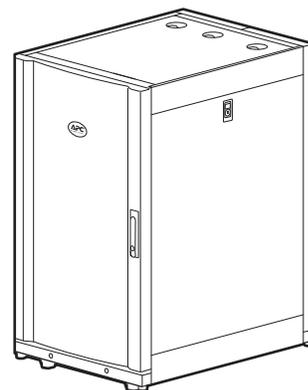


# Installation Manual

## NetShelter<sup>®</sup> 24 U AV Enclosure

AR3814





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# Introduction

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The American Power Conversion (APC®) NetShelter® AV Enclosure is a high-quality enclosure for storage of industry-standard (EIA-310), 19-inch rack-mount hardware, which includes servers, voice, data, networking, security, audio-visual, and APC power protection equipment.

Various accessories are mentioned in this manual. For complete details on any accessory, see the APC Web site, [www.apc.com](http://www.apc.com). To quickly find a part on the APC Web site, enter the part number in the Search field.

For additional information about this product, see the product page on the APC Web site, [www.apc.com](http://www.apc.com)

## Safety Warnings and Cautions

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Observe all Warnings and Cautions in this manual, plus the following.



**Tip Hazard:** This equipment is easily tipped. Use extreme caution when unpacking or moving.



**Heavy:** Use at least two people to unpack the enclosure.



**Warning:** To avoid damage or injury, do not use the roof as a walkway.

# Unpacking the Enclosure

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## Disclaimer

American Power Conversion is not responsible for damage sustained during reshipment of this product.

## Receiving inspection

Inspect the package and contents for shipping damage, and make sure that all parts were sent. Report any damage immediately to the shipping agent. Report missing contents, damage, or other problems immediately to APC or your APC reseller.

## Please Recycle



The shipping materials are recyclable. Save them for later use, or dispose of them appropriately.

## Procedure

1. Move the shipping pallet to a firm, level surface in an open area. Inspect for visible signs of shipping damage. If you detect shipping damage, contact APC Customer Support using the contact information on the back cover of this manual.
2. See the label on the packaging to determine where to cut the wrapping. Using sturdy shears or a utility knife, carefully remove the plastic stretch wrap surrounding the enclosure.
3. Remove the four cardboard corner protectors.
4. Remove and retain the two pallet-mounting brackets with mounting hardware that anchor the enclosure to the shipping pallet. Use a 13-mm wrench (not provided).



**Note:** Save the pallet-mounting brackets if you plan to bolt the enclosure to the floor.

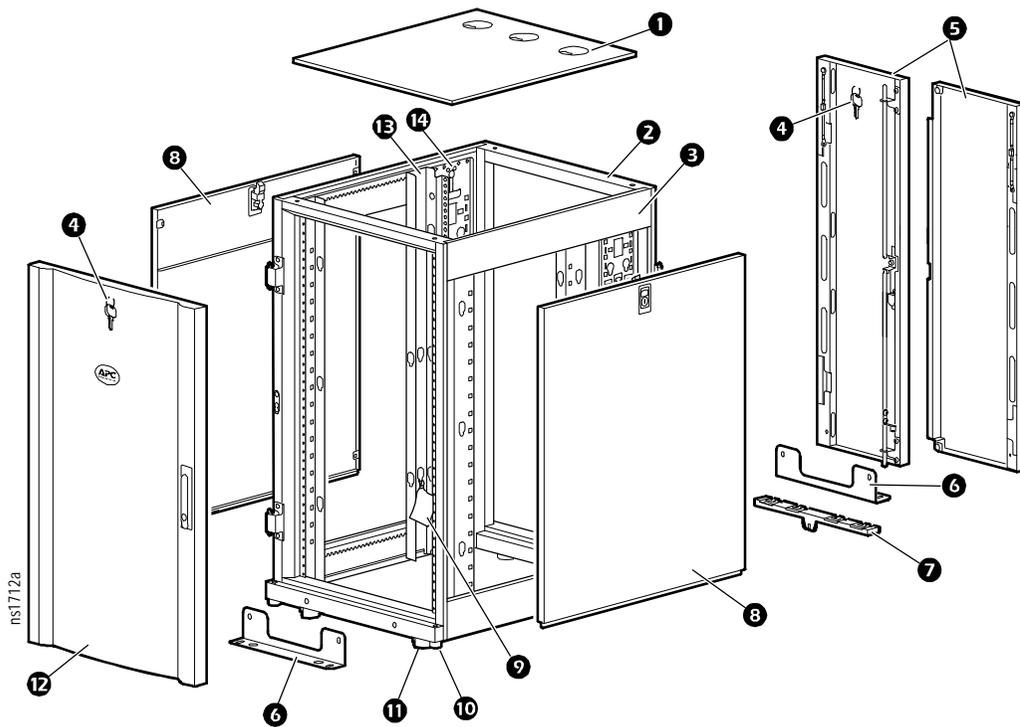
5. With one person on each side of the enclosure, carefully roll it toward the rear of the pallet until the rear casters clear the back edge of the pallet. Continue to slide the enclosure until the rear casters touch the floor.
6. While one person carefully tips the enclosure slightly away from the pallet, have the other person pull the pallet away from the enclosure. Set the enclosure gently on its casters.



**Warning:** Use caution when moving an empty enclosure on its casters; the enclosure may be unstable when pushed or pulled from the side. Push the enclosure from the front or back when moving it on its casters. For extra stability, load 158 kg (350 lbs) of equipment into the bottom of the enclosure before moving it on its casters.

# Component Identification

## Enclosure



- |   |                                      |   |  |
|---|--------------------------------------|---|--|
| ❶ | Roof with cable access (AR7214)      | ❸ | Removable side panel with lock (AR7376; Qty 2) |
| ❷ | Enclosure frame                      | ❹ | Hardware bag (see page 4)                      |
| ❸ | Side brace                           | ❺ | Adjustable leveling feet                       |
| ❹ | Key for doors and side panels        | ❻ | Caster   |
| ❺ | Removable rear split doors (WAR7104) | ❼ | Removable and reversible front door (WAR7004)  |
| ❻ | Pallet/bolt-down bracket             | ❽ | Vertical mounting rail                         |
| ❼ | Rear door cable containment bracket  | ❾ | Adjustable vertical 0 U accessory channel      |

## Hardware bag



TORX<sup>®</sup> T30/#2 Phillips wrench (1)



#10-32 screws (60)



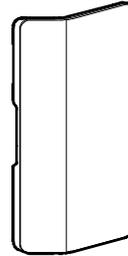
M5 x 12 screws (4)



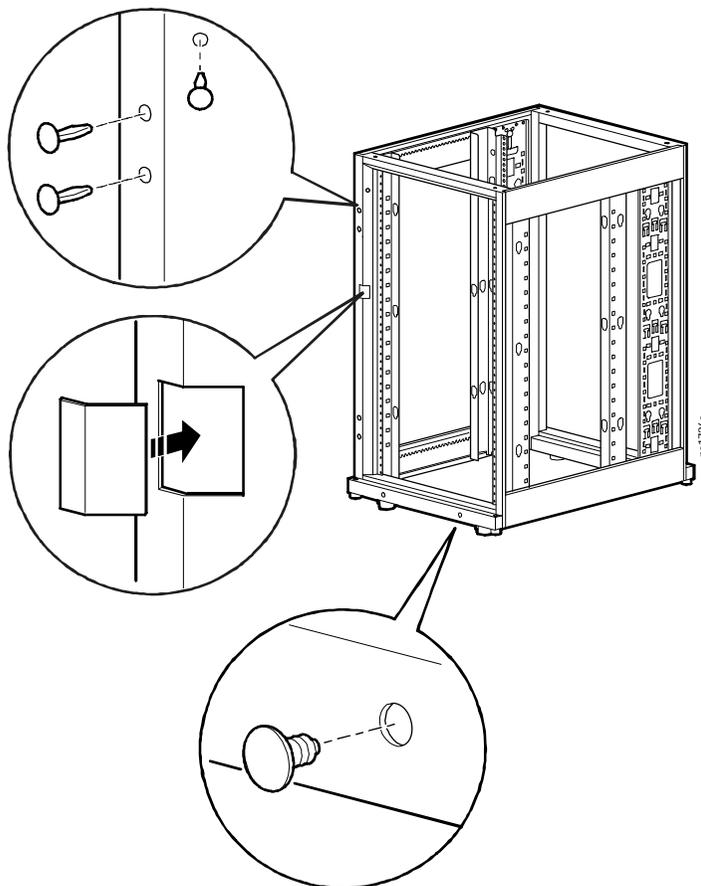
7-mm hole plugs (4)



5-mm hole plugs (5)



Frame handle cutout cover (2)

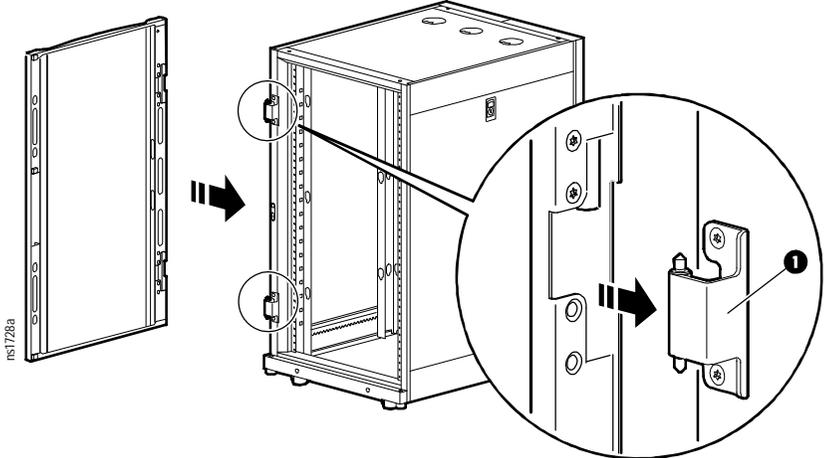


# Helpful Steps for Reinstalling a Door

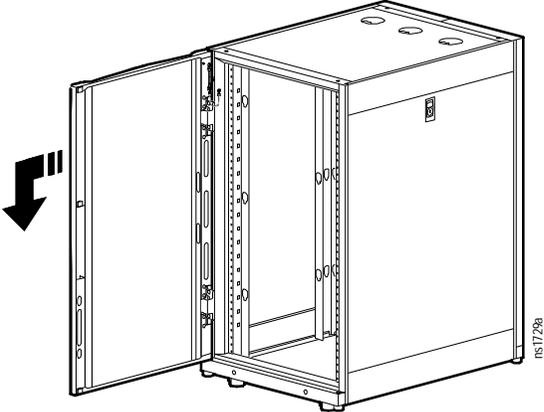


**Note:** Doors self-align on hinge pins when properly reinstalled.

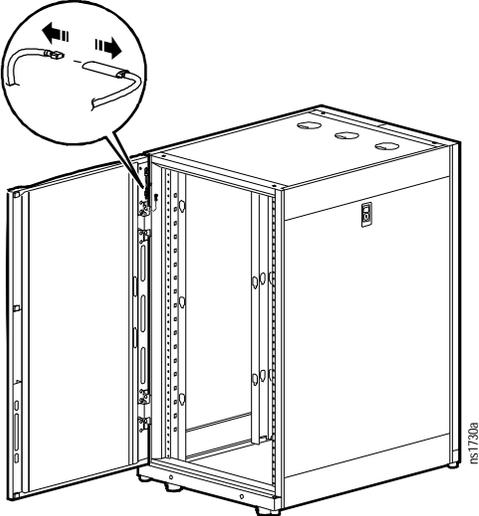
1. At a 90-degree angle to the front of the enclosure, position the door over the hinge pins (1).



2. Use slight pressure to pull the door away from enclosure; then lower the door

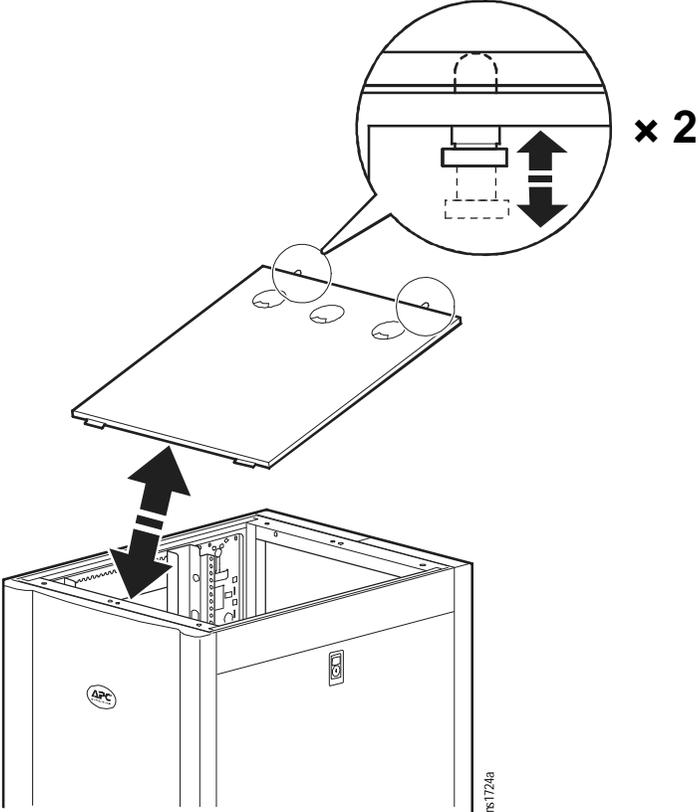


3. Connect the ground wire.



# Removing and Reinstalling the Roof

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# Enclosure Installation

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## Moving the Enclosure



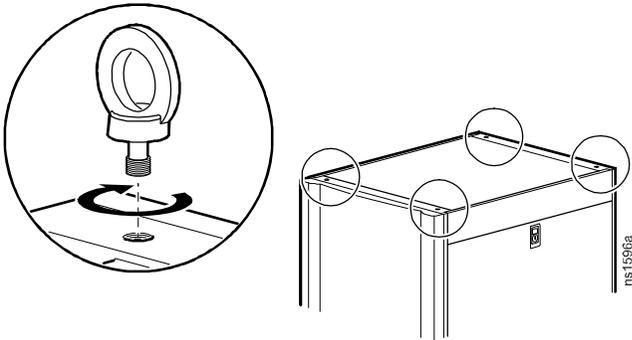
**Caution:** To avoid damaging the enclosure and causing a tip hazard, make sure the leveling feet are up before moving the enclosure.

**Casters.** The enclosure can be moved on its casters with up to 1021 kg (2,250 lbs) of equipment installed.



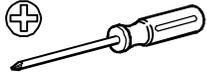
**Tip Hazard:** Use caution when moving an empty enclosure on its casters. Push the enclosure from the front or back only; the enclosure may be unstable if pushed or pulled from the side. For extra stability, load 158 kg (350 lbs) of equipment into the bottom of the enclosure before moving it on its casters.

**Eye bolts.** The enclosure can be lifted using eye bolts with up to 567 kg (1,250 lbs) of equipment installed. Use M10 eye bolts with a shoulder rated for 181 kg (400 lbs).

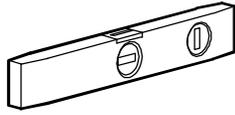


# Leveling the Enclosure

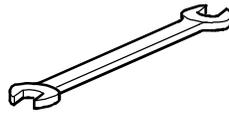
## Required tools:



Phillips screwdriver



Level

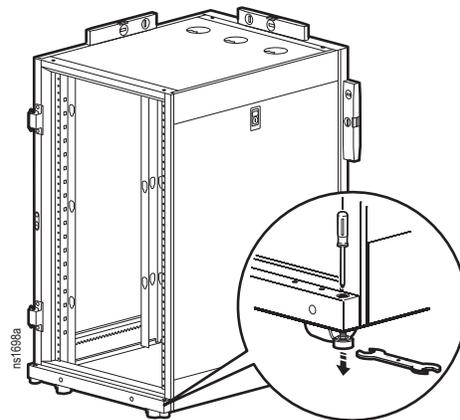


13-mm open-ended wrench



**Warning:** The leveling feet at the corners provide a stable base if the floor is uneven, but they cannot compensate for a badly sloped surface.

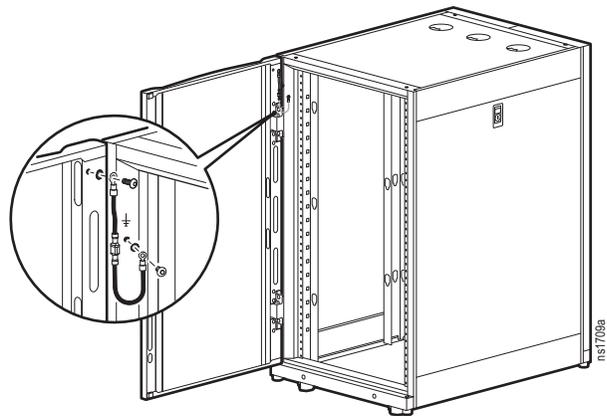
To adjust the leveling feet after equipment has been installed, use a 13-mm open-ended wrench (not provided).



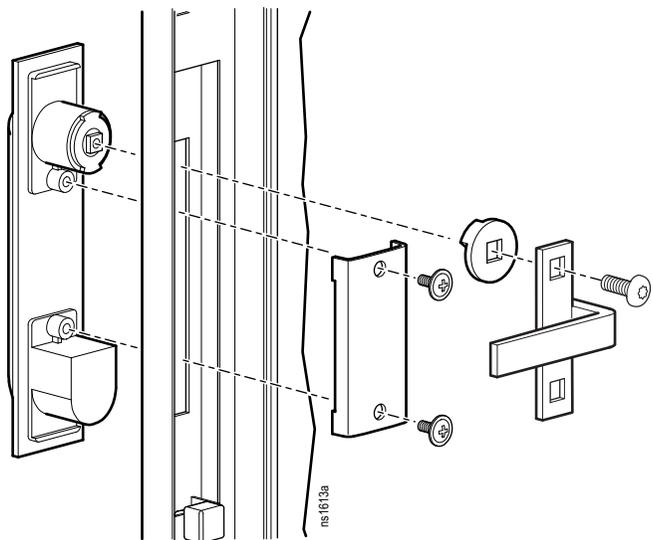
# Reversing the Front Door

If desired, you can reverse the front door so the door opens from the opposite side of the enclosure.

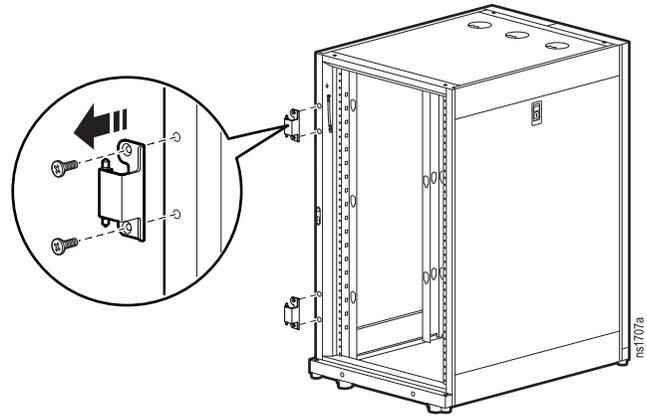
1. Remove the APC nameplate from the front door.
2. Remove the grounding wire using the TORX wrench (provided).



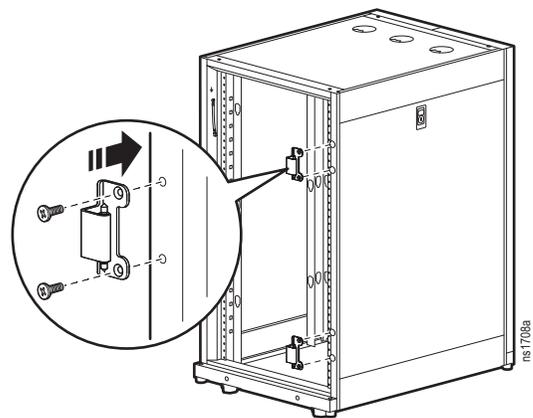
3. Remove the door handle assembly.



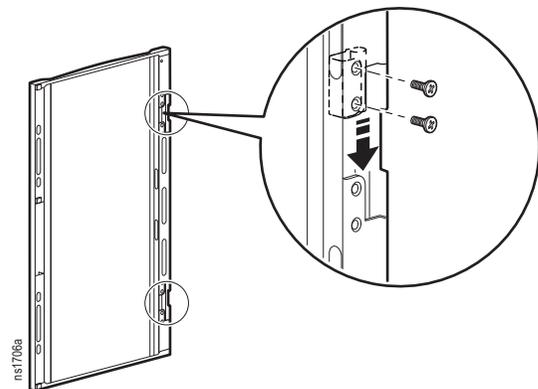
4. Remove the door.
5. Remove the hinges from the frame.



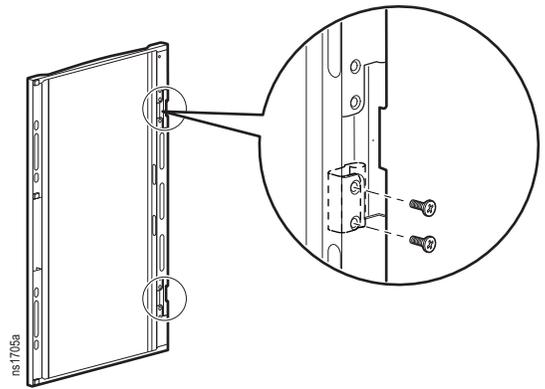
6. Reinstall the hinges on the opposite side of the enclosure.



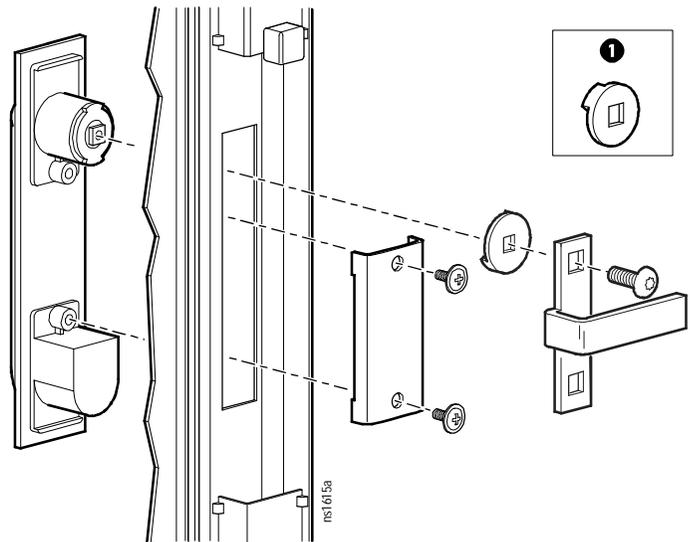
7. Remove screws securing the hinges in the door frame.



8. Reposition and reinstall hinge.
9. Reinstall the door.



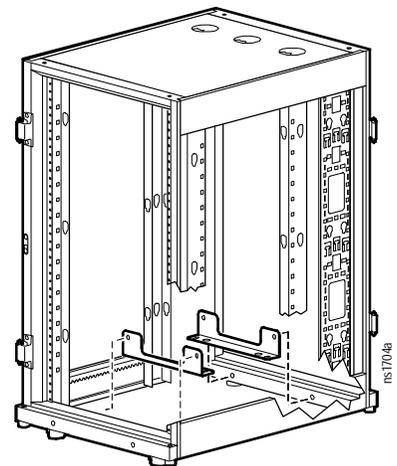
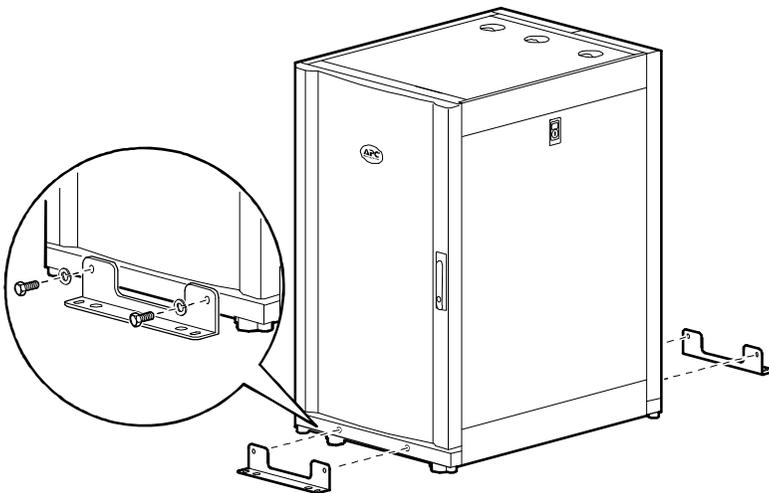
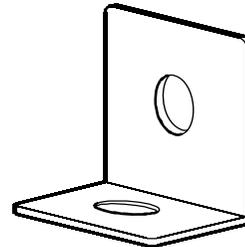
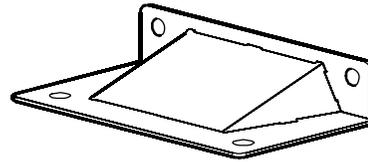
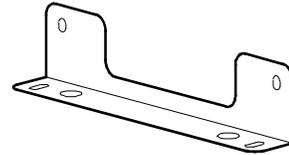
10. Reinstall the door handle assembly with the washer and latch oriented as shown. **The washer is rotated 90 degrees from its original orientation (1).**
11. Reinstall the grounding wire with star washer. **The star washer must be installed under the grounding wire (see step 2).**
12. Reinstall the APC nameplate on the front door.



# Securing the Enclosure

For additional stabilization, secure the enclosure to the floor. Use fastener locations on the outside or inside of the enclosure, and choose from the accessories shown below.

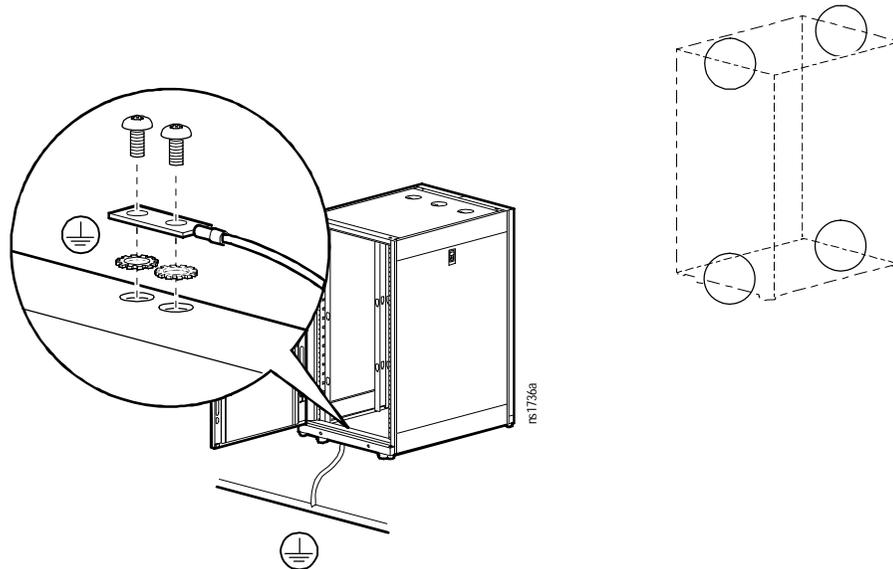
Accessory	SKU	Description
Pallet/bolt-down brackets	(provided with the enclosure; not available as a purchased part)	Attaches to rack and floor internally or externally to provide additional stability without blocking cable access.
NetShelter SX stabilizer plate	AR7700	Attaches externally to the rack and floor to provide additional stability.
Bolt-down kit	AR7701	Attaches to rack and floor internally or externally to provide additional stability without blocking cable access. Meets UBC Zone-4 seismic anchoring requirements.



# Grounding the Enclosure

Each enclosure should be grounded directly to the building ground using one of the designated grounding locations (two M6 threaded inserts) at the top or bottom of the enclosure.

- Use a Common Bonding Network Jumper kit (for example, Listed [KDER] Panduit RGCBNJ660PY or equivalent).
- Use paint-piercing washers between ground terminal and enclosure frame or remove paint on frame under ground terminals per NEC NFPA 70 Article 250.12.
- Torque screws to 6.9 N-m (60 in-lb).
- Do not ground one enclosure to another enclosure in a cascading style.



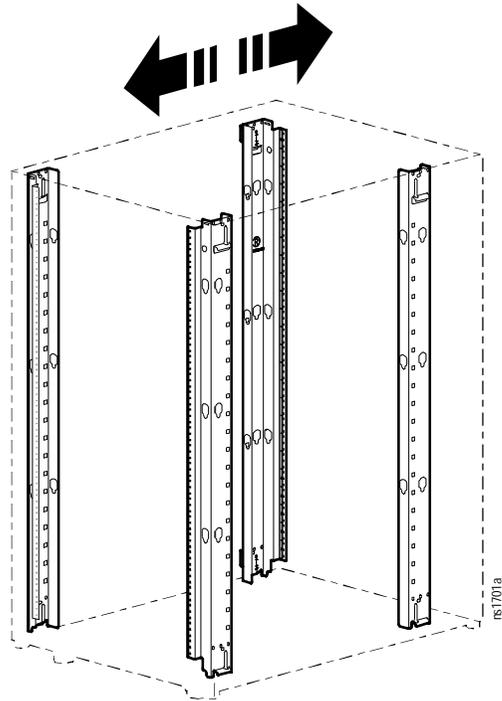
# Equipment Installation

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Installing equipment in the NetShelter AV Enclosure may require adjusting the vertical mounting rails to the correct depth for your equipment and then installing equipment.

## Adjusting the Vertical Mounting Rails

Audio-visual equipment is secured to the vertical mounting rails in the NetShelter AV Enclosure. The vertical mounting rails are adjustable to accommodate the depth of your AV equipment. The vertical mounting rails come factory-installed for use with AV equipment that has a depth of 508 mm (20 in). The vertical mounting rails can be adjusted to be as close together as 191 mm (7.50 in) or as far apart as 680 mm (26.8 in), when the vertical 0 U accessory channels have been removed.

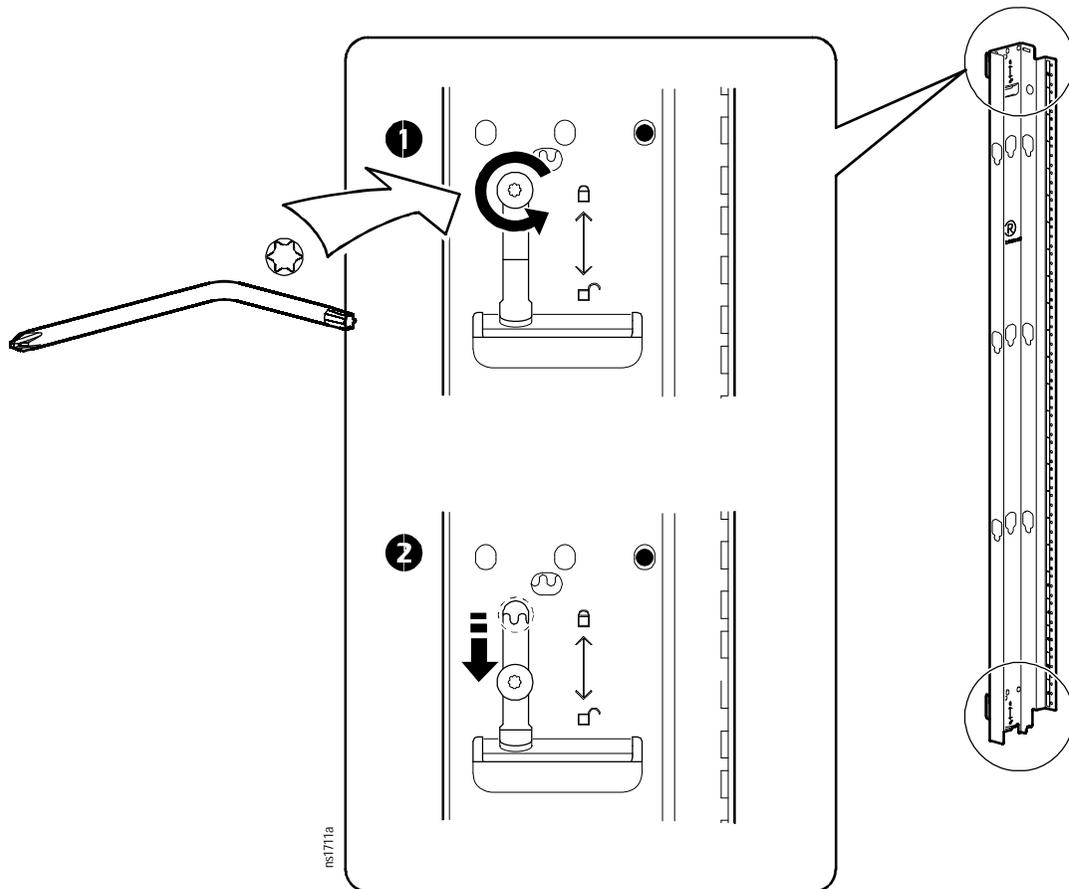


Perform the following steps to adjust a vertical mounting rail:



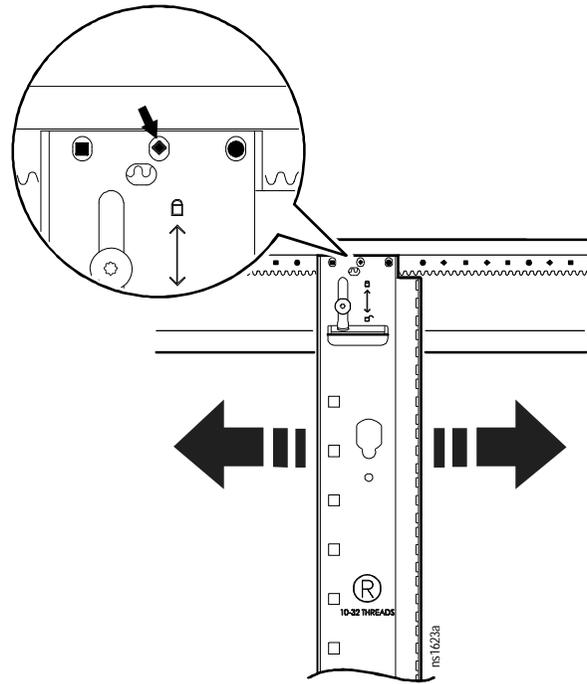
**Warning:** To avoid personal injury or damage to the enclosure, perform this procedure without any equipment installed on the vertical mounting rails.

1. Unlock the vertical mounting rail. Use the TORX wrench (provided in the hardware bag) to loosen the screw—but do not remove.

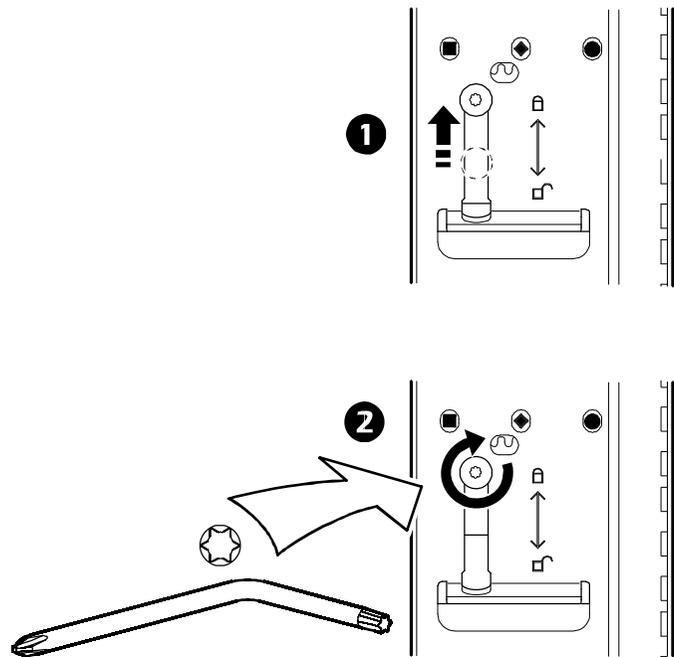


2. Move the vertical mounting rail to the desired location.
3. Check alignment. Note symbols (circle, triangle, or square) visible through the set of three holes at the top and bottom of the vertical mounting rail. Make sure the symbols match. If not, realign the vertical mounting rail.

- Vertical mounting rails adjust in 6-mm (1/4-in) increments.
- Make sure the vertical mounting rails on both sides of the enclosure are adjusted to the same depth. Verify that the same symbols are visible.



4. Lock top and bottom of the vertical mounting rail.



# Installing Equipment

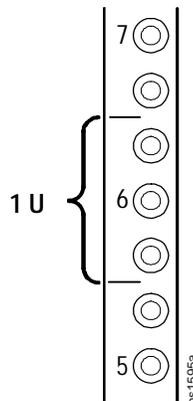


**Warning: To prevent the enclosure from tipping over after equipment installation:**

- Make sure you have secured the enclosure before installing equipment.
- Load the heaviest equipment first toward the bottom of the enclosure to prevent the enclosure from becoming top-heavy.
- Do not extend equipment on sliding rails until you have installed three or more pieces of similar-sized equipment or until you have installed the stabilizer plate or bolt-down brackets.
- Do not extend more than one piece of equipment on sliding rails at a time.

Before getting started, make sure you have adjusted the vertical mounting rails as needed. To install rack-mount equipment in the NetShelter AV Enclosure:

1. Review the equipment manufacturer's installation instructions.
2. Locate the top and bottom U-space on the vertical mounting rails. Every third hole on the mounting rails is numbered to indicate the middle of a U-space. A U-space consists of one of these numbered holes and one hole directly above and below it, as shown.



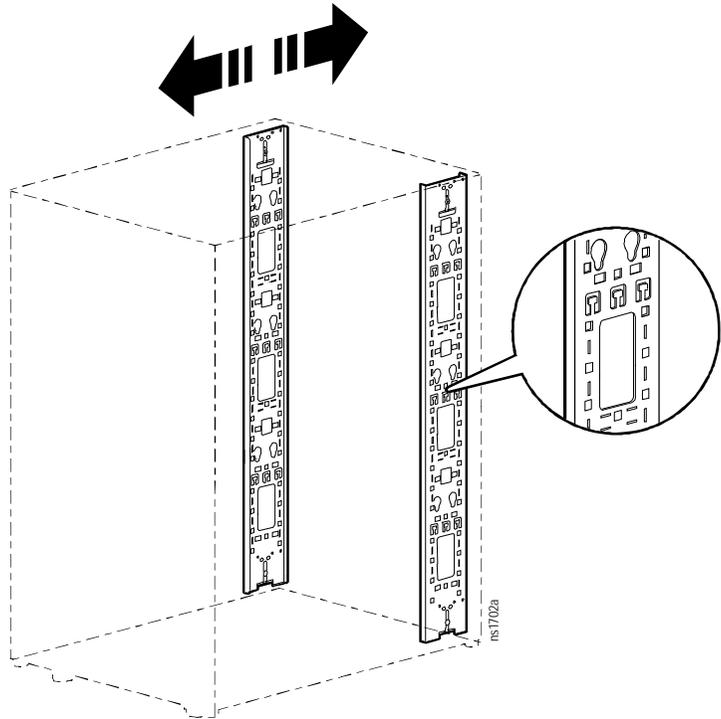
3. Install the equipment using the #10-32 screws (provided). See the manufacturer's instructions provided with the equipment for additional details.

# Cable Routing and Cable Management

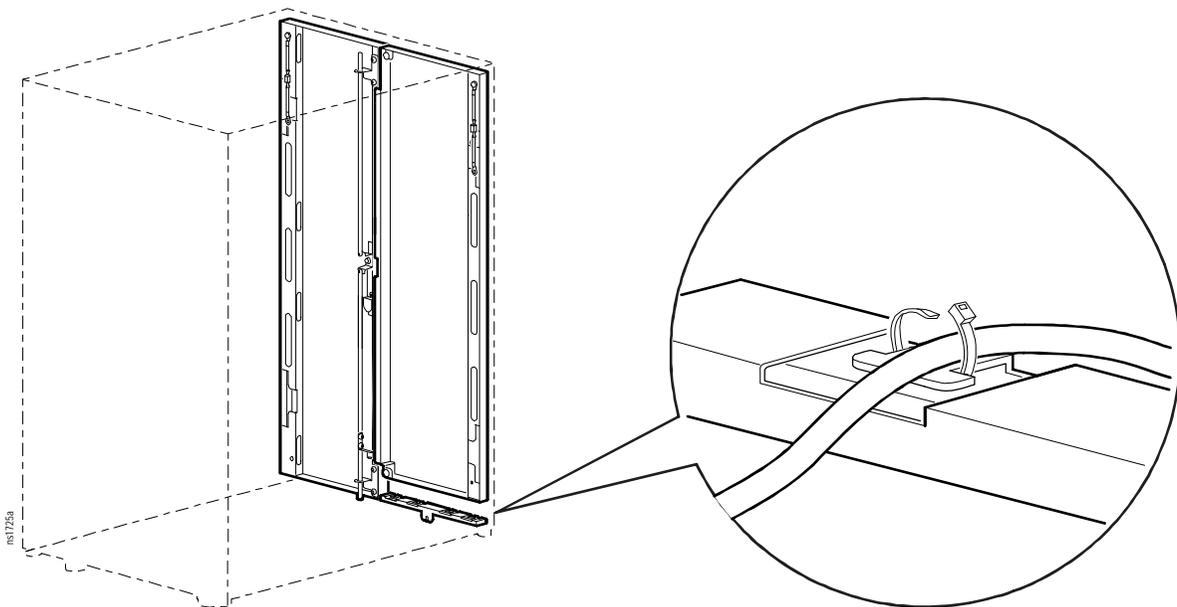
## Vertical 0 U Accessory Channels

The vertical 0 U accessory channels provide toolless mounting capabilities for APC Rack Power Distribution Units (Rack PDU) and APC cable management accessories (see page 19). The vertical 0 U accessory channels also provide tie-off locations for cables.

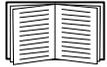
The vertical 0 U accessory channels can be re-located in the enclosure anywhere along the side braces. The standard position for the vertical 0 U accessory channels is in the rear of the enclosure, but they can be positioned anywhere along the side braces like the vertical mounting rails (see “Adjusting the Vertical Mounting Rails” on page 14).



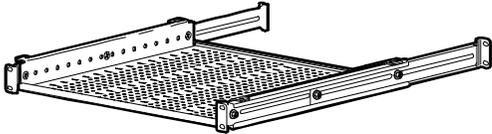
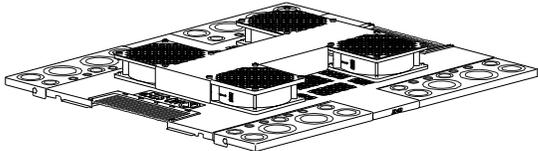
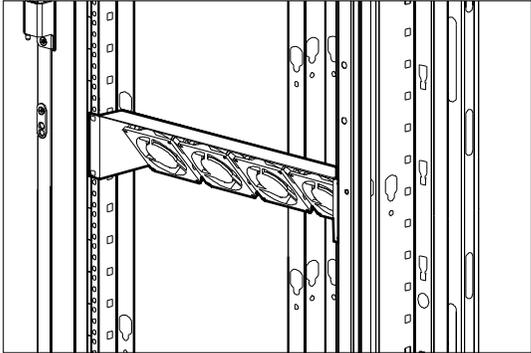
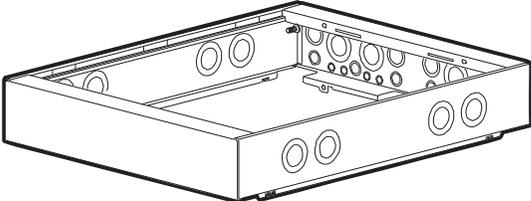
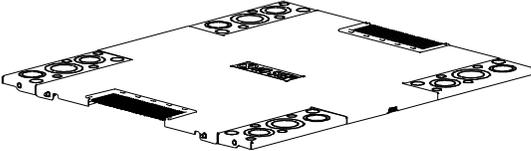
## Rear Door Cable Containment Bracket

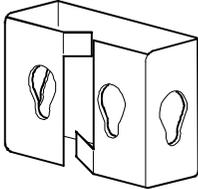
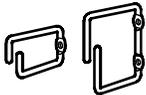


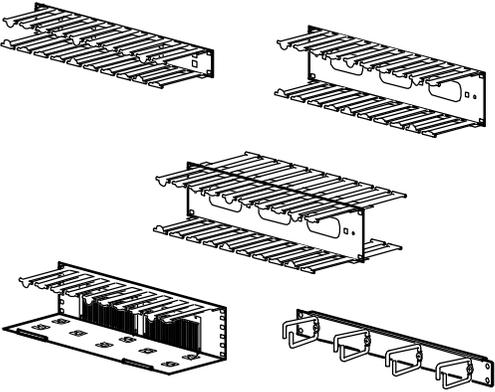
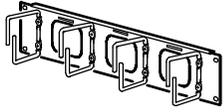
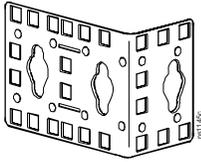
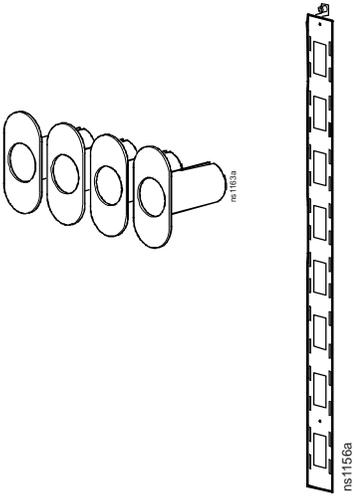
# Accessories



For additional information, see the product page on the APC Web site, [www.apc.com](http://www.apc.com).

Accessory	Part Number	Description	
Copper busbar	AR8395	20 U copper busbar for NetShelter AV enclosures.	
Shelf	AR8125	Adjustable, reversible shelf.	
115 VAC roof fan tray	ACF505	Includes four fans to pull heated air out of the enclosure.	
NetShelter AV 2 U rack fan panel	ACF600	Includes four fans for cooling AV equipment. Accessories include a temperature controller (ACF601), vent panel (ACAC40001), and vent panel with temperature display (ACAC40000).	
Top mount conduit access adapter	AR7215	Allows option to route cable into side of unit. Includes knock out panels for conduit.	
NetShelter AV enclosure roof	AR7213	Includes conduit knock-outs and brush strips for cable access.	

Accessory	Part Number	Description
Toolless hook and loop cable manager (Qty. 10)	AR8621	Includes ten 457-mm (18-in) hook and loop black cable straps that install in the square holes in the vertical 0 U accessory channel or the vertical mounting rail. 
Cable containment brackets (Qty. 6)	AR7710	Contains cables along the vertical 0 U accessory channel. Installs without tools. 
Vertical cable organizer	AR8442	Installs in a vertical 0 U accessory channels to facilitate vertical cable management and eliminates cable stress. Takes up zero U of space within the enclosure. Consists of two pieces of equal size that, when connected, span the height of a 42-U enclosure. Can be used in any APC enclosure. 
Cable management rings (Qty. 5 large and 5 small)	AR8113A	Fastens cables to posts, mounting rails, or braces. 

Accessory	Part Number	Description
19-inch horizontal cable organizers	AR8602 (1 U) AR8600 (2 U) AR8601 (2 U double sided) AR8603 (2 U high density) AR8425A (1 U) AR8426A (2 U)	Routes cables horizontally on the front or back of the 19-inch EIA enclosure. 
19-inch 2-U horizontal cable organizer pass-through	AR8428	Routes cables horizontally or front-to-rear. 
19-inch 1-U cable pass-through with brush strip	AR8429	Assists with containing air in the enclosure and providing an aesthetic solution for cable routing. 
Zero-U accessory mounting bracket (Qty. 2)	AR7711	Zero U multi-purpose accessory mounting bracket for 1 U and 2 U equipment, including Rack PDUs. 
Vertical fiber organizer	AR8443A	The vertical fiber organizer provides a method to manage fiber cabling within an enclosure and mounts toollessly into the vertical 0 U accessory channel. 

# Specifications

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Height	1199 mm (47.2 in)
Width	600 mm (23.6 in)
Depth	825 mm (32.5 in)
Net weight	81.65 kg (180 lb)
Total open area (front door)	345 808 mm <sup>2</sup> (536.0 in <sup>2</sup> )
Total open area (rear door)	375 870 mm <sup>2</sup> (582.6 in <sup>2</sup> )
Open area per U (front door)	14 406 mm <sup>2</sup> (22.3 in <sup>2</sup> )
Open area per U (rear door)	15 658 mm <sup>2</sup> (24.3 in <sup>2</sup> )
Perforation pattern percentage	69%
Percent of perforated area (front)	67%
Percent of perforated area (rear)	73%
Clearance (for wiring between front door and vertical rail)	61.0 mm (2.4 in)
Weight rating: static load <sup>†</sup>	1361 kg (3,000 lb)
Weight rating: rolling	1021 kg (2,250 lb)
Weight rating: shipping <sup>‡</sup>	567 kg (1,250 lb)

<sup>†</sup> Lower the leveling feet if the static weight is over 1020.58 kg (2,250 lb).

<sup>‡</sup> Additional packaging may be required if the enclosure is reshipped with equipment installed. See the APC Web site, [www.apc.com](http://www.apc.com), for details.

# APC Limited Factory Warranty

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The limited warranty provided by American Power Conversion (APC®) in this Statement of Limited Factory Warranty applies only to Products you purchase for your commercial or industrial use in the ordinary course of your business.

## Terms of Warranty

American Power Conversion warrants its products to be free from defects in materials and workmanship for a period of five years from the date of purchase. Its obligation under this warranty is limited to repairing or replacing, at its sole discretion, any such defective products. This warranty does not apply to equipment that has been damaged by accident, negligence, or misapplication or has been altered or modified in any way. Repair or replacement of a defective product or part thereof does not extend the original warranty period. Any parts furnished under this warranty may be new or factory-remanufactured.

## Non-transferable Warranty

This warranty applies only to the original purchaser who must have properly registered the product. Product may be registered at <http://www.warranty.apc.com>.

## Exclusions

APC shall not be liable under the warranty if its testing and examination disclose that the alleged defect in the product does not exist or was caused by end user's or any third person's misuse, negligence, improper installation or testing. Further APC shall not be liable under the warranty for unauthorized attempts to repair or modify wrong or inadequate electrical voltage or connection, inappropriate on-site operation conditions, corrosive atmosphere, repair, installation, start-up by non-APC designated personnel, a change in location or operating use, exposure to the elements, Acts of God, fire, theft, or installation contrary to APC recommendations or specifications or in any event if the APC serial number has been altered, defaced, or removed, or any other cause beyond the range of the intended use.

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  - **www.apc.com/support/**  
Global support searching APC Knowledge Base and using e-support.
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