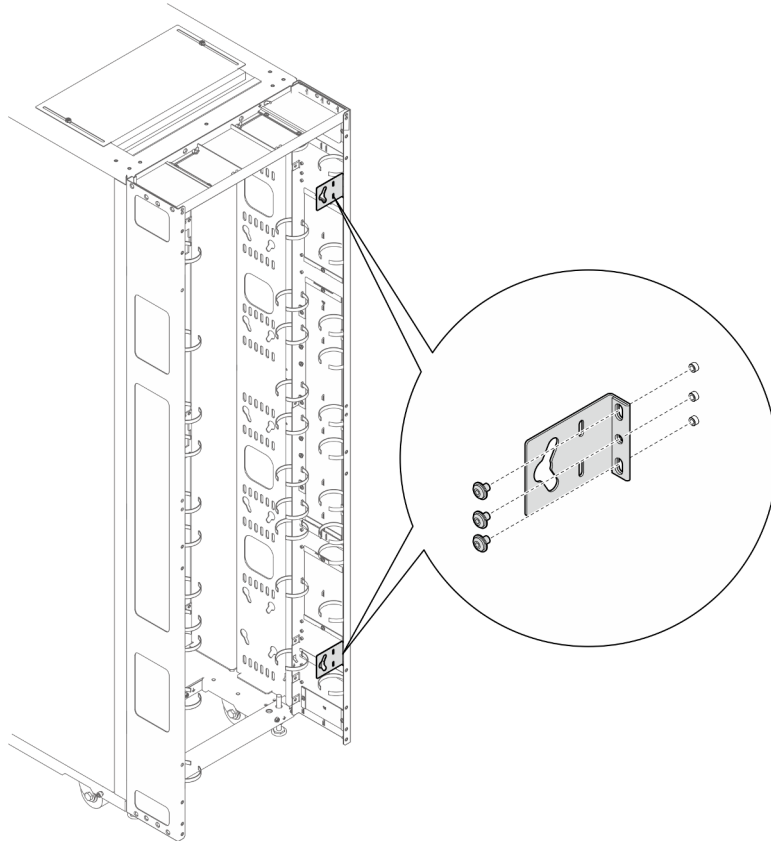
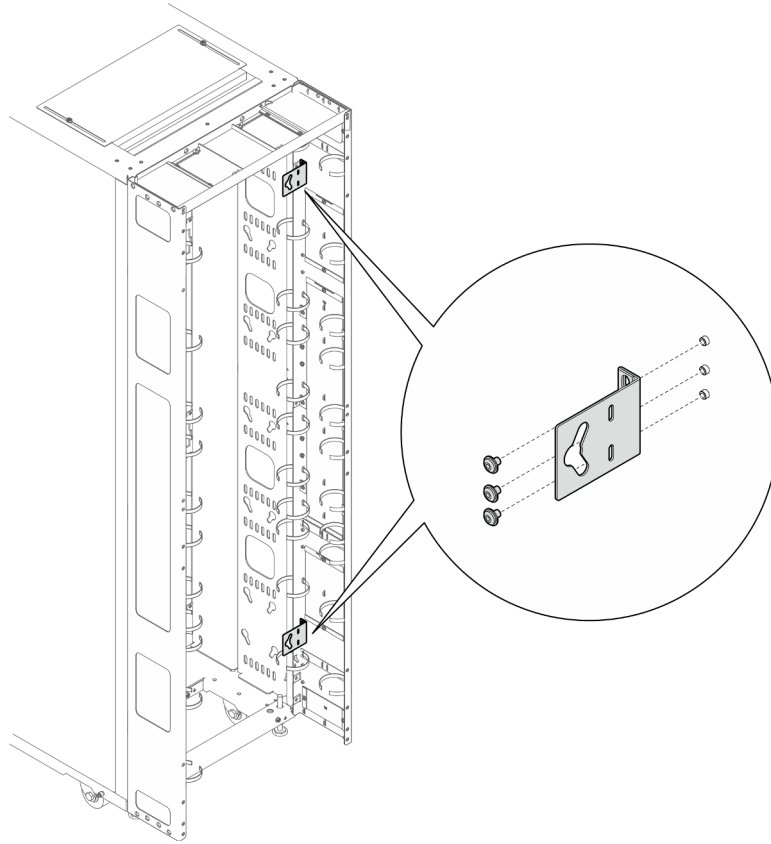


Figure 115. Replacing the screw

1. **1** Remove the M6 hex head flange screw.
  2. **2** Install the M6 round head flange screw.
1. Align the bracket with the extension panel, and secure it with three screws. Choose the installation location for the bracket based on the orientation of the PDU.

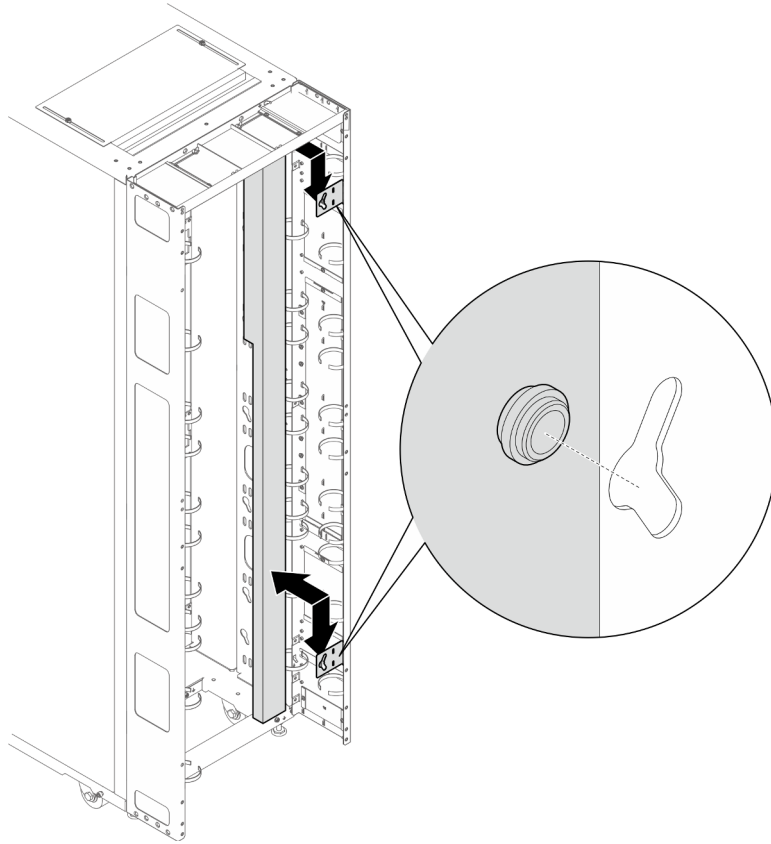


*Figure 116. Installing the L-shaped bracket with the PDU facing the front of the rack cabinet*

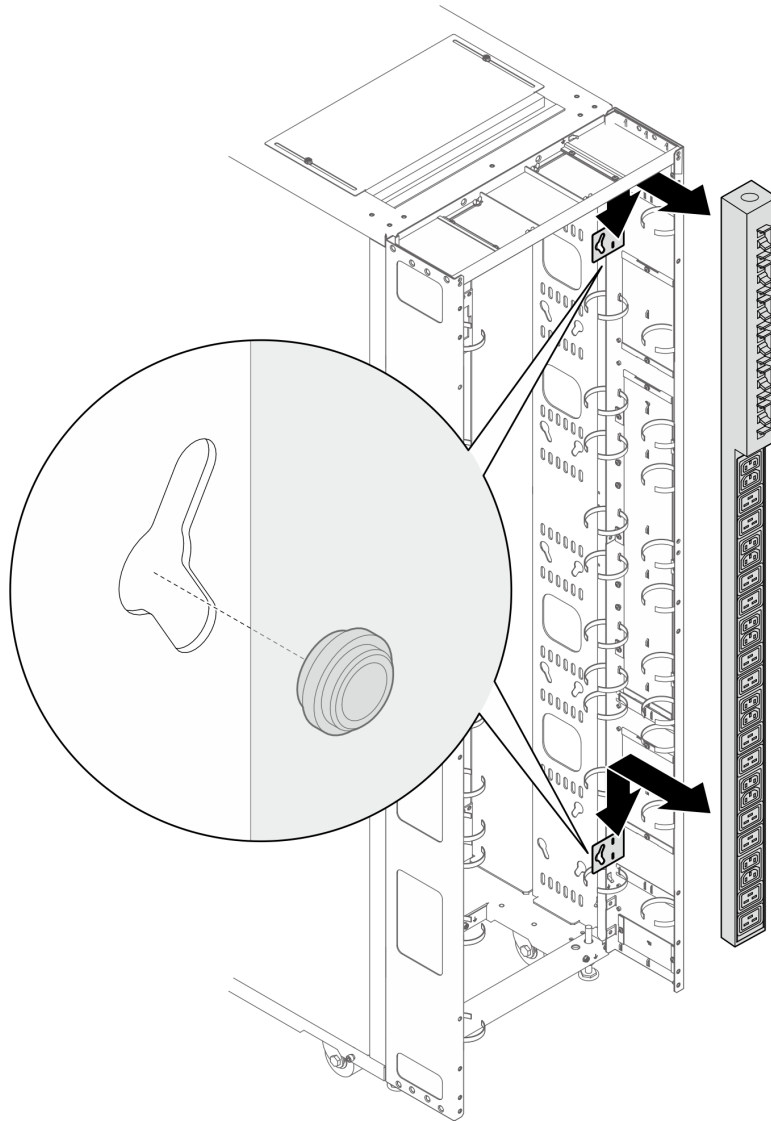


*Figure 117. Installing the L-shaped bracket with the PDU facing the front of the rack cabinet*

2. Insert the two PDU pegs into the keyhole slots on the brackets, and push down the PDU to secure it to the brackets.



*Figure 118. Installing the PDU with the PDU facing the front of the rack cabinet*



*Figure 119. Installing the PDU with PDU facing the rear of the rack cabinet*

Step 10. Depending on the requirements, select one of the following methods to ensure there is sufficient space for routing cables.

- **Slide the brush panel**

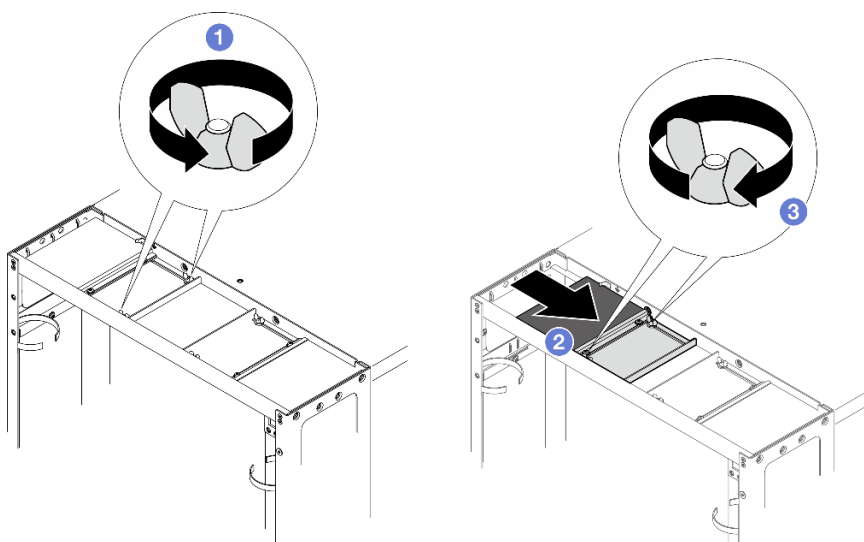


Figure 120. Sliding the brush panel

1. **1** Loosen the two screws that secure the baffle to the top cover.
2. **2** Slide the baffle and brush panel toward the center of the top cover.
3. **3** Tighten the two screws to secure the baffle.

- **Remove the brush panel**

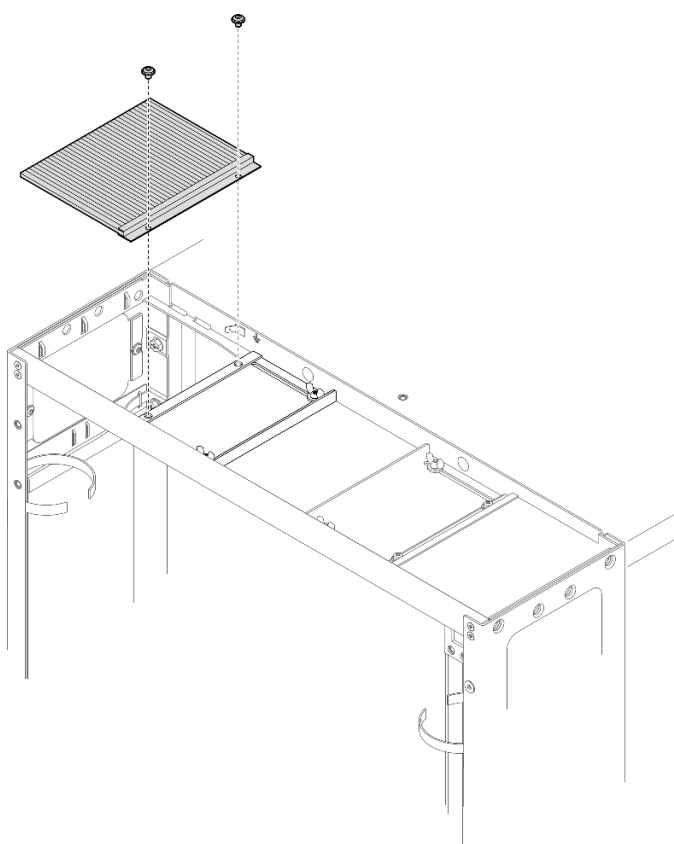
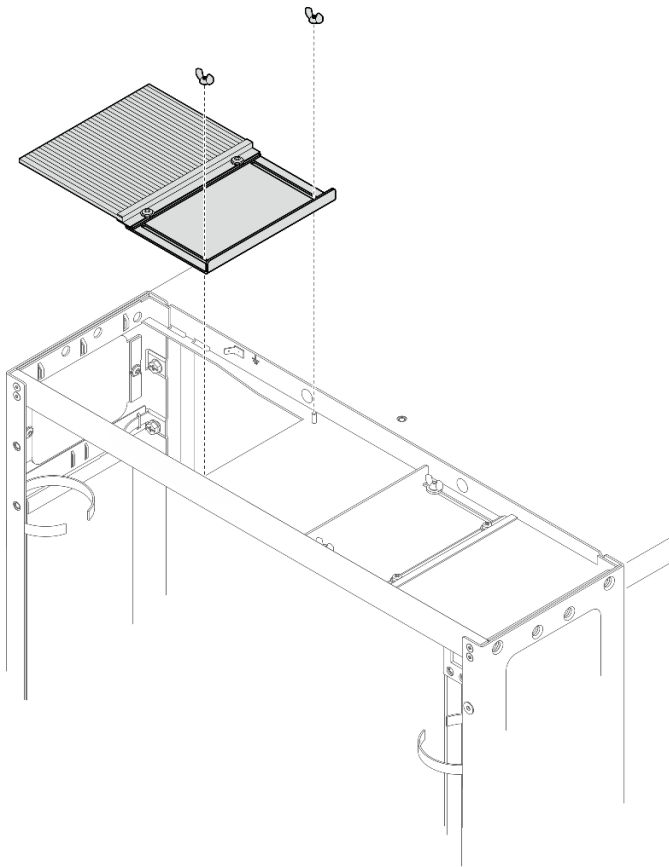


Figure 121. Removing the brush panel

Loosen the two screws to remove the brush panel from the top cover.

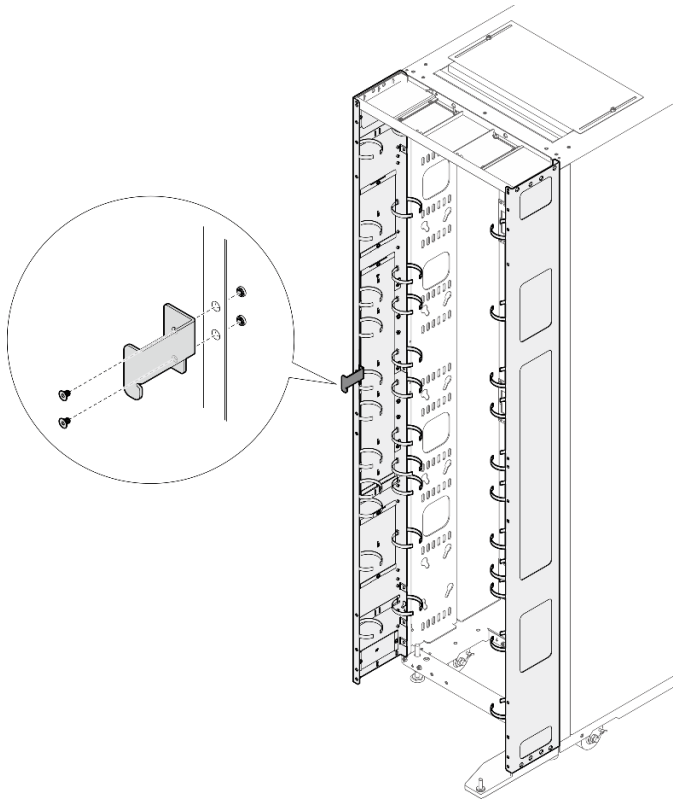
- **Remove the brush panel and baffle**



*Figure 122. Removing the brush panel and baffle*

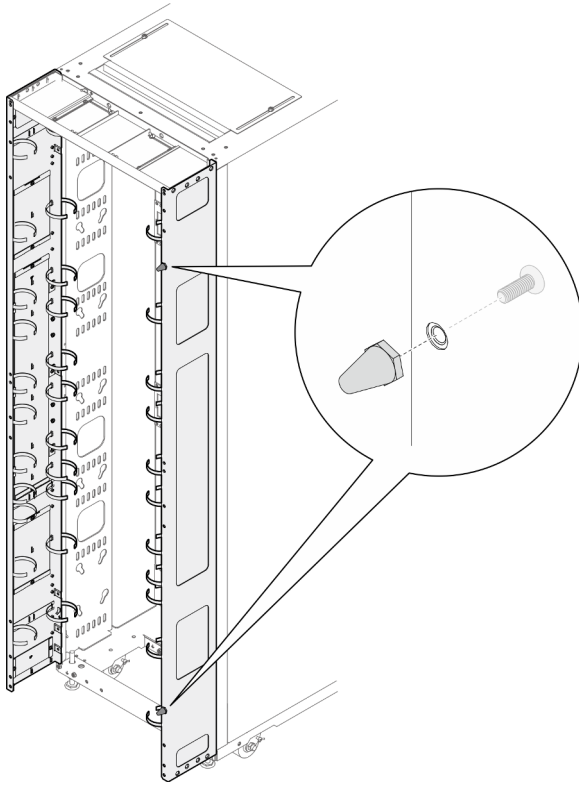
Loosen the two screws to remove the brush panel and baffle from the top cover.

Step 11. Tighten the two screws to secure the latch plate to the left extension panel.



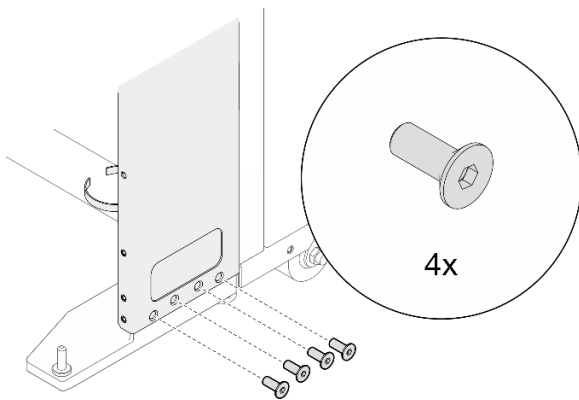
*Figure 123. Installing the latch plate*

Step 12. Remove the two doorstops from the right extension panel.



*Figure 124. Removing the doorstops*

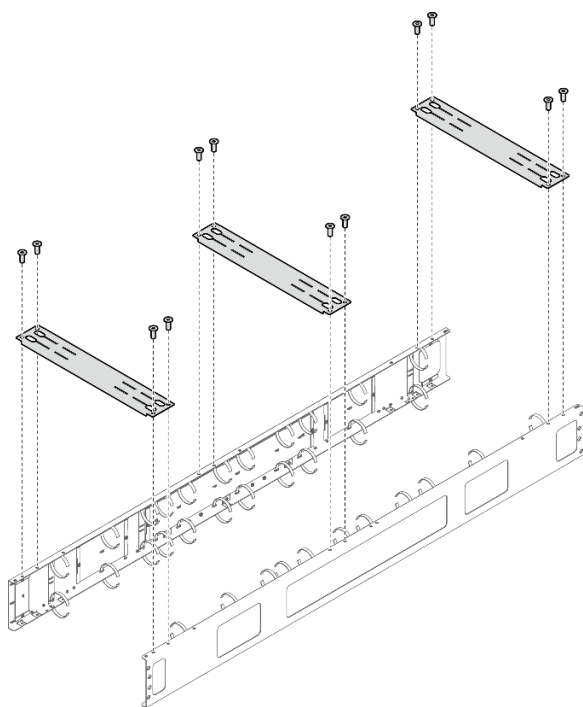
Step 13. Secure the bottom hinge to the right extension panel with four screws.



*Figure 125. Securing the bottom hinge*

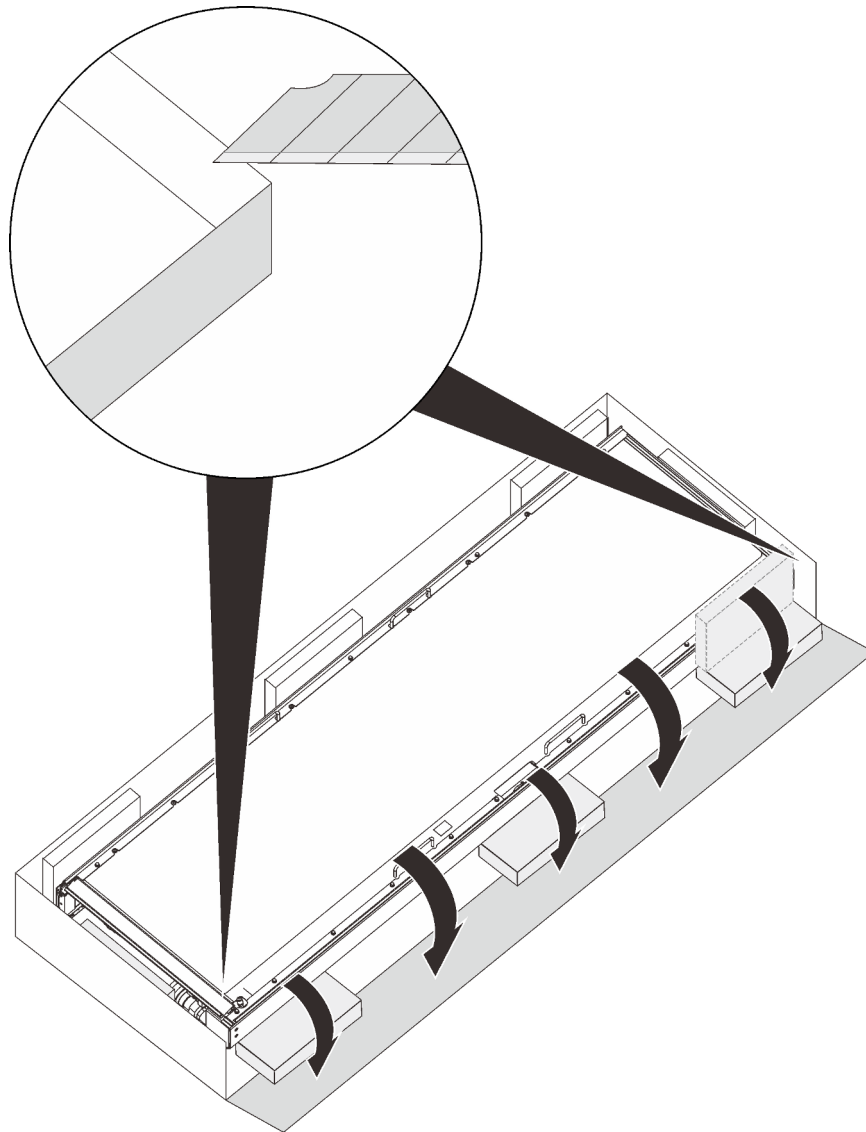
Step 14. If the rack needs to be shipped, install the three support brackets and skip steps 15 to 20.

**Note:** The support brackets must be removed upon arrival at the site to install the RDHX.



*Figure 126. Installing the support brackets*

Step 15. Face the bottom side of the carton, remove the carton top, and slit the two carton corners on your right-hand side with a knife. Then, fold the right carton panel down to the ground, and rotate the three carton inserts down.



**Bottom**

*Figure 127. Unpacking the heat exchanger*

Step 16. With three people, rotate the heat exchanger to vertical on the three carton inserts. Then, remove the inner and outer hose access panels while one person hold the heat exchanger.

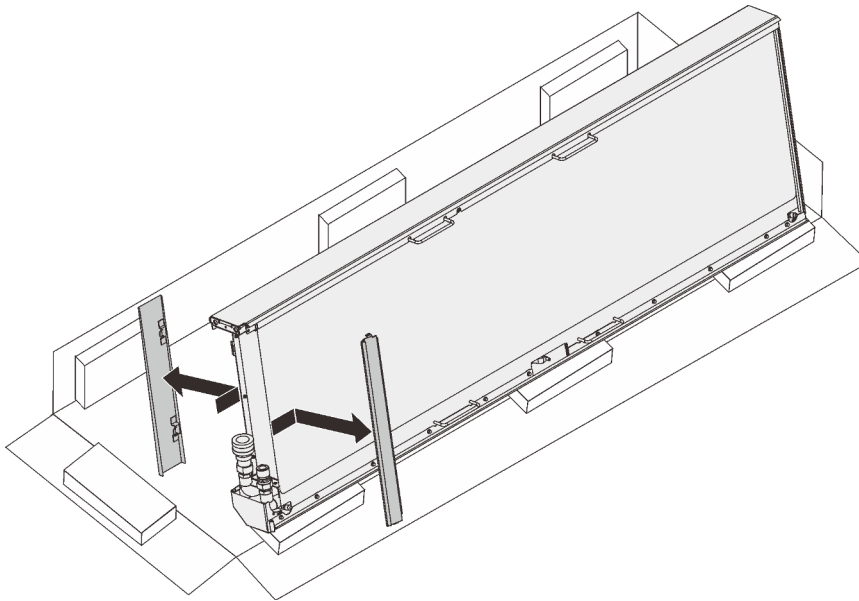


Figure 128. Removing the hose access panels

Step 17. Hold the heat exchanger with three people on the handles/spots as illustrated. Then, carefully lift the heat exchanger and turn it upright.

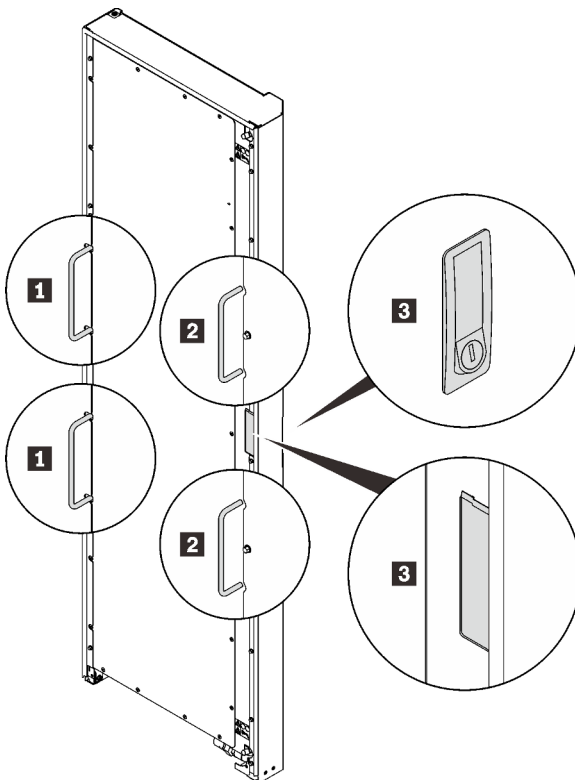
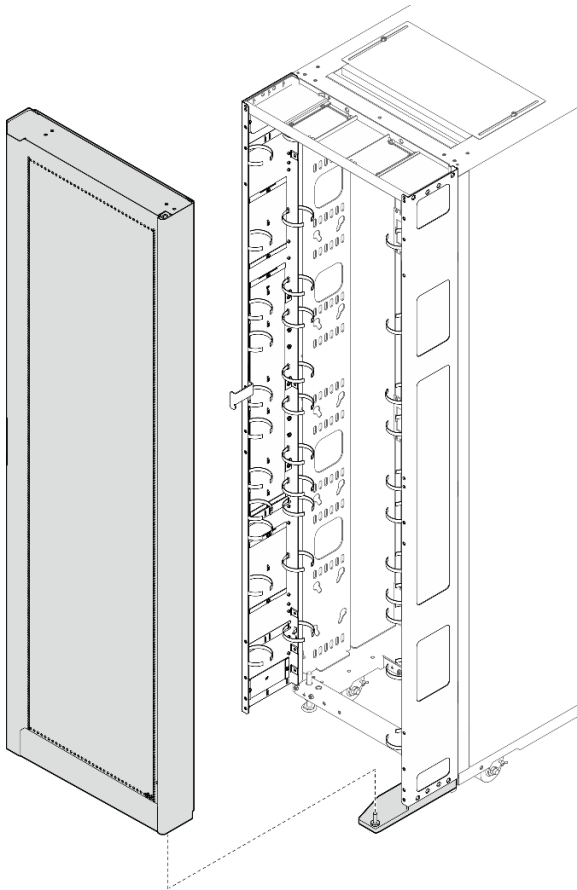


Figure 129. Lifting the heat exchanger with three people

<b>1</b> Handles that the first person hold on to	<b>3</b> Spots that the third person hold on to
<b>2</b> Handles that the second person hold on to	

Step 18. Carry the heat exchanger with three people to the cabinet frame. Align the bottom corner with the bottom hinge pin; then, lower the heat exchanger to fit the pin in.



*Figure 130. Installing the heat exchanger to the rack cabinet*

Step 19. Hold the heat exchanger in place with two people. Insert the top hinge pin to the heat exchanger; then, secure the hinge with seven screws.

**Note:** Do not fully tighten the seven screws in this step.

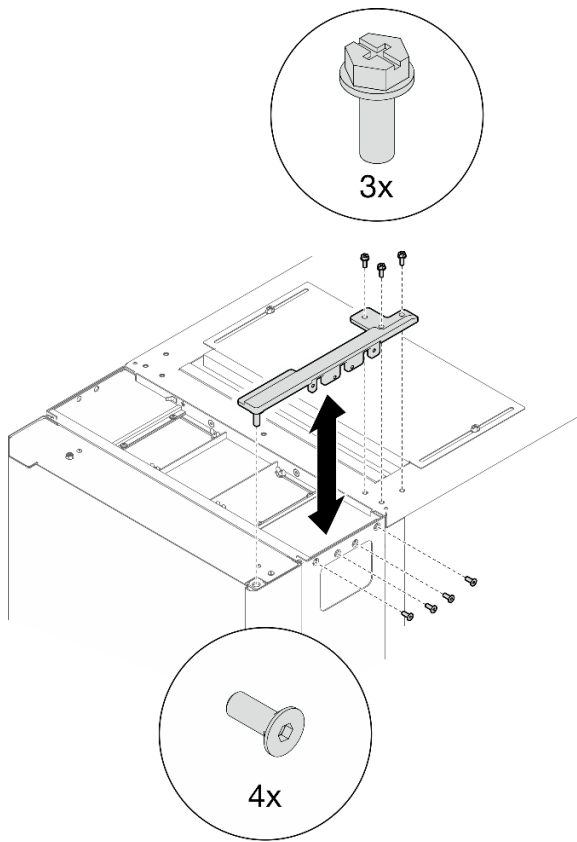


Figure 131. Installing the top hinge

Step 20. Follow the sequence below to fully tighten the screws.

**Note:** Hold the handles on the heat exchanger and slightly lift it in steps 20-a to 20-c.

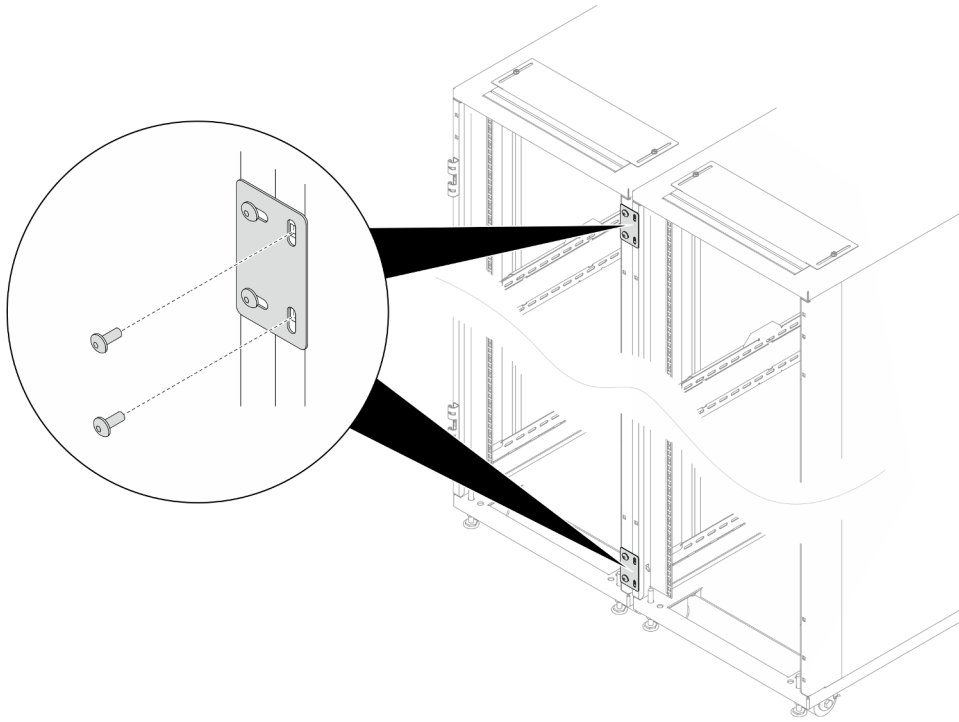
1. Four top hinge screws on the right side in [Step 19 Step 19 on page 115](#)
2. Three top hinge screws at the top in [Step 19 Step 19 on page 115](#)
3. Four bottom hinge screws in [Step 5 Step 5 on page 94](#)
4. Fourteen extension panel screws in [Step 6 Step 6 on page 94](#)

## Install 42U Standard Rack Extension Kit

See this topic to learn how to install 42U Standard Rack Extension Kit.

### Notes:

- Each unit of rack extension kit comes with additional capacity of one unit 0U PDU to each side of the rack.
- Each rack cabinet supports up to two units of rack extension kit (one to the front and one to the rear side).
- If there is a plan to install baying kit while only one of the adjacent cabinets will be installed with extension, make sure to install the baying kit first (see [“Install the baying kit” on page 28](#)). Then, as preparation for this procedure, remove the two screws from the upper and lower part of the cabinet that will be installed with the rack extension kit, and jump to [Step 4 on page 119](#).



*Figure 132. Removing screws to prepare for extension installation*

## **Procedure**

Step 1. Remove the door.

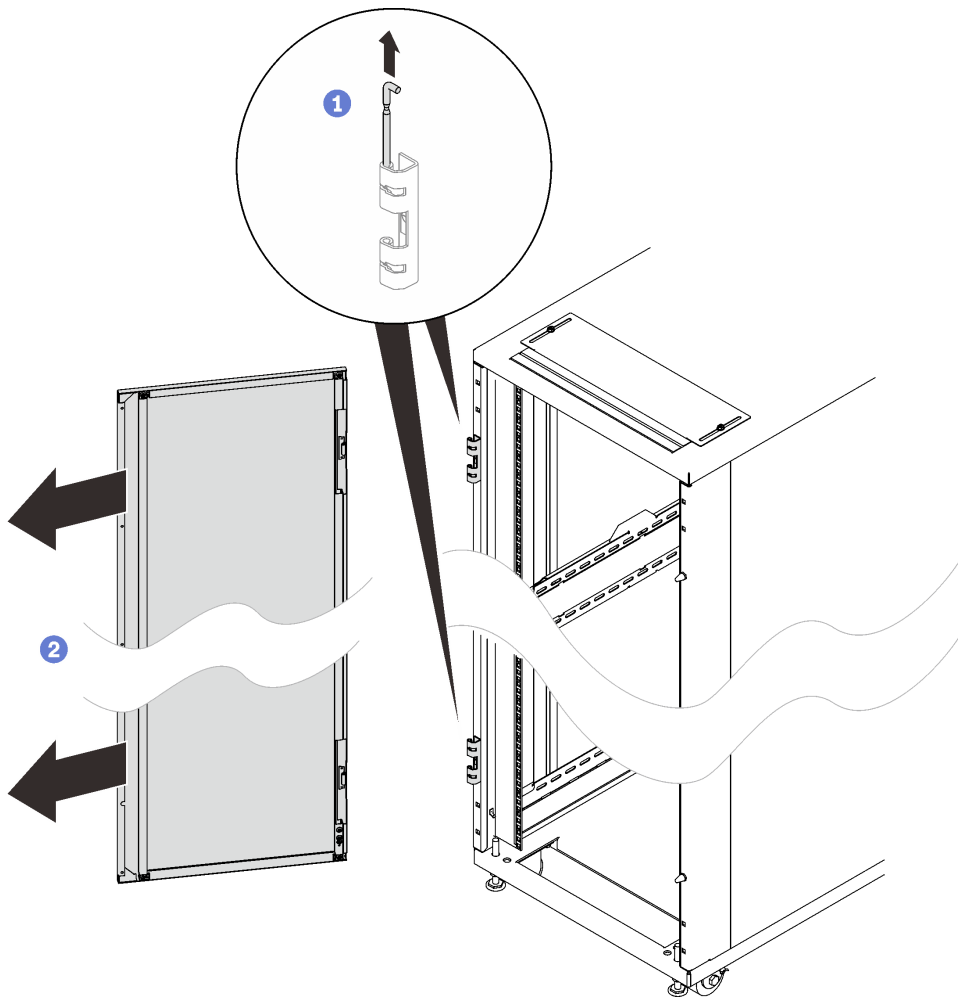


Figure 133. Removing a door

- ① Hold the door in place, and lift both hinge pins until they lock in the open position so that the door is disengaged.
- ② Remove the door from the rack cabinet frame.

Step 2. Remove the two hinges and the two doorstops.

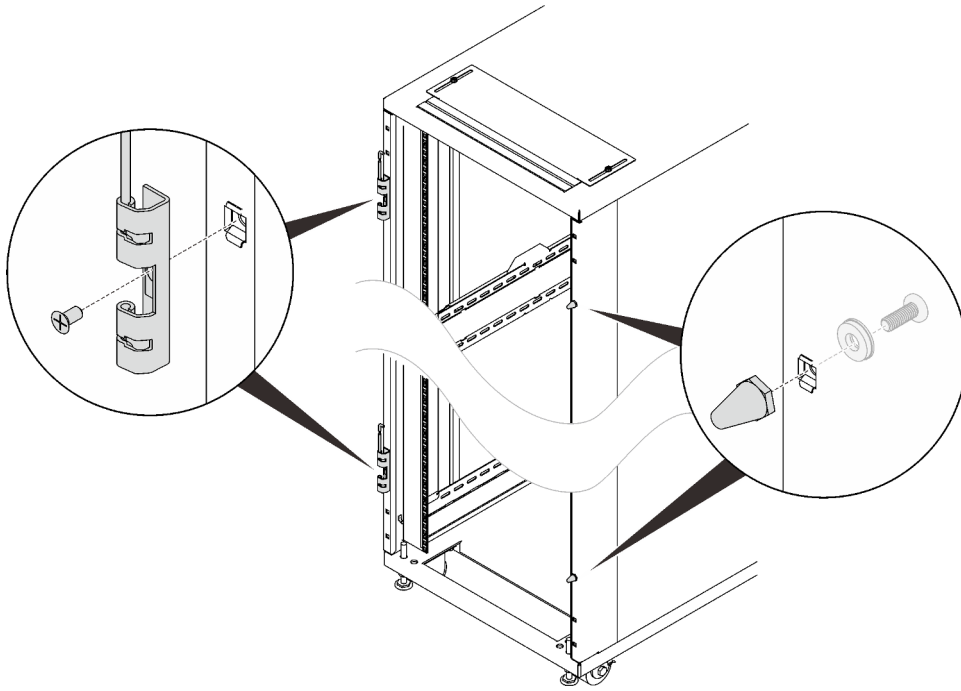


Figure 134. Removing the door hinges and doorstops

Step 3. Remove the door latch.

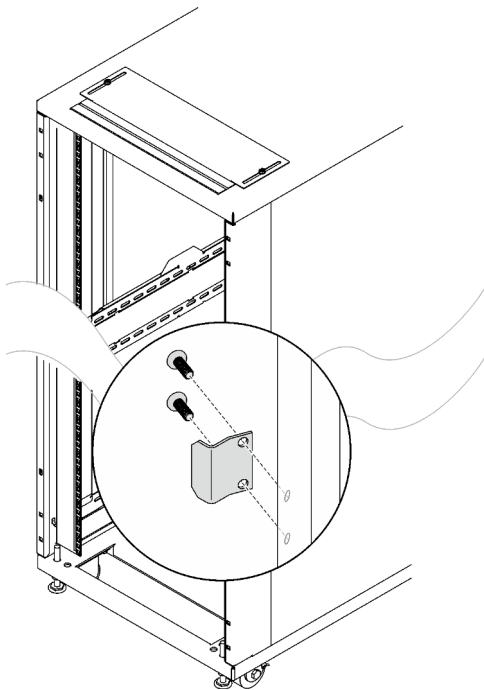
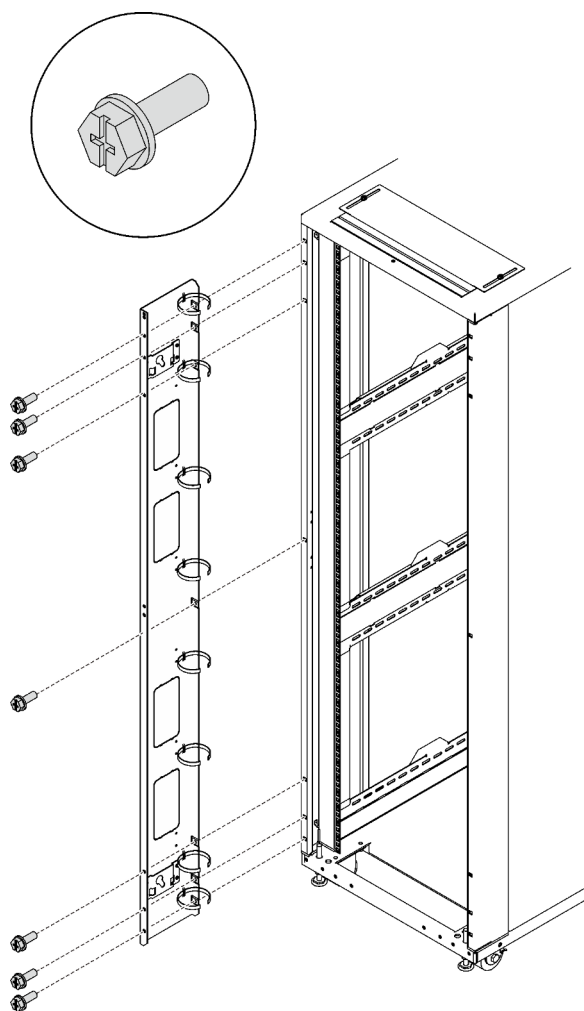


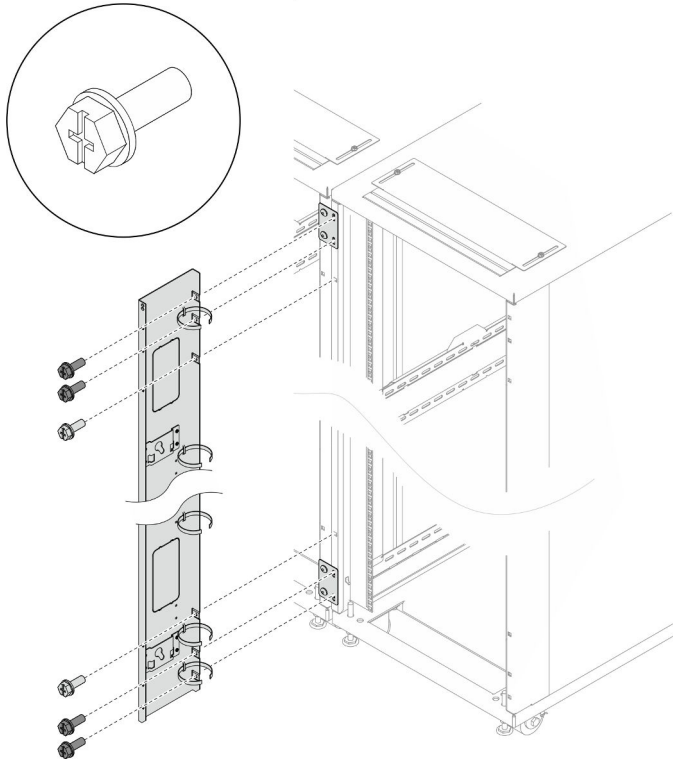
Figure 135. Removing the door latch

Step 4. Secure an extension panel to the side of the rack with seven screws, and repeat the step on the other extension panel.

**Note:** It is advised not to fully tighten the screws in this step.



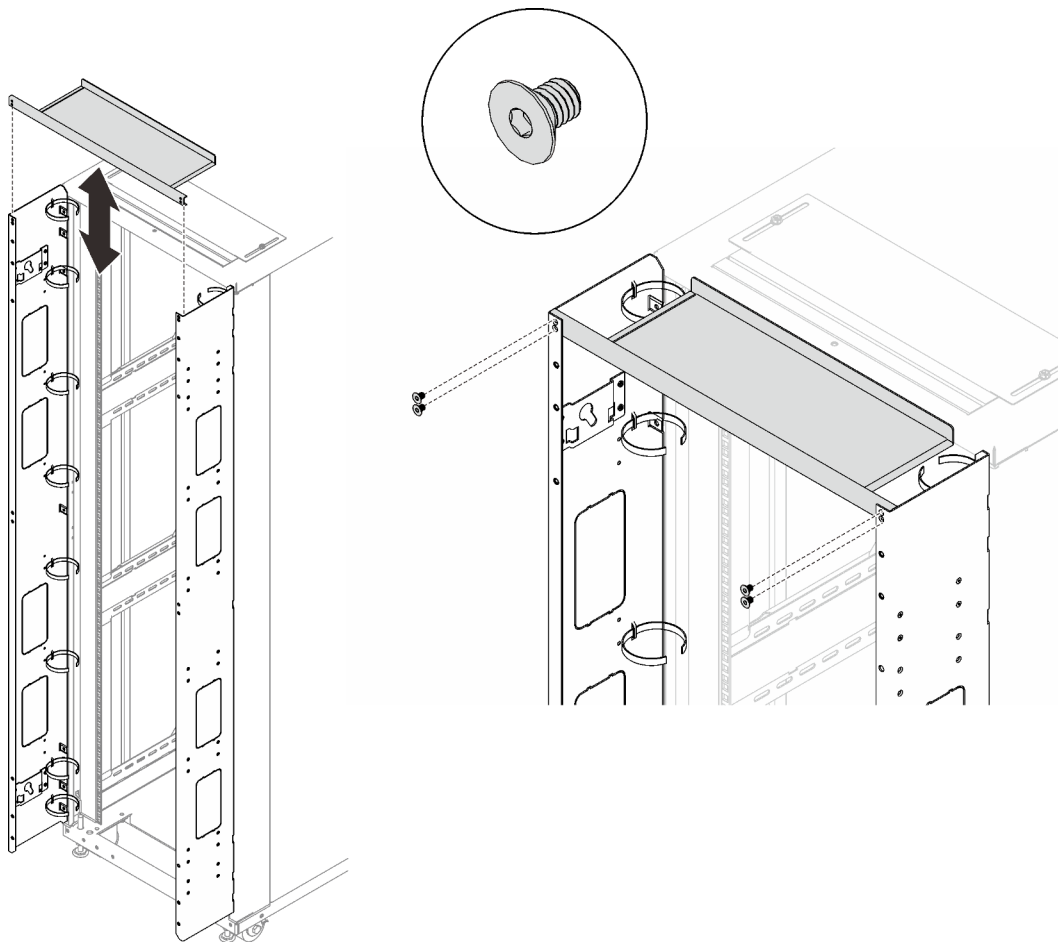
*Figure 136. Installing an extension panel*



*Figure 137. Installing an extension panel (with baying kit)*

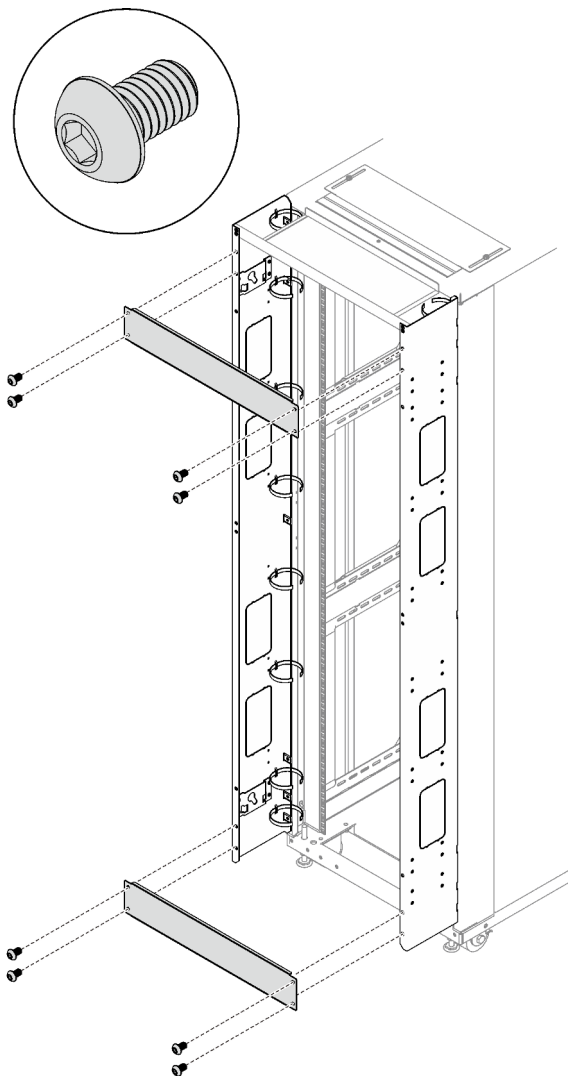
**Note:** If baying kit has been installed previously, make sure to remove the two screws from top and bottom of the cabinet first. Then, secure the screws through the panel and the baying kit.

- Step 5. Align the extension top cover with the screw holes on the front of the rack, and secure each side with two screws.



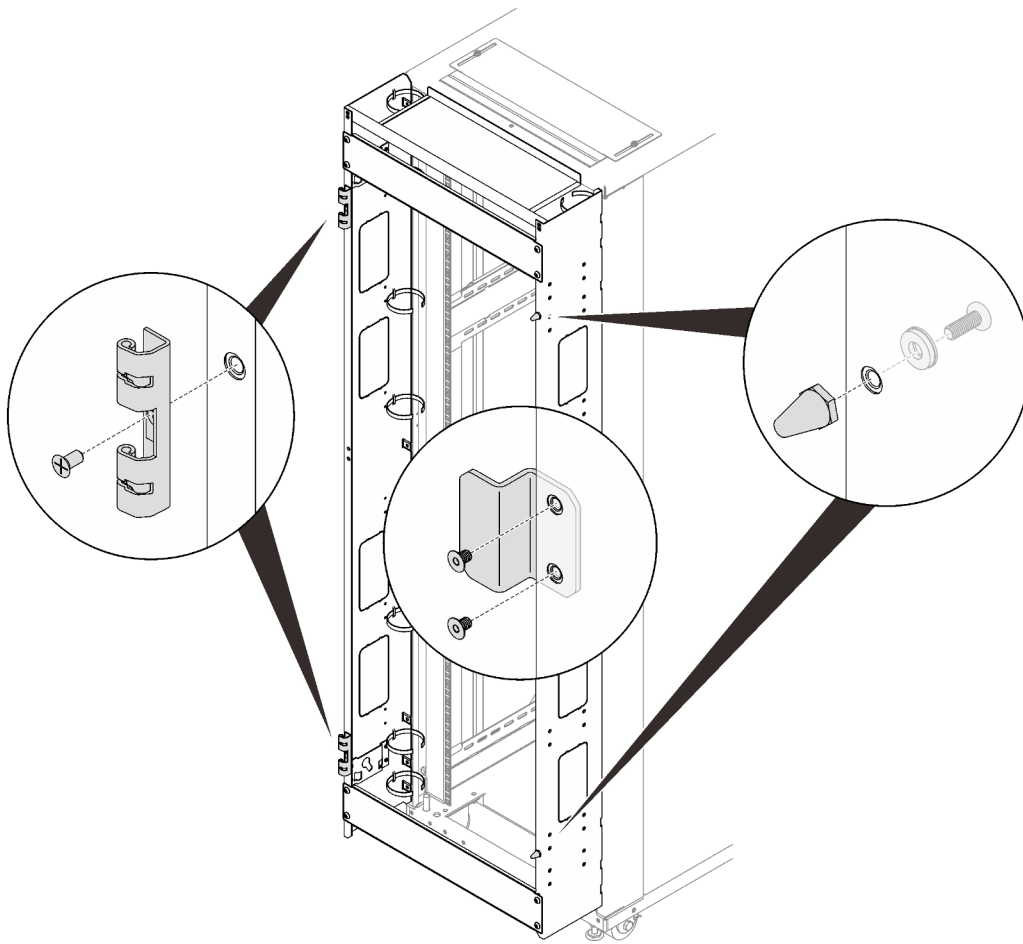
*Figure 138. Installing the extension top cover*

- Step 6. Secure each of the two support brackets to the extension panels with four screws. If the extension panel screws have not been fully tightened, tighten them now.



*Figure 139. Installing the support brackets*

Step 7. Install the two hinges, two doorstops, and the door latch to the rack.



*Figure 140. Install the hinges, doorstops, and door latch*

Step 8. Install the door back to the rack.

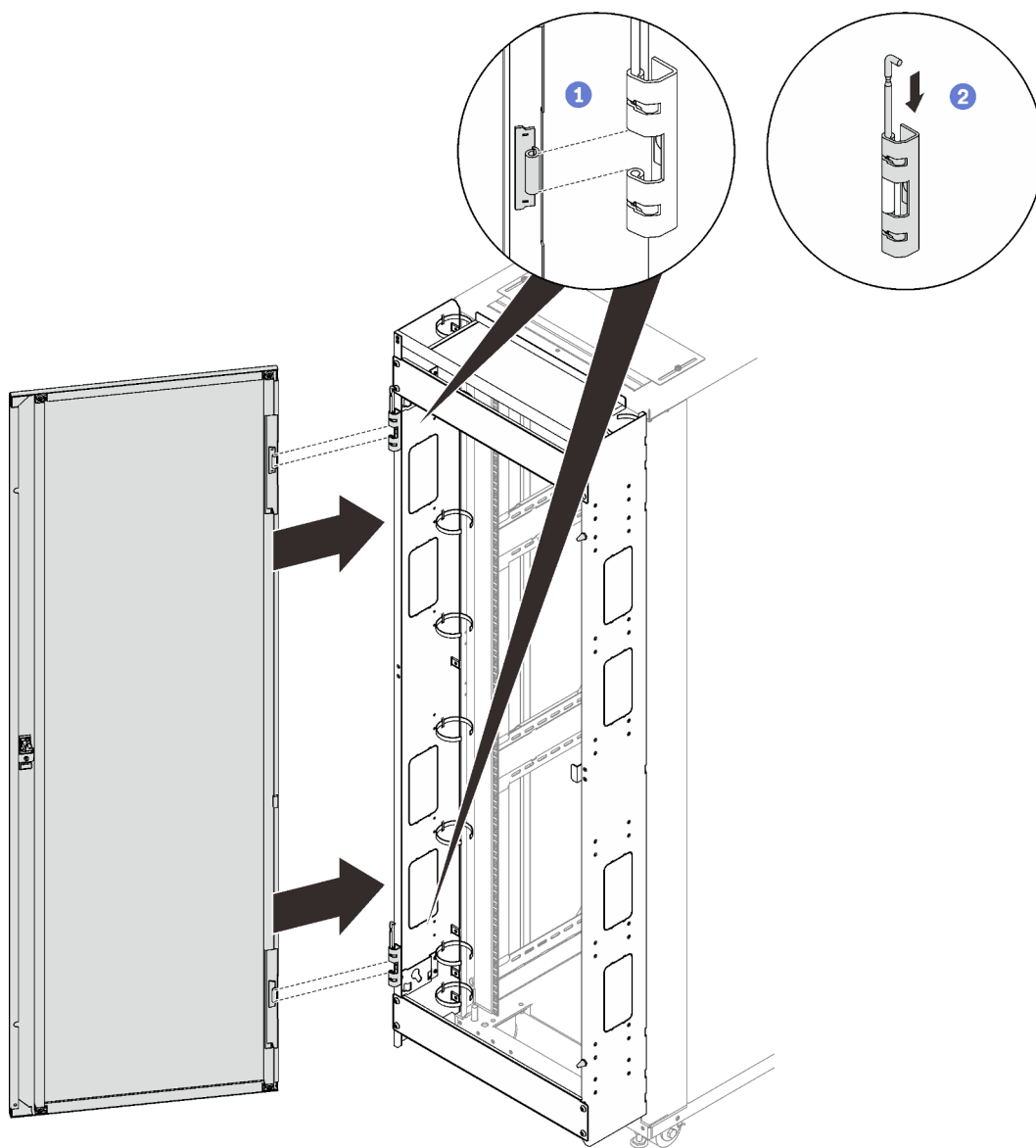


Figure 141. Installing the door

- 1 Align the door with the hinges, and hold the door in place.
- 2 Push the hinge pins down to the closed position so that the door is secured.

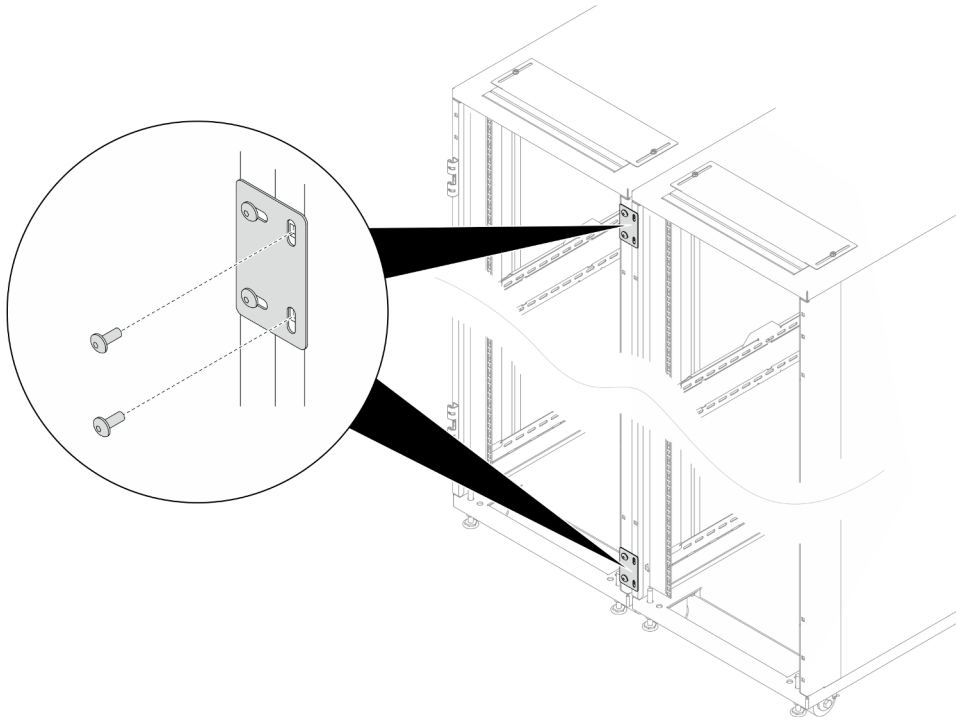
## Install 42U Standard Rack Extension Kit with RDHX

See this topic to learn how to install 42U Standard Rack Extension Kit and RDHX.

### Notes:

- Each unit of rack extension kit comes with additional capacity of one unit 0U PDU to each side of the rack.
- Each rack cabinet supports up to two units of rack extension kit (one to the front and one to the rear side).
- If there is a plan to install baying kit while only one of the adjacent cabinets will be installed with extension, make sure to install the baying kit first (see [“Install the baying kit” on page 28](#)). Then, as preparation for

this procedure, remove the two screws from the upper and lower part of the cabinet that will be installed with the rack extension kit, and skip to [Step 5 on page 131](#).



*Figure 142. Removing screws to prepare for extension installation*

#### **Required tools**

- One tool with plastic blade/scissors
- One Screwdriver with No. 3 Phillips bit
- One Nut-driver with holding hex bit 10 mm
- One rubber hammer

#### **Notes:**

- A utility knife or a pair of scissors is required to unpack the extension kit.
- The extension kit comes with a miscellaneous bag, which contains the following components:

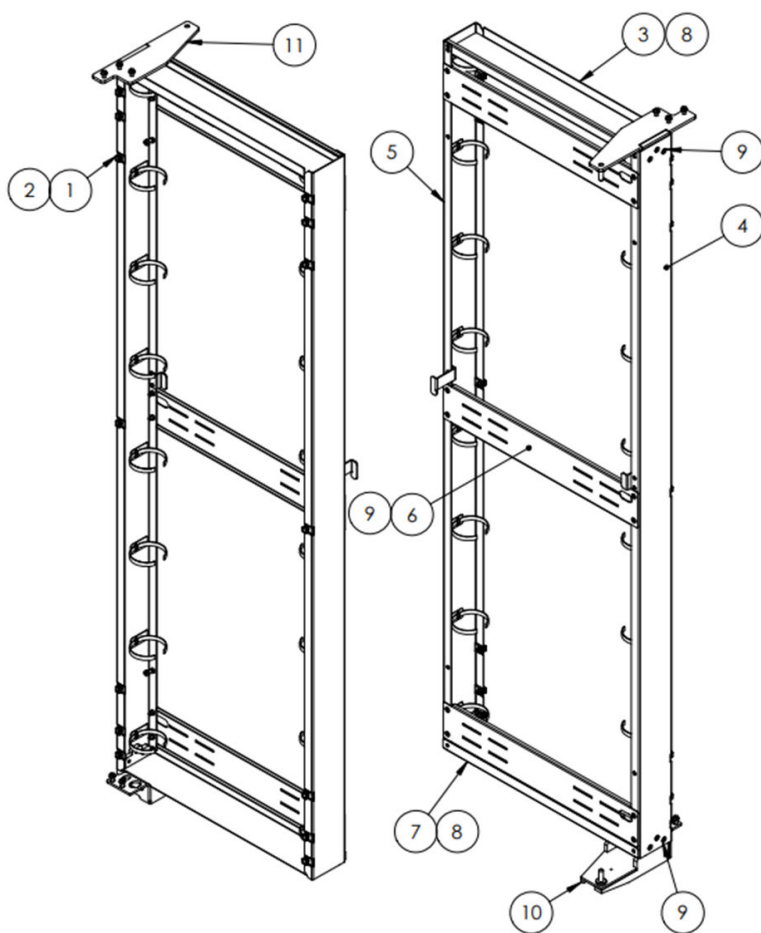


Figure 143. Parts

No.	Description	Quantity	No.	Description	Quantity
<b>1</b>	M6 cage nut	14	<b>7</b>	Bottom support panel	1
<b>2</b>	M6 screw	21	<b>8</b>	M4 screw	10
<b>3</b>	Top support panel	1	<b>9</b>	M6 flat hex screw	18
<b>4</b>	Right extension panel	1	<b>10</b>	Bottom hinge for RDHX	1
<b>5</b>	Left extension panel	1	<b>11</b>	Top hinge for RDHX	1
<b>6</b>	Support bracket	3			



Figure 144. Hex Allen wrenches

No.	Description
<b>1</b>	Hex Allen wrench, 4 mm
<b>2</b>	Hex Allen wrench, 2.5 mm

## Procedure

Step 1. Remove the door.

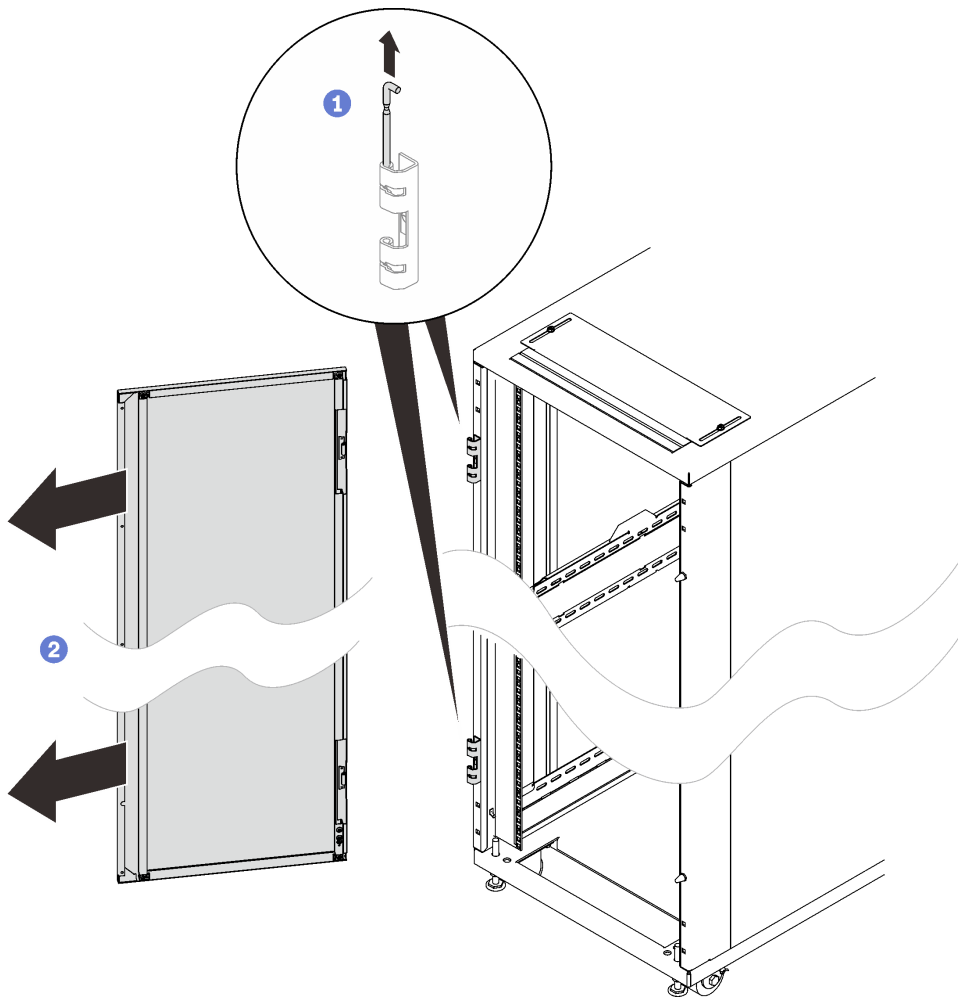


Figure 145. Removing a door

- 1** Hold the door in place, and lift both hinge pins until they lock in the open position so that the door is disengaged.
- 2** Remove the door from the rack cabinet frame.

Step 2. Remove the two hinges and the two doorstops.

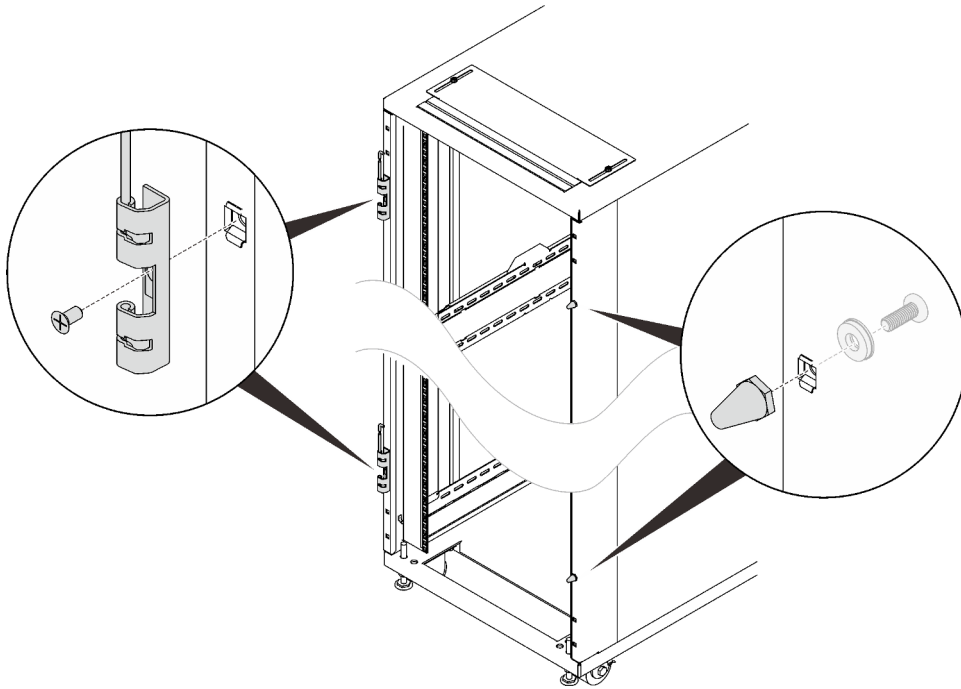


Figure 146. Removing the door hinges and extension bottom covers

Step 3. Remove the door latch.

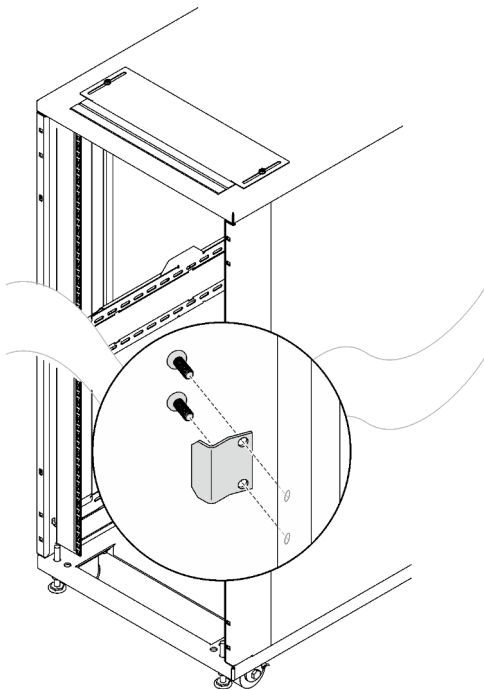


Figure 147. Removing the door latch

Step 4. Install fourteen M6 cage nuts to the rack frame with [cage nut insertion tool](#) or a [flat-blade screwdriver](#).

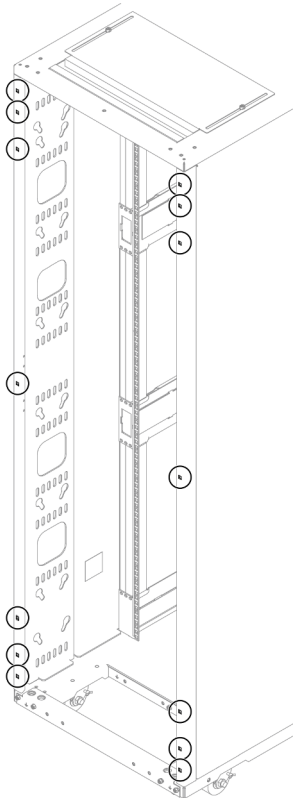
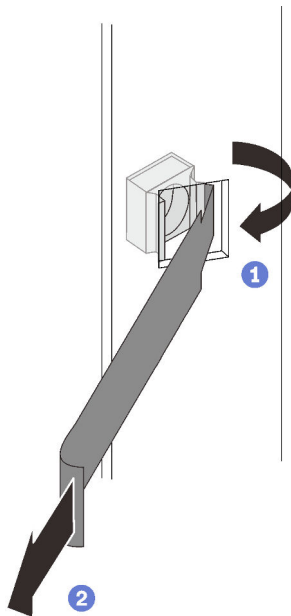


Figure 148. Cage nut installation location

### With cage nut insertion tool



- 1 Insert one edge of the cage nut into the target mounting flange hole, and hook the other edge with the insertion tool through the flange hole.
- 2 Rotate and pull the tool to force the other nut edge into the flange hole, and thus secure the nut.

Figure 149. Installing cage nuts with cage nut insertion tool

### With flat blade screwdriver

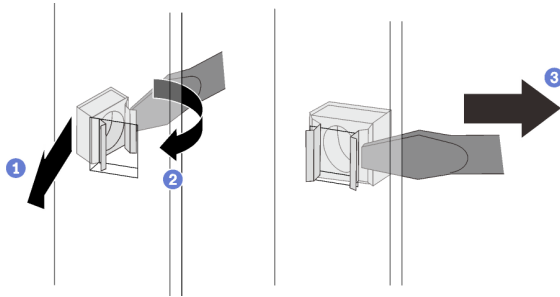


Figure 150. Installing cage nuts with flat blade screwdriver

- 1 Insert one edge of the cage nut into the target mounting flange hole.
- 2 Press and compress the other nut edge with a flat-blade screwdriver, and rotate the screwdriver towards the flange hole until the nut edge goes in the hole.
- 3 Release the screwdriver to secure the nut in the mounting flange hole.

Step 5. Loosely tighten thirteen screws to secure the extension panels to the rack.

#### Notes:

- It is advised not to fully tighten the screws in this step.
- Do not install the two interim screws in this step. See the illustration for the locations.

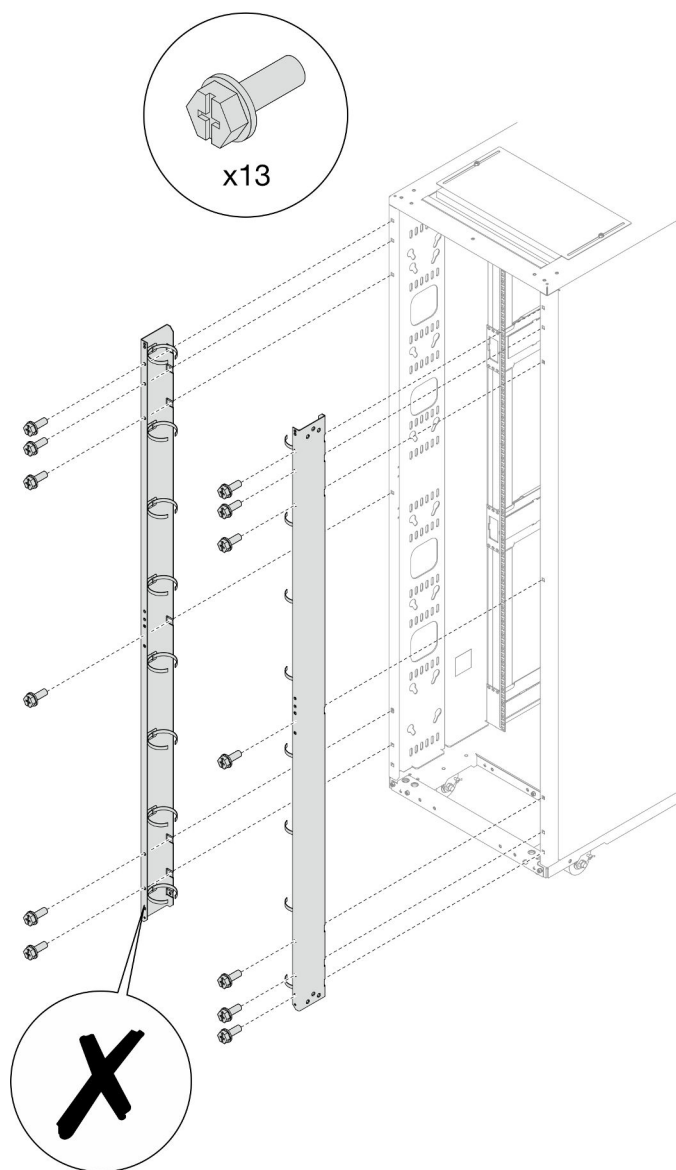


Figure 151. Installing an extension panel

Step 6. Loosely tighten the four screws to secure the extension top cover to the panels loosely.

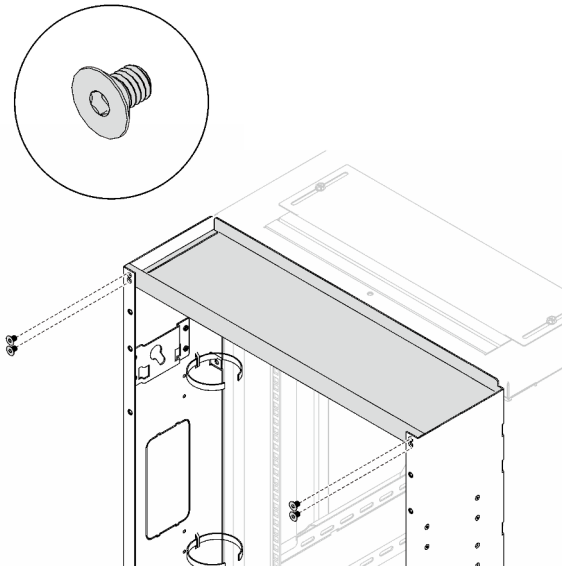


Figure 152. Installing the extension top cover

**Note:** After this step, the extension top cover should be active and could be slightly moved around.

- Step 7. If there is a plan to install RDHX, install the bottom hinge now. Otherwise, tighten all the screws installed in previous steps, and go on with installing the door (see [“Install a door” on page 200](#)).

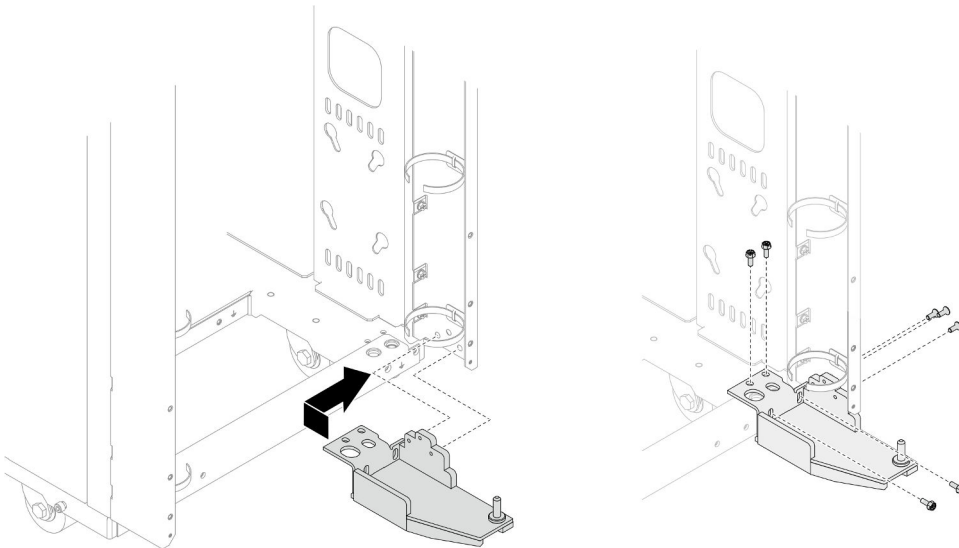


Figure 153. Securing the bottom hinge

Align the hinge with the rack, and secure the hinge to the rack with four hex screws and three flat screws.

- Step 8. Install the extension bottom cover.

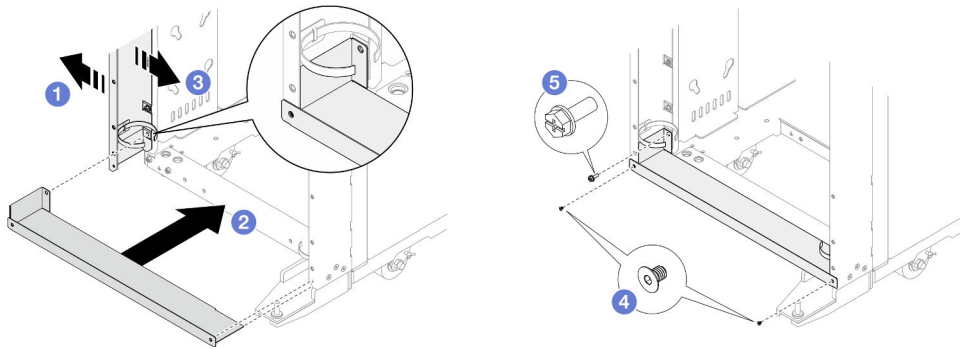


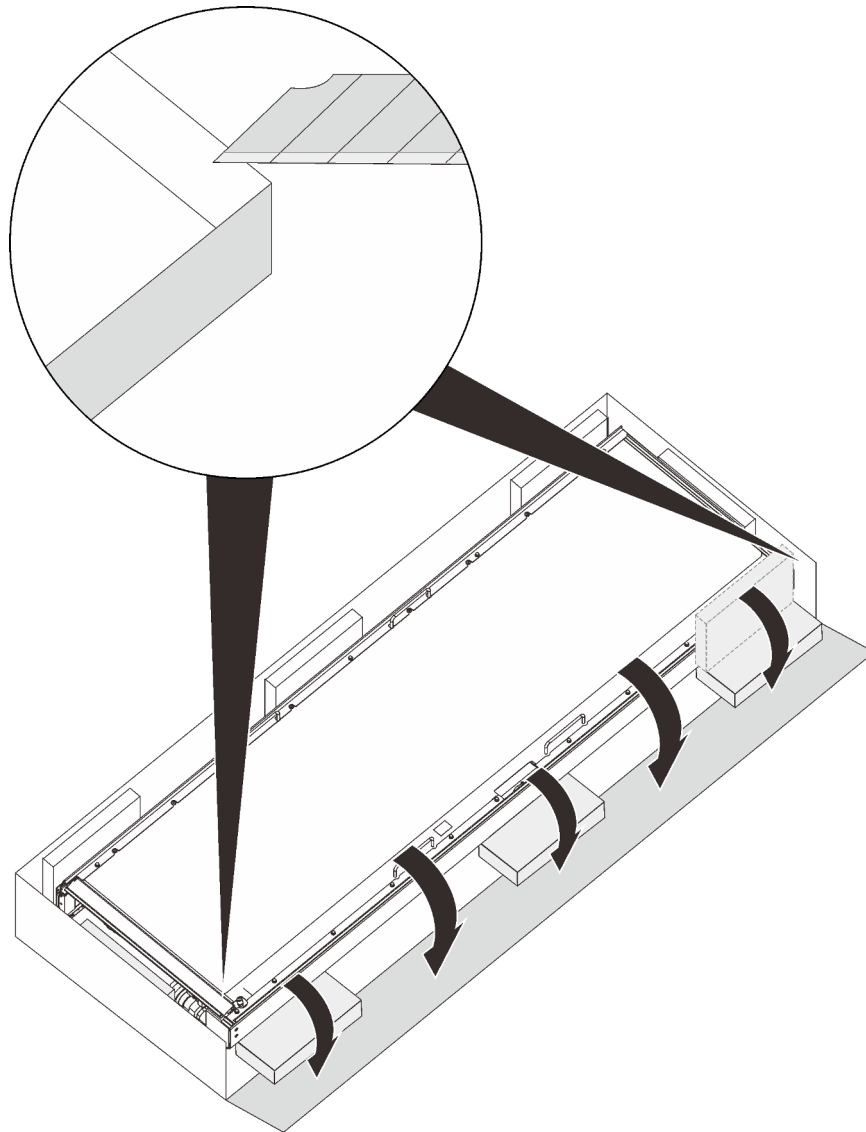
Figure 154. Securing the extension bottom cover

- 1 Slightly push the left panel left to disengage it from the rack. Hold it in the place.
- 2 Align both ends of the extension bottom cover with the rack.
- 3 Release the left panel. Note that the left panel should be embracing the extension bottom cover as illustrated.
- 4 Secure the extension bottom cover to the extension panels with two flat screws.
- 5 Secure the extension bottom cover to the left extension panel and the rack with one hex screw.

**Note:** The bottom hinge can be wrapped with plastic protective film to prevent paint damage and placed in a bag along with the screws if it will not be installed in mfg.; That bag is to be tie-wrapped to one of the extension cross braces.

Step 9. Fully tighten all the screws that were previously loosely tightened.

Step 10. Face the bottom side of the carton, remove the carton top, and slit the two carton corners on your right-hand side with a knife. Then, fold the right carton panel down to the ground, and rotate the three carton inserts down.



**Bottom**

*Figure 155. Unpacking the heat exchanger*

Step 11. With three people, rotate the heat exchanger to vertical on the three carton inserts. Then, remove the inner and outer hose access panels while one person hold the heat exchanger.

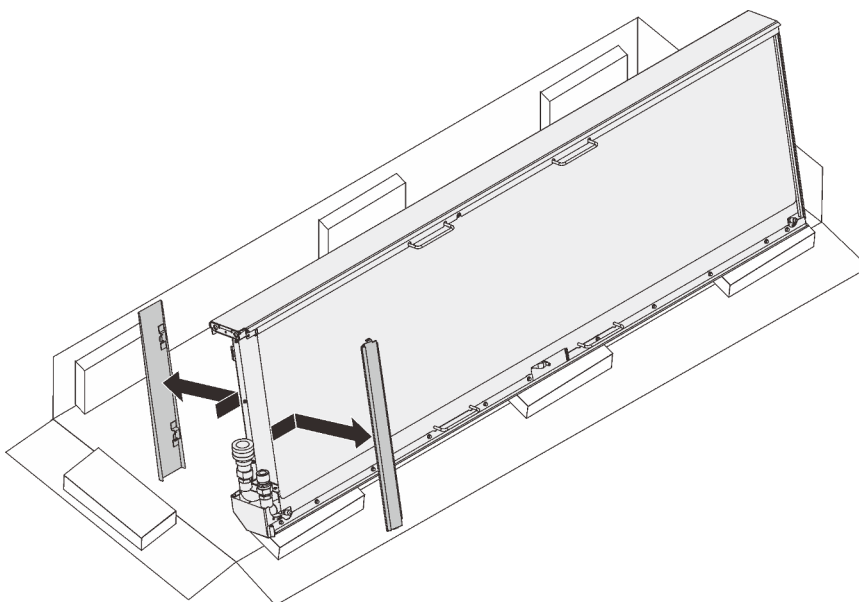


Figure 156. Removing the hose access panels

Step 12. Hold the heat exchanger with three people on the handles/spots as illustrated. Then, carefully lift the heat exchanger and turn it upright.

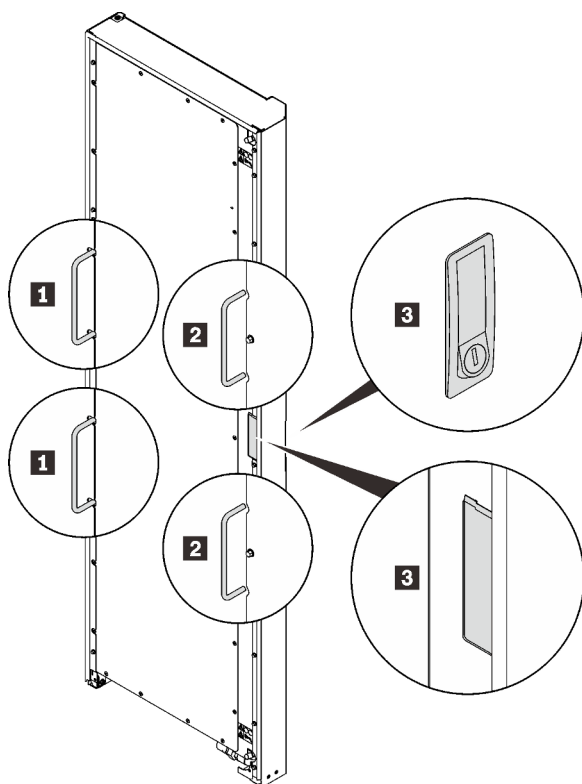
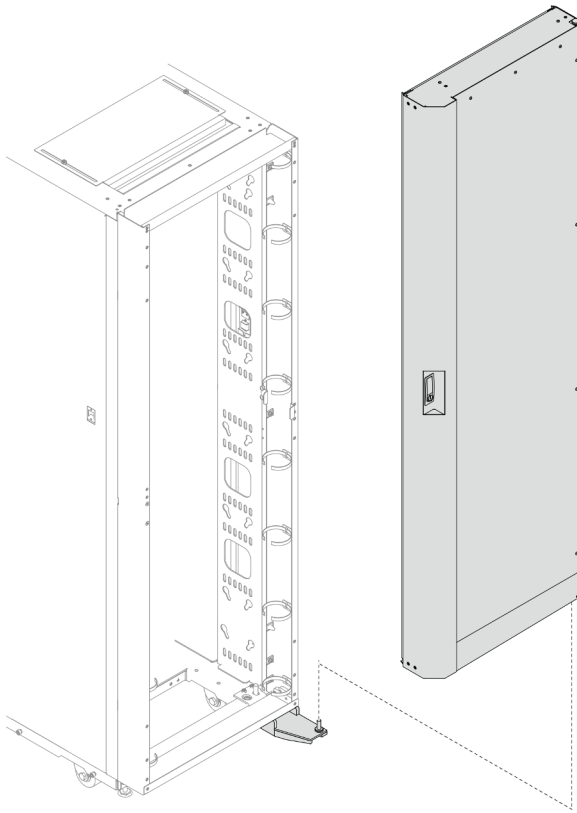


Figure 157. Lifting the heat exchanger with three people

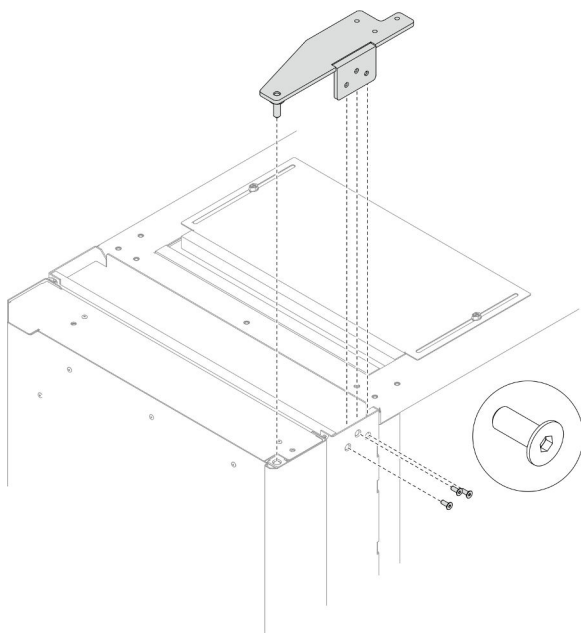
<b>1</b> Handles that the first person hold on to	<b>3</b> Spots that the third person hold on to
<b>2</b> Handles that the second person hold on to	

Step 13. Carry the heat exchanger with three people to the cabinet frame. Align the bottom corner with the bottom hinge pin on the rack cabinet; then, lower the heat exchanger to fit the pin in.



*Figure 158. Installing the heat exchanger to the rack cabinet*

Step 14. Hold the heat exchanger in place with two people. Insert the top hinge pin to the heat exchanger; then, secure the hinge with three screws.

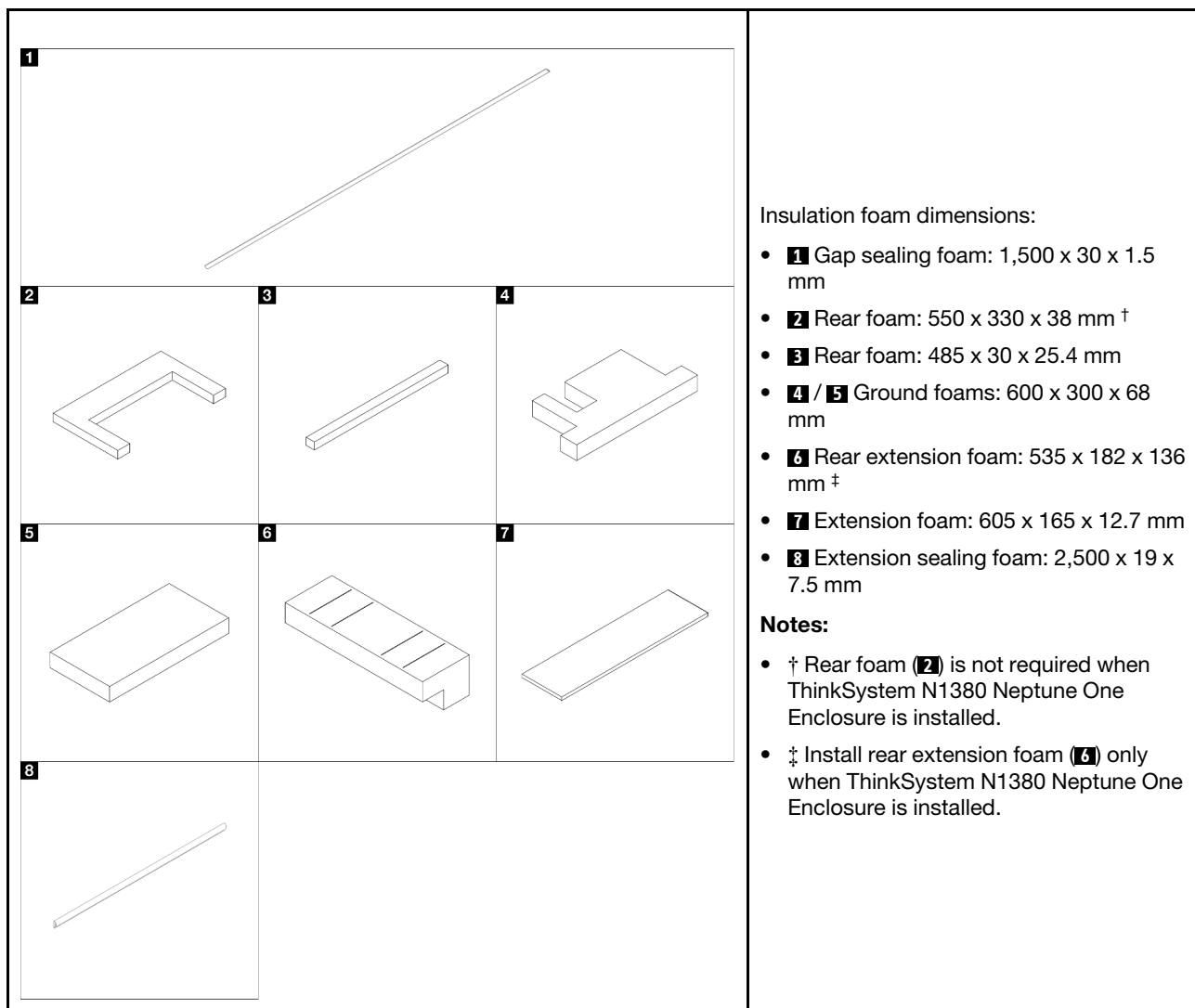


*Figure 159. Installing the top hinge*

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## **Install insulation foams on-site**

See this topic to learn how to install insulation foams on-site.



## 1 Gap sealing foam

Step 1. Peel off the liner from the foam.

Step 2. Place the foam onto the gap between the rack cabinet frame and the extension, and attach it to seal the gap. Cut off the excess foam with a sharp tool.

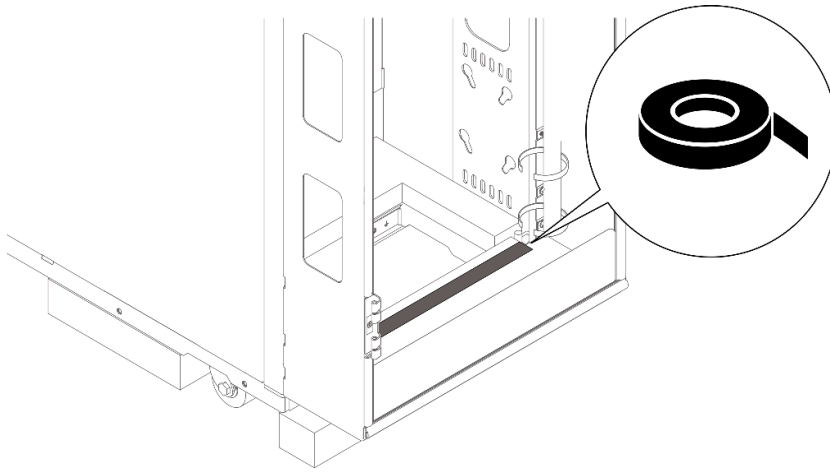


Figure 160. Installing the sealing foam

## 2 3 Rear foams

Step 1.

**Note:** Skip this step when ThinkSystem N1380 Neptune One Enclosure is installed.

Peel off the liner, and attach the foam (2) to the rear side of the rack cabinet as illustrated.

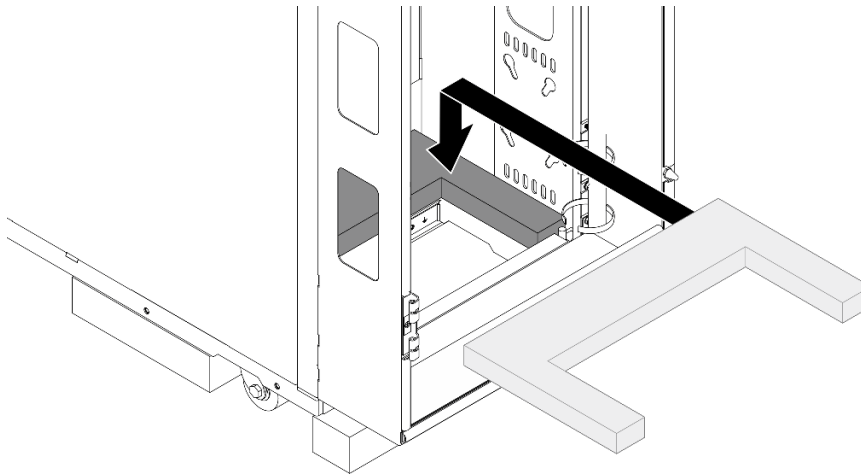


Figure 161. Installing the rear foam

Step 2. Peel off the liner, and attach the foam (3) to the rear side of the rack cabinet as illustrated.

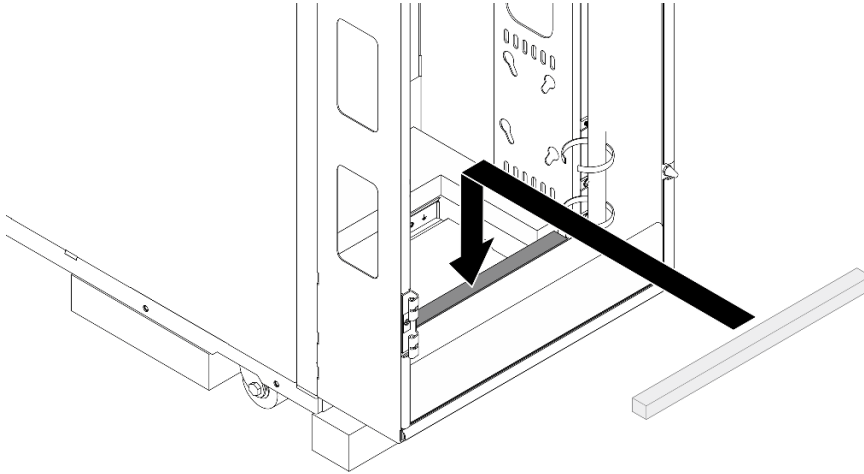


Figure 162. Installing the rear foam

#### **4 5 Ground foams**

- Step 1. Insert the foam (4) into the rear bottom of the rack cabinet.
- Step 2. Insert the foam (5) into the rear bottom of the rack cabinet until it connects to the other one.

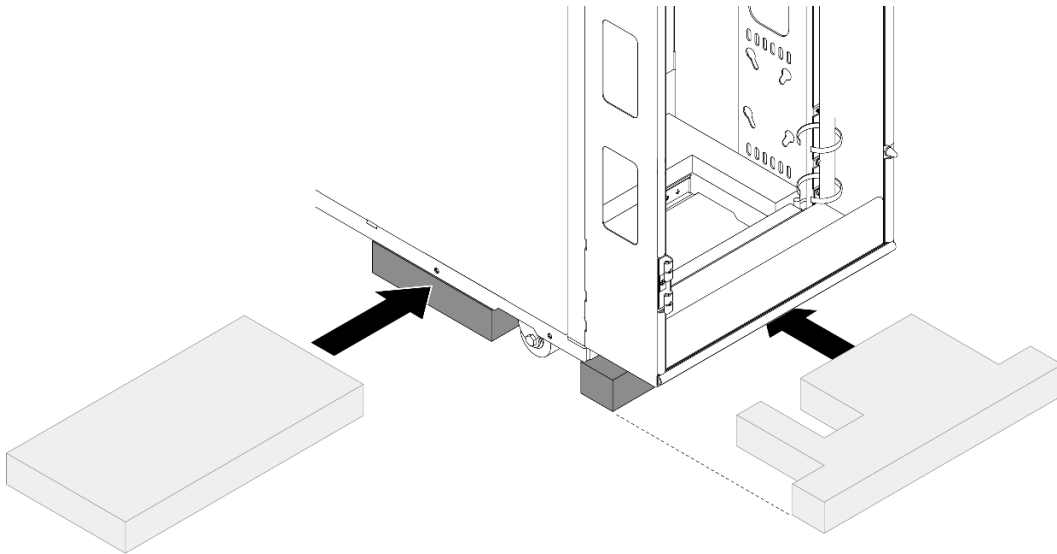


Figure 163. Installing the ground foams

#### **6 Rear extension foam**

**Note:** Install the foam only when ThinkSystem N1380 Neptune One Enclosure is installed.

- Step 1. Peel off the liner from the rear extension foam, and attach it to the ground foam as illustrated.
- Step 2. If necessary, cut the rear extension foam along the cutting lines; then, route cables and hoses through the foam.

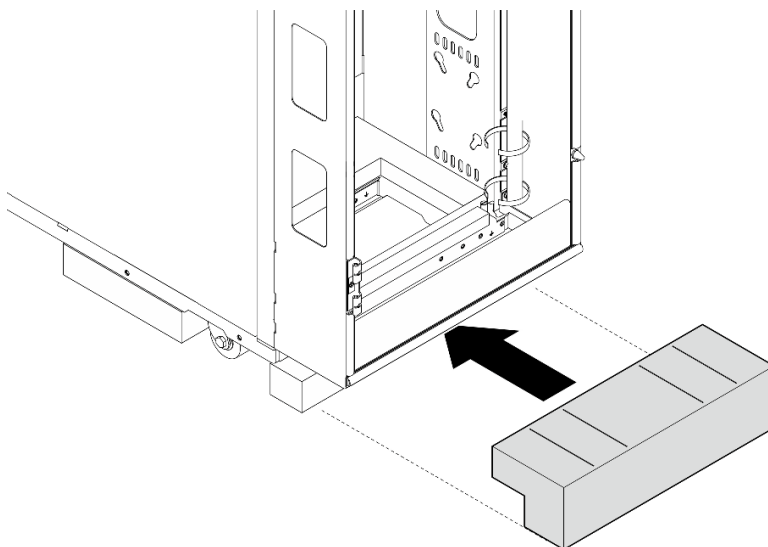


Figure 164. Installing rear extension foam

## 7 Extension foam

Install the extension foam after multiple racks are connected.

- Step 1. Peel off the liner from the foam.
- Step 2. Center align the three foams with the extension, and attach them.
- Step 3. Repeat to attach the foams to the other three extensions.

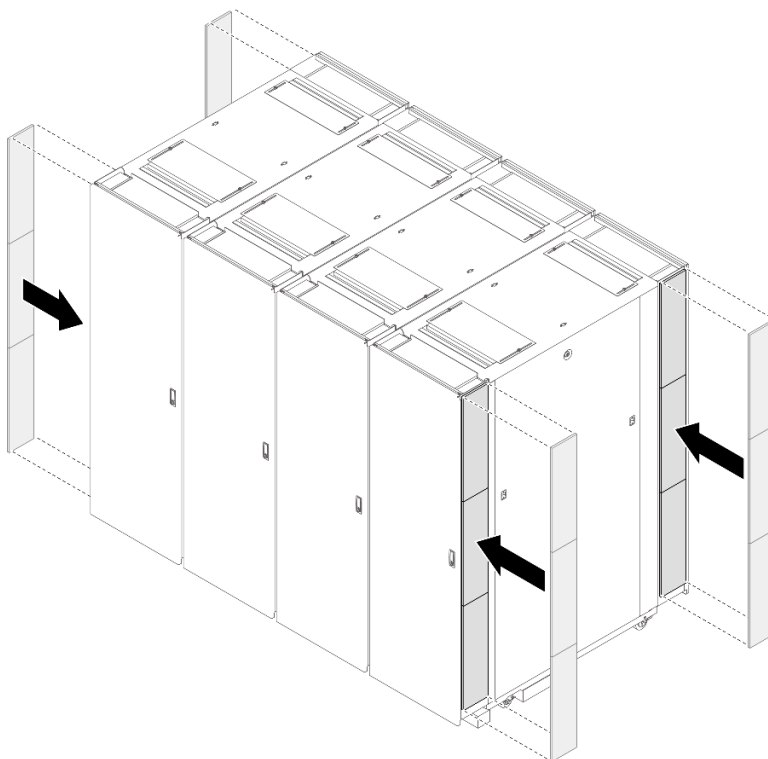


Figure 165. Installing extension foam

## 8 Extension sealing foam

Step 1. Unlock and open the door.

Step 2. Remove the door.

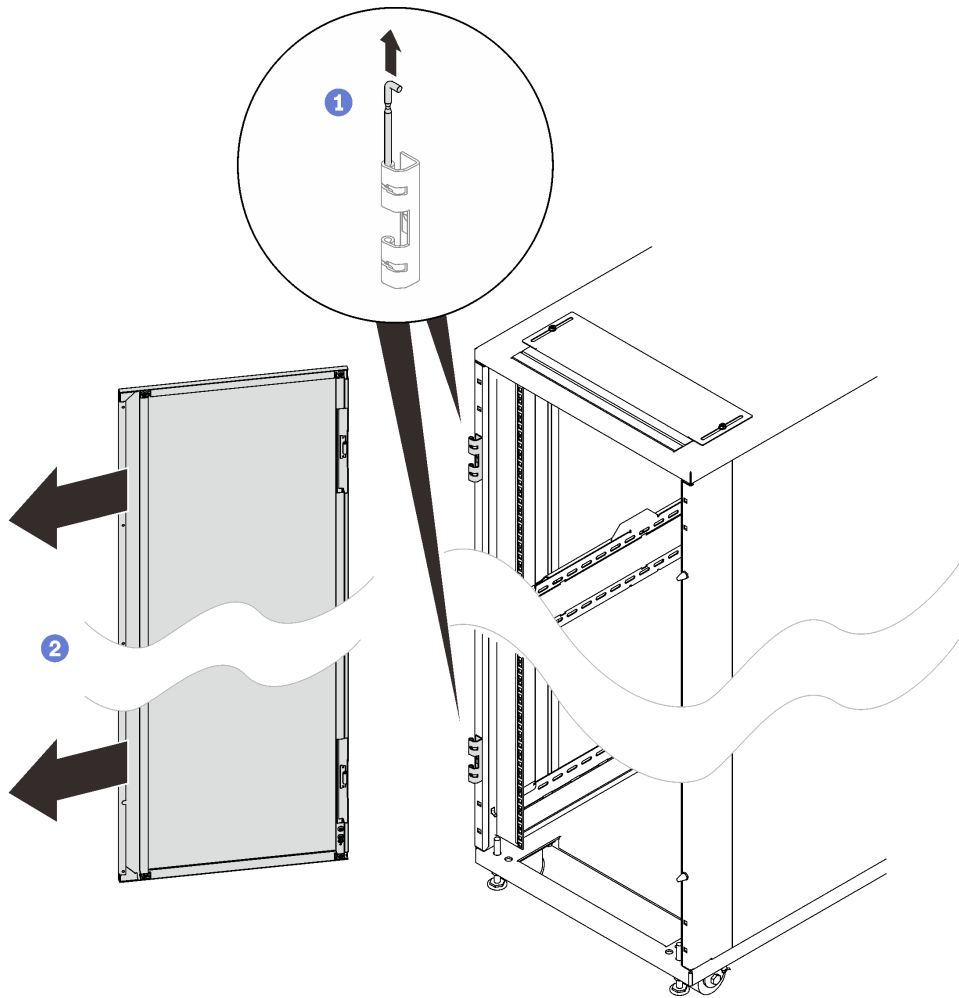
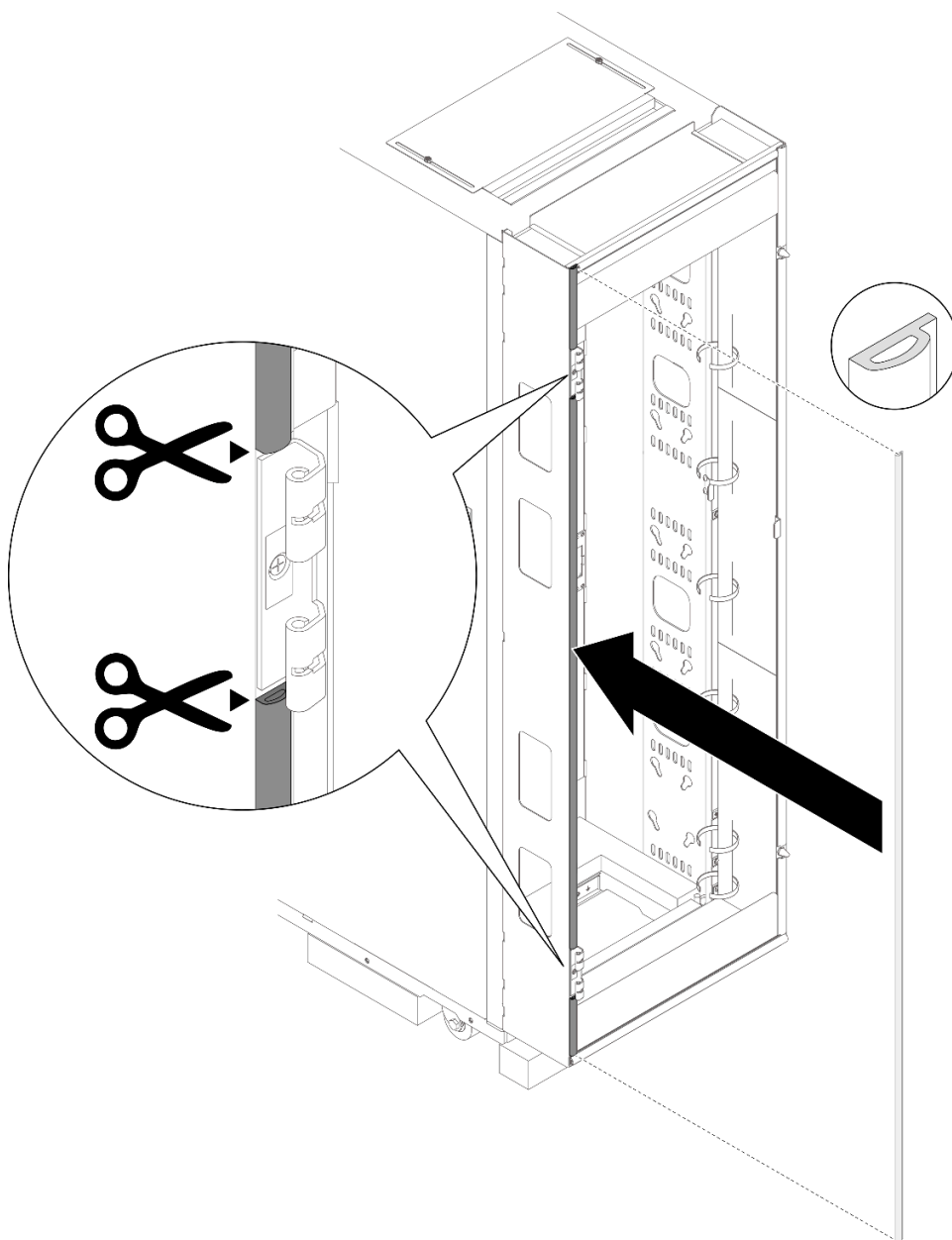


Figure 166. Removing a door

1 Hold the door in place, and lift both hinge pins until they lock in the open position so that the door is disengaged.

2 Remove the door from the rack cabinet frame.

Step 3. Center align the foam with the folded edge of the left side of the rack, and attach it. Cut off the foam with a sharp tool where the hinges are installed.



*Figure 167. Installing the extension sealing foam to the left side of the rack*

- Step 4. Center align the foam with the folded edge of the right side of the rack, and attach it. Cut off the foam with a sharp tool where the guide pins are installed.

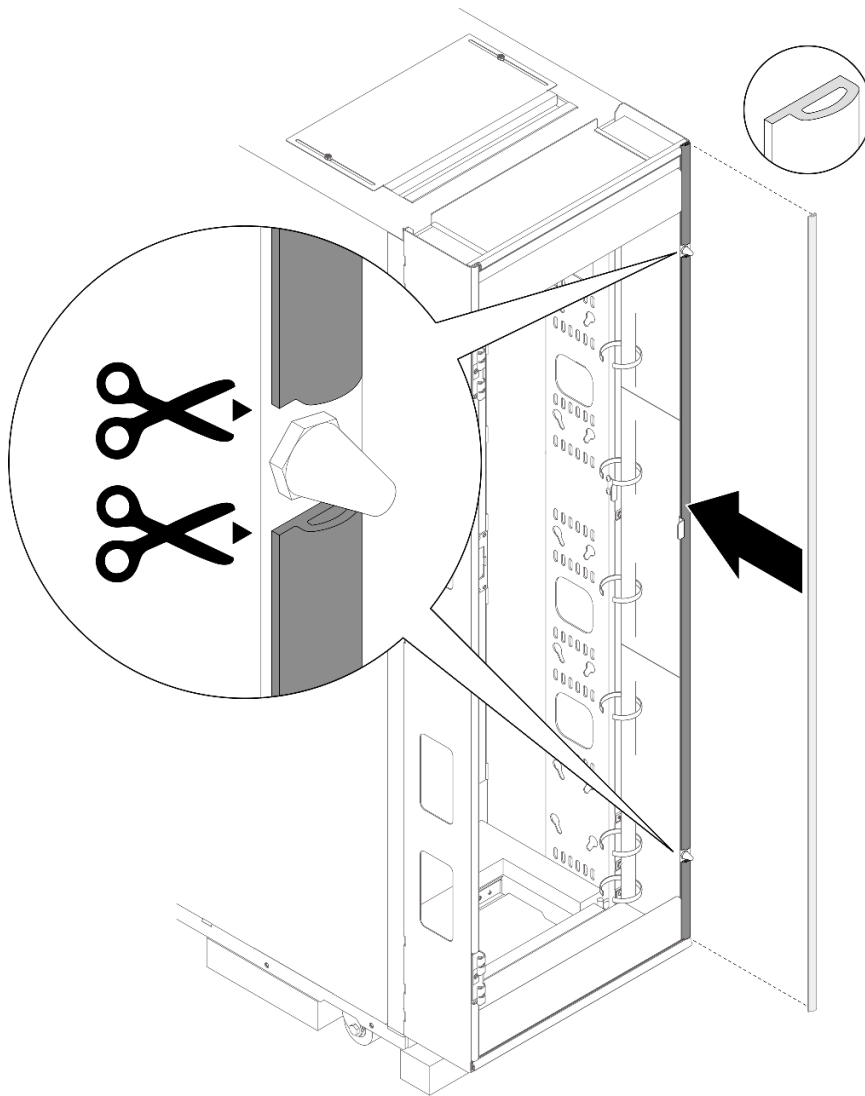


Figure 168. Installing the extension sealing foam to the right side of the rack

Step 5. Install the foam to the extension top cover and bottom cover.

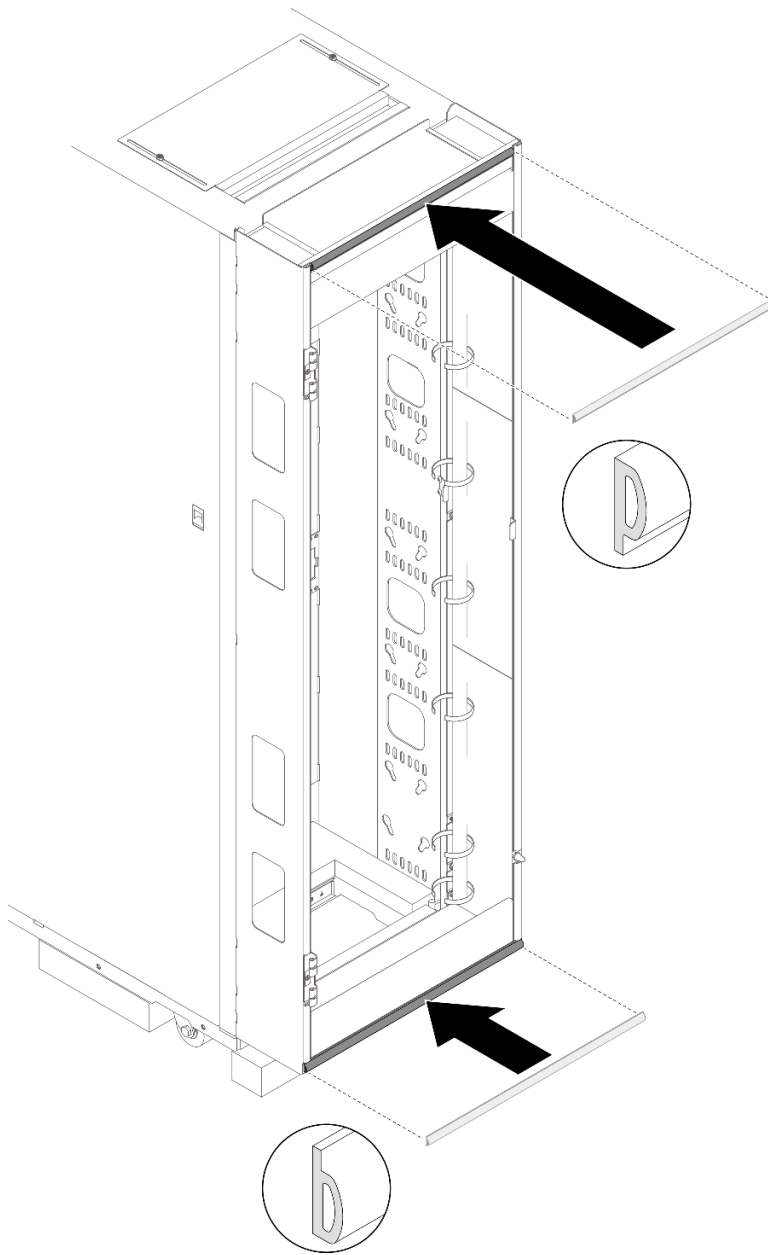
- a. Align the foam with the folded edge of the extension top cover, and attach it. Cut off the excess foam with a sharp tool.

**Note:** A minimum distance of 1 to 2 mm between foam and extension panels needs to be left.

- b.

**Note:** Skip this step for rear extension bottom cover when ThinkSystem N1380 Neptune One Enclosure is installed.

Align the foam with the folded edge of the extension bottom cover, and attach it. Cut off the excess foam with a sharp tool.



*Figure 169. Installing the extension sealing foam to the extension top cover and bottom cover*

Step 6. Install the door.

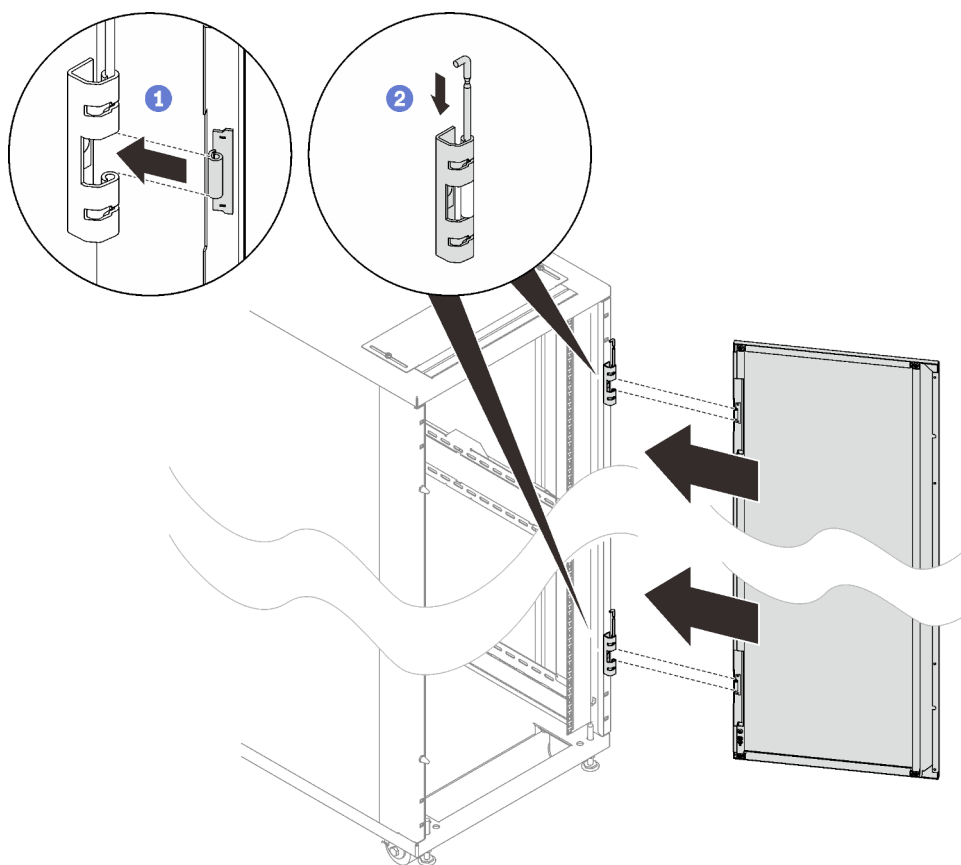


Figure 170. Installing a door

- 1 Align the door with the hinges, and hold the door in place.
- 2 Push the hinge pins down to the closed position so that the door is secured.

---

## Install nuts on the mounting flanges

See this topic to learn how to adjust mounting flange holes with various types of nuts.

## Install clip nuts

### Procedure

- Step 1. Locate the flange hole to install the nut in.
- Step 2. Slide the nut over the target mounting hole.

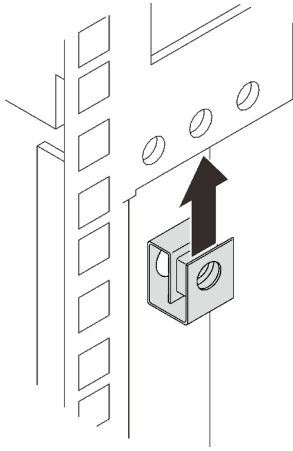


Figure 171. Installing a clip nut

## Install cage nuts with a flat-blade screwdriver

### Procedure

- Step 1. Locate the flange hole to install the nut in.
- Step 2. Install the cage nut.

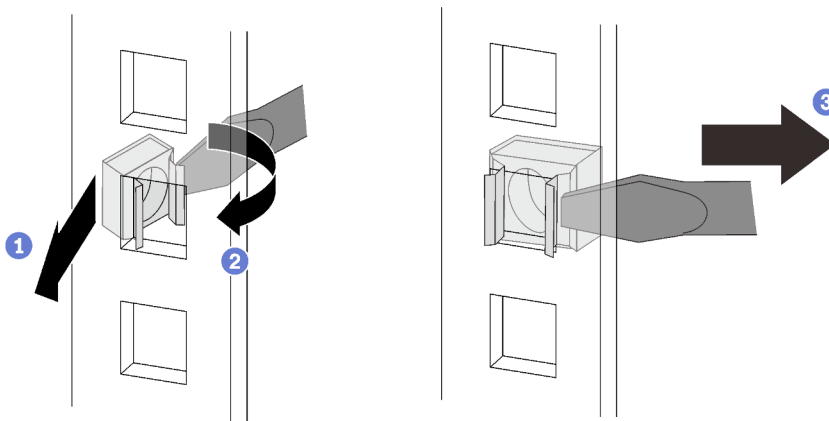


Figure 172. Installing a cage nut

- 1 Insert one edge of the cage nut into the target mounting flange hole.
- 2 Press and compress the other nut edge with a flat-blade screwdriver, and rotate the screwdriver towards the flange hole until the nut edge goes in the hole.
- 3 Release the screwdriver to secure the nut in the mounting flange hole.

## Install cage nuts with insertion tool

### Procedure

- Step 1. Locate the flange hole to install the nut in.
- Step 2. Install the cage nut.

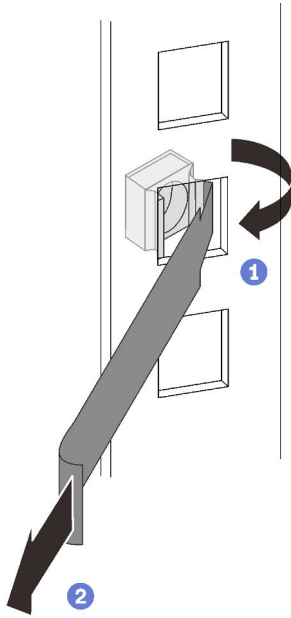


Figure 173. Installing a cage nut

- 1 Insert one edge of the cage nut into the target mounting flange hole, and hook the other edge with the insertion tool through the flange hole.
- 2 Rotate and pull the tool to force the other nut edge into the flange hole, and thus secure the nut.

---

## Install the rack grounding kit

See this topic to learn how to install the rack grounding kit.

### Procedure

- Step 1. Secure each of the two grounding plates to the bottom of the cabinet door and the flange with a screw, and connect the ends of the grounding jumper wire to the two plates.

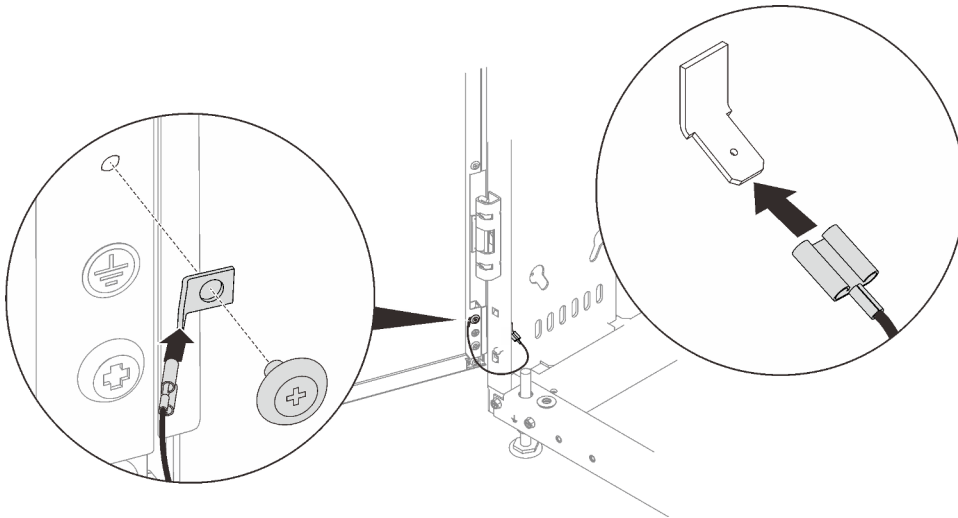


Figure 174. Installing the rack grounding kit

Step 2. Remove the side cover.

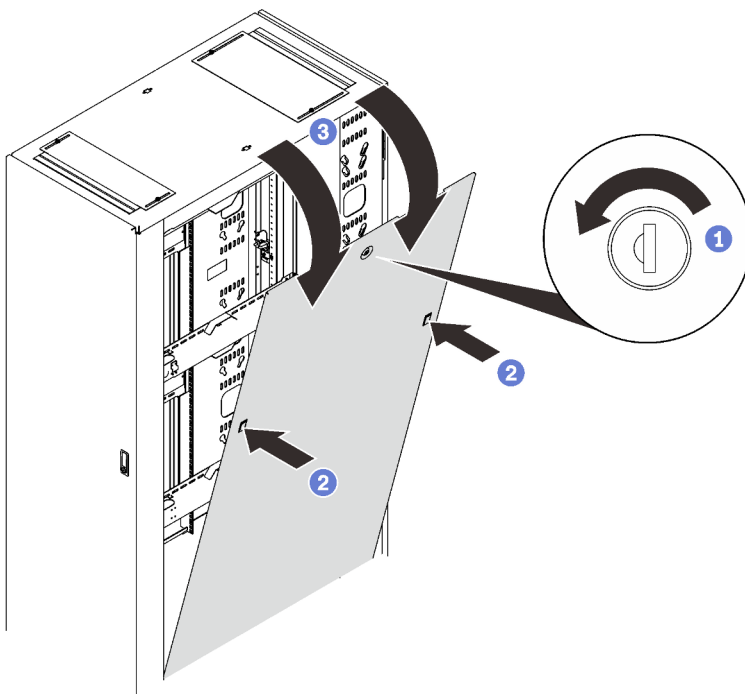
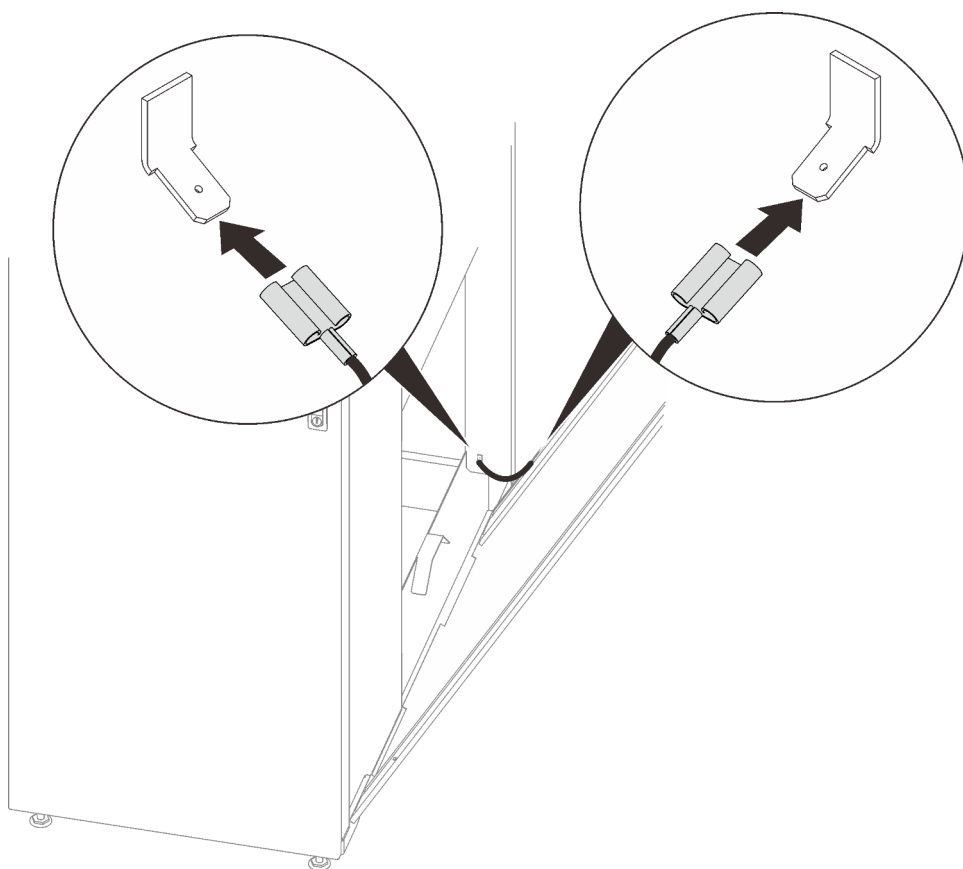


Figure 175. Removing a side cover

- 1 Unlock the side cover with the key.
- 2 Press on the two latches on both sides of the cover to disengage it from the rack.
- 3 Rotate the top of the side cover away from the rack, and remove it.

Step 3. Align the bottom of the side cover with the slot on the rack cabinet; then, connect the grounding jumper wire to the posts on the rack frame and the side cover.



*Figure 176. Installing the grounding jumper wire*

Step 4. Secure the side cover to the rack cabinet.

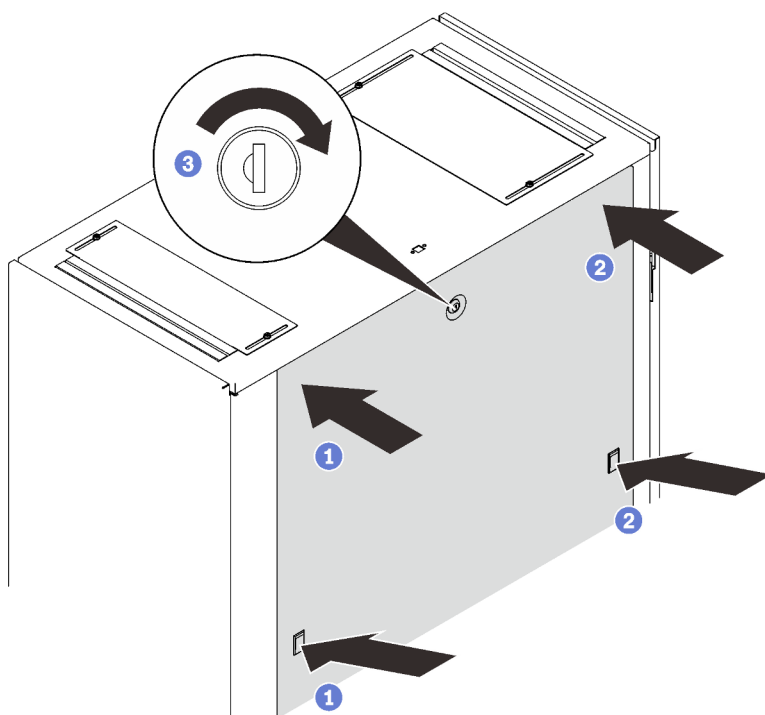


Figure 177. Securing the side cover

**Note:** This procedure is best executed by two people.

- 1 Press and hold the latch of one side, and firmly press the upper corner in.
- 2 Repeat the previous step on the other side.
- 3 Lock the side cover with the key.

Step 5. Repeat the previous three steps on the other side cover.

---

## Set up Rear Door Heat eXchanger V2

See this topic to learn how to install and set up ThinkSystem Rear Door Heat eXchanger V2.

### About this task

Follow the instructions in the section corresponding to the installation scenario:

- If Rear Door Heat eXchanger V2 comes when installed to the rack, see [“Complete setup of Rear Door Heat eXchanger V2 that comes with the rack” on page 154](#) to complete the setup procedure.
- To replace a regular rear door with Rear Door Heat eXchanger V2, see [“Replace a regular door with Rear Door Heat eXchanger V2” on page 155](#).

**Important:** Make sure to plan the cooling system with consideration of [“Water specifications for the secondary cooling loop” on page 165](#).

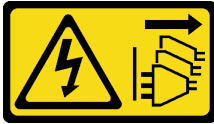
### S010



**CAUTION:**

Do not place any object weighing more than 82 kg (180 lb) on top of rack-mounted devices.

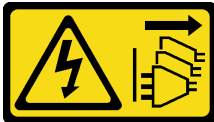
S019



**CAUTION:**

The power-control button on the device does not turn off the electrical current supplied to the device. The device also might have more than one connection to dc power. To remove all electrical current from the device, ensure that all connections to dc power are disconnected at the dc power input terminals.

R007



 **DANGER**

- Connect power cords from devices in the rack cabinet to electrical outlets that are near the rack cabinet and are easily accessible.
- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet before you service any device in the rack cabinet.
- Install an emergency-power-off switch if more than one power device (power distribution unit or uninterruptible power supply) is installed in the same rack cabinet.
- Connect all devices that are installed in a rack cabinet to power devices that are installed in the same rack cabinet. Do not connect a power cord from a device that is installed in one rack cabinet to a power device that is installed in a different rack cabinet.

R004



**CAUTION:**

See the instructions in the rack documentation before you install devices, remove devices, or relocate the rack.

S038



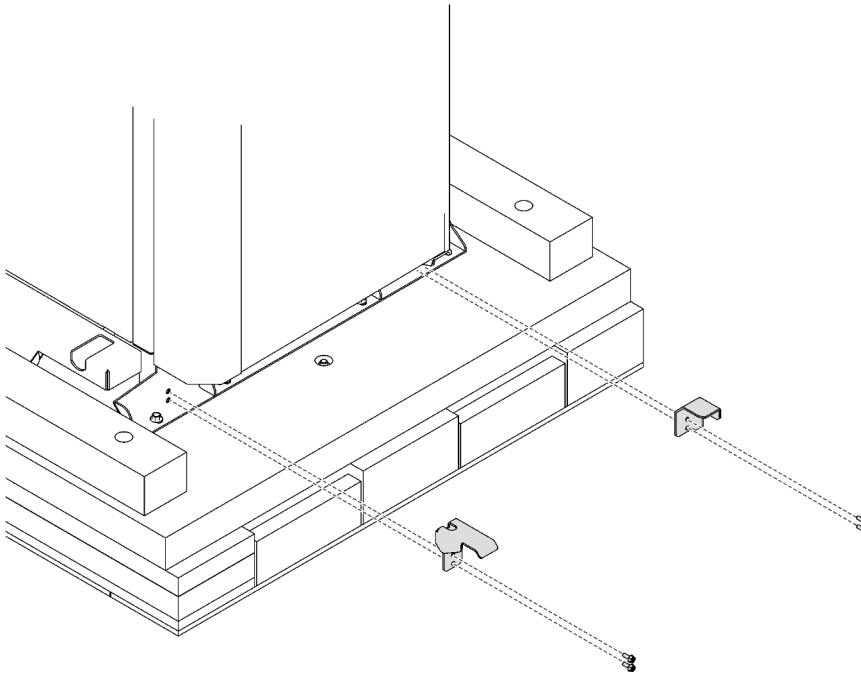
**CAUTION:**  
Eye protection should be worn for this procedure.

## Complete setup of Rear Door Heat eXchanger V2 that comes with the rack

See this topic to learn how to complete setup of ThinkSystem Rear Door Heat eXchanger V2 when it comes already installed to the rack.

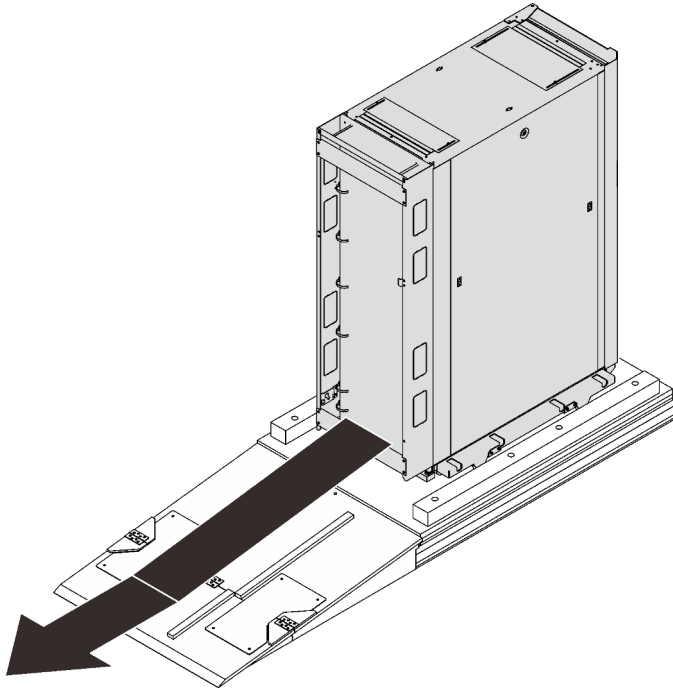
### Procedure

Step 1. Remove the brackets that support the rear door heat exchanger.



*Figure 178. Removing the supporting brackets*

Step 2. Make sure that one specially trained person holds onto the rear door heat exchanger and guides the rack down the ramp. The other specially trained persons must guide the rack down the ramp by holding onto the rack frame. Slowly roll the rack down the ramp until the casters are on the floor. Move the rack to the final location.



*Figure 179. Moving the rack cabinet from the pallet*

### **After this task is completed**

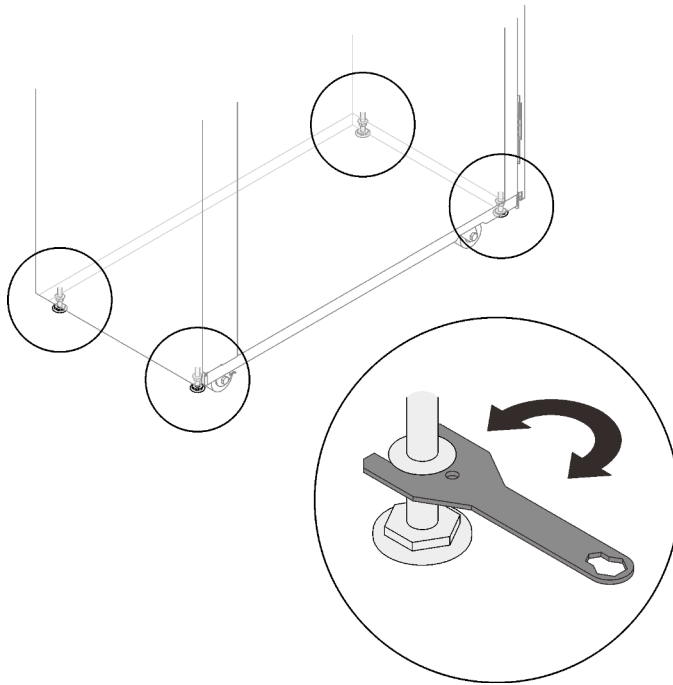
Proceed to [“Fill the heat exchanger with water” on page 175.](#)

## **Replace a regular door with Rear Door Heat eXchanger V2**

See this topic to learn how to replace a regular rear door with ThinkSystem Rear Door Heat eXchanger V2.

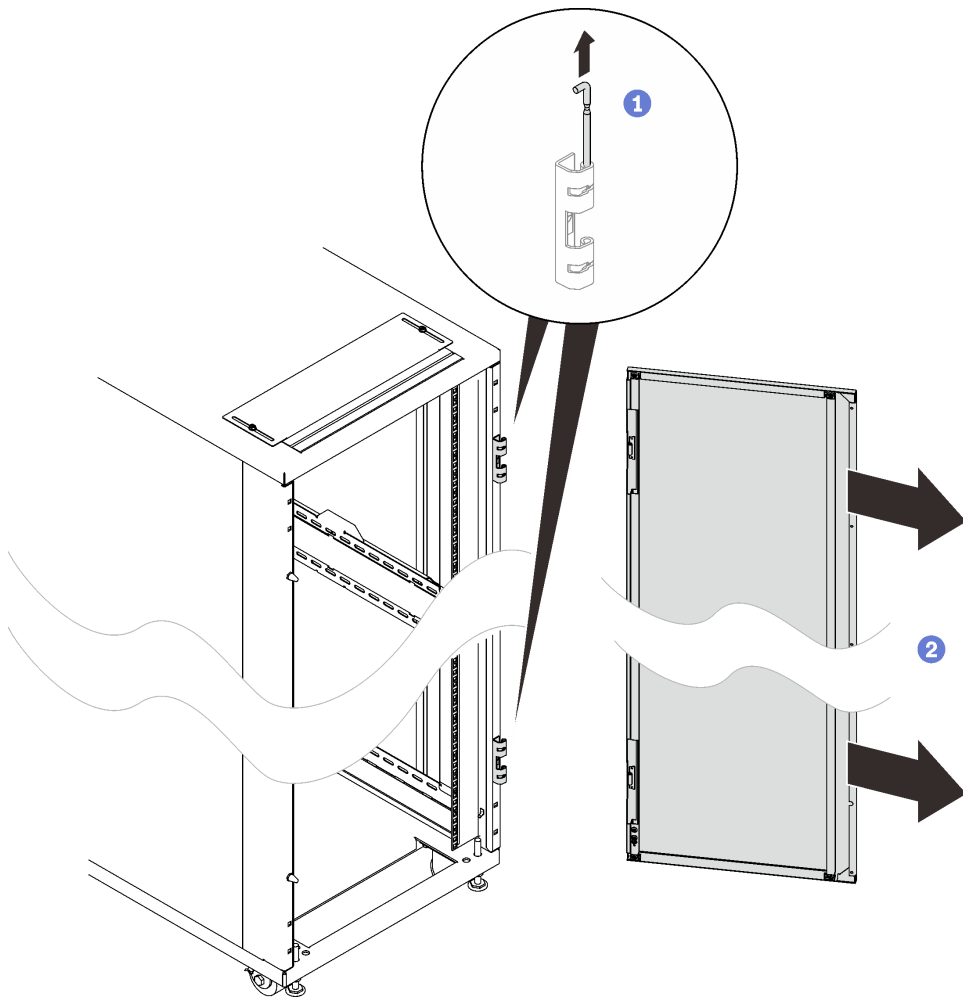
### **Procedure**

- Step 1. Extend each of the four leveling pads in turns until they firmly contact the floor and support the rack cabinet. Make sure the cabinet is balanced by gently pushing the cabinet. If it tilts, adjust the length of the leveling pads until the cabinet is well balanced.



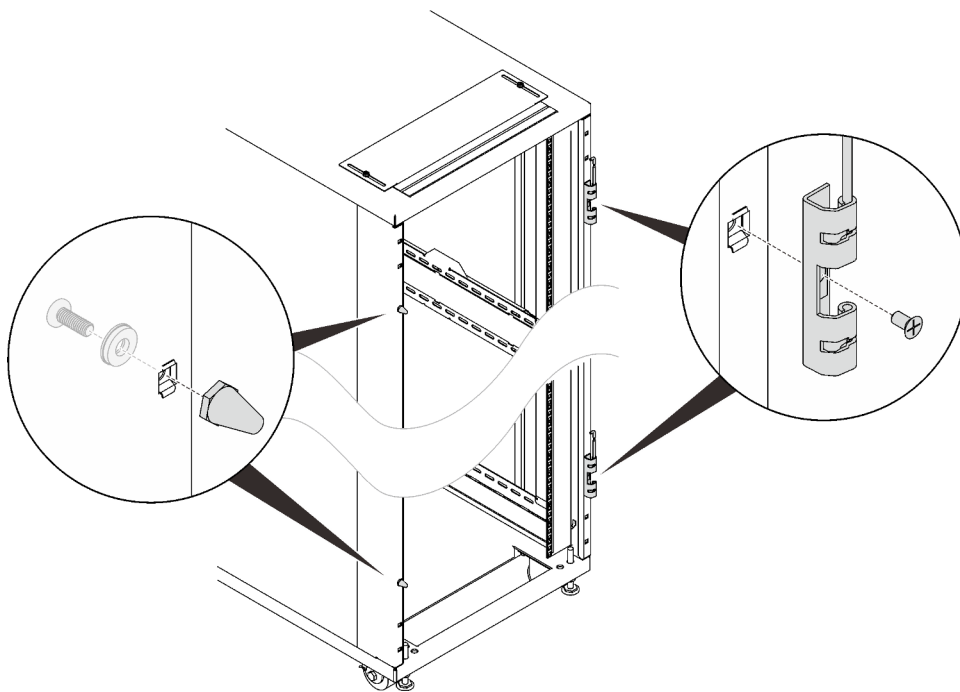
*Figure 180. Lowering the leveling pads*

Step 2. Remove the rear door from the rack cabinet.



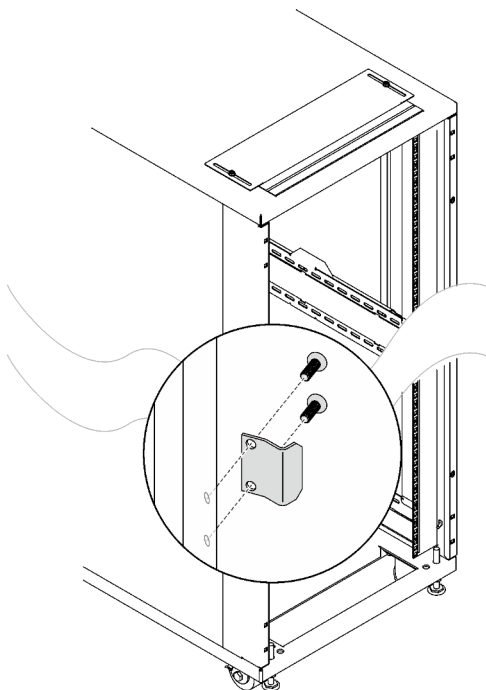
*Figure 181. Removing a door*

Step 3. Remove the two door hinges and the two doorstops.



*Figure 182. Removing the door hinges and doorstops*

Step 4. Remove the door latch.



*Figure 183. Removing the door latch*

Step 5. Align the holes in the latch plate with those in the two clip nuts; then, secure the latch plate in place with two M6 screws.

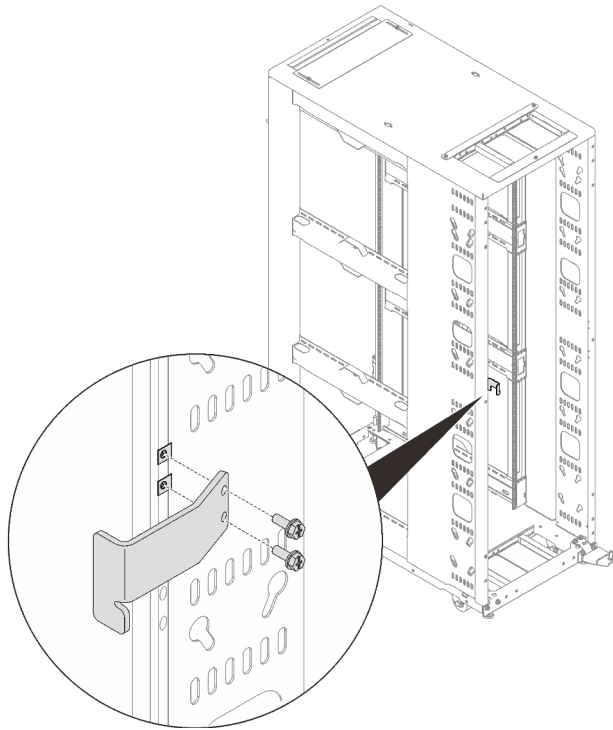


Figure 184. Installing the latch plate

Step 6. Install the upper air baffle.

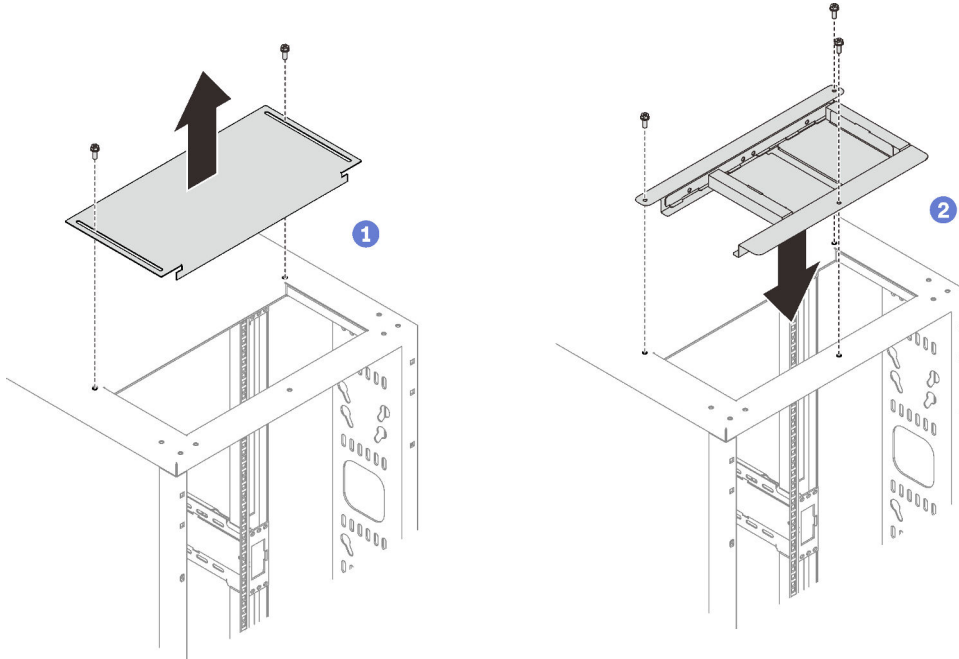
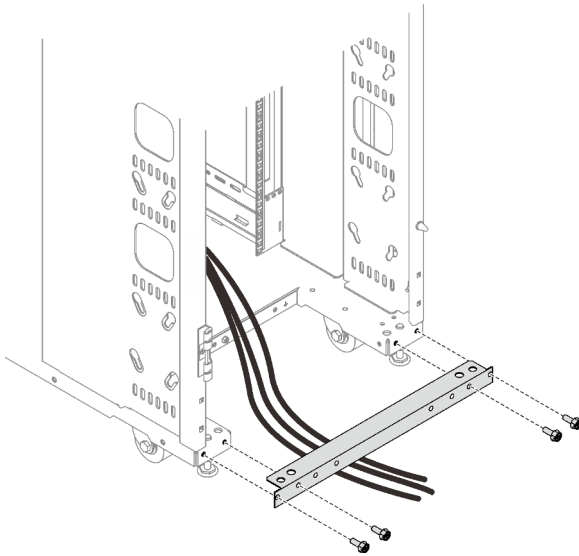


Figure 185. Installing the upper air baffle

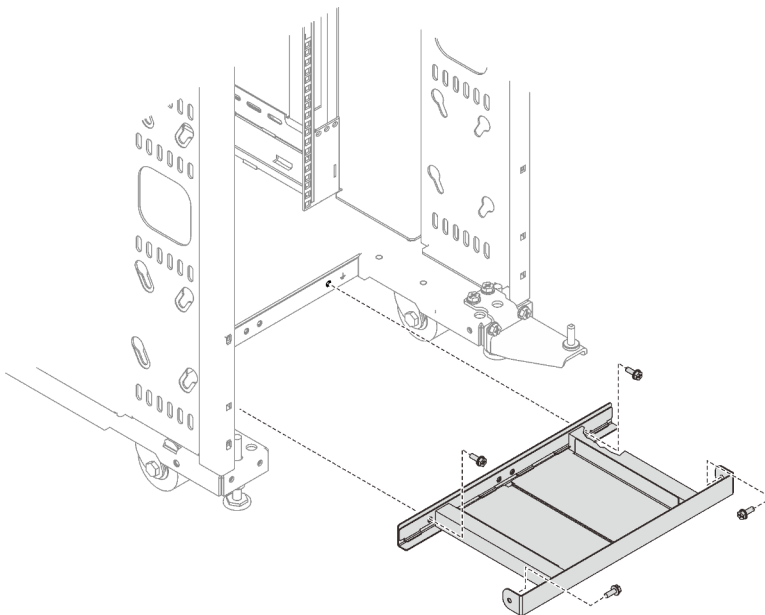
- 1 Remove the two screws that secure the rear cable access cover, and remove the cover.
- 2 Align the upper air baffle with the slot, and secure it with three screws.

Step 7. Remove the four screws that secure the cable access bar, and remove the bar.



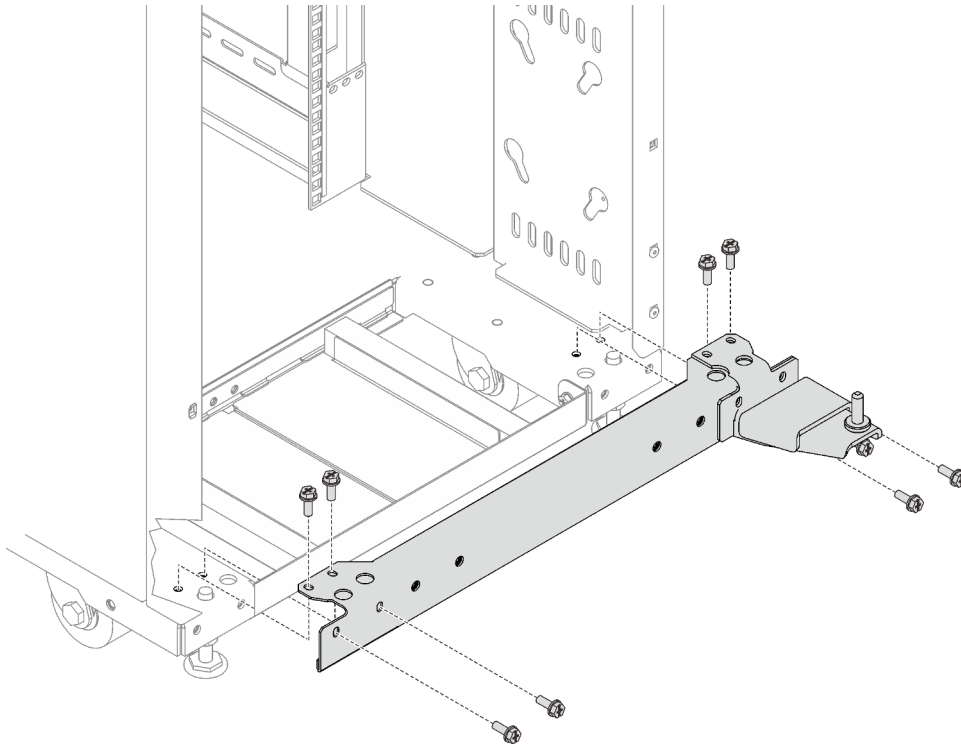
*Figure 186. Removing the cable access bar*

Step 8. Align the lower air baffle to the bottom cable slot, and secure it with four screws as illustrated.



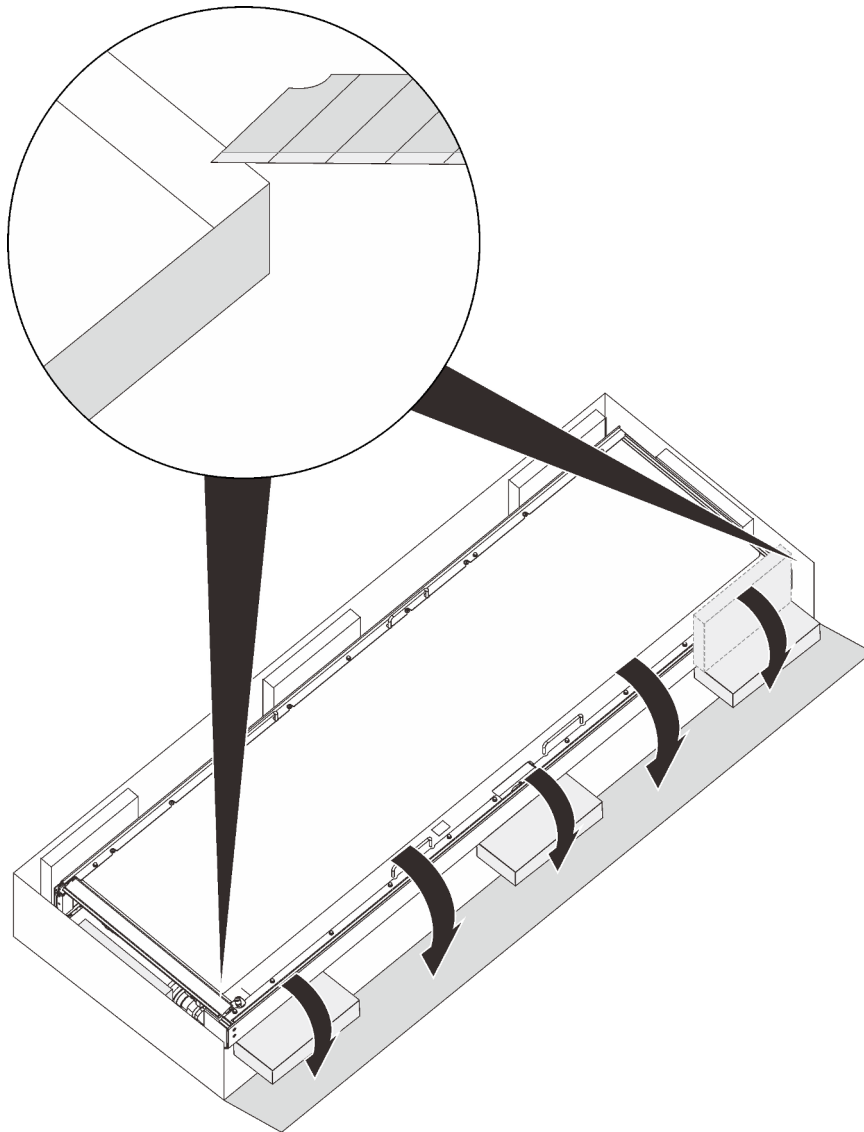
*Figure 187. Installing the lower air baffle*

Step 9. Secure the bottom hinge assembly to the rack cabinet with eight screws.



*Figure 188. Installing the bottom hinge assembly*

Step 10. Face the bottom side of the carton, remove the carton top, and slit the two carton corners on your right-hand side with a knife. Then, fold the right carton panel down to the ground, and rotate the three carton inserts down.



**Bottom**

*Figure 189. Unpacking the heat exchanger*

Step 11. With three people, rotate the heat exchanger to vertical on the three carton inserts. Then, remove the inner and outer hose access panels while one person hold the heat exchanger.

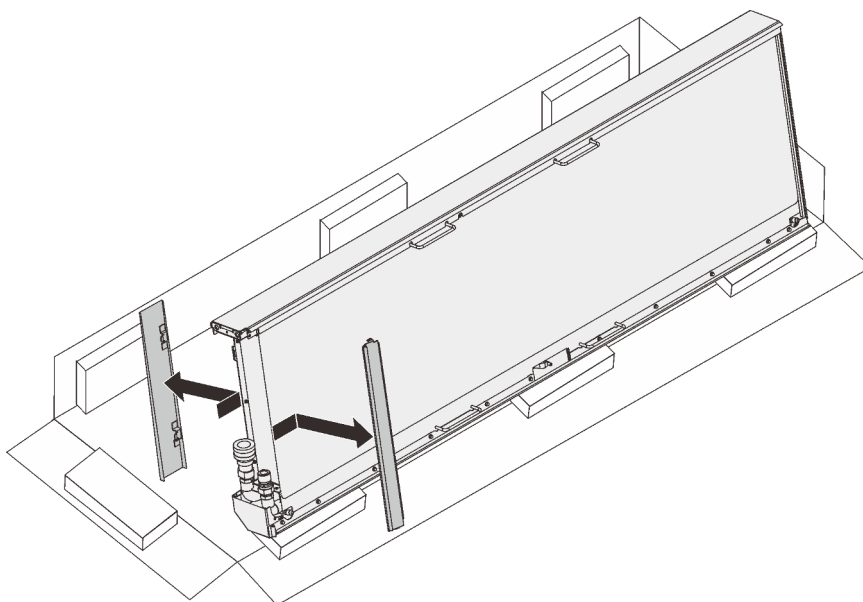


Figure 190. Removing the hose access panels

Step 12. Hold the heat exchanger with three people on the handles/spots as illustrated. Then, carefully lift the heat exchanger and turn it upright.

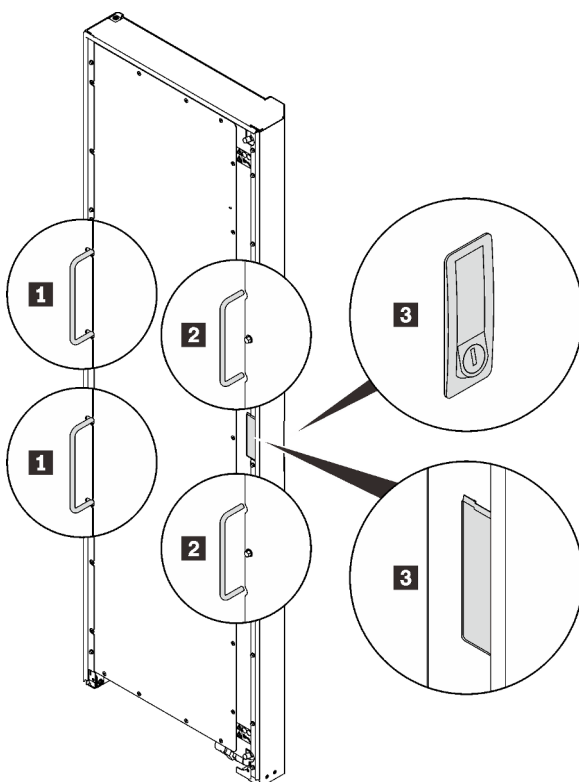
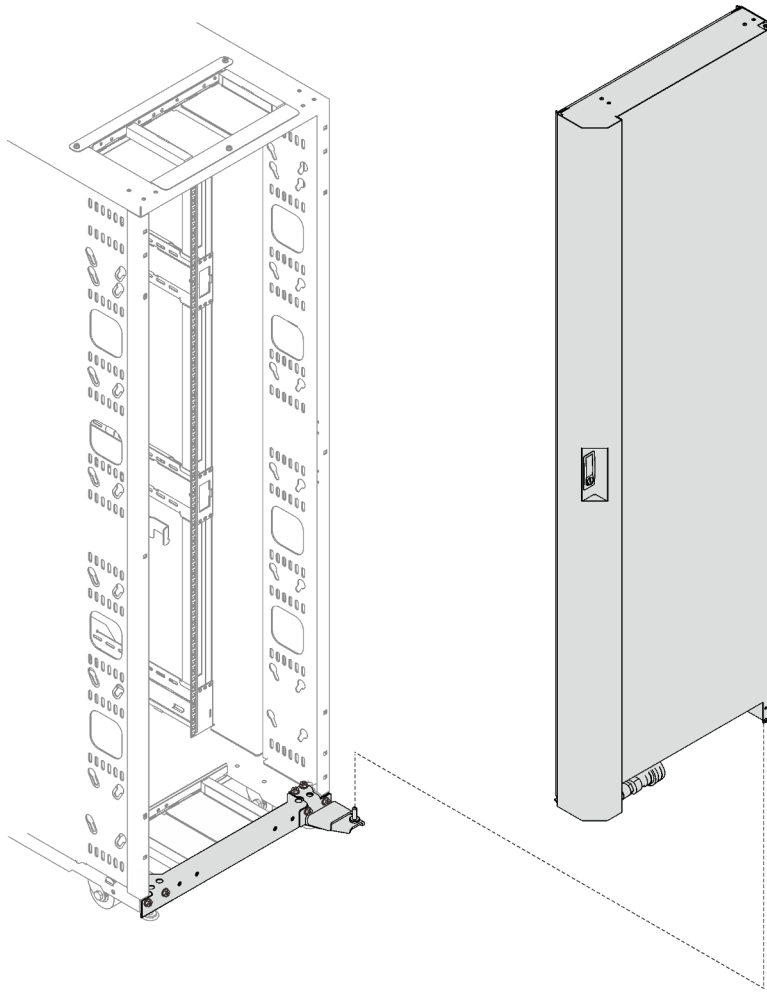


Figure 191. Lifting the heat exchanger with three people

<b>1</b> Handles that the first person hold on to	<b>3</b> Spots that the third person hold on to
<b>2</b> Handles that the second person hold on to	

Step 13. Carry the heat exchanger with three people to the cabinet frame. Align the bottom corner with the bottom hinge pin on the rack cabinet; then, lower the heat exchanger to fit the pin in.



*Figure 192. Installing the heat exchanger to the rack cabinet*

Step 14. Hold the heat exchanger in place with two people. Insert the top hinge pin to the heat exchanger; then, secure the hinge with three screws.

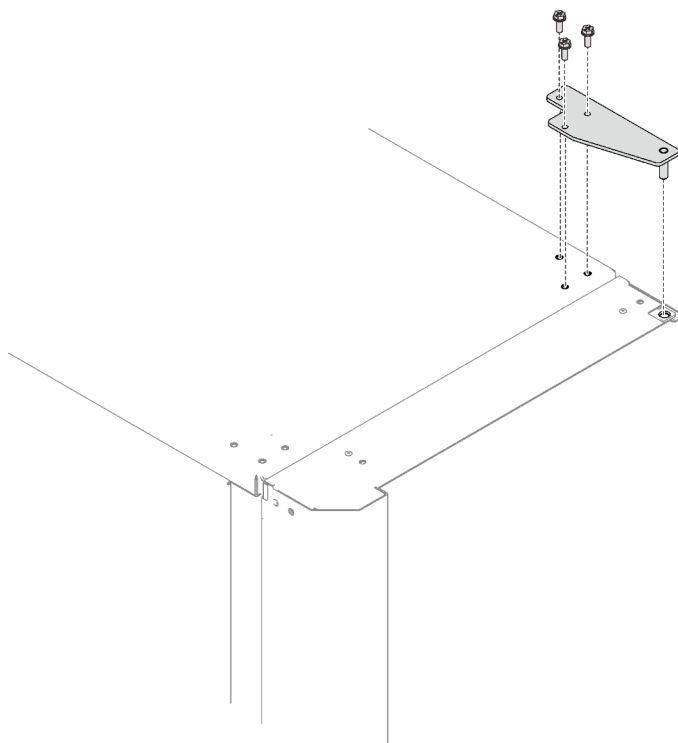


Figure 193. Installing the top hinge

## After this task is completed

Proceed to [“Fill the heat exchanger with water” on page 175.](#)

## Water specifications for the secondary cooling loop

It is of crucial importance that water supplied to the heat exchanger meet the requirements listed in this topic. Make sure to meet the requirements before setting up liquid cooling system.

**Important:** Without the water that is being supplied to the heat exchanger meeting the requirements that are described in this topic, system failures might occur as a result of any of the following problems:

- Leaks due to corrosion and pitting of the metal components of the heat exchanger or the water-supply system.
- Buildup of scale deposits inside the heat exchanger, which can cause the following problems:
  - A reduction of the ability of the heat exchanger to cool the air that is exhausted from the rack
  - Failure of mechanical hardware, such as a hose quick-connect coupling
- Organic contamination, such as bacteria, fungi, or algae. This contamination can cause the same problems as described for scale deposits.

## Control and conditioning of the secondary cooling loop

The water that is used to fill, refill, and supply the heat exchanger must be particle-free deionized water or particle-free distilled water with appropriate controls for avoiding the following issues:

- Metal corrosion
- Bacterial fouling
- Scaling

The water cannot originate from the primary chilled-water system for the building, but must be supplied as part of a secondary closed-loop system.

**Important:** Do not use glycol solutions, because they can adversely affect the cooling performance of the heat exchanger.

### Materials to use in secondary loops

Use any of the following materials in supply lines, connectors, manifolds, pumps and any other hardware that makes up the closed-loop water-supply system:

- Copper
- Brass with less than 30% zinc content
- Stainless steel 303 or 316
- Peroxide-cured ethylene propylene diene monomer (EPDM) rubber, non-metal-oxide material

### Materials to avoid in secondary loops

Do not use any of the following materials in any part of the water-supply system:

- Oxidizing biocides, such as chlorine, bromine, and chlorine dioxide
- Aluminum
- Brass with greater than 30% zinc
- Irons (non-stainless steel)

### Water-supply requirements for secondary loops

This section includes specific characteristics of the system that supplies the chilled conditioned water to the heat exchanger.

- **Temperature:**

The heat exchanger and its supply hose and return hoses are not insulated. Avoid any condition that might cause condensation. The temperature of the water inside the supply hose, return hose, and heat exchanger must be kept above the dew point of the location where the heat exchanger is being used.

**Attention:** Typical primary chilled water is too cold for use in this application because building chilled water can be as cold as 4°C - 6°C (39°F - 43°F).

**Important:** The system that supplies the cooling water must be able to measure the room dew point and automatically adjust the water temperature accordingly. Otherwise, the water temperature must be above the maximum dew point for that data center installation. For example, the following minimum water temperature must be maintained:

- 18°C ±1°C (64.4°F ±1.8°F). This is applicable within an ASHRAE Class 1 Environmental Specification that requires a maximum dew point of 17°C (62.6°F).
- 22°C ±1°C (71.6°F ±1.8°F). This is applicable within an ASHRAE Class 2 Environmental Specification that requires a maximum dew point of 21°C (69.8°F).

See the ASHRAE document *Thermal Guidelines for Data Processing Environments*. Information about obtaining this document is at <https://www.techstreet.com/ashrae/products/1909403>.

- **Pressure**

The water pressure in the secondary loop must be less than 690 kPa (100 psi). Normal operating pressure at the heat exchanger must be 414 kPa (60 psi) or less.

- **Flow rate**

The flow rate of the water in the system must be in the range of 23 - 57 liters (6 - 15 gallons) per minute. Pressure drop versus flow rate for heat exchangers (including quick-connect couplings) is defined as approximately 103 kPa (15 psi) at 57 liters (15 gallons) per minute.

- **Water volume limits**

The heat exchanger holds approximately 9 liters (2.4 gallons). Fifteen meters (50 ft) of 19 mm (0.75 in.) supply and return hoses hold approximately 9.4 liters (2.5 gallons). To minimize exposure to flooding in the event of leaks, the entire product cooling system (heat exchanger, supply hose, and return hose), excluding any reservoir tank, must have a maximum 18.4 liters (4.8 gallons) of water. This is a cautionary statement, not a functional requirement. Also consider using leak detection methods on the secondary loop that supplies water to the heat exchanger.

- **Air exposure**

The secondary cooling loop is a closed loop, with no continuous exposure to room air. After you fill the loop, remove all air from the loop. An air bleed valve is provided at the top of a heat exchanger manifold for purging all air from the system.

## **Water delivery specifications for secondary loops**

This section includes the various hardware components that make up the delivery system secondary loop that provides the chilled, conditioned water to the heat exchanger. The delivery system includes pipes, hoses, and the required connection hardware to connect the hoses to the heat exchanger. Hose management in raised-floor and non-raised-floor environments is also described.

The heat exchanger can remove 100% or more of the heat load from an individual rack when it is running under optimum conditions.

The primary cooling loop is considered to be the building chilled-water supply or a modular chiller unit. The primary loop must not be used as a direct source of coolant for the heat exchanger.

The main purpose of this topic is to provide examples of typical methods of secondary loop setup and operating characteristics that are needed to provide an adequate, safe supply of water to the heat exchanger.

**Attention:** The overpressure safety device must meet the following requirements:

- Comply with ISO 4126-1 (Information about obtaining this document is at <https://webstore.ansi.org/Standards/ISO/ISO41262013>. Search on document number iso 4126-1.)
- Be installed so that it is easily accessed for inspection, maintenance, and repair.
- Be connected as close as possible to the device that it is intended to protect.
- Be adjustable only with the use of a tool.
- Have a discharge opening that is directed so that discharged water or fluid will not create a hazard or be directed toward any person.
- Be of adequate discharge capacity to ensure that the maximum working pressure is not exceeded.
- Be installed without a shutoff valve between the overpressure safety device and the protected device.

The following figures show typical cooling solutions with the most flexibility possible. Consider the following guidelines before planning your solution.

- A method for monitoring and setting the total flow rate delivered to all of the heat exchangers is required. This can be a discrete flowmeter that is built into the flow loop or a flowmeter within the secondary loop of the coolant distribution unit (CDU).
- After you set the total flow rate for all of the heat exchangers by using a flowmeter as previously described, it is important to design the plumbing so that it provides the flow rate that you want for each heat exchanger and provides a way to verify the flow rate. Figure 5 on page 16 through Figure 8 on page

19 illustrate the use of circuit setters to adjust the flow rate to each heat exchanger. Other methods, such as inline or external flowmeters, can provide a more accurate method for setting the flow rate through the individual shutoff valves.

- Design the flow loop to minimize the total pressure drop within the flow loop. The Optional Low Impedance Quick Connect feature (shown in Figure 5 on page 16 through Figure 8 on page 19) cannot be the Eaton quick-connect couplings that are used on the heat exchanger because of the excessive pressure drop associated with flowing through four quick-connect pairs in series. These must be very low, near 0, flow impedance quick connects. Alternatively, these quick connects can be eliminated and replaced with a hose barb connection.

Following are some examples of the most common solutions.

- **Primary and secondary cooling loops**

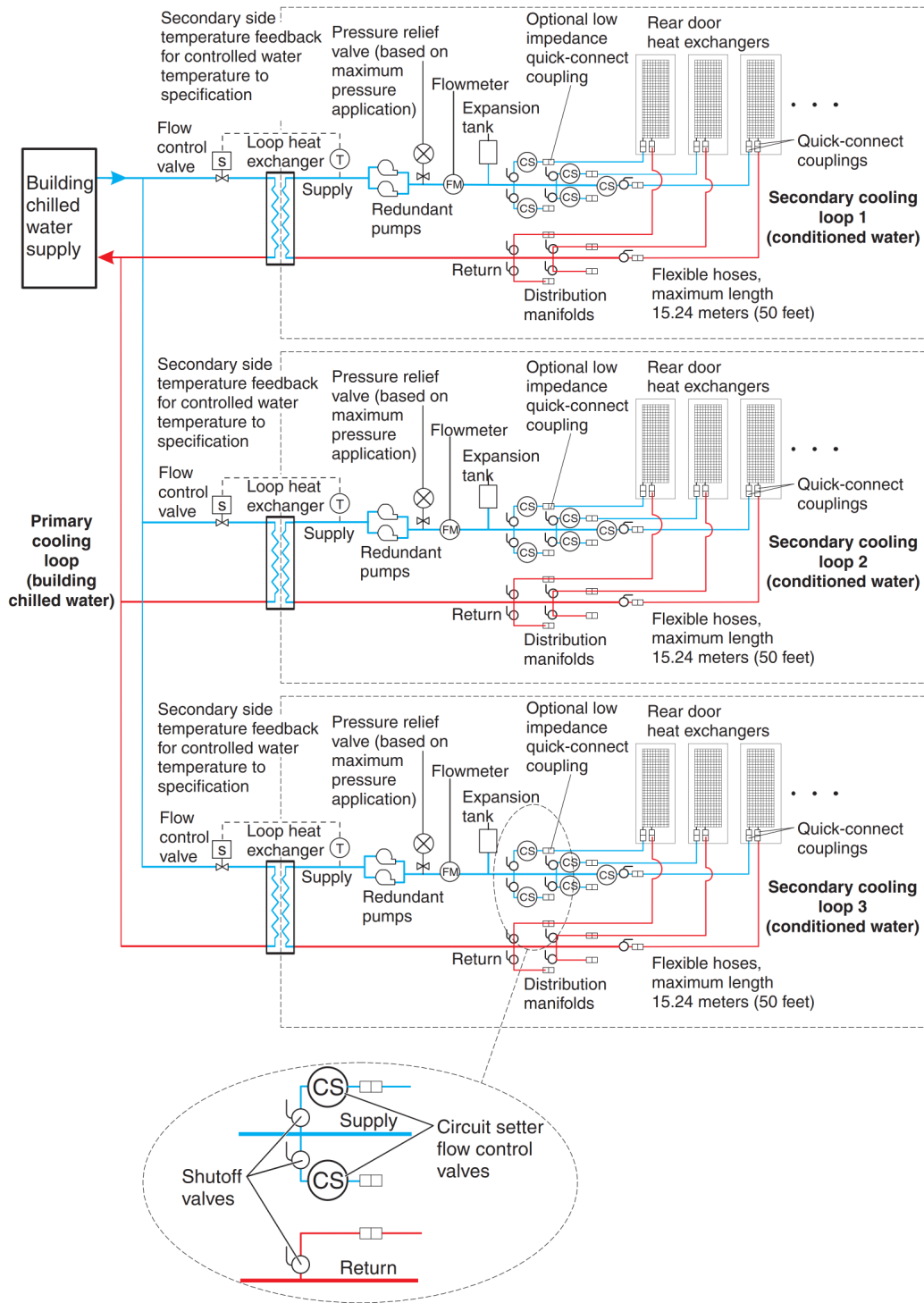


Figure 194. Primary and secondary cooling loops

This figure shows a typical cooling solution and identifies the components of the primary cooling loop and the secondary cooling loop.

- **Coolant distribution unit with a fabricated facilities solution**

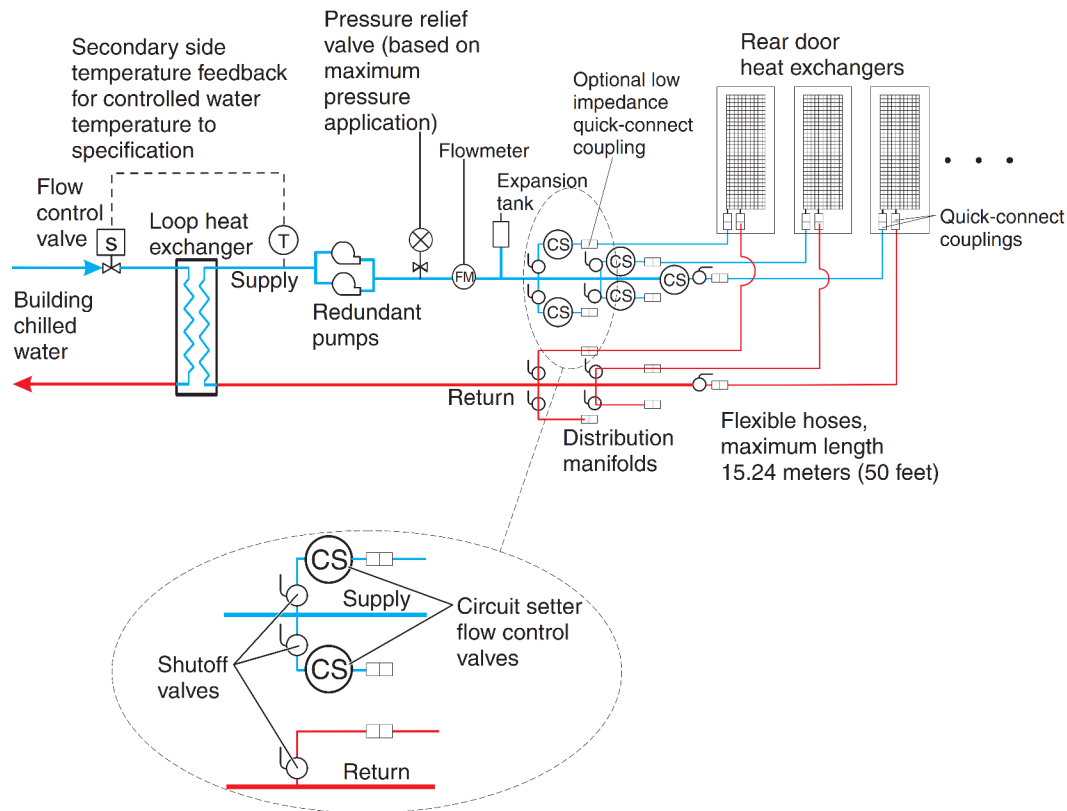


Figure 195. Coolant distribution unit with a fabricated facilities solution

This figure shows an example of a facilities fabricated solution. The actual number of heat exchangers that are connected to a secondary loop depends on the capacity of the coolant distribution unit that is running the secondary loop.

- **Coolant distribution unit with off-the-shelf supplier solutions**

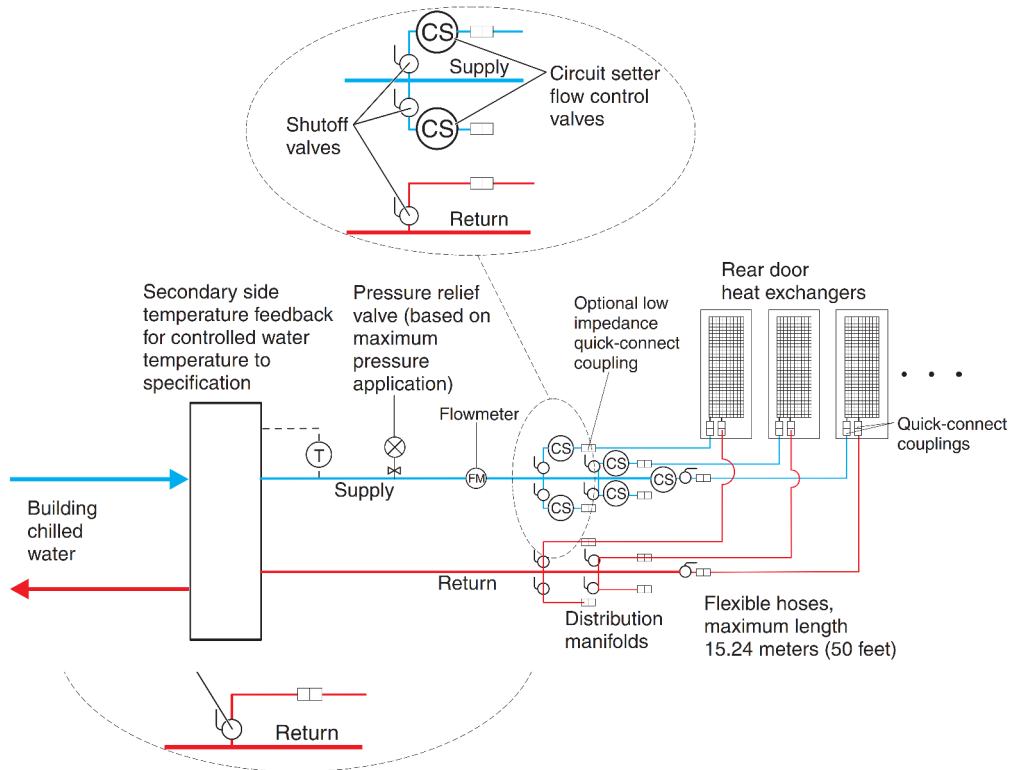


Figure 196. Coolant distribution unit that uses off-the-shelf supplier solutions

**Notes:** Supplier-built coolant distribution unit (CDU) suggested features:

- Temperature and flow metering (monitoring)
- Leak detection or water level sensing and shutdown
- Local and remote monitoring and control
- Access port for filling and water treatment

This figure shows an example of an off-the-shelf modular coolant distribution unit. The actual number of heat exchangers that are connected to a secondary loop depends on the capacity of the coolant distribution unit that is running the secondary loop

- **Coolant distribution unit with a water chiller unit to provide conditioned water**

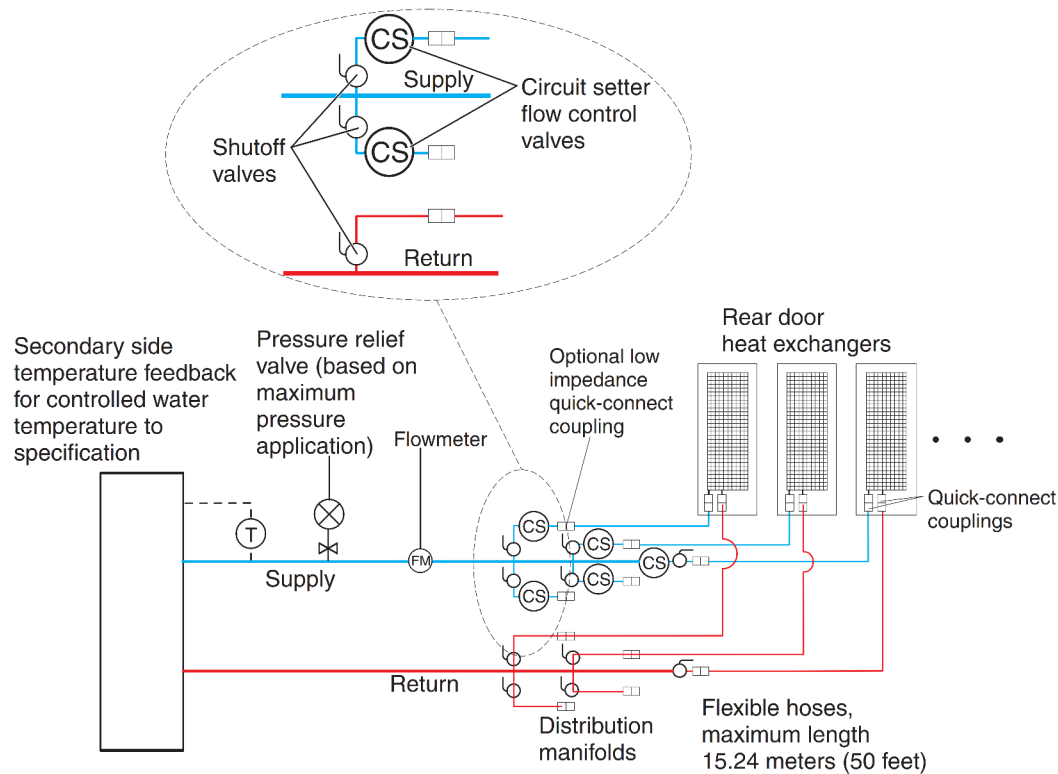


Figure 197. Coolant distribution unit that uses off-the-shelf supplier solutions

**Notes:** Supplier-built water chiller unit required features:

- Temperature and flow metering (monitoring)
- Leak detection or water level sensing and shutdown
- Local and remote monitoring and control
- Access port for filling and water treatment

This figure shows an example of a water chiller unit that supplies conditioned water to one or more heat exchangers. This must be a closed system (no exposure of the water to air) and meet all materials, water quality, water treatment, and temperature and flow specifications that are defined in this document. A water chiller unit is considered an acceptable alternative to use as a building chilled water source for removing heat from an Rear Door Heat eXchanger.

## Manifolds and piping

Manifolds that accept large-diameter feed pipes from a pump unit are the preferred method for splitting the flow of water to smaller-diameter pipes or hoses that are routed to individual heat exchangers. Manifolds must be constructed of materials that are compatible with the pump unit and related piping. The manifolds must provide enough connection points to allow a matching number of supply and return lines to be attached, and the manifolds must match the capacity rating of the pumps and the loop heat exchanger (between the secondary cooling loop and the building chilled-water source). Anchor or restrain all manifolds to provide the required support to avoid movement when quick-connect couplings are connected to the manifolds.

## Example manifold supply pipe sizes

- Use a 50.8 mm (2 in.) or larger supply pipe to provide the correct flow to three 19 mm (0.75 in.) supply hoses, with a 100 kW coolant distribution unit (CDU).

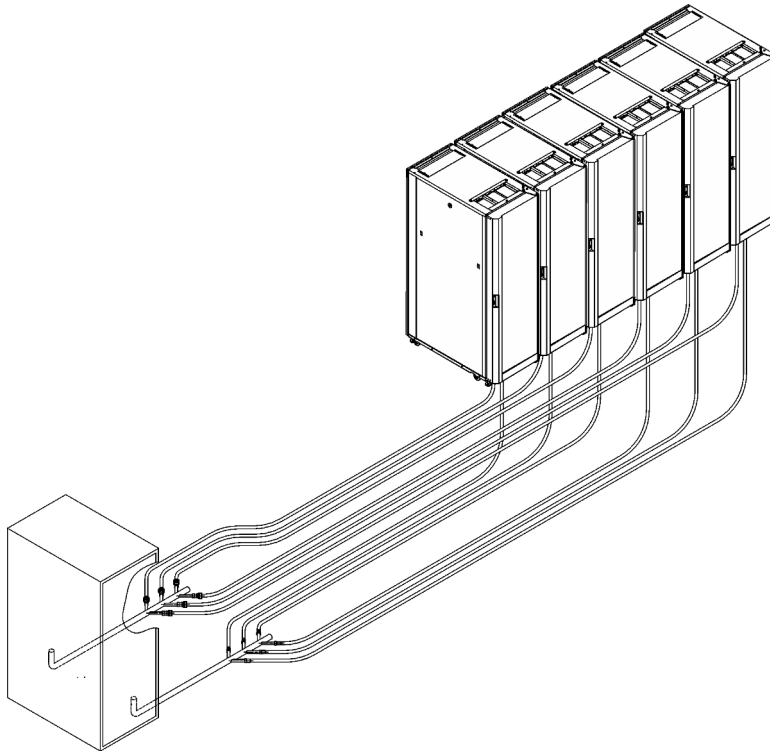
- Use a 63.5 mm (2.50 in.) or larger supply pipe to provide the correct flow to four 19 mm (0.75 in.) supply hoses, with a 120 kW CDU.
- Use an 88.9 mm (3.50 in.) or larger supply pipe to provide the correct flow to nine 19 mm (0.75 in.) supply hoses, with a 300 kW CDU.

To stop the flow of water in individual legs of multiple circuit loops, install shutoff valves for each supply and return line. This provides a way to service or replace an individual heat exchanger without affecting the operation of other heat exchangers in the loop.

To ensure that water specifications are being met and that the optimum heat removal is taking place, use temperature and flow metering (monitoring) in secondary loops.

Anchor or restrain all manifolds and pipes to provide the required support and to avoid movement when quick-connect couplings are being attached to the manifolds.

[Figure 198 “The following figure” on page 173](#) shows another layout for multiple water circuits.



*Figure 198. Typical central manifold (at a central location for multiple water circuits)*

[Figure 199 “The following figure” on page 174](#) shows an extended manifold layout.

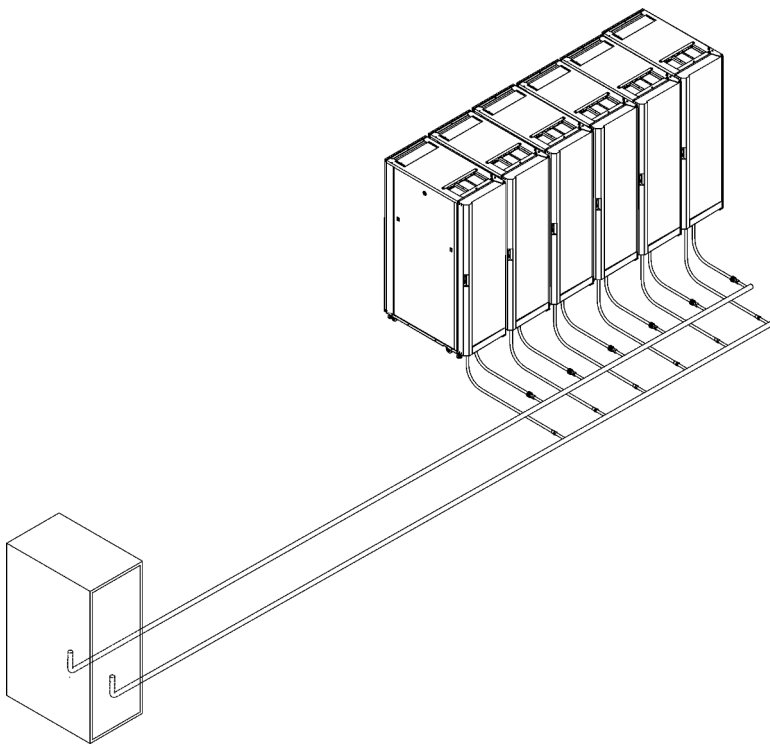


Figure 199. Typical extended manifold (along aisles between racks)

### Flexible hoses and connections to manifolds and heat exchangers

Pipe and hose configurations can vary. You can determine the best configuration for your installation by analyzing the needs of your facilities, or a site preparation representative can provide this analysis.

Flexible hoses are needed to supply and return water between your hard plumbing (manifolds and coolant distribution units) and the heat exchanger (allowing needed movement for opening and closing the rack rear door).

Hoses are available that provide water with acceptable pressure-drop characteristics and that help prevent depletion of some corrosion inhibitors. These hoses must be made of peroxide-cured ethylene propylene diene monomer (EPDM) rubber, non-metal oxide material and must have Eaton self-coupling type quick connector ball valve at one end which are attached to the heat exchanger, and must either have a low impedance quick connect coupling or nothing so as to attach to a barb at the other end. The Eaton ball valves that are described in this topic are compatible with the heat exchanger couplings. Hose lengths from 3 to 15 meters (10 to 50 ft), in increments of 3 meters (10 ft), are available. Hoses that are longer than 15 meters (50 ft) might create unacceptable pressure loss in the secondary circuit and reduce the water flow, reducing the heat removal capabilities of the heat exchanger.

Use quick-connect couplings to attach the hoses to the heat exchangers. Hose couplings that connect to the heat exchanger must have the following characteristics:

- The couplings must be constructed of passivated 300-L series stainless steel or brass with less than 30% zinc content. The coupling size is 19 mm (0.75 in.).
- The hoses must have Eaton part number FD83-2046-16-16, or equivalent.
- If a low impedance quick-connect coupling is used at the opposite (manifold) end of the hose, use positive locking mechanisms to prevent loss of water when the hoses are disconnected. The connections must minimize water spill and air inclusion into the system when they are disconnected.

## Fill the heat exchanger with water

See this topic to learn how to fill ThinkSystem Rear Door Heat eXchanger V2 with water.

### About this task

**S038**

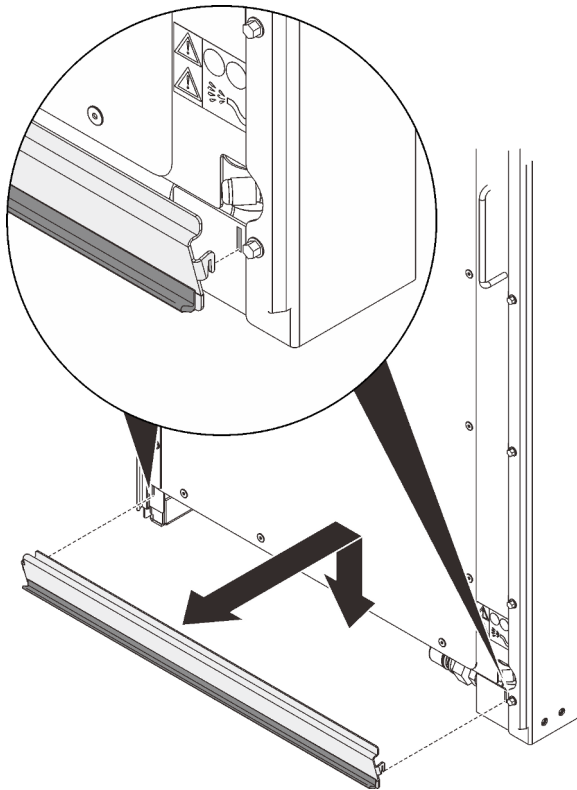


**CAUTION:**  
Eye protection should be worn for this procedure.

**Attention:** Wear safety goggles or other eye protection whenever you fill, drain, or purge air or nitrogen from the heat exchanger.

### Procedure

Step 1. If the inner hose access panel is installed, lift and remove it from the heat exchanger.



*Figure 200. Removing the inner hose access panel*

Step 2. If the outer hose access panel is installed, remove the screw that secures the panel (if applicable), then lift and remove the panel from the heat exchanger.

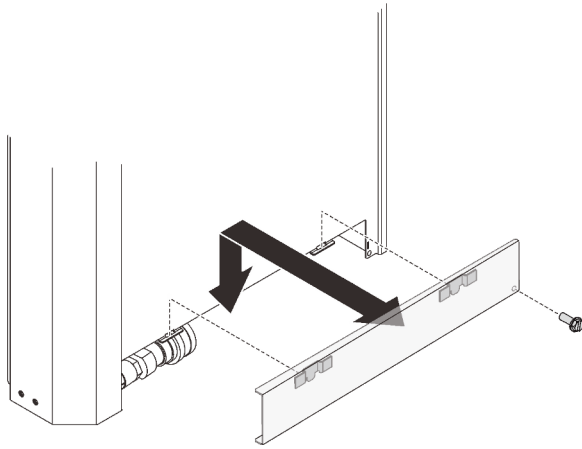


Figure 201. Removing the outer hose access panel

Step 3. Purge the nitrogen that has been filled in the hose from the hose.

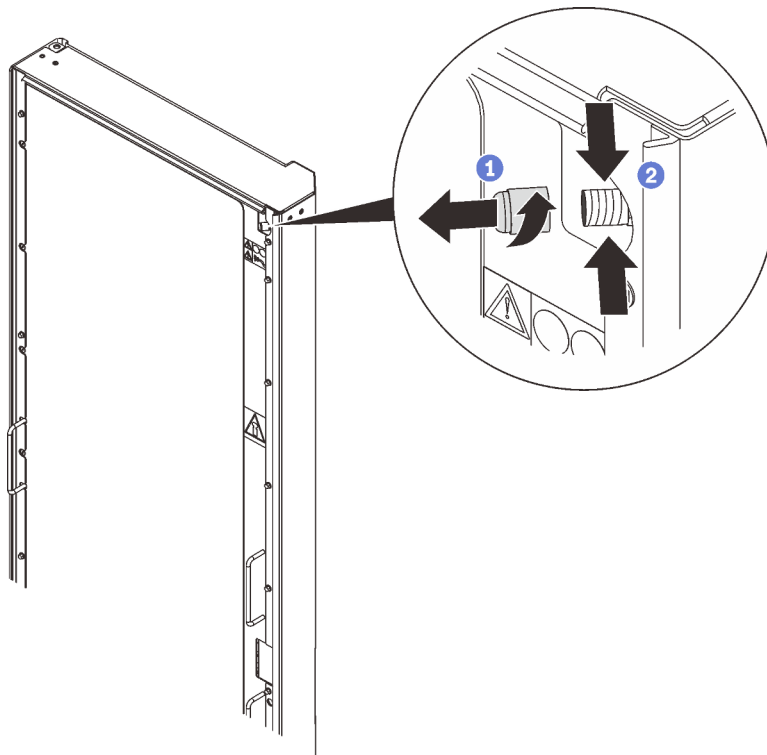
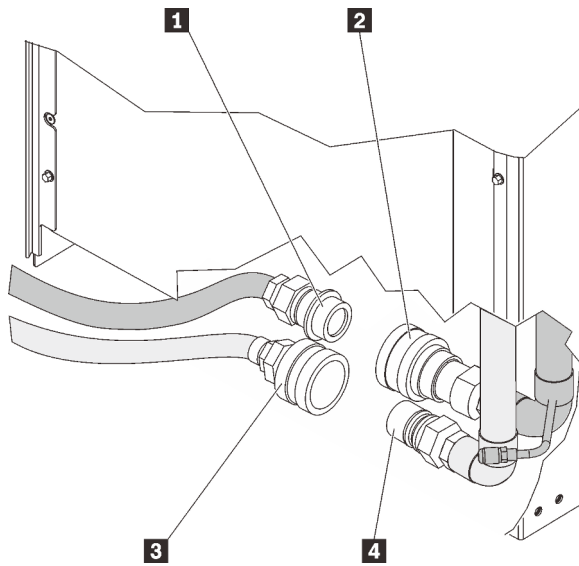


Figure 202. Purging nitrogen

- 1 Loosen and remove the cap from the air-purging valve.
- 2 Press in on the valve stem of the air-purging valve to purge the nitrogen from the heat exchanger. Continue holding in the valve stem until the pressure is released.

Step 4. Align the supply hose coupling with the supply manifold, push it in and pull the collar backward until it locks in place with an audible click. Then, repeat the same procedure on the return hose and manifold.

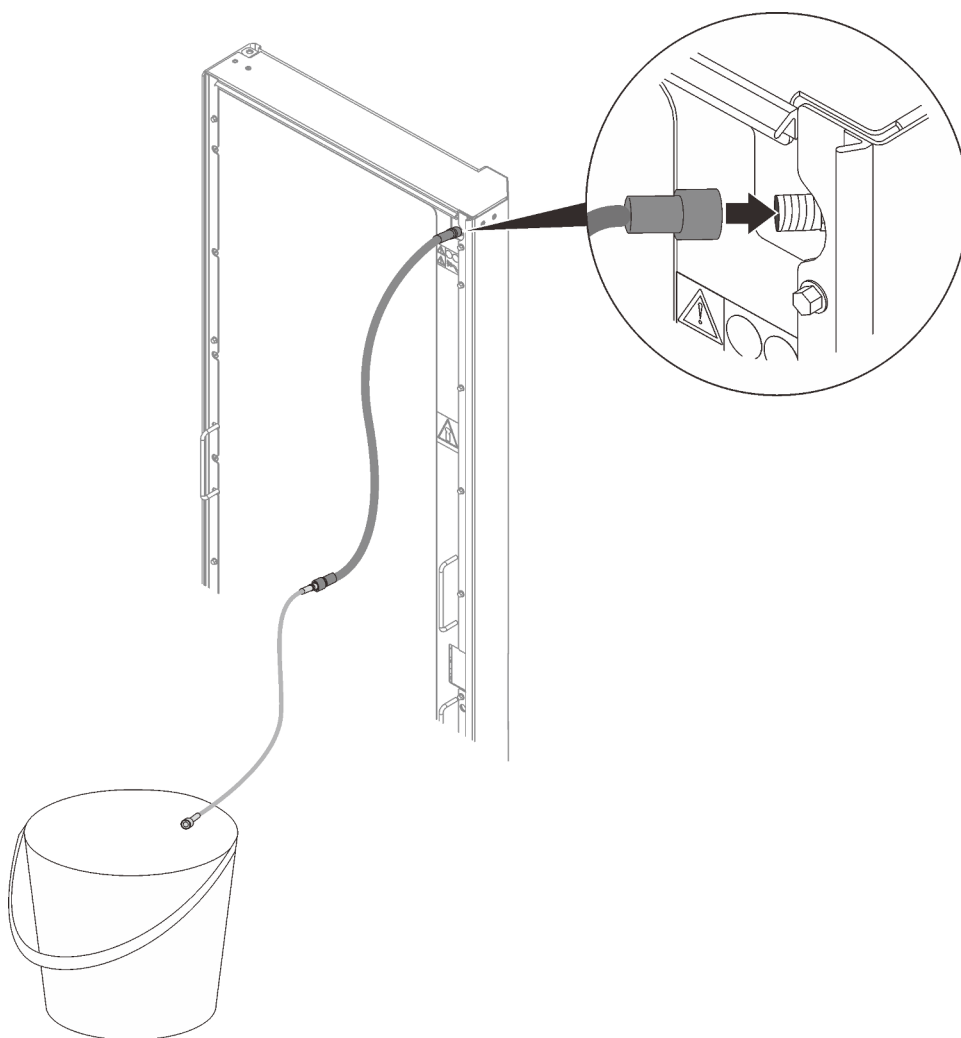


*Figure 203. Supply and return hoses and manifold couplings*

- Connect the supply hose assembly (1) to the supply manifold-coupling (2).
- Connect the return hose assembly (3) to the return manifold-coupling (4).

Step 5. Turn on the flow of water to the heat exchanger, and let it run for several minutes.

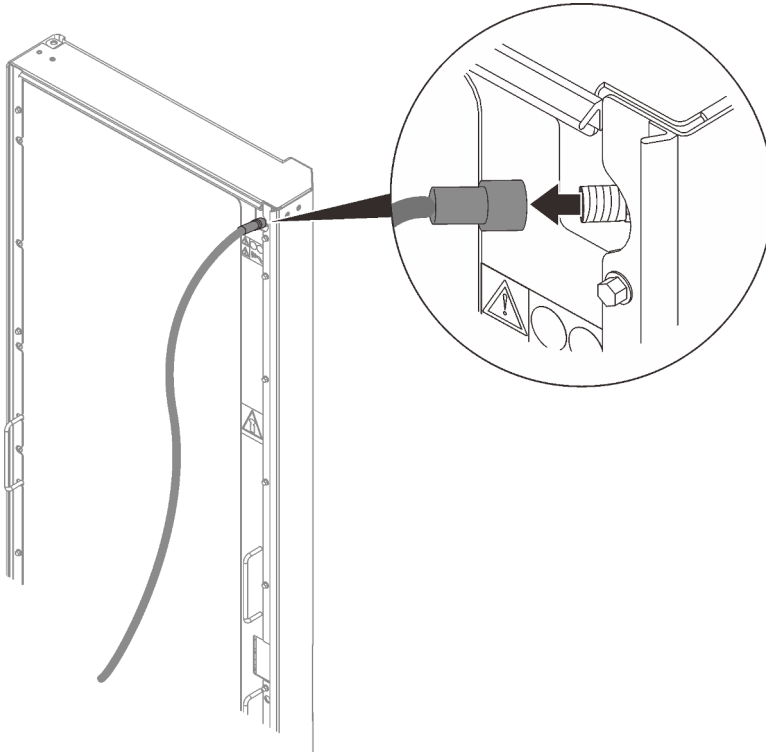
Step 6. Attach the air-purging tool to the air-purging valve at the top of the heat exchanger, and place the drain end into a 2-liter (or larger) container to catch the water and air bubbles that escape during the filling procedure.



*Figure 204. Installing the air-purging tool*

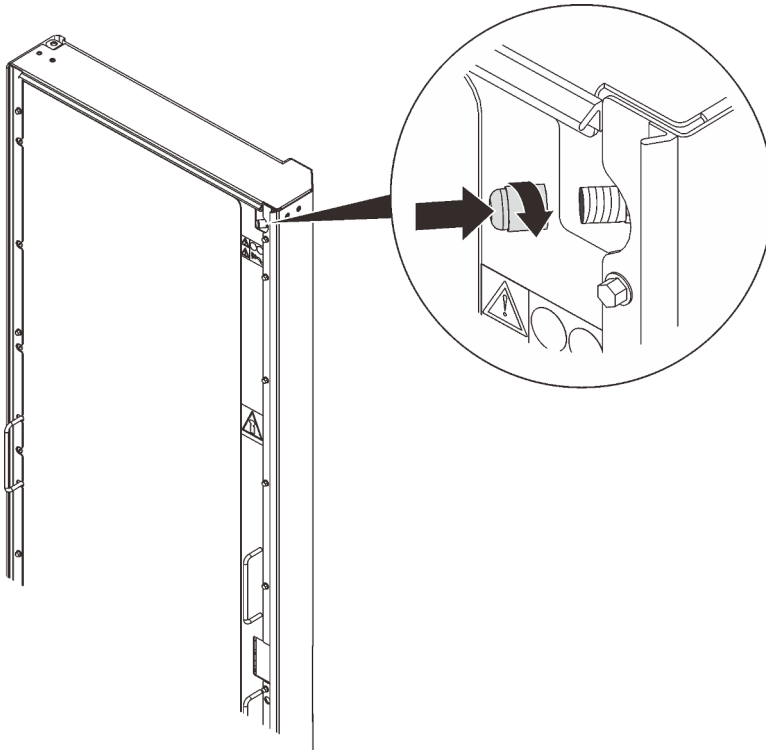
Step 7. When there is a steady stream of liquid into the container from the air-purging tool, disconnect the tool from the heat exchanger.

**Attention:** If water drips from the air-purging valve after you remove the air-purging tool, reattach the tool and disconnect it again to seal the valve.



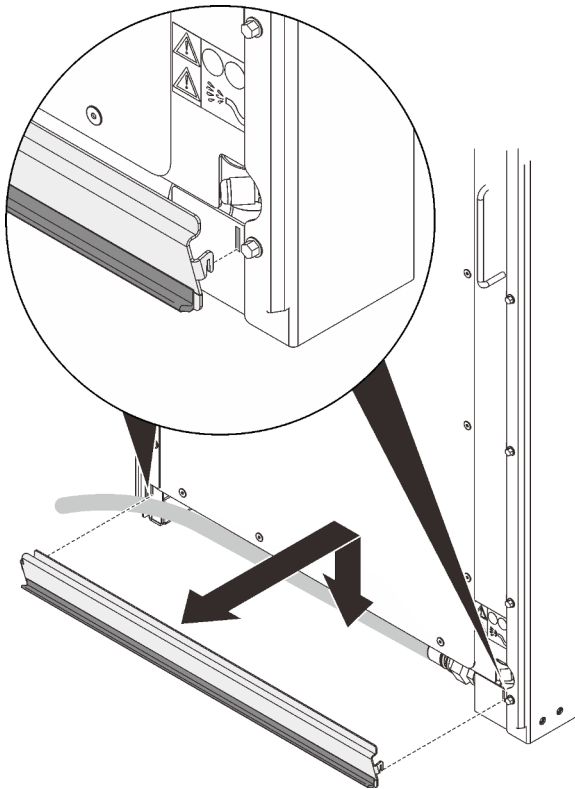
*Figure 205. Removing the air-purging tool*

Step 8. Install the valve cap back to the air-purging valve.



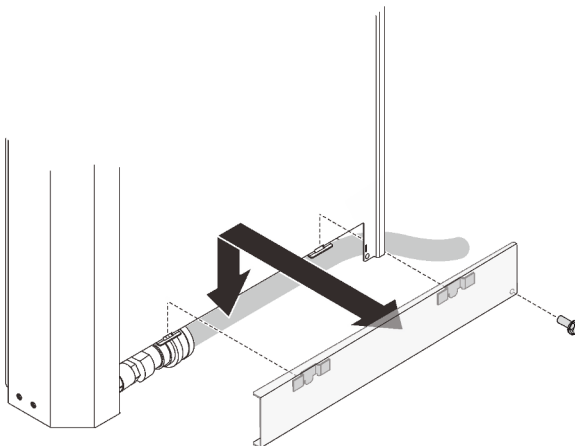
*Figure 206. Installing the valve cap*

- Step 9. Align the hooks on the inner hose access panel with the slots on the inner side of the heat exchanger, and lower the panel to secure it.



*Figure 207. Installing the inner hose access panel*

- Step 10. Align the slots on the outer hose access panel with the hooks on the outer side of the heat exchanger, and lower the panel to attach it to the heat exchanger. Optionally, secure the panel with a M4 screw.



*Figure 208. Installing the outer hose access panel*

---

## Install a 0/1U device into the rack

See this topic to learn how to install a 0/1U device into the rack side.

## About this task

### S001



**DANGER**

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- Connect all power cords to a properly wired and grounded electrical outlet/source.
- Connect any equipment that will be attached to this product to properly wired outlets/sources.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- The device might have more than one power cord, to remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

### S013



**DANGER**

Overloading a branch circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards, ensure that your system electrical requirements do not exceed branch circuit protection requirements. Refer to the information that is provided with your device for electrical specifications.

### S014



#### **CAUTION:**

Hazardous voltage, current, and energy levels might be present. Only a qualified service technician is authorized to remove the covers where the label is attached.

### R009

**CAUTION:**

Removing components from the upper positions in the Enterprise Rack cabinet improves rack stability during relocation. Follow these general guidelines whenever you relocate a populated rack cabinet within a room or building:

- Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must do the following:
  - Remove all devices in the 32 U position and above.
  - Make sure that the heaviest devices are installed in the bottom of the rack cabinet.
  - Make sure that there are no empty U positions between devices installed in the rack cabinet below the 32 U position.
- If the rack cabinet that you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.
- Inspect the route that you plan to take, to eliminate potential hazards.
- Make sure that the route that you choose can support the weight of the loaded rack cabinet. See the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.
- Make sure that all door openings are at least 760 x 2030 mm (30 x 80 in.)
- Make sure that all devices, shelves, drawers, doors, and cables are secure.
- Make sure that the four leveling pads are raised to their highest positions.
- Make sure that no stabilizer bracket is installed on the rack cabinet.
- Do not use a ramp that is inclined more than 10 degrees.
- When the rack cabinet is in the new location, do the following:
  - Lower the four leveling pads.
  - Install stabilizer brackets on the rack cabinet.
  - If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.

If a long-distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also, lower the leveling pads to raise the casters off the pallet and bolt the rack cabinet to the pallet.

This cabinet supports up to four units of 1U devices that are installed to the rack side.

**Note:** Each rack side space only allows two units of 1U or two units of 0U devices to be installed at the same time. Mixing 1U and 0U devices on the same rack side is not feasible.

Refer to corresponding instructions based on the installation scenario:

- [“Install a 0U device” on page 182](#)
- [“Install a 1U PDU or console switch to the rack side” on page 183](#)
- [“Install a 1U device into the side pocket” on page 184](#)

## Install a 0U device

### Procedure

- Step 1. Insert the two PDU pegs into the keyhole slots in the side of the rack cabinet, and push down the PDU to secure it to the rack.

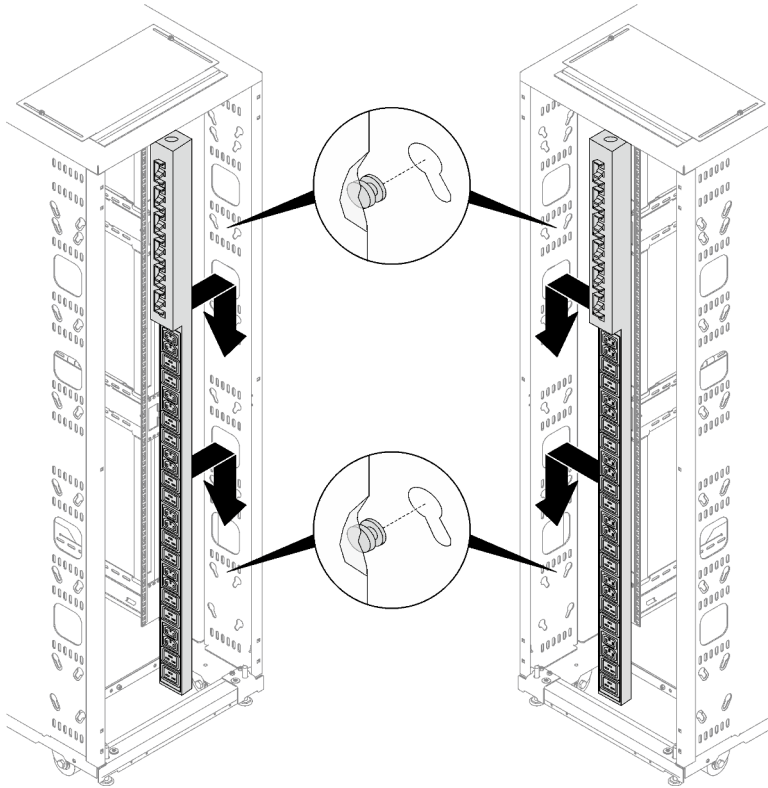


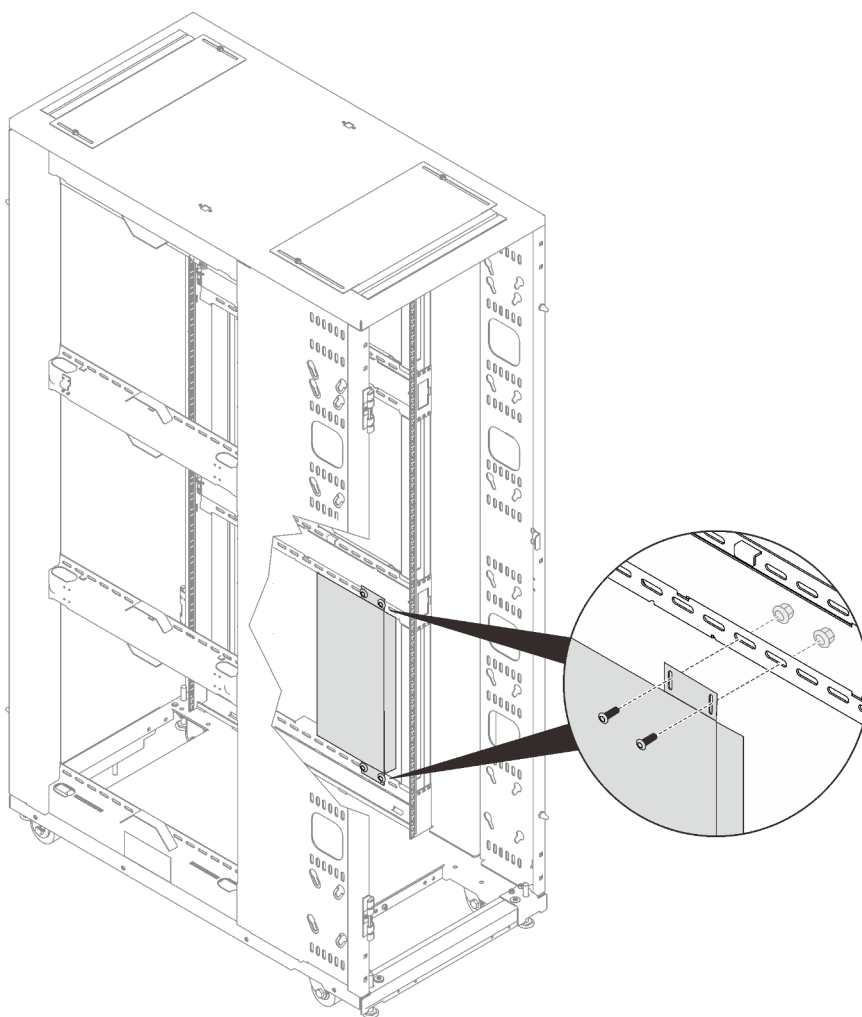
Figure 209. Installing a 0U PDU

**Note:** 0U PDU can be installed with sockets facing either rear or center of the rack cabinet.

## Install a 1U PDU or console switch to the rack side

### Procedure

- Step 1. Refer to the document that comes with the device, and install the mounting brackets if necessary.
- Step 2. Align the mounting brackets with the holes in the rack flange, and secure it with four sets of screw and nut.



*Figure 210. Installing a 1U device into the rack side*

## **Install a 1U device into the side pocket**

### **Procedure**

- Step 1. Refer to the document that comes with the device, and install the mounting brackets if necessary.
- Step 2. Remove the side cover next to the side pocket (see [“Remove a side cover” on page 197](#) ).
- Step 3. Install the device.

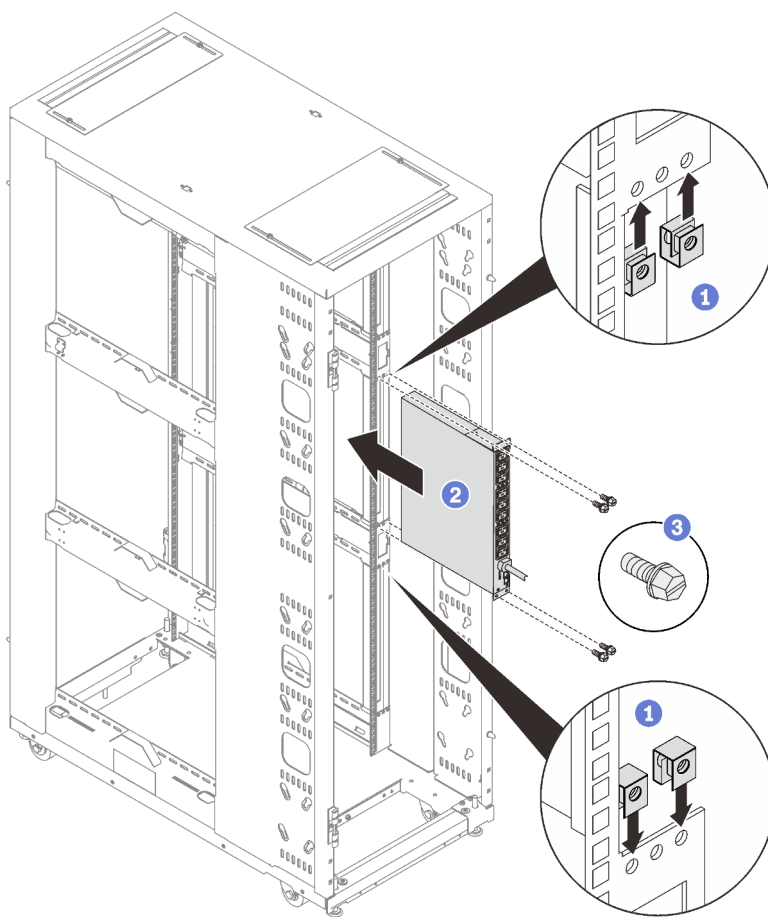


Figure 211. Installing a 1U PDU or console switch

- 1 Install four M6 clip nuts on the rack flanges as shown in the illustration.
- 2 Slide the device all the way into the side pocket.
- 3 Secure the device with four M6 screws.

Step 4. Complete all the required cable connection and setup of the device. Refer to the document that comes with the device for details.

- Make sure to complete all the required cable connection and device setup before installing baying kits to the cabinets, as these tasks will be hard to operate afterwards.
- It is advised to complete all the cable connection and setup task for the device before installing the side cover back.

Step 5. Install the side cover back (see [“Install a side cover”](#) on page 197).



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## Chapter 4. Managing cables and hoses

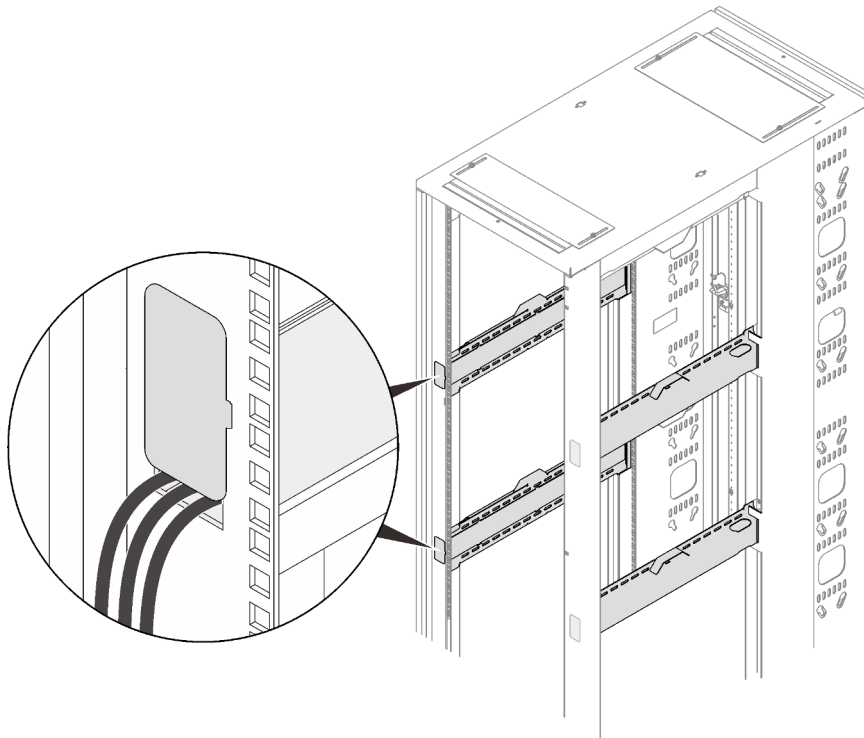
See this topic to learn how to manage the cables going through the rack cabinet.

The following channels and openings are available for cable management:

- [“Front-to-rear cable channels” on page 187](#)
- [“Cable access bar on the bottom of the rack cabinet” on page 187](#)
- [“Cable access openings on the top of the rack cabinet” on page 188](#)
- [“Cable access openings on extension panel” on page 191](#)
- [“Cable strap module” on page 190](#)
- [“Cable access openings on extension panel” on page 191](#)

### Front-to-rear cable channels

When managing cables that go through the cabinet side, route the cables in the channels, and manage them with channel covers.



*Figure 212. Front-to-rear cable channels*

### Cable access bar on the bottom of the rack cabinet

When managing cables near the bottom of the rack cabinet, route the cables in the open space after removing the cable access bar, and install the bar to contain the cables.

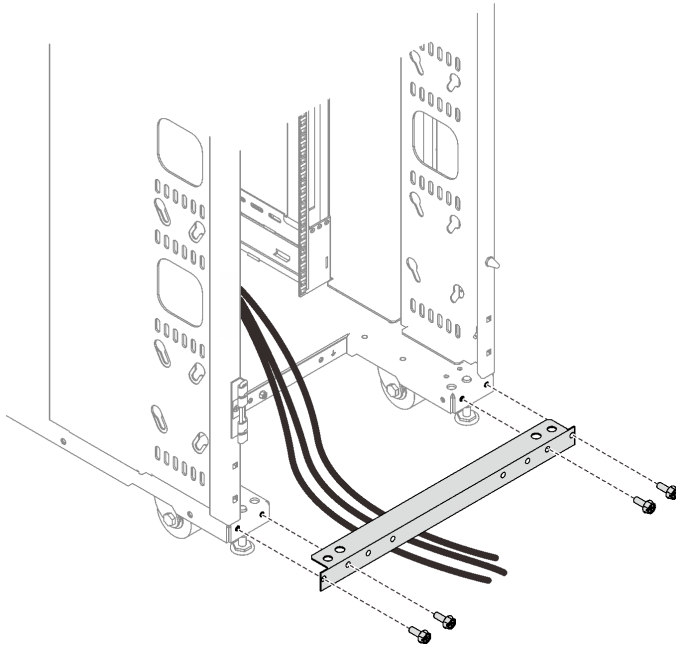
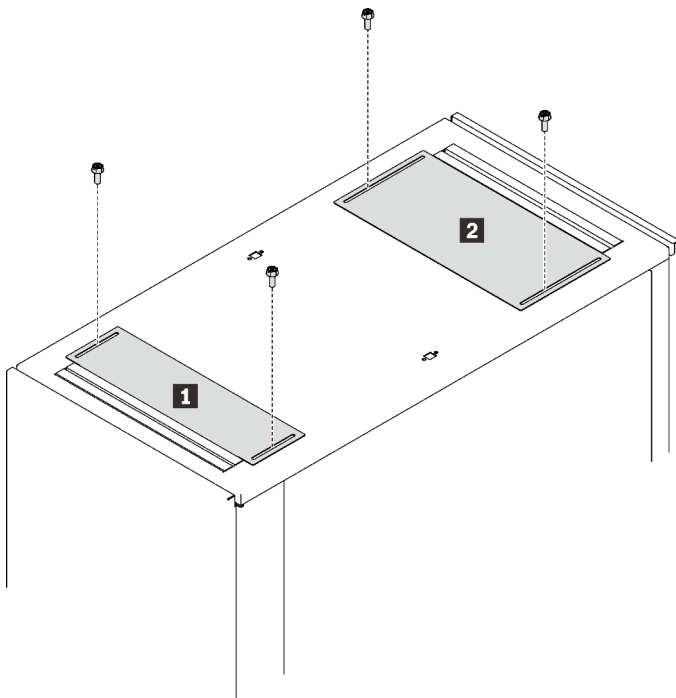


Figure 213. Cable access bar on the bottom of the rack cabinet

#### Cable access openings on the top of the rack cabinet



**1** Front cable access cover

**2** Rear cable access cover

Figure 214. Cable access openings on the top of the cabinet

#### **1** Front cable access cover

Slide the cover as far forward as possible to close off the open area, thus prevent hot exhaust air from recirculating back through the rack.

## 2 Rear cable access cover

Slide the cover all the way open or closed, or in any intermediate position. Leaving the cover open provides extra exhaust area for components near the top and bottom of the rack; however, in some configurations, this shortens the hot air recirculation path from the rear to the front.

### Cable access openings on the rear of the rack cabinet

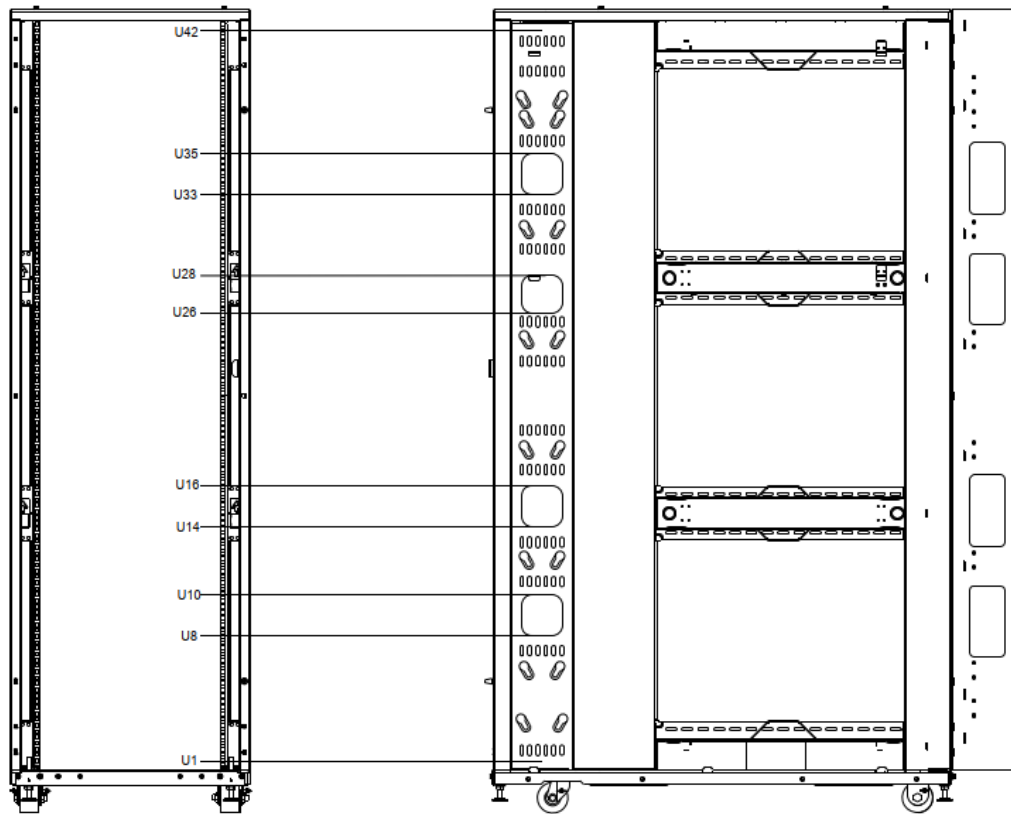
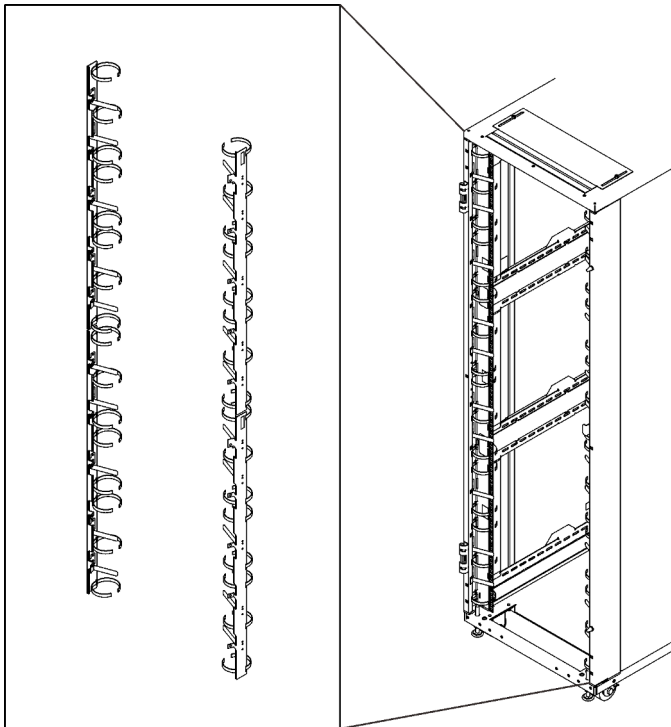


Figure 215. Cable access openings on rear side of the rack cabinet

There are four 101.6 x 101.6 mm openings on each side of the rear side of the cabinet:

- U8 to U10
- U14 to U16
- U26 to U28
- U33 to U35

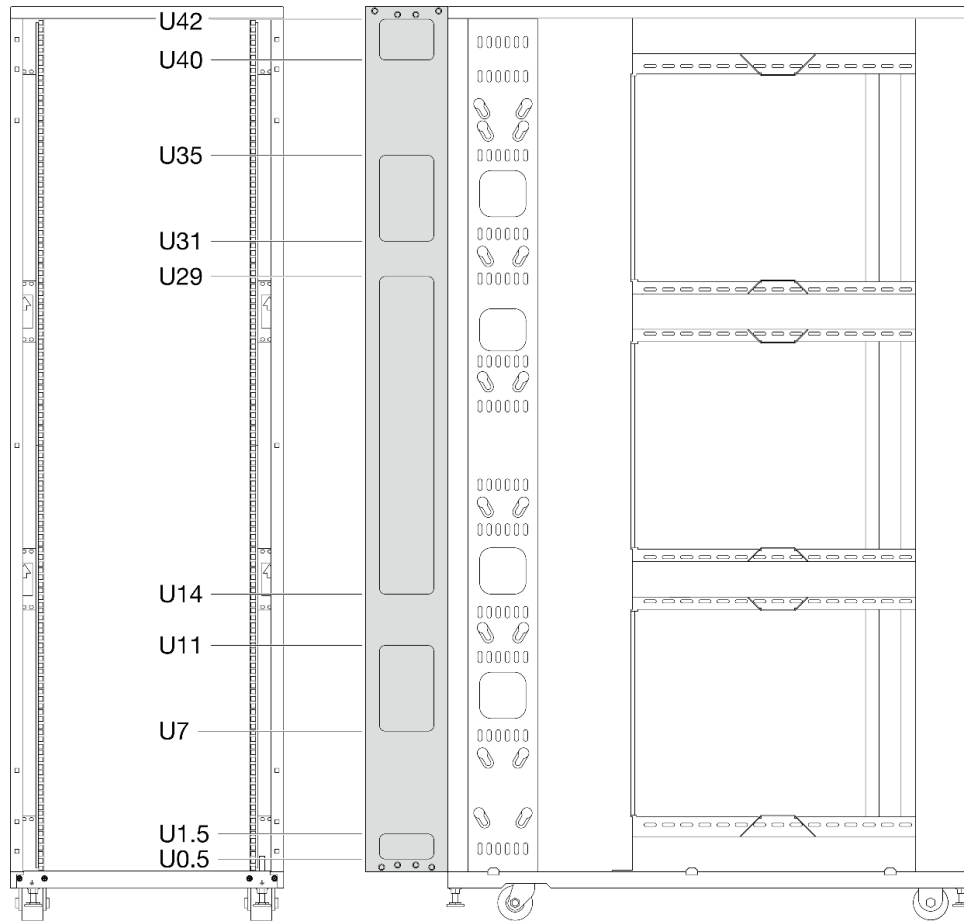
## Cable strap module



*Figure 216. Cable strap module*

Two lines of built-in cable straps along the front door frame are available for cable management.

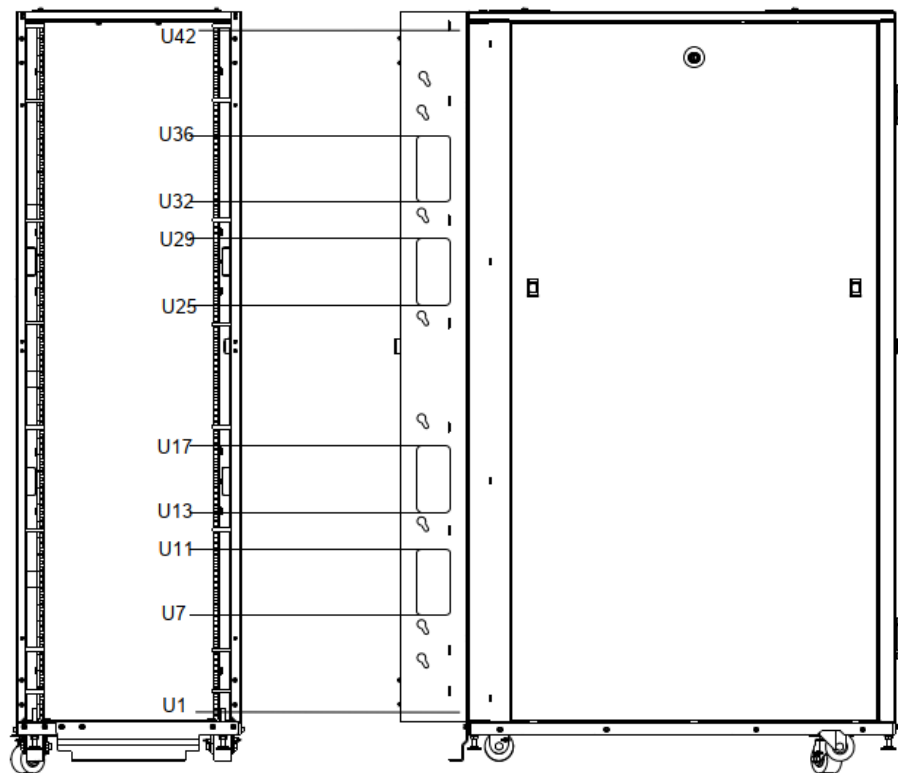
### Cable access openings on extension panel



There are five openings on each extension panel:

- U0.5 to U1.5
- U7 to U11
- U14 to U29
- U31 to U35
- U40 to U42

*Figure 217. Cable access openings on extension panel — 42U Advanced Rack Extension Kit*



There are four 89 (width) x 178 (height) mm openings on each extension panel:

- U7 to U11
- U13 to U17
- U25 to U29
- U32 to U36

*Figure 218. Cable access openings on extension panel — 42U Standard Rack Extension Kit*

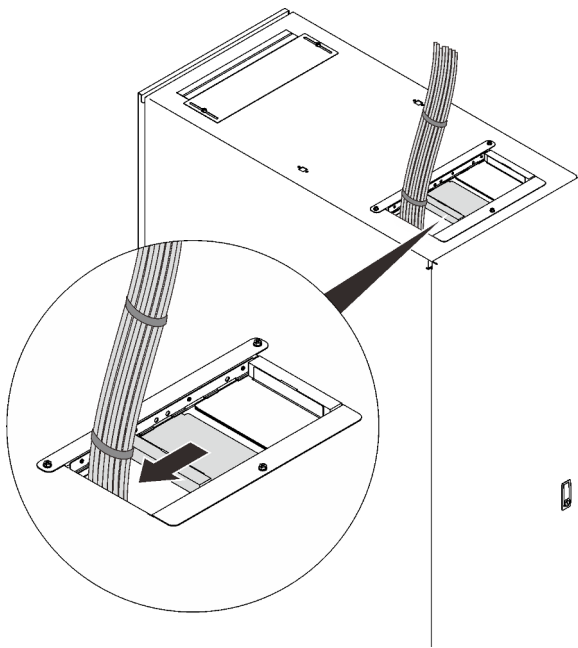
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## Routing cables/hoses for water-cooled system

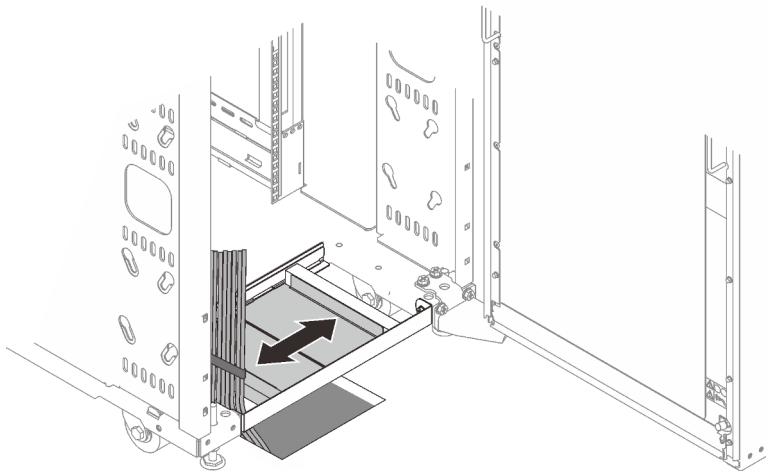
Adopt one of the following procedures, depending on whether the rack is in a raised-floor environment.

**Important:** To help maintain optimal performance and provide proper cooling for all rack components, always take the following precautions:

- Install filler panels over all unoccupied bays.
- Route signal cables at the rear of the rack so that they enter or exit the cabinet through the top and bottom air baffles.



*Figure 219. Managing cables with the upper air baffle*



*Figure 220. Managing cables with the lower air baffle*

- Bundle signal cables together in a rectangle so that the air-baffle sliders are closed as far as possible. Do not bundle signal cables together in a circular formation.

## **Raised-floor environment**

The following illustrations show routing and securing the hoses in a raised-floor environment for individual racks and adjacent racks.

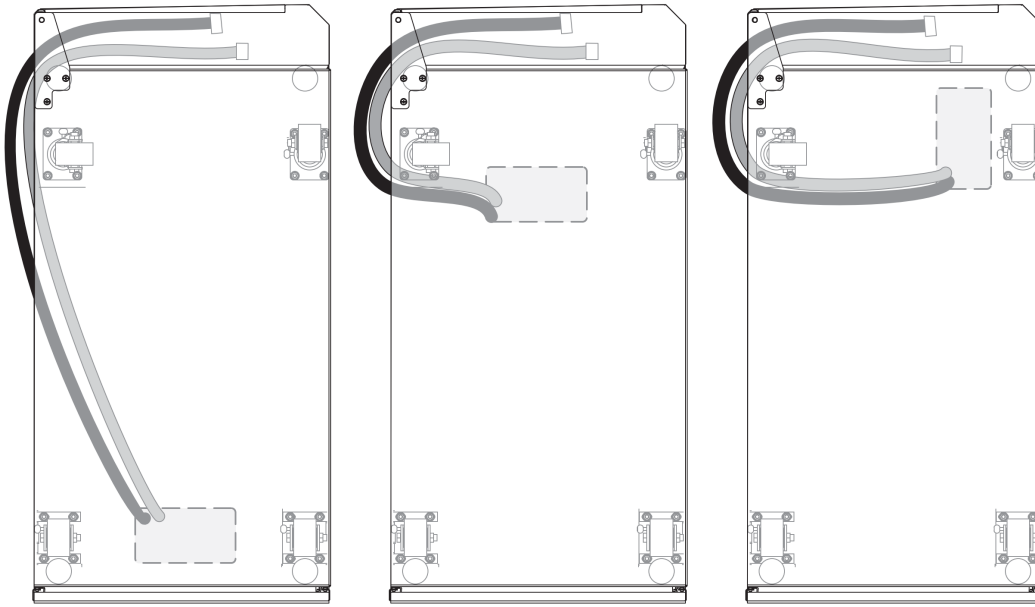
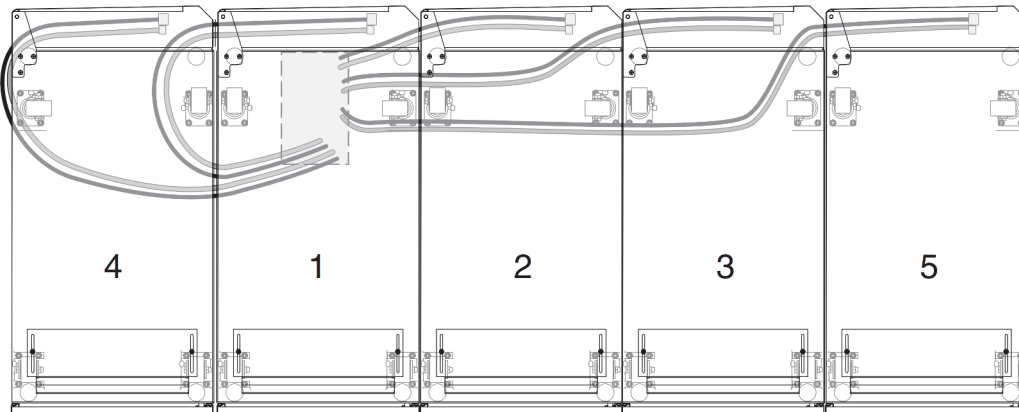


Figure 221. Routing and securing the hoses in a raised-floor environment for individual racks (from the top, looking down)

In the following illustration, the numbers represent the suggested placement of racks that share one hole in the floor. For example, if three racks will share one hole in the floor, place the racks as shown by the numbers 1, 2, and 3. If you want to add a fourth rack that will share the same hole in the floor, place it next to rack number 1.



To route and secure the hoses in a raised-floor environment, complete the following steps:

Figure 222. Option for hoses in adjacent racks to share a single hole in the floor (from the top, looking down)

- Step 1. Remove the floor tile under the rack that will have an access hole cut into it.
- Step 2. Cut an access hole in the floor tile; then, reinstall the floor tile. The access hole for the supply and return hoses must be a minimum of 200 mm (8 in.) long x 100 mm (4 in.) wide.

**Notes:**

- Each hose must be routed through the access hole lengthwise so that the hose has the entire 200 mm (8 in.) to pass through the floor. If adjacent racks share a hole in the floor, increase the size of the hole according to the number of hoses, 50 mm (2 in.) in length for every rack. For

example, the hole for one rack is 100 x 200 mm (4 x 8 in.), the hole for two racks is 150 x 200 mm (6 x 8 in.), and so on. Smaller hole sizes might also work, depending on the hose routing underneath the raised floor.

- Each hose must be routed with a minimum bend radius of 200 mm (8 in.). A bend radius less than 200 mm (8 in.) will cause the hose to kink, will restrict the flow of water to and from the heat exchanger, and will void the heat exchanger warranty.

- Step 3. Route the hoses through the access hole lengthwise, under the rack and around the rear caster on the pivot side of the heat exchanger. See “Filling the heat exchanger with water” on page 48 for information about how to connect the hoses.
- Step 4. Check the heat exchanger for air in the manifolds again after one month of operation, to ensure that the heat exchanger is filled correctly.

## Raised-floor and non-raised-floor environments

If the coolant distribution unit (CDU) that is providing water to the heat exchanger is in a row of racks with heat exchangers, all hoses can be routed on the floor, irrespective of if it is a raised floor or slab installation. The Type 7D6D rack has sufficient clearance underneath the rack to enable the ball valves to be run underneath the rack. This provides a very clean hose-routing solution with hoses of minimum length.

**Note:** Each hose must be routed with a minimum bend radius of 200 mm (8 in.). A bend radius less than 200 mm (8 in.) will cause the hose to kink, will restrict the flow of water to and from the heat exchanger, and will void the heat exchanger warranty.

- Step 1. If the hoses must be run overhead, either route the hoses through the rack vertically, or route them vertically down the hinge (pivot) side of the heat exchanger, leaving enough slack in the hoses to reach the couplings.

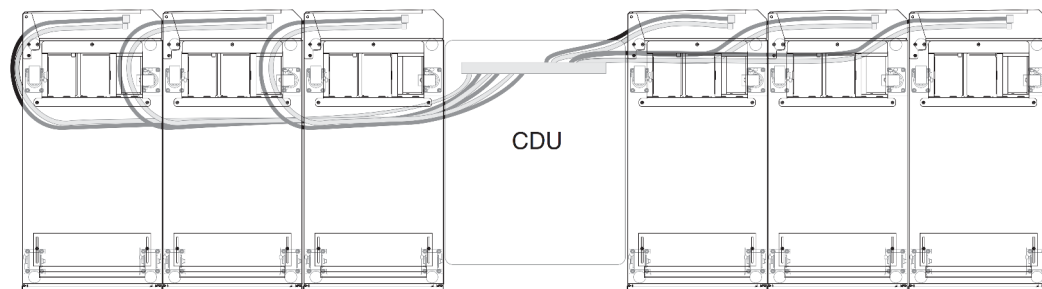


Figure 223. Routing and securing the hoses in raised-floor and non-raised-floor environments (from the top, looking down)

- Step 2. After several hours of operation, repeat the air-purging procedure on the valve (trapped air from the hoses might have migrated to the heat exchanger). To perform the air-purging procedure, complete step 7 on page 52 through step 10 on page 52 in Filling the heat exchanger with water.
- Step 3. Check the heat exchanger for air in the manifolds again after one month of operation, to ensure that the heat exchanger is filled correctly.



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## Chapter 5. Hardware removal, installation and reversion

See this topic to learn how to remove, install and reverse components of ThinkSystem Heavy Duty Full Depth 42U Rack Cabinet.

---

### Removing and installing the side covers

See this topic to learn how to remove and install the side covers.

#### About this task

**Note:** Due to the weight of the side cover, this task required two people.

#### Remove a side cover

##### Procedure

Step 1. Remove the side cover.

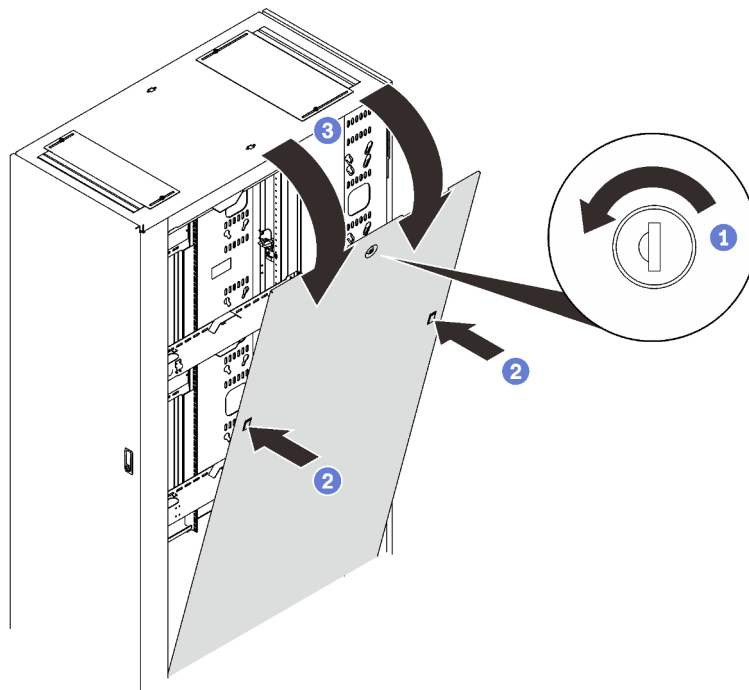


Figure 224. Removing a side cover

- 1 Unlock the side cover with the key.
- 2 Press on the two latches on both sides of the cover to disengage it from the rack.
- 3 Rotate the top of the side cover away from the rack, and remove it.

#### Install a side cover

##### Procedure

Step 1. Install the side cover.

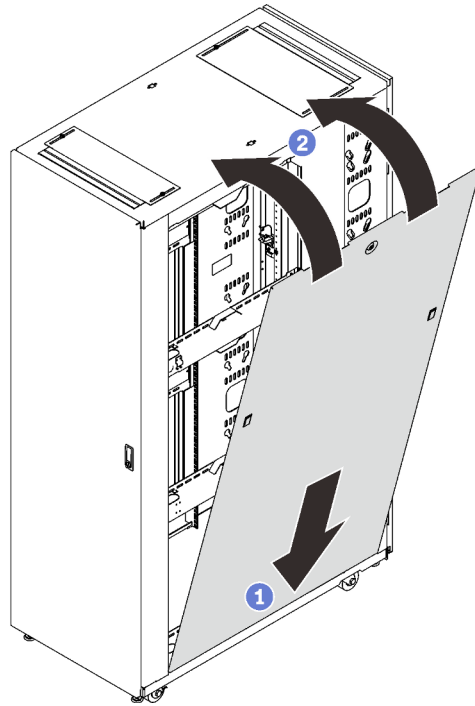


Figure 225. Installing the side cover

- ① Align the bottom of the side cover with the slot on the rack cabinet.
- ② Rotate the top of the cover towards the rack.

Step 2. Secure the side cover to the rack cabinet.

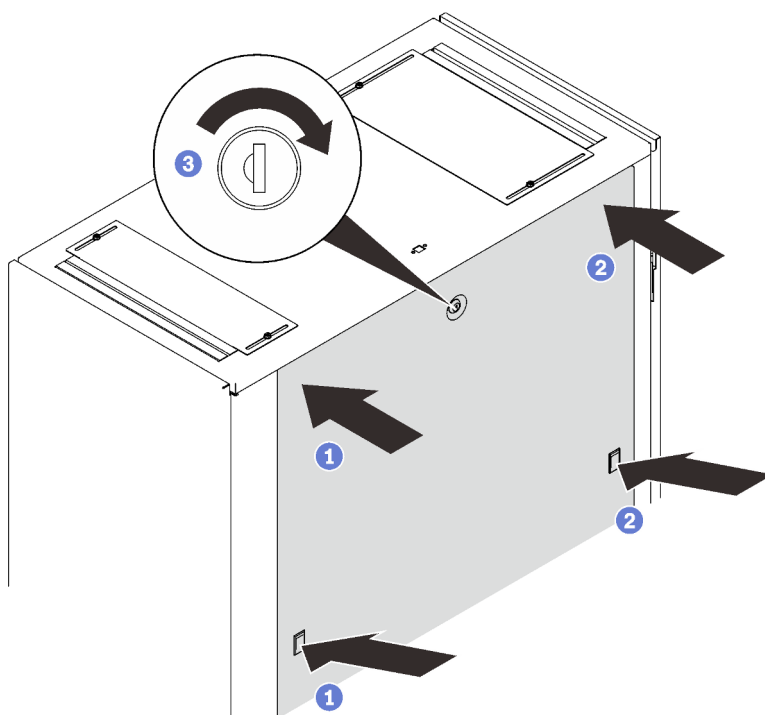


Figure 226. Securing the side cover

**Note:** This procedure is best executed by two people.

- 1 Press and hold the latch of one side, and firmly press the upper corner in.
- 2 Repeat the previous step on the other side.
- 3 Lock the side cover with the key.

---

## Installing, removing, and converting the door

See this topic to learn how to remove, install and convert the door

### Remove and install a door

See this topic to learn how to remove and install a door.

#### Remove a door

##### Procedure

- Step 1. Unlock and open the door.
- Step 2. Remove the door.

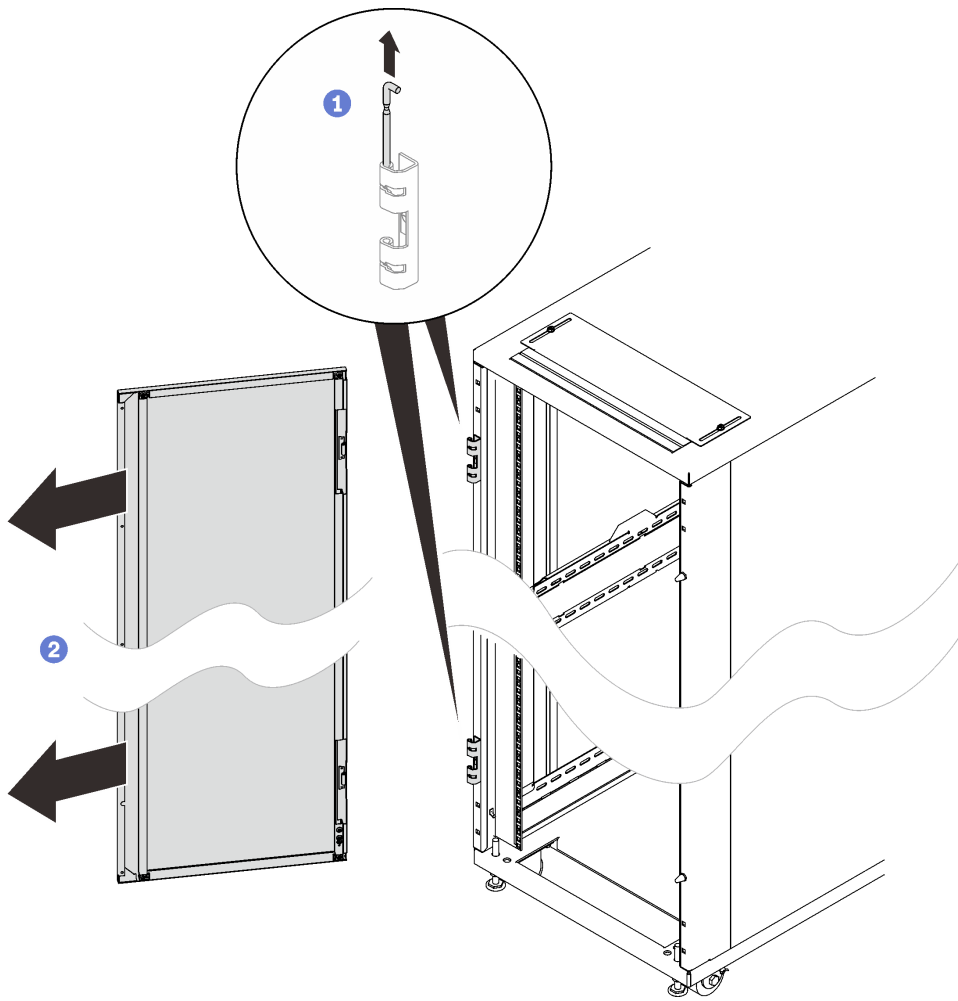


Figure 227. Removing a door

- 1 Hold the door in place, and lift both hinge pins until they lock in the open position so that the door is disengaged.
- 2 Remove the door from the rack cabinet frame.

## Install a door

### Procedure

Step 1. Install the door.

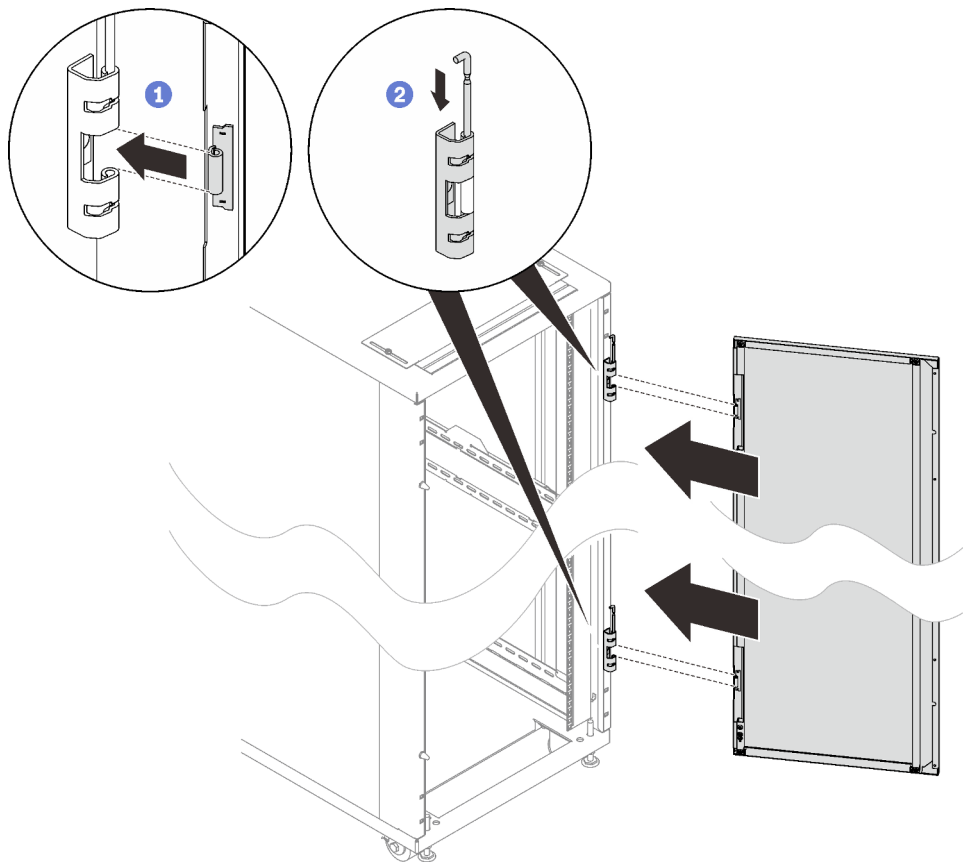


Figure 228. Installing a door

- 1 Align the door with the hinges, and hold the door in place.
- 2 Push the hinge pins down to the closed position so that the door is secured.

## Reverse a door

See this topic to learn how to reverse a door.

### Procedure

Step 1. Remove the door.

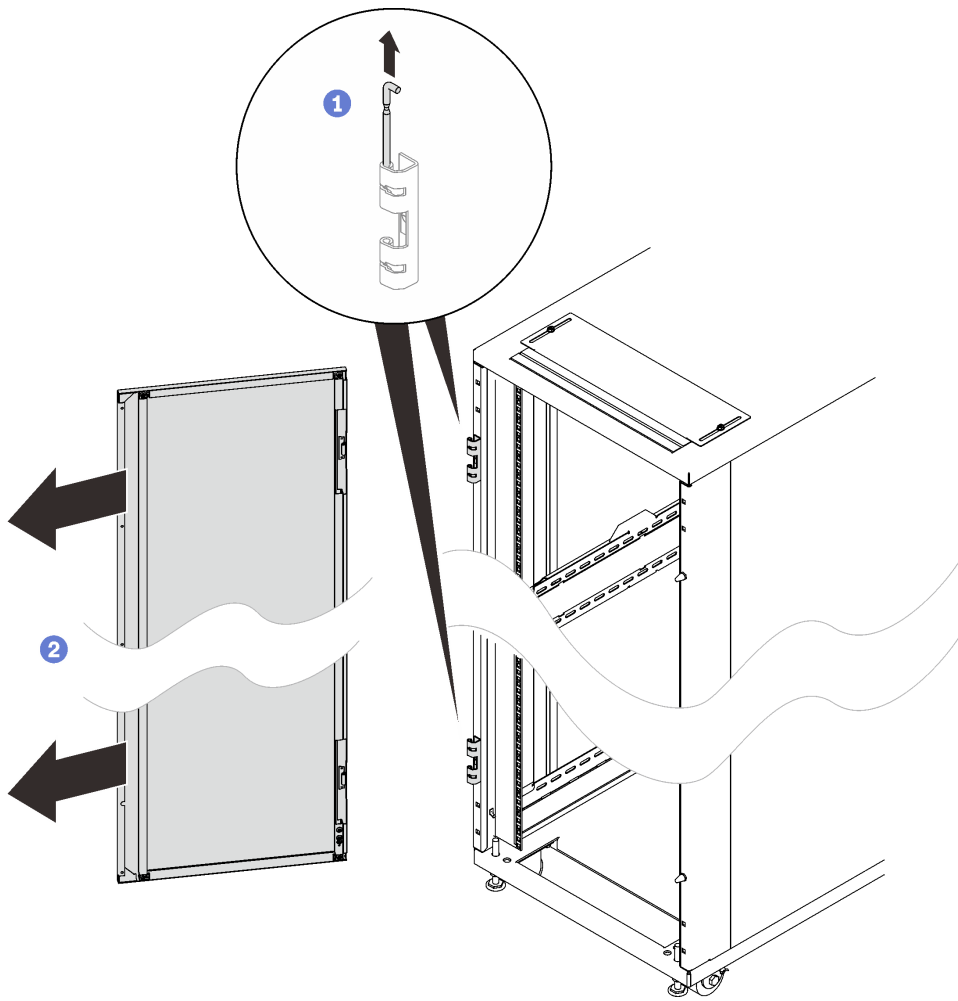
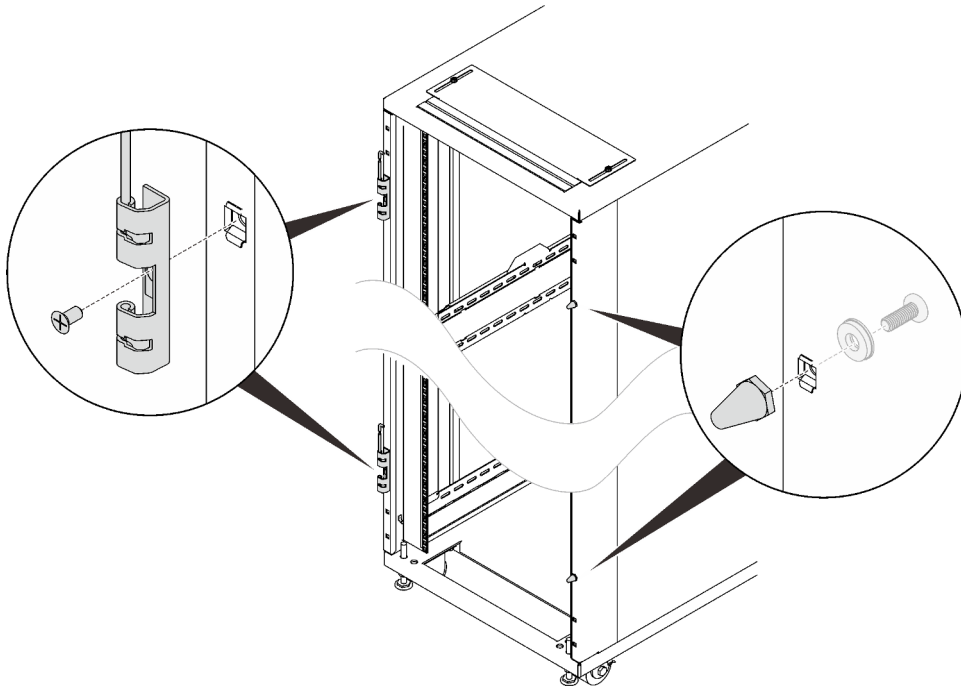


Figure 229. Removing a door

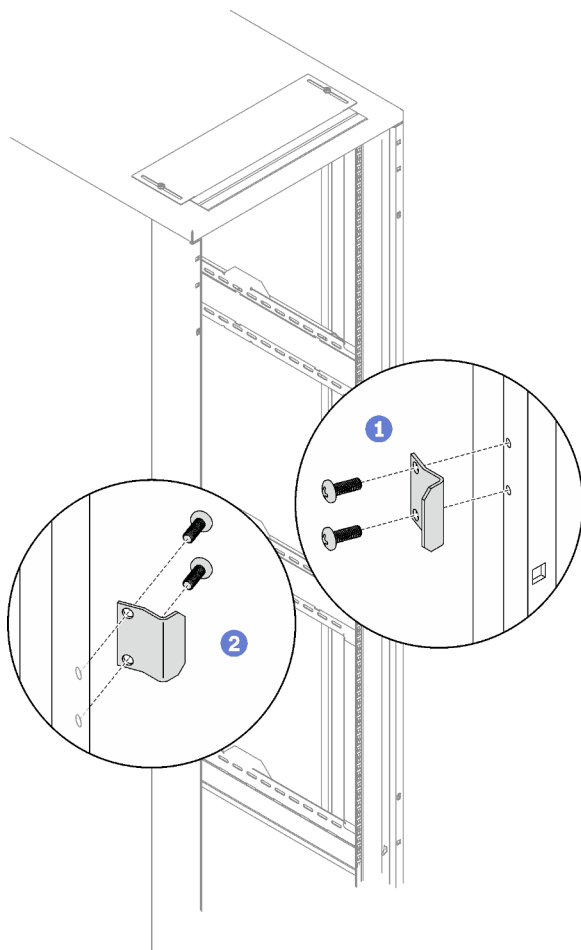
- ① Hold the door in place, and lift both hinge pins until they lock in the open position so that the door is disengaged.
- ② Remove the door from the rack cabinet frame.

Step 2. Remove the two hinges and the two doorstops.



*Figure 230. Removing the hinges and the doorstops*

Step 3. Reverse the door latch.



*Figure 231. Reversing the door latch*

- 1 Remove the two screws that secure the latch to the rack.
- 2 Rotate the latch 180 degree, and secure it to the opposite side on the rack cabinet with two screws.

Step 4. Reverse the hinge orientation

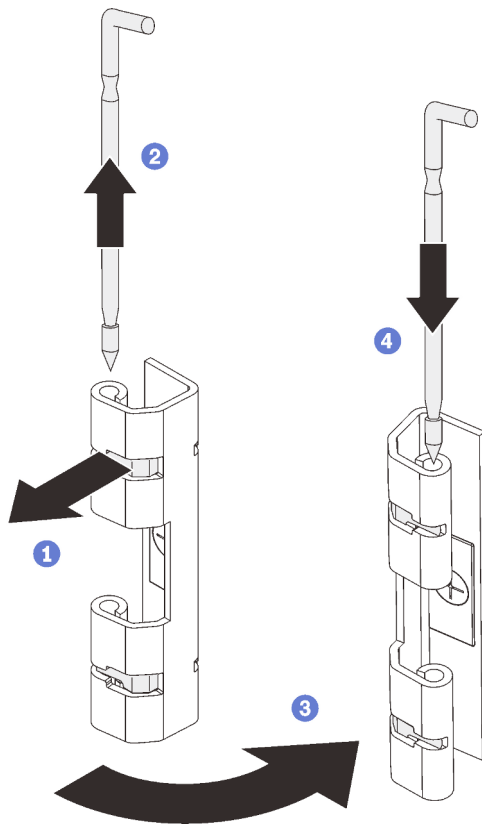
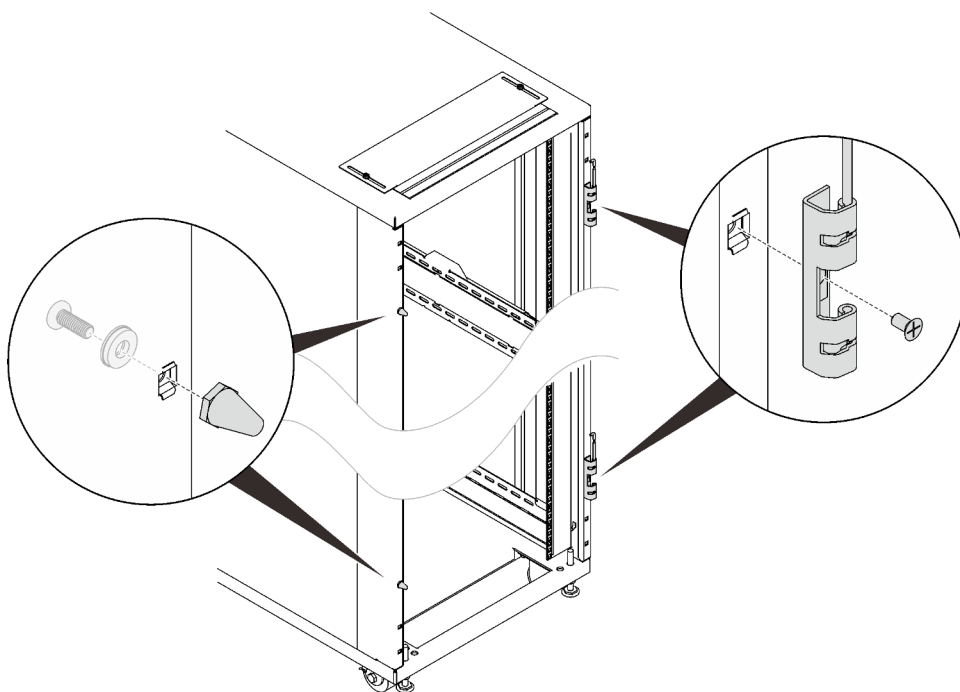


Figure 232. Reversing the hinge orientation

- 1 Pull the retainer spring out to release the hinge pin from the hinge.
- 2 Pull and remove the pin from the hinge.
- 3 Rotate the hinge 180 degree.
- 4 Insert the pin from the top of the hinge.

Step 5. Repeat the previous step on the other hinge.

Step 6. Install the two reversed hinges and the two doorstops to the opposite sides of the rack cabinet frame.



*Figure 233. Installing hinges and doorstops*

Step 7. Reverse the door handle.

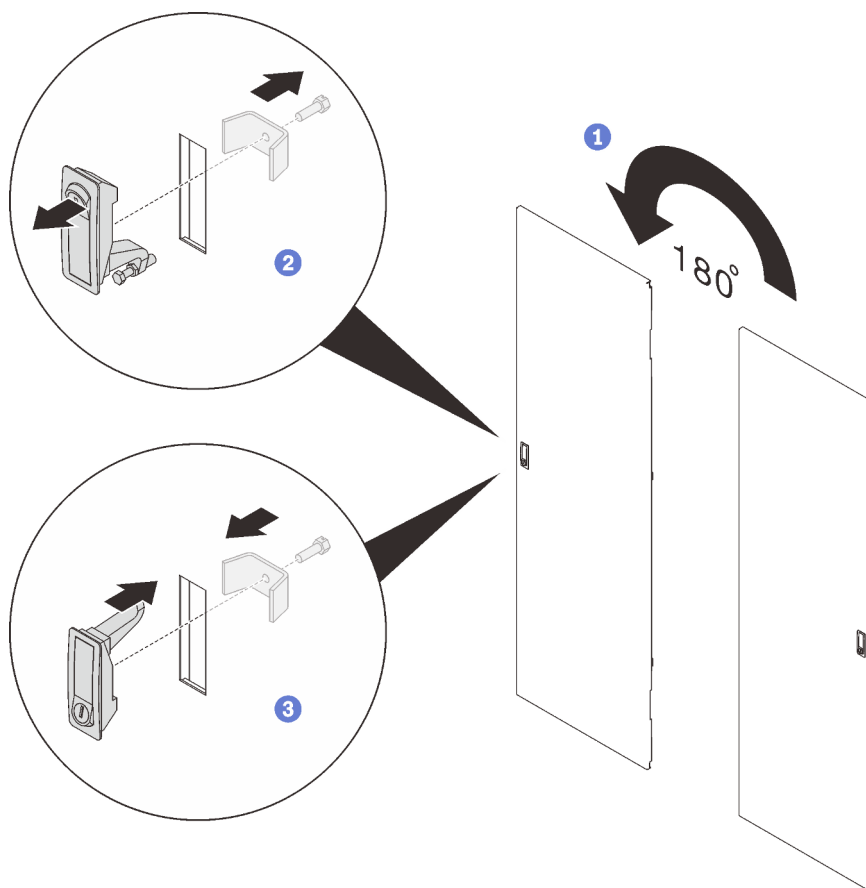


Figure 234. Reversing the door handle

- 1 Rotate the door 180 degree.
- 2 Remove the screw that secures the handle to the door.
- 3 Rotate the door handle 180 degree, and secure it to the door with a screw.

Step 8. Install the door.

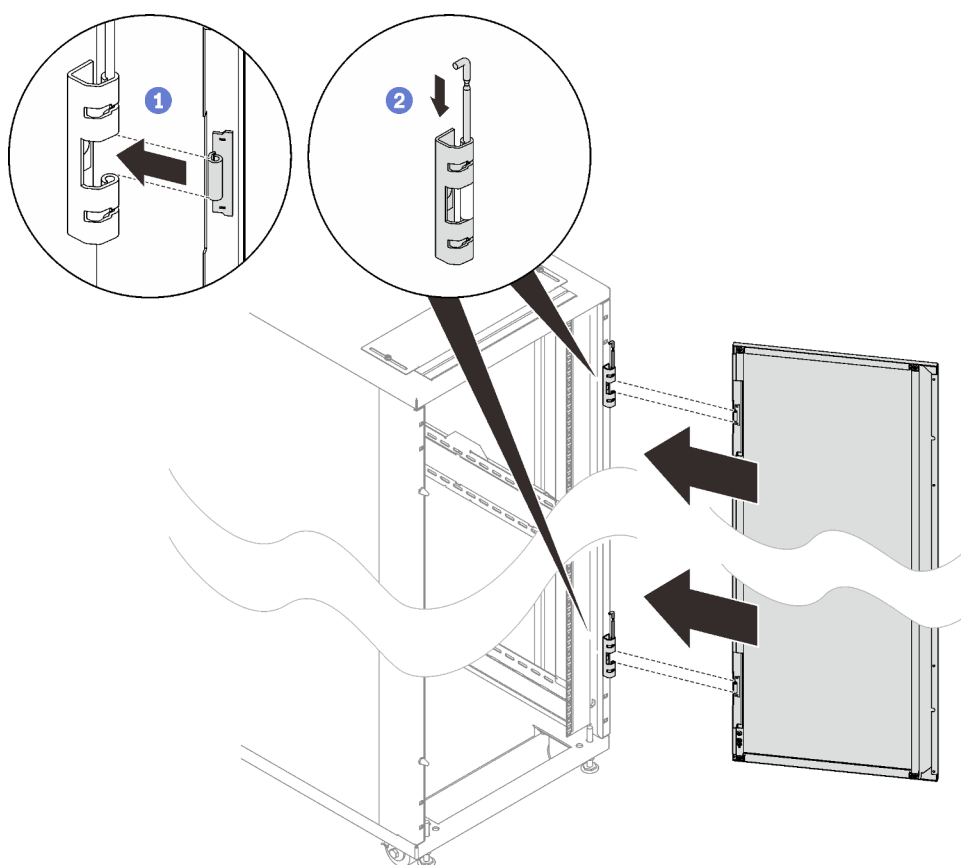


Figure 235. Installing the door

- 1 Align the door with the hinges, and hold the door in place.
- 2 Push the hinge pins down to the closed position so that the door is secured.

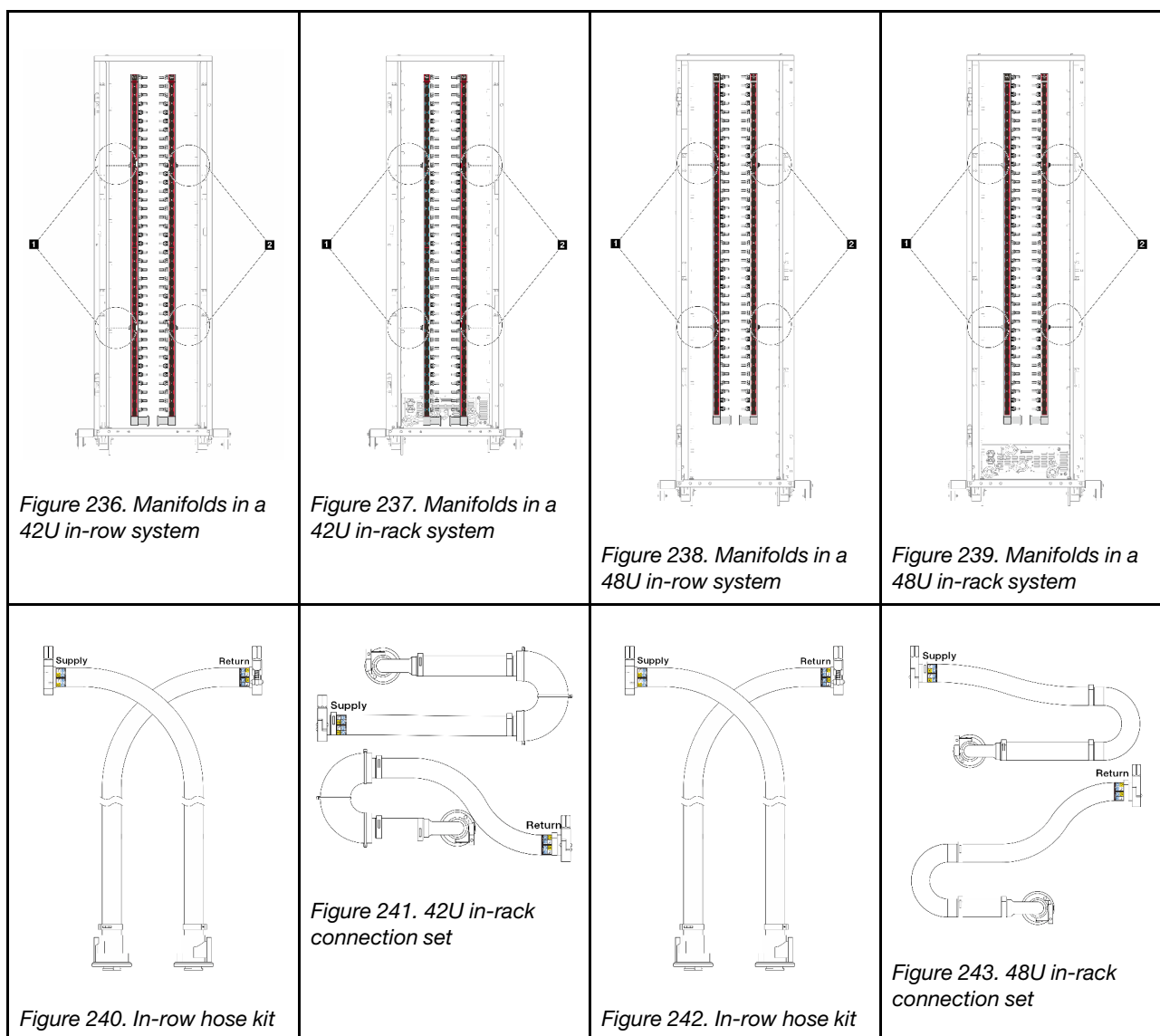
## Installing and removing DWC 38 Port Rack Manifold

Use the following procedures to remove and install the ThinkSystem Neptune® DWC 38 Port Rack Manifold.

**Important:** The coolant runs through the cooling system is de-ionized water. For more information about the coolant, see water requirements section in the user manual of the server.

For more operation and maintenance guidelines on Coolant Distribution Unit (CDU), see [Lenovo Neptune DWC RM100 in-rack Coolant Distribution Unit \(CDU\) Operation & Maintenance Guide](#).

The illustrations below present the rear views of a rack cabinet; three sets of manifolds and three sets of connection hoses. There are two labels attached to the front of the manifolds, and one label on one end of each hose.



- **1** Two left spools on supply manifold
- **2** Two right spools on return manifold
- [“Remove DWC 38 Port Rack Manifold \(in-rack system\)” on page 209](#)
- [“Install DWC 38 Port Rack Manifold \(in-rack system\)” on page 219](#)
- [“Remove DWC 38 Port Rack Manifold \(in-row system\)” on page 232](#)
- [“Install DWC 38 Port Rack Manifold \(in-row system\)” on page 244](#)

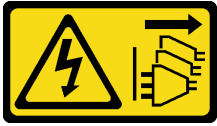
## Remove DWC 38 Port Rack Manifold (in-rack system)

Use this information to remove the manifold in an in-rack direct water cooling system.

### CAUTION:

The coolant might cause irritation to the skin and eyes. Avoid direct contact with the coolant.

**S002**



**CAUTION:**

The power-control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

**S011**



**CAUTION:**

Sharp edges, corners, or joints nearby.

**S038**



**CAUTION:**

Eye protection should be worn for this procedure.

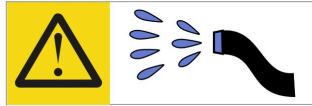
**S040**



**CAUTION:**

Protective gloves should be worn for this procedure.

## L016



خطر: قد يتم التعرض لخطر الصدمة الكهربائية بسبب الماء أو المحلول المائي الذي يوجد بهذا المنتج.  
تجنب العمل في أو بالقرب من أي جهاز فعال بأيدي مبللة أو عند وجود تسرب للماء. (L016)

**AVISO: Risco de choque elétrico devido à presença de água ou solução aquosa no produto. Evite trabalhar no equipamento ligado ou próximo a ele com as mãos molhadas ou quando houver a presença de água derramada. (L016)**

**ОПАСНО:** Риск от токов удар поради вода или воден разтвор, присъстващи в продукта.  
Избягвайте работа по или около оборудване под напрежение,  
докато сте с мокри ръце или когато наоколо има разляна вода.  
(L016)

**DANGER : Risque de choc électrique lié à la présence d'eau ou d'une solution aqueuse dans ce produit. Évitez de travailler avec ou à proximité d'un équipement sous tension avec des mains mouillées ou lorsque de l'eau est renversée. (L016)**

危险：由于本产品中存在水或者水溶液，因此存在电击风险。请避免使用潮湿的手在带电设备或者有水溅出的环境附近工作。(L016)

危險：本產品中有水或水溶液，會造成電擊的危險。手濕或有潑濺的水花時，請避免使用或靠近帶電的設備。(L016)

**OPASNOST:** Rizik od električnog udara zbog vode ili tekućine koja postoji u ovom proizvodu.  
Izbjegavajte rad u  
blizini opreme pod naponom s mokrim rukama ili kad je u blizini prolivena  
tekućina.  
(L016)

**NEBEZPEČÍ:** Riziko úrazu elektrickým proudem v důsledku vody nebo vodního roztoku přítomného v tomto produktu. Dejte pozor, abyste při práci s aktivovaným vybavením nebo v jeho blízkosti neměli mokré ruce a vyvarujte se potřísnění nebo polití produktu vodou. (L016)

**Fare!** Risiko for stød på grund af vand eller en vandig opløsning i produktet. Undgå at arbejde med eller i nærheden af strømførende udstyr med våde hænder, eller hvis der er spildt vand. (L016)

**GEVAAR:** Risico op elektrische schok door water of waterachtige oplossing die aanwezig is in dit product. Vermijd werken aan of naast apparatuur die onder spanning staat als u natte handen hebt of als gemorst water aanwezig is. (L016)

**DANGER:** Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present.  
(L016)

**Gefahr:** Aufgrund von Wasser oder wässriger Lösung in diesem Produkt besteht die Gefahr eines elektrischen Schlags. Nicht mit nassen Händen oder in der Nähe von Wasserlachen an oder in unmittelbarer Nähe von Bauteilen arbeiten, die unter Strom stehen. (L016)

**VESZÉLY:** A víz vagy a termékben lévő vizes alapú hűtőfolyadék miatt fennáll az elektromos áramütés veszélye. Ne dolgozzon áram alatt lévő berendezésen és közelében nedves kézzel, illetve amikor folyadék kerül a berendezésre.  
(L016)

危険：この製品内に存在する水または水溶液によって、電気ショックの危険があります。手が濡れている場合やこぼれた水が周囲にある場合は、電圧が印加された装置またはその周辺での作業は行わないでください。(L016)

**ОПАСНОСТ:** Опасност од струен удар поради присаство на вода или на воден раствор во овој производ. Избегнувајте работење на опрема вклучена во струја или во близина на опрема вклучена во струја со влажни раце или кога има истурено вода.  
(L016)

[illegible]

**NIEBEZPIECZEŃSTWO:** Ryzyko porażenia prądem elektrycznym z powodu występowania w produkcie wody lub roztworu wodnego. Nie należy pracować przy podłączonym do źródła zasilania urządzeniu lub w jego pobliżu z mokrymi dłońmi lub kiedy rozlano wodę.  
(L016)

212 ThinkSystem Heavy Duty Full Depth 42U Rack Cabinet User Guide

**ОПАСНО: Риск поражения электрическим током вследствие присутствия в этом продукте воды или водного раствора. Избегайте выполнения работ на оборудовании, находящемся под напряжением, или рядом с таким оборудованием влажными руками или при наличии пролитой воды. (L016)**

NEBEZPEČENSTVO: Riziko úrazu elektrickým prúdom v dôsledku prítomnosti vody alebo vodného roztoku v tomto produkte. Vyhnite sa práci na zapnutom zariadení alebo v jeho blízkosti s vlhkými rukami, alebo keď je prítomná rozliata voda. (L016)

NEVARNOST: Nevarnost električnega udara zaradi vode ali vodne raztopine, prisotne v izdelku. Ne delajte na opremi ali poleg opreme pod energijo z mokrimi rokami ali ko je prisotna razlita voda. (L016)

**PELIGRO: Existe riesgo de choque eléctrico por agua o por una solución de agua que haya en este producto. Evite trabajar en equipos bajo tensión o cerca de los mismos con las manos húmedas o si hay agua derramada. (L016)**

**Fara: Risk för elektriska stötar på grund av vatten eller vattenbaserat medel i denna produkt. Arbete inte med eller i närheten av elektriskt laddad utrustning om du har våta händer eller vid vattenspill. (L016)**

ཉེན་བརྒྱུ: རྩིས་ལྷན་འདྲིའི་ནང་དུ་རྒྱུ་ལྷན་ཆུ་འཛིན་གྱི་ཁྱུ་གས་འདུས་ཡོད་པ་སྟེ། དེ་ལས་སློབ་ཆུག་པའི་ཉེན་ཁ་ཡོད། ལག་པའི་ཐོག་ཆུ་ཡོད་པའམ་ཆུ་ཐིག་མར་བཞུར་བའི་གནས་ཚུལ་འོག་སློབ་ཆུག་པའི་སློབ་ཆས་ལ་བཞོལ་སྤྱོད་བྱེད་མི་ཉེན་པོ། (L016)

خەتەرلىك: بۇ مەھسۇلاتتا سۇ ياكى ئېرىتمە بولغاچقا، شۇڭا توك سوقۇۋېتىش خەۋپى مەۋجۇتدۇر. قول ھۆل ھالەتتە ۋە ياكى سۇ سىرغىپ چىققان ھالەتتە، توكلۇق ئۇسكۇنىگە قارىتا ۋە ياكى توكلۇق ئۇسكۇنىنىڭ ئەتراپىدا مەشغۇلات ئېلىپ بارغىلى بولمايدۇ. (L016)

Yungyiemi: Youzyiz aen canjbinj miz raemx roxnaeuz raemx yungzyiz, sojyij miz yungyiemi bungqden. Mboujndaej fwngz miz raemx seiz youq ndaw sezbi roxnaeuz youq henzgyawj guhhong. (L016)

#### Attention:

- Ensure proper handling procedures are followed when working with any chemically treated coolant used in the rack cooling system. Ensure that material safety data sheets (MSDS) and safety information are provided by the coolant chemical treatment supplier and that proper personal protective equipment (PPE) is available as recommended by the coolant chemical treatment supplier. Protective gloves and eyewear may be recommended as a precaution.
- This task requires two or more people.

#### Procedure

Step 1. Power off the in-rack CDU and disconnect all power cords.

Step 2. Close both ball valves.

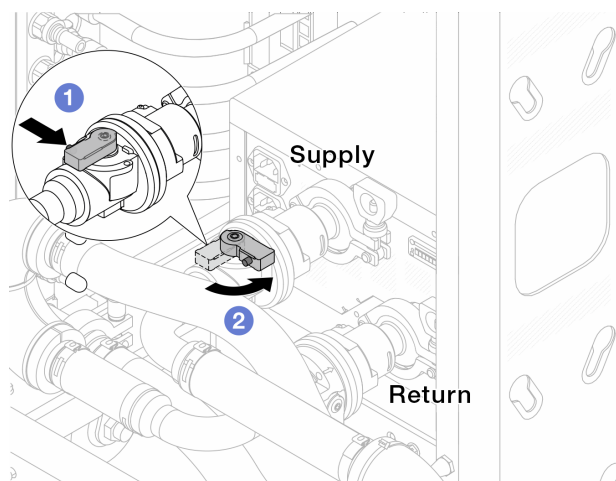


Figure 244. Closing ball valves

- a. ① Press the button on the ball valve switch.
- b. ② Rotate the switch to close the valves as illustrated above.

Step 3. Remove the quick connect plugs to separate the hoses from the manifold.

**Note:** Depending on the model, your server might look different from the illustrations in this topic.

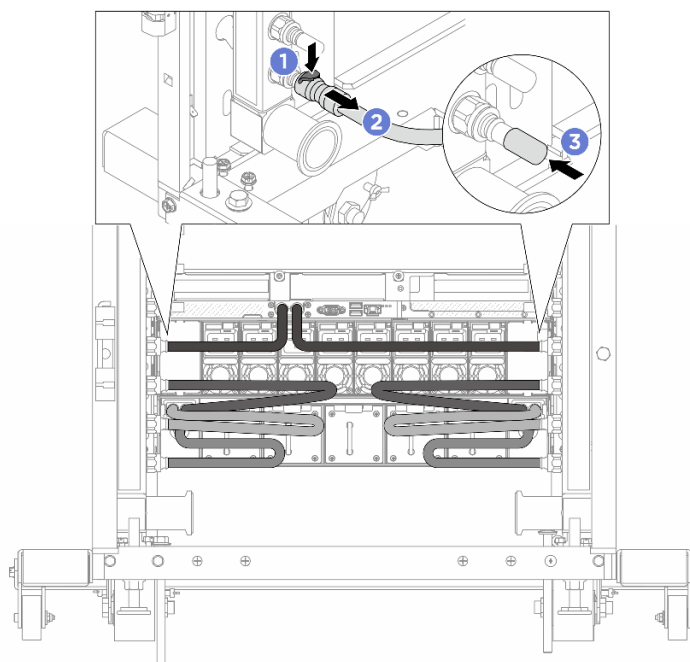


Figure 245. Quick connect plug removal

- a. ① Press the latch down to unlock the hose.
- b. ② Pull the hose off.
- c. ③ Re-install the rubber quick connect plug covers to the ports on the manifold.

Step 4. Repeat [Step 3 step 3 on page 214](#) to the other manifold.

Step 5. Disengage the connection set from ball valves.

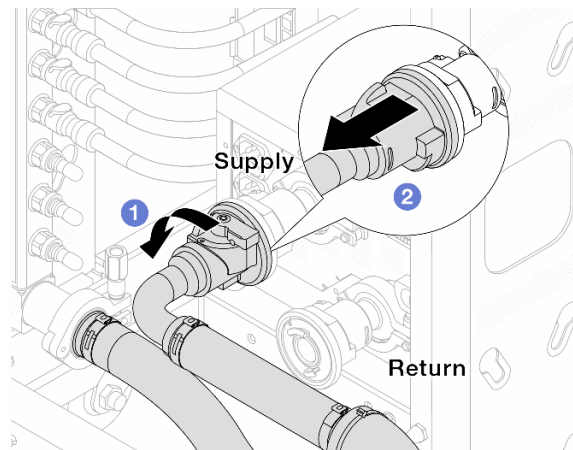


Figure 246. Removing the connection set

- a. ① Rotate the ball valve to the left.
- b. ② Pull the connection set off from ball valve.

Step 6. Remove the manifold with the connection set attached.

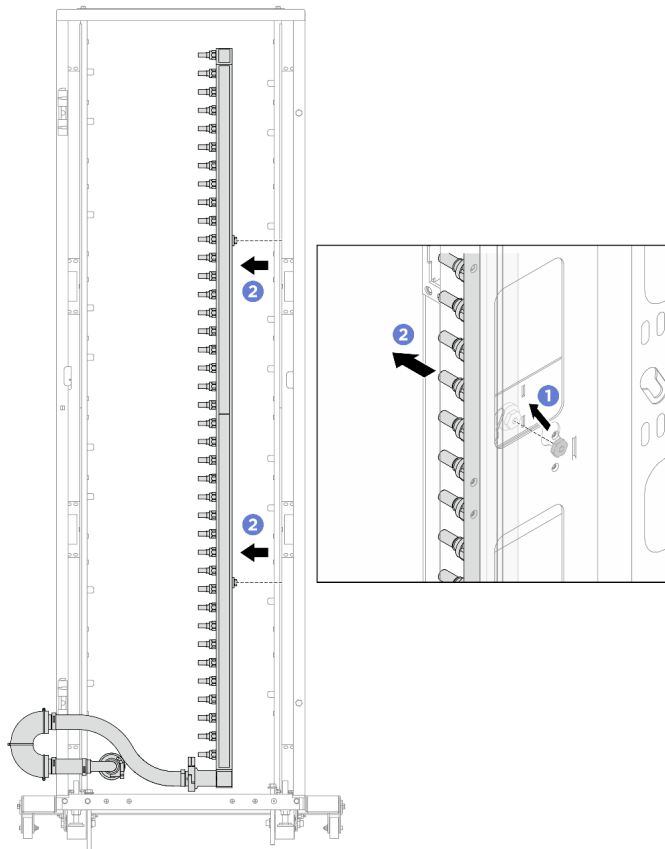


Figure 247. Removing the manifold

- a. ① Hold the manifold with both hands, and lift it upward to relocate the spools from the small openings to large ones on the rack cabinet.
- b. ② Remove the manifold with the connection set attached.

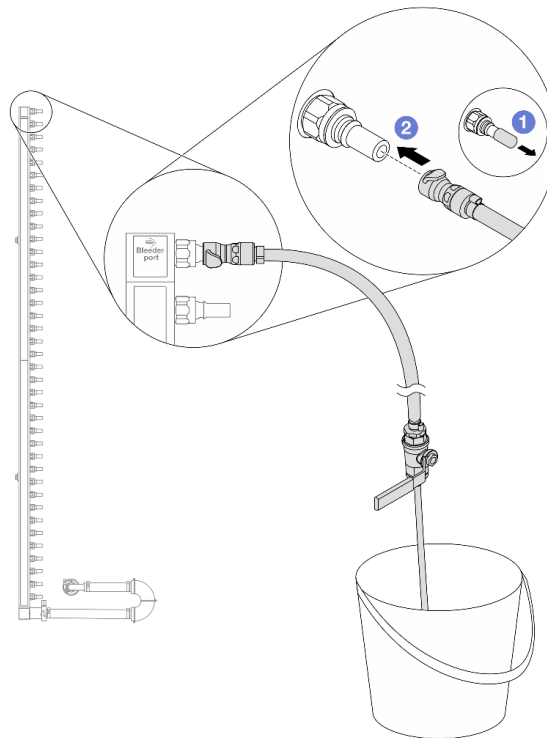
Step 7. Repeat [Step 6 step 6 on page 215](#) to the other manifold.

**Notes:**

- There is remaining coolant inside the manifold and the connection set. Remove both together and leave the further draining to the next step.

Step 8. Install the bleeder kit to the manifold supply side.

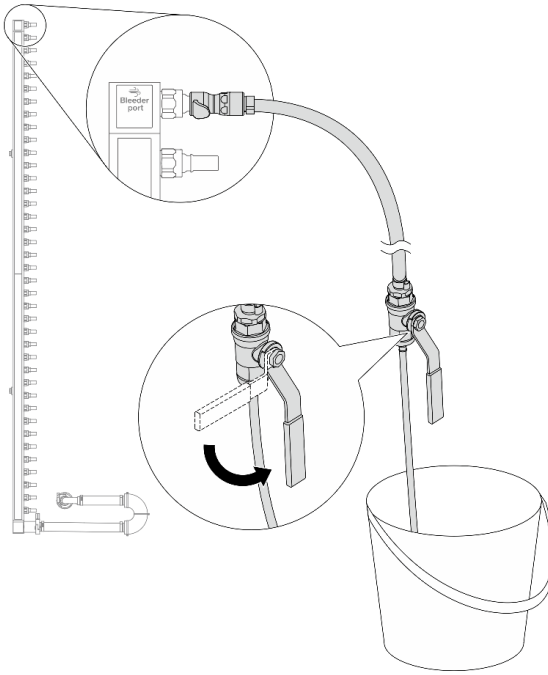
**Note:** This step drains the coolant with the help of a pressure difference inside and outside the supply manifold.



*Figure 248. Installing the bleeder kit to the supply side*

- a. ① Remove the rubber quick connect plug covers from the ports on the manifold.
- b. ② Plug the bleeder kit to the manifold.

Step 9. Slowly open the bleeder valve to allow a steady stream of coolant to drain. Close the bleeder valve once coolant stops flowing.



*Figure 249. Opening the bleeder valve*

Step 10. Install the bleeder kit to the manifold return side.

**Note:** This step drains the coolant with the help of a pressure difference inside and outside the return manifold.

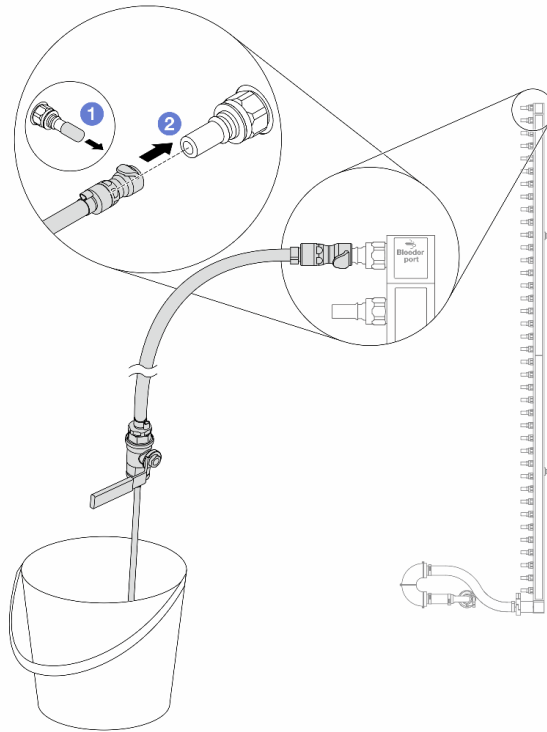


Figure 250. Installing the bleeder kit to the return side

- a. 1 Remove the rubber quick connect plug covers from the ports on the manifold.
- b. 2 Plug the bleeder kit to the manifold.

Step 11. Slowly open the bleeder valve to allow a steady stream of coolant to drain. Close the bleeder valve once coolant stops flowing.

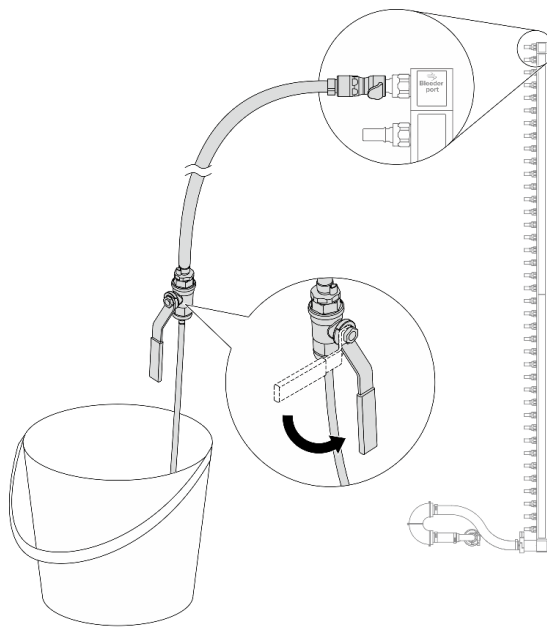


Figure 251. Opening the bleeder valve

Step 12. Separate the manifold from the connection set in a dry and clean work area, and keep a bucket and absorbent cloths around to collect any coolant that may drain out.

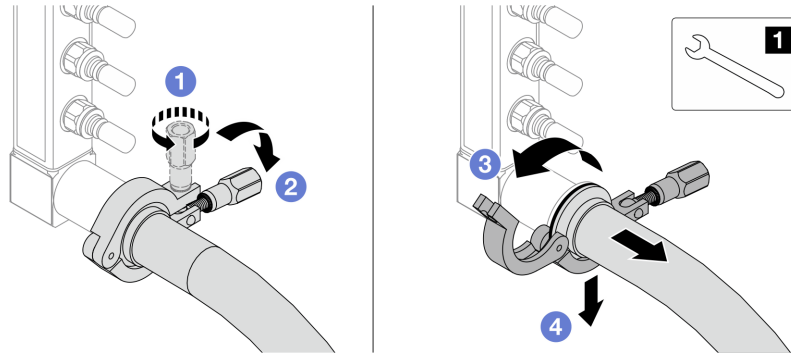


Figure 252. Separating the manifold from the connection set

1 17 mm wrench

- 1 Loosen the screw that locks the ferrule.
- 2 Put the screw down.
- 3 Open the clamp.
- 4 Remove the ferrule and connection set from the manifold.

Step 13. Repeat the last step to the other manifold.

Step 14. For better sanitation, keep the manifold ports and connection sets dry and clean. Re-install quick connect plug covers or any covers that protect connection sets and manifold ports.

## Install DWC 38 Port Rack Manifold (in-rack system)

Use this information to install the manifold in an in-rack direct water cooling system.

### CAUTION:

The coolant might cause irritation to the skin and eyes. Avoid direct contact with the coolant.

### S002



### CAUTION:

The power-control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

### S011



**CAUTION:**  
Sharp edges, corners, or joints nearby.

**S038**



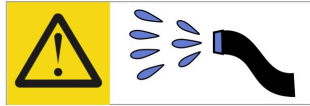
**CAUTION:**  
Eye protection should be worn for this procedure.

**S040**



**CAUTION:**  
Protective gloves should be worn for this procedure.

## L016



خطر: قد يتم التعرض لخطر الصدمة الكهربائية بسبب الماء أو المحلول المائي الذي يوجد بهذا المنتج.  
تجنب العمل في أو بالقرب من أي جهاز فعال بأيدي مبللة أو عند وجود تسرب للماء. (L016)

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докато сте с мокри ръце или когато наоколо има разляна вода.  
(L016)

**DANGER : Risque de choc électrique lié à la présence d'eau ou d'une solution aqueuse dans ce produit. Évitez de travailler avec ou à proximité d'un équipement sous tension avec des mains mouillées ou lorsque de l'eau est renversée. (L016)**

危险：由于本产品中存在水或者水溶液，因此存在电击风险。请避免使用潮湿的手在带电设备或者有水溅出的环境附近工作。(L016)

危險：本產品中有水或水溶液，會造成電擊的危險。手濕或有潑濺的水花時，請避免使用或靠近帶電的設備。(L016)

**OPASNOST:** Rizik od električnog udara zbog vode ili tekućine koja postoji u ovom proizvodu.  
Izbjegavajte rad u  
blizini opreme pod naponom s mokrim rukama ili kad je u blizini prolivena  
tekućina.  
(L016)

**NEBEZPEČÍ:** Riziko úrazu elektrickým proudem v důsledku vody nebo vodního roztoku přítomného v tomto produktu. Dejte pozor, abyste při práci s aktivovaným vybavením nebo v jeho blízkosti neměli mokré ruce a vyvarujte se potřísnění nebo polití produktu vodou. (L016)

**Fare!** Risiko for stød på grund af vand eller en vandig opløsning i produktet. Undgå at arbejde med eller i nærheden af strømførende udstyr med våde hænder, eller hvis der er spildt vand. (L016)

**GEVAAR:** Risico op elektrische schok door water of waterachtige oplossing die aanwezig is in dit product. Vermijd werken aan of naast apparatuur die onder spanning staat als u natte handen hebt of als gemorst water aanwezig is. (L016)

**DANGER:** Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present. (L016)

**Gefahr:** Aufgrund von Wasser oder wässriger Lösung in diesem Produkt besteht die Gefahr eines elektrischen Schlags. Nicht mit nassen Händen oder in der Nähe von Wasserlachen an oder in unmittelbarer Nähe von Bauteilen arbeiten, die unter Strom stehen. (L016)

**VESZÉLY:** A víz vagy a termékben lévő vizes alapú hűtőfolyadék miatt fennáll az elektromos áramütés veszélye. Ne dolgozzon áram alatt lévő berendezésen és közelében nedves kézzel, illetve amikor folyadék kerül a berendezésre.  
(L016)

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(L016)

[illegible]

**NIEBEZPIECZEŃSTWO:** Ryzyko porażenia prądem elektrycznym z powodu występowania w produkcie wody lub roztworu wodnego. Nie należy pracować przy podłączonym do źródła zasilania urządzeniu lub w jego pobliżu z mokrymi dłońmi lub kiedy rozlano wodę.  
(L016)

222 ThinkSystem Heavy Duty Full Depth 42U Rack Cabinet User Guide

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NEBEZPEČENSTVO: Riziko úrazu elektrickým proudem v důsledku přítomnosti vody alebo vodného roztoku v tomto produkte. Vyhnite sa práci na zapnutom zariadení alebo v jeho blízkosti s vlhkými rukami, alebo keď je prítomná rozliata voda. (L016)

NEVARNOST: Nevarnost električnega udara zaradi vode ali vodne raztopine, prisotne v izdelku. Ne delajte na opremi ali poleg opreme pod energijo z mokrimi rokami ali ko je prisotna razlita voda. (L016)

**PELIGRO: Existe riesgo de choque eléctrico por agua o por una solución de agua que haya en este producto. Evite trabajar en equipos bajo tensión o cerca de los mismos con las manos húmedas o si hay agua derramada. (L016)**

**Fara: Risk för elektriska stötar på grund av vatten eller vattenbaserat medel i denna produkt. Arbeta inte med eller i närheten av elektriskt laddad utrustning om du har våta händer eller vid vattenspill. (L016)**

ཉེན་བརྒྱུ: རྩིས་འདིའི་ནང་ཏུ་ཆུ་འཕྲ་ཆུའི་གཤེར་གཟུགས་འདུས་ཡོད་པ་སྟེ། དེ་ལས་སློག་ཆུག་པའི་ཉེན་ཁ་ཡོད། ལག་པའི་སློག་ཆུ་ཡོད་པའམ་ཆུ་ཐིག་མར་བཞུར་བའི་གནས་ཚུལ་འོག་སློག་ཆུ་ཡོད་པའི་སློག་ཆས་ལ་བཞོལ་སྤྱོད་བྱེད་མི་ཉེན་པོ། (L016)

خەتەرلىك: بۇ مەھسۇلاتتا سۇ ياكى ئېرىتمە بولغاچقا، شۇڭا توك سوقۇۋېتىش خەۋپى مەۋجۇتدۇر. قول ھۆل ھالەتتە ۋە ياكى سۇ سىرغىپ چىققان ھالەتتە، توكلۇق ئۇسكۇنىگە قارىتا ۋە ياكى توكلۇق ئۇسكۇنىنىڭ ئەتراپىدا مەشغۇلات ئېلىپ بارغىلى بولمايدۇ. (L016)

Yungyiernj: Youzyiz aen canjbinj miz raemx roxnaeuz raemx yungzyiz, sojyij miz yungyiernj bungqden. Mboujndaej fwngz miz raemx seiz youq ndaw sezbi roxnaeuz youq henzgyawj guhhong. (L016)

#### Attention:

- Ensure proper handling procedures are followed when working with any chemically treated coolant used in the rack cooling system. Ensure that material safety data sheets (MSDS) and safety information are provided by the coolant chemical treatment supplier and that proper personal protective equipment (PPE) is available as recommended by the coolant chemical treatment supplier. Protective gloves and eyewear may be recommended as a precaution.
- This task requires two or more people.

#### Procedure

- Step 1. Make sure that the in-rack CDU and other devices are not powered on, and that all external cables are disconnected.
- Step 2. Install the server into the rack.
- Step 3. Install the manifold.

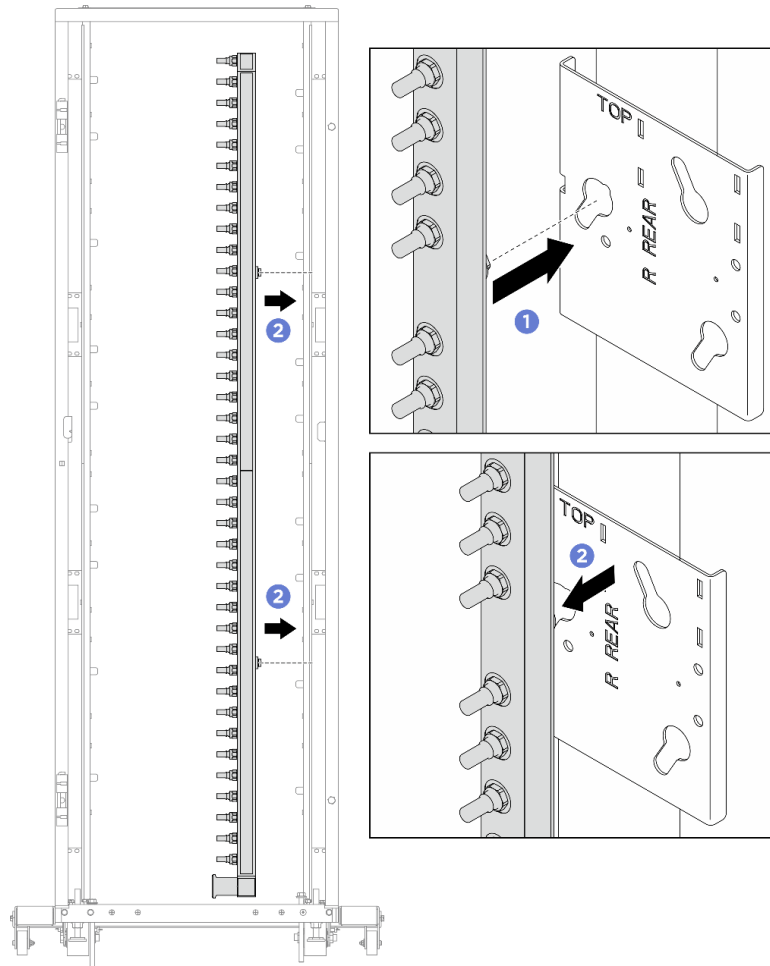


Figure 253. Installing the manifold

- a. ① Hold the manifold with both hands, and mount it onto the rack cabinet.
- b. ② Align the spools with holes, and clutch the cabinet.

Step 4. Repeat the last step to install the other manifold.

Step 5. Install ball valves to CDU.

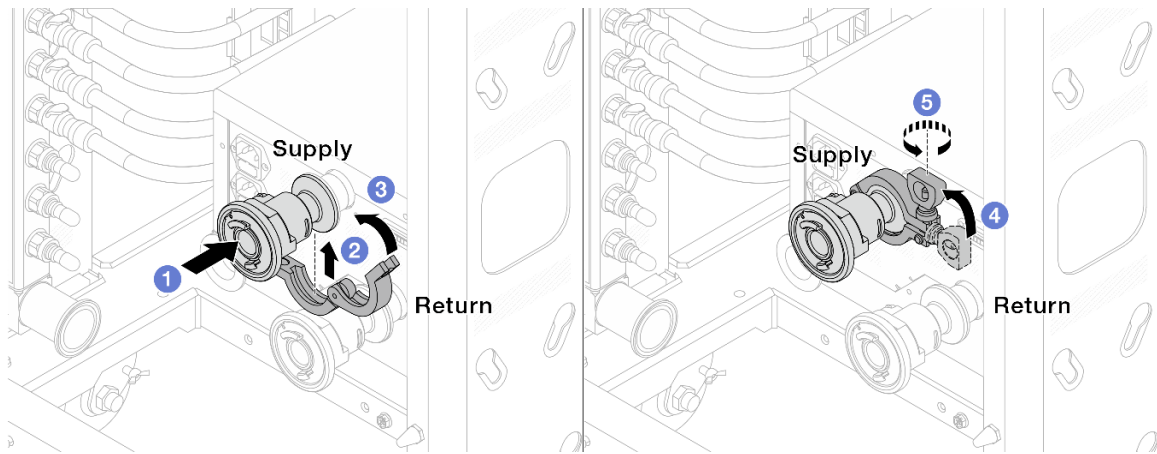


Figure 254. Installing ball valves

- a. ① Connect the ball valves to **Supply** and **Return** ports.
- b. ② Wrap the interface around with the clamp.
- c. ③ Close the clamp.
- d. ④ Lift the screw upright.
- e. ⑤ Tighten the screw and make sure that it is secured.

Step 6. Install the connection set to manifolds.

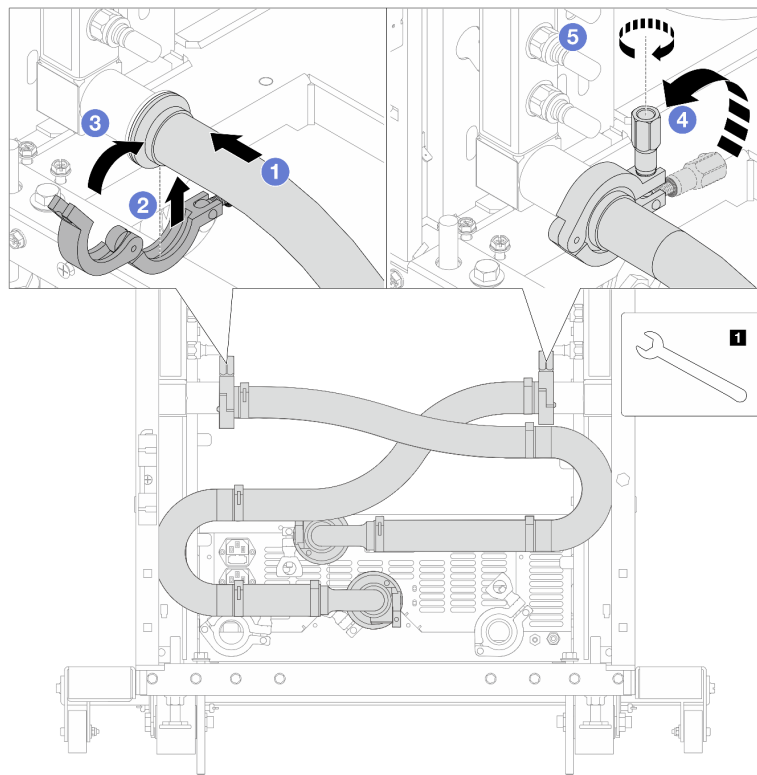


Figure 255. Installing the connection set

**1** 17 mm wrench

- a. **1** Connect the connection set to both manifolds.
- b. **2** Wrap the interface around with the clamp.
- c. **3** Close the clamp.
- d. **4** Lift the screw upright.
- e. **5** Tighten the screw and make sure that it is secured.

Step 7. Install the connection set to ball valves.

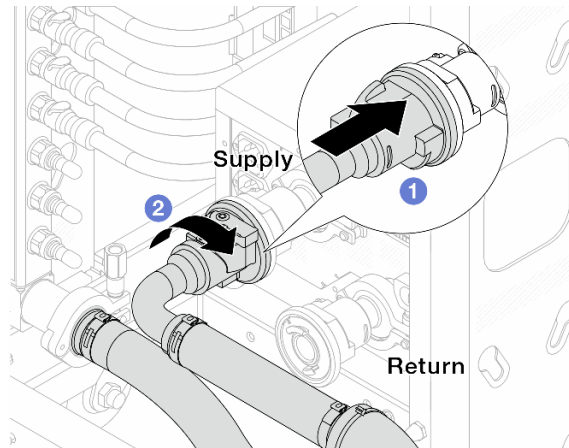


Figure 256. Connecting ball valves

- a. **1** Connect ball valves.
- b. **2** Rotate to the right to lock the two valves.

Step 8. Prepare the in-rack CDU.

- a. Connect the feed hose to inlet port on the front.

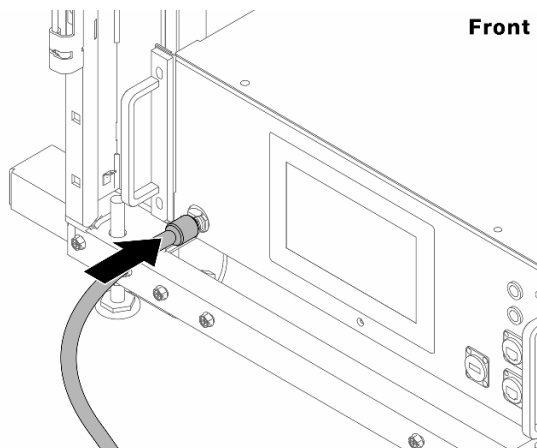


Figure 257. The front of CDU

- b. Connect hoses to the drain port and bleeder port on the rear.

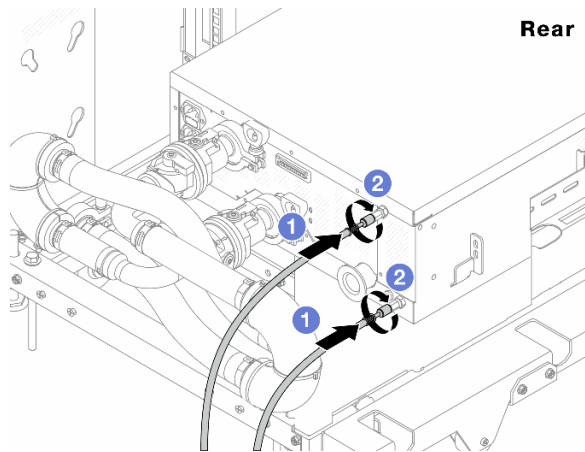


Figure 258. The rear of CDU

- ① Connect both drain and bleeder hoses to CDU.
- ② Rotate the connectors to the right to secure the connection.

**Important:**

- For more operation and maintenance guidelines, see [Lenovo Neptune DWC RM100 in-rack Coolant Distribution Unit \(CDU\) Operation & Maintenance Guide](#).
- For service support, associated warranty and maintenance sizing, contact Lenovo Professional Services team at [cdusupport@lenovo.com](mailto:cdusupport@lenovo.com).

Step 9. Install the quick connect plug to the manifolds.

**Note:** Depending on the model, your server might look different from the illustrations in this topic.

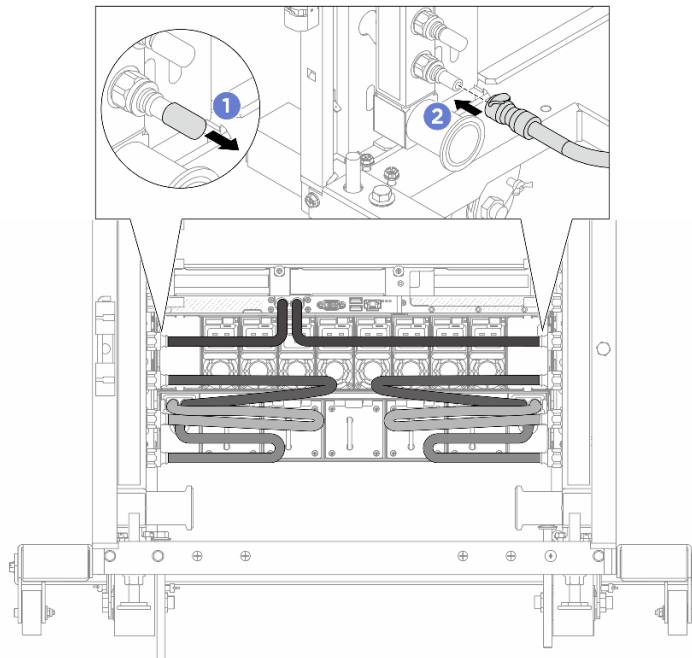


Figure 259. Installing the quick connect plug

- a. ① Remove the rubber quick connect plug covers from the ports on the manifold.
- b. ② Connect the plug to the manifold port.

Step 10. Install the bleeder kit to the manifold supply side.

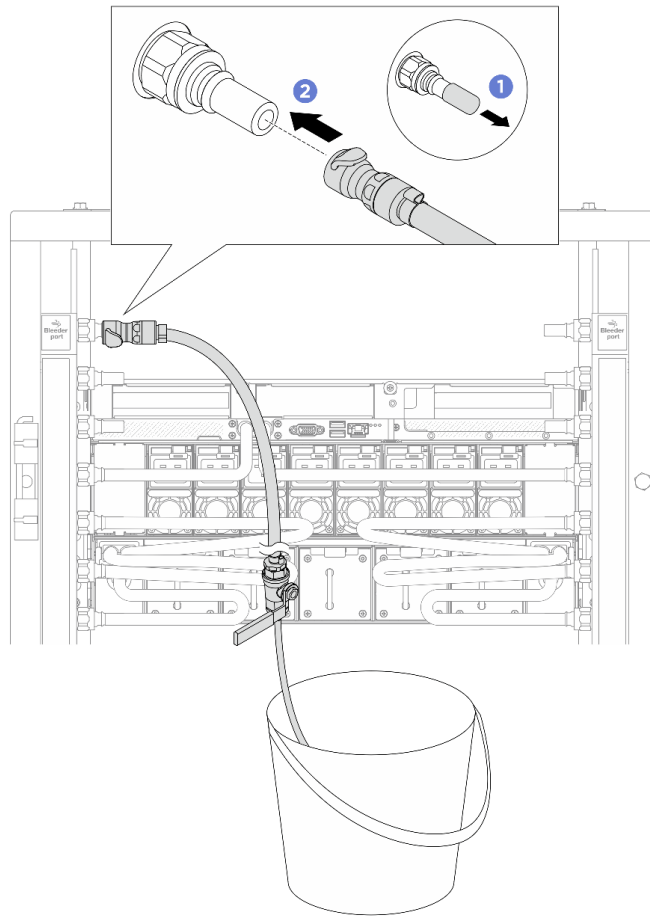


Figure 260. Installing the bleeder kit to the supply side

- a. ① Remove the rubber quick connect plug covers from the ports on the manifold.
- b. ② Plug the bleeder kit to the manifold.

Step 11. To push the air out of the manifolds, open ball valve switches to let coolant fill the system.

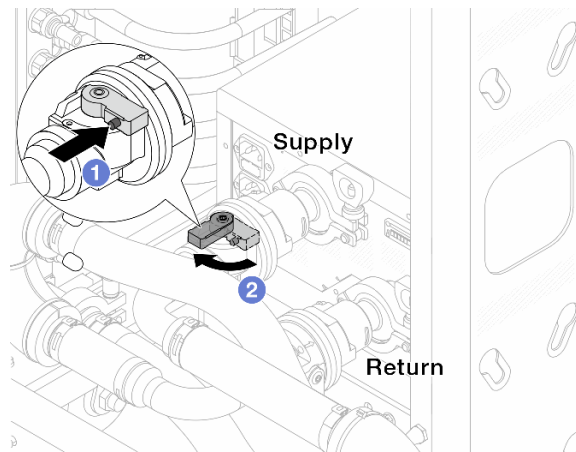


Figure 261. Opening ball valves

- a. ① Press the button on the ball valve switch.
- b. ② Rotate the switch to fully open the valves as illustrated above.

**Attention:**

- Pay close attention to the front display of CDU and maintain the system pressure at **one bar**.
- For more information about coolant temperature and system pressure requirements, see the water requirements section of your server.

Step 12. Slowly open the bleeder valve to conduct the air out of the hose. Close the bleeder valve once a steady stream of water flows into the bucket or there are only minimal bubbles in the bleeder hose.

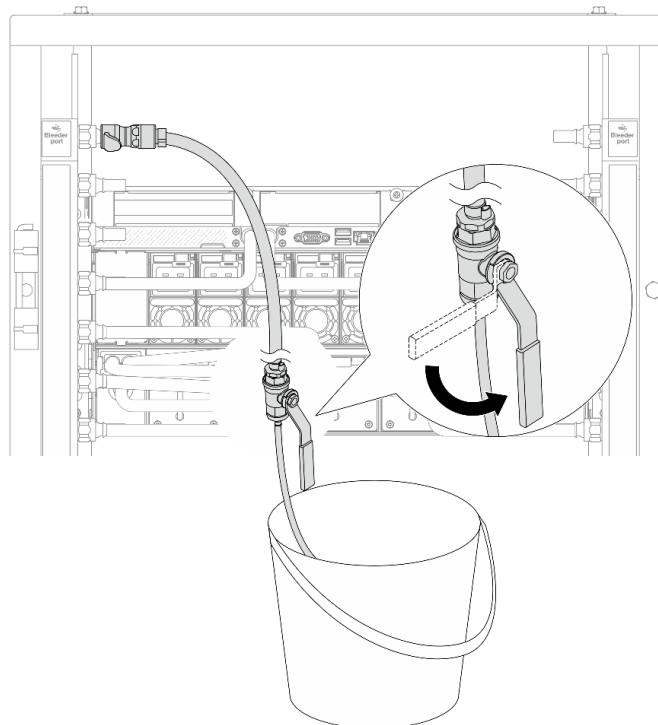


Figure 262. Opening the bleeder valve on the supply side

Step 13. Install the bleeder kit to the manifold return side.

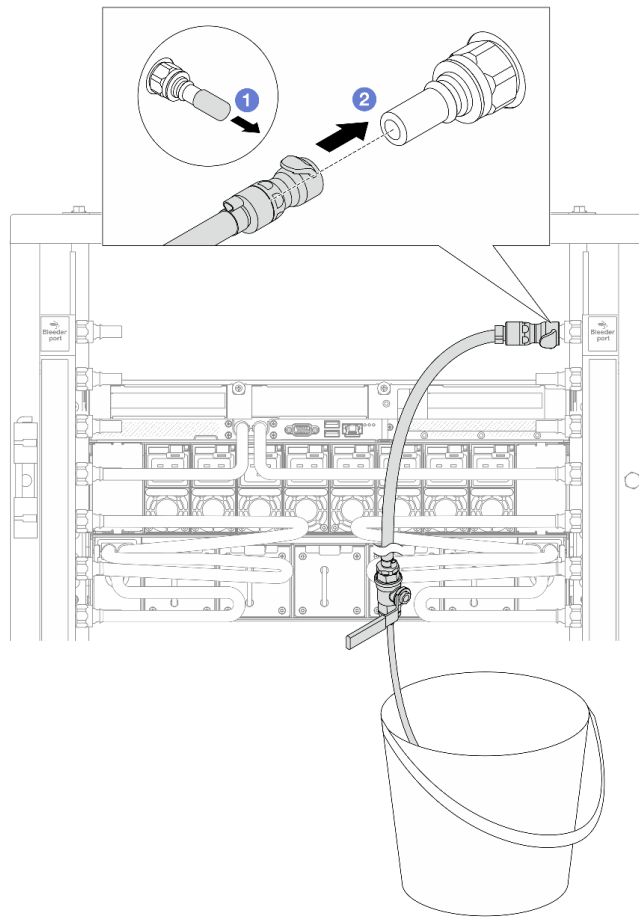
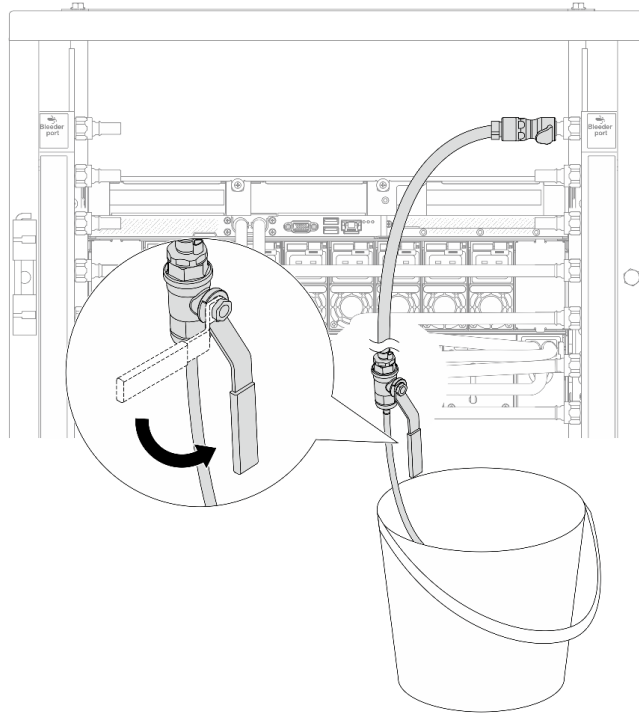


Figure 263. Installing the bleeder kit on the return side

- a. ① Remove the rubber quick connect plug covers from the ports on the manifold.
- b. ② Plug the bleeder kit to the manifold.

Step 14. Slowly open the bleeder valve to conduct the air out of the hose. Close the bleeder valve once a steady stream of water flows into the bucket or there are only minimal bubbles in the bleeder hose.



*Figure 264. Opening the bleeder valve on the return side*

- Step 15. (For precaution) To make sure that the air inside is as little as possible, re-install the bleeder kit back to manifold supply side and do it one more time. Close the bleeder valve once a steady stream of water flows into the bucket or there are only minimal bubbles in the bleeder hose.

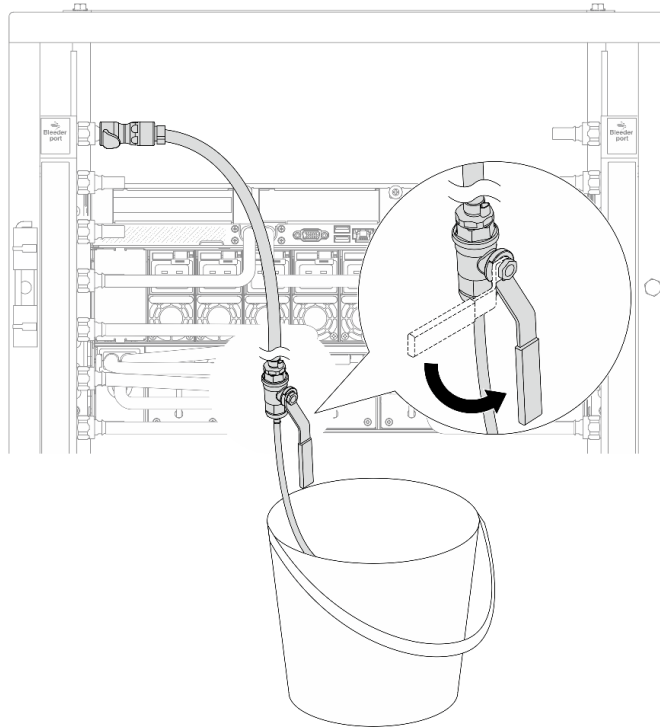


Figure 265. Opening the bleeder valve on the supply side

Step 16. Once completed, pay close attention to the front display of CDU and maintain the system pressure at **one bar**. For more information about coolant temperature and system pressure requirements, see the water requirement section for your server.

## Remove DWC 38 Port Rack Manifold (in-row system)

Use this information to remove the manifold in an in-row direct water cooling system.

### CAUTION:

The coolant might cause irritation to the skin and eyes. Avoid direct contact with the coolant.

### S002



### CAUTION:

The power-control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

### S011



**CAUTION:**  
Sharp edges, corners, or joints nearby.

**S038**



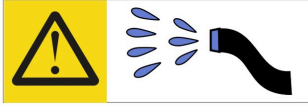
**CAUTION:**  
Eye protection should be worn for this procedure.

**S040**



**CAUTION:**  
Protective gloves should be worn for this procedure.

## L016



خطر: قد يتم التعرض لخطر الصدمة الكهربائية بسبب الماء أو المحلول المائي الذي يوجد بهذا المنتج.  
تجنب العمل في أو بالقرب من أي جهاز فعال بأيدي مبللة أو عند وجود تسرب للماء. (L016)

**AVISO: Risco de choque elétrico devido à presença de água ou solução aquosa no produto. Evite trabalhar no equipamento ligado ou próximo a ele com as mãos molhadas ou quando houver a presença de água derramada. (L016)**

**ОПАСНО:** Риск от токов удар поради вода или воден разтвор, присъстващи в продукта.  
Избягвайте работа по или около оборудване под напрежение,  
докато сте с мокри ръце или когато наоколо има разляна вода.  
(L016)

**DANGER : Risque de choc électrique lié à la présence d'eau ou d'une solution aqueuse dans ce produit. Évitez de travailler avec ou à proximité d'un équipement sous tension avec des mains mouillées ou lorsque de l'eau est renversée. (L016)**

危险: 由于本产品中存在水或者水溶液, 因此存在电击风险。请避免使用潮湿的手在带电设备或者有水溅出的环境附近工作。 (L016)

危險: 本產品中有水或水溶液, 會造成電擊的危險。手濕或有潑濺的水花時, 請避免使用或靠近帶電的設備。 (L016)

OPASNOST: Rizik od električnog udara zbog vode ili tekućine koja postoji u ovom proizvodu.  
Izbjegavajte rad u  
blizini opreme pod naponom s mokrim rukama ili kad je u blizini prolivena  
tekućina.  
(L016)

**NEBEZPEČÍ: Riziko úrazu elektrickým proudem v důsledku vody nebo vodního roztoku přítomného v tomto produktu. Dejte pozor, abyste při práci s aktivovaným vybavením nebo v jeho blízkosti neměli mokré ruce a vyvarujte se potřísnění nebo polití produktu vodou. (L016)**

**Fare! Risiko for stød på grund af vand eller en vandig opløsning i produktet. Undgå at arbejde med eller i nærheden af strømførende udstyr med våde hænder, eller hvis der er spildt vand. (L016)**

**GEVAAR: Risico op elektrische schok door water of waterachtige oplossing die aanwezig is in dit product. Vermijd werken aan of naast apparatuur die onder spanning staat als u natte handen hebt of als gemorst water aanwezig is. (L016)**

**DANGER: Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present. (L016)**



**ОПАСНО: Риск поражения электрическим током вследствие присутствия в этом продукте воды или водного раствора. Избегайте выполнения работ на оборудовании, находящемся под напряжением, или рядом с таким оборудованием влажными руками или при наличии пролитой воды. (L016)**

NEBEZPEČENSTVO: Riziko úrazu elektrickým prúdom v dôsledku prítomnosti vody alebo vodného roztoku v tomto produkte. Vyhnite sa práci na zapnutom zariadení alebo v jeho blízkosti s vlhkými rukami, alebo keď je prítomná rozliata voda. (L016)

NEVARNOST: Nevarnost električnega udara zaradi vode ali vodne raztopine, prisotne v izdelku. Ne delajte na opremi ali poleg opreme pod energijo z mokrimi rokami ali ko je prisotna razlita voda. (L016)

**PELIGRO: Existe riesgo de choque eléctrico por agua o por una solución de agua que haya en este producto. Evite trabajar en equipos bajo tensión o cerca de los mismos con las manos húmedas o si hay agua derramada. (L016)**

**Fara: Risk för elektriska stötar på grund av vatten eller vattenbaserat medel i denna produkt. Arbeta inte med eller i närheten av elektriskt laddad utrustning om du har våta händer eller vid vattenspill. (L016)**

ཉེན་བརྒྱུ: རྩོམ་ཆས་འདིའི་ནང་དུ་ཆུ་འཕྲ་ཆུ་འཕྲ་གཤེར་གཟུགས་འདུས་ཡོད་པ་སྟེ། དེ་ལས་སློག་ཆུག་པའི་ཉེན་ཁ་ཡོད། ལག་པའི་སློག་ཆུ་ཡོད་པའམ་ཆུ་ཐིག་མར་བཞུར་བའི་གནས་ཚུལ་འདི་སློག་ཆུ་ཡོད་པའི་སློག་ཆས་ལ་བཞོལ་སྤྱོད་བྱེད་མི་ཉེན་པོ་ཡོད། (L016)

خەتەرلىك: بۇ مەھسۇلاتتا سۇ ياكى ئېرىتمە بولغاچقا، شۇڭا توك سوقۇۋېتىش خەۋپى مەۋجۇتدۇر. قول ھۆل ھالەتتە ۋە ياكى سۇ سىرغىپ چىققان ھالەتتە، توكلۇق ئۇسكۇنىگە قارىتا ۋە ياكى توكلۇق ئۇسكۇنىنىڭ ئەتراپىدا مەشغۇلات ئېلىپ بارغىلى بولمايدۇ. (L016)

Yungyiemy: Youzyiz aen canjbinj miz raemx roxaeuz raemx yungzyiz, sojyij miz yungyiemy bungqden. Mboujndaej fwngz miz raemx seiz youq ndaw sezbi roxaeuz youq henzgyawj guhhong. (L016)

#### Attention:

- Ensure proper handling procedures are followed when working with any chemically treated coolant used in the rack cooling system. Ensure that material safety data sheets (MSDS) and safety information are provided by the coolant chemical treatment supplier and that proper personal protective equipment (PPE) is available as recommended by the coolant chemical treatment supplier. Protective gloves and eyewear may be recommended as a precaution.
- This task requires two or more people.

## Procedure

Step 1. Close both ball valves.

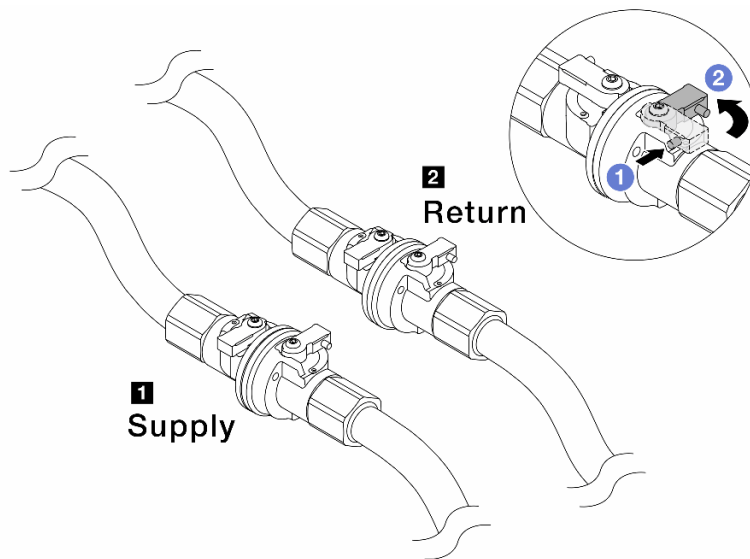


Figure 266. Closing ball valves

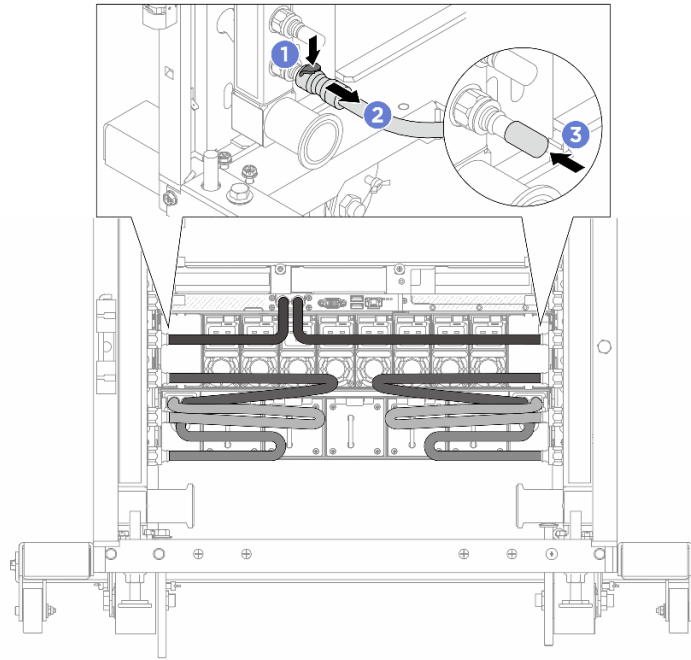
**Note:**

<b>1</b> Manifold supply connects to facility supply	<b>2</b> Manifold return connects to facility return
--	--

- a. ① Press the button on the ball valve switch.
- b. ② Rotate the switches to close the valves as illustrated above.

Step 2. Remove the quick connect plugs to separate the hoses from the manifold.

**Note:** Depending on the model, your server might look different from the illustrations in this topic.



*Figure 267. Quick connect plug removal*

- a. ① Press the latch down to unlock the hose.
- b. ② Pull the hose off.
- c. ③ Re-install the rubber quick connect plug covers to the ports on the manifold.

Step 3. Repeat [Step 2 step 2 on page 237](#) to the other manifold.

Step 4. Remove the manifold with the hose kit attached.

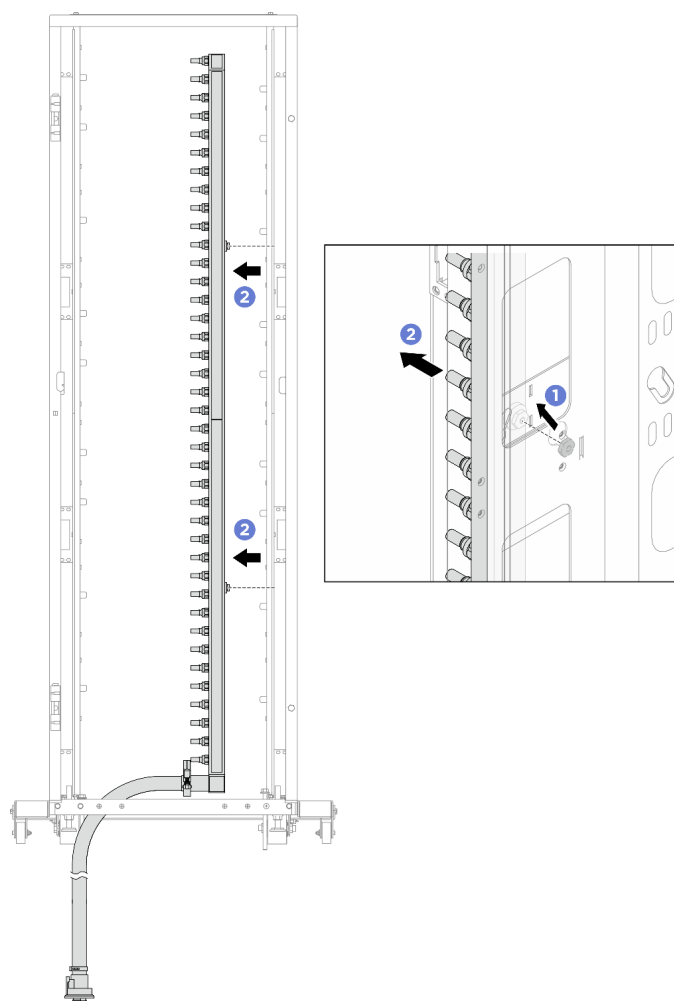


Figure 268. Removing the manifold

- a. ① Hold the manifold with both hands, and lift it upward to relocate the spools from the small openings to large ones on the rack cabinet.
- b. ② Remove the manifold with the hose kit attached.

Step 5. Repeat [Step 4 step 4 on page 238](#) to the other manifold.

**Notes:**

- There is remaining coolant inside the manifold and the hose kit. Remove both together and leave the further draining to the next step.

Step 6. Install the bleeder kit to the manifold supply side.

**Note:** This step drains the coolant with the help of a pressure difference inside and outside the supply manifold.

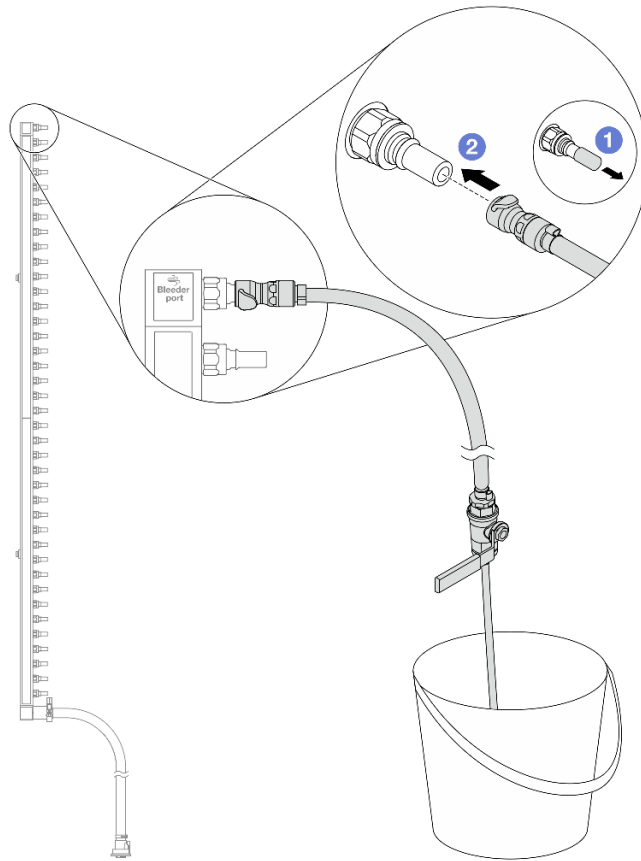
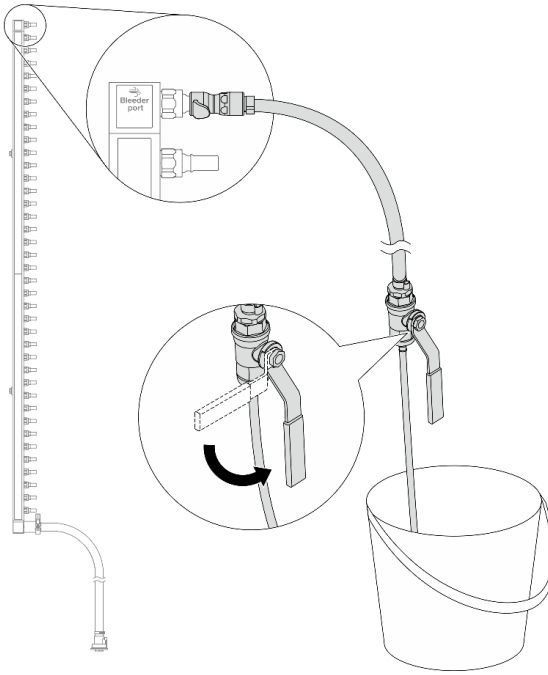


Figure 269. Installing the bleeder kit to the supply side

- a. ① Remove the rubber quick connect plug covers from the ports on the manifold.
- b. ② Plug the bleeder kit to the manifold.

Step 7. Slowly open the bleeder valve to allow a steady stream of coolant to drain. Close the bleeder valve once coolant stops flowing.



*Figure 270. Opening the bleeder valve*

Step 8. Install the bleeder kit to the manifold return side.

**Note:** This step drains the coolant with the help of a pressure difference inside and outside the return manifold.

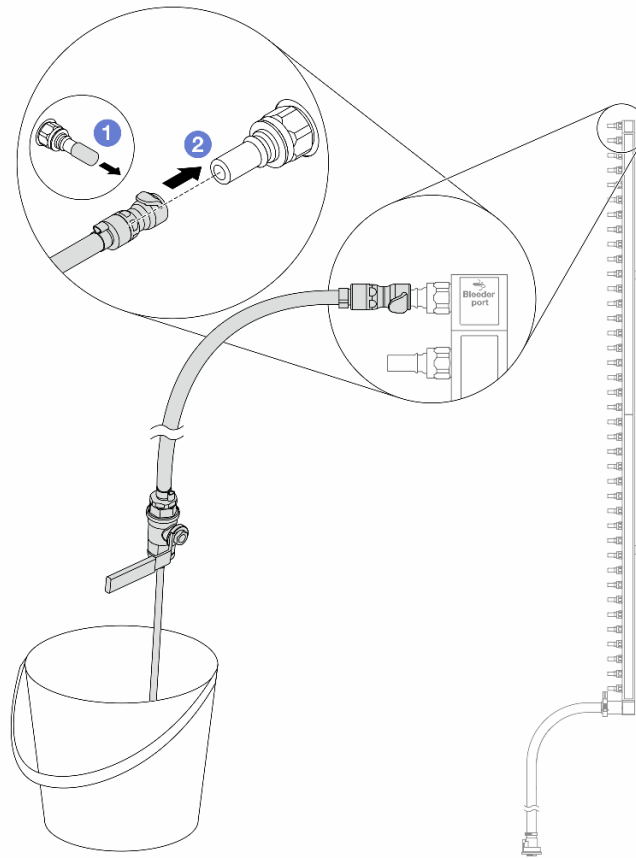


Figure 271. Installing the bleeder kit to the return side

- a. ❶ Remove the rubber quick connect plug covers from the ports on the manifold.
- b. ❷ Plug the bleeder kit to the manifold.

Step 9. Slowly open the bleeder valve to allow a steady stream of coolant to drain. Close the bleeder valve once coolant stops flowing.

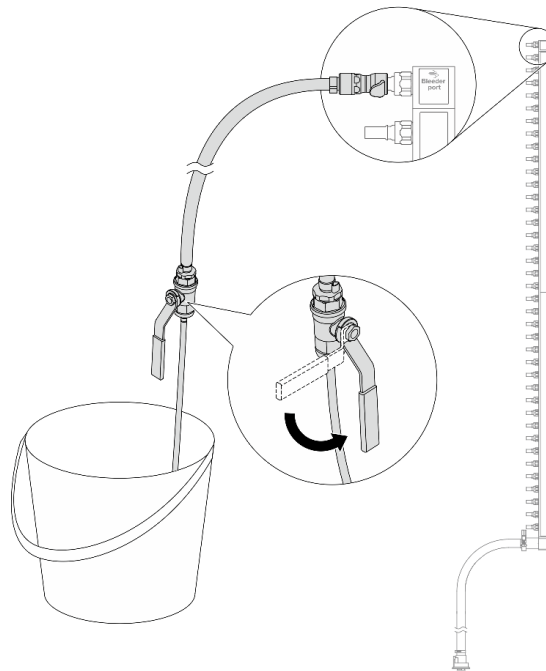


Figure 272. Opening the bleeder valve

Step 10. Separate the manifold from the hose kit in a dry and clean work area, and keep a bucket and absorbent cloths around to collect any coolant that may drain out.

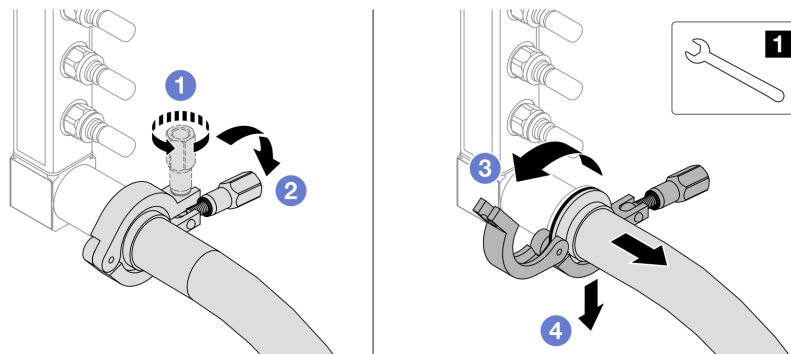


Figure 273. Separating the manifold from the hose kit

**1** 17 mm wrench

- a. **1** Loosen the screw that locks the ferrule.
- b. **2** Put the screw down.
- c. **3** Open the clamp.
- d. **4** Remove the ferrule and hose kit from the manifold.

Step 11. Repeat the last step to the other manifold.

Step 12. For better sanitation, keep the manifold ports and hose kits dry and clean. Re-install quick connect plug covers or any covers that protect hose kits and manifold ports.

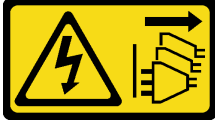
## Install DWC 38 Port Rack Manifold (in-row system)

Use this information to install the manifold in an in-row direct water cooling system.

### CAUTION:

The coolant might cause irritation to the skin and eyes. Avoid direct contact with the coolant.

#### S002



### CAUTION:

The power-control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

#### S011



### CAUTION:

Sharp edges, corners, or joints nearby.

#### S038



### CAUTION:

Eye protection should be worn for this procedure.

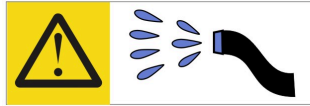
#### S040



### CAUTION:

Protective gloves should be worn for this procedure.

## L016



خطر: قد يتم التعرض لخطر الصدمة الكهربائية بسبب الماء أو المحلول المائي الذي يوجد بهذا المنتج.  
تجنب العمل في أو بالقرب من أي جهاز فعال بأيدي مبللة أو عند وجود تسرب للماء. (L016)

**AVISO: Risco de choque elétrico devido à presença de água ou solução aquosa no produto. Evite trabalhar no equipamento ligado ou próximo a ele com as mãos molhadas ou quando houver a presença de água derramada. (L016)**

**ОПАСНО:** Риск от токов удар поради вода или воден разтвор, присъстващи в продукта.  
Избягвайте работа по или около оборудване под напрежение,  
докато сте с мокри ръце или когато наоколо има разляна вода.  
(L016)

**DANGER : Risque de choc électrique lié à la présence d'eau ou d'une solution aqueuse dans ce produit. Évitez de travailler avec ou à proximité d'un équipement sous tension avec des mains mouillées ou lorsque de l'eau est renversée. (L016)**

危险：由于本产品中存在水或者水溶液，因此存在电击风险。请避免使用潮湿的手在带电设备或者有水溅出的环境附近工作。(L016)

危險：本產品中有水或水溶液，會造成電擊的危險。手濕或有潑濺的水花時，請避免使用或靠近帶電的設備。(L016)

**OPASNOST:** Rizik od električnog udara zbog vode ili tekućine koja postoji u ovom proizvodu.  
Izbjegavajte rad u  
blizini opreme pod naponom s mokrim rukama ili kad je u blizini prolivena  
tekućina.  
(L016)

**NEBEZPEČÍ:** Riziko úrazu elektrickým proudem v důsledku vody nebo vodního roztoku přítomného v tomto produktu. Dejte pozor, abyste při práci s aktivovaným vybavením nebo v jeho blízkosti neměli mokré ruce a vyvarujte se potřísnění nebo polití produktu vodou. (L016)

**Fare!** Risiko for stød på grund af vand eller en vandig opløsning i produktet. Undgå at arbejde med eller i nærheden af strømførende udstyr med våde hænder, eller hvis der er spildt vand. (L016)

**GEVAAR:** Risico op elektrische schok door water of waterachtige oplossing die aanwezig is in dit product. Vermijd werken aan of naast apparatuur die onder spanning staat als u natte handen hebt of als gemorst water aanwezig is. (L016)

**DANGER:** Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present.  
(L016)

**Gefahr:** Aufgrund von Wasser oder wässriger Lösung in diesem Produkt besteht die Gefahr eines elektrischen Schlags. Nicht mit nassen Händen oder in der Nähe von Wasserlächen an oder in unmittelbarer Nähe von Bauteilen arbeiten, die unter Strom stehen. (L016)

**VESZÉLY:** A víz vagy a termékben lévő vizes alapú hűtőfolyadék miatt fennáll az elektromos áramütés veszélye. Ne dolgozzon áram alatt lévő berendezésen és közelében nedves kézzel, illetve amikor folyadék kerül a berendezésre.  
(L016)

危険：この製品内に存在する水または水溶液によって、電気ショックの危険があります。手が濡れている場合やこぼれた水が周囲にある場合は、電圧が印加された装置またはその周辺での作業は行わないでください。(L016)

**ОПАСНОСТ:** Опасност од струен удар поради присаство на вода или на воден раствор во овој производ. Избегнувајте работење на опрема вклучена во струја или во близина на опрема вклучена во струја со влажни раце или кога има истурено вода.  
(L016)

[illegible]

**NIEBEZPIECZEŃSTWO:** Ryzyko porażenia prądem elektrycznym z powodu występowania w produkcie wody lub roztworu wodnego. Nie należy pracować przy podłączonym do źródła zasilania urządzeniu lub w jego pobliżu z mokrymi dłońmi lub kiedy rozlano wodę.  
(L016)

246 ThinkSystem Heavy Duty Full Depth 42U Rack Cabinet User Guide

**ОПАСНО: Риск поражения электрическим током вследствие присутствия в этом продукте воды или водного раствора. Избегайте выполнения работ на оборудовании, находящемся под напряжением, или рядом с таким оборудованием влажными руками или при наличии пролитой воды. (L016)**

NEBEZPEČENSTVO: Riziko úrazu elektrickým proudem v důsledku přítomnosti vody alebo vodného roztoku v tomto produkte. Vyhnite sa práci na zapnutom zariadení alebo v jeho blízkosti s vlhkými rukami, alebo keď je prítomná rozliata voda. (L016)

NEVARNOST: Nevarnost električnega udara zaradi vode ali vodne raztopine, prisotne v izdelku. Ne delajte na opremi ali poleg opreme pod energijo z mokrimi rokami ali ko je prisotna razlita voda. (L016)

**PELIGRO: Existe riesgo de choque eléctrico por agua o por una solución de agua que haya en este producto. Evite trabajar en equipos bajo tensión o cerca de los mismos con las manos húmedas o si hay agua derramada. (L016)**

**Fara: Risk för elektriska stötar på grund av vatten eller vattenbaserat medel i denna produkt. Arbeta inte med eller i närheten av elektriskt laddad utrustning om du har våta händer eller vid vattenspill. (L016)**

ཉེན་བརྒྱུ: རྩིས་འདིའི་ནང་ཏུ་ཆུ་འཕྲ་ཆུའི་གཤེར་གཟུགས་འདུས་ཡོད་པས། རྟེ་ལས་སློག་ཆུག་པའི་ཉེན་ཁ་ཡོད། ལག་པའི་སློག་ཆུ་ཡོད་པའཕྲ་ཆུ་ཐིག་མར་བཞུར་བའི་གནས་ཚུལ་འོག་སློག་ཡོད་པའི་སློག་ཆས་ལ་བཞོལ་སྤྱོད་བྱེད་མི་ཉེན་པོ། (L016)

خەتەرلىك: بۇ مەھسۇلاتتا سۇ ياكى ئېرىتمە بولغاچقا، شۇڭا توك سوقۇۋېتىش خەۋپى مەۋجۇتدۇر. قول ھۆل ھالەتتە ۋە ياكى سۇ سىرغىپ چىققان ھالەتتە، توكلۇق ئۇسكۇنىگە قارىتا ۋە ياكى توكلۇق ئۇسكۇنىنىڭ ئەتراپىدا مەشغۇلات ئېلىپ بارغىلى بولمايدۇ. (L016)

Yungyiemyj: Youzyiz aen canjbinj miz raemx roxnaeuz raemx yungzyiz, sojyij miz yungyiemyj bungqden. Mboujndaej fwngz miz raemx seiz youq ndaw sezbi roxnaeuz youq henzgyawj guhhong. (L016)

#### Attention:

- Ensure proper handling procedures are followed when working with any chemically treated coolant used in the rack cooling system. Ensure that material safety data sheets (MSDS) and safety information are provided by the coolant chemical treatment supplier and that proper personal protective equipment (PPE) is available as recommended by the coolant chemical treatment supplier. Protective gloves and eyewear may be recommended as a precaution.
- This task requires two or more people.

#### Procedure

Step 1. Install the server into the rack.

Step 2. Install the manifold.

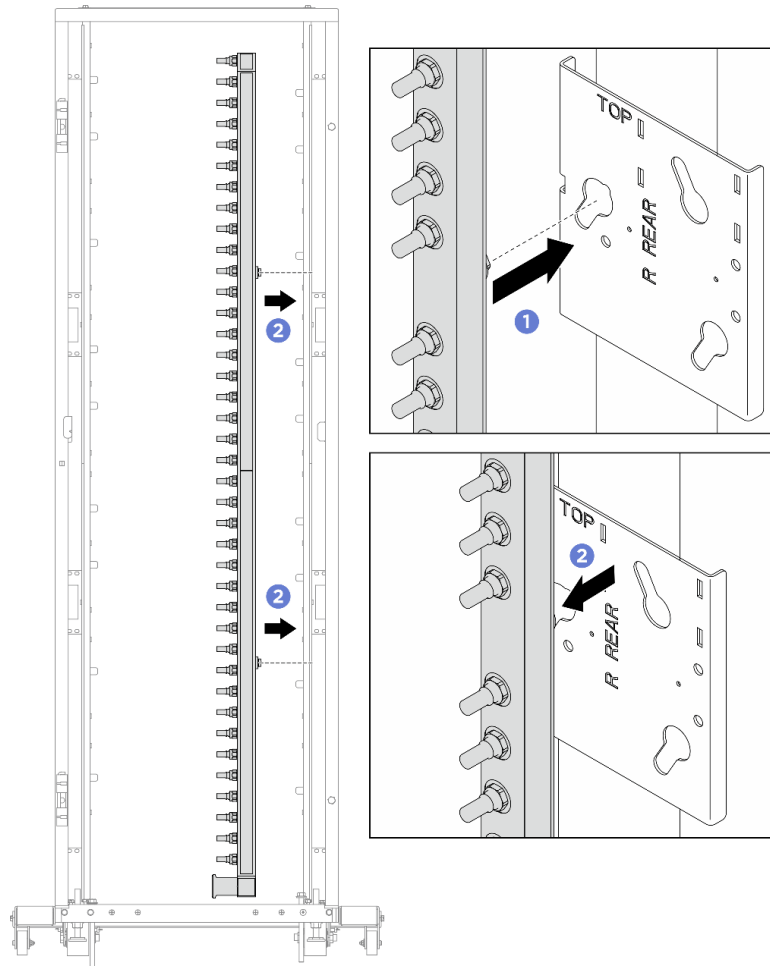


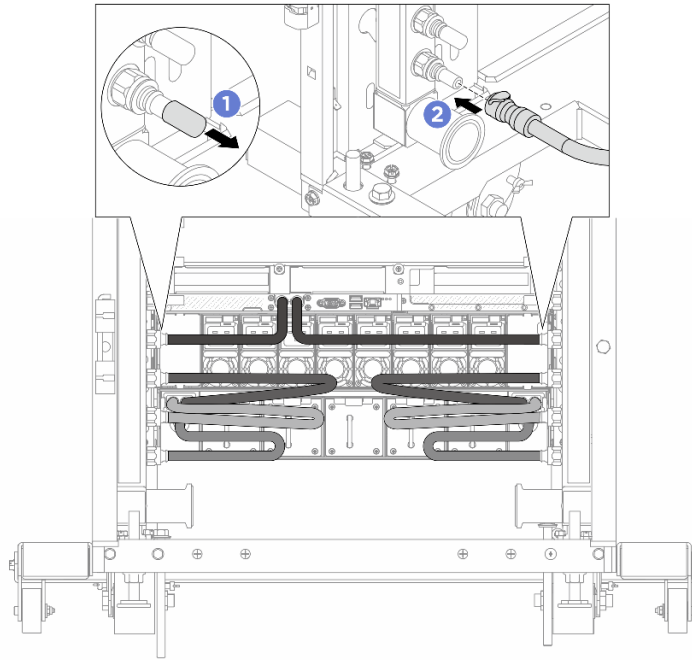
Figure 274. Installing the manifold

- a. ① Hold the manifold with both hands, and mount it onto the rack cabinet.
- b. ② Align the spools with holes, and clutch the cabinet.

Step 3. Repeat the last step to install the other manifold.

Step 4. Install the quick connect plug to the manifolds.

**Note:** Depending on the model, your server might look different from the illustrations in this topic.



*Figure 275. Installing the quick connect plug*

- a. ① Remove the rubber quick connect plug covers from the ports on the manifold.
- b. ② Connect the plug to the manifold port.

Step 5. Install the hose kit to the manifold.

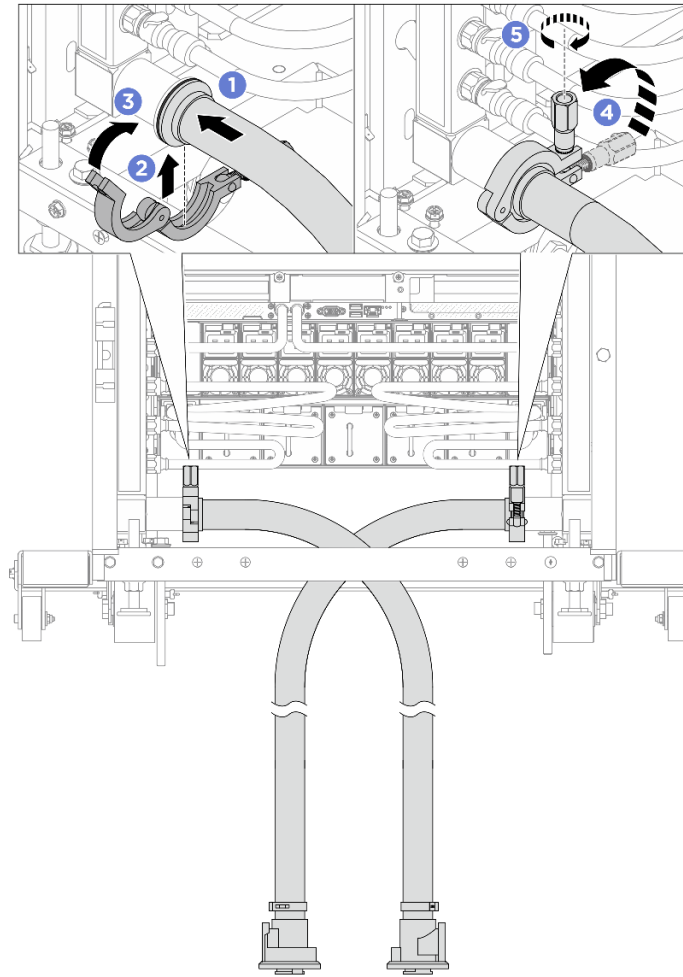


Figure 276. Installing the hose kit

**1** 17 mm wrench

- a. **1** Connect the hose kits to both manifolds.
- b. **2** Wrap the interface around with the clamp.
- c. **3** Close the clamp.
- d. **4** Lift the screw upright.
- e. **5** Tighten the screw and make sure that it is secured.

Step 6. Install the bleeder kit to the manifold supply side.

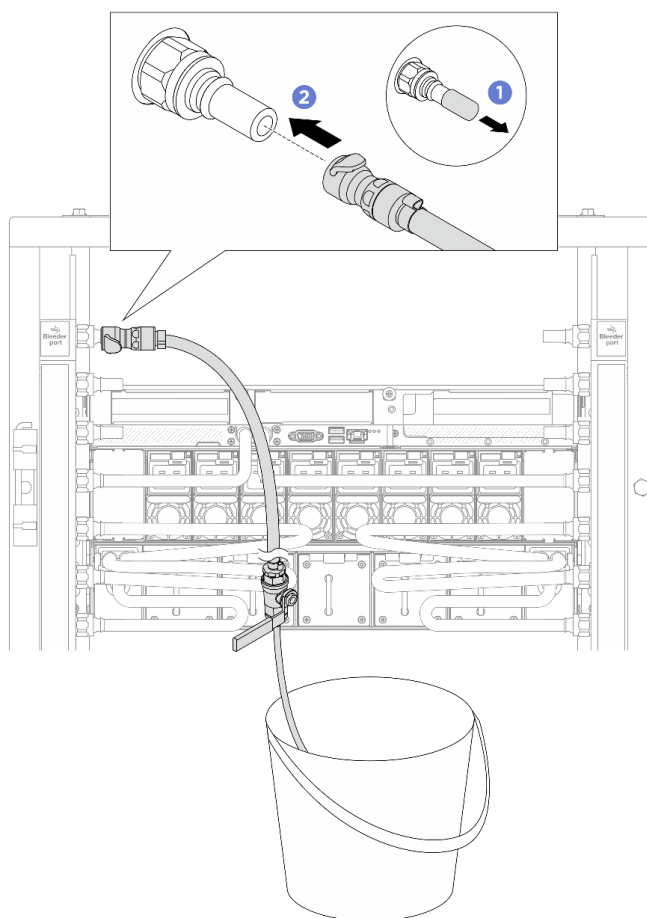


Figure 277. Installing the bleeder kit to the supply side

- a. ① Remove the rubber quick connect plug covers from the ports on the manifold.
- b. ② Plug the bleeder kit to the manifold.

Step 7. To push the air out of the manifold supply side, connect **facility supply** to **manifold return**.

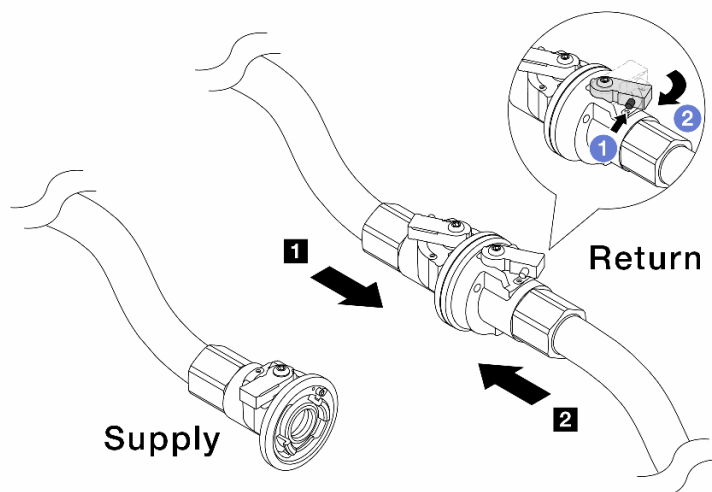


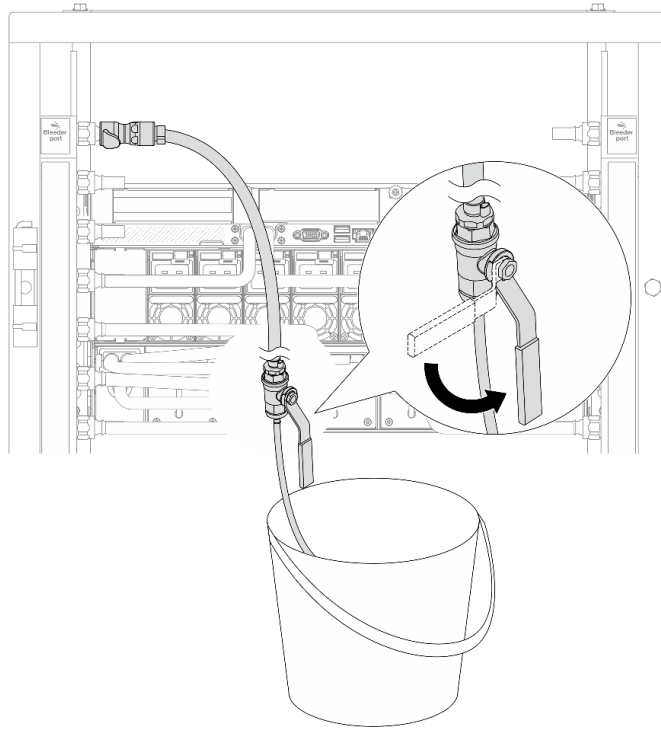
Figure 278. Facility supply to manifold return

- a. ① Press the button on the ball valve switch.
- b. ② Rotate both switches open and stop at around 1/4 of 90 degrees.

**Attention:**

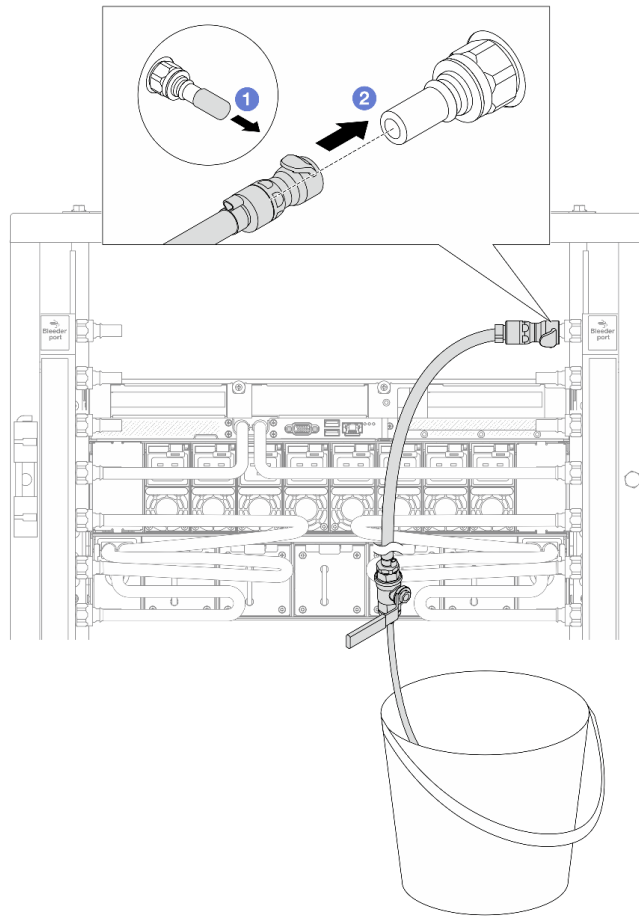
- Open the ball valves on ① manifold return side and ② facility supply side, while keep manifold supply side closed.
- Do not fully open the ball valves, or the water flow gets too rapid to contain.

Step 8. Slowly open the bleeder valve to conduct the air out of the hose. Close the bleeder valve once a steady stream of water flows into the bucket or there are only minimal bubbles in the bleeder hose.



*Figure 279. Opening the bleeder valve on the supply side*

Step 9. Install the bleeder kit to the manifold return side.



*Figure 280. Installing the bleeder kit on the return side*

- a. ① Remove the rubber quick connect plug covers from the ports on the manifold.
- b. ② Plug the bleeder kit to the manifold.

Step 10. To push the air out of the manifold return side, connect **facility supply** to **manifold supply**.

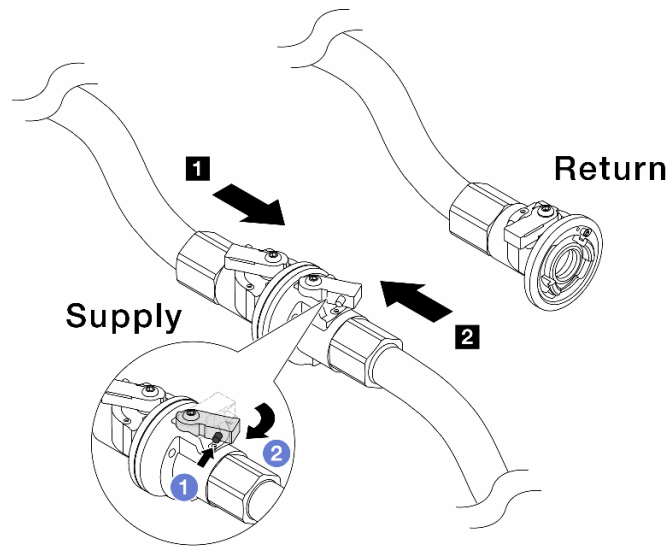


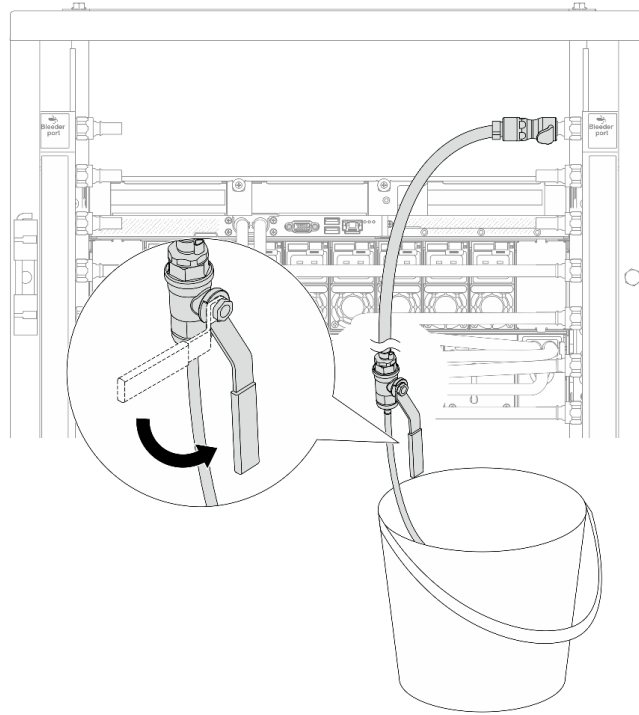
Figure 281. Facility supply to manifold supply

- a. ① Press the button on the ball valve switch.
- b. ② Rotate both switches open and stop at around 1/4 of 90 degrees.

**Attention:**

- Open the ball valves on ① manifold supply side and ② facility supply side, while keep manifold return side closed.
- Do not fully open the ball valves, or the water flow gets too rapid to contain.

Step 11. Slowly open the bleeder valve to conduct the air out of the hose. Close the bleeder valve once a steady stream of water flows into the bucket or there are only minimal bubbles in the bleeder hose.



*Figure 282. Opening the bleeder valve on the return side*

Step 12. (For precaution) To make sure that the air inside is as little as possible, re-install the bleeder kit back to manifold supply side and do it one more time. Close the bleeder valve once a steady stream of water flows into the bucket or there are only minimal bubbles in the bleeder hose.

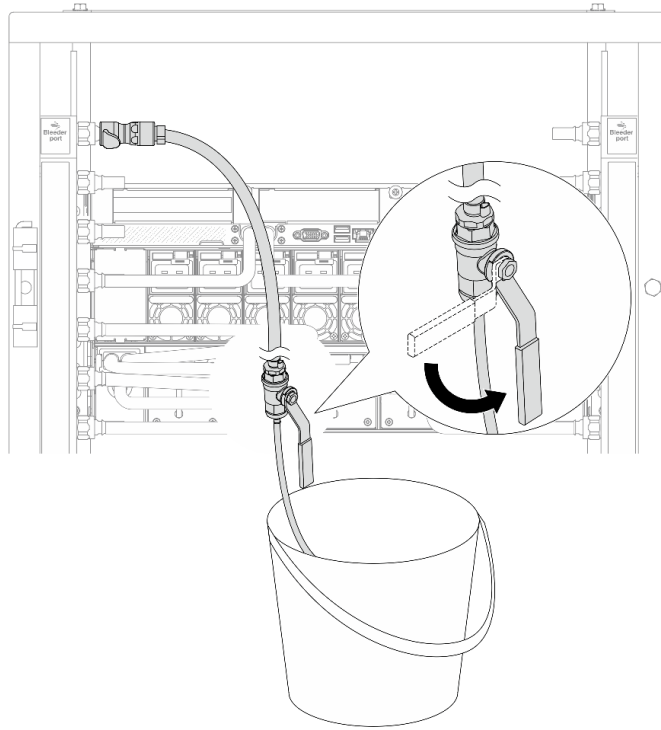


Figure 283. Opening the bleeder valve on the supply side

Step 13. Once completed, connect the supply and return of manifold and facility correspondingly. Fully open all connections on both supply and return sides.

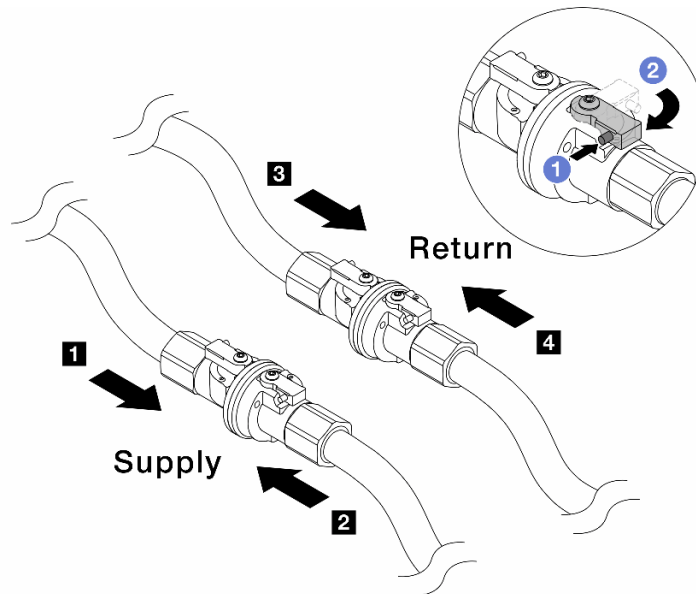


Figure 284. Opening ball valves

**Note:**

**1** Manifold supply connects to **2** facility supply

**3** Manifold return connects to **4** facility return

- a. 1 Press the button on the ball valve switch.
- b. 2 Rotate the switch to fully open the valves as illustrated above.

---

## Rear Door Heat eXchanger V2 replacement

See this topic to learn how to remove and install Rear Door Heat eXchanger V2 and subsidiary components.

### Drain the heat exchanger of water

See this topic to learn how to drain the heat exchanger of water.

#### About this task

**S038**



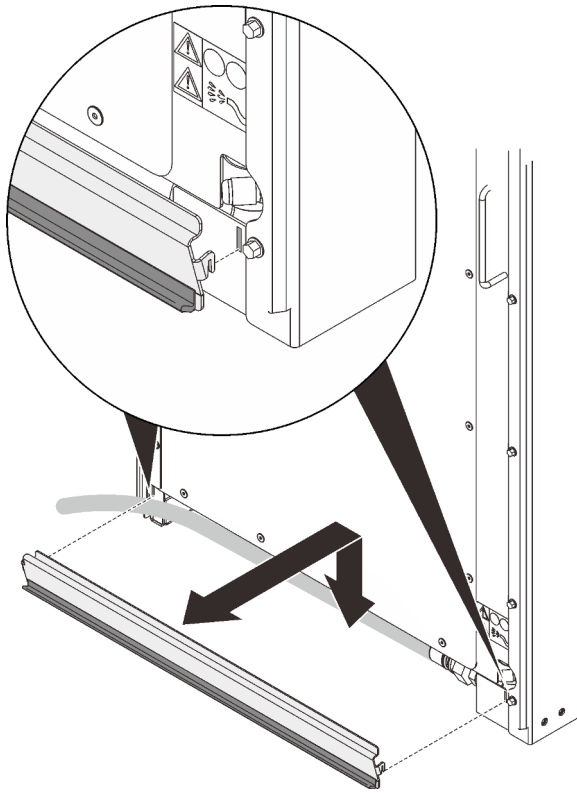
#### **CAUTION:**

**Eye protection should be worn for this procedure.**

**Attention:** Wear safety goggles or other eye protection whenever you fill, drain, or purge air or nitrogen from the heat exchanger.

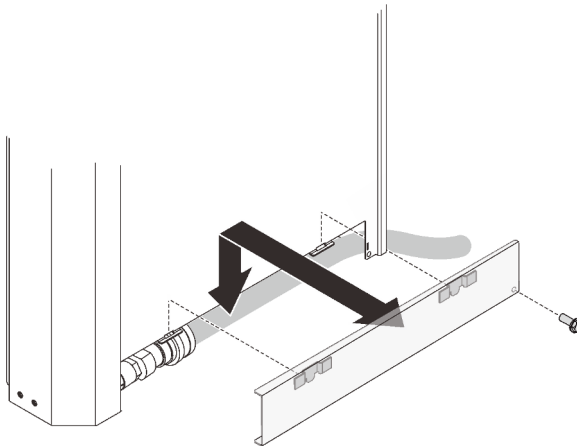
#### **Procedure**

Step 1. Lift and remove the inner hose access panel from the heat exchanger.



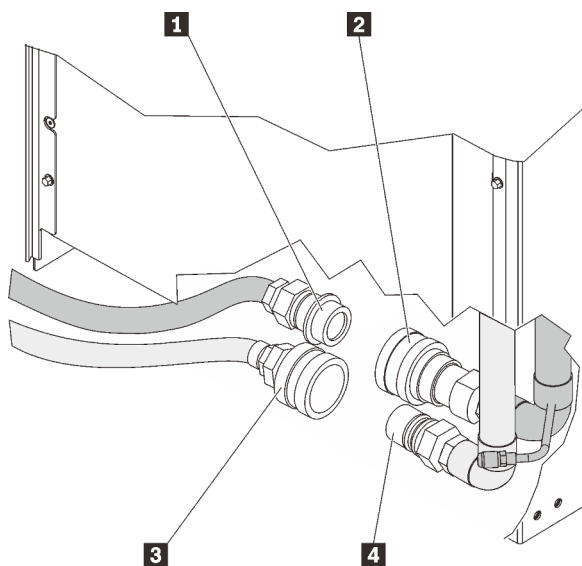
*Figure 285. Removing the inner hose access panel*

- Step 2. Remove the screw that secures the panel if applicable, then lift and remove the panel from the heat exchanger.



*Figure 286. Removing the outer hose access pane*

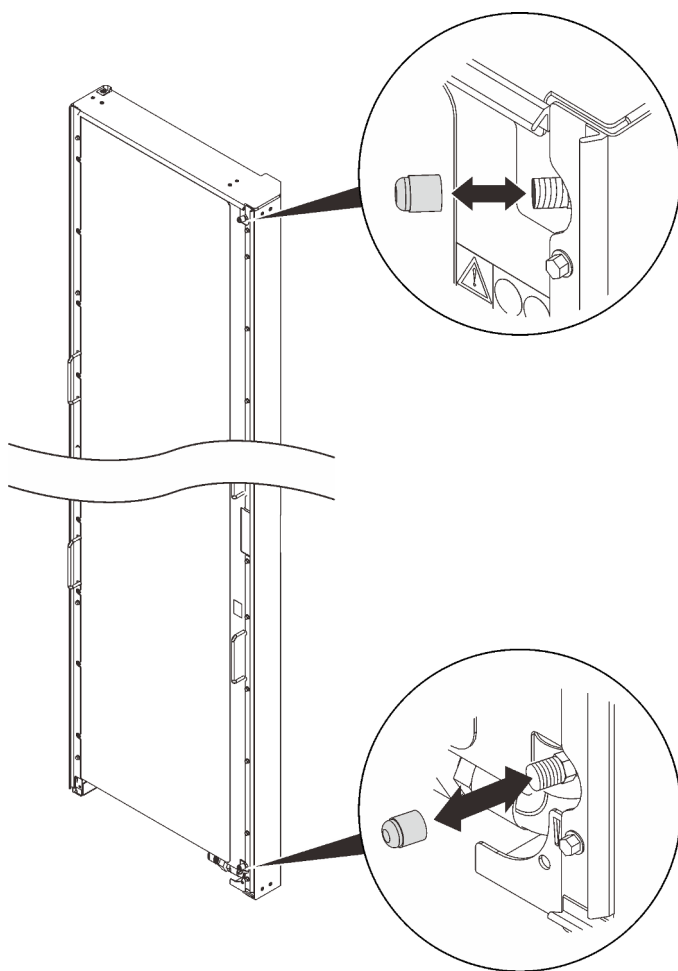
- Step 3. Disconnect the return and supply hose from the manifolds, and remove them from the heat exchanger.



*Figure 287. Supply and return hoses and manifold couplings*

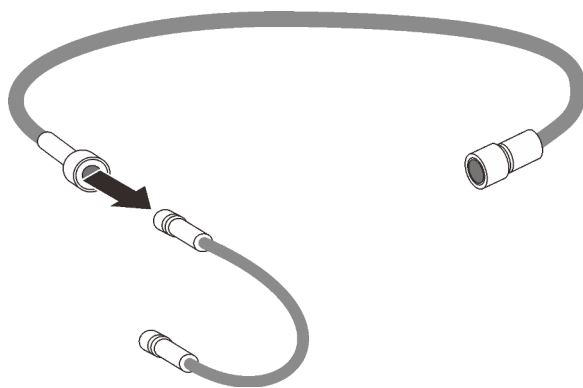
- Remove the supply hose assembly (1) from the supply manifold-coupling (2).
- Remove the return hose assembly (3) from the return manifold-coupling (4).

Step 4. Remove the caps from the air-purging and drain valve.



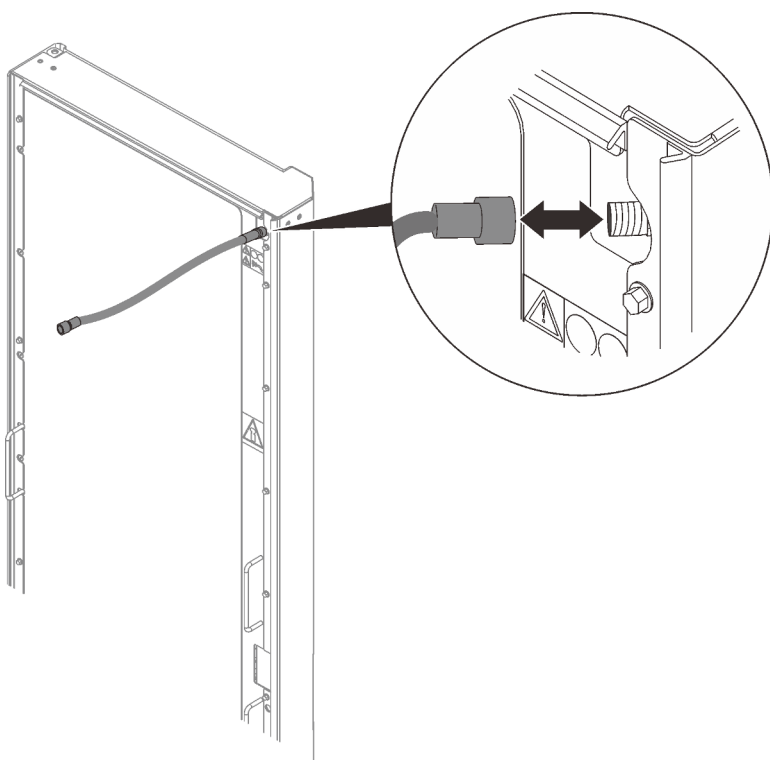
*Figure 288. Removing valve caps*

Step 5. Remove the extension hose from the air-purging tool.



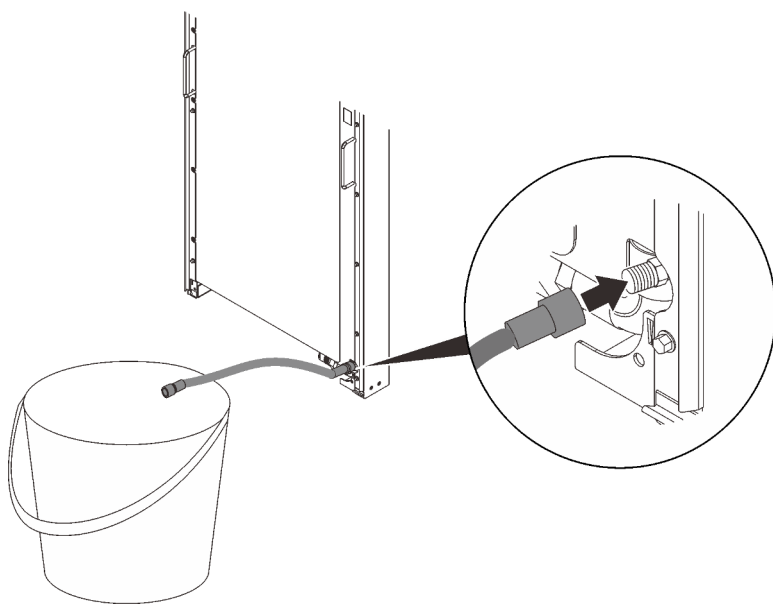
*Figure 289. Removing the extension hose*

Step 6. Insert one end of the air-purging tool extension hose into the center of air-purging valve stem at the top of the heat exchanger to allow air to enter the manifolds.



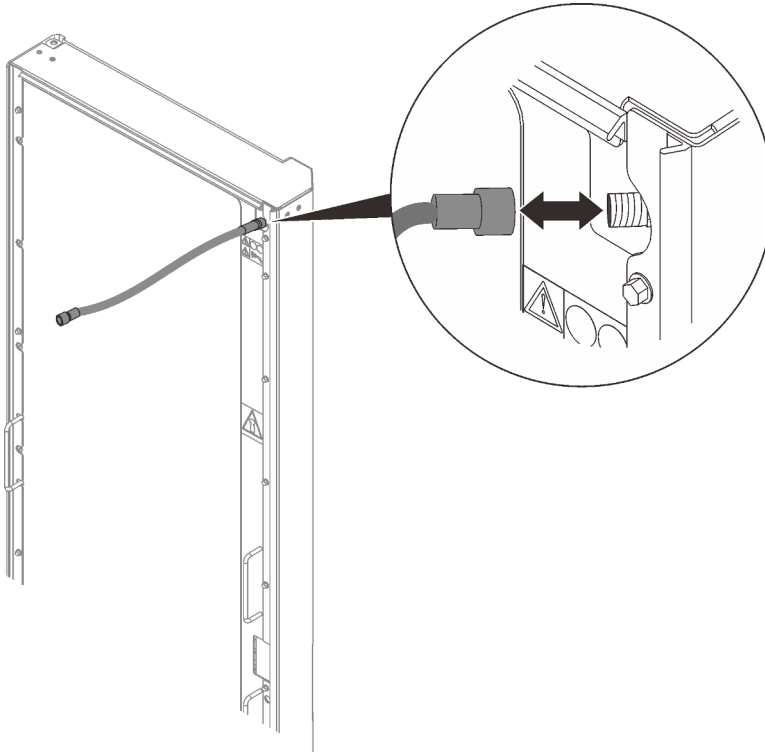
*Figure 290. Inserting the air-purging tool extension hose*

- Step 7. Attach the air-purging tool to the drain valve at the bottom of the heat exchanger, and place the drain end into a 2-liter (or larger) container to catch the water.



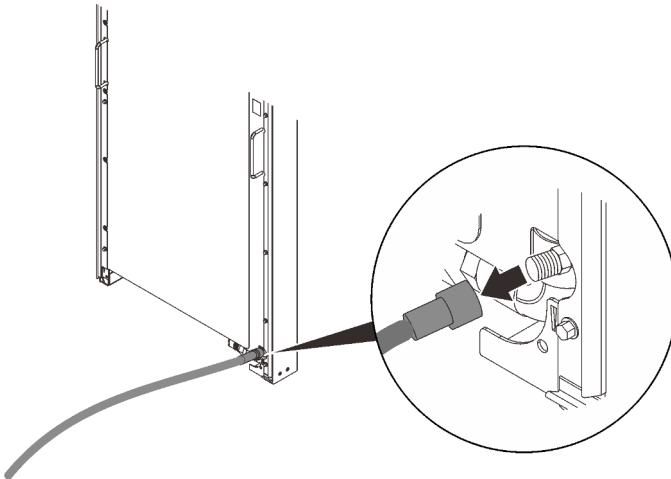
*Figure 291. Draining water*

- Step 8. When the water is drained completely, remove the air-purging-tool extension hose from the valve.



*Figure 292. Removing the air-purging tool extension hose*

Step 9. Remove the air-purging tool from the drain valve.



*Figure 293. Removing the air-purging tool*

Step 10. Install the two caps back to the air-purging and drain valve.

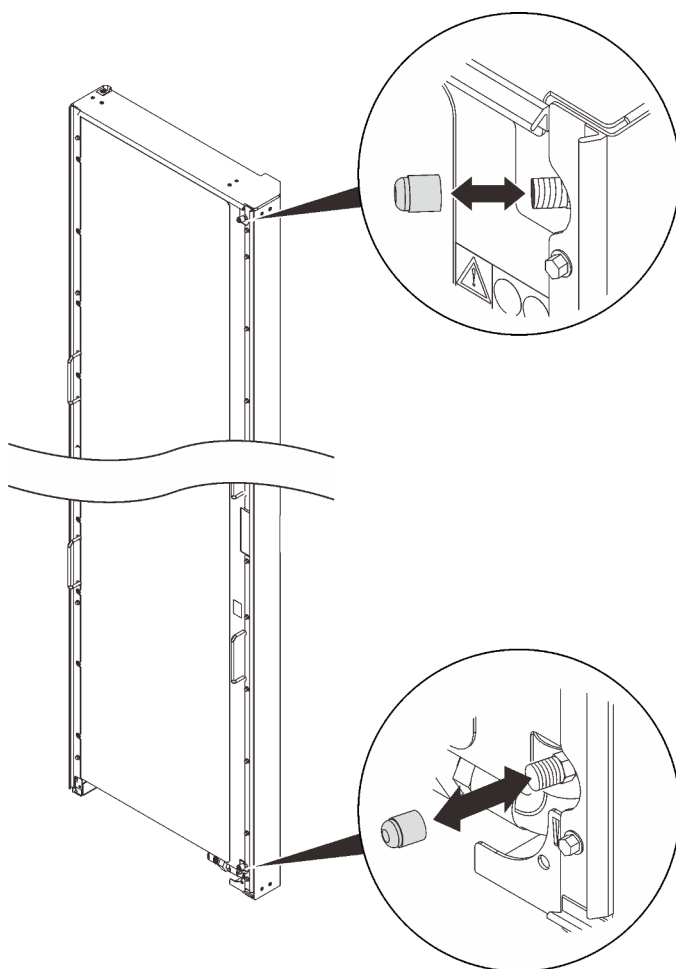


Figure 294. Installing the valve caps

## Remove Rear Door Heat eXchanger V2

See this topic to learn how to remove ThinkSystem Rear Door Heat eXchanger V2.

### About this task

#### S036



18 - 32 kg (39 - 70 lb)



32 - 55 kg (70 - 121 lb)

**CAUTION:**  
Use safe practices when lifting.

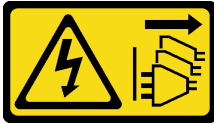
#### S010



**CAUTION:**

Do not place any object weighing more than 82 kg (180 lb) on top of rack-mounted devices.

S019



**CAUTION:**

The power-control button on the device does not turn off the electrical current supplied to the device. The device also might have more than one connection to dc power. To remove all electrical current from the device, ensure that all connections to dc power are disconnected at the dc power input terminals.

R007



 **DANGER**

- Connect power cords from devices in the rack cabinet to electrical outlets that are near the rack cabinet and are easily accessible.
- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet before you service any device in the rack cabinet.
- Install an emergency-power-off switch if more than one power device (power distribution unit or uninterruptible power supply) is installed in the same rack cabinet.
- Connect all devices that are installed in a rack cabinet to power devices that are installed in the same rack cabinet. Do not connect a power cord from a device that is installed in one rack cabinet to a power device that is installed in a different rack cabinet.

R004



**CAUTION:**

See the instructions in the rack documentation before you install devices, remove devices, or relocate the rack.

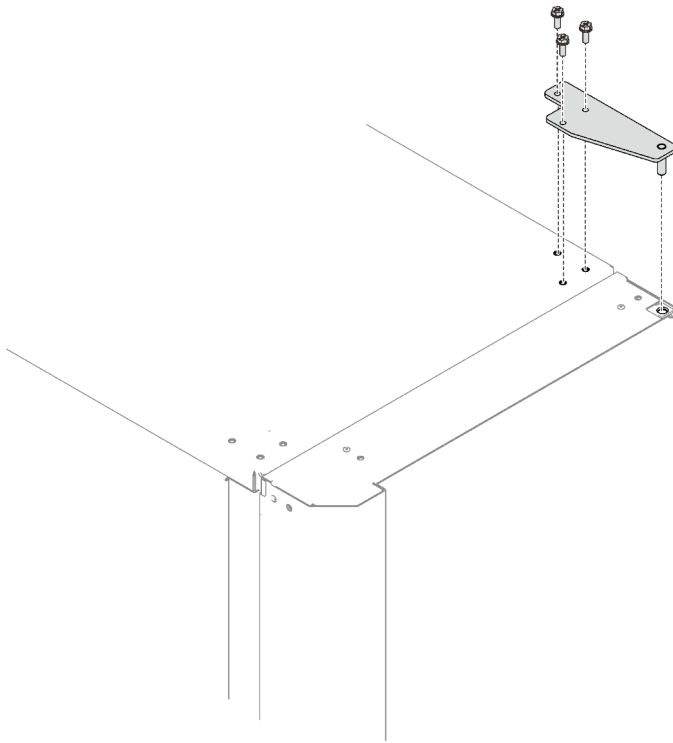
S038



**CAUTION:**  
Eye protection should be worn for this procedure.

## Procedure

- Step 1. Drain the water from the heat exchanger completely (see [“Drain the heat exchanger of water” on page 258](#)).
- Step 2. Hold the heat exchanger in place with two people, and remove the top hinge. Depending on the configuration, select the corresponding removal procedures:
- **Without rack extension kit installed**



*Figure 295. Removing the top hinge*

Unfasten the three screws to remove the top hinge.

- **With 42U Advanced Rack Extension Kit installed**

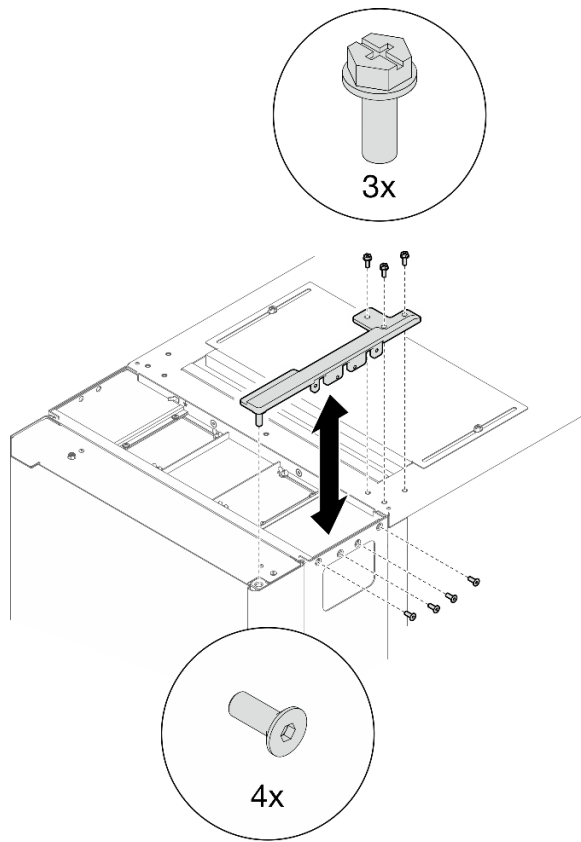


Figure 296. Removing the top hinge

Unfasten the seven screws to remove the top hinge.

- **With 42U Standard Rack Extension Kit installed**

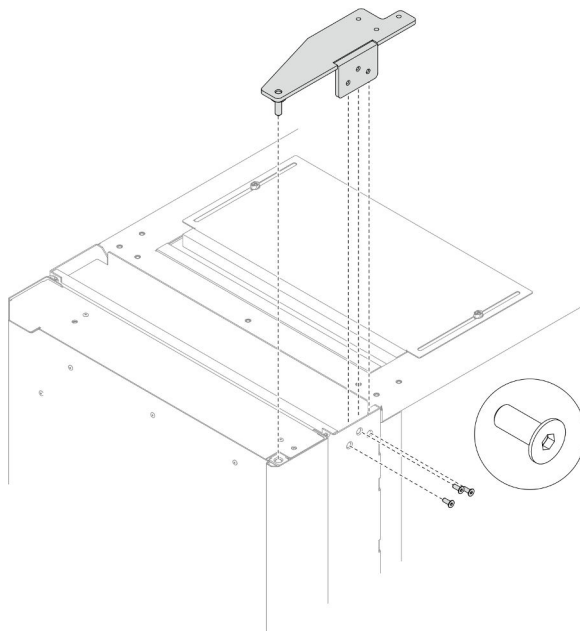


Figure 297. Removing the top hinge

Unfasten the three screws to remove the top hinge.

Step 3. Hold the heat exchanger with three people on the handles/spots as illustrated.

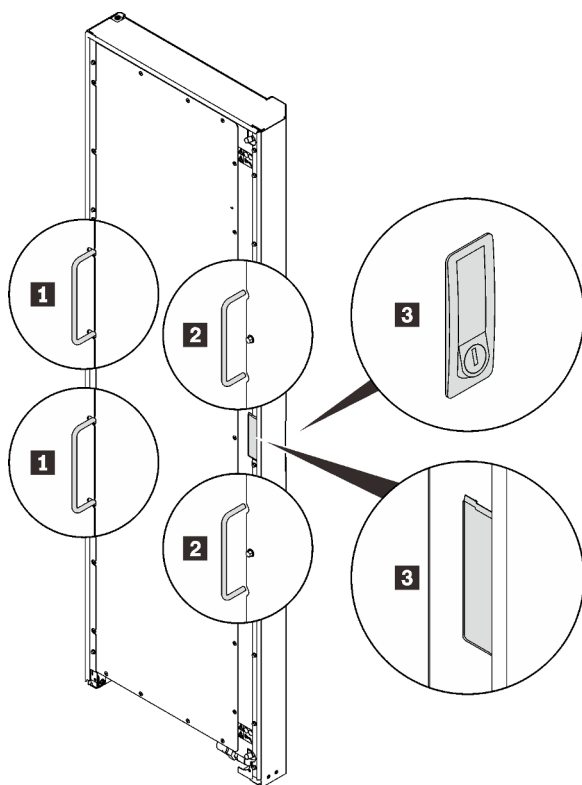


Figure 298. Lifting the heat exchanger with three people

<b>1</b> Handles that the first person hold on to	<b>3</b> Spots that the third person hold on to
<b>2</b> Handles that the second person hold on to	

Step 4. Lift the heat exchanger with three people as described in the previous step, and remove it from the rack cabinet.

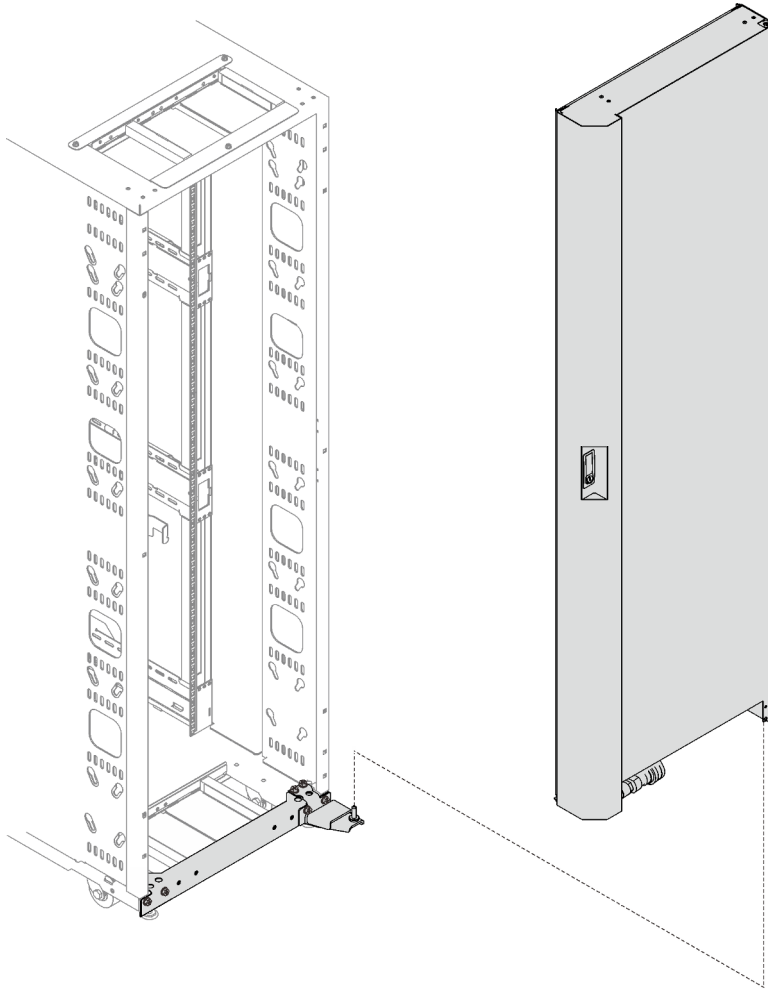


Figure 299. Removing the heat exchanger from the rack cabinet

## Install Rear Door Heat eXchanger V2

See this topic to learn how to install ThinkSystem Rear Door Heat eXchanger V2.

### About this task

#### S036



18 - 32 kg (39 - 70 lb)



32 - 55 kg (70 - 121 lb)

**CAUTION:**  
Use safe practices when lifting.

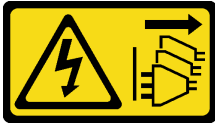
#### S010



**CAUTION:**

Do not place any object weighing more than 82 kg (180 lb) on top of rack-mounted devices.

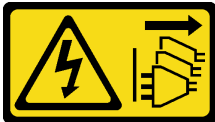
**S019**



**CAUTION:**

The power-control button on the device does not turn off the electrical current supplied to the device. The device also might have more than one connection to dc power. To remove all electrical current from the device, ensure that all connections to dc power are disconnected at the dc power input terminals.

**R007**



 **DANGER**

- Connect power cords from devices in the rack cabinet to electrical outlets that are near the rack cabinet and are easily accessible.
- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet before you service any device in the rack cabinet.
- Install an emergency-power-off switch if more than one power device (power distribution unit or uninterruptible power supply) is installed in the same rack cabinet.
- Connect all devices that are installed in a rack cabinet to power devices that are installed in the same rack cabinet. Do not connect a power cord from a device that is installed in one rack cabinet to a power device that is installed in a different rack cabinet.

**R004**



**CAUTION:**

See the instructions in the rack documentation before you install devices, remove devices, or relocate the rack.

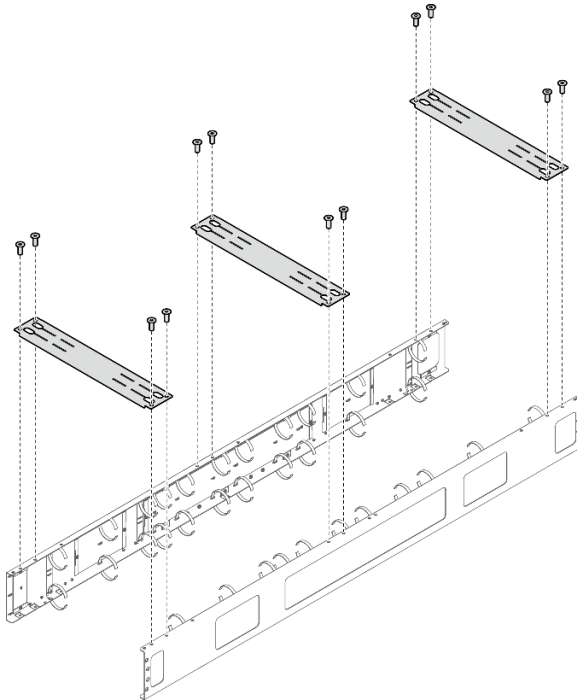
**S038**



**CAUTION:**  
Eye protection should be worn for this procedure.

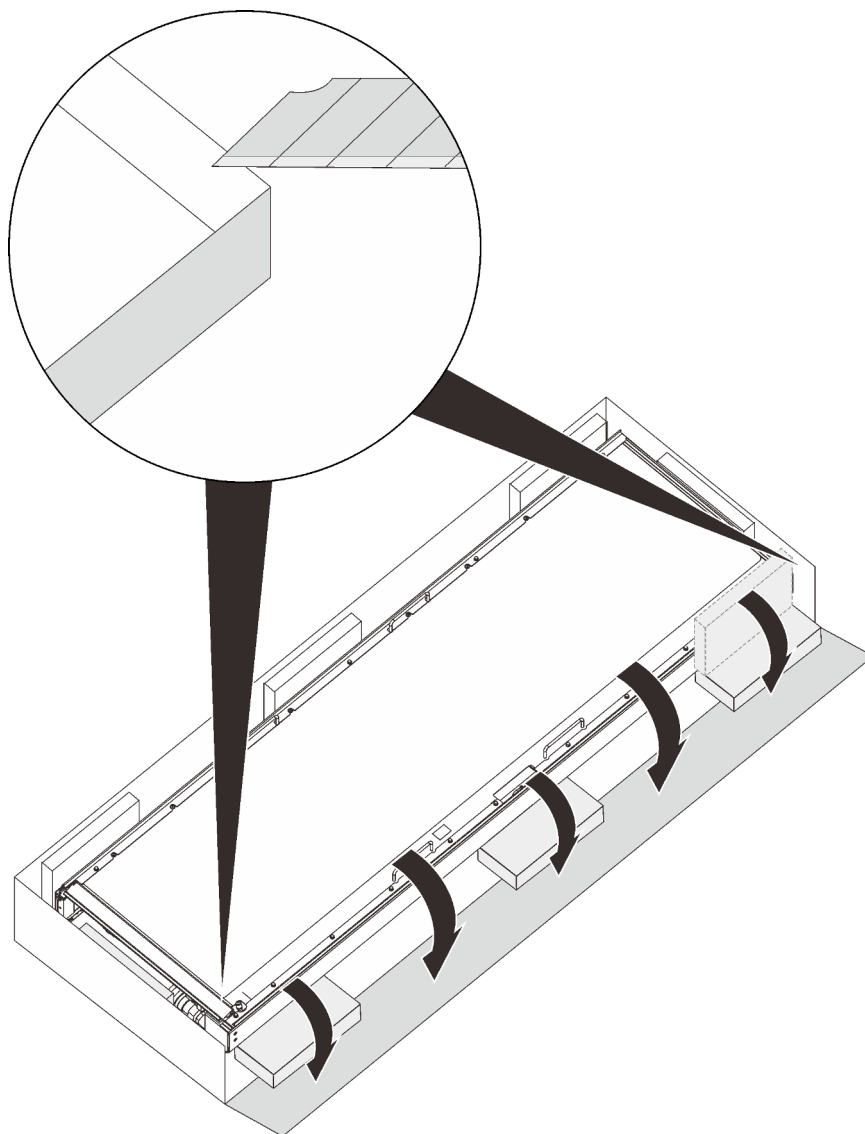
## Procedure

- Step 1. **(With 42U Advanced Rack Extension Kit installed only)** Make sure the three support brackets are removed from the extension panels.



*Figure 300. Removing the support brackets*

- Step 2. Face the bottom side of the carton, remove the carton top, and slit the two carton corners on your right-hand side with a knife. Then, fold the right carton panel down to the ground, and rotate the three carton inserts down.



**Bottom**

*Figure 301. Unpacking the heat exchanger*

- Step 3. With three people, rotate the heat exchanger to vertical on the three carton inserts. Then, remove the inner and outer hose access panels while one person hold the heat exchanger.

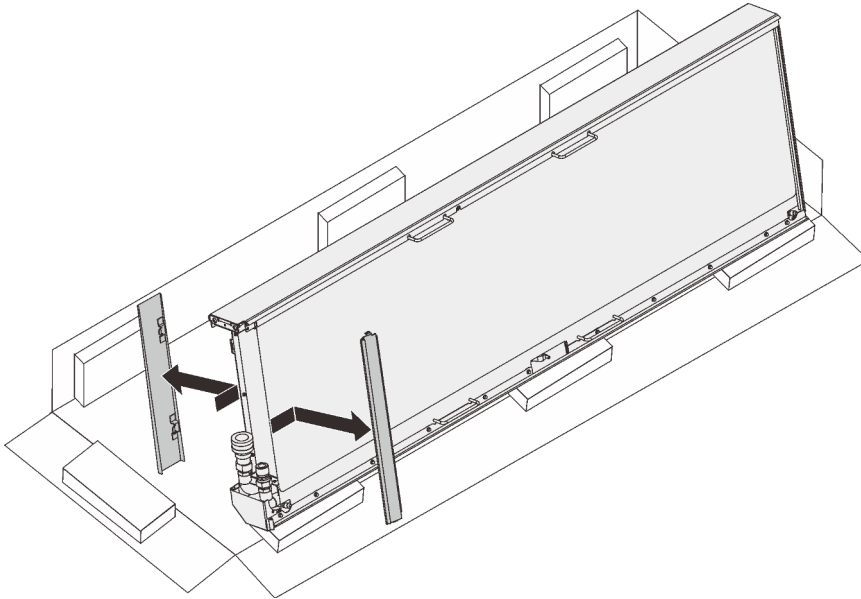


Figure 302. Removing the hose access panels

Step 4. Hold the heat exchanger with three people on the handles/spots as illustrated. Then, carefully lift the heat exchanger and turn it upright.

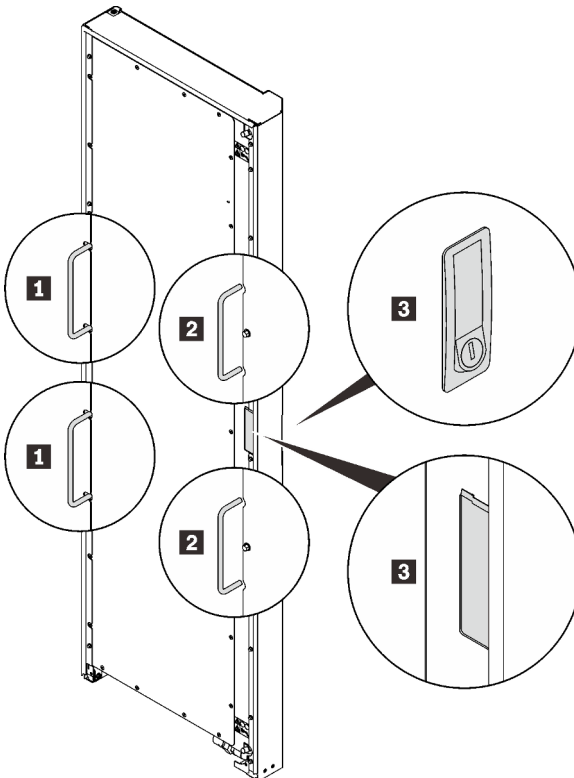
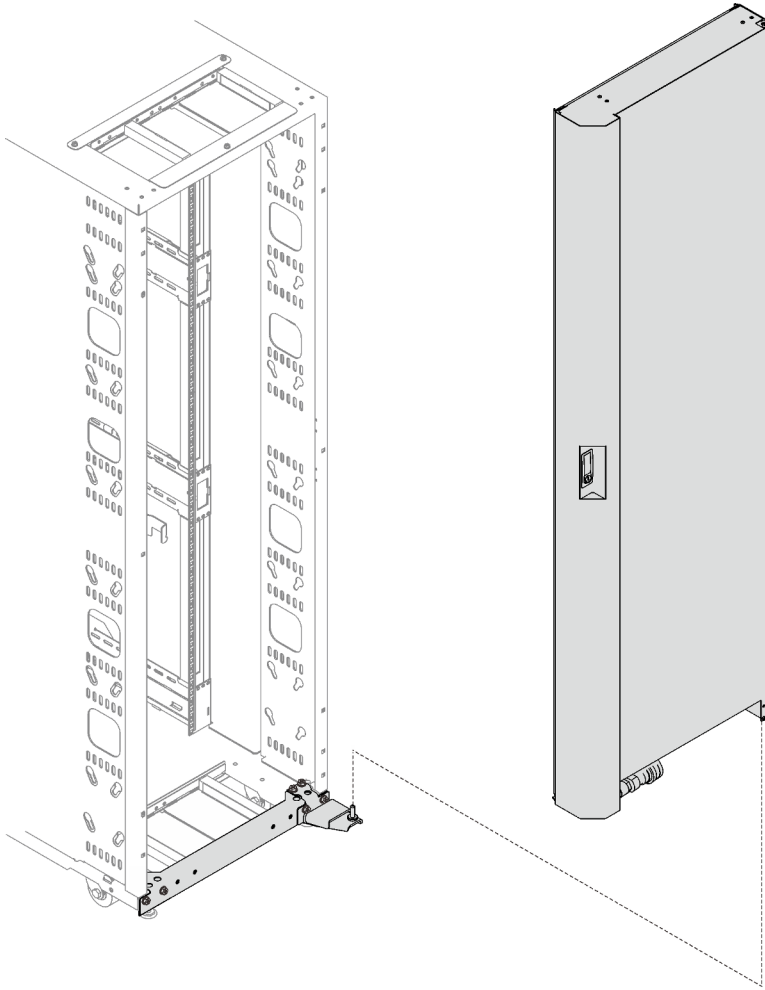


Figure 303. Lifting the heat exchanger with three people

<b>1</b> Handles that the first person hold on to	<b>3</b> Spots that the third person hold on to
<b>2</b> Handles that the second person hold on to	

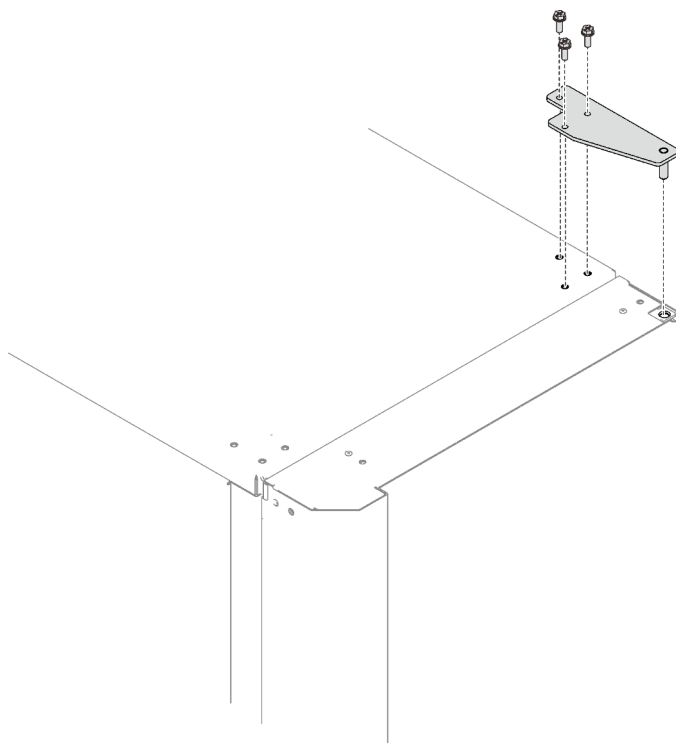
Step 5. Carry the heat exchanger with three people to the cabinet frame. Align the bottom corner with the bottom hinge pin on the rack cabinet; then, lower the heat exchanger to fit the pin in.



*Figure 304. Installing the heat exchanger to the rack cabinet*

Step 6. Hold the heat exchanger in place with two people, and install the top hinge. Depending on the configuration, select the corresponding installation procedures:

- **Without rack extension kit installed**



*Figure 305. Installing the top hinge*

Insert the top hinge pin to the heat exchanger; then, secure the hinge with three screws.

- **With 42U Advanced Rack Extension Kit installed**

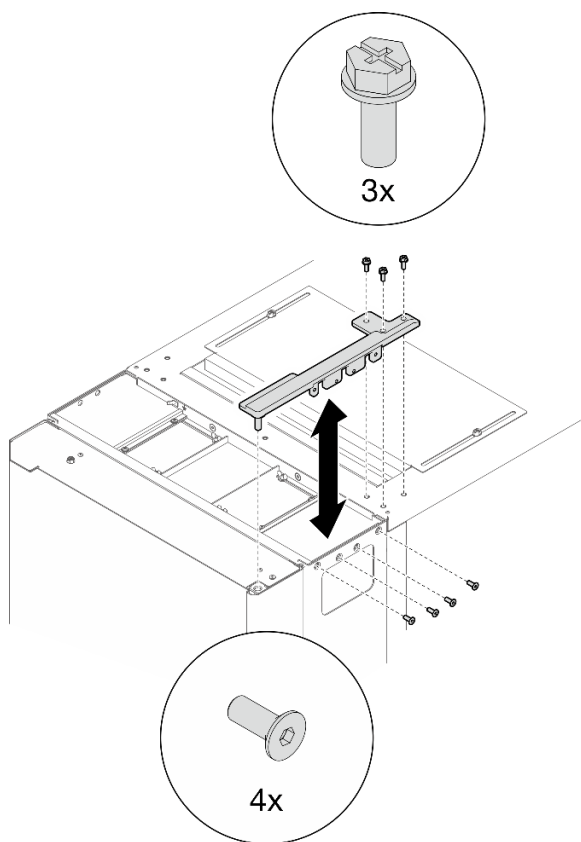


Figure 306. Installing the top hinge

Insert the top hinge pin to the heat exchanger; then, secure the hinge with seven screws.

- **With 42U Standard Rack Extension Kit installed**

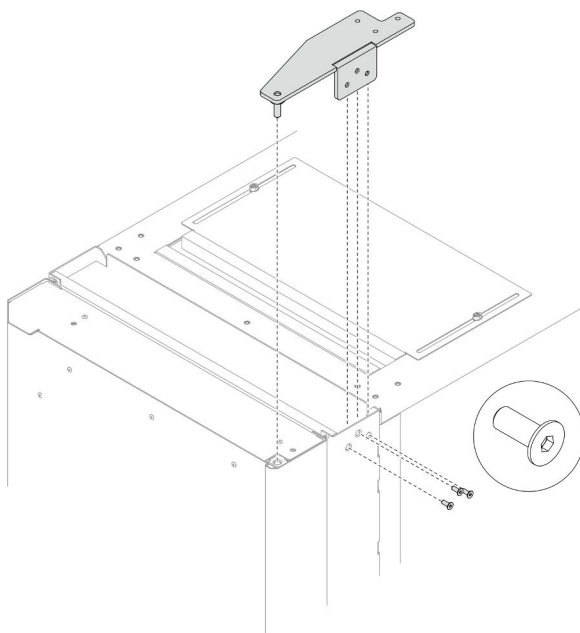


Figure 307. Installing the top hinge

Insert the top hinge pin to the heat exchanger; then, secure the hinge with three screws.

### **After this task is completed**

Proceed to [“Fill the heat exchanger with water” on page 277](#).

## **Fill the heat exchanger with water**

See this topic to learn how to fill ThinkSystem Rear Door Heat eXchanger V2 with water.

### **About this task**

**S038**



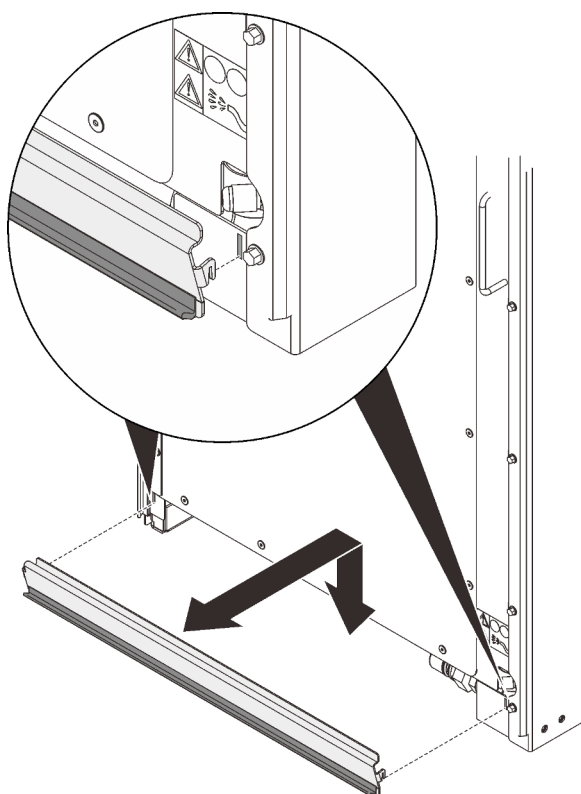
#### **CAUTION:**

**Eye protection should be worn for this procedure.**

**Attention:** Wear safety goggles or other eye protection whenever you fill, drain, or purge air or nitrogen from the heat exchanger.

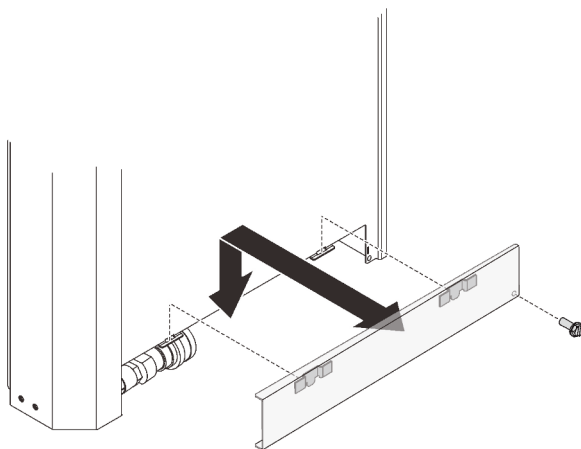
### **Procedure**

Step 1. If the inner hose access panel is installed, lift and remove it from the heat exchanger.



*Figure 308. Removing the inner hose access panel*

- Step 2. If the outer hose access panel is installed, remove the screw that secures the panel (if applicable), then lift and remove the panel from the heat exchanger.



*Figure 309. Removing the outer hose access panel*

- Step 3. Purge the nitrogen that has been filled in the hose from the hose.

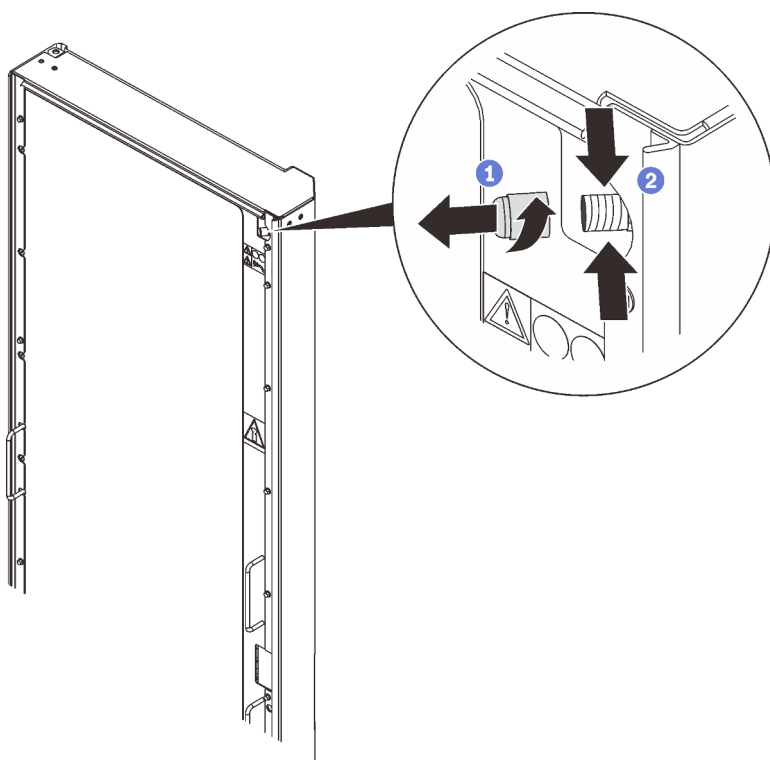


Figure 310. Purging nitrogen

- 1 Loosen and remove the cap from the air-purging valve.
- 2 Press in on the valve stem of the air-purging valve to purge the nitrogen from the heat exchanger. Continue holding in the valve stem until the pressure is released.

Step 4. Align the supply hose coupling with the supply manifold, push it in and pull the collar backward until it locks in place with an audible click. Then, repeat the same procedure on the return hose and manifold.

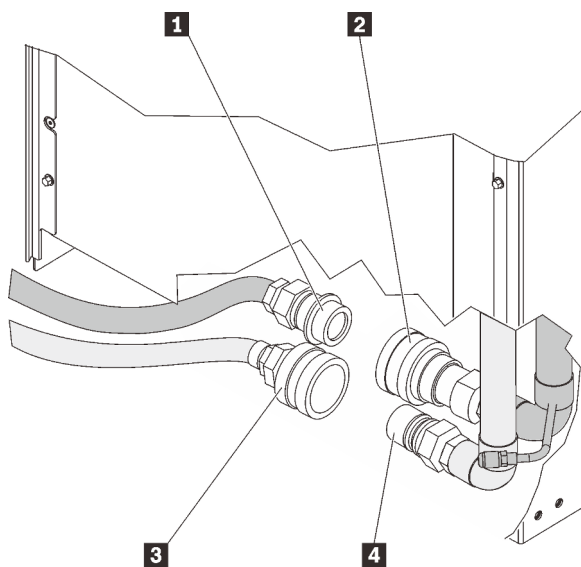


Figure 311. Supply and return hoses and manifold couplings

- Connect the supply hose assembly (1) to the supply manifold-coupling (2).
- Connect the return hose assembly (3) to the return manifold-coupling (4).

Step 5. Turn on the flow of water to the heat exchanger, and let it run for several minutes.

Step 6. Attach the air-purging tool to the air-purging valve at the top of the heat exchanger, and place the drain end into a 2-liter (or larger) container to catch the water and air bubbles that escape during the filling procedure.

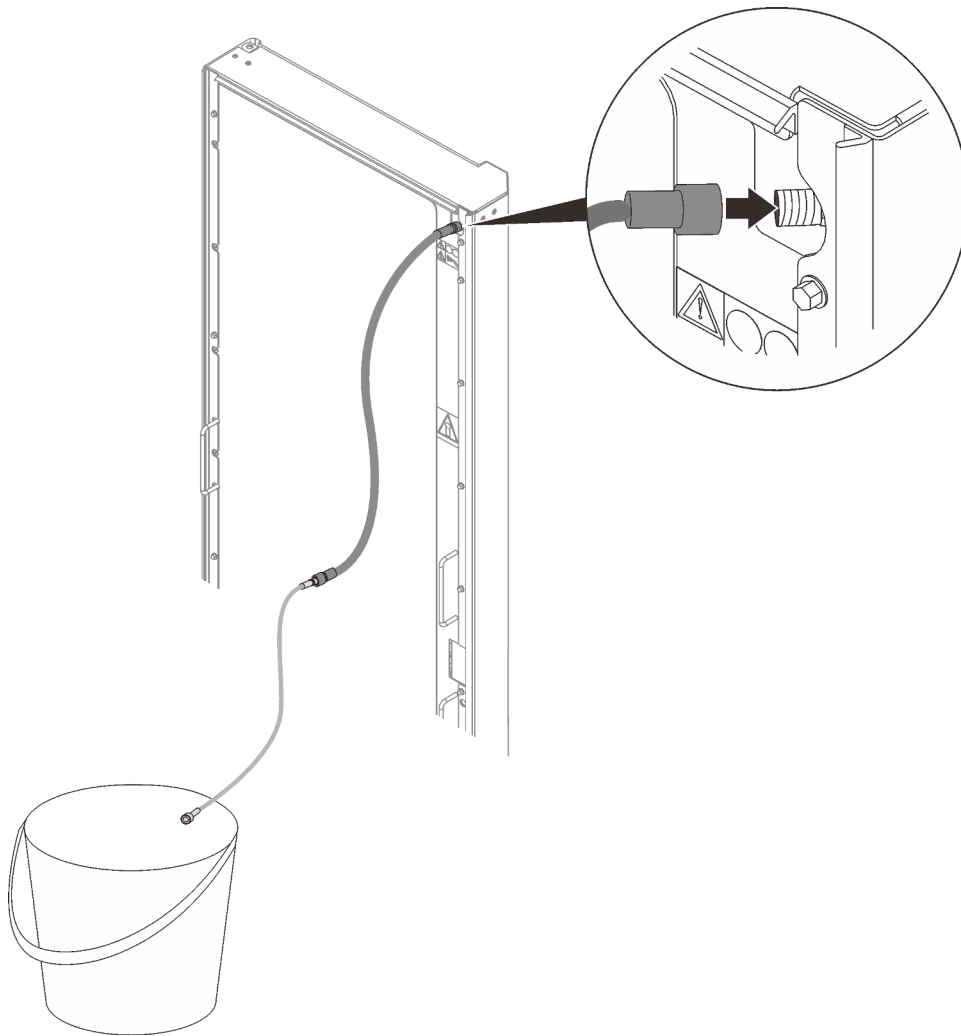
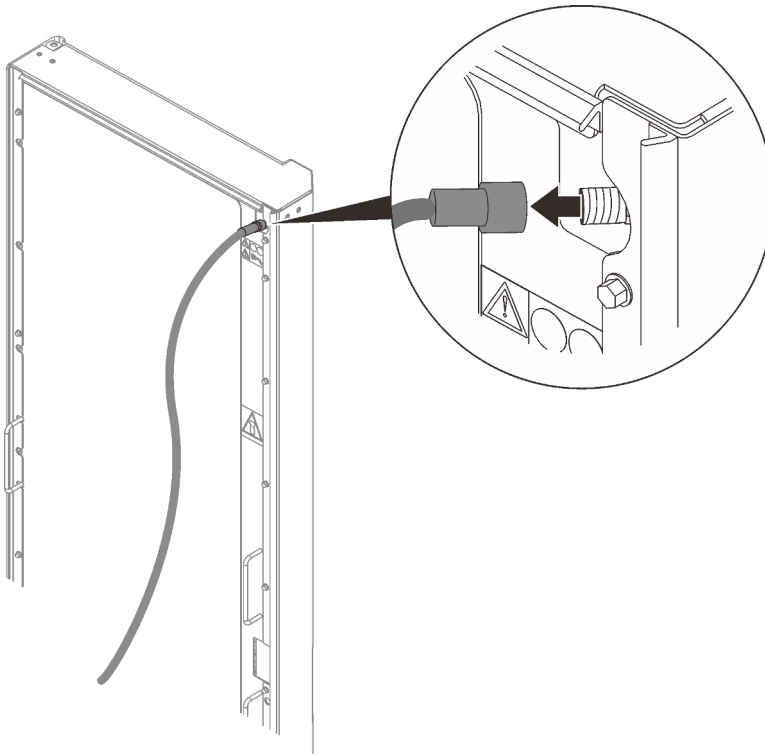


Figure 312. Installing the air-purging tool

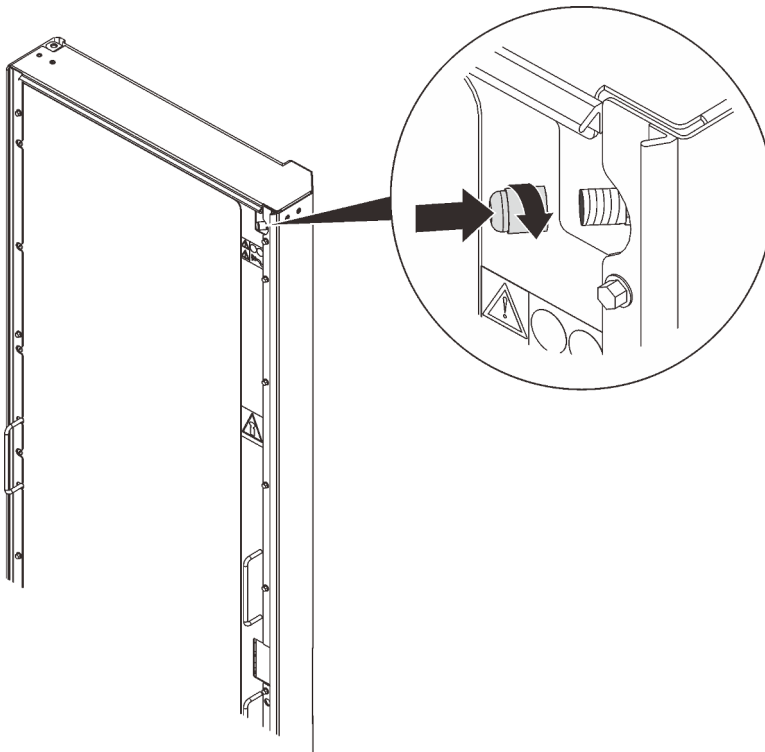
Step 7. When there is a steady stream of liquid into the container from the air-purging tool, disconnect the tool from the heat exchanger.

**Attention:** If water drips from the air-purging valve after you remove the air-purging tool, reattach the tool and disconnect it again to seal the valve.



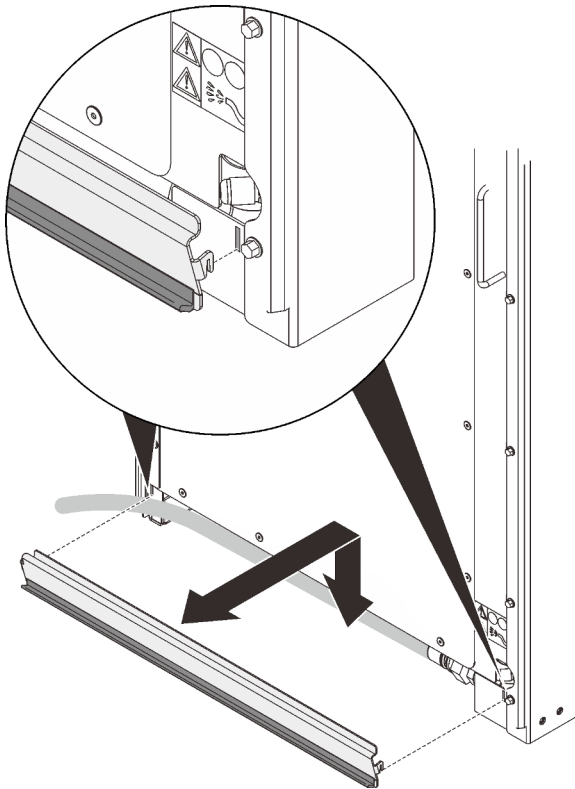
*Figure 313. Removing the air-purging tool*

Step 8. Install the valve cap back to the air-purging valve.



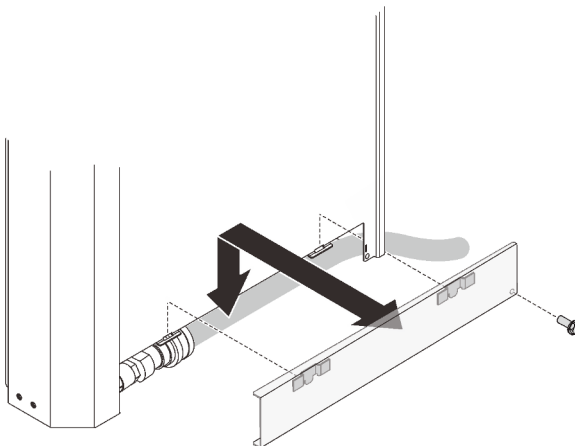
*Figure 314. Installing the valve cap*

- Step 9. Align the hooks on the inner hose access panel with the slots on the inner side of the heat exchanger, and lower the panel to secure it.



*Figure 315. Installing the inner hose access panel*

- Step 10. Align the slots on the outer hose access panel with the hooks on the outer side of the heat exchanger, and lower the panel to attach it to the heat exchanger. Optionally, secure the panel with a M4 screw.



*Figure 316. Installing the outer hose access panel*

## Replace the door latch

See this topic to learn how to replace the door latch of Rear Door Heat eXchanger.

## Procedure

- Step 1. Remove the screw that secure the latch to the heat exchanger; then, secure the replacement unit with the same screw.

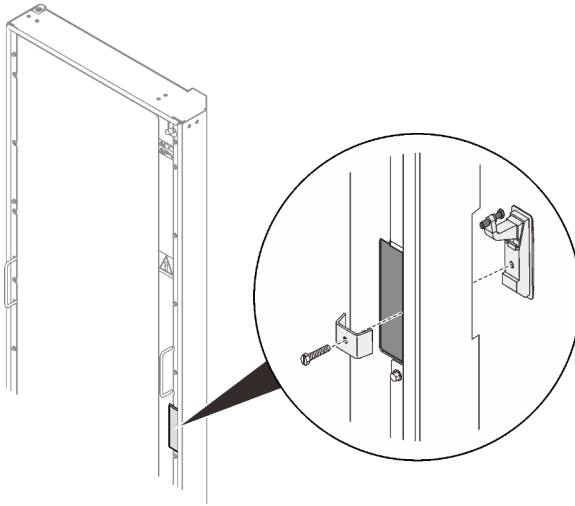


Figure 317. Replacing the door latch

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## Installing and removing rack extension kit

The rack cabinet supports up to two units of rack extension kit. See this topic to learn how to remove and install the rack extension kit.

### Install 42U Advanced Rack Extension Kit

See this topic to learn how to install 42U Advanced Rack Extension Kit.

#### Notes:

- Each unit of rack extension kit comes with additional capacity for up to two 0U PDUs, or one 0U PDU and one manifold, on each side of the rack.
- Each rack cabinet supports up to two units of rack extension kit (one to the front and one to the rear side).
- If there is a plan to install baying kit while only one of the adjacent cabinets will be installed with extension, make sure to install the baying kit first (see [“Install the baying kit” on page 28](#)). Then, as preparation for this procedure, remove the two screws from the upper and lower part of the cabinet that will be installed with the extension kit, and jump to [Step 2 on page 287](#).

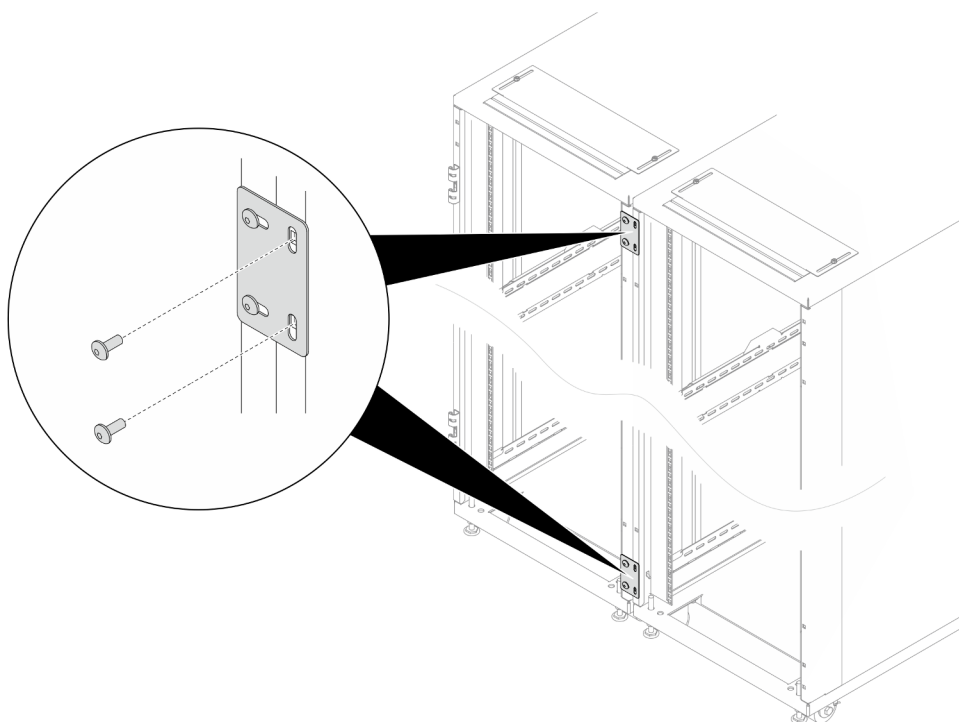


Figure 318. Removing screws to prepare for extension installation

- **Required tools**

- One tool with plastic blade/scissors to open the packaging
- One rubber hammer to align the extension panels with the side of the rack
- One Screwdriver with No. 3 Phillips bit to tighten the M6 screws (9 in the next bullet point)
- One Nut-driver with holding hex bit 10 mm to tighten the M6 screws (9 in the next bullet point)
- One 2.5 mm Hex bit socket to tighten the M4 screws (13 in the next bullet point)
- One 3 mm Hex bit socket to tighten the M5 screws (PDU/manifold brackets, opening covers on the extension panels)
- One 4 mm Hex bit socket to tighten the M6 screws (3 and 12 in the next bullet point)
- The extension kit comes with a miscellaneous bag, which contains the following components:

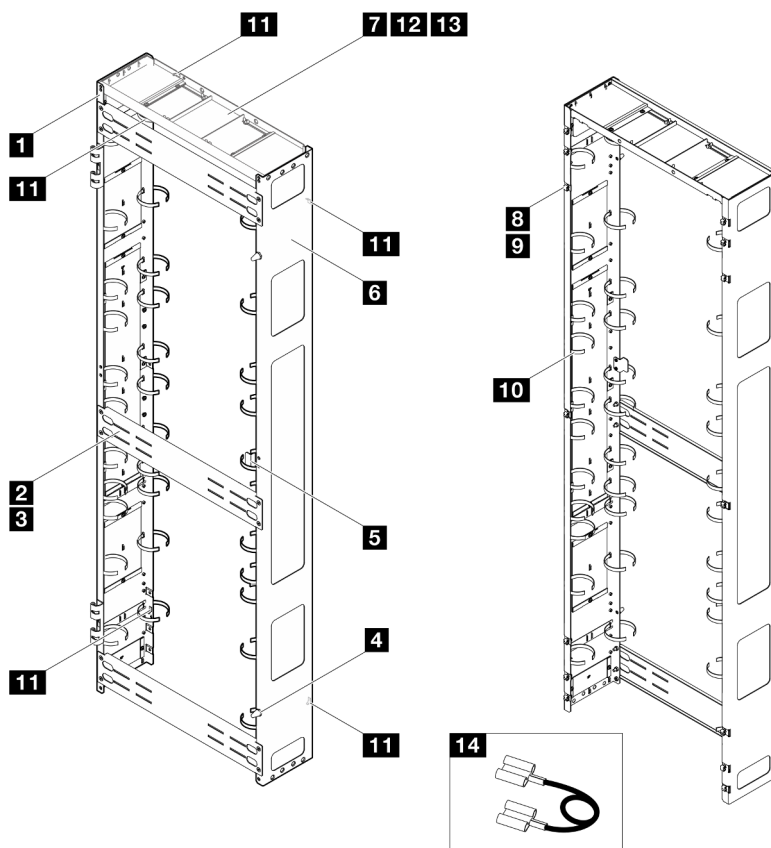


Figure 319. Parts

No.	Description	Quantity	No.	Description	Quantity
<b>1</b>	Left extension panel	1	<b>8</b>	M6 cage nut	14
<b>2</b>	Support bracket	3	<b>9</b>	M6 x 16 mm hex head flange screw	14
<b>3</b>	M6 x 12 mm flat head socket cap screw	12	<b>10</b>	Cable strap module <sup>123</sup>	2
<b>4</b>	Doorstop	2	<b>11</b>	Grounding plate	5
<b>5</b>	Door latch	1	<b>12</b>	M6 x 16 mm flat head socket cap screw	2
<b>6</b>	Right extension panel	1	<b>13</b>	M4 x 6 mm flat head socket cap screws	4
<b>7</b>	Extension top cover	1	<b>14</b>	Grounding wire <sup>4</sup>	3

- <sup>1</sup> Cable straps are removable, remove the straps from the extension panels if needed.
- <sup>2</sup> Cable straps can be lengthened by connecting two or more straps together.
- <sup>3</sup> Use cable straps to secure PDUs and manifolds prior to shipping.
- <sup>4</sup> Connect one end of the grounding wire to the grounding plate on the extension panel and the other end to the nearest grounding plate on the rack.

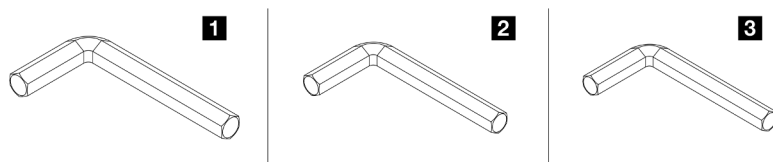


Figure 320. Hex Allen wrenches

No.	Description
<b>1</b>	Hex Allen wrench, 4 mm
<b>2</b>	Hex Allen wrench, 3 mm
<b>3</b>	Hex Allen wrench, 2.5 mm

## Procedure

- Step 1. Install fourteen M6 cage nuts to the rack frame with [cage nut insertion tool](#) or a [flat-blade screwdriver](#).

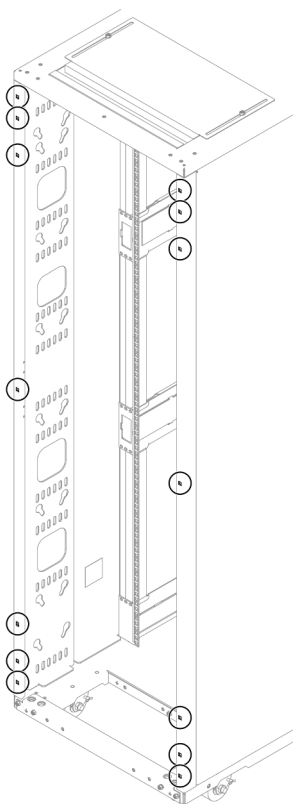
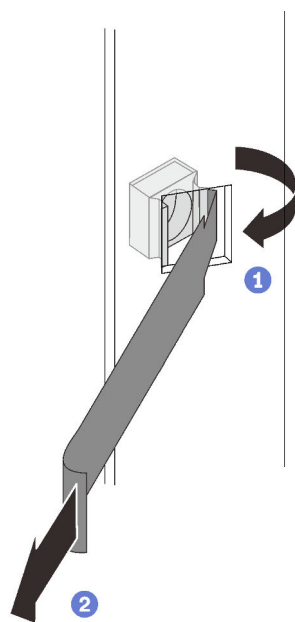


Figure 321. Cage nut installation location

### With cage nut insertion tool



- 1 Insert one edge of the cage nut into the target mounting flange hole, and hook the other edge with the insertion tool through the flange hole.
- 2 Rotate and pull the tool to force the other nut edge into the flange hole, and thus secure the nut.

Figure 322. Installing cage nuts with cage nut insertion tool

#### With flat blade screwdriver

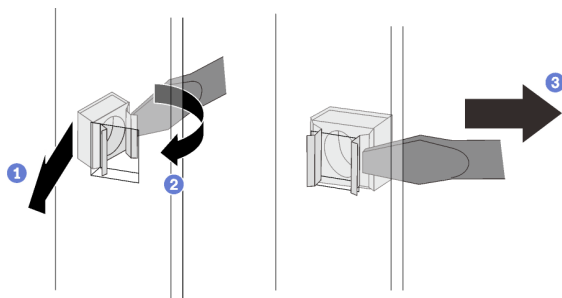
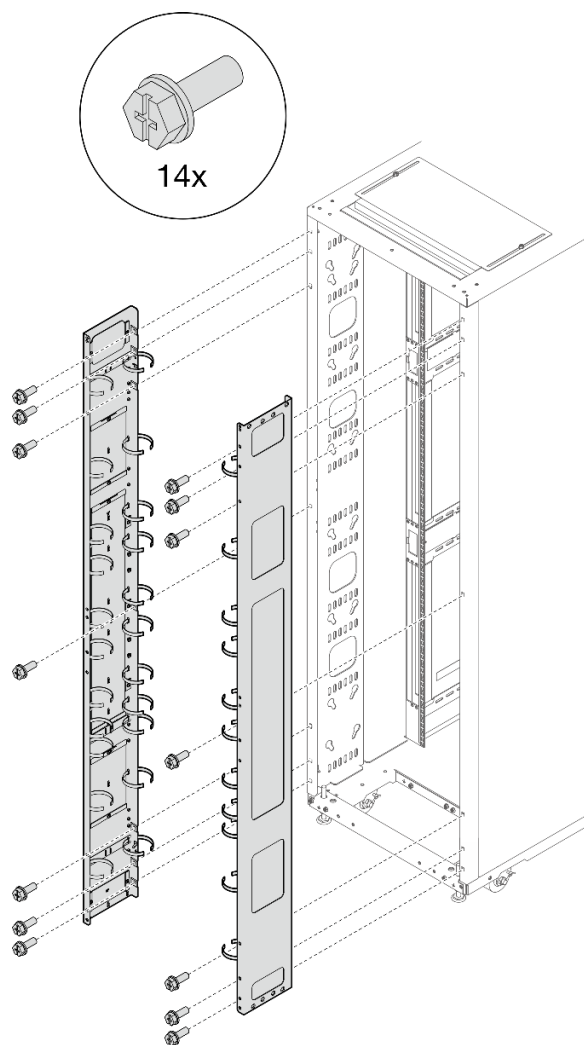


Figure 323. Installing cage nuts with flat blade screwdriver

- 1 Insert one edge of the cage nut into the target mounting flange hole.
- 2 Press and compress the other nut edge with a flat-blade screwdriver, and rotate the screwdriver towards the flange hole until the nut edge goes in the hole.
- 3 Release the screwdriver to secure the nut in the mounting flange hole.

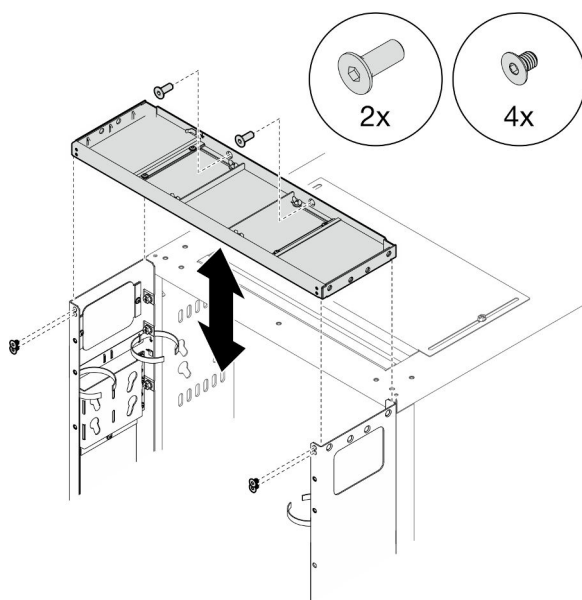
Step 2. Tighten the fourteen screws to secure the two extension panels to the rack.

**Note:** If baying kit has been installed previously, make sure to remove the two screws from top and bottom of the cabinet first. Then, secure the screws through the panel and the baying kit.



*Figure 324. Installing the extension panels*

- Step 3. Align the extension top cover with the screw holes on the extension panels, and secure it with six screws.



*Figure 325. Installing the extension top cover*

Step 4. Depending on the requirements, remove the filler(s) from the extension panels to route cables.

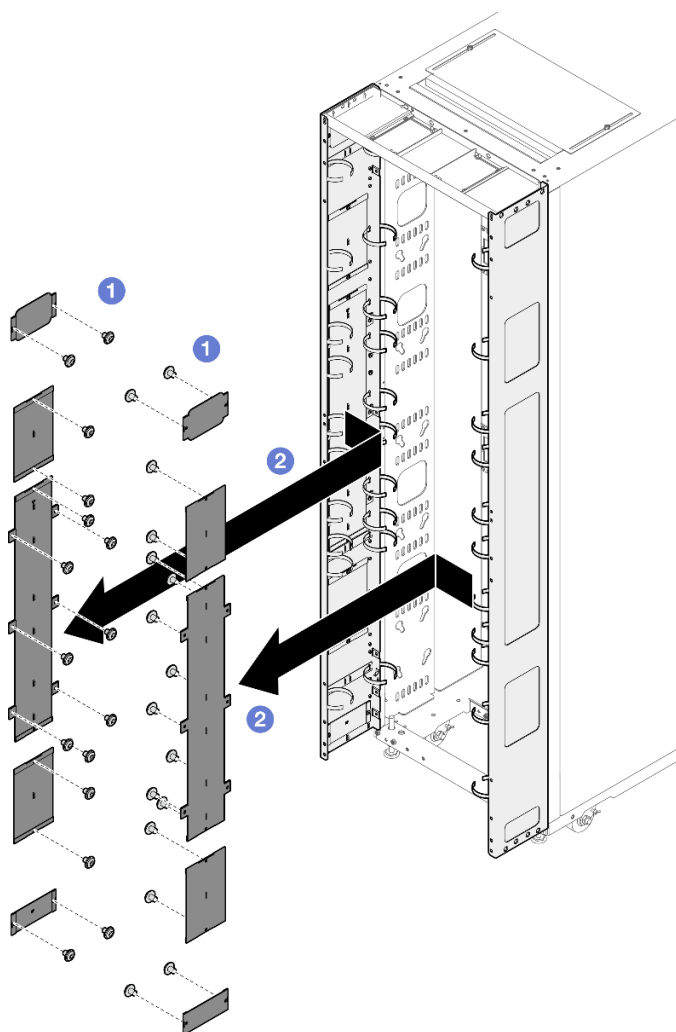


Figure 326. Removing the fillers

1. ① Loosen the screws that secure the filler to the extension panel.
2. ② Remove the filler.

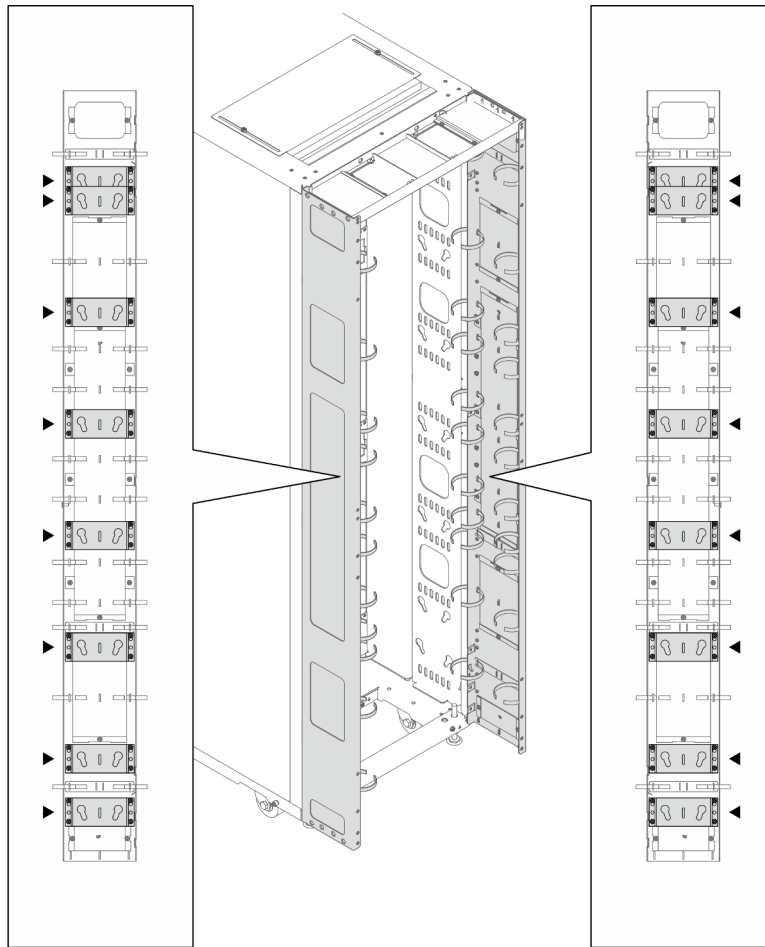
Step 5. If there is a plan to install 0U PDU to the extension panel, complete the following steps.

Depending on the requirements, select the corresponding installation procedures.

- **Bracket with two keyhole slots (up to two PDUs, or one PDU and one manifold)**

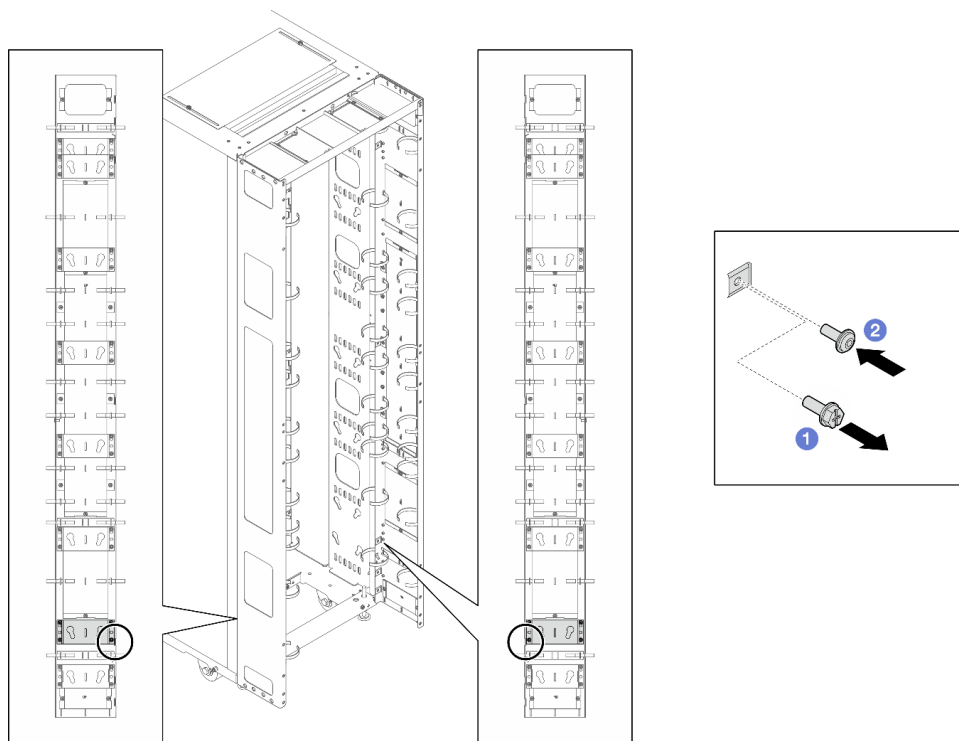
**Notes:**

- Below illustration shows the locations for installing the brackets.



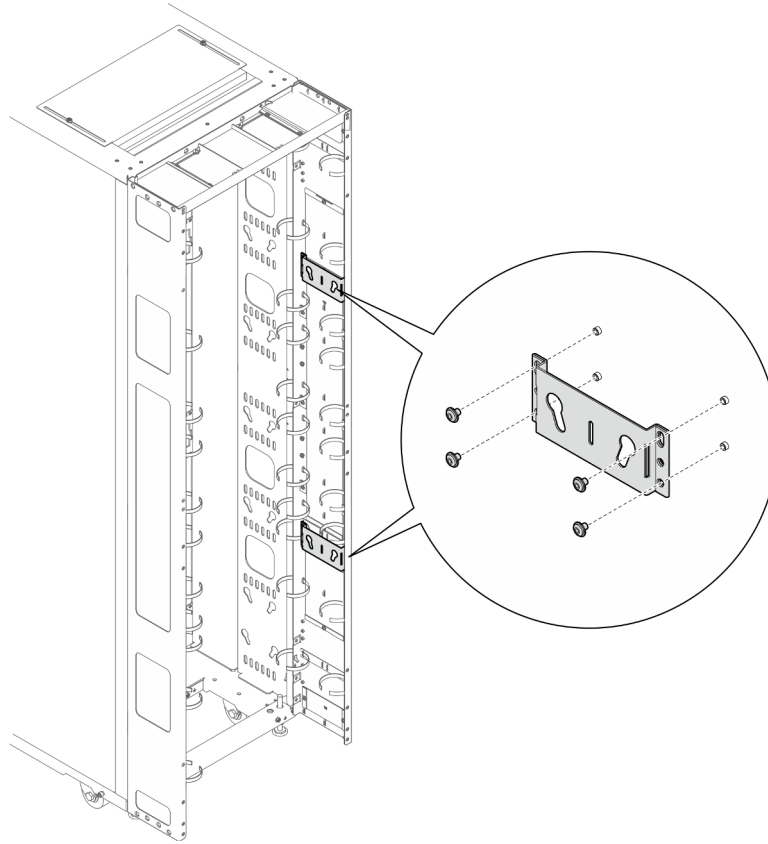
*Figure 327. Locations for installing the brackets with two keyhole slots*

- If one or two brackets are installed in the locations indicated in the illustration below, the M6 hex head flange screw must be replaced with an M6 round head flange screw.



*Figure 328. Replacing the screws*

1. **1** Remove the M6 hex head flange screw.
  2. **2** Install the M6 round head flange screw.
1. Align the bracket with the extension panel, and secure it with four screws.



*Figure 329. Installing the bracket with two keyhole slots*

2. Insert the two PDU pegs into the keyhole slots on the brackets, and push down the PDU to secure it to the brackets. Choose the left or right slot for PDU installation based on the requirements.

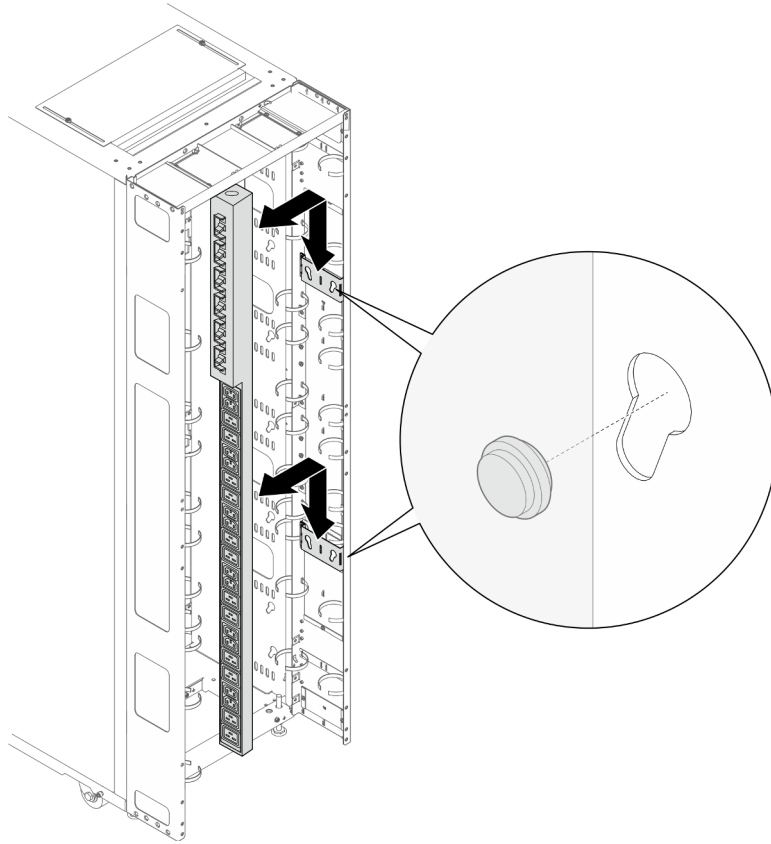


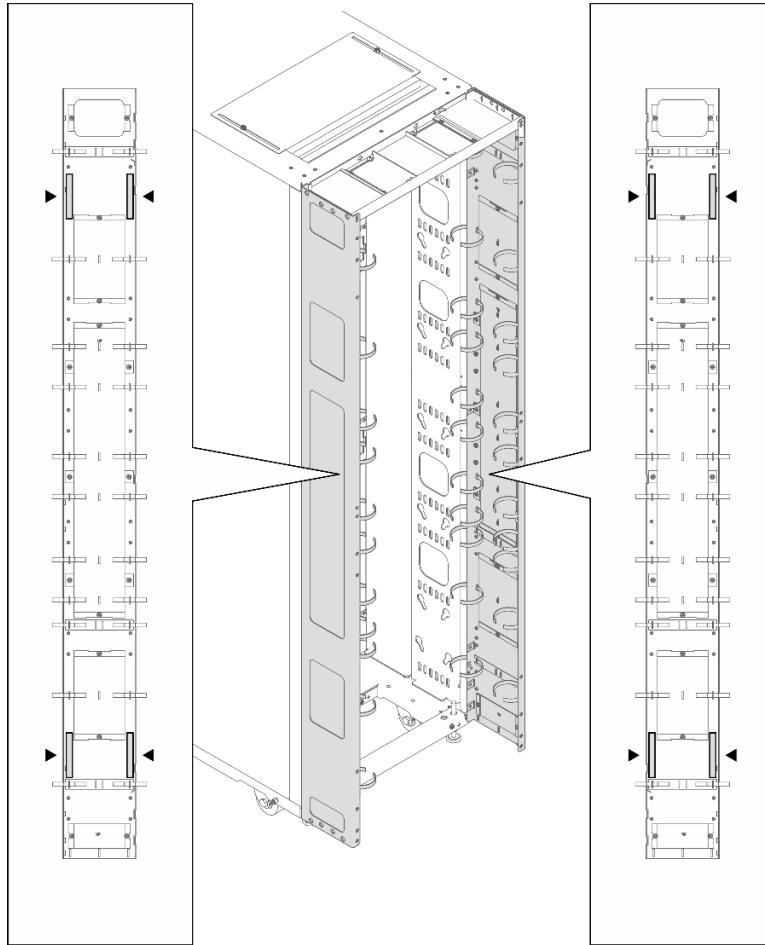
Figure 330. Installing the PDU

**Note:** PDU can be rotated 180 degrees for installation with the input cable at the bottom.

- **L-shaped bracket (up to two PDUs, or one PDU and one manifold)**

**Notes:**

- Below illustration shows the locations for installing the brackets.



*Figure 331. Locations for installing the L-shaped brackets*

- If one or two brackets are installed in the locations indicated in the illustration below, the M6 hex head flange screw must be replaced with an M6 round head flange screw.

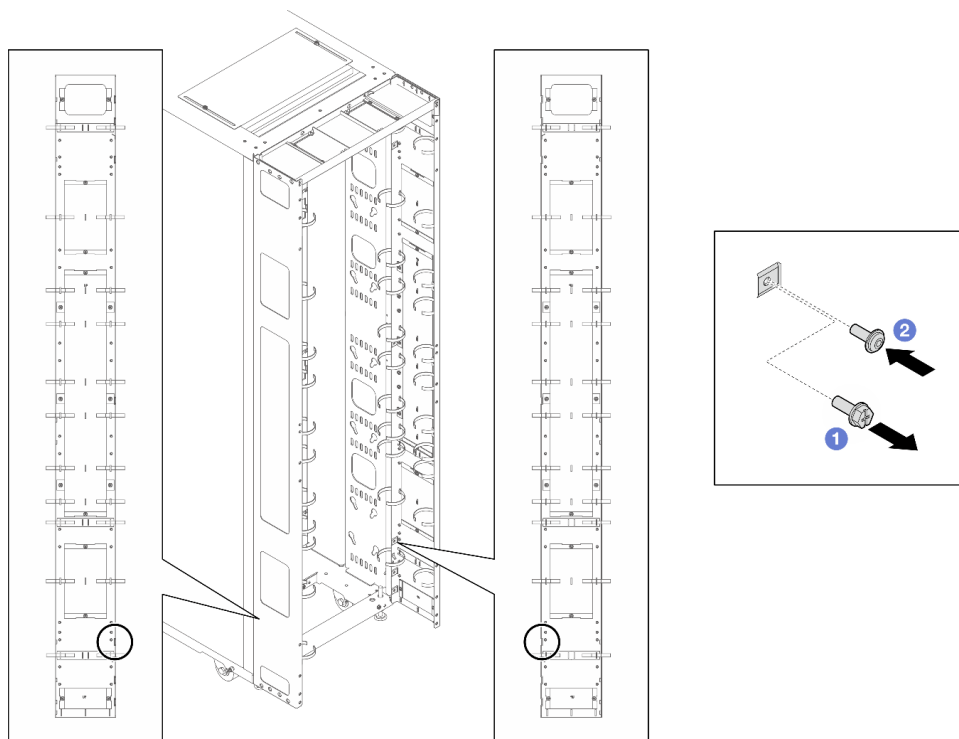
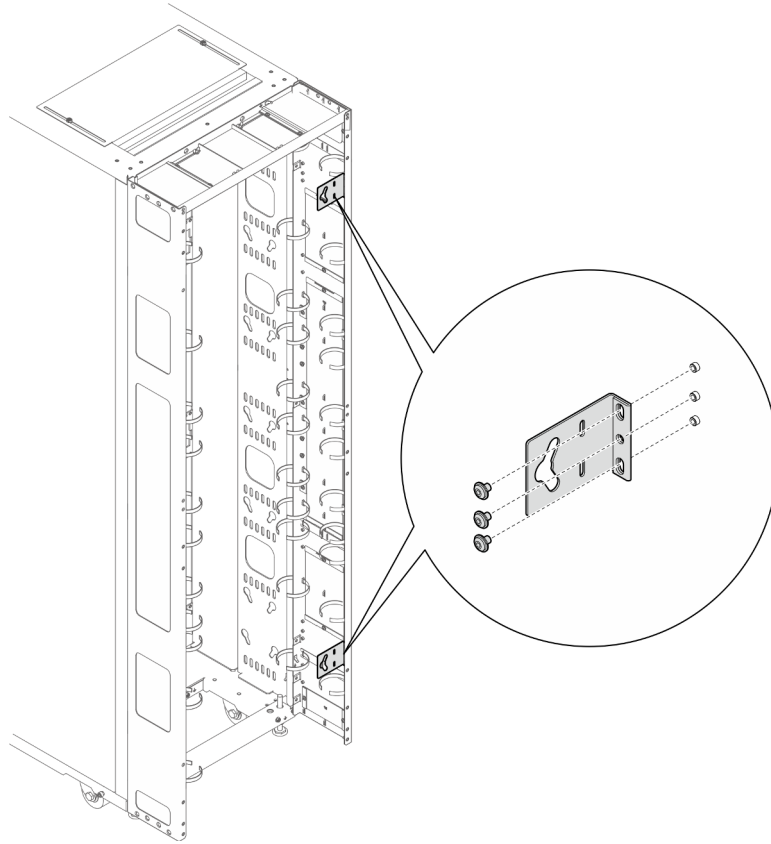
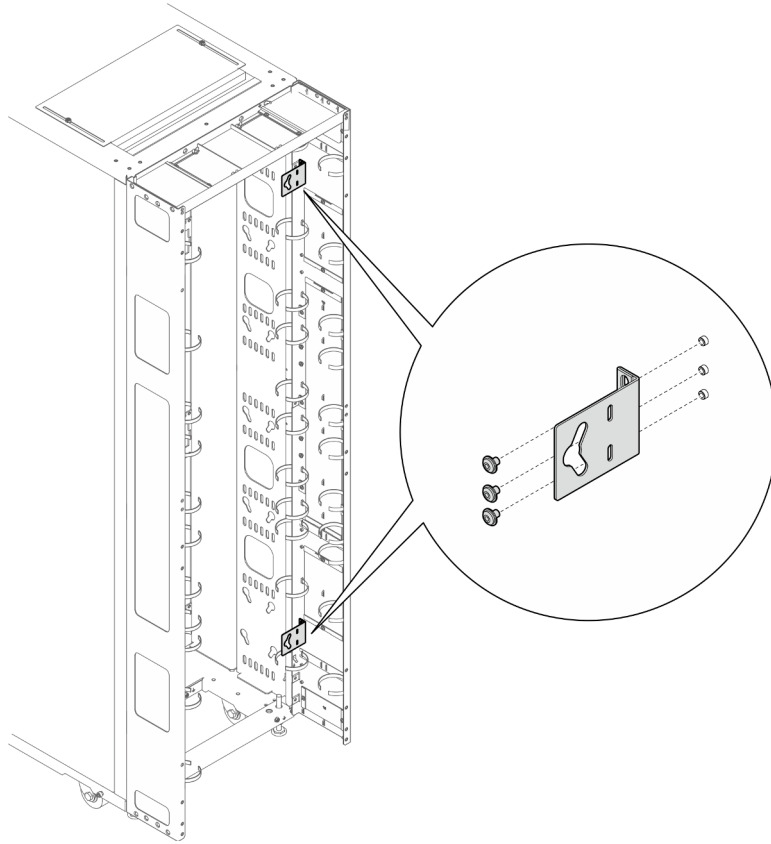


Figure 332. Replacing the screw

1. **1** Remove the M6 hex head flange screw.
  2. **2** Install the M6 round head flange screw.
1. Align the bracket with the extension panel, and secure it with three screws. Choose the installation location for the bracket based on the orientation of the PDU.

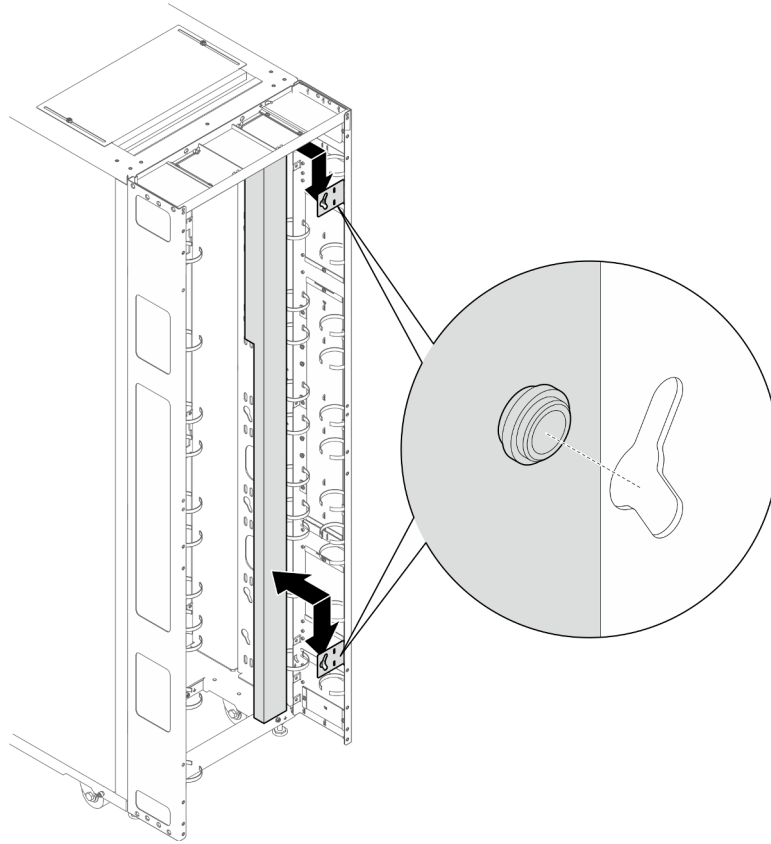


*Figure 333. Installing the L-shaped bracket with the PDU facing the front of the rack cabinet*

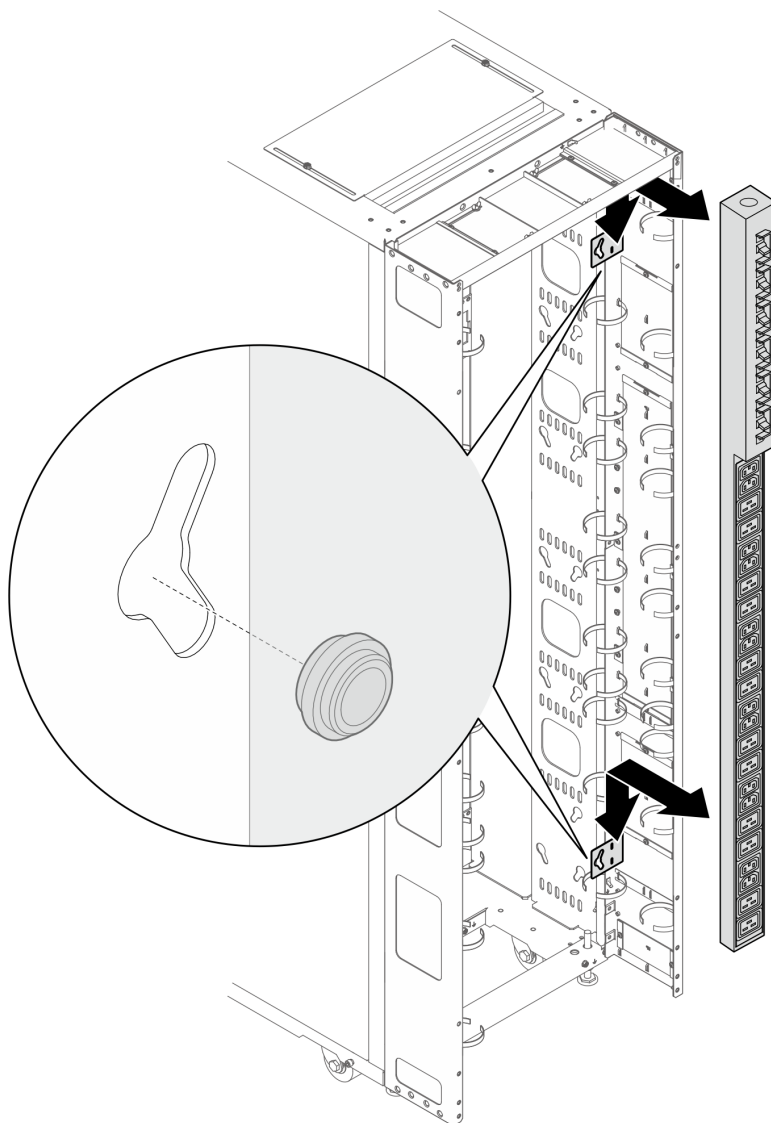


*Figure 334. Installing the L-shaped bracket with the PDU facing the front of the rack cabinet*

2. Insert the two PDU pegs into the keyhole slots on the brackets, and push down the PDU to secure it to the brackets.



*Figure 335. Installing the PDU with the PDU facing the front of the rack cabinet*



*Figure 336. Installing the PDU with PDU facing the rear of the rack cabinet*

Step 6. Depending on the requirements, select one of the following methods to ensure there is sufficient space for routing cables.

- **Slide the brush panel**

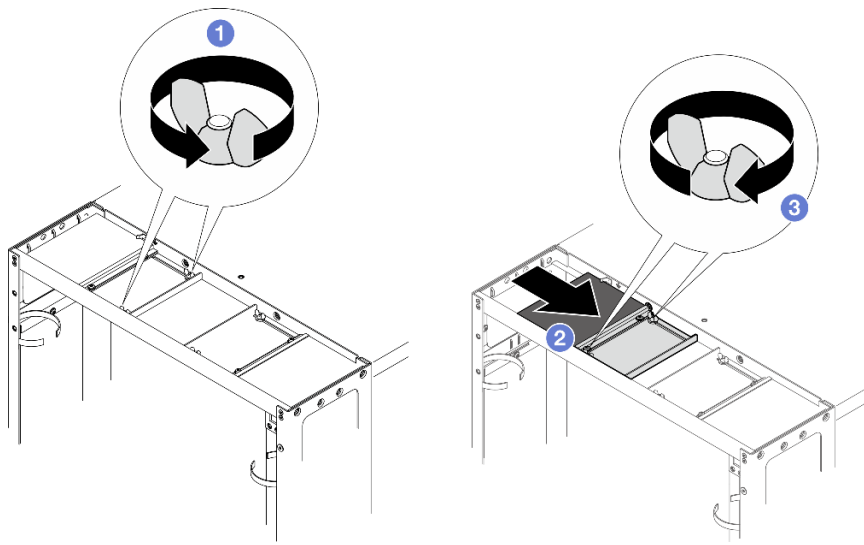


Figure 337. Sliding the brush panel

1. **1** Loosen the two screws that secure the baffle to the top cover.
2. **2** Slide the baffle and brush panel toward the center of the top cover.
3. **3** Tighten the two screws to secure the baffle.

- **Remove the brush panel**

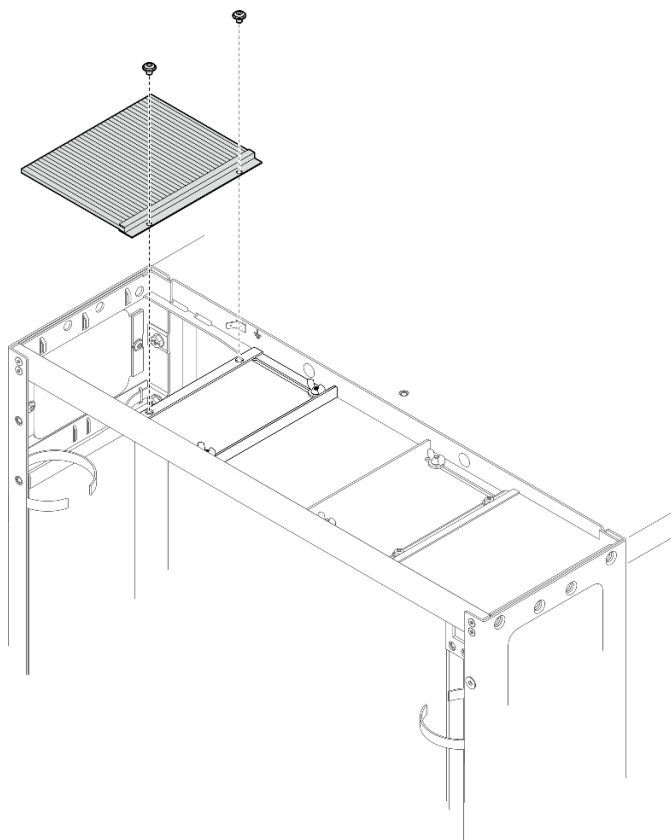
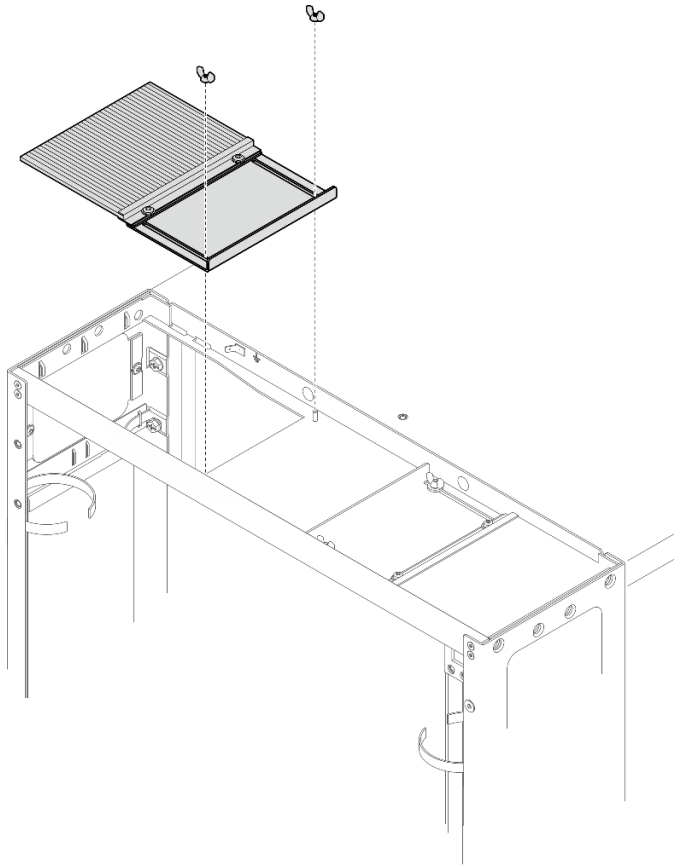


Figure 338. Removing the brush panel

Loosen the two screws to remove the brush panel from the top cover.

- **Remove the brush panel and baffle**



*Figure 339. Removing the brush panel and baffle*

Loosen the two screws to remove the brush panel and baffle from the top cover.

Step 7. Install the two door hinges and the door latch to the extension panels.

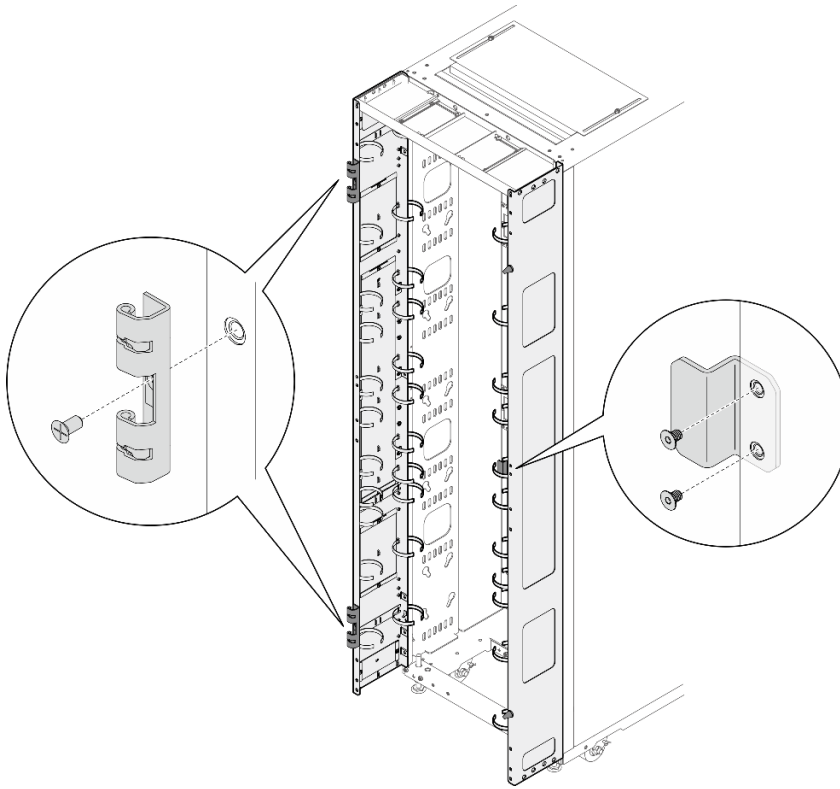


Figure 340. Installing the door hinges and door latch

Step 8. If the rack needs to be shipped, install the three support brackets.

**Note:** Depending on the requirement, remove the support brackets upon arrival at the site.

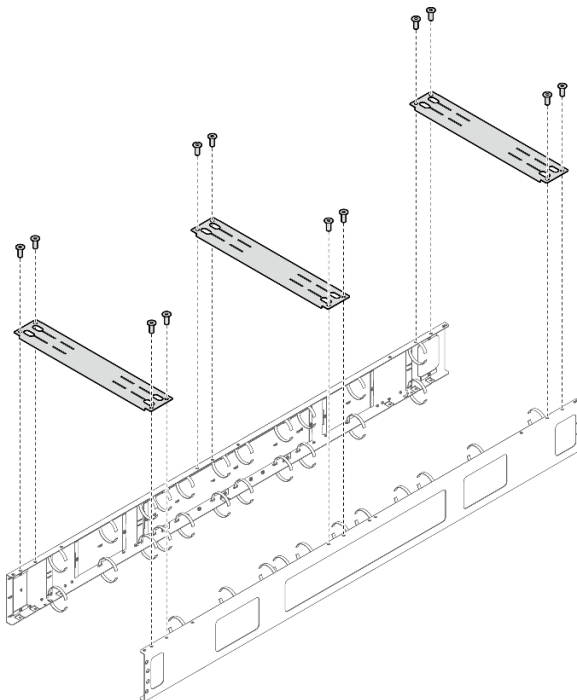


Figure 341. Installing the support brackets

Step 9. Install the door back to the rack.

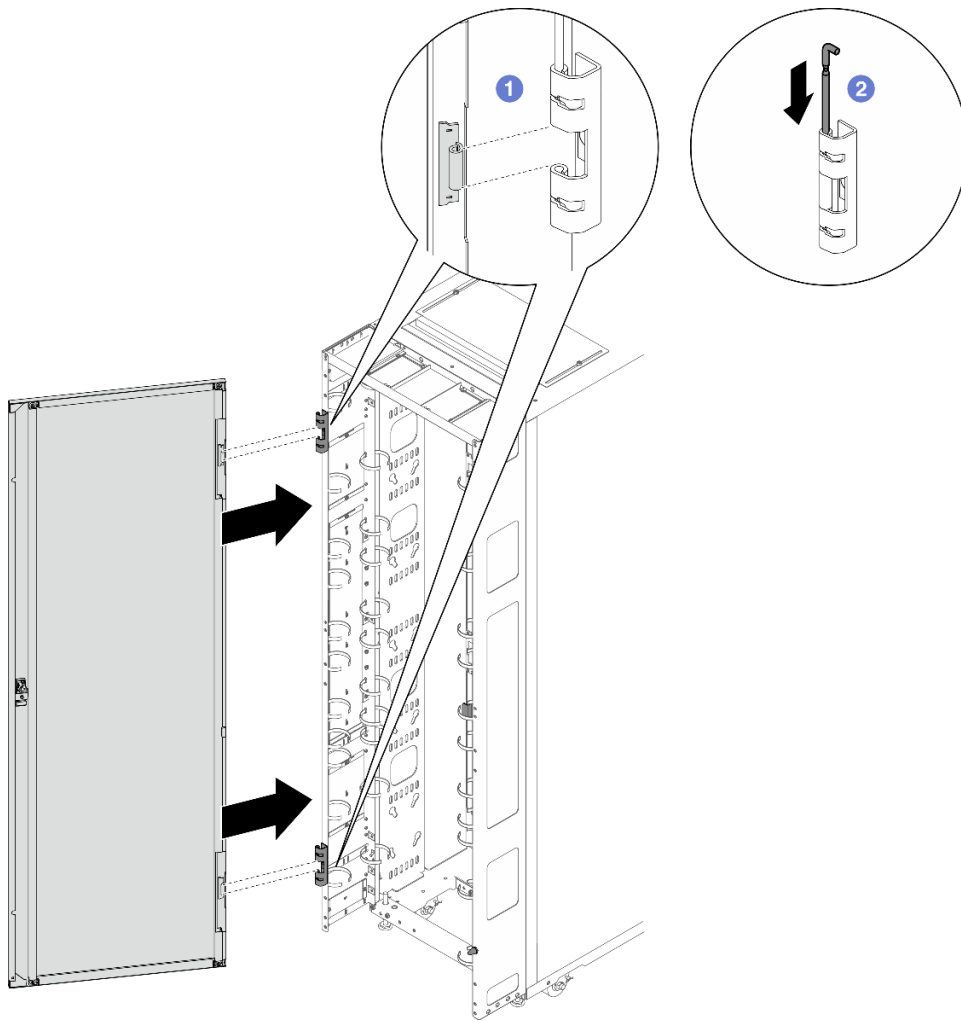


Figure 342. Installing the door

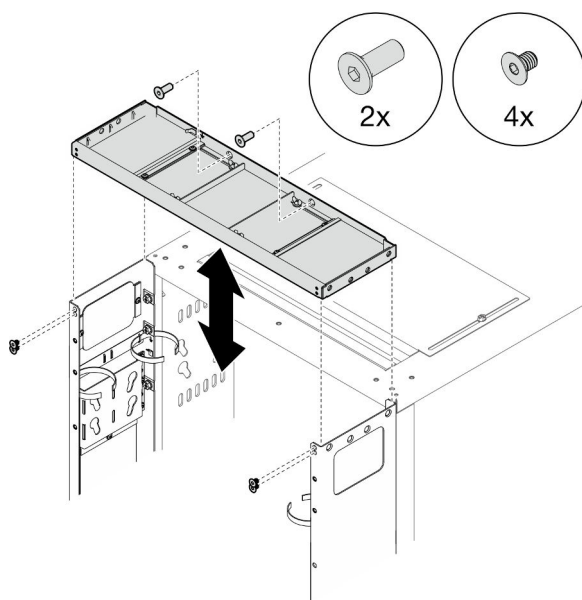
- 1 Align the door with the hinges, and hold the door in place.
- 2 Push the hinge pins down to the closed position so that the door is secured.

## Remove 42U Advanced Rack Extension Kit

See this topic to learn how to remove 42U Advanced Rack Extension Kit.

### Procedure

- Step 1. Remove the door from the rack cabinet (see [“Remove a door” on page 199](#)).
- Step 2. If any devices are installed to the extension panels, remove them (see [“Remove a 0U PDU” on page 349](#)).
- Step 3. Unfasten the six screws, and remove the extension top cover.



*Figure 343. Removing the extension top cover*

Step 4. Unfasten the fourteen screws, and remove the two extension panels.

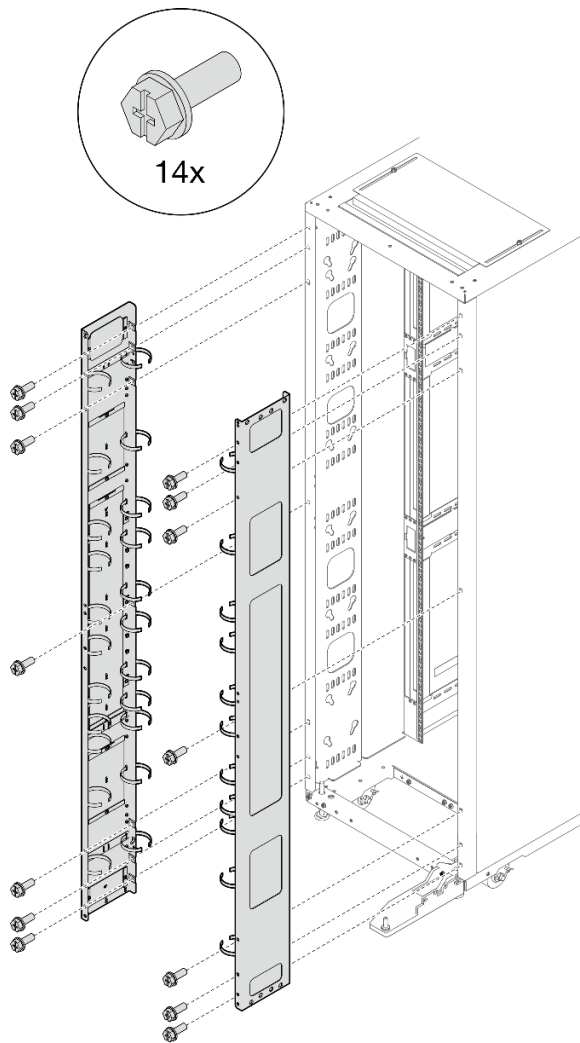


Figure 344. Removing the extension panels

### After this task is completed

Reinstall the door (see [“Remove and install a door” on page 199](#)).

## Install 42U Advanced Rack Extension Kit with RDHX

See this topic to learn how to install 42U Advanced Rack Extension Kit and RDHX.

### Notes:

- Each unit of rack extension kit comes with additional capacity for up to two 0U PDUs, or one 0U PDU and one manifold, on each side of the rack.
- Each rack cabinet supports up to two units of rack extension kit (one to the front and one to the rear side).
- If there is a plan to install baying kit while only one of the adjacent cabinets will be installed with extension, make sure to install the baying kit first (see [“Install the baying kit” on page 28](#)). Then, as preparation for this procedure, remove the two screws from the upper and lower part of the cabinet that will be installed with the extension kit, and skip to [Step 2 on page 310](#).

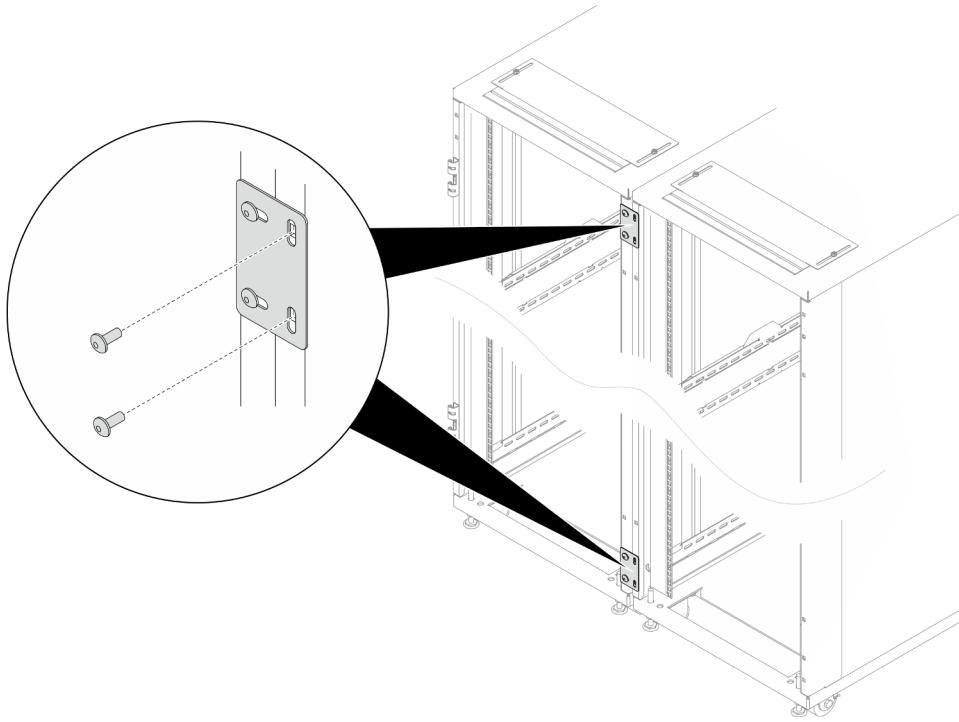


Figure 345. Removing screws to prepare for extension installation

- **Required tools**

- One tool with plastic blade/scissors to open the packaging
- One rubber hammer to align the extension panels with the side of the rack
- One Screwdriver with No. 3 Phillips bit to tighten the M6 screws (9 in the next bullet point)
- One Nut-driver with holding hex bit 10 mm to tighten the M6 screws (9 in the next bullet point)
- One 2.5 mm Hex bit socket to tighten the M4 screws (13 in the next bullet point)
- One 3 mm Hex bit socket to tighten the M5 screws (PDU/manifold brackets, opening covers on the extension panels)
- One 4 mm Hex bit socket to tighten the M6 screws (4 and 14 in the next bullet point)
- The extension kit comes with a miscellaneous bag, which contains the following components:

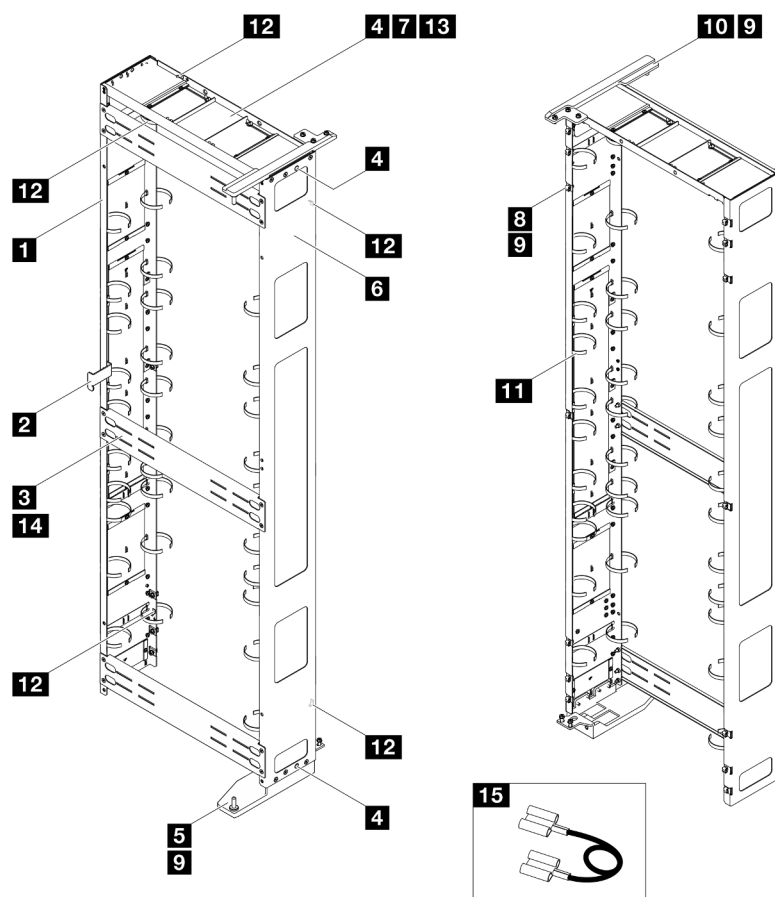


Figure 346. Parts

No.	Description	Quantity	No.	Description	Quantity
<b>1</b>	Left extension panel	1	<b>9</b>	M6 x 16 mm hex head flange screw	21
<b>2</b>	Latch plate	1	<b>10</b>	Top hinge for RDHX	1
<b>3</b>	Support bracket	3	<b>11</b>	Cable strap module <sup>1, 2, 3</sup>	2
<b>4</b>	M6 x 16 mm flat head socket cap screw	10	<b>12</b>	Grounding plate	5
<b>5</b>	Bottom hinge for RDHX	1	<b>13</b>	M4 x 6 mm flat head socket cap screws	4
<b>6</b>	Right extension panel	1	<b>14</b>	M6 x 12 mm flat head socket cap screw	12
<b>7</b>	Extension top cover	1	<b>15</b>	Grounding wire <sup>4</sup>	3
<b>8</b>	M6 cage nut	14			

- <sup>1</sup> Cable straps are removable, remove the straps from the extension panels if needed.
- <sup>2</sup> Cable straps can be lengthened by connecting two or more straps together.
- <sup>3</sup> Use cable straps to secure PDUs and manifolds prior to shipping.

- <sup>4</sup> Connect one end of the grounding wire to the grounding plate on the extension panel and the other end to the nearest grounding plate on the rack.

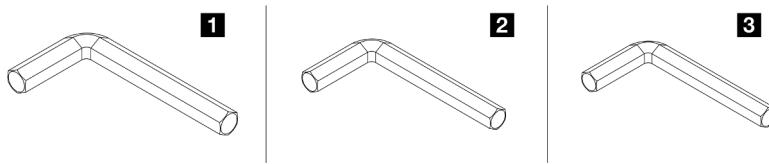


Figure 347. Hex Allen wrenches

No.	Description
<b>1</b>	Hex Allen wrench, 4 mm
<b>2</b>	Hex Allen wrench, 3 mm
<b>3</b>	Hex Allen wrench, 2.5 mm

## Procedure

- Step 1. Install fourteen M6 cage nuts to the rack frame with [cage nut insertion tool](#) or a [flat-blade screwdriver](#).

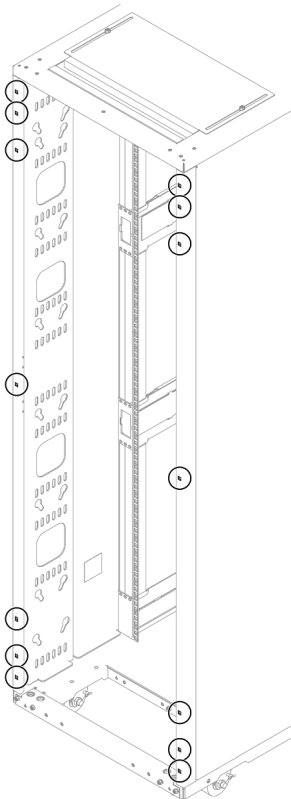
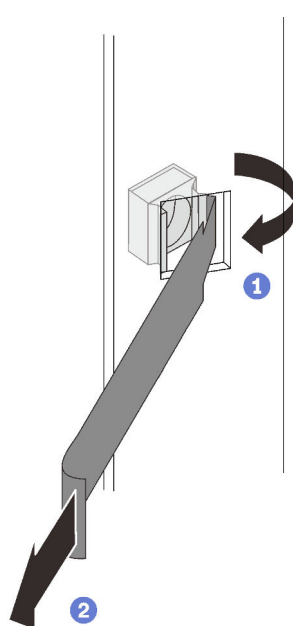


Figure 348. Cage nut installation location

### With cage nut insertion tool



- 1 Insert one edge of the cage nut into the target mounting flange hole, and hook the other edge with the insertion tool through the flange hole.
- 2 Rotate and pull the tool to force the other nut edge into the flange hole, and thus secure the nut.

Figure 349. Installing cage nuts with cage nut insertion tool

#### With flat blade screwdriver

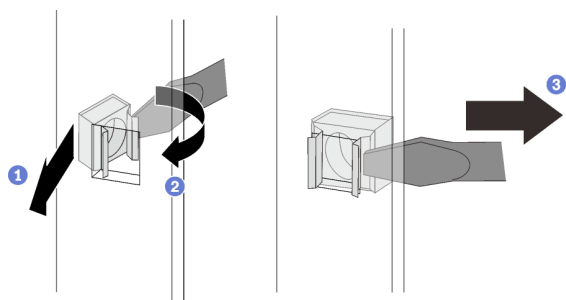


Figure 350. Installing cage nuts with flat blade screwdriver

- 1 Insert one edge of the cage nut into the target mounting flange hole.
- 2 Press and compress the other nut edge with a flat-blade screwdriver, and rotate the screwdriver towards the flange hole until the nut edge goes in the hole.
- 3 Release the screwdriver to secure the nut in the mounting flange hole.

Step 2. Install the bottom hinge.

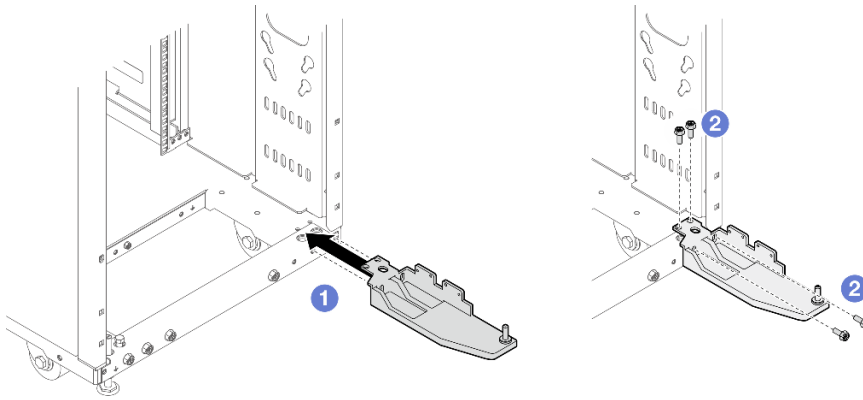


Figure 351. Securing the bottom hinge

**Note:** Do not fully tighten the four screws in this step.

- 1 Align the hinge with the rack.
- 2 Secure the hinge to the rack with four screws.

Step 3. Secure the two extension panels to the rack with fourteen screws.

**Notes:**

- Do not fully tighten the fourteen screws in this step.
- If baying kit has been installed previously, make sure to remove the two screws from top and bottom of the cabinet first. Then, secure the screws through the panel and the baying kit.

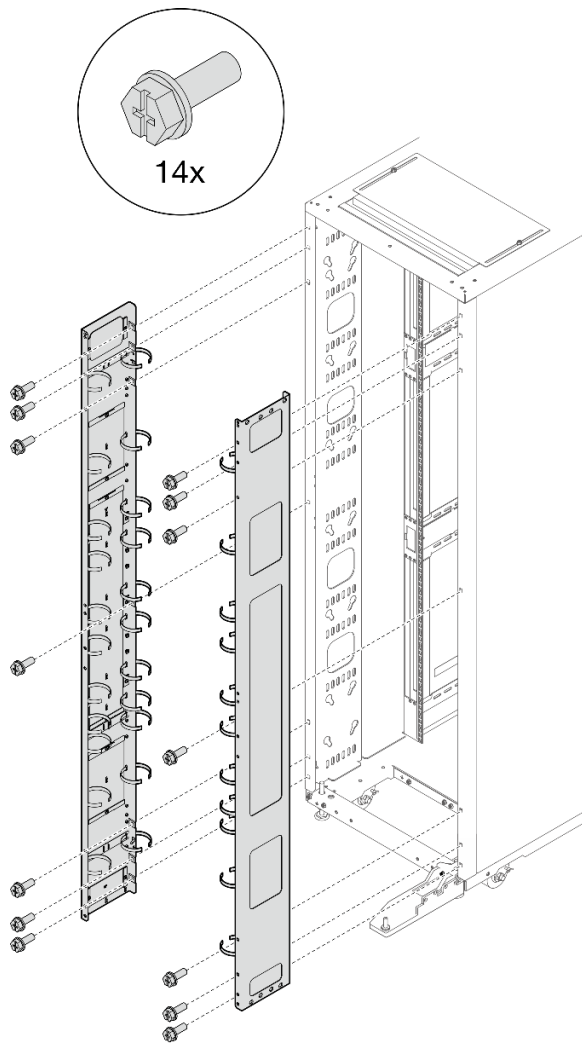
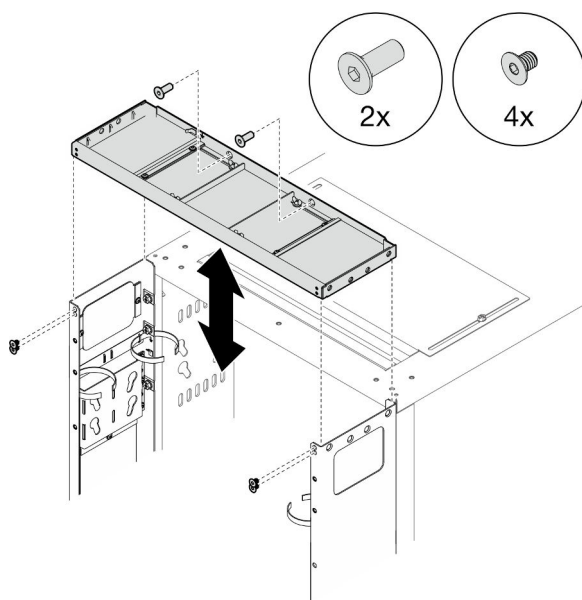


Figure 352. Installing the extension panels

- Step 4. Align the extension top cover with the screw holes on the extension panels, and secure it with six screws.



*Figure 353. Installing the extension top cover*

Step 5. Depending on the requirements, remove the filler(s) from the extension panels to route cables.

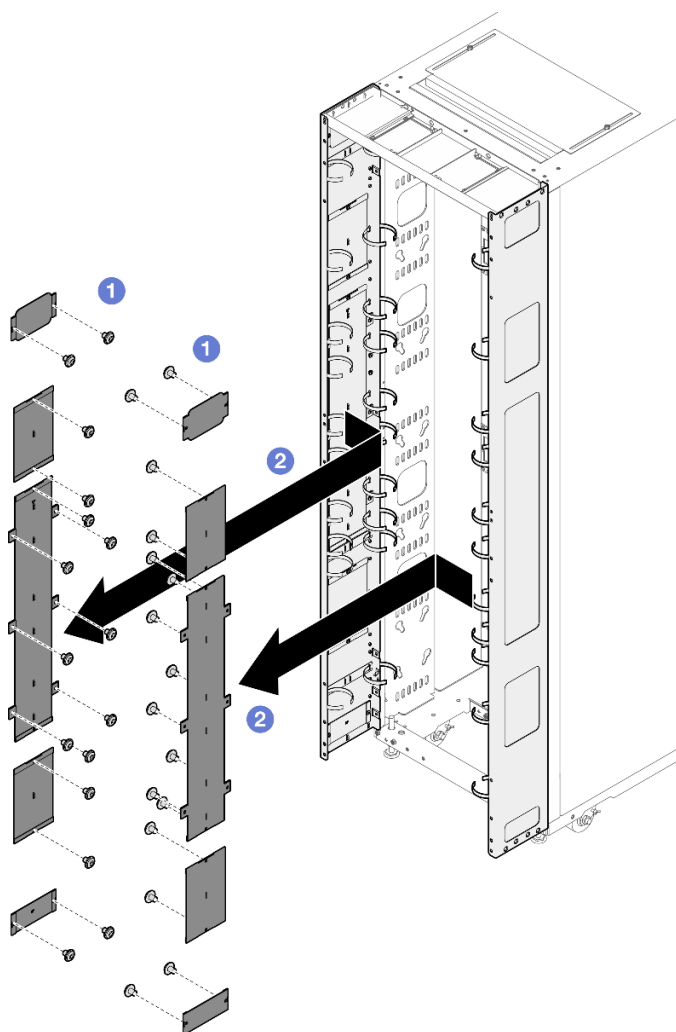


Figure 354. Removing the fillers

1. ① Loosen the screws that secure the filler to the extension panel.
2. ② Remove the filler.

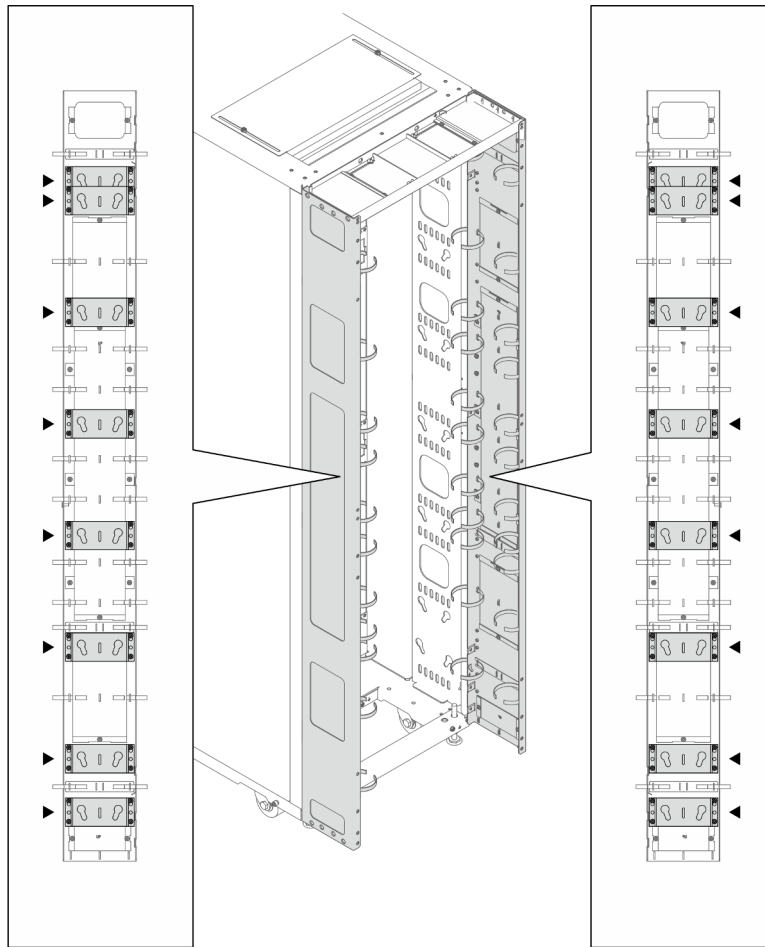
Step 6. If there is a plan to install 0U PDU to the extension panel, complete the following steps.

Depending on the requirements, select the corresponding installation procedures.

- **Bracket with two keyhole slots (up to two PDUs, or one PDU and one manifold)**

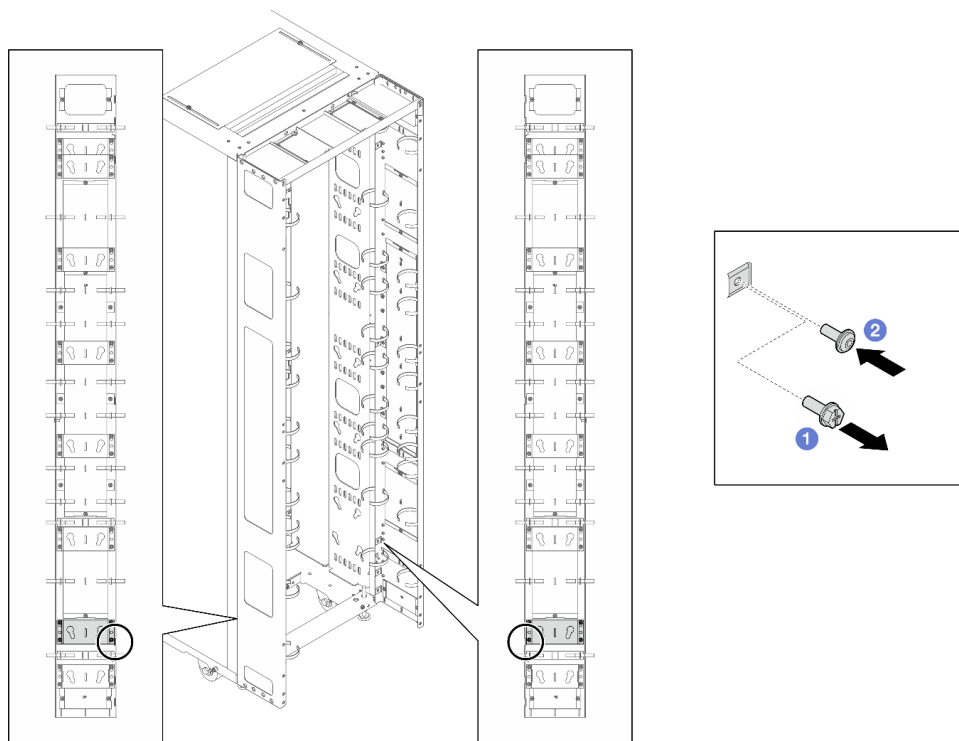
**Notes:**

- Below illustration shows the locations for installing the brackets.



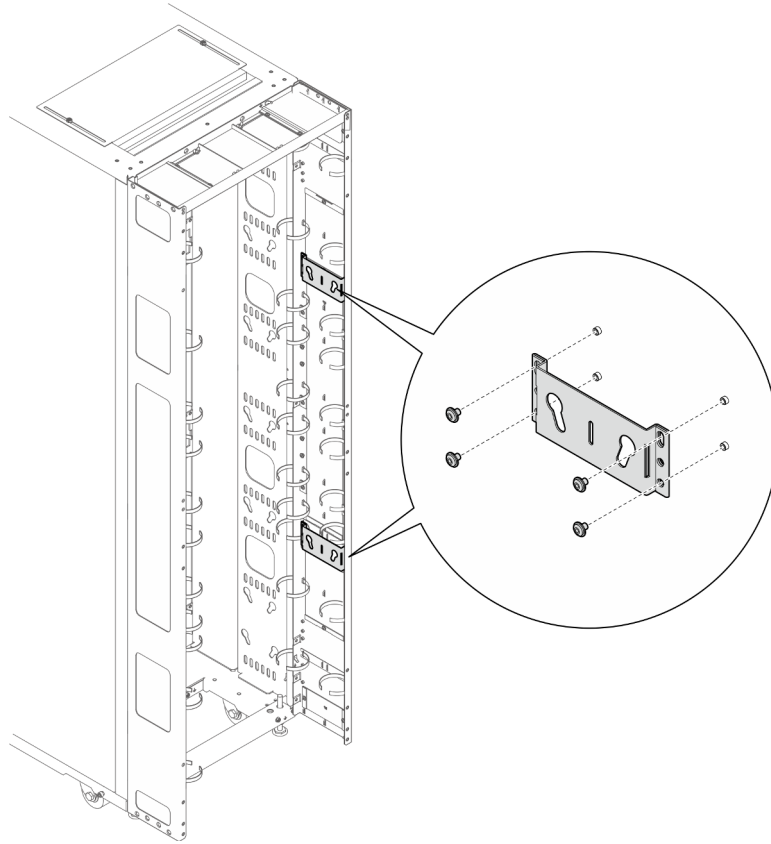
*Figure 355. Locations for installing the brackets with two keyhole slots*

- If one or two brackets are installed in the locations indicated in the illustration below, the M6 hex head flange screw must be replaced with an M6 round head flange screw.



*Figure 356. Replacing the screws*

1. **1** Remove the M6 hex head flange screw.
  2. **2** Install the M6 round head flange screw.
1. Align the bracket with the extension panel, and secure it with four screws.



*Figure 357. Installing the bracket with two keyhole slots*

2. Insert the two PDU pegs into the keyhole slots on the brackets, and push down the PDU to secure it to the brackets. Choose the left or right slot for PDU installation based on the requirements.

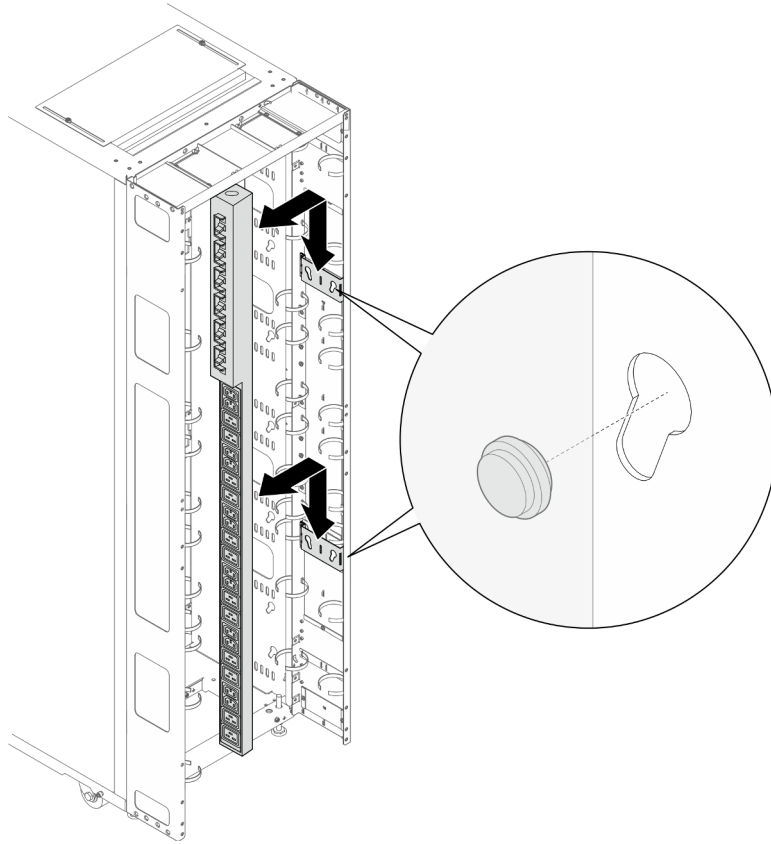


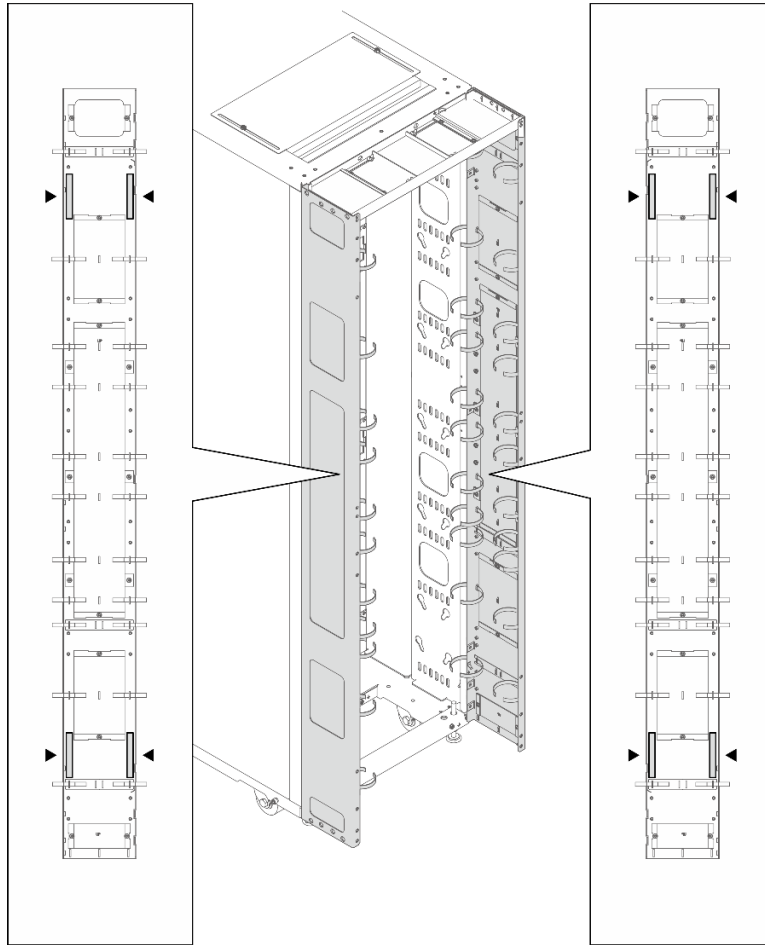
Figure 358. Installing the PDU

**Note:** PDU can be rotated 180 degrees for installation with the input cable at the bottom.

- **L-shaped bracket (up to two PDUs, or one PDU and one manifold)**

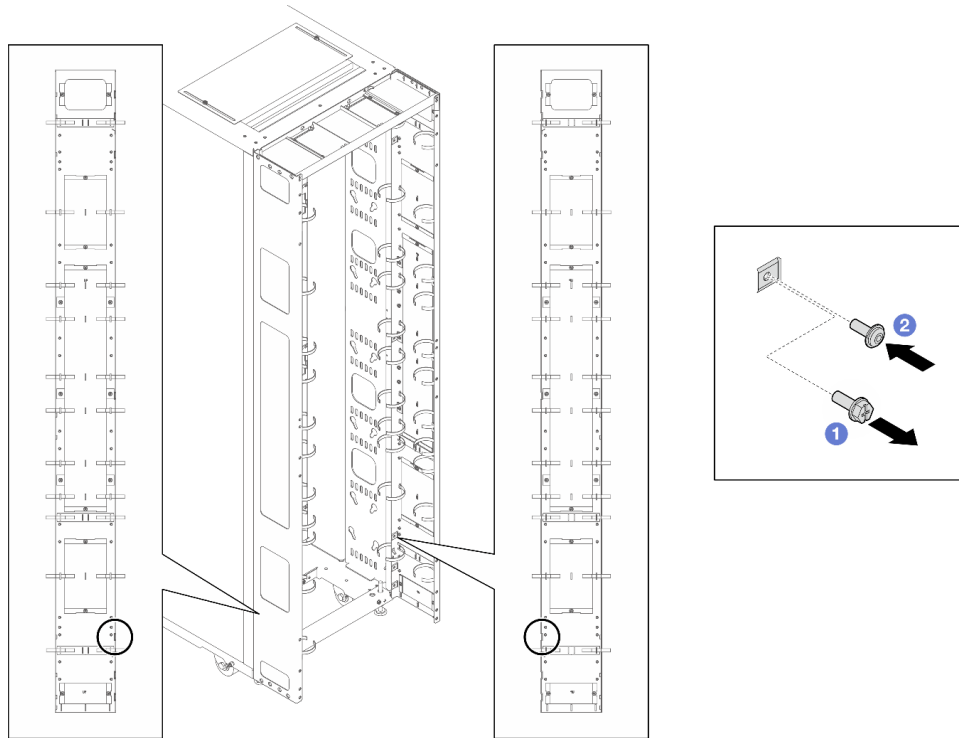
**Notes:**

- Below illustration shows the locations for installing the brackets.



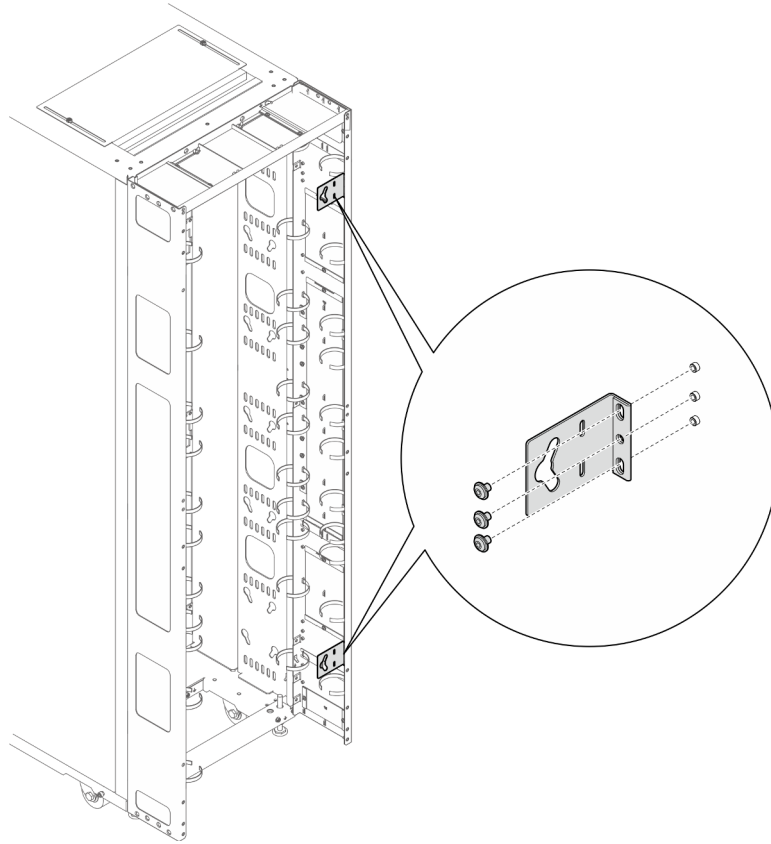
*Figure 359. Locations for installing the L-shaped brackets*

- If one or two brackets are installed in the locations indicated in the illustration below, the M6 hex head flange screw must be replaced with an M6 round head flange screw.

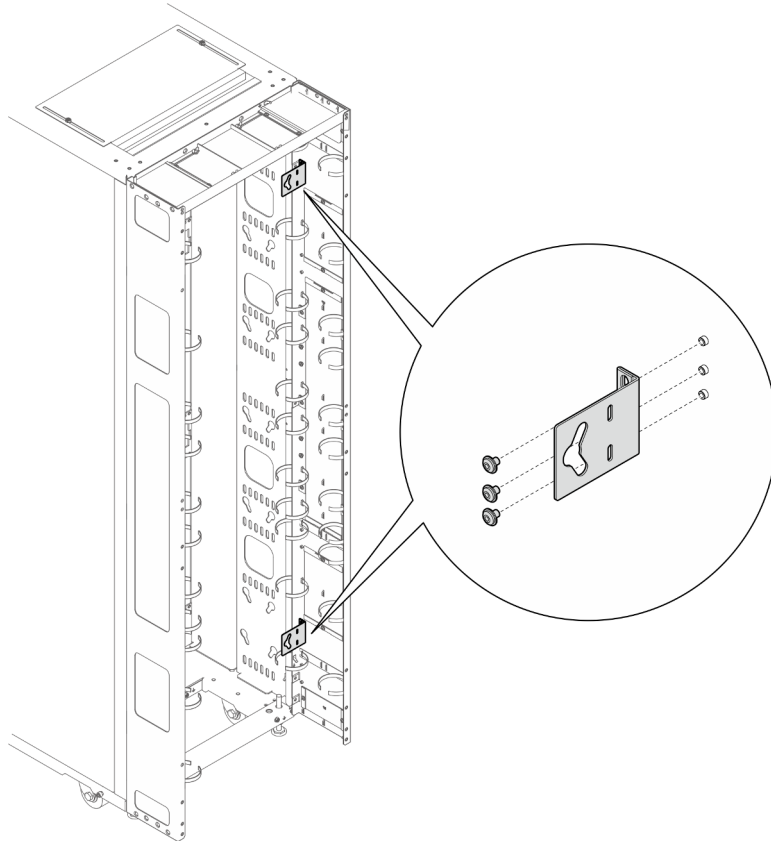


*Figure 360. Replacing the screw*

1. **1** Remove the M6 hex head flange screw.
  2. **2** Install the M6 round head flange screw.
1. Align the bracket with the extension panel, and secure it with three screws. Choose the installation location for the bracket based on the orientation of the PDU.

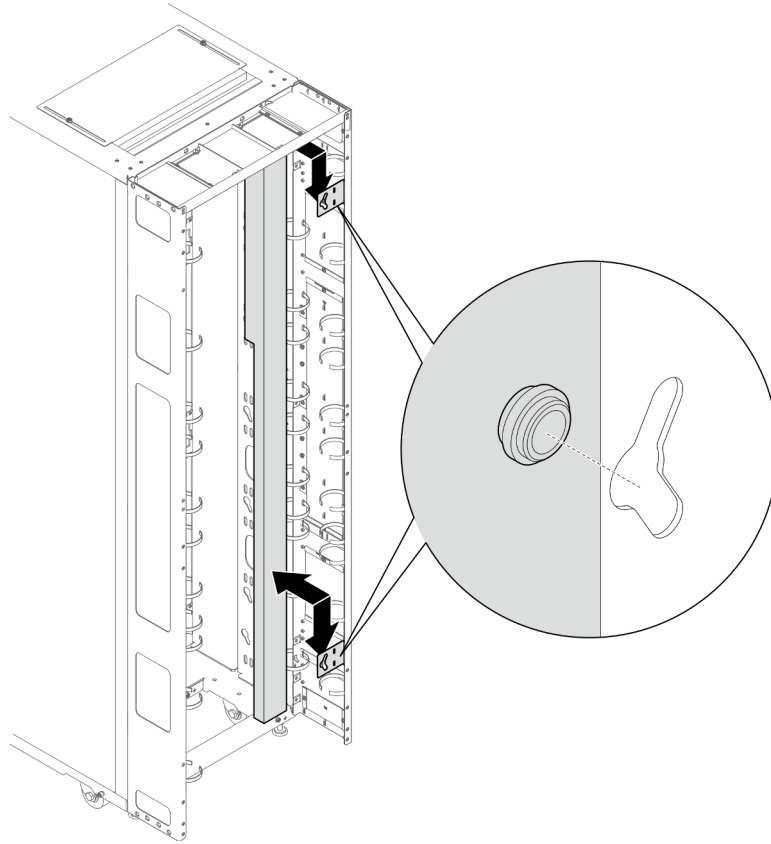


*Figure 361. Installing the L-shaped bracket with the PDU facing the front of the rack cabinet*



*Figure 362. Installing the L-shaped bracket with the PDU facing the front of the rack cabinet*

2. Insert the two PDU pegs into the keyhole slots on the brackets, and push down the PDU to secure it to the brackets.



*Figure 363. Installing the PDU with the PDU facing the front of the rack cabinet*

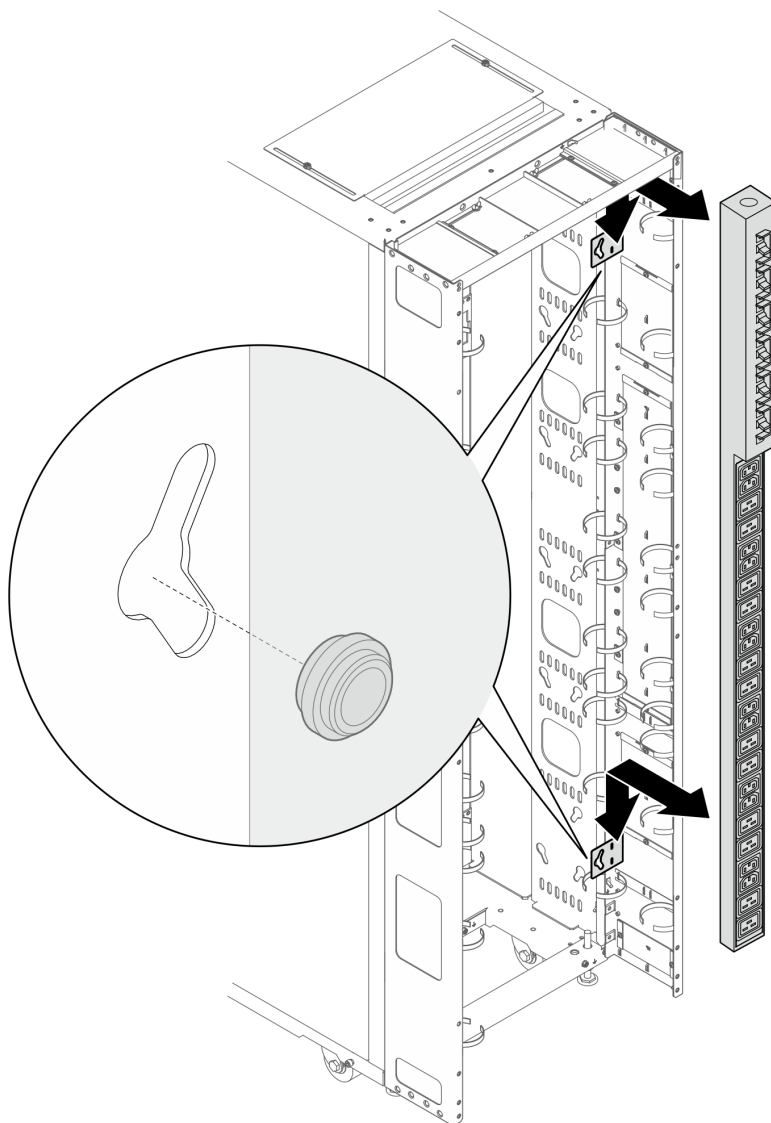


Figure 364. Installing the PDU with PDU facing the rear of the rack cabinet

Step 7. Depending on the requirements, select one of the following methods to ensure there is sufficient space for routing cables.

- **Slide the brush panel**

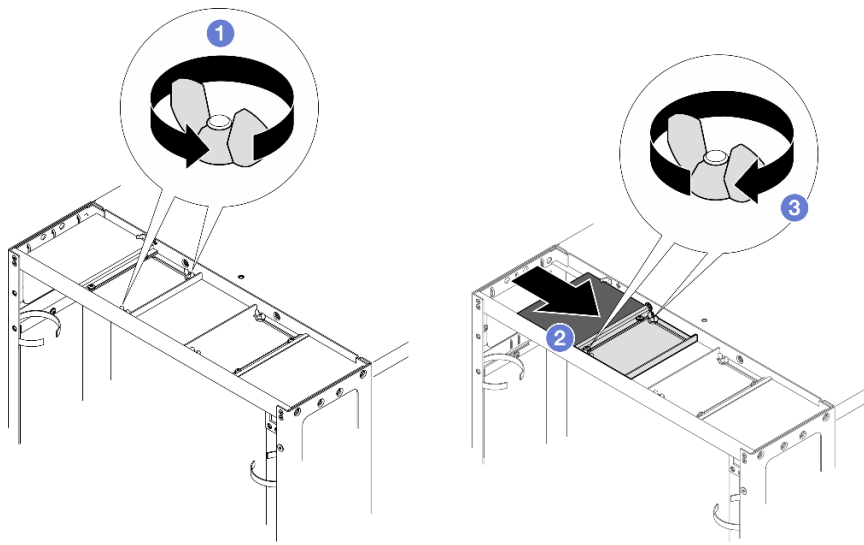


Figure 365. Sliding the brush panel

1. **1** Loosen the two screws that secure the baffle to the top cover.
2. **2** Slide the baffle and brush panel toward the center of the top cover.
3. **3** Tighten the two screws to secure the baffle.

- **Remove the brush panel**

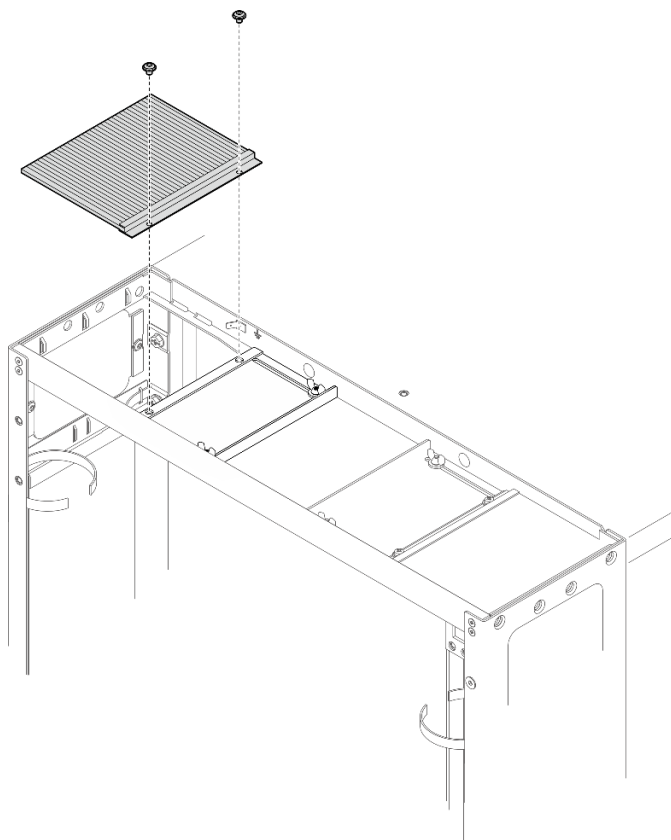
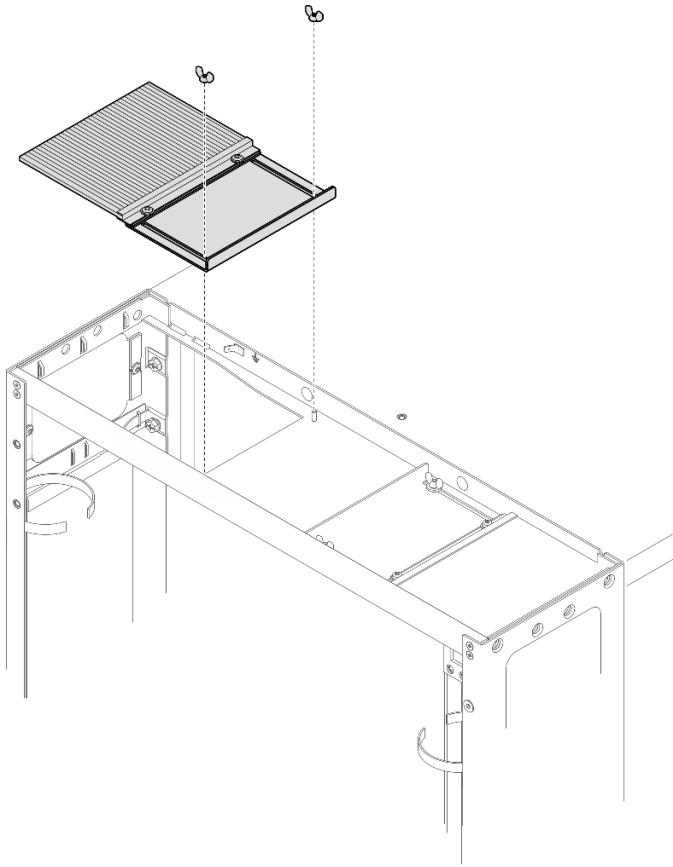


Figure 366. Removing the brush panel

Loosen the two screws to remove the brush panel from the top cover.

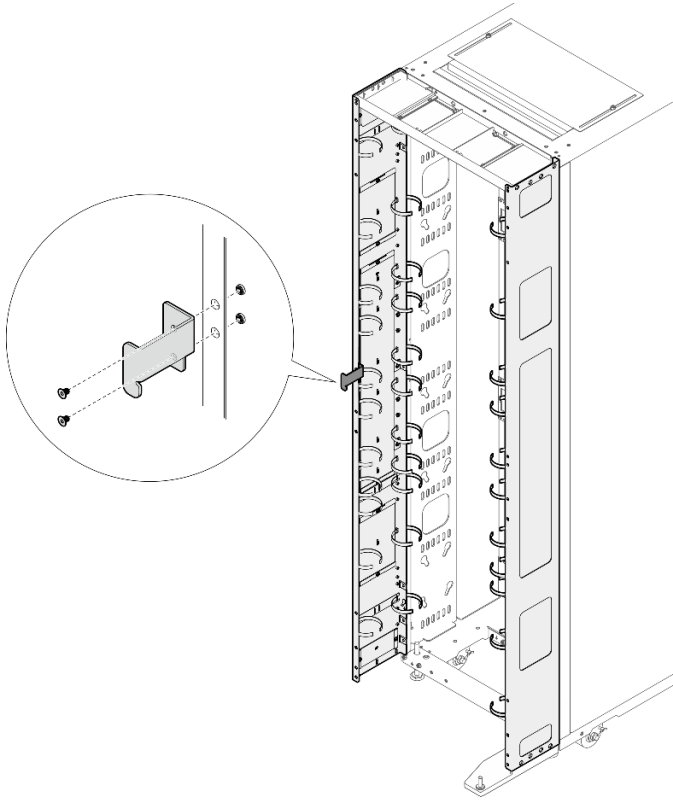
- **Remove the brush panel and baffle**



*Figure 367. Removing the brush panel and baffle*

Loosen the two screws to remove the brush panel and baffle from the top cover.

Step 8. Tighten the two screws to secure the latch plate to the left extension panel.



*Figure 368. Installing the latch plate*

Step 9. Remove the two doorstops from the right extension panel.

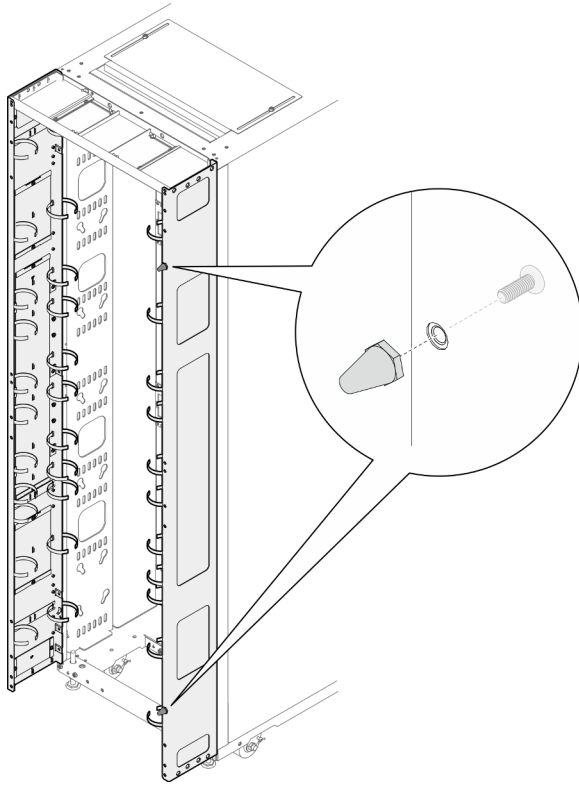


Figure 369. Removing the doorstops

Step 10. Secure the bottom hinge to the right extension panel with four screws.

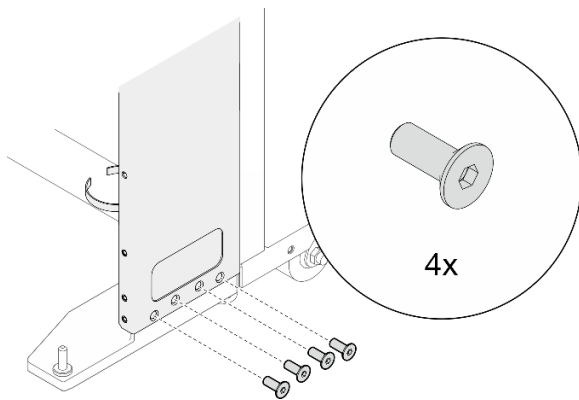
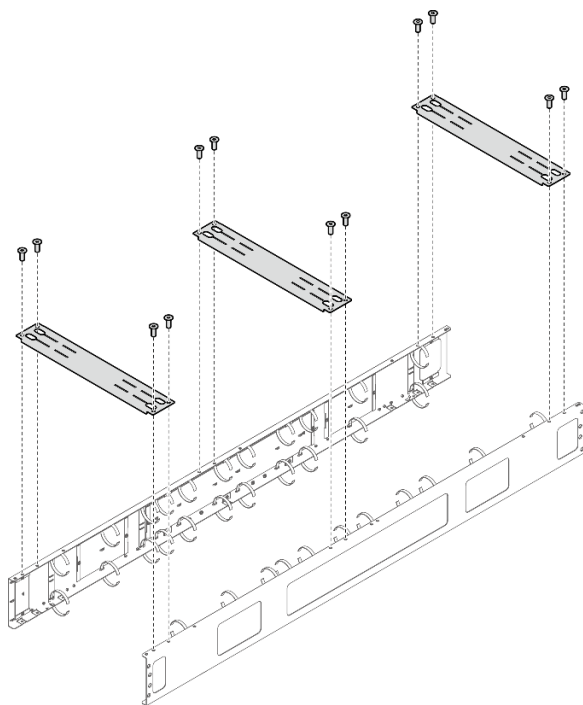


Figure 370. Securing the bottom hinge

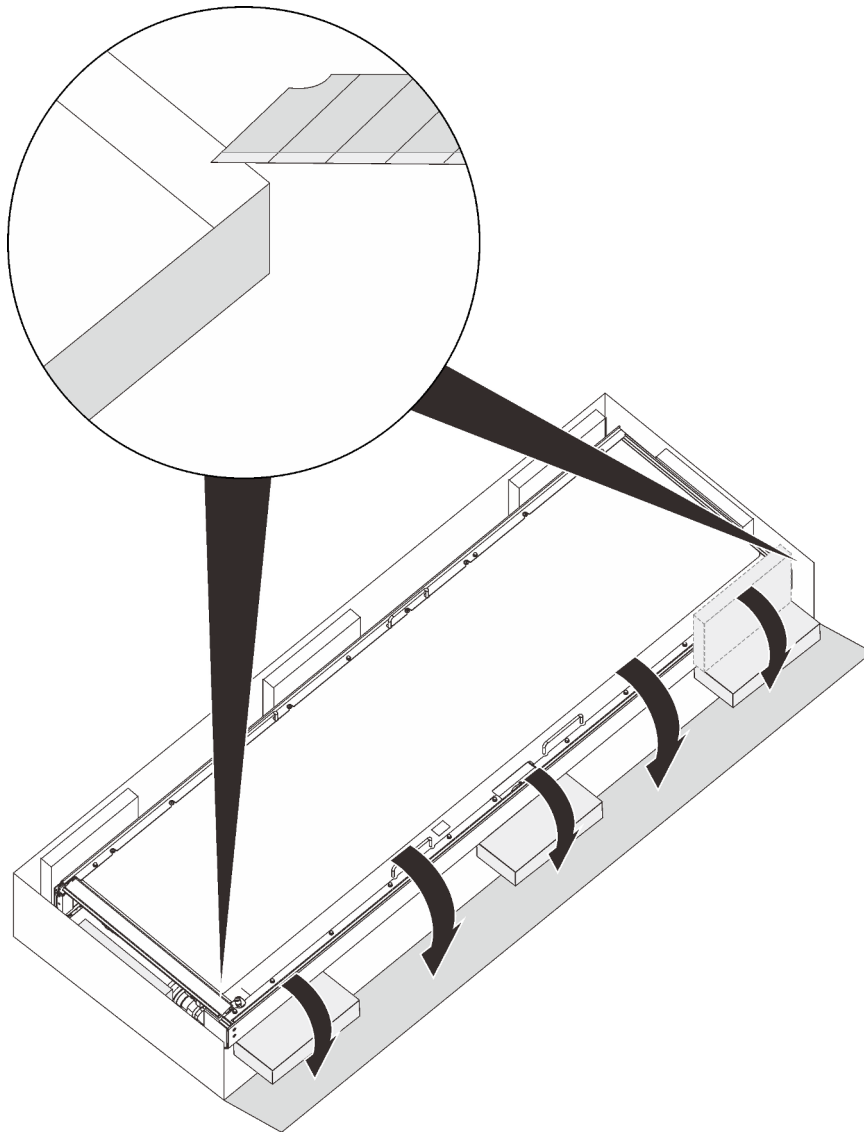
Step 11. If the rack needs to be shipped, install the three support brackets and skip steps 12 to 17.

**Note:** The support brackets must be removed upon arrival at the site to install the RDHX.



*Figure 371. Installing the support brackets*

- Step 12. Face the bottom side of the carton, remove the carton top, and slit the two carton corners on your right-hand side with a knife. Then, fold the right carton panel down to the ground, and rotate the three carton inserts down.



Bottom

*Figure 372. Unpacking the heat exchanger*

Step 13. With three people, rotate the heat exchanger to vertical on the three carton inserts. Then, remove the inner and outer hose access panels while one person hold the heat exchanger.

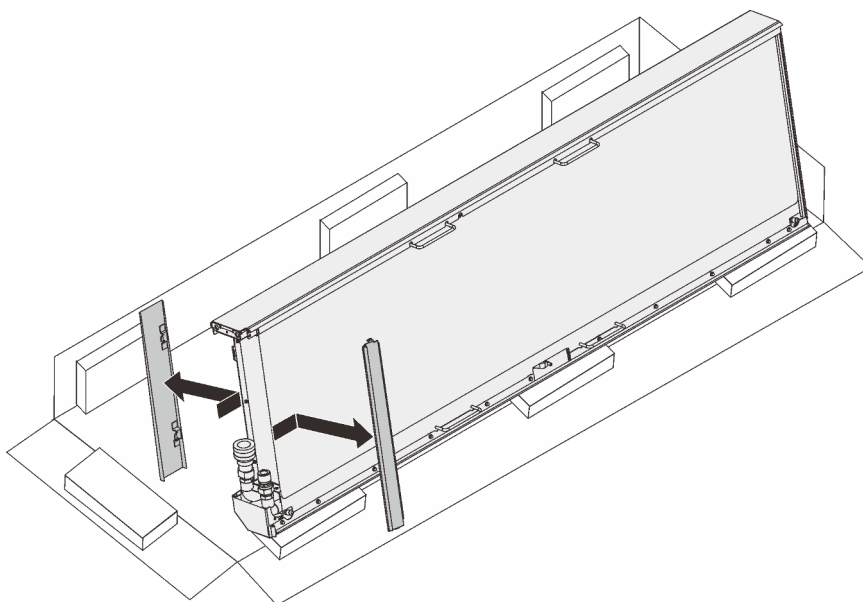


Figure 373. Removing the hose access panels

Step 14. Hold the heat exchanger with three people on the handles/spots as illustrated. Then, carefully lift the heat exchanger and turn it upright.

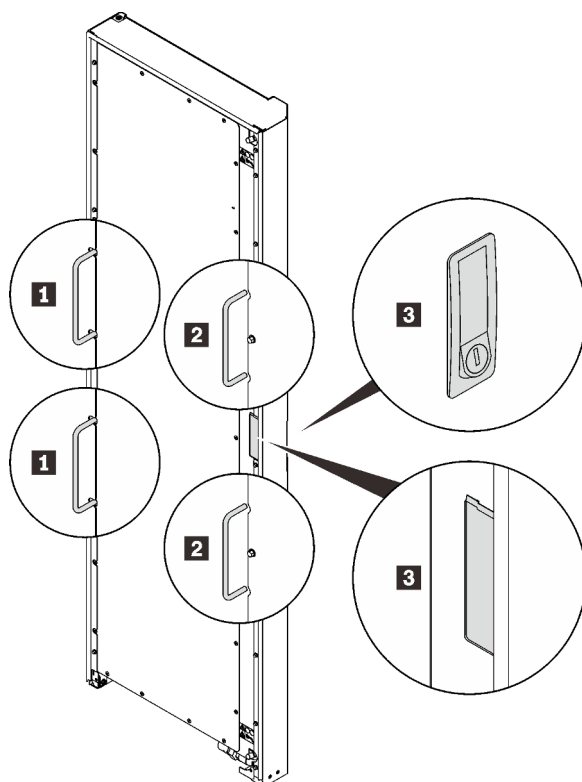
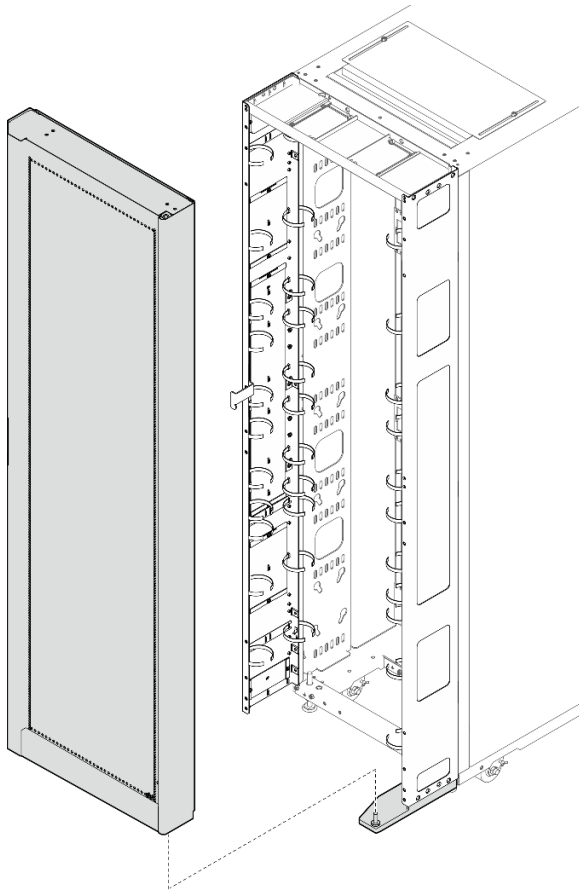


Figure 374. Lifting the heat exchanger with three people

<b>1</b> Handles that the first person hold on to	<b>3</b> Spots that the third person hold on to
<b>2</b> Handles that the second person hold on to	

Step 15. Carry the heat exchanger with three people to the cabinet frame. Align the bottom corner with the bottom hinge pin; then, lower the heat exchanger to fit the pin in.



*Figure 375. Installing the heat exchanger to the rack cabinet*

Step 16. Hold the heat exchanger in place with two people. Insert the top hinge pin to the heat exchanger; then, secure the hinge with seven screws.

**Note:** Do not fully tighten the seven screws in this step.

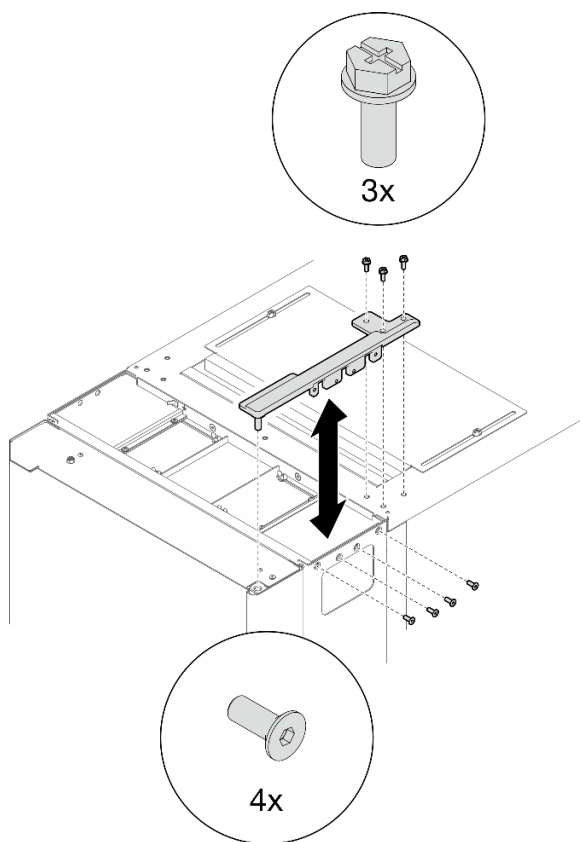


Figure 376. Installing the top hinge

Step 17. Follow the sequence below to fully tighten the screws.

**Note:** Hold the handles on the heat exchanger and slightly lift it in steps 17-a to 17-c.

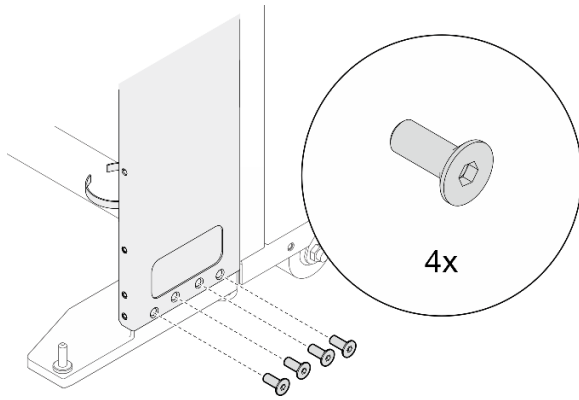
1. Four top hinge screws on the right side in [Step 16 Step 16 on page 332](#)
2. Three top hinge screws at the top in [Step 16 Step 16 on page 332](#)
3. Four bottom hinge screws in [Step 2 Step 2 on page 310](#)
4. Fourteen extension panel screws in [Step 3 Step 3 on page 311](#)

## Remove 42U Advanced Rack Extension Kit with RDHX

See this topic to learn how to remove 42U Advanced Rack Extension Kit with RDHX.

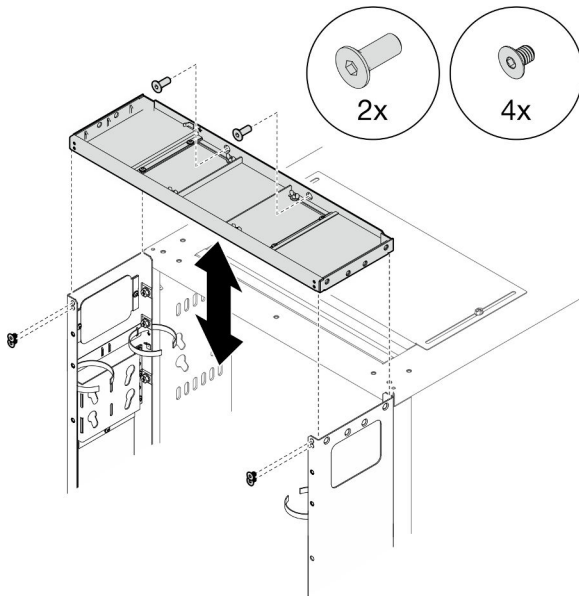
### Procedure

- Step 1. Remove the RDHX (see [“Remove Rear Door Heat eXchanger V2” on page 264](#)).
- Step 2. If any devices are installed to the extension panels, remove them (see [“Remove a 0U PDU” on page 349](#)).
- Step 3. Remove the four screws that secure the bottom hinge to the right extension panel.



*Figure 377. Removing the screws*

Step 4. Unfasten the six screws, and remove the extension top cover.



*Figure 378. Removing the extension top cover*

Step 5. Unfasten the fourteen screws, and remove the two extension panels.

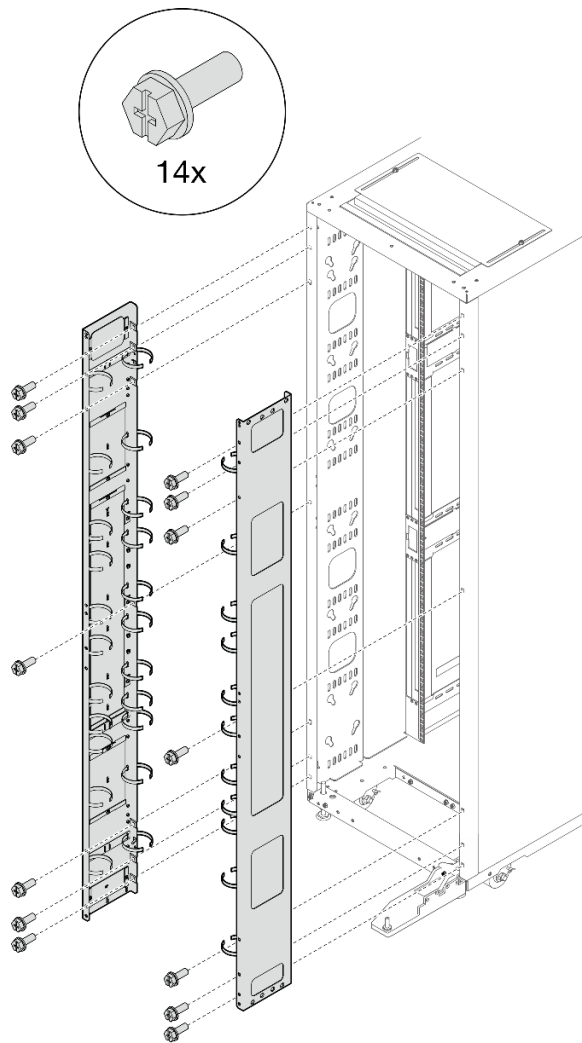


Figure 379. Removing the extension panels

Step 6. Remove the bottom hinge.

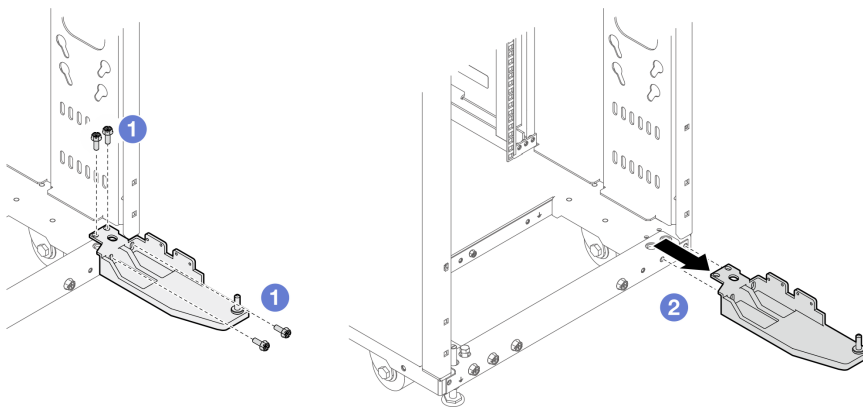


Figure 380. Removing the bottom hinge

- 1 Loosen the four screws from the hinge.

- 2 Remove the hinge from the rack.

### After this task is completed

Depending on the requirement, reinstall the door or the RDHX (see [“Remove and install a door” on page 199](#) or [“Install Rear Door Heat eXchanger V2” on page 269](#)).

## Install 42U Standard Rack Extension Kit

See this topic to learn how to install 42U Standard Rack Extension Kit.

### Notes:

- Each unit of rack extension kit comes with additional capacity of one unit 0U PDU to each side of the rack.
- Each rack cabinet supports up to two units of rack extension kit (one to the front and one to the rear side).
- If there is a plan to install baying kit while only one of the adjacent cabinets will be installed with extension, make sure to install the baying kit first (see [“Install the baying kit” on page 28](#)). Then, as preparation for this procedure, remove the two screws from the upper and lower part of the cabinet that will be installed with the rack extension kit, and jump to [Step 1 on page 336](#).

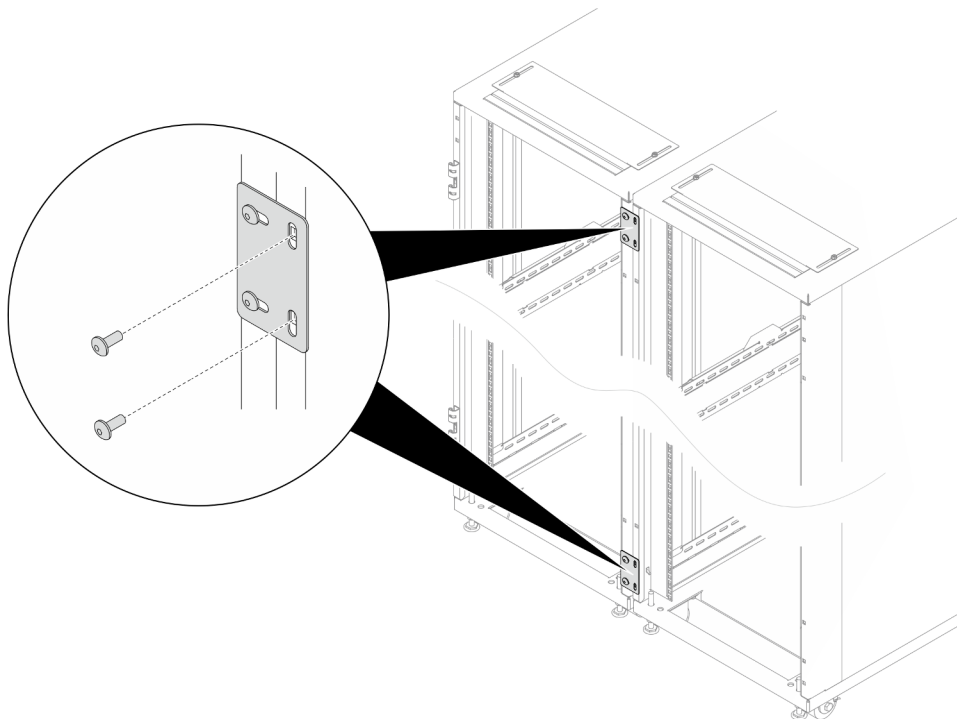
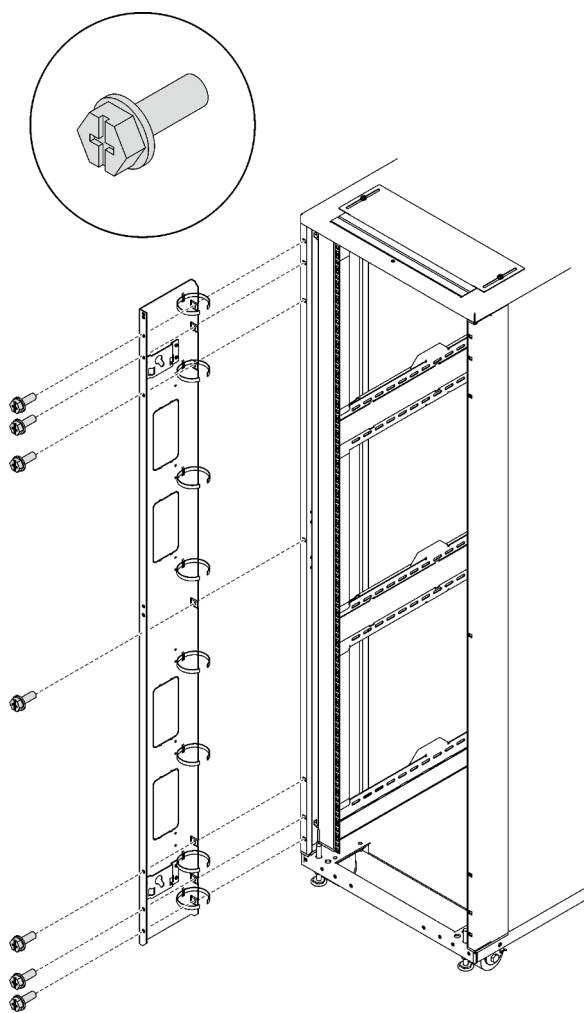


Figure 381. Removing screws to prepare for extension installation

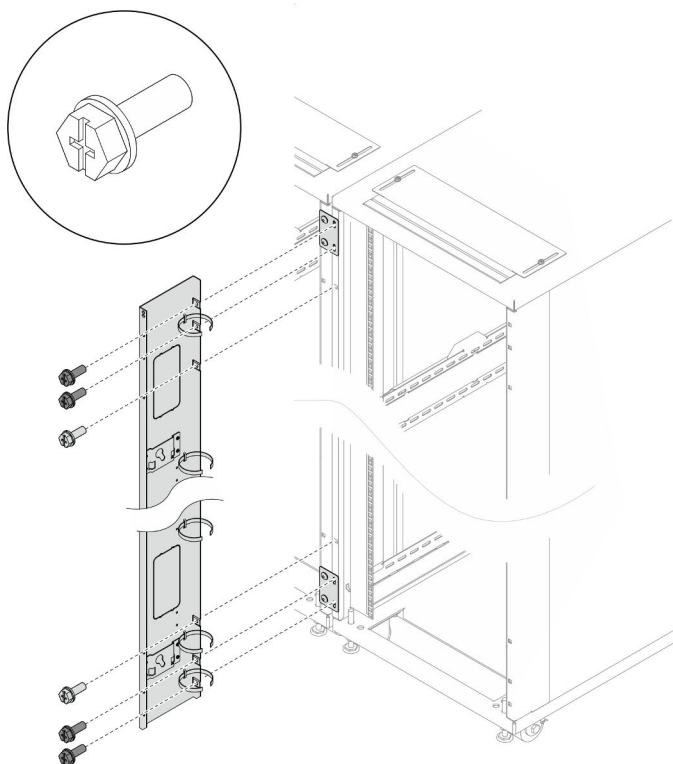
### Procedure

- Step 1. Secure an extension panel to the side of the rack with seven screws, and repeat the step on the other extension panel.

**Note:** It is advised not to fully tighten the screws in this step.



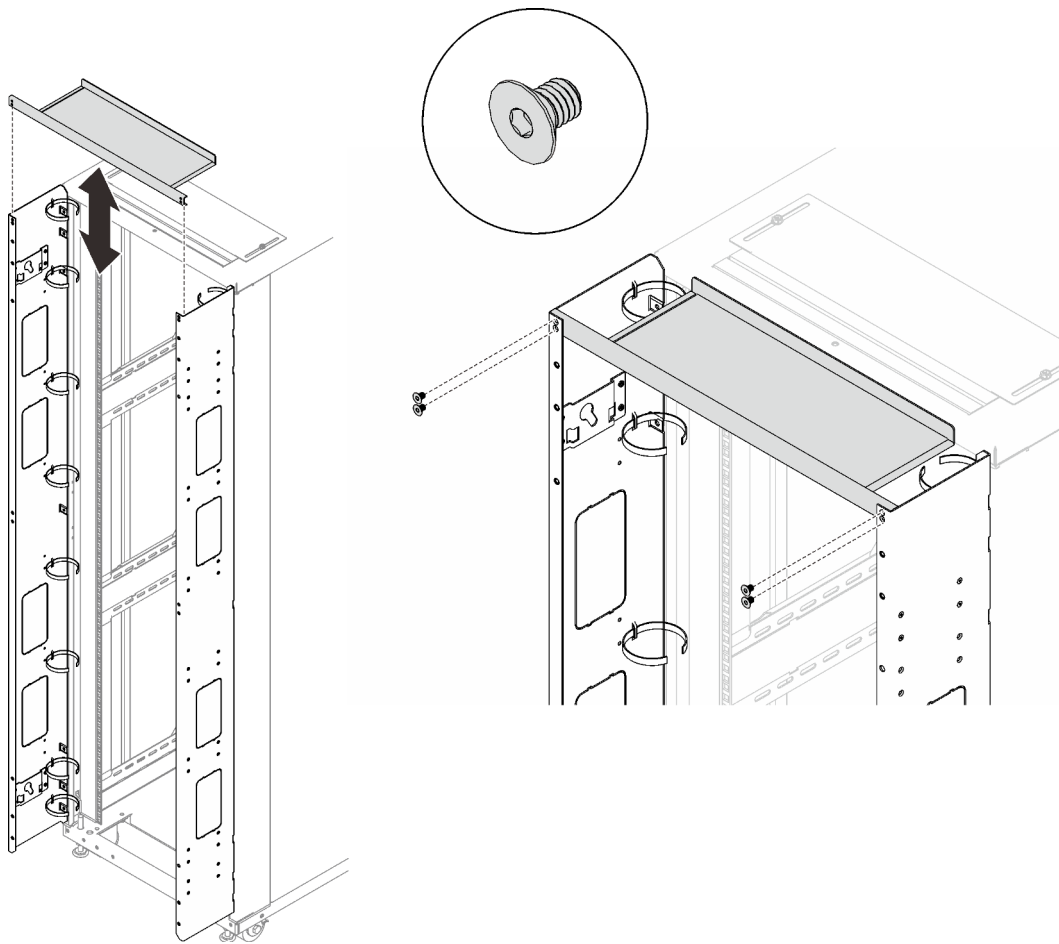
*Figure 382. Installing an extension panel*



*Figure 383. Installing an extension panel (with baying kit)*

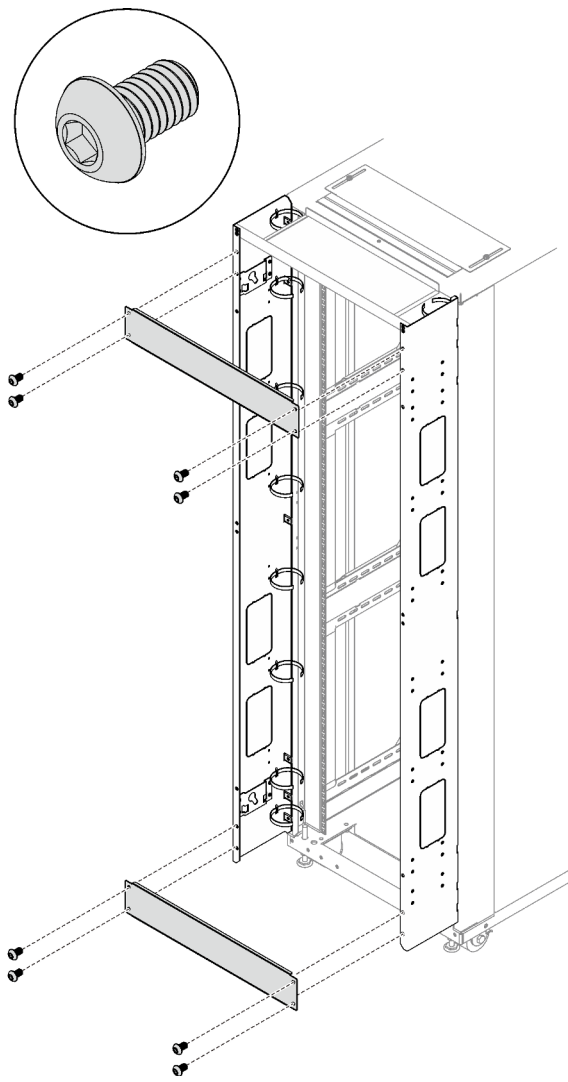
**Note:** If baying kit has been installed previously, make sure to remove the two screws from top and bottom of the cabinet first. Then, secure the screws through the panel and the baying kit.

Step 2. Align the extension top cover with the screw holes on the front of the rack, and secure each side with two screws.



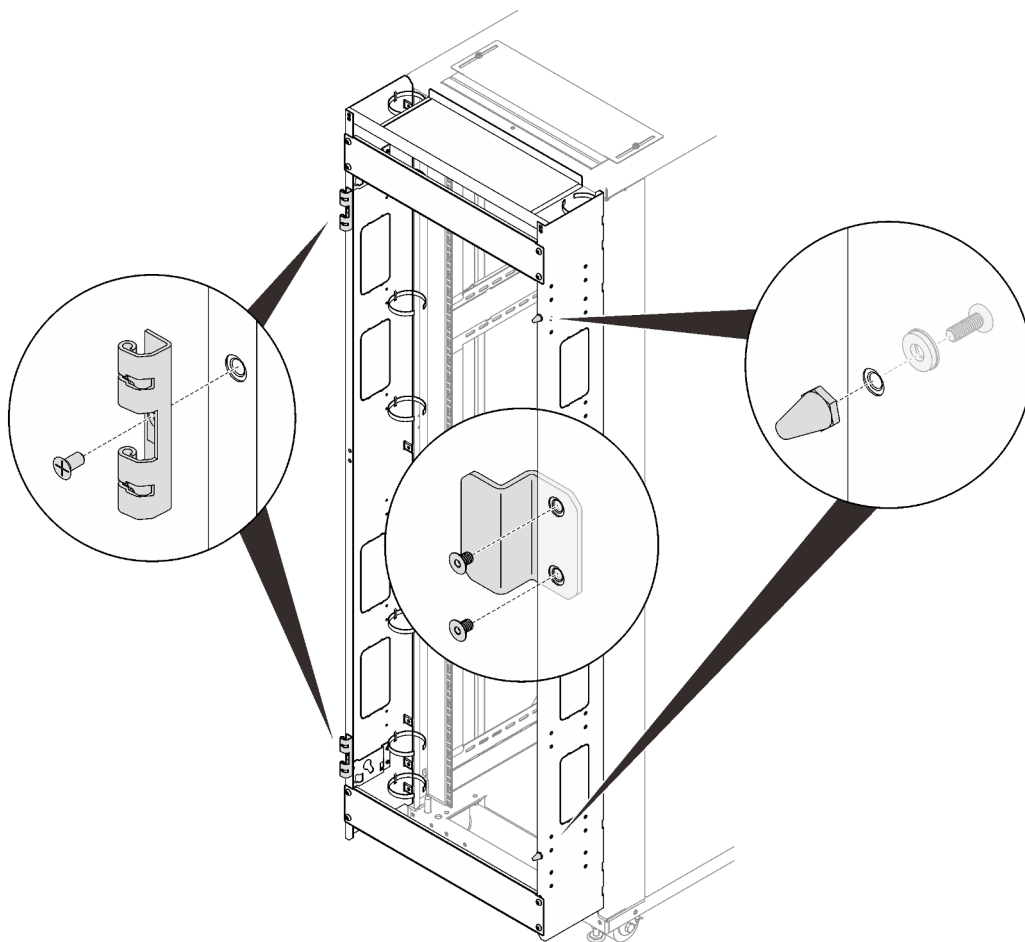
*Figure 384. Installing the extension top cover*

- Step 3. Secure each of the two support brackets to the extension panels with four screws. If the extension panel screws have not been fully tightened, tighten them now.



*Figure 385. Installing the support brackets*

Step 4. Install the two hinges, two doorstops, and the door latch to the rack.



*Figure 386. Install the hinges, doorstops, and door latch*

Step 5. Install the door back to the rack.

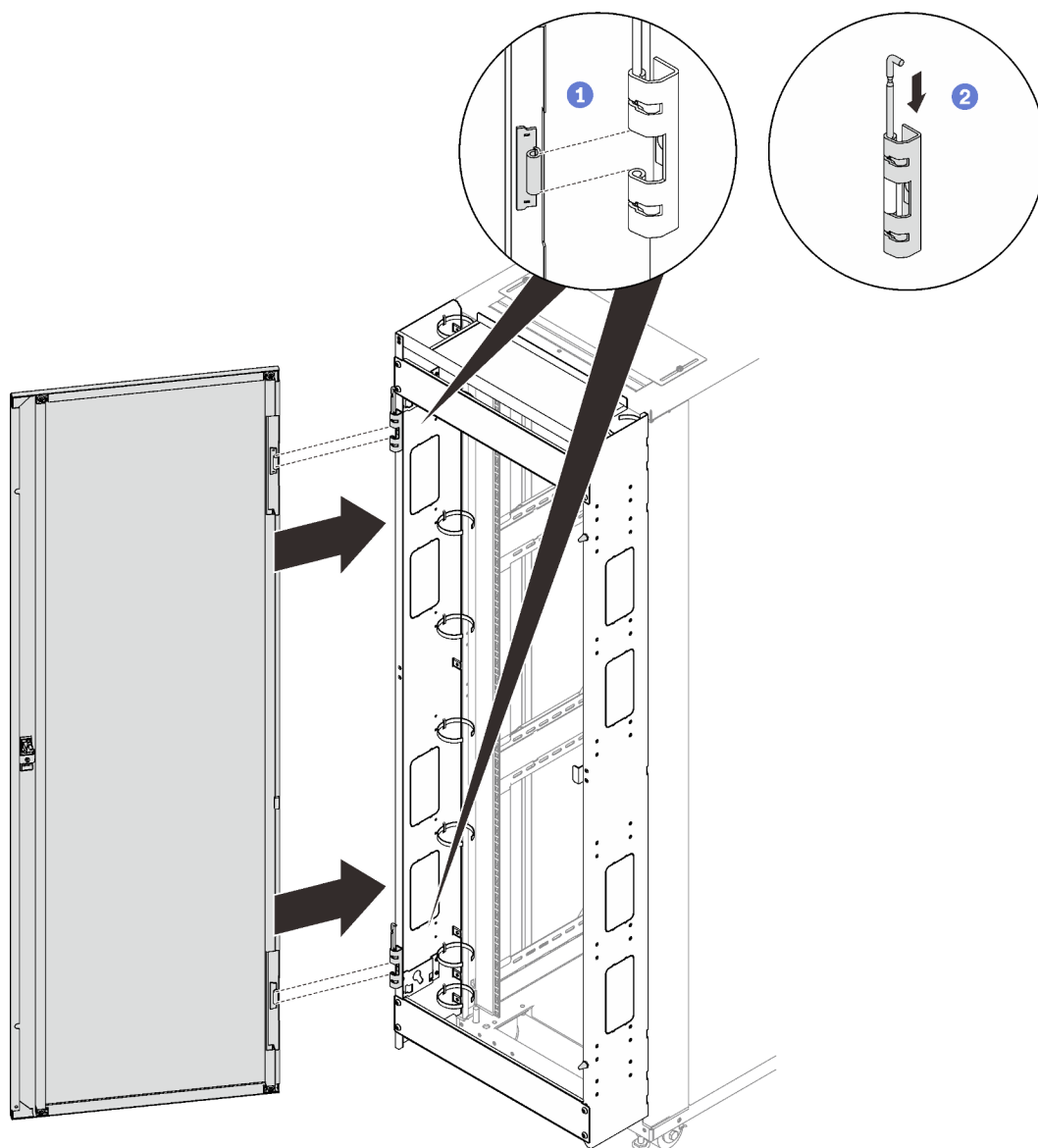


Figure 387. Installing the door

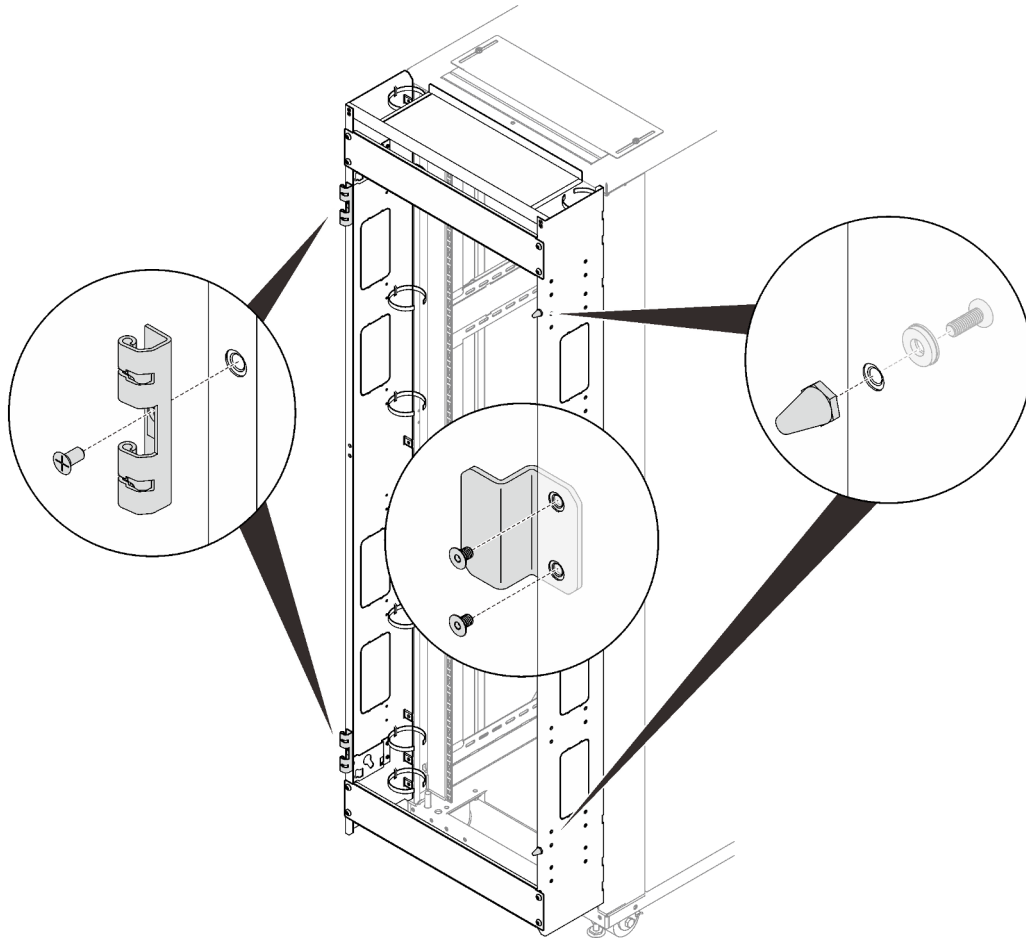
- 1 Align the door with the hinges, and hold the door in place.
- 2 Push the hinge pins down to the closed position so that the door is secured.

## Remove 42U Standard Rack Extension Kit

See this topic to learn how to remove 42U Standard Rack Extension Kit.

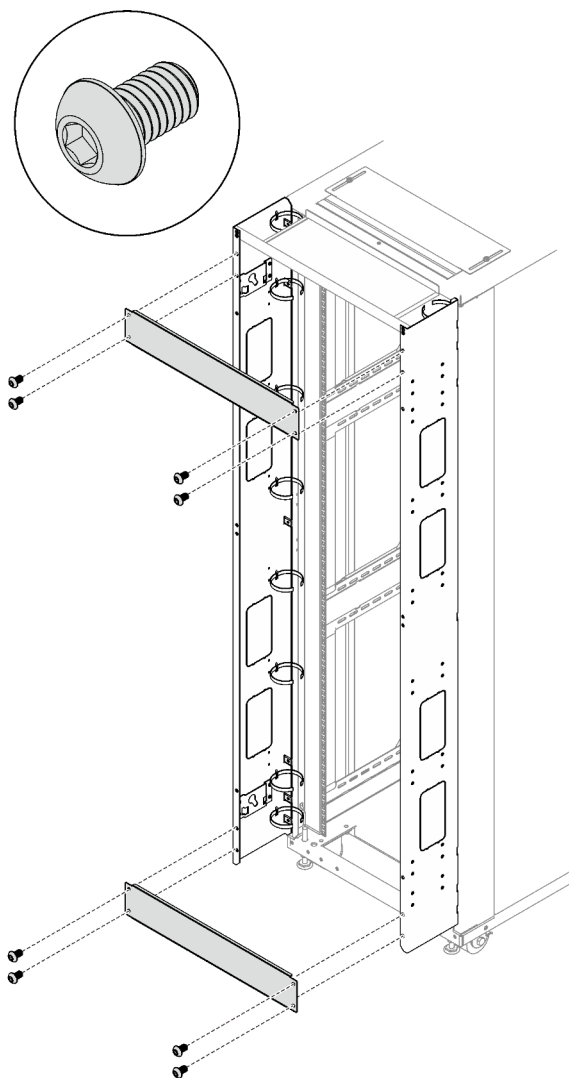
### Procedure

- Step 1. If any devices are installed to the extension panels, remove them (see [“Remove a 0U PDU” on page 349](#) or [“Remove a 1U PDU or console switch from the rack side” on page 353](#)).
- Step 2. Remove the door from the rack cabinet (see [“Remove a door” on page 199](#)).
- Step 3. Remove the two hinges, two door stops, and the door latch if necessary.



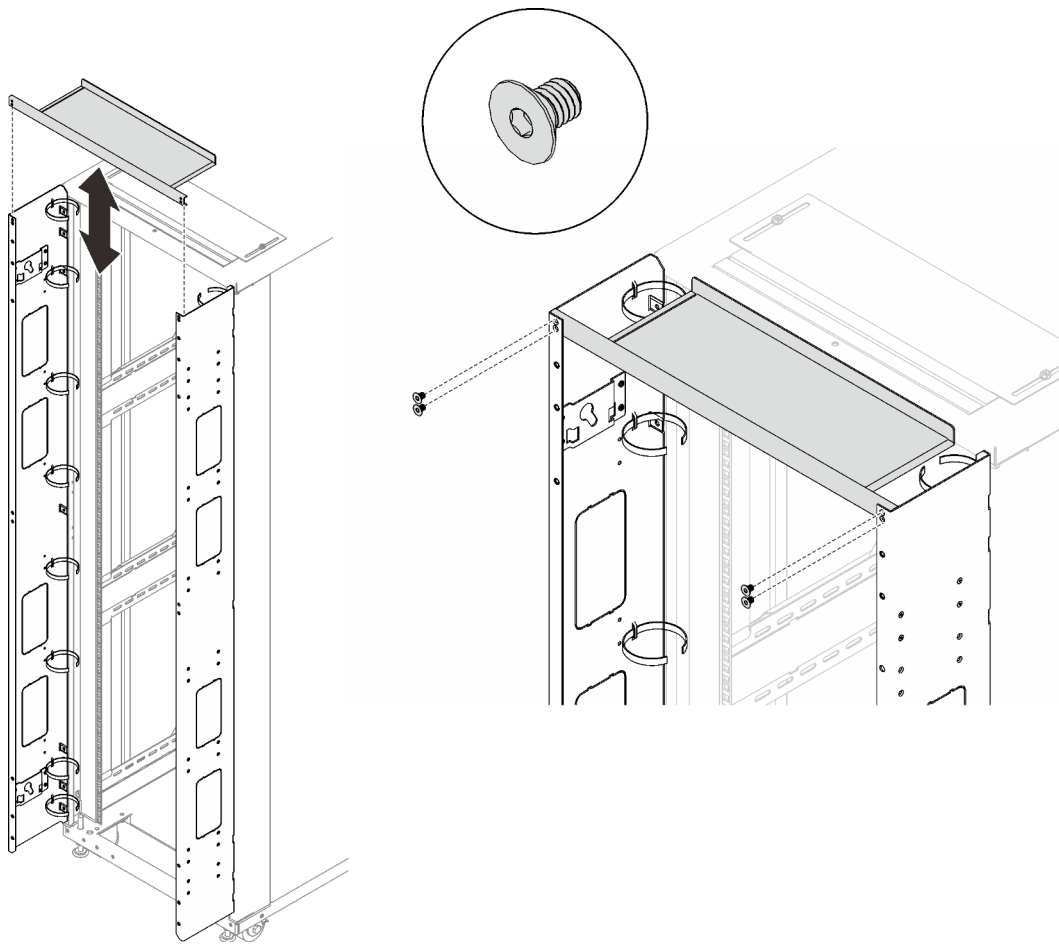
*Figure 388. Removing the door hinges, doorstops and latch*

- Step 4. Remove the four screws that secure each of the two support brackets, and remove the support brackets.



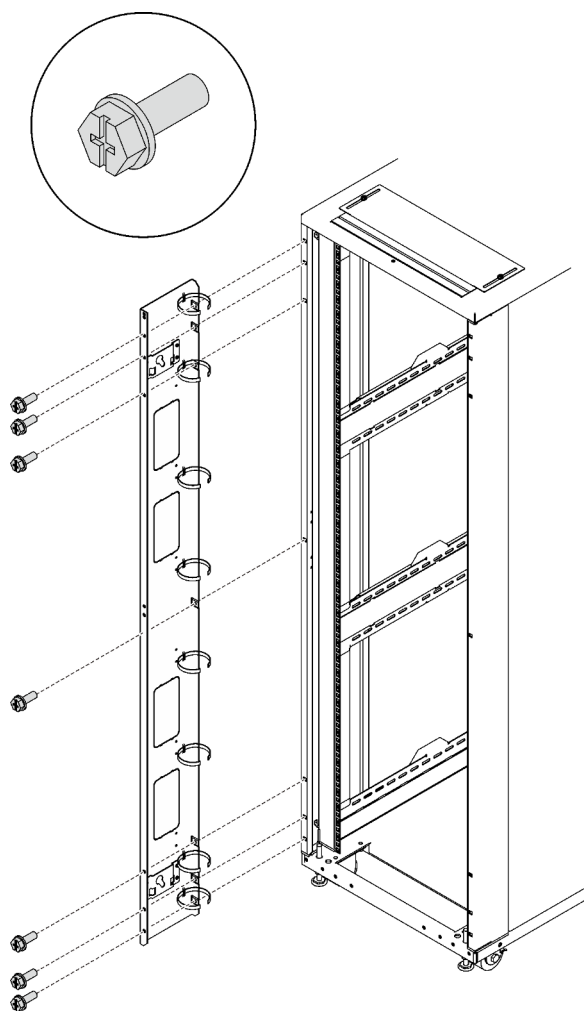
*Figure 389. Removing the support brackets*

Step 5. Remove the four screws that secure the top cover, and remove the cover.



*Figure 390. Removing the extension top cover*

- Step 6. Remove the seven screws that secure the extension panel, and repeat the step on the other extension panel.



*Figure 391. Installing an extension panel*

### **After this task is completed**

Complete the following steps to install the door back to the rack if necessary.

1. Install the door latch.

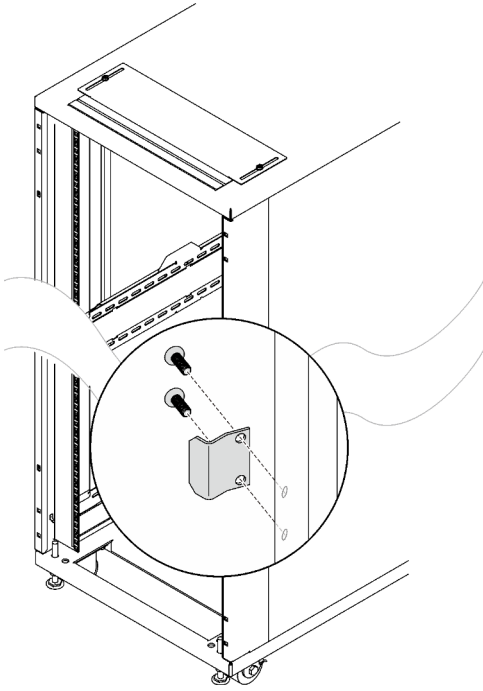


Figure 392. Installing the door latch

2. Install the two hinges and the two doorstops.

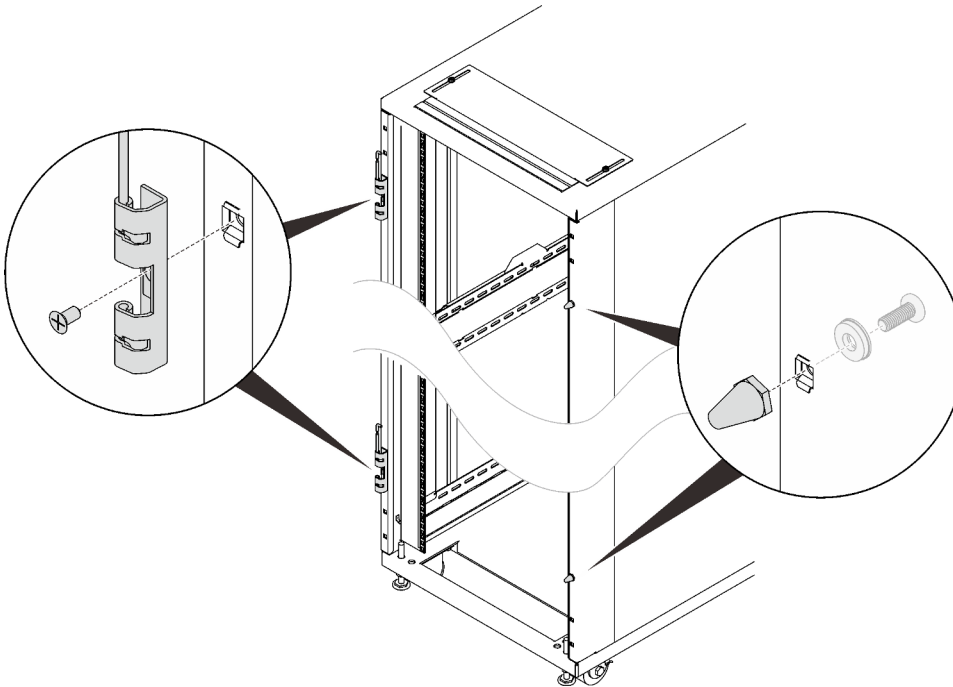


Figure 393. Installing the hinges and doorstops

3. Install the door.

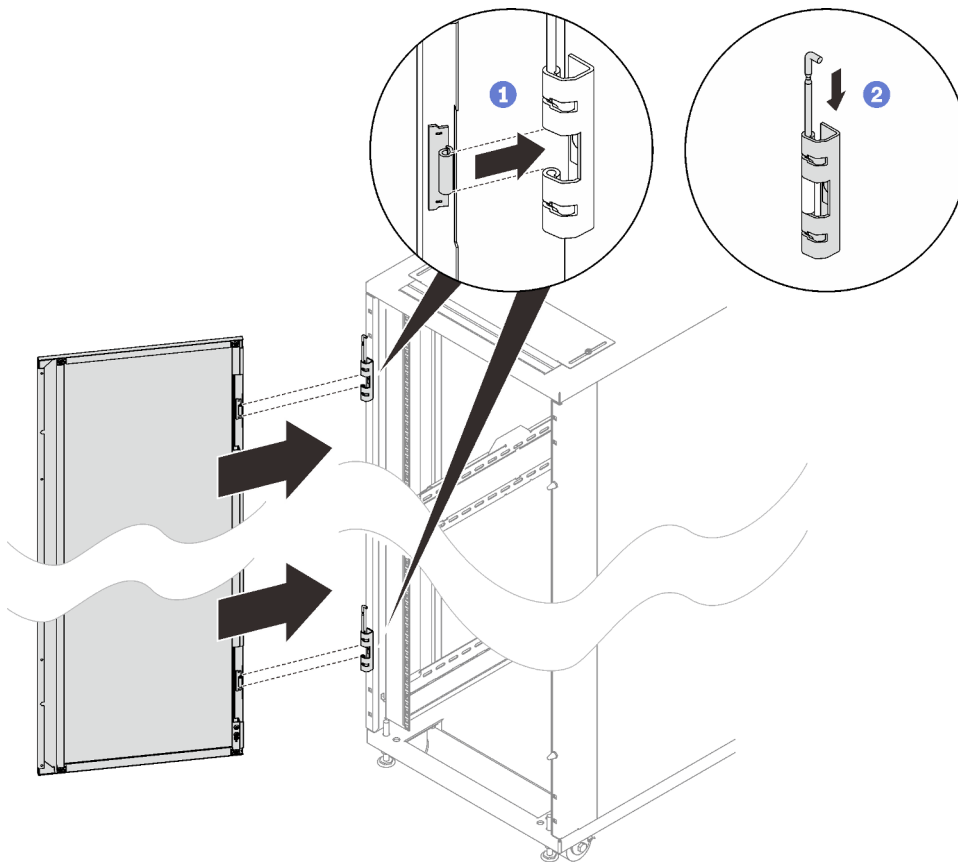


Figure 394. Installing the door

- 1 Align the door with the hinges, and hold the door in place.
- 2 Push the hinge pins down to the closed position so that the door is secured.

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## Installing and removing power distribution units or switches

See this topic to learn how to remove and install power distribution units or switches.

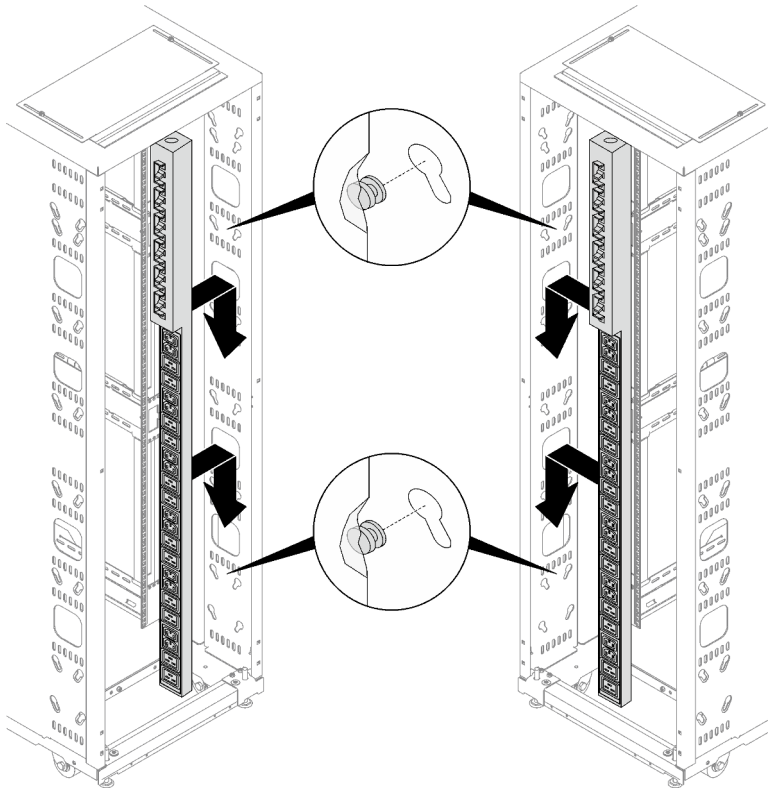
### Install and remove a 0U PDU

See this topic to learn how to install and remove a 0U PDU.

#### Install a 0U PDU

##### Procedure

- Step 1. Insert the two PDU pegs into the keyhole slots in the side of the rack cabinet, and push down the PDU to secure it to the rack.



*Figure 395. Installing a 0U PDU*

**Note:** 0U PDU can be installed with sockets facing either rear or center of the rack cabinet.

## **Remove a 0U PDU**

### **Procedure**

Step 1. Lift the PDU to detach it from the rack, and remove it.

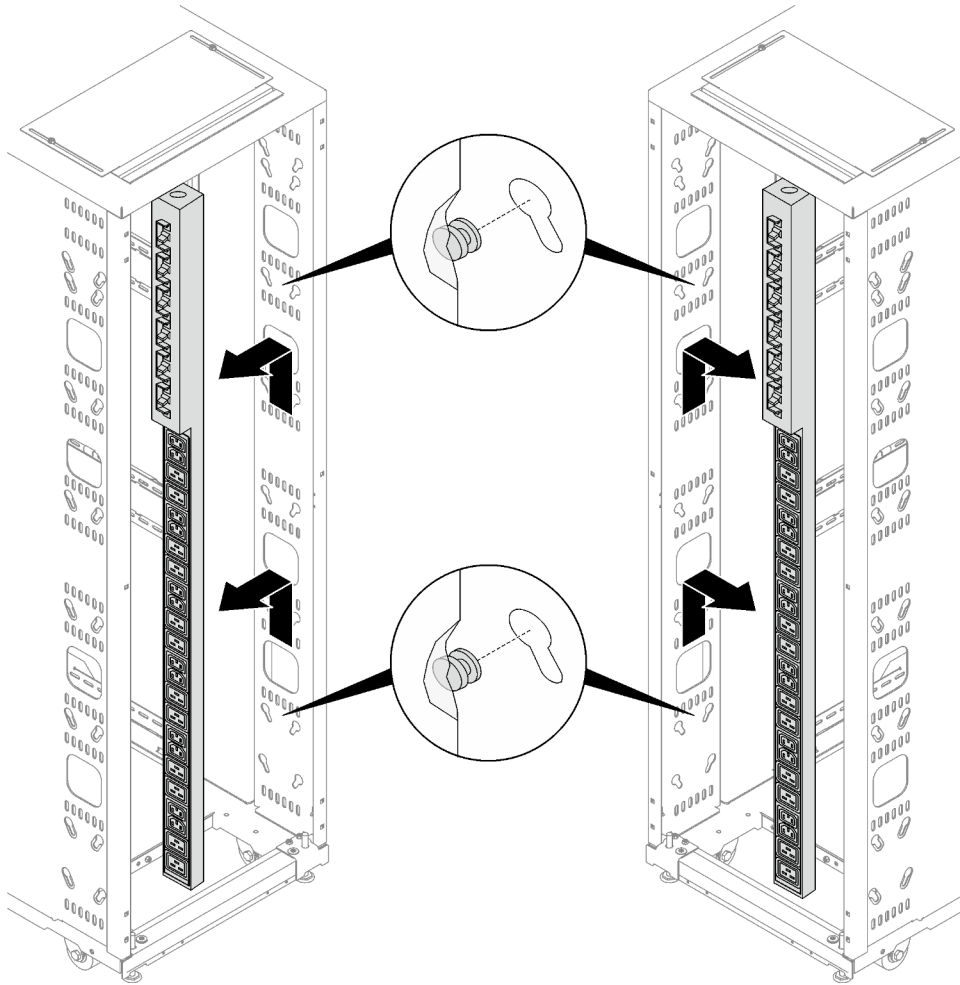


Figure 396. Removing a 0U PDU

## Install or remove a 1U device into or from the rack side

See this topic to learn how to install or remove a 1U device into or from the rack side.

### About this task

S001





**DANGER**

Electrical current from power, telephone, and communication cables is hazardous.  
To avoid a shock hazard:

- Connect all power cords to a properly wired and grounded electrical outlet/source.
- Connect any equipment that will be attached to this product to properly wired outlets/sources.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- The device might have more than one power cord, to remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

#### S013



**DANGER**

Overloading a branch circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards, ensure that your system electrical requirements do not exceed branch circuit protection requirements. Refer to the information that is provided with your device for electrical specifications.

#### S014



#### **CAUTION:**

Hazardous voltage, current, and energy levels might be present. Only a qualified service technician is authorized to remove the covers where the label is attached.

#### R009



#### **CAUTION:**

Removing components from the upper positions in the Enterprise Rack cabinet improves rack stability during relocation. Follow these general guidelines whenever you relocate a populated rack cabinet within a room or building:

- Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must do the following:
  - Remove all devices in the 32 U position and above.
  - Make sure that the heaviest devices are installed in the bottom of the rack cabinet.
  - Make sure that there are no empty U positions between devices installed in the rack cabinet below the 32 U position.
- If the rack cabinet that you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.
- Inspect the route that you plan to take, to eliminate potential hazards.
- Make sure that the route that you choose can support the weight of the loaded rack cabinet. See the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.
- Make sure that all door openings are at least 760 x 2030 mm (30 x 80 in.)
- Make sure that all devices, shelves, drawers, doors, and cables are secure.
- Make sure that the four leveling pads are raised to their highest positions.
- Make sure that no stabilizer bracket is installed on the rack cabinet.
- Do not use a ramp that is inclined more than 10 degrees.
- When the rack cabinet is in the new location, do the following:
  - Lower the four leveling pads.
  - Install stabilizer brackets on the rack cabinet.
  - If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.

If a long-distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also, lower the leveling pads to raise the casters off the pallet and bolt the rack cabinet to the pallet.

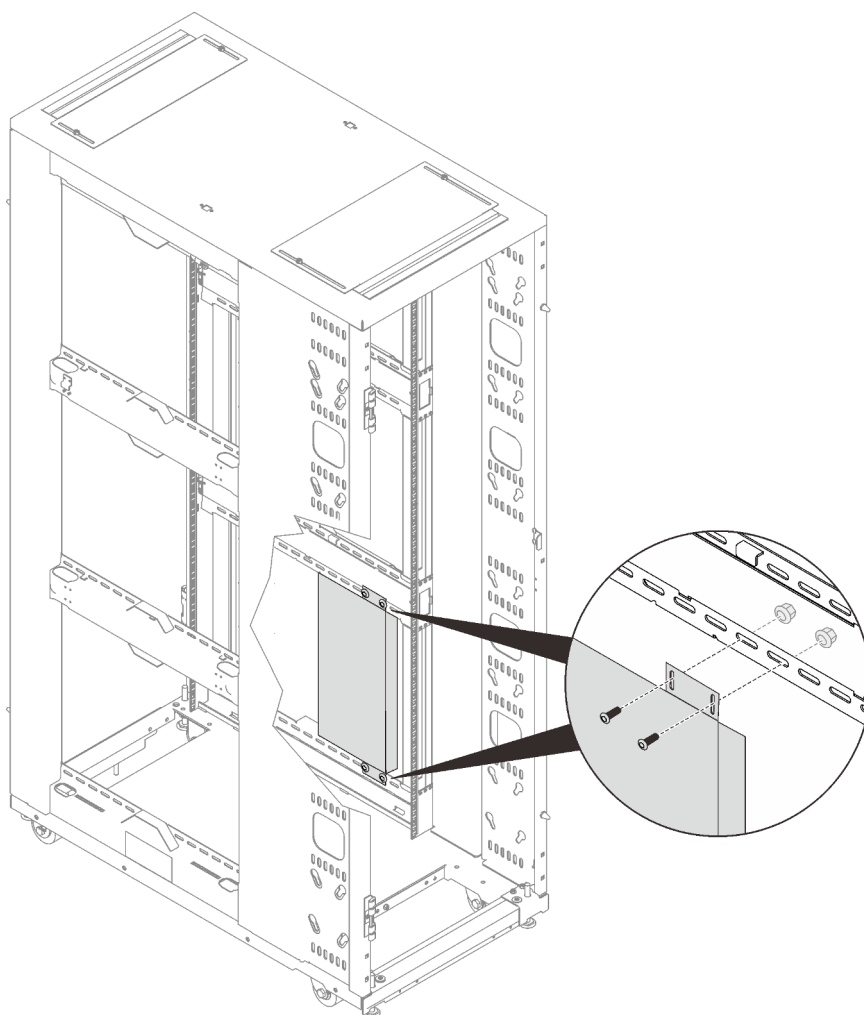
This cabinet supports up to four units of 1U devices that are installed to the rack side.

**Note:** Each rack side space only allows two units of 1U or two units of 0U devices to be installed at the same time. Mixing 1U and 0U devices on the same rack side is not feasible.

## **Install a 1U PDU or console switch to the rack side**

### **Procedure**

- Step 1. Refer to the document that comes with the device, and install the mounting brackets if necessary.
- Step 2. Align the mounting brackets with the holes in the rack flange, and secure it with four sets of screw and nut.

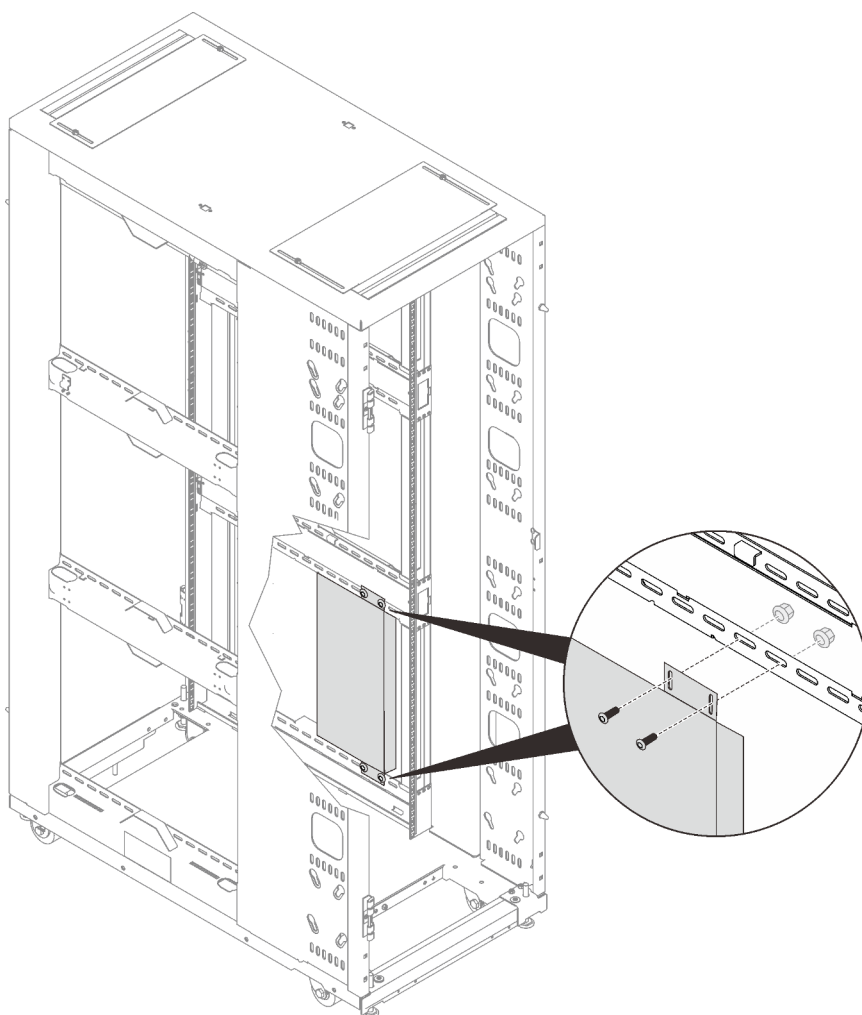


*Figure 397. Installing a 1U device into the rack side*

## **Remove a 1U PDU or console switch from the rack side**

### **Procedure**

Step 1. Remove the four screws and nuts that secure the device, and remove the device.



*Figure 398. Removing a 1U device from the rack side*

## Installing and removing a 1U device in/from the side pocket

See this topic to learn how to install or remove a 1U PDU or console switch in the side pocket.

### About this task

Make sure to complete all the required cable connection and device setup before installing baying kits to the cabinets, as these tasks will be hard to operate afterwards.

### Procedure

- Step 1. Refer to the document that comes with the device, and install the mounting brackets if necessary.
- Step 2. Remove the side cover next to the side pocket (see [“Remove a side cover” on page 197](#)).
- Step 3. Install the device.

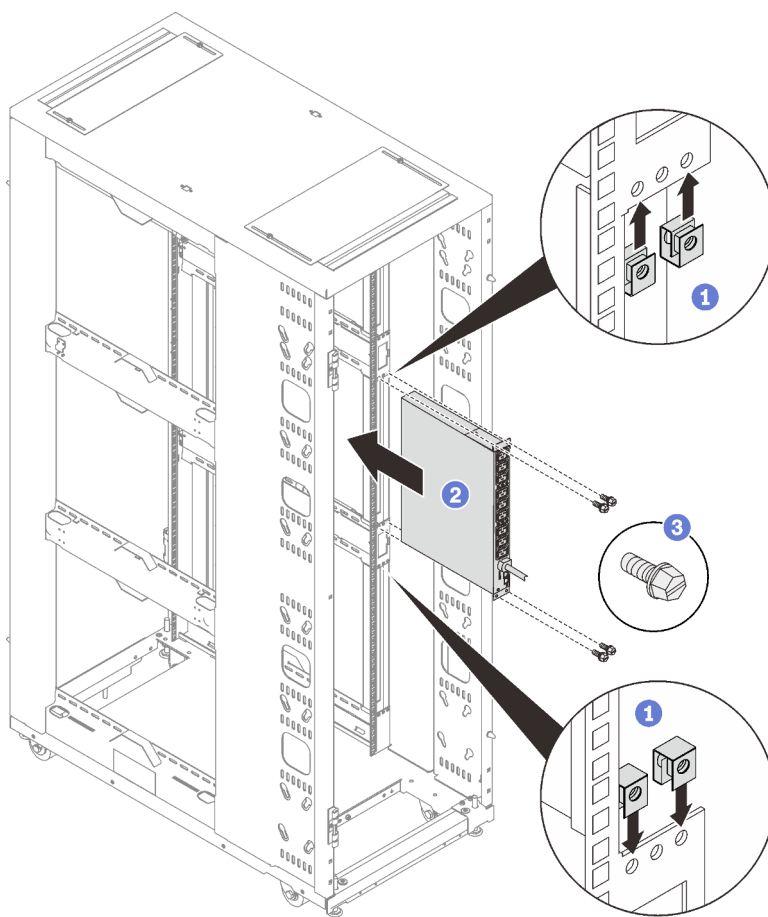


Figure 399. Installing a 1U PDU or console switch

- 1 Install four M6 clip nuts on the rack flanges as shown in the illustration.
- 2 Slide the device all the way into the side pocket.
- 3 Secure the device with four M6 screws.

Step 4. Complete all the required cable connection and setup of the device. Refer to the document that comes with the device for details.

- Make sure to complete all the required cable connection and device setup before installing baying kits to the cabinets, as these tasks will be hard to operate afterwards.
- It is advised to complete all the cable connection and setup task for the device before installing the side cover back.

Step 5. Install the side cover back (see [“Install a side cover” on page 197](#)).

## Remove a 1U device from the side pocket

### Procedure

Step 1. Remove the device.

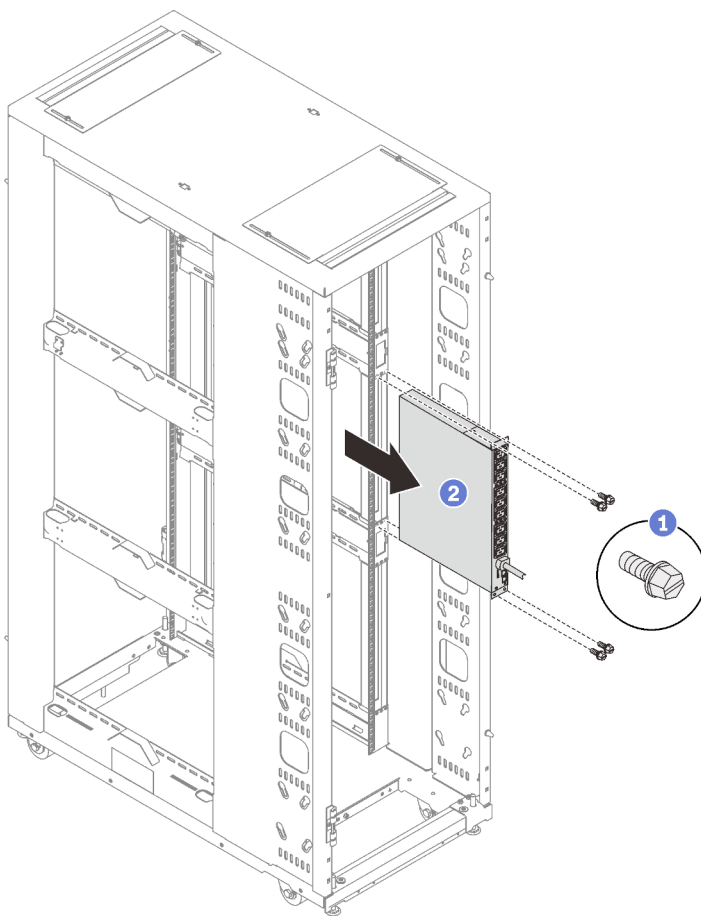


Figure 400. Removing a 1U PDU or console switch

- 1 Remove the four M6 screws.
- 2 Slide the device all the way out from the side pocket.

---

## Install and remove the outriggers

Outriggers enhance stability of a single unit of rack cabinet. See this topic to learn how to install and remove the outriggers.

### Remove the outriggers

#### About this task

**Notes:** To maintain balance of the rack cabinet, **do not** remove the outriggers except the following situations:

- when two or more rack cabinets are connected with the baying kit.
- when the rack cabinet is secured to the floor with stabilizer.

#### Procedure

- Step 1. Extend each of the four leveling pads in turns until they firmly contact the floor and support the rack cabinet. Make sure the cabinet is balanced by gently pushing the cabinet. If it tilts, adjust the length of the leveling pads until the cabinet is well balanced.

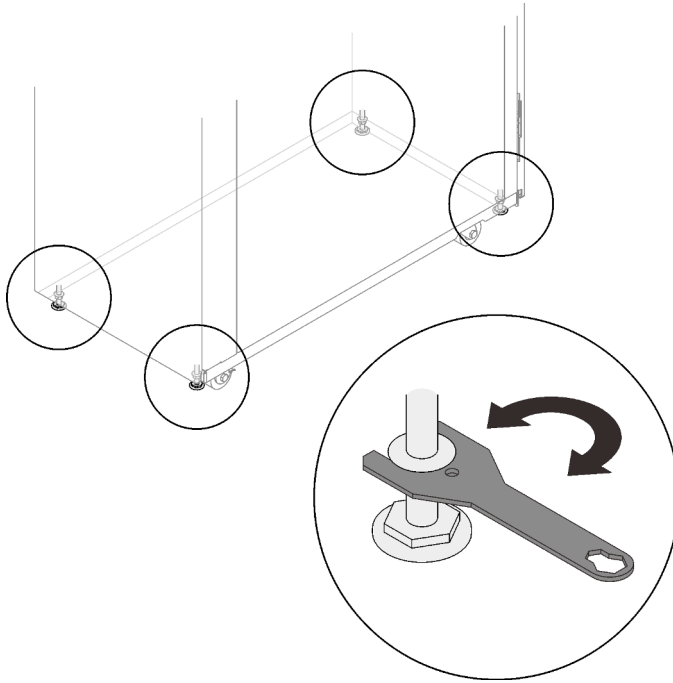


Figure 401. Lowering the leveling pads

- Step 2. Remove the outrigger stabilizing bars, and remove them.

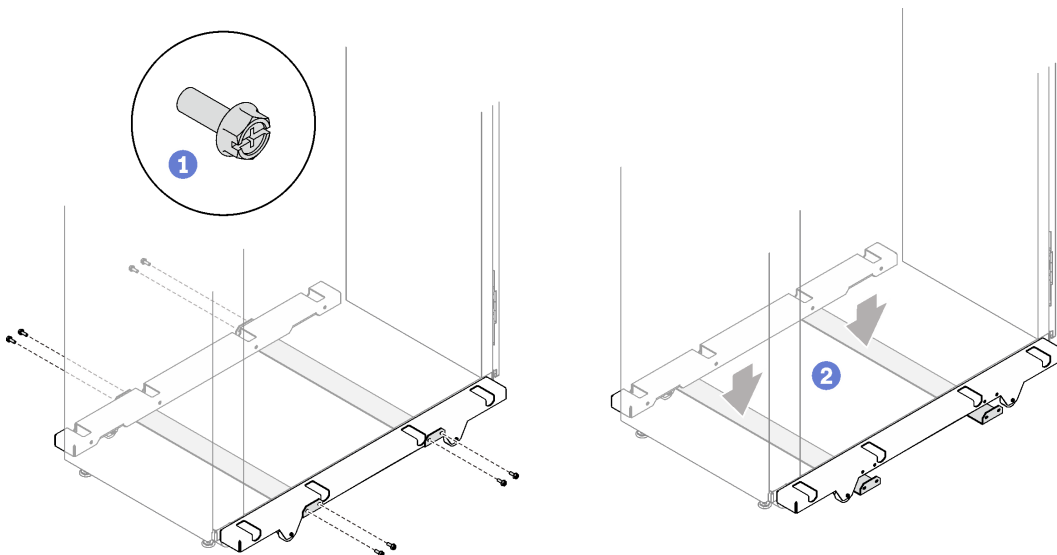
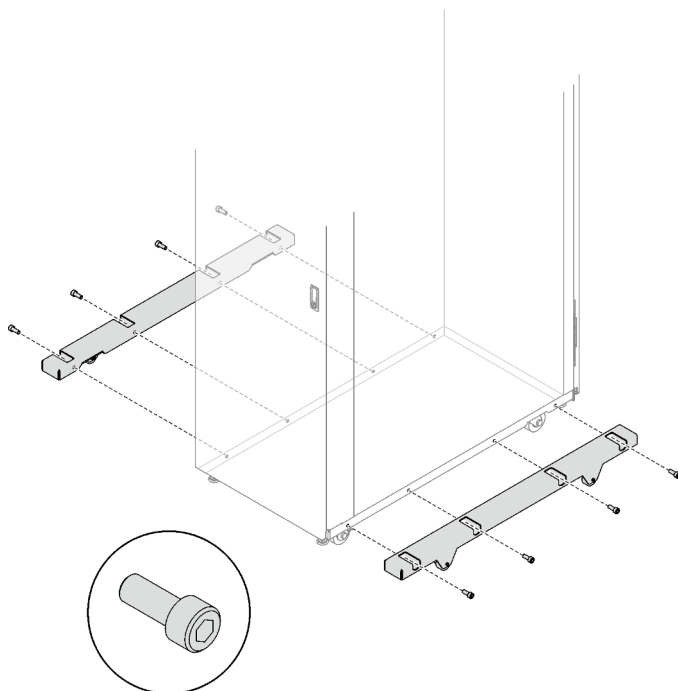


Figure 402. Removing the outrigger stabilizing bars

- 1 Remove the eight screws that secure the two bars to the rack cabinet.
  - 2 Place the two stabilizing bars on the ground, and remove the bars.
- Step 3. Remove the four screws that secure each of the outriggers, and remove the outriggers.

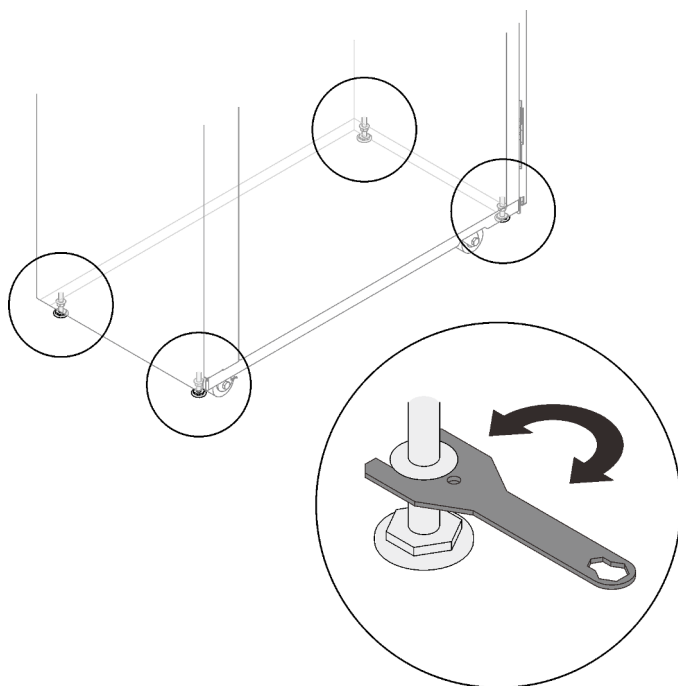


*Figure 403. Removing the outriggers*

## **Install the outriggers**

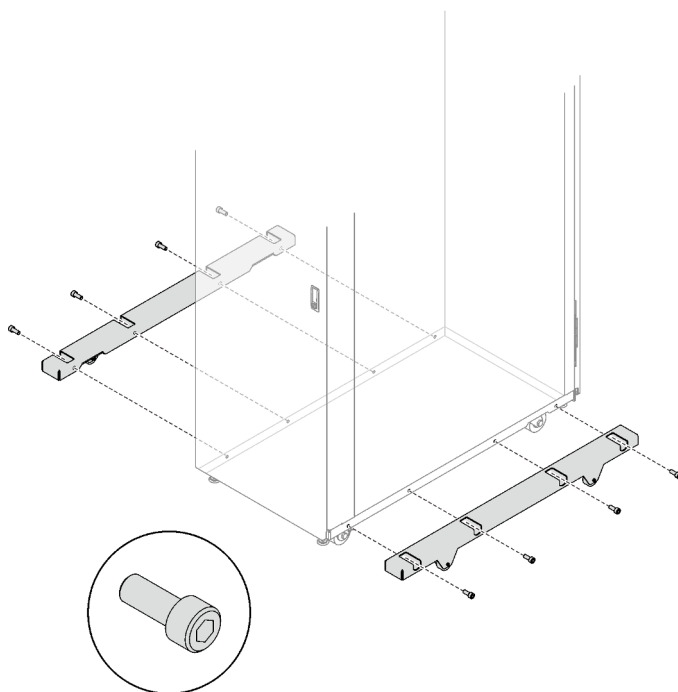
### **Procedure**

- Step 1. Extend each of the four leveling pads in turns until they firmly contact the floor and support the rack cabinet. Make sure the cabinet is balanced by gently pushing the cabinet. If it tilts, adjust the length of the leveling pads until the cabinet is well balanced.



*Figure 404. Lowering the leveling pads*

Step 2. Secure each of the outriggers with four screws.



*Figure 405. Installing the outriggers*

Step 3. Install the outrigger stabilizing bars.

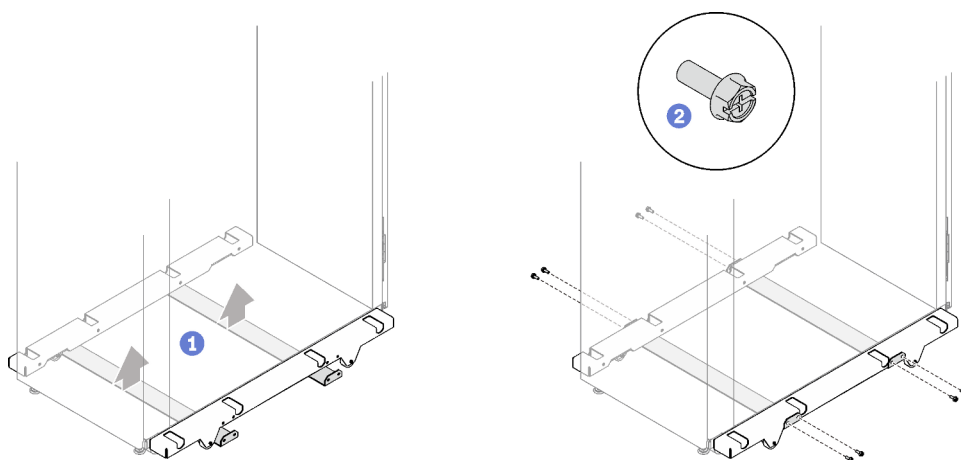


Figure 406. Installing the outrigger stabilizing bars

- 1 Align the two stabilizing bars with the bottom of the rack cabinet.
- 2 Secure the two stabilizing bars with eight screws.

Step 4. If you intend to move the rack cabinet, shorten the leveling pads until the cabinet weight is solely on the outriggers.

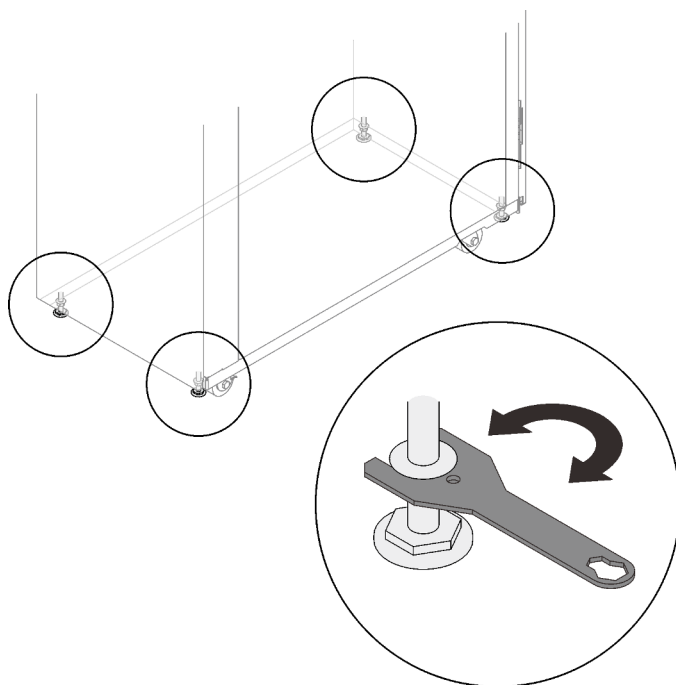


Figure 407. Shortening the leveling pads

## Installing and removing cable management brackets

See this topic to learn how to remove and install the cable management brackets.

### Remove a cable management bracket

See this topic to learn how to remove a cable management bracket.

## Remove a 21U front cable management bracket

### Procedure

- Step 1. Open the front door, and release all the cables that are secured by the cable straps on the bracket.
- Step 2. Remove the six screws that secure the front cable management bracket, and remove the clip nuts.

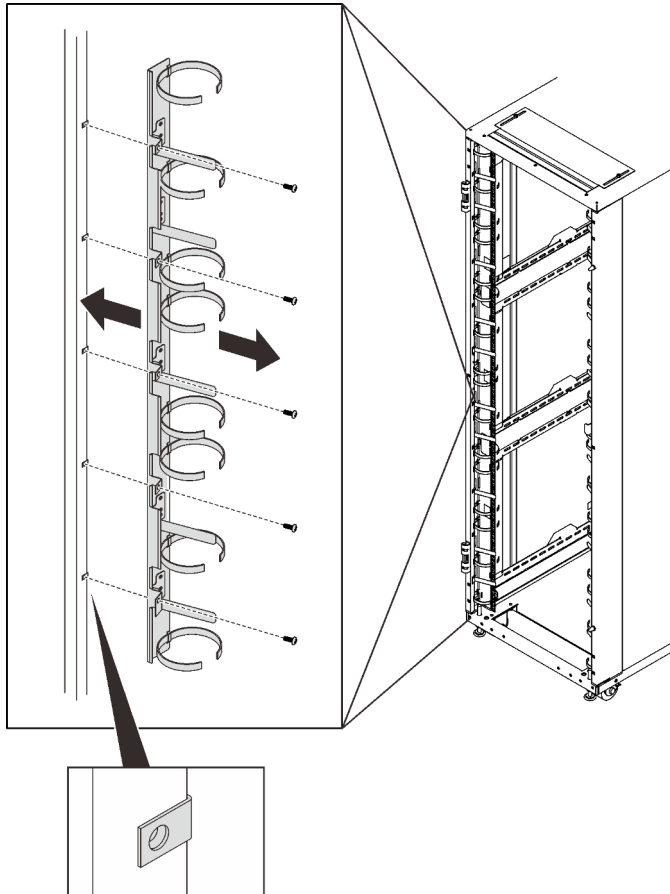
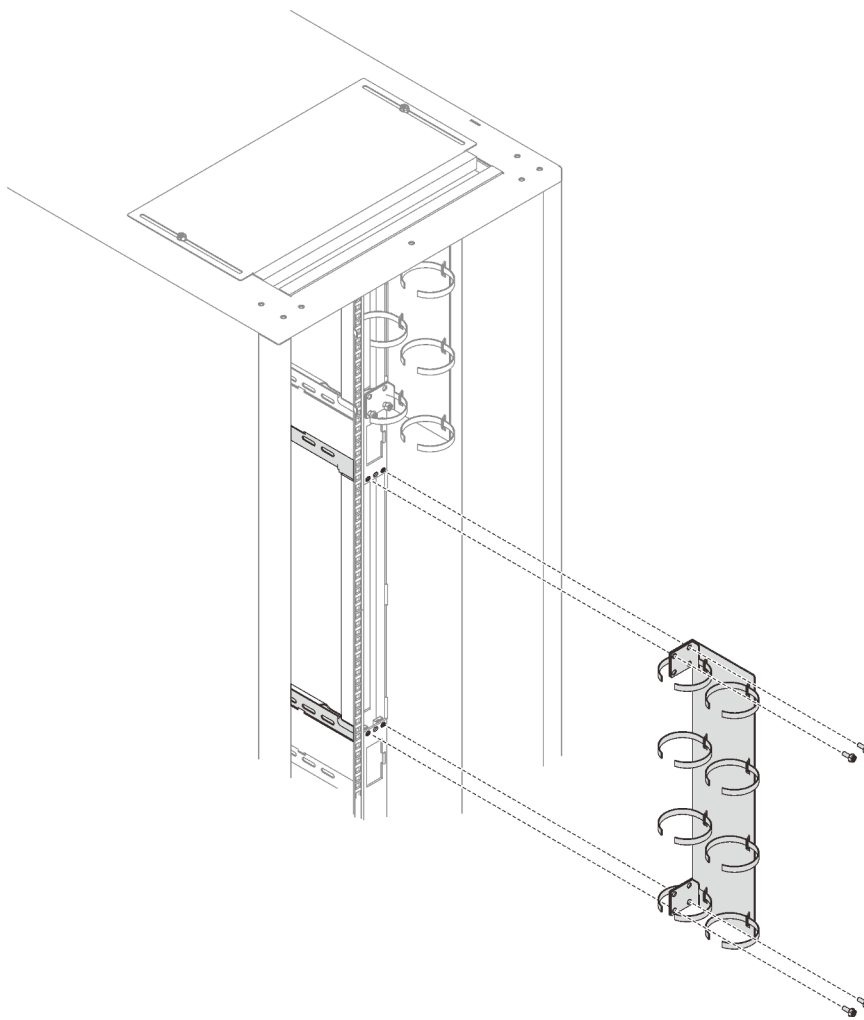


Figure 408. Removing a 21U front cable management bracket

## Remove a rear cable management bracket

- Step 1. Open the rear door, and release all the cables that are secured by the cable straps on the bracket.
- Step 2. Remove the four screws that secure the rear cable management bracket to the side pocket, and remove the bracket.



*Figure 409. Removing a rear cable management bracket*

## **Install a cable management bracket**

See this topic to learn how to install cable management brackets.

### **Install a 21U front cable management bracket**

#### **Procedure**

Step 1. Install six clip nuts, and secure the front cable management bracket with six screws.

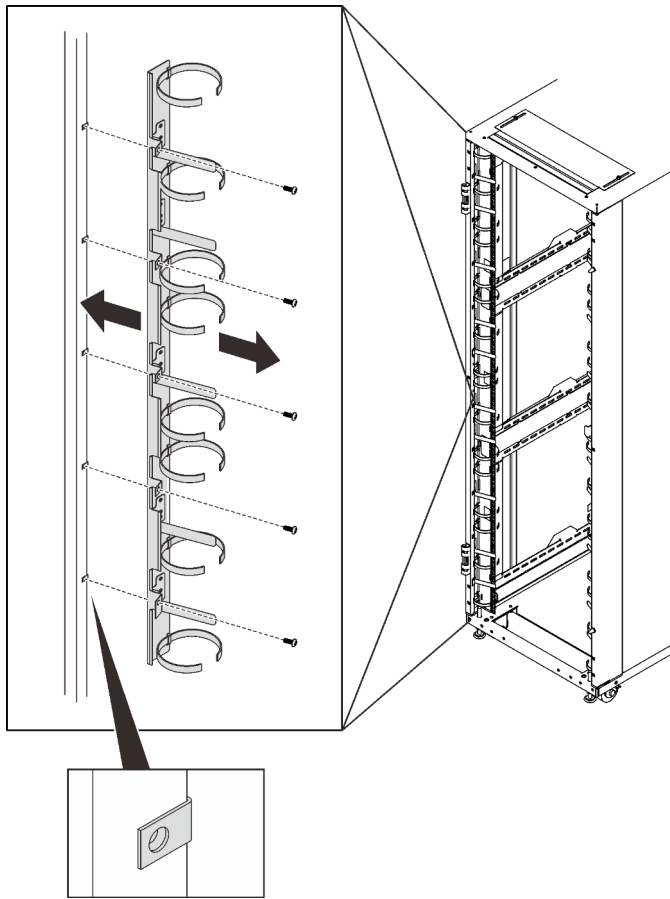
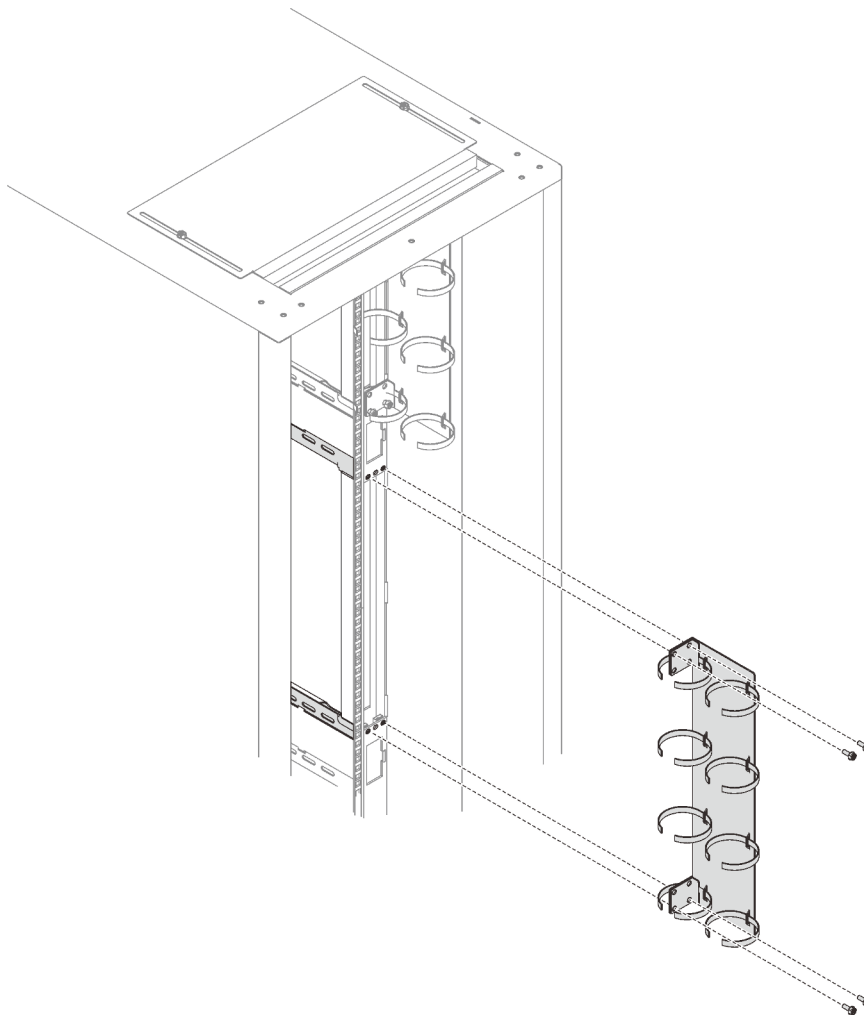


Figure 410. Installing a 21U front cable management bracket

## Install a rear cable management bracket

### Procedure

Step 1. Secure the rear cable management bracket to the side pocket with four screws.



*Figure 411. Installing a rear cable management bracket*

---

## Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about Lenovo products, you will find a wide variety of sources available from Lenovo to assist you.

On the World Wide Web, up-to-date information about Lenovo systems, optional devices, services, and support are available at:

<http://datacentersupport.lenovo.com>

**Note:** This section includes references to IBM web sites and information about obtaining service. IBM is Lenovo's preferred service provider for ThinkSystem.

---

### Before you call

Before you call, there are several steps that you can take to try and solve the problem yourself. If you decide that you do need to call for assistance, gather the information that will be needed by the service technician to more quickly resolve your problem.

#### Attempt to resolve the problem yourself

You can solve many problems without outside assistance by following the troubleshooting procedures that Lenovo provides in the online help or in the Lenovo product documentation. The Lenovo product documentation also describes the diagnostic tests that you can perform. The documentation for most systems, operating systems, and programs contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

You can find the product documentation for your ThinkSystem products at the following location:

<http://thinksystem.lenovofiles.com/help/index.jsp>

You can take these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- If you have installed new hardware or software in your environment, check <https://static.lenovo.com/us/en/serverproven/index.shtml> to make sure that the hardware and software is supported by your product.
- Go to <http://datacentersupport.lenovo.com> and check for information to help you solve the problem.
  - Check the Lenovo forums at [https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv\\_eg](https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg) to see if someone else has encountered a similar problem.

You can solve many problems without outside assistance by following the troubleshooting procedures that Lenovo provides in the online help or in the Lenovo product documentation. The Lenovo product documentation also describes the diagnostic tests that you can perform. The documentation for most systems, operating systems, and programs contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

#### Gathering information needed to call Support

If you believe that you require warranty service for your Lenovo product, the service technicians will be able to assist you more efficiently if you prepare before you call. You can also see <http://datacentersupport.lenovo.com/warrantylookup> for more information about your product warranty.

Gather the following information to provide to the service technician. This data will help the service technician quickly provide a solution to your problem and ensure that you receive the level of service for which you might have contracted.

- Hardware and Software Maintenance agreement contract numbers, if applicable
- Machine type number (Lenovo 4-digit machine identifier)
- Model number
- Serial number
- Current system UEFI and firmware levels
- Other pertinent information such as error messages and logs

As an alternative to calling Lenovo Support, you can go to <https://support.lenovo.com/servicerequest> to submit an Electronic Service Request. Submitting an Electronic Service Request will start the process of determining a solution to your problem by making the pertinent information available to the service technicians. The Lenovo service technicians can start working on your solution as soon as you have completed and submitted an Electronic Service Request.

---

## Contacting Support

You can contact Support to obtain help for your issue.

You can receive hardware service through a Lenovo Authorized Service Provider. To locate a service provider authorized by Lenovo to provide warranty service, go to <https://datacentersupport.lenovo.com/serviceprovider> and use filter searching for different countries. For Lenovo support telephone numbers, see <https://datacentersupport.lenovo.com/supportphonelist> for your region support details.

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