# Installation and Customization

NetShelter<sup>™</sup> SX Cabinet

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by Schneider Electric

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# **Table of Contents**

Introduction.		1
Important Sa	fety Information	2
Safety	Instructions	3
Labels		3
Component I	dentification	4
Cabine	.t	4
	Hardware	-
	Tools provided	
	Illation	
	he Cabinet	
	he Equipment	
	e Cabinets	
	the Cabinet	
	the Cabinet	
Install Side P	anels, Roof and Doors	
	Side Panels	
	Roof	
	Door Installation	
	Reverse the Front Door	
Equipment In	stallation	15
Adjust	the Vertical Mounting Flanges	. 15
	Position the Vertical Mounting Flanges	
Install	Vertical Mounting Flange Adjustment	
Install	the Equipment	
	Cage nuts	
	Remove the Cable Cutout Covers	
Cable Manag	jement	21
Access	sory Channel	. 21
Specification	S	22
	ctory Warranty	
	Terms of warranty	
	Non-transferable warranty	23
	Exclusions	
	Warranty claims	24

# Introduction

The Schneider Electric NetShelter SX cabinets are high-quality cabinets for storage of industry-standard (EIA/ECA-310), 19 in. (483 mm) rack-mount hardware, which includes servers and voice, data, networking, internetworking, and power protection equipment.

This manual covers the general installation and the customization of the NetShelter SX Premium Datacenter Cabinets. Refer to the NetShelter SX specification manual for detailed measurements and ratings of specific models.

These cabinets are available in 600 mm (23.6 in.), 700 mm (27.6 in.), 750 mm (29.5 in.), and 800 mm (31.5 in.) widths. Optional vertical mounting flanges are available for the 750 mm (29.5 in.) and 800 mm (31.5 in.) cabinets to accommodate 23 in. EIA / ECA telecommunications equipment.

# **Important Safety Information**

Read the instructions carefully to become familiar with the equipment before trying to install, operate, service or maintain it. The following messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

## 

**DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

### A WARNING

**WARNING** indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

### A CAUTION

**CAUTION** indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

### CAUTION

**CAUTION**, used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, **can result in** equipment damage.

### NOTICE

**NOTICE** addresses practices not related to physical injury including certain environmental hazards, potential damage or loss of data.

## **Safety Instructions**

This manual contains important instructions that must be followed during the installation and customization of the cabinet.

### **WARNING**

#### TIP / HEAVY EQUIPMENT HAZARD

- This cabinet is easily tipped. Use extreme caution when unpacking or moving.
- At least two people are required to unpack and move the cabinet.
- Before moving the cabinet on its casters, load 158 kg (350 lb) of equipment into the bottom of the cabinet for extra stability.
- Make sure the leveling feet are up and push the cabinet only from the front or rear when moving the cabinet on its casters. Never push the cabinet from the sides.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

## Labels

Look for additional safety information affixed to the cabinet. See "Labels" on page 6 for more information.

# **Component Identification**

## Cabinet



- 1 Adjustable vertical 0 U accessory channel\*
- 2 Removable rear split doors
- 3 Removable side panel with lock
- Cabinet frame
- Adjustable leveling feet
- **6** Hardware bag (see page 5)

- Casters
- 8 Removable and reversible front door
- Key for doors and side panels
- Vertical mounting flanges
- Roof

Not shown: Cable Cutouts, 750 mm (29.5 in.) and 800 mm (31.5 in.) wide models only. See "Remove the Cable Cutout Covers" on page 20.

\* 1200 mm (47.24 in.) deep cabinets include four vertical 0U Accessory Channels.

#### Hardware











Plastic cup washer (60)

M6 x 16 Phillips M5 x 12 slot screw (60) Screw (4)

Cage nut (60)

7 mm (0.28 in.) hole plug (4)

**Tools provided** 



Torx<sup>®</sup> T30 / #2 Phillips tool

Cage nut tool (1)

# **Cabinet Installation**

## Move the Cabinet

## **WARNING**

#### **TIP HAZARD**

- This cabinet is easily tipped. Use extreme caution when unpacking or moving.
- At least two people are required to unpack and move the cabinet.
- Before moving the cabinet on its casters, load 158 kg (350 lb) of equipment into the bottom of the cabinet for extra stability.
- Make sure the leveling feet are up and push the cabinet only from the front or rear when moving the cabinet on its casters. Never push the cabinet from the sides.

Failure to follow these instructions can result in death, serious injury, or equipment damage.





**Labels:** The following labels can be found on the cabinet, and serve to communicate the following information:

Label **1**: Generic Tip Hazard

Label 2: Extend Slide-Mounted Hardware One Piece at a Time

**Casters:** The cabinet can be moved on its casters with up to 1 020.58 kg (2,250 lb) of equipment installed. Once in place, lower the leveling feet. With the leveling feet lowered, the static cabinet can be loaded to 1 704.97 kg (3,750 lb).

**NOTE:** Some labels on cabinet indicate caster related information. See label **3** to right.

**Eye bolts:** The cabinet can be lifted using eye bolts with up to 567 kg (1,250 lb) of

equipment installed. Use M10 eye bolts with a shoulder rated for 181 kg (400 lb).

**NOTE**: Use appropriate lifting hardware to assure straight-line pull on lifting eye bolts.



## Level the Equipment

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

Ensure the cabinet is in its intended location. Remove the front and rear doors. See "Door Removal" on page 12 for instruction.

**NOTE:** Before removing the front door, unplug the ground wires and any other wire connections that may interfere with the removal of the doors.

Insert a Phillips head screwdriver into the screw above the leveling foot. Turn the screw clockwise to extend the leveling foot until it makes firm contact with the floor.

#### NOTE:

- This method works best with an empty, or near empty, cabinet.
- A13 mm open ended wrench can also be used to lower the leveling feet if the cabinet is loaded with equipment.
- Door removal is not required if using the 13 mm open-ended wrench.

Adjust each foot and, using a level, adjust the feet until the cabinet is level and plumb.

Do not install the doors until after the cabinet is joined to others in the row



## Join the Cabinets

Join cabinets with the provided brackets to provide alignment and added stability. Cabinets may be joined with or without the side panels installed.

### A WARNING

#### TIP HAZARD

Joining cabinets provides limited stability to the cabinets. Secure the cabinet to the floor before installing equipment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

If installed, remove the front and rear doors. See "Door Removal" on page 12 for instructions.

Choose between 24 in. centers or 600 mm centers.

Align the cabinets and locate the joining brackets. There are two brackets on the front and two brackets on the back of each cabinet.

Cabinets are joined using a M5 x 12 countersunk screw, provided in the hardware bag. Using the Phillips head end of the provided tool or a similar tool, insert the screw into the designated hole and tighten.

Install the doors. See "Door Removal" on page 12 for instructions.



## **Ground the Cabinet**

## A DANGER

#### HAZARD OF ELECTRIC SHOCK

Connection of the cabinet to building Common Bonding Network (CBN) is required. Failure to follow these instructions will result in death or serious injury.

Each cabinet should be bonded directly to a common ground using one of the designated grounding locations (two M6 threaded inserts) at the top or bottom of the cabinet.

- Use a Common Bonding Network Jumper kit (for example, Listed [KDER] Panduit® RGCBNJ660PY or equivalent).
- Use paint-piercing washers between the ground terminal and the cabinet frame, or remove the paint on the frame under the ground terminals, per NEC NFPA 70 Article 250.12.
- Torque the screws to 6.9 N•m (60 lb-in.).



**Bonding Locations on the Cabinet** 

**NOTE:** If needed, additional functional grounding points are available at the top of the cabinet. Do not connect the building CBN to these functional grounding points.



## Secure the Cabinet

### **WARNING**

#### TIP HAZARD

Secure the cabinet to the floor before installing equipment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The cabinet can be bolted to the floor internally or externally, as shown below. See **www.apc.com** for a complete list of available stabilization options.

NOTE: Only use the stabilization accessories with the casters or leveling feet installed.

Accessory	Part Number	Description	
Pallet/bolt-down brackets	Provided	Attaches to the rack and floor, internally or externally, to provide additional stability without blocking cable access. Designed for use in low and moderate seismic regions.	
NetShelter SX stabilizer plate	Option (AR7700)	Attaches externally to the rack and floor to provide additional stability. Designed for use in low and moderate seismic regions.	C C C C C C C C C C C C C C C C C C C
Bolt-down kit	Option (AR7701)	Attaches to the rack and floor, internally or externally, to provide additional stability without blocking cable access. Designed for use in low and moderate seismic regions.	
High-seismic region bolt-down kit	Option (AR7701A-S)	Attaches to rack and floor, internally and externally, to provide additional stability without blocking cable access. With the appropriate mounting hardware, meets high seismic region (UBC Zone-4) requirements. <b>NOTE:</b> Not a substitute for racks designed to meet UBC Zone-4 requirements.	



# **Install Side Panels, Roof and Doors**

### Side Panels



#### **Door Removal**

- 1. Unlock the cabinet front door handle and open the door.
- 2. Disconnect the ground wire and any other wire connections that may interfere with the removal of the doors.



3. The hinges come apart by lifting upward and outward. Slowly lift and pull the door from the cabinet until the hinge pins on the door are free of the hinges on the cabinet frame.



#### **Door Installation**

- The doors self-align on hinge pins when properly installed. With the door at a 90 degree angle to the front of the cabinet, position the door over the hinge pins ①.
- 2. Slowly lower the door into the cabinet frame ensuring that the door hinges correctly align to the cabinet frame hinges.
- Connect the ground wire and any other wire connections. Reverse the Front Door





#### **Reverse the Front Door**

**NOTE:** The front door can be reversed so that the door opens in the other direction. This procedure assumes that initially, when facing the cabinet, the hinges are on the left and the door is opening from right.

1. Remove the handle by removing the screw-plate. Pull the handle from the door.

 Disconnect the ground wire, and any other wire connections. Remove the door from the frame. See "Door Removal" on page 12 for more information.





 Locate the upper hinge on the cabinet frame. Remove the two screws holding the hinge in place. Install the hinge onto the other side of the cabinet frame. Repeat this step for the lower hinge.



- Rotate the door ①. Remove the hinges ② from the door, and install them to the alternate hole location
  ③. The hinges on door should now align with the hinges on the cabinet.
- Install the door to the hinges now on the reverse side of the cabinet frame. See "Door Removal" on page 12 for instruction. Connect the ground wire and any other wire connections previously disconnected.



 Locate the lock handle. Remove the cam screw, cam washer, and cam.

> Rotate the cam washer 90 degrees, and the latch 180 degrees. Install the handle on the door.









# **Equipment Installation**

**NOTE:** NetShelter SX cabinets are intended for use with Listed equipment. If you install un-Listed equipment, you should evaluate the safety of your configuration.

## **Adjust the Vertical Mounting Flanges**



Vertical mounting flanges come factory-installed at 737 mm (29 in.), the proper location for use with rack-mountable equipment.

The mounting flanges are adjustable towards the front or the rear of the cabinet to accommodate different rails or equipment with other depths.

A common application for the 750 mm (29.5 in.) or 800 mm (31.5 in.) wide cabinet is to move the flanges to a depth of 476 mm (18.75 in.) to accommodate networking and telecommunications equipment.

#### **Position the Vertical Mounting Flanges**

- **Configuration 1:** The Accessory Channel is installed. The Vertical Mounting Flanges can be installed a minimum distance of (**a**) and can extend as far as (**b**).
- **Configuration 2:** The Accessory Channel is removed. The Vertical Mounting Flanges can extend as far as (c).



Cabinet Width (W)	Cabinet Depth (D)	а	b	С
600/700 mm	1070 mm	190 mm (7.5 in.)	781 mm (30.75 in.)	921 mm (36.25 in.)
750/800 mm	1070 mm	286 mm (11.25 in.)	781 mm (30.75 in.)	921 mm (36.25 in.)
600/700 mm	1200 mm	190 mm (7.5 in.)	781 mm (30.75 in.)	1035 mm (40.75 in.)
750/800 mm	1200 mm	286 mm (11.25 in.)	781 mm (30.75 in.)	1048 mm (41.25 in.)

### **WARNING**

#### FALLING EQUIPMENT

Remove all equipment installed on the vertical mounting flanges before performing any adjustments.

Failure to follow these instructions can result in serious injury or equipment damage.

1. Use the provided Torx T30 tool to loosen the top, middle, and bottom Torx screws To holding the vertical mounting flange in place. The brackets, all held in place by the Torx screws, will now be loose. Move all three brackets to the designated unlocked position Tot.

**NOTE**: The cabinets have different brackets. See the illustrations below.



600 mm wide cabinet 700 mm wide cabinet



750 mm wide cabinet 800 mm wide cabinet

2. Move the mounting flange to the desired location. Vertical mounting flanges adjust in 6 mm (1/4 in.) increments.

 To align the vertical mounting flange, note the symbol (for example, a diamond) visible through one of the three holes. Only one symbol will be visible. In the factory standard position, a circle symbol is visible.

Make sure the same symbol is visible through the corresponding hole at both the top and the bottom of the flange.



 When the vertical mounting flange is in the desired location at the top, middle, and bottom, raise the flat bracket to the lock position. The teeth in the bracket will engage fully with the teeth in the side brace ①. Tighten the Torx screws ②.

**NOTE**: On the 750 mm (29.5 in.) and 800 mm (31.5 in.) wide cabinets there are circle symbols 476 mm (18.75 in.) behind the front mounting flange. These circle symbols designate rear vertical mounting flange positions required for installation of particular networking and telecommunications equipment.



## Install the Equipment

### A WARNING

#### TIP HAZARD

- This cabinet is easily tipped. Make sure you have secured the cabinet to the floor before installing equipment.
- Install the heaviest equipment first and toward the bottom of the cabinet to prevent the cabinet from becoming top-heavy.
- Do not extend equipment on sliding rails until you have installed 158 kg (350 lb) of equipment into the bottom of the cabinet for stability 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.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

#### To install rack-mount equipment in the cabinet:

- 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.
- 3. Install the cage nuts on the interior of the vertical mounting rail; then install the equipment.

#### Cage nuts

APC by Schneider Electric offers a cage nut hardware kit (AR8100) for use with square holes.

## A CAUTION

#### FALLING EQUIPMENT HAZARD

Do NOT install cage nuts vertically with the ears engaging the top and bottom of the square hole.

Failure to follow these instructions can result in minor or moderate injury.

- Install cage nuts horizontally, with the ears engaging the sides of the square hole.
- Install the cage nuts on the interior of the vertical mounting rail.



6

#### Installation:

- 1. From inside of the cabinet, insert the cage nut into the square hole.
- 2. Hook one ear of the cage nut assembly through the far side of the hole.
- 3. Place the cage nut tool on the other side of the cage nut and pull to snap into position.

#### Removal:

- 1. Remove any attached screw.
- 2. Grasp the cage nut and squeeze the sides to release it from the square hole.





#### **Remove the Cable Cutout Covers**

NetShelter SX 750 mm (29.5 in.) and 800 mm (31.5 in.) wide cabinets include cable cutouts. For equipment requiring side airflow, on the side of the cabinet nearest the air intake for the equipment, remove the cable cutout covers from the front vertical mounting flange. Reinstall the covers in the cable cutout holes on the rear vertical mounting flange on the same side of the cabinet.



The NetShelter SX cabinet has multiple cable access openings, including on the roof, sides, and bottom. Route, secure, and organize cables using these openings.

In addition, two rear vertical 0U cable organizers, or accessory channels, are included with the cabinet. Further cable management accessories are available. Please go to **www.schneider-electric.com**, or contact a Schneider Electric reseller for more information.

## **Accessory Channel**

The accessory channels provide toolless mounting capabilities for Rack Power Distribution Units and cable management accessories.

There are four Accessory Channels included with the 1200 mm (47.24 in.) deep cabinet. There are two included with all other cabinets. The factory-default position for the accessory channels is in the rear of the cabinet, as shown in the graphic to the right.

The channels also provide tie-off locations for cables, as well as other specific holes for managing cables with many NetShelter brackets, fasteners, and toolless mounting equipment.

Similar to the mounting flanges, the accessory channel can be moved anywhere along the side braces. See "Adjust the Vertical Mounting Flanges" on page 15 for more instruction.

**NOTE:** If needed, the accessory channels can be removed. Additional vertical 0U accessory channels are available for order.



# **Specifications**

#### General specifications for SX cabinets:

(For detailed dimensions and weights refer to the NetShelter SX Specification manuals.)

U	mm	in.
42U	1 991	78.4
45U	2 124	83.6
48U	2 258	88.9
50U	2 347	92.4
52U	2 436	95.9
54U*	2 525	99.4

Width

mm	in.	
600	23.6	
700*	27.6	
750	29.5	
800	31.5	
* 700 mm models in Japan only		

Depui	De	pt	h
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mm	in.
1 070	42.1
1 200	47.2

\* 54U models have not been evaluated by UL.

Door Perforation pattern	69% open area
Clearance for wiring between front door and vertical rail	60.96 mm (2.40 in.)
Weight rating: static load <sup>1</sup>	1 704.97 kg (3,750 lb)
Weight rating: rolling <sup>2</sup>	1 020.58 kg (2,250 lb)

 $^1$  Lower the leveling feet if the static weight is over 1 020.58 kg (2,250 lb).  $^2$  Rolling rating valid only for rolling the cabinet into position.

NOTE: Additional packaging is required if the cabinet is being shipped with equipment installed. See the NetShelter SX product family page at www.apc.com for details on cabinets with shock packaging.

# **Five-Year Factory Warranty**

The limited warranty provided by APC by Schneider Electric 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

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